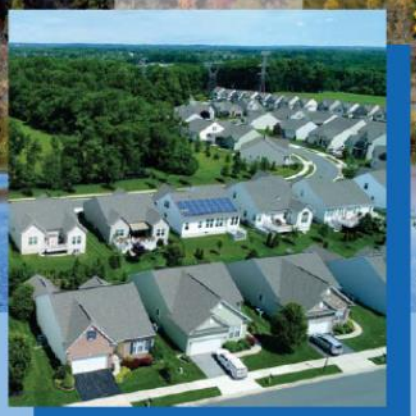
Delaware's Chesapeake Bay Watershed Implementation Plan



Phase 3 2 1

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DRAFT

Delaware's Phase III Chesapeake Bay Watershed Implementation Plan – DRAFT

Assembled by

Delaware's Chesapeake Bay WIP Steering Committee

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Abbreviations and Acronyms

Acronym/Abbreviation	Term
4R	Right Source of nutrients at the Right Rate and Right Time in the Right Place
AFO	animal feeding operation
BMP	best management practice
CAFO	concentrated animal feeding operation
CAST	Chesapeake Assessment Scenario Tool
CBIG	Chesapeake Bay Implementation Grant
CBP	Chesapeake Bay Program
CBRAP	Chesapeake Bay Regulatory and Accountability Program
CREP	Conservation Reserve Enhancement Program
CRP	Conservation Reserve Program
CSP	Conservation Stewardship Program
CWA	Clean Water Act
CWSRF	Clean Water State Revolving Fund
DALPP	Delaware Agricultural Lands Preservation Program
DDA	Delaware Department of Agriculture
DelDOT	Delaware Department of Transportation
DEN	Delaware Environmental Navigator
DE PSC	Delaware Public Service Commission
DFS	Delaware Forest Service
DNMC	Delaware Nutrient Management Commission
DNREC	Department of Natural Resources and Environmental Control
DSHP	Delaware Soil Health Partnership
DSSR	Delaware Sediment and Stormwater Regulations
DURMM	Delaware Urban Runoff Management Model
E3	every best management practice implemented by everyone, everywhere
EF	Environmental Finance Office
EFC	Environmental Finance Center
EPA	U.S. Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
FRAM	Flood Risk Adaptation Map
FSA	Farm Service Agency
FY	fiscal year
GIS	geographic information system
gpd	gallons per day
GWDS	Groundwater Discharges Section
IPA	Institute for Public Administration
KCD	Kent Conservation District
LAPG	local area planning goal
lbs	Pounds
lbs/year	pounds per year

M4RA	Mid-Atlantic 4R Nutrient Stewardship Association
MCM	minimum control measure
mg/L	milligrams per liter
MOA	Memorandum of Agreement
MS4	municipal separate storm sewer system
NCCD	New Castle Conservation District
NMP	nutrient management plan
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
OSPC	Office of State Planning Coordination
OWTDS	on-site wastewater treatment and disposal system
PLUS	Preliminary Land Use Service
ppm	parts per million
PSC	Principal's Staff Committee
PSN	Performance Standard Nitrogen
PSP	Performance Standard Phosphorus
RASCL	Resilient and Sustainable Communities League
RC&D	Resource, Conservation and Development 21st Century Fund
RCPP	Regional Conservation Partnership Program
SCD	Sussex Conservation District
SOP	Standard Operating Procedure
SRF	State Revolving Fund
TMDL	Total Maximum Daily Load
TN	total nitrogen
TP	total phosphorus
WIAC	Water Infrastructure Advisory Council
WIP	watershed implementation plan
WLA	wasteload allocation
WRC	Water Resource Center
WWTP	wastewater treatment plant

Executive Summary

Delaware has participated in the Chesapeake Bay Program (CBP) since signing a multijurisdictional Memorandum of Understanding in 2000, committing to achieving water quality goals to protect and improve the Bay and tributary waters. Since past CBP restoration goals have not yet been met, on May 12, 2009, President Obama signed Executive Order 13508, *Chesapeake Bay Protection and Restoration*, placing increased focus and heightened emphasis on Bay restoration. In addition to Executive Order 13508 being issued, Congress drafted legislation to reauthorize the CBP and federal, state, and local agencies called for more aggressive measures to improve water quality in the Chesapeake Bay. Before either of those initiatives could get underway, however, the U.S. Environmental Protection Agency (EPA) had already begun developing a total maximum daily load (TMDL) for nitrogen, phosphorus, and sediment for the entire six-state and Washington, D.C. area of the Chesapeake Bay watershed to address water quality impairments that had existed for decades.

As the largest estuary in the United States, the Chesapeake Bay is essential for the wellbeing of many living things. Not only is it an irreplaceable home for various bay-dwelling organisms, it is also an important resource for thousands of people. Pollutants entering the rivers and Bay have negatively affected the ecosystem's habitats and the economical situations of many people living in the watershed. In particular, nutrient pollution has been a concern in Delaware's Chesapeake Bay tributaries as decades of monitoring have revealed high levels of nutrients and low levels of dissolved oxygen, resulting in those waterways being included on the state's list of impaired waters under Section 303(d) of the Clean Water Act. Prominent signs of the pollution have included algal blooms and decaying algae. The coordinated effort led by EPA to develop a TMDL for the entire Chesapeake Bay watershed is the most recent attempt to correct these issues.

EPA's 2010 TMDL requires significant reductions in point and nonpoint pollutant loadings from all jurisdictions (the six states and DC) within the Chesapeake Bay watershed so that water quality standards can be achieved. As part of the TMDL, each jurisdiction is required to develop a series of three watershed implementation plans (WIPs) that detail how load allocations will be achieved and maintained now and in the future. Phase I and Phase II WIPs were submitted to EPA in November 2010 and March 2012, respectively. The Phase III WIPs describe refined actions and controls to be implemented between 2018 and 2025 to achieve the applicable nitrogen and phosphorus water quality standards. Jurisdictions must identify actions that are available to be implemented by 2025.

To ensure that Delaware is able to adhere to EPA's requirements for developing the WIPs, the Delaware Department of Natural Resources and Environmental Control convened the state's Chesapeake Interagency Workgroup to address the situation. The group was made up of representatives from the departments of Natural Resources and Environmental Control, Agriculture, and Transportation; the Office of State Planning Coordination; county conservation districts; the U.S. Department of Agriculture; and other key stakeholders. For the Phase III WIP, the workgroup was reconfigured into the overarching Chesapeake Bay WIP Steering Committee and two sector steering committees—the Developed Sector WIP Steering Committee and the Agricultural Sector WIP Steering Committee—to address the issues involved in developing the Phase III WIP. Each committee brought together stakeholders with interests and expertise in specific areas of the WIP to streamline the development process.

Committees were tasked with recommending, reviewing, and sub-allocating methodologies to the various point and nonpoint sources within the sectors; assessing current data tracking and reporting systems; determining maximum implementation goals and methods to fill program and funding gaps; and assisting with providing input and writing sections of the WIP. The committees also communicated proposed actions to the respective stakeholder groups and solicited their input on WIP elements.

This document is the final phase of Delaware's Chesapeake Bay WIP and outlines actions and programs through which Delaware will achieve the Chesapeake Bay TMDL requirements and additional EPA expectations discussed in the Introduction (Section 1). The CBP provided the jurisdictions with updated state planning targets in July 2018 based on corrections and modifications made to the Phase 6 Chesapeake Bay Watershed Model. Delaware's state targets were 4.55 million lbs/year total nitrogen and 0.108 million lbs/year total phosphorus, which Delaware's WIP Steering Committee divided by sector into local area planning goals for each of the three counties, New Castle, Kent, and Sussex.

Chesapeake Loads	Target (million lbs/year)	Phase III WIP (million lbs/year)
Nitrogen	4.55	4.462
Phosphorus	0.108	0.081

Significant changes and updates incorporated into the Phase III WIP include the following:

- The grouping of wastewater, on-site wastewater, and urban/suburban stormwater into the Developed Sector, while agriculture and restoration were grouped into the Agricultural Sector.
- Best management practice implementation levels that will meet Delaware's 2025 nutrient planning targets, along with comparisons to 2017 progress, potential funding sources, and identification of challenges to meeting the 2025 goals.
- Revisions, additions, and improvements have been made to available programs, funding sources, and best management practices.
- Separate sections have been added to specifically address local engagement, climate change, co-benefits, accounting for growth, and the Conowingo Dam.

Delaware's Chesapeake Bay WIP Steering Committee recognizes that EPA expects an innovative plan that expands on accomplishments since the Phase II WIP. The Committee has thoroughly evaluated a variety of scenarios, utilizing different practices, but most are not deemed feasible. Since the Phase II WIP, Delaware has achieved many successes such as updated sediment and stormwater regulations, updated on-site wastewater regulations, increased oversight of regulated communities (concentrated animal feeding operations, industrial stormwater, municipal separate storm sewer systems), new initiatives to increase voluntary agricultural practices, and assisting beginning farmers with new poultry operations.

Notable changes to the implementation strategy for the Developed Sector include a decrease in the total nitrogen goal for the five wastewater facilities in Sussex County. The current nutrient loads form these facilities are below the Phase II WIP Goals, therefore, the Phase III WIP Goals were decreased, while leaving room to allow for future growth. The Developed Sector also saw the revision of Delaware's Sediment and Stormwater Regulations and Regulations Governing the Design, Installation and Operation of On-Site Wastewater Treatment and Disposal Systems since the completion of the Phase II WIP. The revised Delaware Sediment and Stormwater Regulations focus on runoff reduction practices, which are expected to minimize stormwater loads from new development.

The revised Regulations Governing the Design, Installation and Operation of On-Site Wastewater Treatment and Disposal Systems address anticipated new or increased nutrient loads from on-site wastewater systems. The design and level of treatment requirements in the on-site wastewater regulations are more stringent than EPA's recommendations.

Notable changes to the implementation strategy for the Agricultural Sector include a decrease in the goal for forest buffers and an increase in cover crops and nutrient management. The Phase II WIP forest buffer goals were found to be unrealistic because of cost, landowner interest, and the number of acres available for implementation. The Phase III WIP focuses on cover crops and nutrient management to account for the loss in forest buffer area. Farmers are being encouraged to plant cover crops (small grain or mixed cover) on every eligible acre. Delaware is launching a new cost-share program in combination with cover crop programs sponsored by the Natural Resources Conservation Service to promote the increase in cover crops. The request for additional cost-share funding for the cover crop program is expected to be included in the FY2020 Governor's budget. Delaware also has a new protocol for auditing nutrient management practices.

Core nutrient management is a requirement of Delaware's Nutrient Management Law and has been reported annually to track progress in the Chesapeake Bay watershed, but enhanced levels of nutrient management practices are not currently captured. New compliance procedures are expected to capture and verify the enhanced levels of nutrient management (nitrogen and phosphorus placement, rate, and timing) over the core level.

Delaware developed the *Nonpoint Source Best Management Practice Implementation Data Quality Assurance and Verification Plan* (DNREC 2018b) in 2015 to improve their processes for tracking, reporting and verifying best management practices implemented in Developed and Agricultural sectors in the Chesapeake Bay watershed and throughout the state. The plan was most recently updated in November 2018.

Discussions on local engagement, co-benefits and climate change are completely new to the Phase III WIP. Delaware has built upon the relationships forged during the development of the Phase II WIP and worked with multiple stakeholders at the federal, state, county and municipal level to develop the goals for the Phase III WIP. Local stakeholders involved in the process included representatives from the city of Seaford, New Castle, Kent, and Sussex county conservation districts, non-profit organizations, agribusinesses, Delaware Department of Agriculture, Delaware Department of Natural Resources and Environmental Control, Delaware Department of Transportation, Delaware Office of State Planning Coordination, University of Delaware Water Resource Center, University of Delaware Cooperative Extension, Natural Resources Conservation Service, Maryland Agriculture Associates, and local farmers.

The best management practices included in Delaware's Phase III WIP were chosen based on cost-effectiveness and ease of implementation because of existing and potential funding and landowner interest. Delaware has also identified the co-benefits provided by each of the chosen best management practices. The selected best management practices will help Delaware meet the water quality goals of the Chesapeake Bay TMDL, while also achieving additional benefits such as climate adaptation, flood control, biodiversity and improved habitat.

Finally, the Phase III WIP includes programmatic efforts to address climate change. Numeric goals will be developed at a later date. The CBP provided Delaware with modeled nutrient load projections due to climate change in July 2018. Preliminary numeric load targets due to 2025 climate change for Delaware are 0.397 million lbs total nitrogen and 0.006 million lbs total phosphorus. Delaware is committed to addressing the causes and consequences of climate change, including reducing vulnerability to climate impacts and reducing greenhouse gas emissions that drive global climate change.

Delaware understands there are still challenges ahead but feels that the Phase III WIP accurately represents the intentions of the Developed and Agricultural Sectors to attain EPA's assigned planning targets.

Delaware would like to investigate additional practices for inclusion in the Chesapeake Bay Watershed Model in an effort to incorporate innovative practices. For example, explore the opportunities to run shallow groundwater wells to draw nutrient rich water for irrigation under nutrient management plans.

Delaware continues to explore new programs and innovative financing strategies in an effort to fund practices:

- Expansion of State Revolving Fund funding to urban best management practices;
- Expansion of the Watersheds Program in the new Farm Bill; and
- Creative solutions to support underfunded priority practices such as cover crops.

Delaware will use the information in the Phase III WIP to continue its efforts to meet the nutrient goals of the Chesapeake Bay TMDL. The Phase III WIP goals will be used to identify the most cost-effective practices to implement as well as identify locations for implementation that have the biggest impact on improved water quality in the watershed.

1 Introduction

The 2010 Chesapeake Bay Total Maximum Daily Load (TMDL) identified the reductions of the pollutants nitrogen, phosphorus, and sediment across the seven jurisdictions in the Chesapeake Bay watershed—Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia, and the District of Columbia—and set pollution limits necessary to meet applicable water quality standards in the Bay and its tidal rivers and embayments (DCIW 2012). The Chesapeake Bay Partnership recently completed a midpoint assessment of the 2010 TMDL (2017 Progress). This Phase III watershed implementation plan (WIP) is Delaware's response to the midpoint assessment.

The U.S. Environmental Protection Agency (EPA) set expectations for the seven jurisdictions to develop WIPs that would demonstrate reasonable assurance that the allocations the 2010 Chesapeake Bay TMDL assigned to them would be achieved and maintained (EPA 2018). Since developing WIPs is a complicated, multilayered process that involves coordination and communication among various stakeholders, EPA allowed the jurisdictions to adopt a three-phase approach to the process (Phases I, II, and III). EPA set expectations for the Phase I and Phase II WIPs in 2009 and 2011, respectively. In June 2018, the Agency set additional expectations for the jurisdictions' Phase III WIPs. The goals of the Phase III WIP are to maintain accountability in the implementation efforts under the 2010 Chesapeake Bay TMDL, encourage continued efforts to apply adaptive management to the new information generated during and after the TMDL 2017 midpoint assessment, and lay the groundwork for implementing the next generation of innovative practices (EPA 2018).

Final Phase I and Phase II WIPs were submitted to EPA in November 2010 and March 2012, respectively, and the final Phase III WIP is due to EPA in August 2019. The Phase III WIP describes refined actions and controls to be implemented between 2018 and 2025 to achieve applicable water quality standards.

The Phase III expectations are directed toward ensuring that the seven jurisdictions and their local, regional, and federal partners have all practices in place by 2025 that will achieve the Chesapeake Bay's dissolved oxygen, water clarity/submerged aquatic vegetation, and chlorophyll *a* standards (through reductions of nitrogen and phosphorus).

EPA is asking Delaware and each of the other six jurisdictions to include the following content in their Phase III WIPs:

- Programmatic and numeric implementation commitments between 2018 and 2025 needed to achieve Phase III WIP planning targets;
- Comprehensive strategies for engagement of the full array of local, regional, and federal partners in implementing the WIP;
- Local planning goals below the state-major basin scales and in the form best suited for directly engaging local, regional, and federal partners in implementing the WIP; and
- Commitments to address changed conditions resulting from Conowingo Dam infill, growth, and climate change.

This document focuses on the requirements of the Phase III WIP for the state of Delaware. Figure 1-1 shows the location of the entire Chesapeake Bay watershed across the seven bay jurisdictions as well as the portion of Delaware in the watershed. Delaware consists of three counties: New Castle, Kent, and Sussex. Only a portion of each county— 29,838 acres (10%), 131,206 acres (33%), and 291,241 acres (50%), respectively—falls within the Chesapeake Bay watershed. The land use in the Delaware portion of the watershed is primarily agricultural (40%) and natural areas (46%) with a smaller amount of developed land (14%) (Figure 1-2 and Figure 1-3). The Chesapeake Bay Program (CBP) has developed a land-use scenario for the Phase III WIP that represents expected land-use changes by 2025. The Phase III WIP scenario is based on current zoning in the watershed with any projected growth directed toward areas zoned for it. Section 6, Accounting for Growth, presents the 2025 land-use scenario used for developing the Phase III WIP.

The municipalities in the watershed include a portion of Middletown in New Castle County; Farmington, a portion of Harrington, and Hartly in Kent County; and Bethel, Blades, Bridgeville, Delmar, Ellendale, Georgetown, Greenwood, Laurel, and Seaford in Sussex County (Figure 1-4). Middletown is the largest Delaware town in the Chesapeake Bay watershed with a population of 22,000 (Census Bureau 2017); however, only the western and more rural portions of the town fall within the watershed. The largest municipality in Sussex County is Seaford with a population of 7,750, while Hartly is the smallest with a population of 74 (Census Bureau 2017). Sections 1 and 2 of *Delaware's Phase II Chesapeake Bay Watershed Implementation Plan*, provide more detailed information on the history of the Chesapeake Bay TMDL, a description of the Chesapeake Bay watershed, and more information on the Phase I and II WIPs (DCIW 2012).

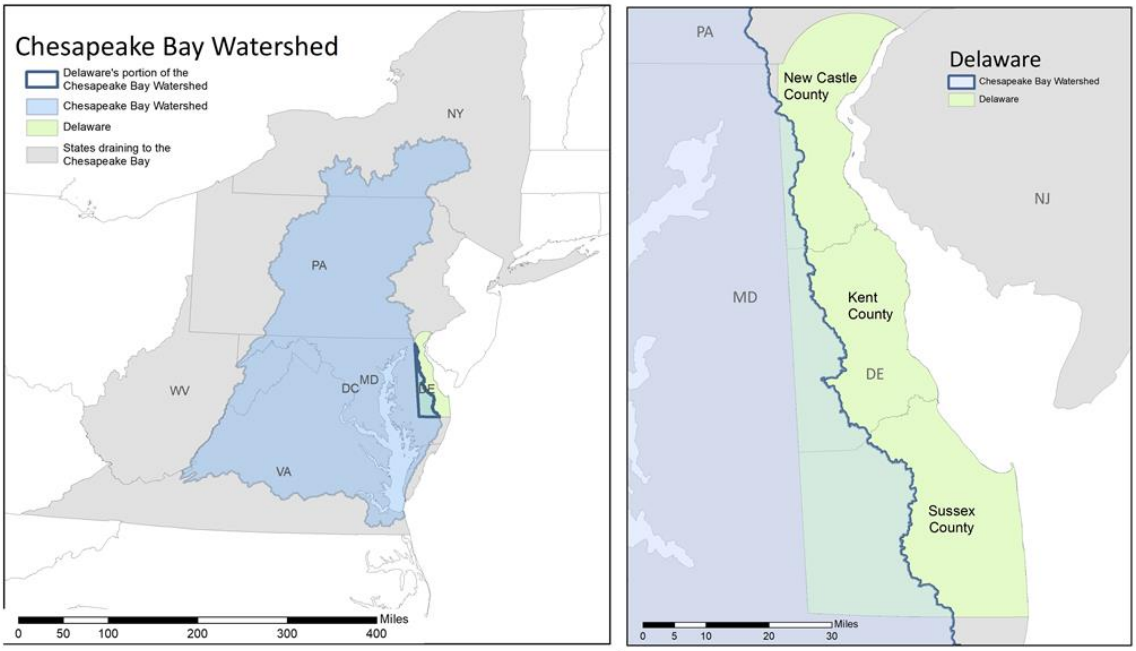

Figure 1-1. Location of the Chesapeake Bay watershed and the portion of Delaware in the watershed.

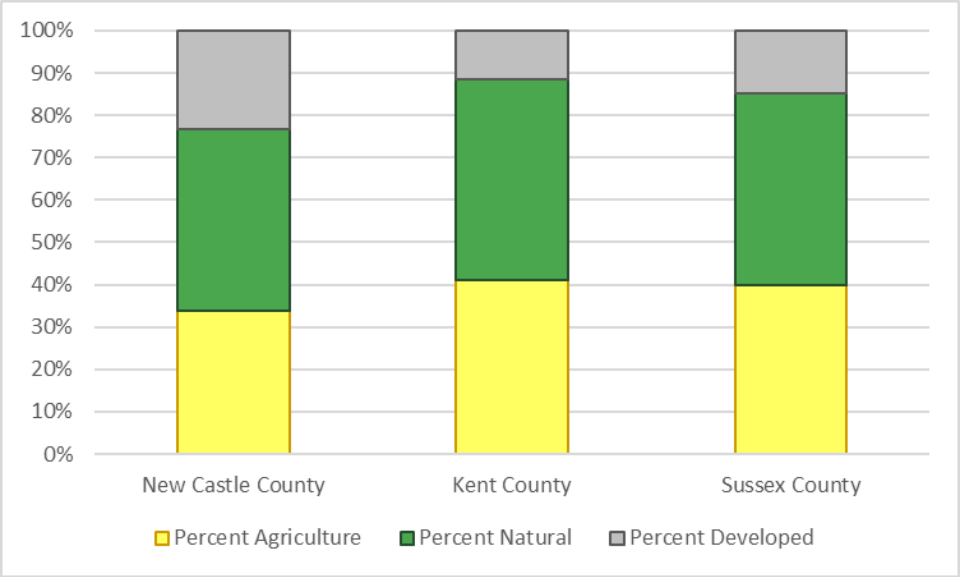

Figure 1-2. Current percentages of agricultural, developed, and natural land-use areas in the portions of New Castle, Kent, and Sussex counties in the Chesapeake Bay watershed (*Source*: CAST 2017 land use data).

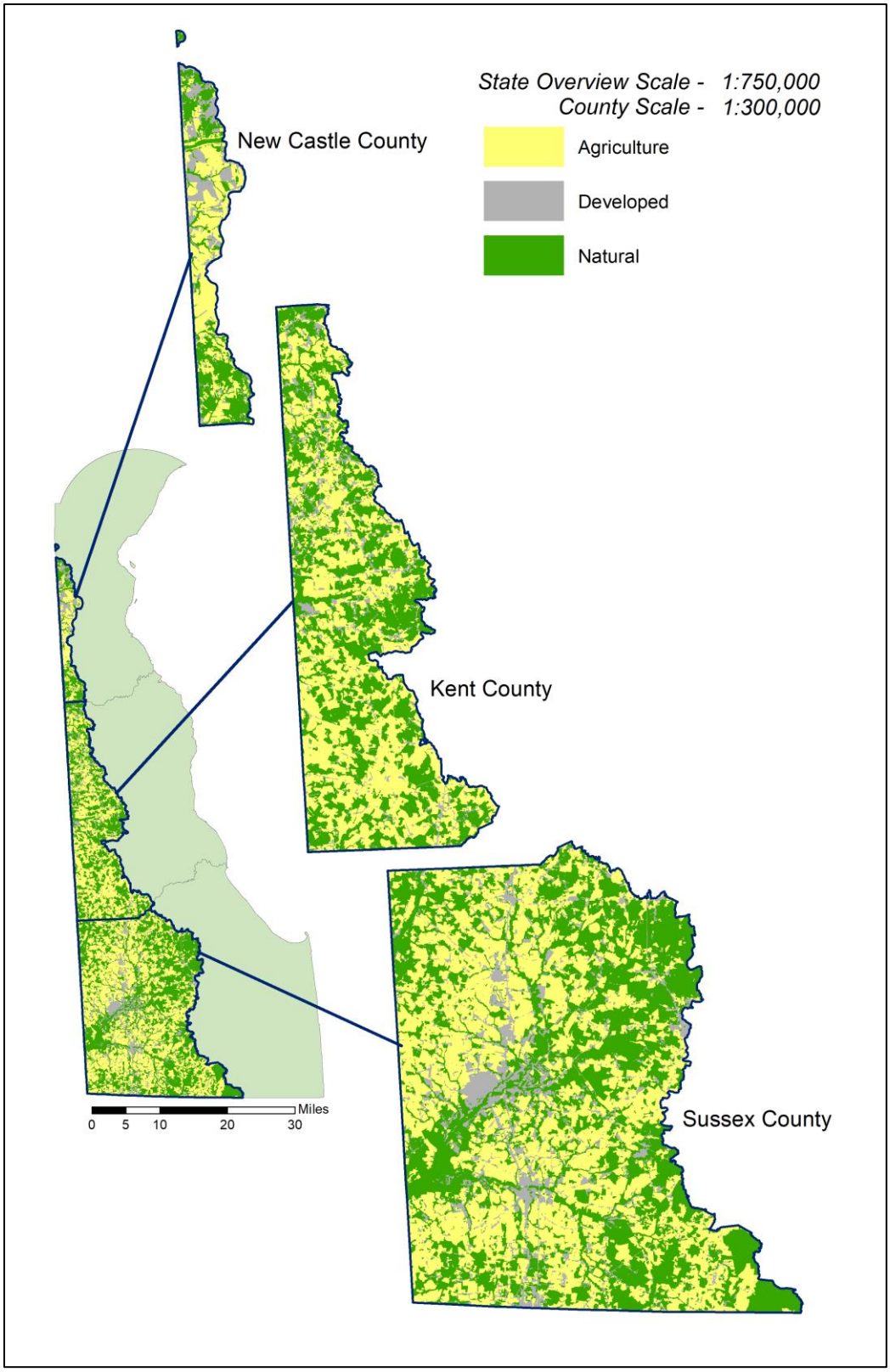

Figure 1-3. Land use and land cover for the Delaware portion of the Chesapeake Bay watershed (*Source*: State of Delaware 2012 Land Use, Land Cover).

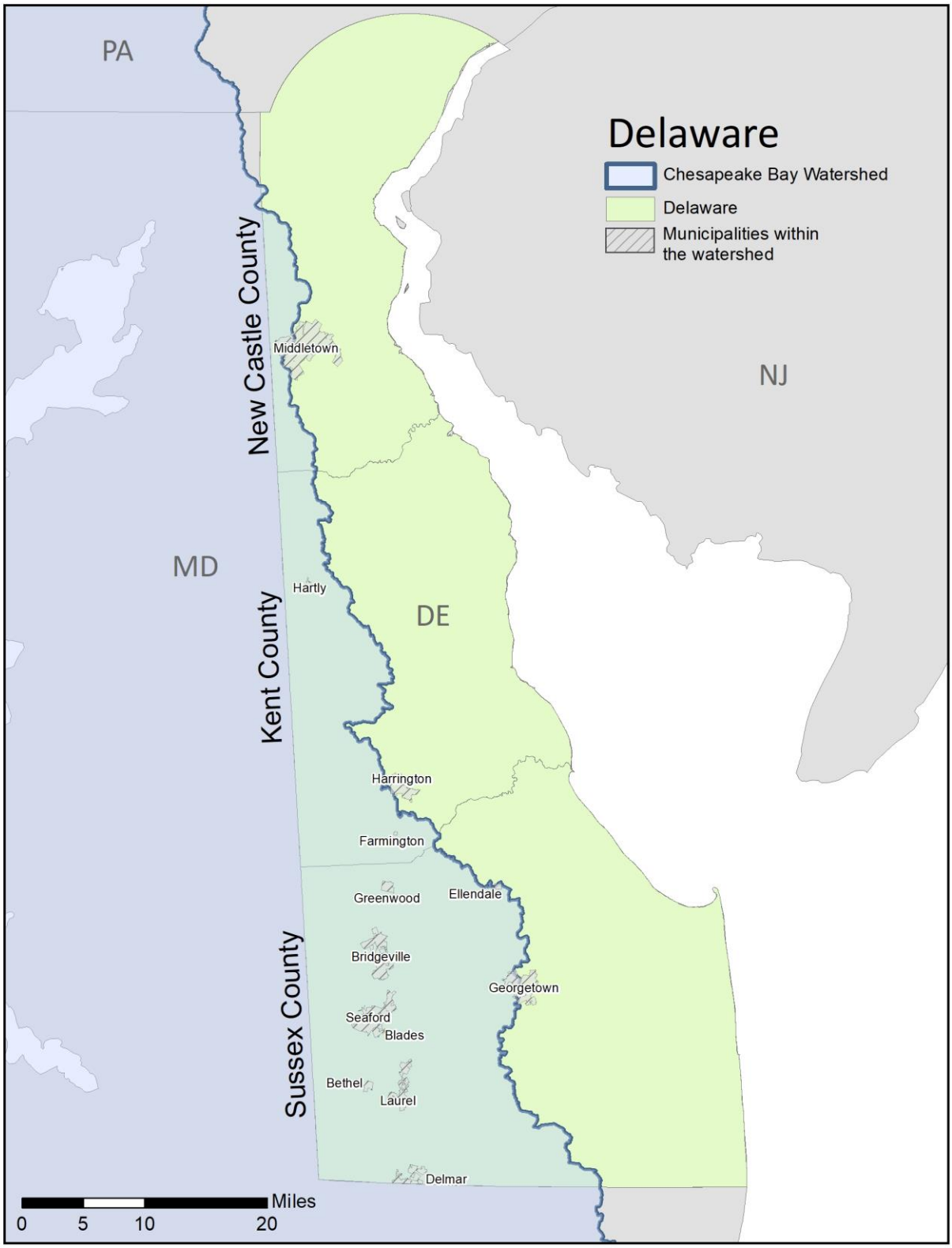

Figure 1-4. Municipalities in the Delaware portion of the Chesapeake Bay watershed.

2 State Planning Targets

Since the establishment of the Chesapeake Bay TMDL in 2010, EPA has refined the Chesapeake Bay Watershed Model to create more accurate estimates of nitrogen and phosphorus loads than in earlier versions. These refinements resulted in new planning targets for the Phase II WIP and now the Phase III WIP. The new Phase III planning targets are based on the most recent version of EPA's Chesapeake Bay Watershed Model, Phase 6, which incorporates the most up-to-date science and monitoring data available, reporting and accounting procedures, and other methods into the suite of modeling tools (Felver 2018; EPA 2018).

The CBP provided draft planning targets to the states in 2017. Delaware was allocated a state target of 4.84 million pounds per year (lbs/year) total nitrogen and 0.08 million lbs/year total phosphorus. Delaware's initial local area planning goals (LAPGs) were developed using these numbers.

Corrections and modifications made to the Phase 6 model changed the planning targets. The final state planning targets for the Phase III WIP were approved by the CBP Principals' Staff Committee (PSC) on July 23, 2018. Delaware was allocated a state target of 4.55 million lbs/year total nitrogen and 0.108 million lbs/year total phosphorus.

2.1 Delaware's Local Area Planning Goals

A group of local experts first met on March 21, 2017, to kick off Phase III WIP planning. These experts included the Phase II WIP sector leads and stakeholders. Jennifer Volk, Chesapeake Bay Watershed Coordinator during Phase II WIP planning, facilitated the meeting. The goal was to build on the experiences of developing Phase I and II and apply lessons learned (Figure 2-1). It was the hope of the committee to have more engagement and an achievable Phase III WIP.

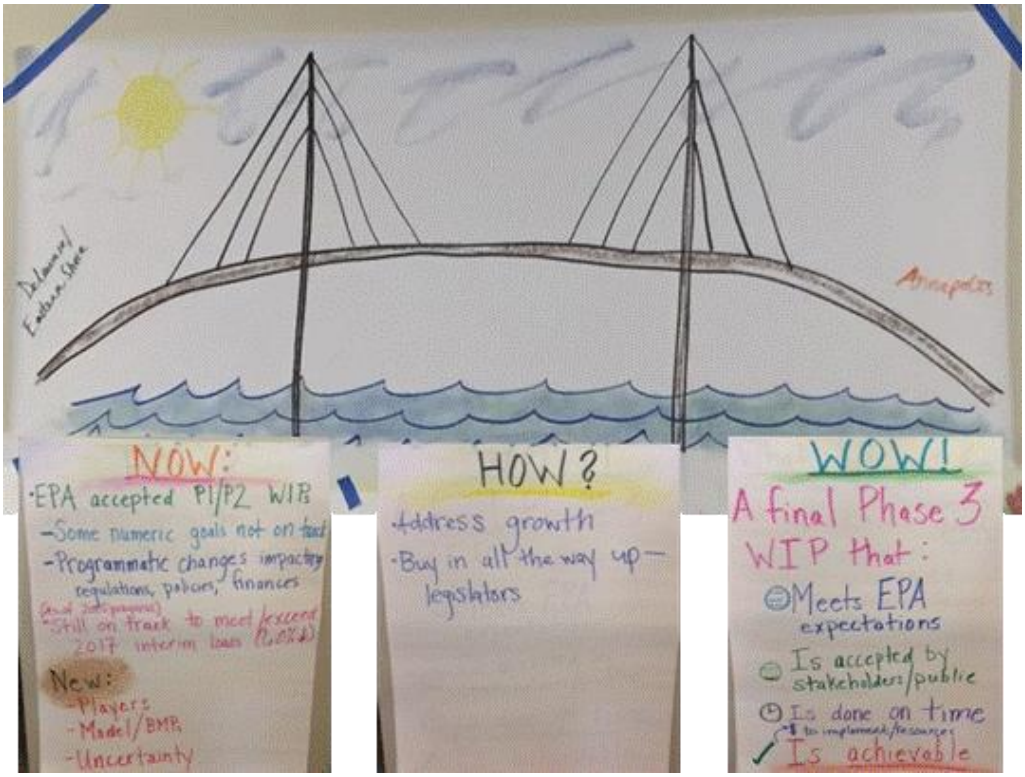

Figure 2-1. Facilitated planning meeting creating a bridge between Phase II and Phase III WIPs.

The planning committee became Delaware's Chesapeake Bay WIP Steering Committee and, on February 28, 2018, convened a second meeting that included other local experts identified the previous March during the committee's first meeting. The agenda for this meeting included an overview of planning targets, the development of a plan for sector subcommittee meetings, and beginning discussions of how LAPGs would be defined for the state. The group discussed dividing the loads by sector (agricultural, developed, and natural) and by geographic unit (acre or county). Devereux Consulting assisted with both scenarios, which were discussed in future meetings. Further details regarding both WIP Steering Committee and Sector Steering Committees efforts can be found in Appendix A.

The WIP Steering Committee decided to divide the planning targets into two major sectors: Agricultural and Developed. LAPGs were then further localized by dividing the targets by counties (New Castle, Kent, and Sussex) (Table 2-1). The committee also decided to split the natural loads from forests, streambeds, and stream banks between them based on major land use in each county. The Developed Sector includes wastewater, urban and suburban stormwater, on-site wastewater, and natural loads from New Castle County. The Agricultural Sector accounts for agricultural loads from all three of Delaware's counties (New Castle, Kent, and Sussex) and the natural loads from Kent and Sussex counties. A wastewater load was provided for Sussex County only because no other wastewater plants are located in the Bay portion of the other counties.

LAPGs for both sectors for total nitrogen and total phosphorus were created using the same method that the CBP employed to determine the state basin planning targets. This method distributes the load based on (1) the effect of total nitrogen and total phosphorus on dissolved oxygen in the Bay and (2) the difference between a No Action scenario and an E3 scenario (every best management practice [BMP] implemented by everyone, everywhere). Committee members agreed on the method used for determining LAPGs after analysis of the draft E3 scenario, Phase II WIP on 2025, 2017 Progress, and No Action scenario. The group might have used a different method if they had evaluated the method with final E3. Substantial changes occurred between the draft and final E3 scenario for the Developed Sector that impacted the load attributed to that sector.

2.2 Approach to Meeting 2025 State Planning Targets

The remainder of this document presents the approach for meeting the 2025 planning targets for the Developed and Agricultural Sectors. These loads will be met by implementing BMPs through the programs for developed and agricultural land outlined in Section 3 and Section 4, respectively.

Table 2-1. Delaware's Phase III WIP Local Area Planning Goals

County	Sector	Total Nitrogen Planning Target (lbs/year)	Total Phosphorus Planning Target (lbs/year)
New Castle County	Agricultural	145,510	2,537
	Developed	41,435	3,612
Kent County	Agricultural	643,319	18,413
	Developed	83,745	7,379
Sussex County	Agricultural	2,967,499	54,620
	Developed	503,649	19,098
	Wastewater	165,051	2,787
TOTAL		4,550,209	108,446

Delaware's Chesapeake Bay WIP Steering Committee determined that creating LAPGs at the county scale would be best suited for engaging local, regional, and federal partners in WIP implementation. The Developed and Agricultural sectors met multiple times throughout the WIP planning process and discussed cost-effective BMPs, potential funding opportunities, and BMPs where implementation could potentially be expanded. After a series of meetings (Appendix A), BMP scenarios were created for each sector and are described in Section 3.3 and Section 4.3.

Delaware has taken advantage of the new Chesapeake Bay suite of modeling tools for Phase 6 to target BMP implementation and grant funding. For fiscal year (FY) 2018 through FY2025, the state will target a significant portion of its Chesapeake Bay Implementation Grant (CBIG) to competitively fund local partners for water quality improvement projects in Delaware's portion of the Chesapeake Bay watershed. The request for proposals advertising available grant funding (see Appendix B) targets cost-effective BMPs (e.g., forest buffers, water control structures, tree plantings, grass buffers, cover crops, and wetland restoration) in specific land river segments in the watershed that are the most effective at delivering pollutants to the Chesapeake Bay. By using CBIG funding, Delaware is demonstrating a greater level of focus on bay segments that might be significantly out of attainment.

A targeted area of interest for implementation (because of high nutrient loadings) was developed for each county in the request for proposals, as demonstrated in Figure 2-2, Figure 2-3, and Figure 2-4. The specific areas of interest for New Castle, Kent, and Sussex counties are the Chester River–Andover Branch, the Choptank River, and the Nanticoke River watersheds, respectively.

The Sussex Conservation District's (SCD's) current FY2018 CBIG signatory agreement's area of interest is in the Nanticoke River watershed. The agreement is for $255,550 that will fund 3,986 acres of early established cover crops, two water control structures, and two forested or grassed buffers around stormwater ponds on poultry farms in the targeted watershed.

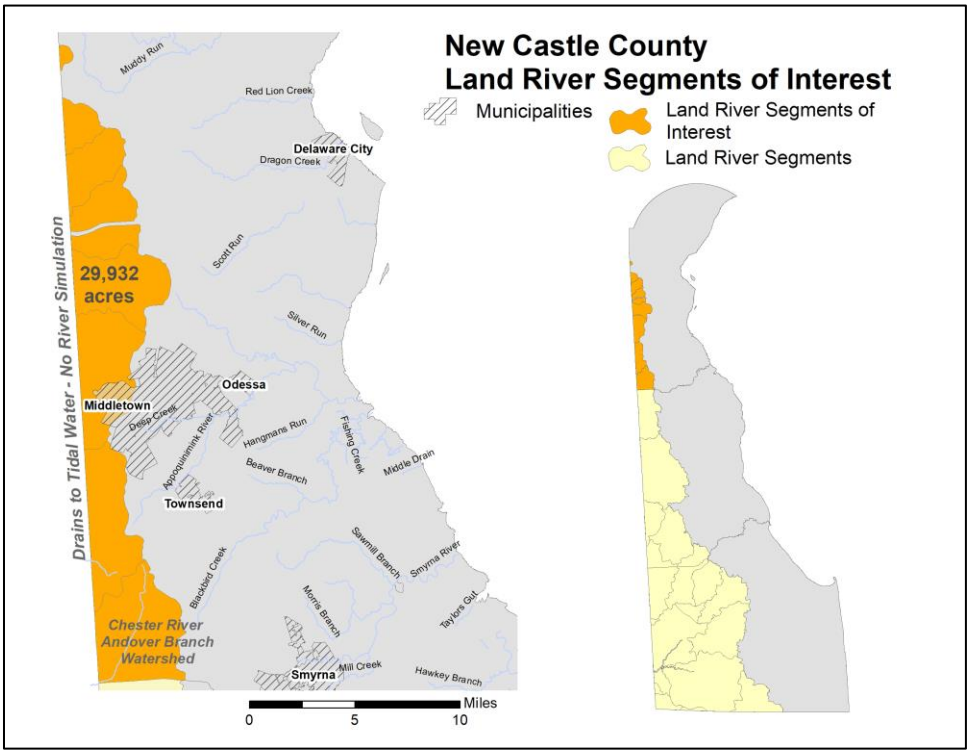

Figure 2-2. The area of interest for New Castle County–Chester River–Andover Branch watershed.

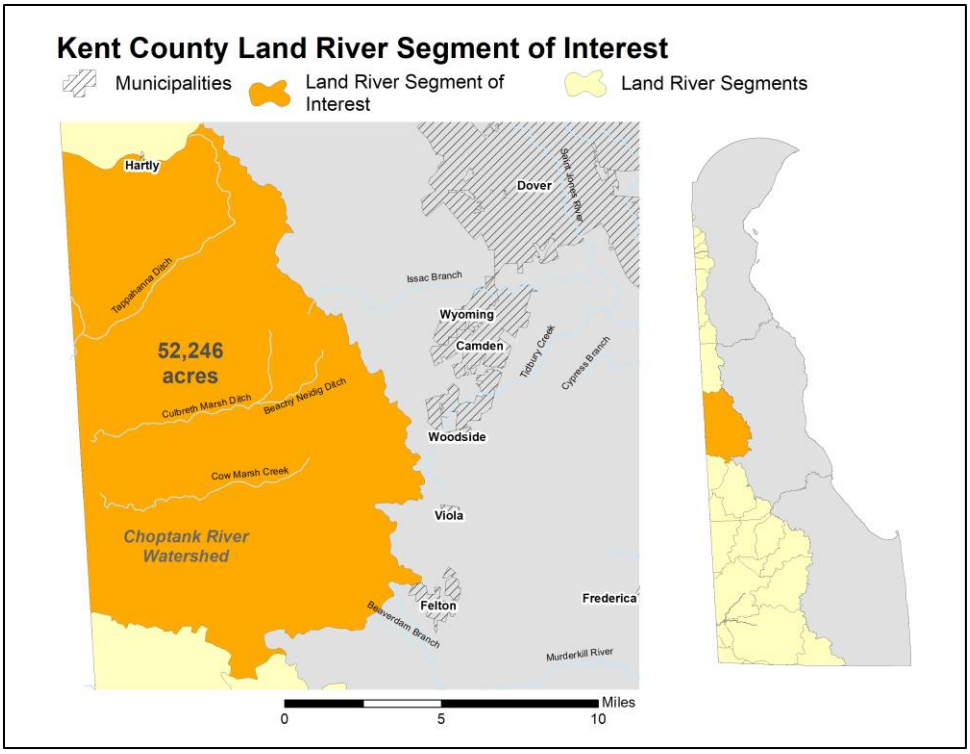

Figure 2-3. The area of interest for Kent County–Choptank River watershed.

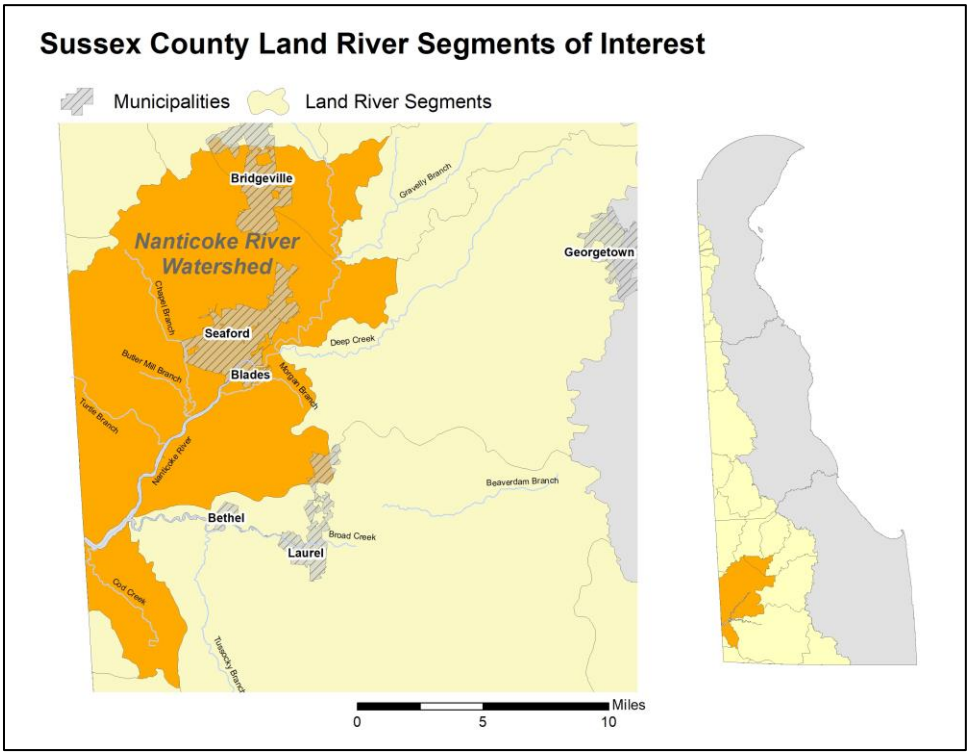

Figure 2-4. The area of interest for Sussex County–Nanticoke River watershed.

3 Developed Sector

For the Phase III WIP, the Developed Sector includes wastewater, urban and suburban stormwater, on-site wastewater, and natural loads (forest, streambed, and stream banks loads) from New Castle County. Natural loads from Kent and Sussex counties are included in the Agricultural Sector. This section presents the following information:

- LAPGs for the Developed Sector
- Existing programs for developed land in Delaware that can be used to implement the necessary practices to meet the 2025 Chesapeake Bay Phase III WIP planning targets
- Specific numeric implementation plan to meet the 2025 planning targets
- Efforts to engage local entities in the Phase III WIP process

3.1 LAPGs for the Developed Sector

The Developed Sector represents developed land in the portions of New Castle, Kent, and Sussex counties in the Chesapeake Bay watershed. Developed land currently accounts for approximately 10% of Delaware's portion of the Chesapeake Bay watershed. For the area in each county that drains to the Chesapeake Bay, the Developed Sector comprises 20.2% in New Castle County, 7.4% in Kent County, and 10.6% in Sussex County (see Figure 1-3). The Developed Sector Steering WIP Committee agreed to treat the natural loads coming from New Castle County in addition to the loads from developed areas in New Castle, Kent, and Sussex counties. LAPGs for the Developed Sector are presented in Table 3-1.

Table 3-1. Delaware's Developed Sector's LAPGs

County	Sector	Total Nitrogen Planning Target (lbs/year)[a]	Total Phosphorus Planning Target (lbs/year)[b]
New Castle County	Developed	41,435	3,612
Kent County	Developed	83,745	7,379
Sussex County	Developed	503,649	19,098
	Wastewater	165,051	2,787
TOTAL		**793,880**	**32,876**

Notes:
[a]The total nitrogen planning target for the Developed Sector is 793,880 lbs/year, which includes 628,829 lbs/year from developed land and 165,051 lbs/year from wastewater.
[b]The total phosphorus planning target for the Developed Sector is 32,876 lbs/year, which includes 30,089 lbs/year from developed land and 2,787 lbs/year from wastewater.

Based on the planning targets in Table 3-1, Delaware's planning targets for total nitrogen and total phosphorus on developed land in the Chesapeake Bay watershed are 0.79 million lbs/year and 0.03 million lbs/year, respectively. Results of the 2017 Progress Run of the Chesapeake Bay Watershed Model show that the existing loads of total nitrogen and total phosphorus from the Developed Sector are 0.9 million lbs/year and 0.03 million lbs/year, respectively. Based on the 2017 loads, the Developed Sector must reduce total nitrogen by 12% to meet the 2025 targets and is meeting the total phosphorus target of 0.03 million lbs/year.

3.2 Programmatic Commitments for the Developed Sector

This section describes the existing programs available to implement the practices necessary to meet the 2025 Chesapeake Bay planning targets on developed lands in Delaware (see sections 2.1 and 3.1 for planning targets). These programs include assistance in the forms of financial cost-share, technical assistance, regulatory oversight, and other incentives.

3.2.1 National Pollutant Discharge Elimination System Wastewater Program

The Delaware Department of Natural Resources and Environmental Control's (DNREC's) Surface Water Discharges Section is responsible for issuing regulatory permits for point sources of pollution discharging to Delaware's surface waters under the National Pollutant Discharge Elimination System (NDPES). A NPDES permit legally sanctions the discharge of substances that could become pollutants. The NPDES permit, however, is designed to limit the discharge of those substances so that there will be no adverse effect on the quality of the receiving waters or interference with the designated uses of those waters. The health of a waterbody is measured by its attainment of designated uses. If potential pollutants in a NPDES discharge are reduced to levels that allow receiving waters to meet applicable designated uses, then, in effect, the pollutant discharge has been eliminated. NPDES permits specify discharge limitations, monitoring requirements, and other terms and conditions that must be met.

The Surface Water Discharges Section contains three branches: the *Compliance and Enforcement Branch*, the *Wastewater Residuals Branch*, and the *Discharges Permits Branch*.

The *Compliance and Enforcement Branch* conducts assessments of wastewater treatment facilities to ensure compliance with applicable permit conditions. If a facility is unable to maintain compliance with their permit, this branch has various enforcement tools, ranging from a Notice of Violation with required corrective actions to an Administrative Order with penalty. They can be used to document a violation and require a return to compliance to protect surface water quality. The *Compliance and Enforcement Branch* is also the liaison with the Wastewater Operator Board of Certification responsible for issuing of wastewater operator licenses. Additionally, the *Compliance and Enforcement Branch* inspects and works to identify new industrial stormwater facilities.

The *Wastewater Residuals Branch* is responsible for the Biosolids Program, which issues permits and ensures compliance for the land application and the distribution and marketing of biosolids. In addition, the *Wastewater Residuals Branch* is also responsible for the Concentrated Animal Feeding Operations (CAFO) Program, which is administered in cooperation with the Delaware Department of Agriculture (DDA). The CAFO Program is discussed in greater detail in the Agricultural Sector section (see Section 4.2.4) of this document because the nutrient loads from CAFOs have been included with agricultural nutrient loads rather than with loads from developed land.

The *Discharges Permits Branch* is responsible for writing, reviewing, and issuing individual permits for construction and operation of municipal and industrial wastewater facilities, as well as general permits for municipal separate storm sewer systems (MS4s) and industrial stormwater.

Note that this section of the WIP focuses on municipal and industrial wastewater rather than stormwater. Other known sources of nutrients and sediment subject to NPDES regulations are covered in other sections of this document. Industrial stormwater and MS4s are discussed in Section 3.2.2.

Five wastewater treatment plants (WWTPs) located in the Chesapeake Bay watershed are currently permitted to discharge nutrients and sediment (Table 3-2 and Figure 3-1).

Table 3-2. NPDES facilities in the Chesapeake Bay watershed

NPDES ID	Facility Name	Facility Location	Receiving Waterbody	Permit Expiration Date
DE0020249	Bridgeville WWTP	Bridgeville, DE	Nanticoke River	3/31/2019
DE0020125	Laurel WWTP	Laurel, DE	Broad Creek	10/31/2021
DE0020265	Seaford WWTP	Seaford, DE	Nanticoke River	10/31/2020
DE0000035	Invista		Nanticoke River	10/3/2020
DE0050725	Mobile Gardens Mobile Home Park		Unnamed Tributary of the Nanticoke River	10/31/2018[a]

Note:
[a]This permit is expired and administratively continued (i.e., still enforceable). DNREC received a complete application on 05/01/18 and the permit is scheduled to be reissued by September 2019.

All "major" and 50% of "minor" permitted WWTP facilities in Delaware receive on-site inspections as well as an annual audit of their monitoring records by the Division of Water, Surface Water Discharges Section, *Compliance and Enforcement Branch*. The compliance rates are near 100% and are actively being maintained. No additional regulatory or enforcement authorities are needed to meet these compliance rates.

Figure 3-1. Major and minor NPDES wastewater facilities in Delaware's portion of the Chesapeake Bay watershed.

3.2.2 Developed Lands Stormwater Management Programs

Several programs in Delaware address stormwater from developed lands. This section provides an overview of each program. The Delaware Sediment and Stormwater Regulations (DSSR) for construction stormwater (new and post-construction) are addressed in Section 3.2.2.1. General permits for MS4s are addressed in Section 3.2.2.2, and general permits for industrial stormwater are addressed in Section 3.2.2.3.

3.2.2.1 Delaware Sediment and Stormwater Program

DNREC's Sediment and Stormwater Program is responsible for the DSSR, which require erosion and sediment control during construction and post-construction stormwater quantity and stormwater quality control. The Sediment and Stormwater Program's initial emphasis is on preventing existing flooding and water quality from worsening and limiting further degradation from land disturbances associated with new land development. BMPs such as bioretention, filter strips, source area disconnection, biofiltration swales, permeable pavement, vegetated roofs, afforestation, and infiltration are the preferred practices for mitigating the hydrologic impacts from land-disturbing activities. These BMPs use filtering in vegetative areas as well as infiltration and recharge to mimic natural hydrology. This approach can extract a relatively high concentration of pollutants from the water, depending on the practice chosen. The resulting cleaner water can then enter a waterway or soak into the ground to recharge underground water sources. The DSSR include 17 categories of post-construction stormwater management BMPs. Many of these categories also include several variants, giving designers significant BMP flexibility for compliance.

The DSSR cover the entire development process, from the time construction begins through project completion and permanent maintenance of stormwater management facilities. Unless specifically exempted, any proposed land development project that disturbs more than 5,000 square feet of land must comply with the DSSR. All projects that disturb 1.0 or more acres must be permitted through the NPDES Construction General Permit. The DSSR are effective statewide and are applicable to new development, redevelopment, MS4s, and non-MS4s. To comply with the DSSR, projects must employ stormwater BMPs as part of a Sediment & Stormwater Management Plan to address water quality and water quantity impacts. The Sediment & Stormwater Management Plans are reviewed by local delegated agencies (made up of specified municipalities, counties, and conservation districts) and are only approved if they meet minimum statewide regulatory requirements. These delegated agencies also ensure approved plans are constructed properly in the field through a process of frequent inspections. Conducting construction reviews on a regular basis ensures regulatory compliance with the DSSR and includes a final inspection and close-out process. The penalty section of the DSSR provides DNREC with the authority to pursue both civil and criminal actions should enforcement for noncompliance be necessary.

The Delaware Department of Transportation (DelDOT) has also been delegated the responsibility for program elements related to their in-house transportation-related projects. Delegated responsibilities include plan review and approval, construction review, and maintenance inspections of existing stormwater management facilities. See Section 3.4.4 for more details on the inspection process, tracking, reporting, and verification.

To achieve enhanced water quantity and water quality goals, the Sediment and Stormwater Program identified the need to revise the regulations that govern stormwater runoff from developed lands. Regulations were revised in 2014, and following a legal challenge based on procedure, have undergone further revisions. The proposed regulations were promulgated and went into effect in February 2019 and apply to new development and redevelopment projects. The regulations emphasize runoff reduction practices, which are expected to be adequate for minimizing new stormwater loads in the Developed Sector.

DNREC plans to undertake education and outreach efforts to train the various delegated agency staff and regulated community in conjunction with promulgation of the revised regulations. The revised regulations continue to include requirements for both construction site and post-construction stormwater management statewide. In addition to revisions to the regulations, DNREC has reviewed and updated all the practices included in both the Delaware Erosion & Sediment Control Handbook (DNREC 2019a) and the *Delaware Post Construction Stormwater BMP Standards & Specifications* (DNREC 2019b) to meet the current state of the science.

3.2.2.2 Municipal Separate Storm Sewer System Program

DNREC's Surface Water Discharges Section endeavors to improve water quality and supports the implementation of the Developed Sector's goals of the Chesapeake Bay WIP through the issuance and enforcement of NPDES permits to municipal stormwater dischargers that serve certain populations. MS4s are conveyance systems (e.g., roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) that are owned or operated by a state, city, town, county, district, association or other public body and are designed or used for collecting or conveying stormwater. MS4s are not combined sewers and are not part of a publicly owned treatment works (NPDES regulations on stormwater discharges in Title 40 of the *Code of Federal Regulations* 122.26(b)(8)).

Urban stormwater runoff is commonly transported through MS4s and is often discharged, untreated, into local waterbodies. To prevent harmful pollutants from being washed or dumped into an MS4, certain operators must obtain a NPDES permit (Phase I or Phase II) and develop a stormwater pollution prevention and management program. The Phase I Rule, issued in 1990, requires medium and large cities or certain counties with populations of 100,000 or more to obtain NPDES permit coverage for their stormwater discharges. The Phase II Rule, issued in 1999 and remanded in 2016, requires regulated small MS4s in U.S. Census Bureau-defined urbanized areas, as well as small MS4s outside the urbanized areas that are designated by the permitting authority, to obtain NPDES permit coverage for their stormwater discharges. Currently, 25% of Delaware is covered under the MS4 program, with only a small portion of the Chesapeake Bay watershed having MS4 permit coverage (Figure 3-2).

3.2.2.2.1 Phase I MS4 Permits

Currently, permit areas are delineated by jurisdiction, not by watershed. A small portion of the New Castle County/DelDOT Phase I MS4 (DE0051071) area falls within the Chesapeake Bay watershed. The Phase I MS4 permit—which expired in May 2018 and is administratively continued until the permit is reissued—is in the process of being updated and will include more expansive measures and requirements to address stormwater runoff, including the implementation of BMPs and fulfillment of water quality improvement plans. Measures to address the Chesapeake Bay TMDL in the permit include tracking and monitoring BMPs in the watershed. The Phase I MS4 permit is anticipated to be issued in calendar year 2019 unless a public hearing is requested during the public comment period.

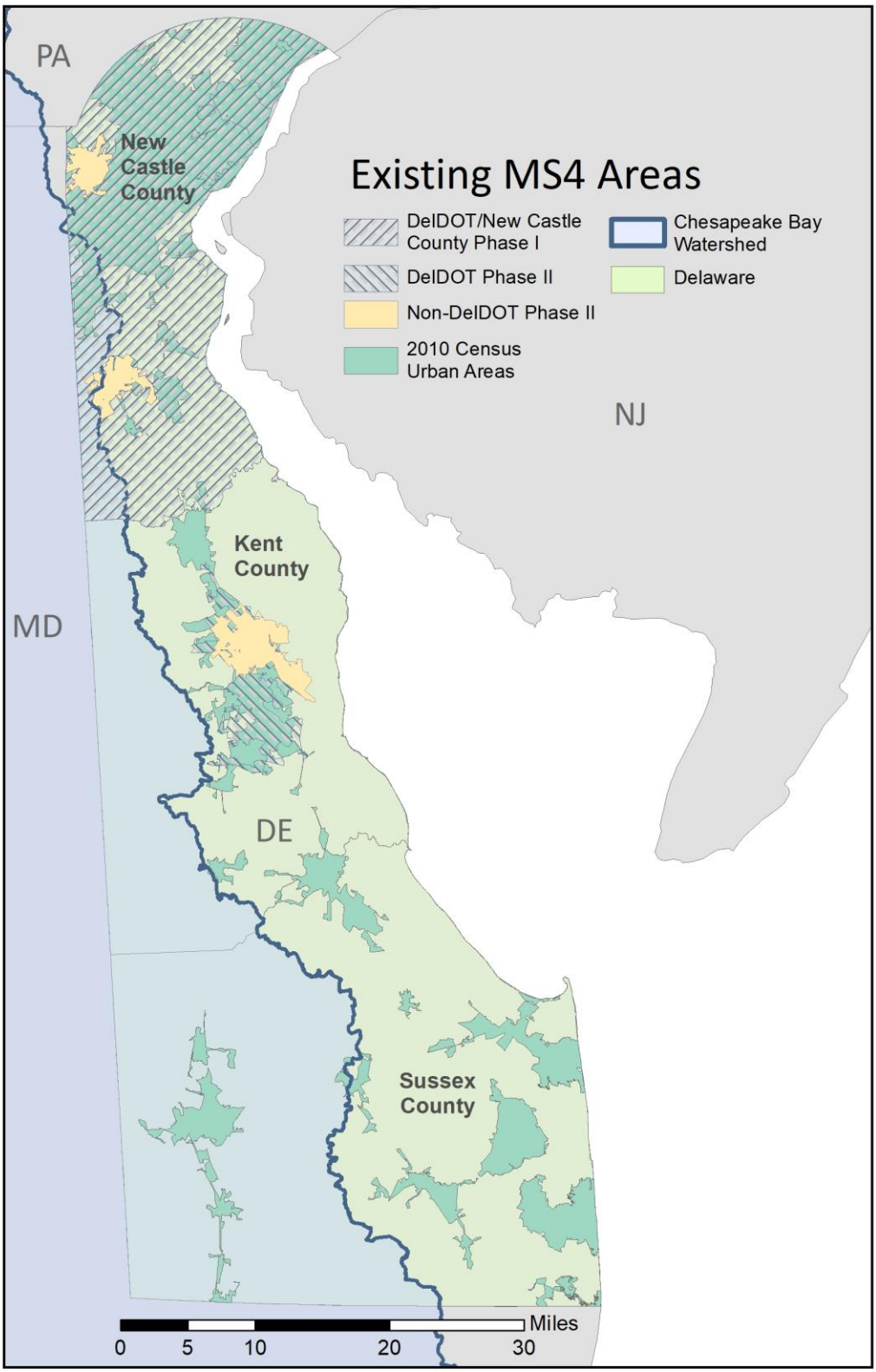

Figure 3-2. Delaware's existing MS4 areas and 2010 Census identified urban areas.

DNREC plans to refer to the DSSR for nearly all construction and post-construction stormwater management measures in all future MS4 permits. The regulations apply to all parcels inside and outside MS4s and address all needs in regard to green technology requirements, post-construction maintenance measures, and water quantity requirements. If water quality measures are not addressed through the new DSSR, they will be handled on an individual basis through TMDL plans.

DNREC has determined by analyzing land-use patterns that stormwater retrofits are not the solution to reduced nutrient loading in Chesapeake Bay watershed communities. The new draft Phase I MS4 permit for New Castle County/DelDOT, however, will require WIPs that contain some elements of retrofitting in two selected watersheds within the MS4 boundary. These watersheds are not required to fall within the Chesapeake Bay watershed area.

All BMPs constructed within and outside of MS4 areas are inspected regularly throughout the state, not only through MS4 permit commitments, but also through mandates relating to the DSSR that additionally require property owners to regularly maintain BMPs. All currently designated MS4s in the Chesapeake Bay watershed have received Surface Water Matching Planning Grants to map stormwater infrastructure. As of October 2018, DelDOT inventoried and inspected approximately 98,902 structure points (inlets, manholes, outfalls, and swale ends) and 29,459,845 linear feet of conveyance (pipes and swales). Of those totals, 13,032 structure points and 10,500,770 linear feet of conveyance were in the Chesapeake Bay watershed. As of October 2018, New Castle County has inventoried and inspected approximately 2,308 BMPs, 75 of which are located in the Chesapeake Bay watershed.

3.2.2.2.2 Phase II MS4 Permits

The MS4 program currently permits four individual Phase II MS4s. Delaware's existing Phase II MS4 permittees are Dover (NPDES Permit: DE 0051161), Kent County DelDOT (NPDES Permit: DE 0051144), Middletown (NPDES Permit: DE 0051209), and Newark/University of Delaware (NPDES Permit: DE 0051152). Middletown is the only existing permittee that has an MS4 permitted area in the Chesapeake Bay watershed. Based on municipal and watershed boundaries, 995 acres of Middletown's 7,529 total acres of permitted area are in the Chesapeake Bay watershed (Figure 3-3). The Surface Water Discharges Section is currently in the process of implementing a Phase II General Permit that will replace the individual Phase II permits. The Phase II General Permit will comprise two separate Tiers (Tier I and Tier II). The Tier I General Permit (DE 0051195) will be issued to any MS4s that have an existing individual Phase II MS4 Permit. The Tier II General Permit (DE0051217) will capture any newly identified (or designated) MS4s. In addition, the Surface Water Discharges Section is also establishing waiver criteria that will be implemented with the Phase II General Permits. Both permits and the waiver criteria have gone through a Pre-Notice public comment period. While this draft Phase III WIP document was being developed (March 2019), DNREC was responding to comments on Pre-Notice draft versions of the Tier I and Tier II General Permits and preparing the permits for Public Notice. The MS4 program intends to issue the General Permits by September 2019 unless a public hearing is requested during the public notice comment period.

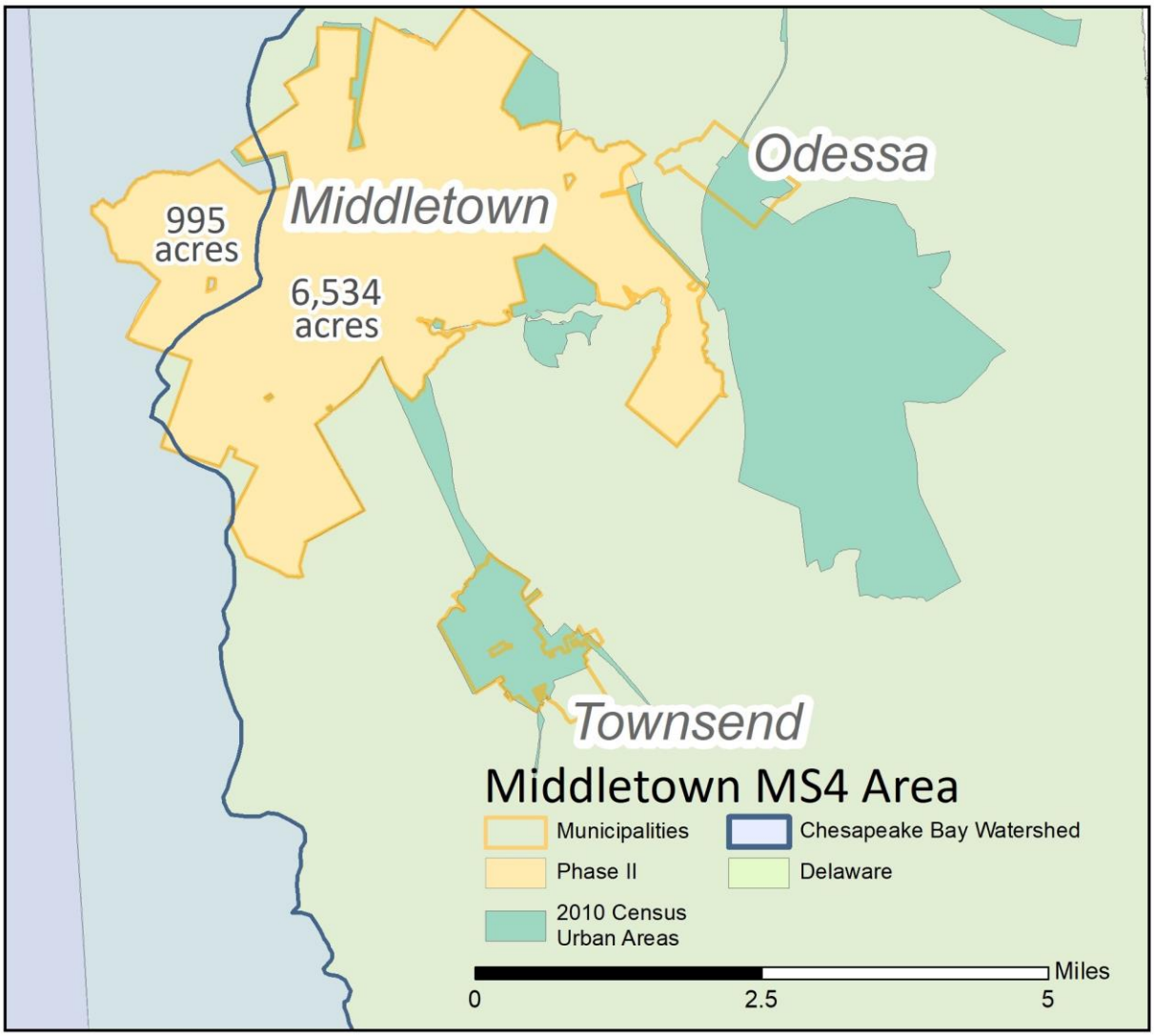

Figure 3-3. Portion of the Middletown MS4 area in the Chesapeake Bay watershed.

The Phase II MS4 Tier I General Permit (DE 0051195) will focus on modifying the existing minimum control measures (MCMs) to meet EPA's 2016 Phase II Remand Rule. All four existing Phase II MS4 permits will transition from their individual permits to the Tier I General Permit. The Tier I General Permit will require "clear, specific, and measurable" goals and practices for the permittees to follow. In addition, the Tier I General Permit will require a TMDL Plan that will provide for the implementation of BMPs to reduce pollutants associated with TMDLs in each respective watershed. As part of the Chesapeake Bay watershed, the town of Middletown will be implementing a TMDL Plan.

The Tier II General Permit (DE 0051217) is designed for newly identified or designated MS4s that need to establish an MS4 program and do not meet the Surface Water Discharges Section's proposed waiver criteria. The Tier II General Permit will include all permittees identified as "urbanized areas" by the 2010 Census that do not currently have an MS4 permit. The Tier II Permit will cover areas of the Chesapeake Bay watershed, including Seaford and Laurel, and DelDOT's jurisdiction within the urbanized areas. Under the Tier II General Permit, permittees will establish each MCM and begin identifying BMPs to be implemented. The focus of the Tier II General Permit will be MS4 program development. After one permit cycle, these permittees will then transition to a Tier I General Permit.

The Tier I and Tier II permits focus on BMP implementation to address water quality concerns. Upon permit issuance, the permittees will be required to implement specific BMPs and report on the effectiveness of those BMPs to improve water quality. For Phase II MS4 Tier I permittees, the TMDL Plan will provide a targeted approach to BMP implementation to address the pollutants of concern with the TMDLs in their watershed. Tier II permittees will be developing their MS4 program and identifying BMPs that can be implemented in the future.

3.2.2.3 General Permits for Industrial Stormwater

The focus of the General Industrial Stormwater Permitting Program is to manage material handling, storage, and other industrial activities to eliminate or minimize (to the maximum extent practicable) contamination from stormwater runoff from a site. The General Permit Program is designed to provide NPDES permit coverage to a specified group, category, or class of industrial activity that is required to abide by criteria set forth in the general regulations, Section 9.1 of the Regulations Governing the Control of Water Pollution (General Permit Program). These regulations outline the general provisions or requirements that apply to all discharges within the specified category. Currently, the Industrial Stormwater Program requires monitoring of stormwater discharges under certain Standard Industrial Classification codes, but data are not required to be submitted unless requested by the Surface Water Discharges Section. Conversely, an individual NPDES permit is tailored to a specific discharge and location. These are typically stormwater outfalls from industrial plants that discharge to surface water. The NPDES permit includes stormwater management measures and specifies limitations, monitoring requirements, and other terms and conditions the permittee must meet to be allowed to discharge.

Of the nearly 400 sites currently under the General Permit Program in Delaware, approximately 55 of them are in the Chesapeake Bay watershed. The five individually permitted wastewater facilities within the Chesapeake Bay watershed also have permit requirements regarding management of the facilities' industrial stormwater. A list of the Chesapeake Bay industrial stormwater sites with General Permit coverage is included in Appendix C. It has been the Surface Water Discharges Section policy to inspect sites under the General Permit Program (having full coverage under a Notice of Intent) at a minimum once every three years, while No Exposure Certified facilities are inspected at a minimum of once every five years. This policy has been in place since the program's inception. EPA's Regional Administrator for Region 3 approved Delaware's General Permit Program on October 23, 1992. DNREC's Regulations Governing the Control of Water Pollution were amended on June 30, 1993, to include provisions for regulating discharges of stormwater associated with industrial activities and became effective on July 10, 1993.

For compliance assistance or enforcement, the Industrial Stormwater Program has traditionally based its program on compliance assistance using voluntary compliance via inspection results. Sites having individual permits have strict oversight and monitoring, where all TMDL allocations are being strictly followed. The *Compliance and Enforcement Branch* under the Surface Water Discharges Section typically conducts compliance sampling inspections or compliance evaluation inspections annually for major individual permits, and every two years for minor individual permits. This policy has been in place since the inception of the program.

3.2.3 On-Site Wastewater Program

DNREC's Groundwater Discharges Section (GWDS) is responsible for overseeing all aspects of the siting, design, and installation of Delaware's on-site wastewater treatment and disposal systems (OWTDSs), also known as septic systems. The GWDS has two branches: the *Small Systems Branch* and the *Large Systems Branch*. The *Small Systems Branch* reviews and approves site evaluations and permit applications, and conducts installation and compliance inspections of systems with daily flows less than 2,500 gallons per day (gpd). The *Large Systems Branch* reviews and permits OWTDSs with daily flows equal to and greater than 2,500 gpd.

Since 2007, the GWDS has been using a database called the Delaware Environmental Navigator (DEN) that tracks all permitted OWTDSs. The DEN tracks licenses, service providers, site evaluations, permits, inspections, and violations. It has a geographic information system (GIS) capability and the Delaware Department of Technology and Information personnel upgrade it annually to include additional fields as required and as resources are made available.

The GWDS issues permits for all OWTDSs. The types of systems permitted for small systems are determined by a soils-based approach to establish the limiting zone by interpreting the seasonal high water table. The systems permitted are subsurface systems that include gravity (full-depth and capping fill), low pressure pipe (full-depth and capping fill), peat systems, and drip irrigation. There are two above grade systems: the elevated sand mound and Wisconsin-at-grade. The GWDS captures this information in DEN, which also tracks the various advanced treatment, innovative/alternative, and large systems.

3.2.3.1 New Initiatives since the Phase II WIP

After the completion of the Phase II WIP, Delaware pursued legislative changes to its Regulations Governing the Design, Installation and Operation of On-Site Wastewater Treatment and Disposal Systems. DNREC's GWDS revised the OWTDS regulations in 2014 to ensure that local water quality is maintained and/or local TMDLs are complied with to address anticipated new or increased nutrient loads from additional OWTDSs. Delaware's OWTDS regulations go above and beyond the recommendations identified in EPA's *National Guidelines for Management of Onsite and Clustered (Decentralized) Wastewater Treatment Systems* (EPA 2003). The GWDS has already implemented the "Five Management Models" listed in the EPA document. The design and level of treatment requirements in the 2014 OWTDS regulations are more stringent than the EPA recommendations. The revised OWTDS regulations are discussed in sections 3.2.3.1.1 through 3.2.3.1.4.

The GWDS has also been working with several partners to ensure the permittees in the Chesapeake Bay watershed are working toward a successful implementation of the Chesapeake Bay TMDL. The challenges associated with meeting the reduced load allocations require everyone to work together and to use every resource available. Many partnerships have already been formed both internally within DNREC and externally between local government agencies and private citizens.

Partnerships formed with the GWDS include:

Internal to DNREC: Surface Water Discharges Section, Watershed Assessment and Management Section, Environmental Finance Office (EF), Nonpoint Source Program, and Sediment and Stormwater Management Program.

External to DNREC: Delaware On-Site Wastewater Recycling Association, licensees, Southeast Rural Community Assistance Project, Inc., First State Community Action, Water Infrastructure Advisory Council (WIAC), Tidewater Utilities, Diamond State Sustainability Corporation, EDEN Delmarva, Clean Water Solutions, and Artesian Water Company.

3.2.3.1.1 Inspection and Pump-Out Program for Small Systems

A statewide inspection and pump-out program requires properties served by OWTDSs to be inspected by a Class H inspector and the septic tank pumped by a Class F liquid waste hauler prior to the transfer of a property. Unsatisfactory systems (including cesspools and seepage pits) identified upon inspection are required to be repaired, replaced, or upgraded, depending on location and date (see Section 3.2.3.1.2). The GWDS receives inspection reports from licensees indicating the type of system and the condition of the system at the time of property transfer. This information is entered into DEN. The seller/buyer is required to come into compliance for failing/malfunctioning systems. The GWDS does not have any estimates of how many cesspools and seepage pits are in the Chesapeake Bay watershed. The GWDS will use the enforcement tools available to ensure these systems come into compliance.

Individual OWTDSs are required by permit conditions to have the septic tank pumped out once every three years. To ensure these systems are pumped out, the regulations require the licensed pumper to submit the 911 address and gallons pumped to the GWDS to enable them to track the number of pump-outs. This requirement came into effect on January 11, 2016, two years after promulgation of the OWTDS regulations, which allowed time to educate property owners and the pumpers. Pump-outs have been tracked and reported annually since 2016.

The GWDS released two Class F Non-Hazardous Liquid Waste Transporter pump-out applications that went online in October 2018: (1) a smartphone-compatible application that allows the pumper to record the pump-out event while on-site and (2) a computer/web-based application for use by the pumper or the pump-out company if a smartphone application is not an option. In both applications, specific data including date, 911 address, gallons pumped, license number of the waste hauler, and comments are collected and transmitted to a database for reporting to EPA. The Class F licensee specifically records septic tank pump-outs with the applications. These data provide EPA with information regarding the collection of potentially nutrient-rich wastewater that is being disposed of properly at WWTPs. The data can also be used to determine the frequency with which homeowners are having their septic tanks pumped.

3.2.3.1.2 Advanced Treatment Upgrades for Existing Individual Small Systems

Delaware's on-site regulations require all OWTDSs within 1,000 feet of tidal waters and associated tidal wetlands in the Chesapeake Bay watershed to be upgraded with advanced treatment technologies when new OWTDSs are installed or when failing/malfunctioning systems are replaced. These areas were identified as hot spots for delivering nutrients to Delaware's local waterways.

Figure 3-4 shows the parcels located within 1,000 feet of the Chesapeake Bay tidal waters and associated tidal wetland areas in Delaware. There are two tidal areas in the portion of the Chesapeake Bay watershed in Delaware: the Nanticoke River and the western portion of the Chesapeake and Delaware Canal. The parcels were classified to show if they currently have an OWTDSs, central sewer service, or neither (meaning that the parcel is currently undeveloped).

The OWTDSs achieve Delaware's Performance Standard Nitrogen (PSN) 3, which requires an average annual effluent concentration of 20 milligrams per liter (mg/L) total nitrogen sampled at the advanced treatment unit's end-of-pipe or a 50% reduction in effluent total nitrogen concentration when compared to the influent total nitrogen concentration. As part of a contingency plan, the GWDS may also require all other OWTDSs within the watershed to be upgraded to advanced treatment requirements at the time of failure by 2025.

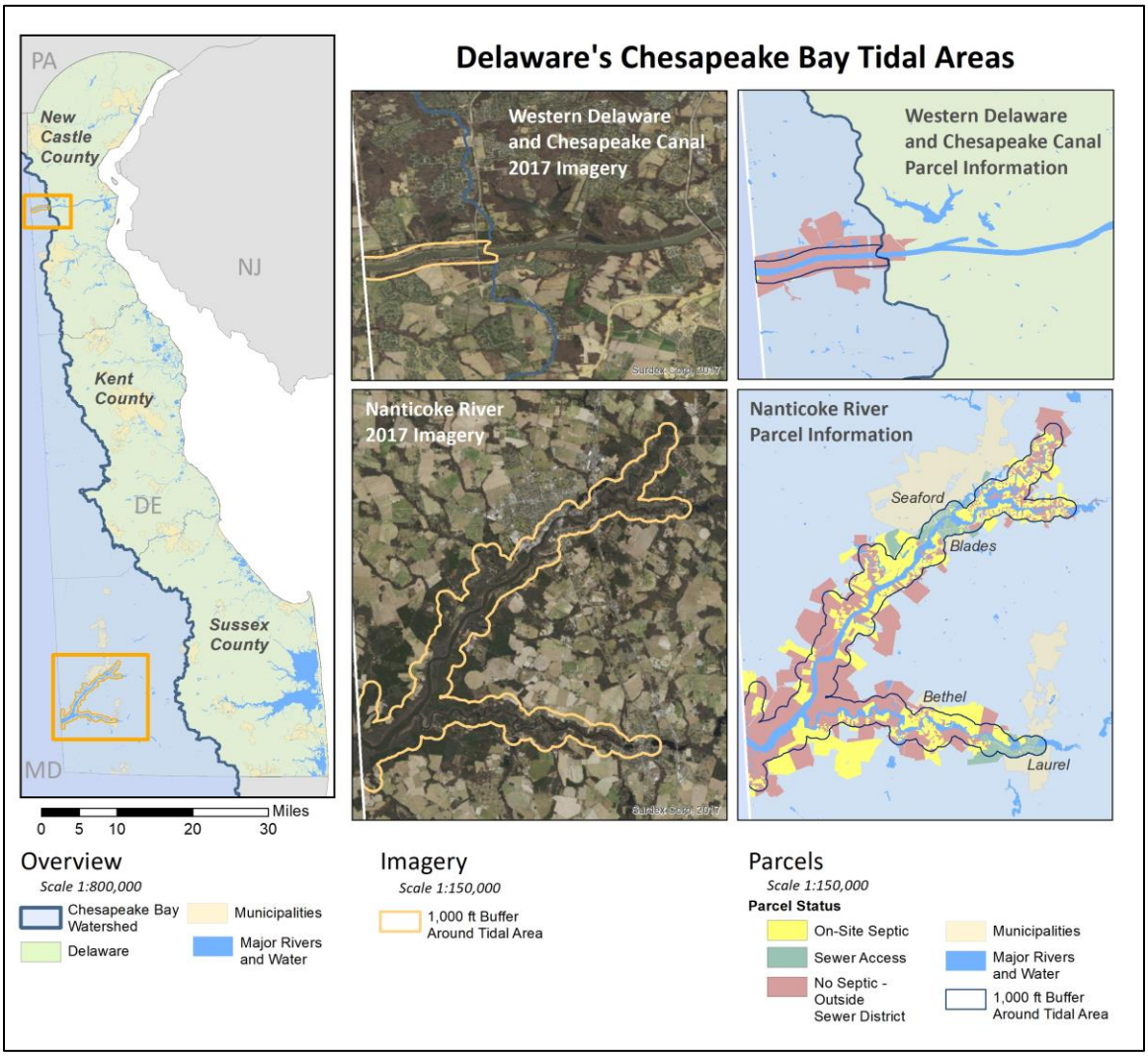

Figure 3-4. Parcels that will be required to upgrade to advanced treatment units (within 1,000 of Chesapeake Bay tidal waters).

3.2.3.1.3 Operation and Maintenance of Innovative/Alternative Technologies for Small Systems

Owners of innovative/alternative technology systems are required to have a contract with a certified service provider who inspects the system twice a year and submits inspection reports to the GWDS. If the system is found to be out of compliance, the GWDS will takes appropriate action to have the owner bring the system back into compliance.

3.2.3.1.4 Regulations for Large Systems

Delaware's 2014 OWTDS regulations also placed stricter controls on large systems, as documented below.

All large systems in Delaware are required to comply with the applicable performance standards presented in Table 3-3.

- Routine effluent sampling is required to verify compliance with the performance standards. All large systems are required to install monitoring wells to verify that the discharge from the facility is not causing a violation of any primary drinking water standard.
- Large system applications require a surface water assessment report to verify compliance with applicable TMDL requirements.
- A comprehensive annual inspection is performed for every large system. Systems with a design flow greater than or equal to 20,000 gpd are inspected on a quarterly basis. Inspection frequencies are increased if a facility is out of compliance. Penalties for noncompliance include voluntary compliance agreements, a verbal warning, noncompliance notifications, Notice of Violation, and Secretary Order, which could include fines.
- All large systems with a design greater than or equal to 2,500 gpd are required to have a licensed wastewater operator in direct responsible charge of the wastewater treatment facility. The level of license required is based on the complexity of the wastewater treatment facility, as documented in the *Delaware Regulations for Licensing Operators of Wastewater Facilities* (DNREC 2018)
- All new large systems serving 50 or more units must be owned and operated by a public utility approved by the Delaware Public Service Commission (PSC). The utility must obtain a Certificate of Public Convenience and Necessity from the Delaware PSC before constructing any large system. The Delaware PSC oversees the financial stability of the utility and approves sewer rates. New systems serving fewer than 50 units are required to establish an escrow account to ensure long-term financial viability of the system.

Table 3-3. On-Site Wastewater Performance Standard Definitions and Requirements

Performance Standard	Requirements
TN Performance Standards	
PSN level 1 (PSN1)[a]	Total nitrogen levels must achieve either: • An average annual concentration of 5 mg/L (ppm) total nitrogen in effluent sampled at the end-of-pipe of the pretreatment unit; • A 90% reduction in the effluent total nitrogen concentration when compared to the influent total nitrogen concentration; or • An average annual concentration of 10 mg/L beneath any permitted wastewater spray irrigation field as verified by monitoring in-field lysimeters, providing that the design percolate concentration does not exceed 10 mg/L on an average annual basis.
PSN level 2 (PSN2)[a]	Total nitrogen levels must achieve either: • An average annual concentration of 10 mg/L total nitrogen in effluent sampled at the end-of-pipe of the pretreatment unit; • An 80% reduction in effluent total nitrogen concentration when compared to the influent total nitrogen concentration; or • An average annual concentration of 10 mg/L beneath any permitted wastewater spray irrigation field as verified by monitoring in-field lysimeters, providing that the design percolate concentration does not exceed 10 mg/L on an average annual basis.
PSN level 3 (PSN3)	Total nitrogen levels must achieve either: • An average annual concentration of 20 mg/L total nitrogen in effluent sampled at the end-of-pipe of the pretreatment unit; or • A 50% reduction in effluent total nitrogen concentration when compared to the influent total nitrogen concentration.
TP Performance Standards	
PSP level 1 (PSP1)[a]	Total phosphorus levels must achieve either: • An average annual concentration of 3.9 mg/L total phosphorus in effluent sampled at the end-of-pipe of the pretreatment unit; • A 75% reduction in effluent total phosphorus concentration when compared to the influent total phosphorus; or • An average annual concentration of 3.9 mg/L beneath any permitted wastewater spray irrigation field as verified by monitoring in-field lysimeters, providing that the design percolate concentration does not exceed 3.9 mg/L on an annual average basis.
PSP level 2 (PSP2)[a]	Total phosphorus levels must achieve either: • An average annual concentration of 7.85 mg/L total phosphorus in effluent sampled at the end-of-pipe of the pretreatment unit; or • A 50% reduction in effluent total phosphorus concentration when compared to the influent total phosphorus concentration.

Notes: ppm = parts per million; PSP = Performance Standard Phosphorus.

[a] Discharge limitations are to be expressed as a mass, based on average design flows (221 gpd per unit for residential systems).

Requirements for large systems with flows greater than 2,500 gpd but less than 20,000 gpd are as follows:

- All new systems shall meet a PSN level 2 (PSN2).
- All replacement systems shall meet a PSN level 3 (PSN3).
- When the operation permit expires for an existing system, the system must meet a PSN3. If DNREC deems that the system must be redesigned to meet PSN3, the owner or operator of the system will have up to 60 months from the permit expiration date to bring the system into compliance with the new standard.

Requirements for large systems with flows greater than 20,000 gpd are as follows:

- All new systems shall meet PSN level 1 (PSN1).
- All replacement systems shall meet PSN2.
- When the operation permit expires for an existing system, DNREC will require the system to meet PSN2. If the DNREC deems that the system must be redesigned to meet PSN2, the owner or operator of the system will have up to 60 months from the permit expiration date to bring the system into compliance with the new standard.
- Where the system location is identified as having high potential for phosphorus mobility, the large system shall meet a Performance Standard Phosphorus level 1 (PSP1).
- When the operation permit expires for an existing system and the system location is identified as having high potential for phosphorus mobility, the system must comply with the PSP1. If the DNREC deems that the system must be redesigned to meet PSP1, the owner or operator of the system will have up to 60 months from the permit expiration date to bring the system into compliance with the new standard.

Requiring upgrades when operation permits expire for existing systems might cause a hardship. DNREC will work with the system owners through the EF for low-interest loans, if necessary.

3.2.3.2 Septic Connections

Through expanding sewer districts, OWTDSs will be eliminated in the future. Local short-term (2020 and 2025) and long-term (2035) sewer annexation plans were reviewed and existing OWTDSs that will fall within the expanding districts were identified (see Section 3.3.2.7).

3.3 Numeric Implementation for the Developed Sector

This section presents the numeric implementation commitments between 2018 and 2025 needed to achieve the Phase III WIP planning targets for Delaware's Developed Sector. See Section 2.1 and 3.1 for the LAPGs for the Developed Sector. Developed Sector loads of total nitrogen and total phosphorus include loads from all developed land uses, septic systems, wastewater, and the natural load from New Castle County.

The Chesapeake Assessment Scenario Tool (CAST) was used to determine the numeric planning goals for the Phase III WIP. BMPs were chosen based on which practices are the most effective for the smallest cost and which practices can be readily implemented because of existing and potential funding and landowner interest. Information on effectiveness and cost was downloaded from CAST during the summer of 2018 to support BMP choices for the Phase III WIP.

Delaware is presenting local numeric planning goals as quantities of implementation goals for specific BMPs. Definitions of all Phase III WIP BMPs are presented in Appendix D. Sections 3.3.1 through 3.3.2.10 present the Phase III WIP (2025) goals for each Developed Sector BMP type implemented by county in the Chesapeake Bay watershed in Delaware as well as the progress that has been made toward reaching that goal. Changes between the Phase II WIP and the Phase III WIP are discussed, as well as the funding mechanisms available to implement each BMP, and the challenges facing the implementation process. Appendix E contains a summary comparing the Phase II WIP goals, 2017 Progress, and the new Phase III WIP goals. BMPs will primarily be implemented on newly developed land because of the higher costs to retrofit existing development.

3.3.1 Stormwater Performance Standard Practices

Stormwater management practices used in Delaware have evolved over the years from traditional treatment practices to the more contemporary use of practices that promote recharge and reuse of stormwater runoff. The water quality benefits from the former class of treatment practices are based on their pollutant removal efficiency, which in turn is largely based on physical settling and filtering processes. The original technical standards under the DSSR that went into effect in 1991 were based on 80% reduction in annual total suspended solids loads for the first inch of runoff.

Runoff reduction practices, on the other hand, achieve their benefits through reducing or slowly releasing stormwater runoff volume to mimic natural systems. This not only reduces pollutant loadings, but it also has the added benefit of protecting receiving waters from the hydrologic impacts associated with new development. Green technology practices were initially introduced into the DSSR through revisions that became effective in 2005 that elevated them to the highest preference in the stormwater BMP hierarchy. These practices were expanded in 2014 under the *Delaware Post Construction Stormwater BMP Standards & Specifications* (DNREC 2019). They were further refined, adjusted, and updated with adoption of the revised DSSR in February 2019.

The 2019 revisions to the DSSR are based on management of the annualized runoff from the 1-year frequency storm event, which is approximately 2.7 inches of rainfall in Delaware. This represents all annual precipitation runoff associated with impervious areas up to the 99th percentile. For new development, the initial goal is to employ runoff reduction practices to the maximum extent practicable to capture runoff volume so the effective imperviousness for the site is brought down to 0%, reducing pollutant loadings by an equivalent amount. Redevelopment projects are required to reduce their effective imperviousness to 15% of the existing condition, with a consequential 15% reduction in the existing pollutant load. If site conditions make it impossible to meet the runoff reduction criteria, an offset must be provided so equivalent runoff reduction objectives can be met elsewhere in the project's immediate or adjacent watershed. This approach is consistent with the recommendations from the National Research Council's report on *Urban Stormwater Management in the United States* (NRC 2009), as well as EPA policy memoranda that recognize stormwater flow and volume management as appropriate surrogates for meeting overall water quality and habitat protection goals and objectives.

The Phase III WIP was designed with BMPs falling into one of two categories: runoff reduction or stormwater treatment (Table 3-4). All existing structural stormwater BMPs were converted to the Stormwater Performance Standard–runoff reduction or stormwater treatment treating 1.0 inch of runoff. Runoff reduction and stormwater treatment BMPs receive more credit than individual BMPs. The credit is based on volume of runoff treated, area treated, and percent imperviousness. Runoff reduction BMPs reduce the volume of runoff and pollutant concentration, while stormwater treatment BMPs reduce only the pollutant concentration. For compliance purposes, stormwater treatment BMPs that provide 48-hour detention meet the runoff reduction goals under the 2019 DSSR, but pollutant reductions are based on removal efficiency rather than a load reduction. The Stormwater Performance runoff reduction and stormwater treatment practices used 1.0 inch treated for existing BMPs and 1.5 inches treated for new implementation.

Urban BMPs that are not runoff reduction or stormwater treatment performance standard BMPs include conservation landscaping practices, erosion and sediment control, urban tree planting, urban nutrient management, urban stream restoration, street sweeping, septic system connections to sewer, septic denitrification, septic pumping, and forest harvesting practices. A description of these urban BMPs is provided in Appendix D.

Table 3-4. Runoff Reduction and Stormwater Performance Standard BMP Groupings

BMP Category	BMPs for Developed Land
Runoff Reduction Practices	Bioretention
	Bioswale
	Impervious Disconnection
	Infiltration Practices
	Permeable Pavement
	Urban Filter Strips
	Vegetated Open Channel
Stormwater Treatment Practices	Dry Ponds
	Extended Dry Ponds
	Filtering Practices
	Floating Treatment Wetlands
	Grey Infrastructure
	Wet Ponds & Wetlands

The number of acres treated for each of the Stormwater Performance Standard practices identified in Table 3-4 were summed for the Phase II WIP and the 2017 Progress for comparison to the Stormwater Performance Standard practices included in the Phase III WIP.

Phase III WIP Goal: The 2025 Phase III goals for New Castle, Kent, and Sussex counties are presented in Table 3-5.

Funding Mechanism: The funding opportunities to improve stormwater quality in the Chesapeake Bay watershed are tied to several funding sources. The State Revolving Fund (SRF) has recently been expanded to include "green projects" of which stormwater is a major component. Projects may seek this funding to improve community drainage, and a strategy should be employed to ensure that a water quality benefit is also part of the project design.

The state uses a special fund called the Resource, Conservation and Development (RC&D) 21st Century Fund to finance major and minor flooding and drainage projects throughout the state. While these funds are limited, there should be a concerted effort to integrate water quality management practices into projects funded through this program. As of July 1, 2018, there are 935 approved projects in the state with an estimated funding deficit of $81 million.

State cost-share funds if enhanced, could be made available for funding more urban projects with a demonstrated water quality benefit in the future. These funds are made available to landowners and could be expanded to include municipalities with a plan for identifying and implementing water quality practices.

In June 2017, the University of Maryland Environmental Finance Center prepared a document titled *Strategies for Financing Water Quality Restoration in Delaware* (UMEFC 2017). The Environmental Finance Center provided a suite of strategies for financing water quality restoration from existing financing to imposing tighter restrictions on municipalities and agriculture. Unlike Maryland, Delaware does not have the driver of required impervious reduction or nutrient load reductions from the MS4s in the Chesapeake Bay watershed. Strategies such as Pay for Performance and P3 Partnerships are great tools in the appropriate areas in Maryland; however, they are not cost-effective in Kent and Sussex counties. Other strategies included the creation of more regulated areas, implementation of new fees and taxes, and hiring an independent financing entity to manage water restoration investments.

Recognizing the financial challenge to local municipalities, DNREC's EF, through the leadership of the WIAC, has developed programs to deliver funding to municipalities and community organizations. Using Surface Water Matching Planning Grants, municipalities and counties can develop preliminary plans for water quality improvement projects at a 50% cost savings. The WIAC and EF have developed grant funding opportunities through Community Water Quality Improvement Grants for homeowners' associations, community organizations, and other nonprofits to implement water quality improvement projects through matching grants.

For municipalities that are not receiving subsidies, EF has also developed loan programs focusing on water quality and land conservation to link with new or existing wastewater loans at a reduced rate. These loans are for municipalities to take advantage of during construction or for comprehensive planning by the purchase of conservation easements to preserve stream buffers, excellent recharge areas, or future municipal park sites.

The WIAC has developed a strategy for the best use of fees-in-lieu collected as offsets for projects unable to comply with the resource protection event requirements under the DSSR.

Other grant funding opportunities through Clean Water Act (CWA) Section 319 Grants, and direct grant funds through the CBP and sources such as the National Fish and Wildlife Federation will be used in the watershed. Historically, most of these funds have not been used in urban corridors. Strategies are changing, however, and, in the future, more funds may be directed toward the developed landscape.

DNREC will continue to seek additional funding resources to help the towns, municipalities, and conservation districts meet the growing demands for funding stormwater source reduction strategies and retrofits in the Chesapeake Bay watershed.

The new DSSR make provisions for stormwater management banking, offsets, and trading, along with the creation of a stormwater management offset districts. These opportunities are currently being explored for use by Sussex County.

DNREC has established an internal workgroup to better understand the possibilities allowed by the framework of the DSSR. The internal workgroup has been directed to explore separate regulations for banking, offsets, and trading of items not permissible under the DSSR (i.e., copper, zinc, TMDLs other than nitrogen and phosphorus).

Challenges: While several municipalities in the Chesapeake Bay watershed are financially challenged and qualify for subsidies from the SRF for upgrades of their drinking water and wastewater infrastructure, including the implementation of stormwater BMPs, they are faced with balancing improvement projects and maintaining daily operations. DNREC works with municipalities to help them understand the need to implement water quality improvements while other major projects (e.g., sewer/water line replacement, and street and sidewalk rehabilitation) are being completed. To this end, several water quality improvement projects have been identified and municipalities are waiting to incorporate them into major scale projects.

Each MS4 community will be responsible for implementing their own BMPs to address the new Tier I and Tier II general permit MCMs. As a result, the BMPs implemented and their associated costs will vary across communities. The costs associated with BMPs represent a significant challenge for Delaware's MS4 communities. These communities do not have significant or permanent funding or staffing resources to allocate to their MS4 programs. While grants are available, they can be limited in scope or availability. They may also have matching requirements that are not feasible for a community to meet. Even low-interest loans may be limited based on the community's ability to repay or to take on more debt. The state's MS4 program will need to work closely with MS4 communities to find creative and cost-effective methods to resolve these issues.

Table 3-5. Phase III WIP 2025 Cumulative Goals for Stormwater Performance Standards Practices (Runoff Reduction and Stormwater Treatment)

BMP Name	County	Phase III WIP 2025 Goal (acres treated)	Progress to Date[c] (% of goal met)
Runoff Reduction[a]	New Castle County	104	100%
	Kent County	248	38%
	Sussex County	1,725	91%
Stormwater Treatment Practices[b]	New Castle County	1,170	24%
	Kent County	1,157	77%
	Sussex County	9,088	100%
TOTAL		**13,494**	**91%**

Notes:
[a] Runoff reduction practices included in the Phase II WIP, 2017 Progress, and Phase III WIP include bioretention, bioswale, impervious disconnection, urban infiltration practices, urban filter strips, and vegetated channels.
[b] Stormwater treatment practices included in the Phase II WIP, 2017 Progress, and Phase III WIP include dry ponds, filtering practices, and wet ponds and wetlands.
[c] Progress as of 2017 midpoint assessment.

3.3.2 BMPs Not Categorized under Stormwater Performance Standard Practices

3.3.2.1 Conservation Landscaping

Conservation landscaping is a BMP that was not available for the Phase II WIP or 2017 Progress but is available to be implemented for the Phase III WIP. Conservation landscaping is the conversion of managed turf to unmanaged turf or meadow.

Phase III WIP Goal: The 2025 Phase III goals for New Castle, Kent, and Sussex counties presented in Table 3-10 were determined by implementing conservation landscaping on 5%, or 3,207 acres in New Castle, Kent, and Sussex counties.

Funding Mechanism: Conservation landscaping is not currently funded. Funding for a new program, including technical and financial resources, could potentially come from the Nonpoint Source Section 319 Grant, CBIG, or the Chesapeake Bay Regulatory and Accountability Program (CBRAP). Additionally, the Division of Climate, Coastal and Energy could support using Regional Greenhouse Gas Initiative funds.

Challenges: To begin a new program and implement conservation landscaping would require additional technical and financial resources. The DNREC and University of Delaware are exploring these options to begin a new program in the unregulated community.

Table 3-6. Phase III WIP 2025 Cumulative Goals for Conservation Landscaping

BMP Name	County	Phase III WIP 2025 Goal (acres)	Progress to Date[a] (% of goal met)
Conservation Landscaping	New Castle County	343	0%
	Kent County	709	0%
	Sussex County	2,155	0%
TOTAL		**3,207**	**0%**

Note:
[a] Progress as of 2017 midpoint assessment.

3.3.2.2 Erosion and Sediment Control

The DSSR require erosion and sediment control on any land-disturbing activities exceeding 5,000 square feet; therefore, 100% of the goal has been met. The Phase III WIP goals for erosion and sediment control have decreased from the Phase II goals and 2017 Progress to represent any noncompliance (Table 3-7).

Phase III WIP Goal: The Phase III WIP goal places erosion and sediment control on 99% of all sites. The NPDES Construction General Permit requires 100% implementation, but 99% represents any potential noncompliance.

Funding Mechanism: Regulatory requirement.

Challenges: DNREC's Sediment and Storm Water Program has determined that additional funding is necessary to support heavier *implementation and additional* enforcement and compliance. With current economic status, the regulatory agencies have not been able to meet full staffing capacity. The Sediment and Storm Water Program will consider increasing the current staffing level by one full-time employee ($50,000 annually).

Table 3-7. Phase III WIP 2025 Annual Goals for Erosion and Sediment Control

BMP Name	County	Phase III WIP 2025 Goal (acres/year)	Progress to Date[a] (% of goal met)
Erosion and Sediment Control Practices	New Castle County	91	100%
	Kent County	5	100%
	Sussex County	433	100%
TOTAL		**529**	**100%**

Note:
[a] Progress as of 2017 midpoint assessment.

3.3.2.3 Urban Tree Planting

The focus area for urban tree planting is on Kent and Sussex counties because of their larger areas in the Chesapeake Bay watershed. Only a small portion of the tree planting goal for the two counties has been met, but Delaware is confidant the Phase III WIP goals can be achieved.

Phase III WIP Goal: The 2025 Phase III goals for New Castle, Kent, and Sussex counties presented in Table 3-11 were determined by implementing urban tree planting on 1%, or 366 acres, of turfgrass in Kent and Sussex counties. In a Delaware Forest Service (DFS) study, tree planting projects audited from the DFS's Urban and Community Forestry Program Grants from 2000 to 2014 and inventoried surviving trees from 212 planting sites. This study demonstrated an average annual survival rate for the 15 years was 95.8%.

Funding Mechanism: Funding for urban tree planting is provided primarily through the DFS's Urban and Community Forestry Program Grants. The program offers financial assistance to communities across the state to increase urban tree canopy. Additional funding has been provided and is available through DNREC's Division of Watershed Stewardship Nonpoint Source Section 319 Grant and CBIG. Additionally, the Division of Climate, Coastal and Energy has funding available from Regional Greenhouse Gas Initiative funds.

Challenges: The Urban and Community Forestry Program has determined additional funding is necessary to support increased implementation and provide technical assistance to the regulated and unregulated community.

Table 3-8. Phase III WIP 2025 Cumulative Goals for Urban Tree Planting

BMP Name	County	Phase III WIP 2025 Goal (acres)	Progress to Date[a] (% of goal met)
Urban Tree Planting	New Castle County	0	100%
	Kent County	100	0.14%
	Sussex County	266	0.75%
TOTAL		**366**	**1%**

Note:
[a] Progress as of 2017 midpoint assessment.

3.3.2.4 Urban Nutrient Management (Residential Fertilizer Use)

Phase III WIP Goal: The 2025 Phase III goals for New Castle, Kent, and Sussex counties presented in Table 3-9 were determined by applying urban nutrient management to 50% of high-risk lawns in each county. High-risk lawns for urban nutrient management are used because most of Delaware is classified as having high-risk lawns based on sandy soils (Schueler and Lane 2013). The DDA and Nutrient Management Commission (DNMC) are uniquely capable and have the authority to develop and implement, with the University of Delaware, a robust Urban Nutrient Management Program.

The current regulations for turf applications limit total application rates and timing for nitrogen and phosphorus. However, the only current enforcement of the program for residential turf is requiring Commercial Nutrient Handler certification and annual reporting for nutrient application activities across the state. This does not include following a nutrient management plan (NMP), despite an existing legal and regulatory requirement. The first step in remedying this inadequacy is the University of Delaware developing an Urban Nutrient Management Plan template, consistent with the existing regulations.

There will also be an investigation into how many lawncare companies and individuals working in the developed landscape that could require certification as Commercial Nutrient Handlers exist in the state. To do this, certifications through the pesticide program managed by DDA and other partner databases (e.g., the Delaware Nursery and Landscape Association membership) will be consulted. The University of Delaware has been certifying Commercial Nutrient Handlers on the developed side since the inception of the program and, in the last few years, has ramped up programming aimed at that community. The total extent possible numbers will be compared to the numbers that have already gone through the program to determine how much additional training and certification will be required for those applying nutrients in the Developed Sector. Depending on the size of this group, a schedule will be set for bringing those individuals into compliance and a phased approach may be considered, as was taken with the Agricultural Sector in the late 1990s.

Outreach for this program would include advertising that this existing requirement will now be enforced at stakeholder meetings. The stakeholder meetings would consist of presentations highlighting the role of the DNMC as well as roles and responsibilities for lawn fertilizer applicators within companies that have total client acreage of 10 or more acres. These meetings would also serve as training for using the new Urban Nutrient Management Plan template. After coordinating these meetings, the University would enroll prospective new Commercial Nutrient Handlers, training them in horticulturally focused nutrient management trainings, including the use and application of the Nutrient Management Plan template. Commercial Nutrient Handler certifications require passage of a written exam.

Ongoing operation of this program would require consistent offerings of the horticultural nutrient management certification sessions. It would also need coordination of continuing education credits for certification holders, processing of annual reporting forms, and audits to confirm annual reporting was in accordance with NMPs. It is expected this would require the hiring of two individuals, one for education and one focused on enforcement. Similar to the agricultural enforcement, one position would be an Environmental Scientist II and analogous to DDA's pesticide program, the other would be a Program Coordinator. In 2019 position funding estimates this would cost roughly $130,000 annually, with $75,000 to fund the Environmental Scientist II position and $55,000 to fund the Program Coordinator position for salary, insurance, and other employee costs. Additional costs would be incurred for materials, mailings, travel, and software development projects. DNREC has expressed interest in funding this initiative.

Peer-reviewed data originating in the Phase 4.3 Watershed Model estimate that 50% of lawns are maintained by professional services, so the expected program coverage and compliance would be 85% of those lawns, or 43% of lawns across the state. Further credit for urban nutrient management could come from voluntary programs like Delaware Livable Lawns among the do-it-yourself homeowners' lawns.

In addition, Delaware Livable Lawns tracks progress on their urban nutrient practices using website forms, statewide databases of homeowner provided data, and certified commercial applicator data. Data provided by homeowners participating in the program could include lawn size, watershed, and type of fertilizer used (nutrient profile, fertilizer application dates, and amount of fertilizer applied). In addition to the homeowner data, each Delaware Livable Lawns certified commercial applicator provides annual data to the program, including the number of fertilizer customers served with a separate distinction for the number of new customers gained that year, total lawn area served for those customers, number of soil tests performed, the timing of fertilizer applications, and amount of nitrogen applied and total area in which it was applied. DDA also supplies Delaware Livable Lawns with information upon request on certified Nutrient Management Handlers to promote the program to applicators.

Funding Mechanism: CBP grant funding. DNREC and DDA will coordinate funding an education, outreach, and enforcement program as mutually committed to by the DNREC and DDA Secretaries. Funding for Delaware Livable Lawns comes from DelDOT and DNREC's Nonpoint Source Section 319 Grant and CBIG.

Challenges: Funding is limited and additional resources are needed for staff through the University of Delaware nutrient management certification program and DDA for staff to enforce urban nutrient management compliance. Other challenges include timing of the funding and implementing a full program from recruitment to full rollout.

Table 3-9. Phase III WIP 2025 Annual Goals for Urban Nutrient Management

BMP Name	County	Phase III WIP 2025 Goal (acres/year)	Progress to Date[a] (% of goal met)
Urban Nutrient Management	New Castle County	2,623	0%
	Kent County	5,353	0%
	Sussex County	15,580	0%
TOTAL		**23,556**	**0%**

Note:
[a] Progress as of 2017 midpoint assessment.

3.3.2.5 Urban Stream Restoration

Phase III WIP Goal: The Phase II WIP goal was to maintain 200 feet of urban stream restoration on a low-density pervious site in the Seaford area in Sussex County, which was exceeded by 375 feet (Table 3-10). The Phase III WIP goal is to have 10 feet of urban stream restoration per acre of new development on all modeling segments that grow between 2017 and 2025 (33,117 feet). See Section 6 for a discussion on how growth between 2017 and 2025 was estimated in the Phase 6 Chesapeake Bay Watershed Model. The largest area of urban stream restoration will be in Sussex County, which is the area of the watershed expected to see the most growth between 2018 and 2025.

In addition to urban stream restoration, the Developed Sector also includes non-urban stream restoration on forested areas (natural load) in New Castle County. The Phase III WIP does not include any goals for non-urban stream restoration in New Castle County.

Funding Mechanism: DNREC's Division of Watershed Stewardship has funding through the Nonpoint Source Section 319 Grant, CBIG, and CBRAP. Additionally, the DNREC EF administers Delaware's Clean Water State Revolving Fund (CWSRF), which includes loan and grant programs for water quality projects. These projects include nonpoint source, watershed protection, restoration, green infrastructure, estuary management projects, and traditional municipal wastewater treatment projects. The funding is available to municipalities, private organizations, nonprofit organizations, and private individuals.

Challenges: Stream restoration projects are expensive compared to many of the other available BMPs. Lack of funding and requiring landowner permission for contiguous stretches of streams are some challenges faced for increasing implementation.

Table 3-10. Phase III WIP 2025 Cumulative Goals for Urban Stream Restoration

BMP Name	County	Phase III WIP 2025 Goal (feet)	Progress to Date[a] (% of goal met)
Urban Stream Restoration	New Castle County	5,691	0%
	Kent County	289	0%
	Sussex County	29,637	2%
Non-Urban Stream Restoration	New Castle County	0.0	0%
TOTAL		**35,617**	**2%**

Note:
[a] Progress as of 2017 midpoint assessment.

3.3.2.6 Street Sweeping

Phase III WIP Goal: The Phase II WIP goal of 3,143 acres was primarily based on DelDOT's efforts to continue meeting their MS4 permit requirements for street sweeping. These goals have not been met to date because of reporting issues and the street sweeping methods not meeting the CBP's street sweeping standards. New DelDOT staff have reexamined their methods since the Phase II WIP was developed and have determined that their tandem sweeping method (mechanical broom that runs alongside a vacuum) can receive credit in the Phase 6 Watershed Model. The 2025 Phase III goals for New Castle, Kent, and Sussex counties are presented in Table 3-11.

Funding Mechanism: Regulatory requirement.

Challenges: More street sweeping occurs than is documented, but most municipality and DelDOT efforts in the Chesapeake Bay watershed do not conform to the frequencies required to be considered a BMP in the Phase 6 Chesapeake Bay Watershed Model.

Table 3-11. Phase III WIP 2025 Annual Goals for Street Sweeping

BMP Name	County	Phase III WIP 2025 Goal (acres/year)	Progress to Date[a] (% of goal met)
Street Sweeping (Mechanical Broom Technology)	New Castle County	92	0%
	Kent County	133	0%
	Sussex County	178	13%
TOTAL		**403**	**6%**

Note:
[a]Progress as of 2017 midpoint assessment.

3.3.2.7 Septic System Connections

Phase III WIP Goal: The Phase III WIP goal is to eliminate a minimum of 350 septic systems through connection to sewer systems (reported as equivalent dwelling units) by 2020 and 600 systems by 2025. The 2025 Phase III goals for New Castle, Kent, and Sussex counties are presented in Table 3-12.

Funding Mechanism: DNREC's Division of Watershed Stewardship has funding through the Nonpoint Source Section 319 Grant Program and CBIG. The DNREC EF administers Delaware's CWSRF, which includes loan and grant programs for water quality projects, including sewer connections by expanding sewer service districts.

Challenges: General challenges to implementing the Phase III WIP goals for septic connections as well as septic system upgrades and septic system pump-out are included here (see sections 3.3.2.8 and 3.3.2.9). In preparation for the TMDLs and Pollution Control Strategies implementation over the past five years, DNREC has increased staffing in the GWDS by establishing two new full-time positions: an Environmental Scientist position to review and issue permits, and inspect advanced treated OWTDSs statewide and a Senior Environmental Compliance Specialist to review and provide quality assurance/quality control for inspections performed by Class H licensees that inspect systems at the sale of a property. To improve compliance and increase participation rates by 20%, funding should be increased to provide greater outreach, staffing, and technical resources. The GWDS would be better served by increasing the staffing levels by one full-time employee ($50,000 annually). Additional needs to fill gaps are identified below:

- Additional staff or staff movement will likely be needed to maintain a more aggressive operation and maintenance inspection program for the innovative and alternative system requirements and data collection.
- Improved tracking and reporting of pump-outs and inspections, advanced treatment units, and connections to central sewer.
    - DEN, a data management system, needs improvements. Additional funding for database upgrades and management ($50,000 annually); and
    - EQuIS, an environmental data management system, the most widely used in the world, needs to be implemented. Seed monies were used to initiate the implementation. Additional funding is needed to provide for enhancements and maintenance ($50,000 annually).
- Grant funding to update the database to track waste haulers and verify that septic system pump-out requirements are being met.
- Funds to update database to incorporate GIS mapping, watershed boundaries, and document scanning.
- State and federal funding resources to include grants to make municipal systems affordable, to extend municipal sewer service to areas with high densities of septic systems, and to help low-income on-site users replace or repair failing systems and/or install nutrient reducing technologies.

Table 3-12. Phase III WIP 2025 Cumulative Goals for Sewer Connections

BMP Name	County	Phase III WIP 2025 Goal (Number of systems)	Progress to Date[a] (% of goal met)
Septic Connections	New Castle County	19	21%
	Kent County	147	100%
	Sussex County	434	15%
TOTAL		**600**	**63%**

Note:
[a]Progress as of 2017 midpoint assessment.

3.3.2.8 Advanced Treatment Upgrades (Septic System Denitrification)

Phase III WIP Goal: The Phase III WIP goal for advanced treatment upgrades has increased since the Phase II WIP and is to upgrade 25% of the systems across the watershed. This includes upgrading 1,432 existing small septic systems within 1,000 feet of tidal waters and associated tidal wetlands to advanced treatment (denitrification) technologies. Since these systems will be required to upgrade only if and when they fail, it is difficult to determine timing. It is assumed that all systems will be upgraded by 2035; however, if they are maintained properly, some existing systems could last longer. Therefore, Delaware is not setting milestone and interim goals for upgrades. The 2025 Phase III goals for New Castle, Kent, and Sussex counties are presented in Table 3-13.

Funding Mechanism: An initiative is underway that improves water quality and protects the health of streams and rivers in Sussex County by reducing the number of failing OWTDSs in the Chesapeake Bay watershed. The initiative will replace failing OWTDSs by identifying and securing qualified loan applicants for the Delaware CWSRF's Septic Rehabilitation Loan Program and the Septic Extended Funding Option Program. This initiative will use the services of First State Community Action, a nonprofit grassroots organization with a proven ability to access the needs of homeowners in low-to-moderate income communities. A portion of the funding for this initiative is from CBIG.

Challenges: See challenges listed in Section 3.3.2.7.

Table 3-13. Phase III WIP 2025 Cumulative Goals for Advanced Treatment Upgrades

BMP Name	County	Phase III WIP 2025 Goal (Number of systems)	Progress to Date[a] (% of goal met)
Septic System Denitrification	New Castle County	122	4%
	Kent County	954	6%
	Sussex County	2,817	7%
TOTAL		**3,983**	**7%**

Note:
[a]Progress as of 2017 midpoint assessment.

3.3.2.9 Septic Pump-Out

The Phase II WIP goal was to achieve 60% septic pump-out once every three years by 2017. At of the end of 2017, the goal was met and exceeded. The 2025 Phase III WIP goals for New Castle, Kent, and Sussex counties are presented in Table 3-14. The Phase III WIP goal for the inspection and pump-out program for small septic systems is that, by 2025, one-third (33%) of all OWTDSs in the Chesapeake Bay watershed will be pumped out each year. In other words, all OWTDSs in the watershed will be pumped out once every three years. This goal is based on the requirements of the statewide inspection and pump-out program (see Section 3.2.3.1.1).

Phase III WIP Goal: Approximately one-third (33%) of all OWTDSs in the Chesapeake Bay watershed will be pumped out each year.

Funding Mechanism: None.

Challenges: See challenges listed in Section 3.3.2.7.

Table 3-14. Phase III WIP 2025 Annual Goals for Septic Pump-Out

BMP Name	County	Phase III WIP 2025 Goal (Number of pump-outs/year)	Progress to Date[a] (% of goal met)
Septic System Pumping	New Castle County	161	90%
	Kent County	1,260	63%
	Sussex County	3,719	100%
TOTAL		**5,140**	**95%**

Note:
[a]Progress as of 2017 midpoint assessment.

3.3.2.10 Wastewater

There are five wastewater facilities located in the Chesapeake Bay watershed in Delaware. All five of the facilities are in Sussex County. Four of the facilities are considered significant facilities (Bridgeville, Invista, Laurel, and Seaford), while one is considered nonsignificant (Mobile Gardens) and did not receive a wasteload allocation (WLA) for total nitrogen or total phosphorus in the 2010 Chesapeake Bay TMDL. Significant facilities are categorized by having a design flow greater than 0.4 million gpd (EPA 2010). Each of the five wastewater facilities and the Phase III WIP goals for wastewater are discussed below.

The town of Bridgeville currently owns and operates a sanitary sewer system for the Bridgeville/Greenwood service area. The Bridgeville WWTP's last permit required the town to make significant upgrades to their facility to be able to meet new nutrient effluent limits. The municipal councils of Bridgeville and Greenwood requested that Sussex County investigate an alternate scenario in February 2017. Sussex County, in conjunction with their respective municipal engineering consultants, developed an alternate scenario for a Western Sussex County Sewer District connecting Bridgeville's flow to the city of Seaford. The city of Seaford's council has agreed in principle to the outlined arrangement, including a full buy-in for the existing municipal systems as they exist today, with any remaining legacy obligations conditioned upon the nutrient load allocation transfer under the Chesapeake Bay TMDL. So, rather than completing the required upgrades, Bridgeville has decided to retire the facility and direct the wastewater to the Seaford WWTP. The Chesapeake Bay TMDL lists specific WLAs for point source discharges but includes provisions that allow for nutrient trading among dischargers. This will allow Bridgeville's load to be transferred to Seaford upon commissioning of the Western Sussex Sewer District and termination of Bridgeville's NPDES discharge. The aging Bridgeville WWTP is anticipated to be taken off-line by the end of 2020, and the flows from Greenwood and Bridgeville will be sent to the city of Seaford, where the effluent can be treated at a higher level before being discharged to the Nanticoke River. Although it will still discharge to the river, the discharge point will be further downstream, lessening the environmental impact to the more sensitive upstream portion of the river. Once Bridgeville's flow goes to Seaford and the WWTP is no longer in operation, Bridgeville's allocated TMDL loads will be transferred to Seaford and Bridgeville's NPDES permit for wastewater discharge will be terminated. DNREC and EPA are working closely with Bridgeville, Seaford, and Sussex County in developing this project into the Western Sussex Sewer District. This partnership includes working together on timelines, modifying permits and orders, and issuing wastewater conveyance permits as necessary.

The Seaford WWTP has been operating well below its flow capacity and is equipped to handle the additional flow from Bridgeville. Seaford is currently able to operate in compliance with its own allocated loads and, with the addition of Bridgeville's allocation, will continue to be able to operate in compliance with load limits after the additional flow is added. On top of this change, Seaford will still have available capacity at its facility to accommodate short-term growth in the area. Long-term growth for Seaford or any other municipality in the Western Sussex Sewer District may require treatment plant upgrades.

The Invista plant has scaled down operations in recent years based on market conditions and has invested in new equipment at the facility such as replacing the oversized WWTP with a smaller package plant. The smaller package plant more efficiently treats the resulting lower wastewater flows. Invista is operating well under its total nitrogen load and has indicated that they would like to increase their total phosphorus allocation from 0 mg/L to 1 mg/L. To accommodate this need, Invista entered into a nutrient trading agreement with Seaford. This Nitrogen-Phosphorus Trading Agreement assigned 1,460 lbs/year of Seaford's total annual phosphorus load allocation to Invista in exchange for 27,431 lbs/year of Invista's total annual nitrogen load allocation that was then assigned to Seaford. With this trading agreement in place, Invista can accommodate growth at its facility. DNREC's Surface Water Discharges Section will be evaluating a request by Invista and Seaford to make this trade permanent during the next permitting cycle.

The Laurel WWTP is operating well below its capacity and short-term growth may be accommodated within the allocated loads; however, longer term growth will be problematic for this community without significant treatment plant upgrades.

The nutrient load from Mobile Gardens is minor and will remain at the current permitted levels for both total nitrogen and total phosphorus. Current permit limits for the facility are 13.2 mg/L total nitrogen and 1.8 mg/L total phosphorus. DNREC's Surface Water Discharges Section will maintain the permitted concentrations and resulting loads based on the current design flows. Mobile Gardens has rapid infiltration basins and uses a stream discharge as a back-up when needed.

Phase III WIP Goal: The 2025 Phase III goals for Delaware WWTPs are presented in Table 3-15. They are based on WLAs with some notable modifications. As noted above, the WLA from Bridgeville is anticipated to move to Seaford once Bridgeville redirects their flow and discontinues operation. Additionally, as previously noted, Invista and Seaford currently have a trading agreement exchanging Invista's nitrogen for Seaford's phosphorus. The Agreement is anticipated to continue and become permanent; the trade has been reflected in the table. Lastly, Invista has a larger nitrogen WLA than their current operations require. Although neither their WLA nor limit is anticipated to change, it is anticipated that the facility will continue generating less nitrogen than they are currently allocated so their goal nitrogen load has been decreased.

Funding Mechanism: The CBRAP Grant provides limited funding to assist with permitting work. Given the state's permitting backlog, this funding has helped to obtain contractor support for NPDES wastewater permitting, allowing Delaware to prioritize Chesapeake Bay permits.

The CWSRF program offers low interest financing agreements for wastewater treatment, nonpoint source pollution control, and watershed and estuary management. CWSRF programs combine the federal and state capitalization funds with other program resources such as tax-exempt revenue bond proceeds, fund investment earnings, and loan repayments to provide low-interest loans for eligible projects, including wastewater infrastructure loans.

Challenges: DNREC will be working on permit modifications and a termination in the coming years to accommodate the closing of Bridgeville's wastewater treatment facility and the transferring of the flow and load allocation to Seaford's wastewater treatment facility. Future increases in flow via growth will require facility upgrades that will present significant financial hardships for the affected communities without external financial assistance. Future increases in flow will be addressed by maintaining current loads while tightening concentration limits. Compliance and participation rates for WWTPs do not need to be improved, as they are currently at satisfactory levels.

Permitting backlogs have been an issue with DNREC. In the past several years, DNREC has added effluent limits compliant with TMDL load allocations to all Chesapeake Bay permits. There is still work to be done, however, renewing permits and modifying permits to accommodate facility upgrades and changes like the addition of the Western Sussex Sewer District.

There are few modifications planned for existing regulatory programs concerning additional nutrient and sediment reductions for WWTPs. There are no plans to modify permitting strategies for WWTPs; however, there is a backlog that needs to be addressed to catch up statewide.

Table 3-15. Phase III WIP 2025 Goals for Wastewater

Facility Name and NPDES Permit ID	County	Phase II WIP 2025 Goal (lbs/year)[a]		Phase III WIP 2025 Goal (lbs/year)	
		TN (lbs/year)	TP (lbs/year)	TN (lbs/year)	TP (lbs/year)
Bridgeville Wastewater Treatment Plant (DE0020249)	Sussex County	9,746	2,437	0.0	0.0
Laurel Wastewater Treatment Plant (DE0020125)	Sussex County	8,529	2,132	8,529	2,132
Seaford Wastewater Treatment Plant (DE0020265)	Sussex County	24,367	6,092	61,544b[b,c]	7,069[b,c]
Invista (DE0000035)	Sussex County	172,000	0.0	92,564[b]	1,460[b]
Mobile Gardens Mobile Home Park (DE0050725)	Sussex County	2,414	322	2,414	322
TOTAL		**217,057**	**10,983**	**165,051**	**10,983**

Note:
DNREC acknowledges that the Phase III WIP goals for wastewater are larger than the planning goals presented in Table 3-1; however, based on the Phase III WIP BMP implementation scenarios for the Developed and Agricultural Sectors, the nitrogen and phosphorus loads will be below the overall planning goals of 4.55 million lbs per year total nitrogen and 0.108 million lbs per year total phosphorus for the state.
[a]Phase II WIP Goals are presented as Edge of Stream (EOS) loads.
[b]Nitrogen trade of 27,431 lbs/year from Invista WWTP to Seaford WWTP. Phosphorus trade of 1,460 lbs/year from Seaford WWTP to Invista WWTP.
[c]Bridgeville's nitrogen and phosphorus loads have been added to Seaford to account for the pending connection.

3.4 Local Engagement Strategies and Commitments for the Developed Sector

Local engagement for Delaware's Phase III WIP development began in March 2018 at the Chesapeake Bay WIP meeting hosted by DNREC in the state capital of Dover. This was an informational meeting focused on providing an update to stakeholders interested in the status of the Chesapeake Bay TMDL and WIP as well as Delaware's plans for Phase III WIP development. Stakeholders included federal, state, county, and municipal representatives, conservation districts, Delaware Nature Society, Nanticoke Watershed Alliance, DelDOT, Delaware Office of State Planning Coordination, University of Delaware Water Resource Center (WRC), and University of Delaware Cooperative Extension. Attendees were given the opportunity to participate in the WIP subcommittees that were directly developing the planning goals.

Specific examples of local engagement for the development of the Phase III WIP as well as its implementation are discussed below.

3.4.1 Developed Sector WIP Steering Committee

In addition to the larger informational WIP meeting in March 2018, DNREC also hosted smaller, more interactive Developed Sector WIP Steering Committee planning meetings to develop the Phase III WIP goals. The Developed Sector WIP Steering Committee included representatives from state agencies (DNREC, DelDOT, Office of Management and Budget, and University of Delaware WRC), counties, conservation districts, local municipalities (City of Seaford), contractors (Devereux Consulting and Tetra Tech), and nonprofits, including Delaware Nature Society and the Nanticoke Watershed Alliance. Interested parties were invited to attend regular planning meetings from June through September 2018. At these meetings, the committee worked to determine which BMPs were most efficient, where implementation should be focused, and what programs could be used to implement the selected BMPs.

Data from CAST were used to examine BMP effectiveness, based on both nutrient reduction and cost. Information from the CBP's Modeling Workgroup's geographic isolation runs identified subwatersheds in Delaware's portion of the Chesapeake Bay watershed that were out of attainment with the Chesapeake Bay water quality standards and should be targeted with greater BMP implementation in the Phase III WIP (see Section 2.1).

3.4.2 Municipal Ordinance Review Survey

In addition to the Developed Sector WIP Steering Committee planning meetings, DNREC partnered with the University of Delaware's WRC to develop a survey based on a municipal ordinance review completed by Tetra Tech in 2012 as part of the Phase II WIP (see Appendices K and L of the Phase 2 WIP for the full ordinance reviews). The ordinance reviews were completed for eight towns (Bethel, Blades, Bridgeville, Delmar, Georgetown, Greenwood, Laurel, and Seaford) and two counties (Kent and Sussex counties) in the Chesapeake Bay watershed. The goal of the ordinance review was to provide a service to local governments in Delaware by reviewing existing land-use ordinances for barriers to implementing the Chesapeake Bay WIP and potential opportunities for improving communities and allowing more techniques to be used to help property owners address nutrient and sediment loads from new developments. These included techniques such as green infrastructure, low impact development, conservation design and performance standards, allowing flexibility as there are often unintended barriers to these techniques in local ordinances.

To further engage local governments, assess progress, and identify potential opportunities, the WRC followed up on Tetra Tech's 2011 ordinance review by sending out an electronic survey to the towns and jurisdictions located in the Chesapeake Bay watershed in September 2018. The purpose of the survey was to help identify any ordinance changes or recommendations that have been made since the 2011 assessment. The goal of the survey was to identify opportunities for stormwater management improvements in local towns and jurisdictions in the Chesapeake Bay watershed. A sample of the letters and surveys sent to the towns and counties as well as the results are included in Appendix F.

The WRC received completed surveys from six of the 10 original respondents included in the 2011 ordinance review (Bethel, Delmar, Georgetown, Kent County, Laurel, and Seaford). The towns of Greenwood and Bridgeville provided alternative responses stating that they have new town managers since the 2011 ordinance review and do not have the background knowledge to be able to complete the survey. Sussex County and Blades did not provide responses to the survey.

Based on the results of the survey, the WRC found that the towns have not incorporated Tetra Tech's ordinance recommendations into their local ordinances. The WRC recommends the following actions be taken based on the survey results:

- Reach out to the towns/counties and identify reasons/obstacles to changing/updating ordinances.
- Follow up with the four towns/county that did not complete the survey to identify ways that DNREC can assist.
- Follow up with the towns on specific changes that can be made or on specific comments noted in the survey results.
- Continue to work with the CBP's Local Leadership Workgroup to use the available resources and implement the practices identified by the workgroup in the local governments in Delaware.
- Determine if there is a need for the local governments to participate in a Chesapeake Bay local government training. This training would discuss issues relevant to the towns/counties (e.g., TMDLs, WIPs, and MS4s) and engage them in actions to help achieve the Chesapeake Bay WIP goals as well as secure the necessary funding.

The WRC is willing to continue working with the local governments as it relates to the Chesapeake Bay Phase III WIP and DNREC's needs regarding local government outreach and pollution reduction in the Chesapeake Bay watershed.

3.4.3 Targeted Local Engagement

DNREC will continue to use a variety of techniques to engage local, regional, and federal stakeholders in implementation of the Phase III WIP. Methods include sharing information and updates on the WIP through direct mailings, emails, and newsletters; hosting webcast viewings with facilitated discussions; and using the Environmental Justice Screen Tool along with social media to target audiences. Because of Delaware's small size, holding in-person discussions with local officials is also possible.

Workshops starting soon after the Phase II WIP was completed were held to engage and interact with local governments in the Chesapeake Bay watershed. The goals were multifaceted in respect to providing information and tools to assist local governments with finding funding and implementing projects. These workshops also provided the opportunity to inform local governments about the WIP process and the state's efforts, next steps, and expectations, as well as listen to their concerns and issues. These types of workshops set the groundwork for partnerships and helped guide the planning efforts for the development of the Phase III WIP.

Specific local engagement activities planned for 2019 occurring in the Chesapeake Bay watershed include local government workshops, a community charrette in Seaford, and a new buffer/setback initiative in Sussex County. DNREC will continue to work with the municipalities in the watershed to incorporate water quality ordinances into their codes. Municipalities must be in compliance with their wastewater permits and are required to have sediment and stormwater approval for development, but all other DNREC recommendations for the municipalities are voluntary.

Established in 2013, DNREC's Reclaim Our River Program—a partnership between community volunteers, local nonprofit organizations, and state and federal agencies—offers the public utilizing the Chesapeake Bay watershed opportunities to connect with Delaware's waterways and become stakeholders; learning about the WIP process, what it means for them, and what they can do to help improve water quality. The program offers a monthly series of water quality-oriented events, workshops, presentations, and recreational opportunities.

The Reclaim Our River Program has also supported efforts like the instillation of rain gardens, shore and river cleanups, tree plantings. Since its creation, the program has been expanding its public outreach efforts utilizing innovative Facebook and radio campaigns to highlight the Delaware Livable Lawns Program, pet waste management, healthy soil practices, Nanticoke Watershed Alliance's Creekwatchers Program, and the importance of pollinators.

3.4.3.1 Phase III WIP Fact Sheet

A Phase III Chesapeake Bay WIP fact sheet, sent by mail to local governments in January 2019 (see Appendix G), presents information on local government's role in the Chesapeake Bay TMDL implementation effort. The fact sheet encourages local governments to report to the state any BMP implementation they have completed so Delaware can report the full extent of actions occurring in the Chesapeake Bay watershed.

3.4.3.2 Community Charrette – Seaford

There is a Resilient by Design project scheduled for Delaware in July 2019. The project is funded by EPA and will provide contractor support to DNREC to support a green infrastructure design community charrette (a meeting in which all stakeholders in a project attempt to resolve conflicts and map solutions). The municipality chosen for the community charrette is the city of Seaford, located in the Chesapeake Bay watershed in Sussex County. The contractor will work collaboratively with EPA, the city of Seaford, and other partners to organize the charrette and develop a conceptual design that can be used on a focus area in Seaford to leverage additional support for implementation.

The contractor will assess the roadway and evaluate pavement conditions, areas of flooding, space constraints, current usage patterns, and other factors impacting suitability of the Seaford focus area for application of green street concepts. The contractor will also identify potential flood hazards and provide an initial estimate of stormwater volumes captured within the area. The 2-day charrette will include information on the basics of green infrastructure, low impact development, and green streets, providing both simple and advanced green street design examples to elicit ideas and prompt discussion. Charrette participants will be provided with green infrastructure practice game pieces, photographs, aerial images and maps of the site, and example green streets from other towns that can be used to develop design strategies for the Seaford focus area. The contractor will develop a preliminary conceptual design for the green street focus area that will be primarily based on the design strategies recommended at the community charrette. The final design concepts will complement any ongoing improvement initiatives in Seaford. The final product will outline key recommendations from state and federal agency staff and provide recommended next steps for local stakeholders.

3.4.3.3 Additional Public Outreach

In March 2015, DNREC hosted a Chesapeake Bay BMP Verification Framework Kick-Off Meeting at the St. Jones Reserve. The meeting focused on analyzing Delaware's historical BMP data and verification framework of the Agricultural, Wastewater, Stormwater, Forestry, and Restoration sectors. Local, state, regional, and federal stakeholders were encouraged to participate.

Public outreach efforts in 2017–2018 included participating in events such as the Sustainable Landscaping in Community Open Spaces Workshop, the Clean Water Rally, the Delaware State Fair, the Becoming an Outdoors Woman Weekend, Coast Day, and the Blackbird Creek Fall Festival. DNREC hosted tree plantings as well as a rain barrel art contest, a Delaware watersheds photo contest, a Nonpoint Source Conference, and a Community Canopy tree giveaway. Previous Phase II public outreach efforts are provided in Section 14 of the Phase II WIP (DCIW 2012).

A detailed strategic communications plan outlining DNREC's citizen stewardship, diversity, and local leadership goals can be found in Appendix H.

3.4.3.4 Sussex County Buffer Initiative

A new Sussex County buffers and wetlands working group will be meeting in 2019 for the first time to begin the process of reviewing county codes and ordinances to make recommendations to the county council on buffer widths in the county (MacArthur 2019). Sussex County's buffer requirements are currently much less stringent than Kent and New Castle counties and the surrounding states of Maryland and New Jersey. Sussex County requires only a 50-foot buffer on tidal wetlands, while Kent and New Castle counties both require 100-foot buffers. Sussex County does not require any buffers along nontidal waterbodies while Kent and New Castle counties require 25- and 50-foot buffers, respectively. The working group will begin by reviewing definitions in the current buffer ordinance and in summer 2019 will begin to write recommendations for any updates to the ordinance.

3.4.4 Commitments to Implementation for the Developed Sector

As stated earlier, all BMPs constructed within and outside MS4 areas in Delaware are inspected regularly through MS4 permit commitments and through mandates relating to the DSSR that require property owners to regularly maintain BMPs. All currently designated MS4s in the Chesapeake Bay watershed portion of Sussex County have received Surface Water Matching Planning Grants to map stormwater infrastructure.

The DNREC Sediment and Stormwater Program has implementation responsibilities for all state and some federal projects. Implementation responsibilities for all other private development projects are handled by a local delegated agency. Delegated responsibilities include plan review and approval, construction review, and maintenance inspections of existing stormwater management facilities. Projects having site compliance issues or problems relating to site design or erosion and sediment control are referred to DNREC for any necessary enforcement actions.

The DSSR also contain a provision for training private individuals to serve as Certified Construction Reviewers to augment the local agencies' resources for performing construction site reviews on a weekly basis. Coupled with the oversight reviews by the local agencies, this ensures that each active construction site is checked for compliance on a regular basis.

3.4.5 Tracking, Reporting and Verification

Delaware's *Nonpoint Source Best Management Practice Implementation Data Quality Assurance and Verification Plan* (DNREC 2018b) provides details on the methods used to track, report, and verify all BMPs implemented in the Chesapeake Bay watershed. The plan was updated in November 2018. For more information on the BMP tracking, reporting, and verification methodology applied for all BMPs included in the Developed Sector Phase III WIP see the *Nonpoint Source Best Management Practice Implementation Data Quality Assurance and Verification Plan* (DNREC 2018b).

3.4.5.1 Tracking Municipal and Industrial Stormwater BMPs

Tracking and reporting of sites covered under individual NPDES permits and the General Permit Program has changed since the Phase II WIP. The Surface Water Discharges Section conducts inspections of individually permitted sites and sites covered under the General Permit Program, and inspection documentation and enforcement/compliance are audited by EPA through the State Review Framework process. The Surface Water Discharges Section began using an Access database January 1, 2011. This database tracks all inspections and enforcement actions for each site. GIS data can also be used to track industrial stormwater sites.

On October 22, 2015, EPA promulgated the NPDES Electronic Reporting Rule (eRule), which will modernize CWA reporting for municipalities, industries, and other facilities by replacing most paper-based NPDES reporting requirements with electronic reporting. Specifically, the rule requires regulated entities to report information electronically, instead of filing written paper reports. These reports include (1) Discharge Monitoring Reports, (2) Notices of Intent to discharge in compliance with a general permit, and (3) other specified program reports. The rule also requires states and other regulatory authorities to share data electronically with EPA. The data that these regulatory authorities will share with EPA include permit, compliance monitoring (e.g., inspection), violation determination, and enforcement action data. To implement the requirements of the eRule, the Surface Water Discharges Section has been working with Delaware's Department of Technology and Information to upgrade the DEN system to record and submit the required data elements. This database upgrade will include industrial and municipal sites located in the Chesapeake Bay watershed.

3.4.5.2 Tracking Construction Site BMPs

The delegated agencies conduct construction site inspections on a regular basis and use the Certified Construction Reviewers reports as a tool to help target their inspections. Deficiencies found at a construction site are noted on an inspection form and a time frame is given for correction. If the issues are not corrected, the result could be a Notice of Violation. Penalties for noncompliance under the Delaware Sediment and Stormwater Program include state enforcement, including civil and criminal penalties, as well as administrative penalties at the state level.

SWPPPTrack is a proprietary application being used by the Sediment and Stormwater Program, Kent Conservation District (KCD), and SCD to complete timely and accurate construction review reports for active construction sites. SWPPPTrack has a module that allows for post-construction maintenance inspections to be included as well.

In addition to construction site review, the DNREC Sediment and Stormwater Program and associated delegated agencies also are responsible for performing maintenance reviews of all permanent post-construction stormwater management BMPs installed in accordance with the DSSR. The current maintenance review target is a minimum 10% of existing inventory to ensure each BMP is checked at least once every 10 years in accordance with the DNREC *Nonpoint Source Best Management Practice Implementation Data Quality Assurance and Verification Plan* (DNREC 2018b).

4 Agricultural Sector

The Agricultural Sector in Delaware includes all agricultural land from New Castle, Kent, and Sussex counties and natural loads from Kent and Sussex counties. This section presents the following information:

- LAPGs for the Agricultural Sector
- Existing agricultural programs in Delaware that can be used to implement the necessary practices to meet the 2025 Chesapeake Bay Phase III WIP planning targets
- A specific numeric implementation plan to meet the 2025 planning targets
- Efforts to engage local entities in the Phase III WIP process

4.1 LAPGs for the Agricultural Sector

The Agricultural Sector represents agricultural land in the portions of New Castle, Kent, and Sussex counties in the Chesapeake Bay watershed. Agricultural land accounts for the majority (48%) of Delaware's portion of the Chesapeake Bay watershed and specifically 45%, 50%, and 48% in New Castle, Kent, and Sussex counties, respectively (Figure 1-3). The Agricultural Sector WIP Steering Committee agreed to treat the natural loads coming from Kent and Sussex counties in addition to the loads from agricultural areas in all three counties. All other land use categories are combined as "Other," LAPGs for the Agricultural Sector are presented in Table 4-1.

Table 4-1. Delaware's Agricultural Sector's LAPGs

County	Sector	Total Nitrogen Planning Target (lbs/year)	Total Phosphorus Planning Target (lbs/year)
New Castle County	Agricultural	145,510	2,537
Kent County	Agricultural	643,319	18,413
Sussex County	Agricultural	2,967,499	54,620
TOTAL		**3,756,328**	**75,570**

The overall planning targets for total nitrogen and total phosphorus on agricultural land are 3.8 million lbs/year and 0.08 million lbs/year, respectively. Results of the 2017 Progress Run of the Chesapeake Bay Watershed Model show that the existing loads of total nitrogen and total phosphorus from the Agricultural Sector are 5.02 million lbs/year and 0.04 million lbs/year, respectively. The Agricultural Sector must reduce nitrogen by 24% to meet the 2025 targets in Table 4-1, but is already meeting the target for phosphorus.

4.2 Programmatic Commitments for the Agricultural Sector

This section includes descriptions of the existing programs available to implement the practices necessary to meet the 2025 Chesapeake Bay planning targets on agricultural lands in Delaware (see Section 2 for planning targets). These programs include assistance in the forms of financial cost-share, technical assistance, regulatory oversight, and other incentives.

4.2.1 Chesapeake Bay Cover Crop Initiative

The goal of the Chesapeake Bay Cover Crop Initiative is for the DDA to initiate a cost-share program in combination with the U.S. Department of Agriculture's (USDA's) Natural Resources Conservation Service- (NRCS-) sponsored cover crop programs to enroll every eligible acre in some small grain or mixed cover.

The potential to increase this dynamic conservation practice is vast. Across the state, as much as 85,000 acres of cereals, legumes, brassicas, and sunflowers are grown to trap nutrient leftovers during the off-season. This leaves an opportunity for 175,000 more acres to be planted in cover crops during the fall that are not growing commodity wheat, barley, and rye.

Incentives for farmers to implement these practices are intended to cost-share the expense of essential inputs like seed, fuel, time, and mechanical equipment. In Sussex County, where an average 55,000 acres have been grown over the last several years, farmers apply for as much as $50 per acre to grow mixed stands of soil-conditioning plants and up to $30 per acre for grains that will perform a similar function as a commodity crop harvested in time to plant soybeans.

The cost of this program is covered by a mix of local, state, and federal funds. In FY2018, close to $750,000 from the Bond Bill was leveraged nearly 100% for matching grant dollars to pay $1.3 million for verified acres of cover crops. The SCD administers program sign-ups as well as tracks and reports progress using only 10% of the total budget. This successful program has been established in Kent and New Castle counties as well.

Progress to date represents roughly one-third of the state's cover crop goals, despite being limited by funding shortages. With an annual budget increase of 200% (an addition of $2.8 million in new funding resulting in total funding of $4.2 million), the DDA expects to fully fund cover crop programs for all three conservation districts.

Combining the pollution abatement of these anticipated new acres with existing regulatory programs and excellent voluntary practices from Delaware's stewardship-driven farming community, agriculture could achieve Delaware's Chesapeake Bay water quality goals without sacrificing the industry's profitability and viability. Furthermore, implementation dollars, such as those mentioned, have a multiplying effect in federal and nongovernment grants. As demonstrated by the SCD, nearly every dollar of state funds is currently matched to a federal or local grant source.

Through a NRCS Contribution Agreement, the SCD will partner with NRCS to assist with Farm Bill implementation and education and outreach efforts in Sussex County. As part of this agreement, additional funding was allocated for the implementation of cover crops in the Chesapeake Bay watershed. In the 2011 agreement, NRCS provided $425,000 for early planted cover crops in the watershed. In addition, the district's conservation planners assist with Environmental Quality Incentives Program (EQIP) applications, rankings, and contracts, as well as developing comprehensive NMPs.

The SCD implemented a pilot program during its 2012 cost-share cycle to encourage early planting of rye on corn ground that has received manure in the Broad Creek watershed. The district allocated $200,000 for the Broad Creek watershed project and increased the incentive rates for this project to $60 per acre, an increase of $20 per acre. The cap, or maximum amount of cost-share a farmer can receive for participating in this program, was also double that of the district's traditional program. The purpose of the project was to see if the increased incentive was enough to encourage farmers to plant rye (the most efficient cover crop species) to maximize nutrient uptake and push the agricultural community in Delaware closer to the WIP implementation goals. In the first year of the pilot project, 3,064 acres were enrolled in the program, obligating $146,408.

4.2.2 Delaware's Nutrient Management Program

Delaware's 1999 Nutrient Management Law (Delaware Code Title 3. Agriculture § 2247. Nutrient management plans) resulted in the Delaware Nutrient Management Program, which mandates that all farmers, golf courses, and other nutrient handlers develop and implement phosphorous-limiting NMPs, maintain nutrient-handling records, maintain nutrient certification, and submit an annual report. One hundred percent of Delaware farmland is covered by NMPs. The DNMC was formed to direct the program and develop regulations pertaining to nutrient management, waste management for animal feeding operations (AFOs), and NPDES permits for CAFOs. To clarify, the NPDES CAFO Program is administered by DNREC and managed by DDA. The CAFO Program is discussed separately in Section 4.2.4. The DNMC serves an advisory role.

The DNMC implements agreements with Delaware poultry companies (Allen's, Mountaire, and Perdue), resulting in the incorporation of the phytase enzyme in all feed, which helps poultry digest phosphorus and reduces the amount in litter. Phytase and other litter/manure amendments and handling practices have reduced the phosphorus content in litter by 20%–30% and possibly up to 40%. Poultry company agreements have also led to increased nutrient management education, certification, and stewardship and additional funding for the Nutrient Relocation Program (see Section 4.2.2.1).

The DNMC administers the nutrient management training, education, and certification program. Both the DNMC and DDA continue to view education as a priority for compliance, protection of water quality, and many other nutrient related topics. The University of Delaware Cooperative Extension and agribusinesses are used to educate nutrient handlers. The DNMC serves as an integral component of the Nutrient Management Program's regulatory compliance strategy. As farmers and other nutrient handlers become certified and continue to meet educational requirements, better nutrient-handling decisions are made. The DNMC has issued over 2,700 certifications since 2004. Currently 1,683 different nutrient management certificates are maintained by the program. Maintenance of nutrient management certification is mandatory for all nutrient generators, handlers, and consultants/planners in Delaware. Certification includes classroom instruction and passage of rigorous examinations.

The Nutrient Management Law controls the minimum set of management practices that are included in NMPs. Regarding phosphorus in soils, it is important to note that Delaware's NMPs are phosphorus-based and have been for many years. The application of phosphorus is limited on high-phosphorus soils and uses a three-year crop removal policy to restrict phosphorus application in certain conditions on high-phosphorus soils (as determined based on the Phosphorus-Site Index analysis). In the absence of phosphorus data, DDA conducts yield-based assessments using the four highest yield goals out of the last seven years.

In addition to the phosphorus and nitrogen limiting plans, Delaware has a manure and mortality relocation program aimed at reducing phosphorus in soils. To obtain appropriate agronomic rates for application of manure, biosolids, and organic byproducts, the NMP incorporates soil testing, manure testing, phosphorus index, and crop needs. Delaware allows three- and one-year NMPs, with the majority being one-year plans. In addition, feedback from NMP writers indicates that most Delaware's producers and Nutrient Management Consultants are using yearly soil test data regardless of plan length. Winter application of nitrogen and phosphorous nutrients (organic or chemical based) is not permitted between the dates of December 7 and February 15.

Implementation verification is a two-step process. Every farmer receives and submits an annual report, which is required by law. These reports on the activities of nutrient application and transfer are entered into the Salesforce database, made possible in part due to CBRAP II funding. These returned reports verify the total acres engaged in nutrient management and inform the statistical sampling method described in an appendix to the DNMC standard operating procedures (SOPs) for inspection and audit, made possible by contractor support provided by the CBP in 2017. The statistical analysis suggests that an inspection rate of 18% of farms engaged in nutrient management activities will yield a representative average compliance rate. This rate for core nutrient management activities and enhanced activities reported by the farmer will be submitted in annual progress runs. This verification program is the most statistically robust inspection procedure in the Chesapeake Bay watershed and exceeds approved verification specifications for Chesapeake Bay Watershed Model reporting.

Penalties for noncompliance with the provisions outlined in the Nutrient Management Law include fines that range from $50 to $1,000 per violation. Final fines and penalties are addressed through the DNMC. Compliance audits are conducted in response to complaints made to the Delaware Nutrient Management Program.

There is also an effort to increase farmer adoption of the Right Source of Nutrients at the Right Rate and Right Time in the Right Place practices, or the 4R Nutrient Stewardship practices. Funding for this effort is $400,000, which is split between Maryland, Delaware, and Pennsylvania. The Mid-Atlantic 4R Nutrient Stewardship Association (M4RA) received a grant from the National Fish and Wildlife Foundation in 2017 to conduct farmer and consultant education and increase implementation of 4R Nutrient Stewardship practices such as variable rate application, using inhibitors, and injection. The M4RA serves as an umbrella organization for local 4R efforts in the Mid-Atlantic Region.

The Delaware-Maryland 4R Alliance, founded by The Nature Conservancy and the Delaware-Maryland Agribusiness Association in 2015, is a collaboration between agribusinesses, farmers, government agencies, conservation groups, and scientists. The alliance is working to increase implementation of 4R practices to benefit the economic, environmental, and social well-being of the region and local farmers (DM4A 2019).

A partnership between M4Ra and the Delaware-Maryland 4R Alliance will begin a concerted effort in 2019 and 2020 to devise a method for capturing supplemental nutrient management BMPs in agriculture. Tentative plans are to support a survey of Delmarva farmers about supplemental practice knowledge, adoption, and implementation. The results of this survey will guide and help support an effort by the DNMC to enhance the annual reports from farmers across Delaware to assess and document their supplemental activities for capture and inspection by the Verification Audit SOP approved in March 2018. These captured enhancements will, for the first time, capture pervasive BMPs like split application of nutrients, pre-sidedress nitrate tests, phosphorus site index use, and manure injection for inclusion in reporting to the annual progress runs of the Chesapeake Bay Watershed Model.

M4RA will work with agribusinesses and Cooperative Extension to collect and verify these data in a manner that is statistically defensible. After working with Pennsylvania State University on a proof of concept, the partnership will begin education and outreach in 2019. The watershed wide goal is 300,000 acres with approximately 90,000 of those acres being in Delaware. All practice information collected will be specific to the nutrient management enhancements approved by the Chesapeake Bay Partnership.

4.2.2.1 Nutrient Relocation Program

The Nutrient Relocation Program provides financial reimbursement as well as technical and outreach/education assistance to farmers, brokers, and trucking businesses for the transportation cost of relocating litter or mortality from a Delaware farm to an alternative use project or another farm for land application. The application process validates eligible senders, receivers, truckers, and alternative use projects. The annual budget for nutrient relocation in the Chesapeake Bay watershed is $213,695.

Excess litter continues to be transported for land application throughout Delaware as well as Maryland, New Jersey, and Virginia. A total of 7,288 tons of manure from farms located in the Chesapeake Bay watershed were relocated to farms and alternative uses outside the watershed in 2018. Alternative use projects are essential for managing excess poultry litter.

The Perdue AgriRecycle plant was an alternative use facility included in the Phase II WIP, but it closed in 2017. A new poultry waste recycling plant operated by CleanBay Renewables was approved by the Sussex County Council in July 2018. The recycling plant is proposed to be built just outside the Chesapeake Bay watershed in Georgetown, DE, and will be used to convert chicken litter to electricity and fertilizer. The goal of the recycling plant is to use anaerobic digestion and nutrient-recovery technologies to recycle 90,000 tons of chicken litter annually to create electricity for the region (MacArthur 2018). The facility is expected to produce five megawatts of electricity per day, which is enough electricity to power approximately 3,500 homes (MacArthur 2018). The facility will also remove phosphorous from the chicken litter to create fertilizer that will be sold to farmers in the Midwest where there is a need for phosphorus. The remaining material will be available to area farmers to use as a soil amendment.

4.2.2.2 Mortality Recycling Program

The Mortality Recycling Program is new to Delaware since the Phase II WIP. The goal of the program is to pair two new BMPs—mortality freezers and mortality transport—to revolutionize routine mortality management in Delaware. The program encourages faster adoption by poultry farms of a mortality management practice that is more cost-effective at nutrient reduction than other mortality management BMPs.

With the loss of the Perdue AgriRecycle plant in 2017, Delaware has expedited its efforts at supporting other alternative use opportunities. The DNMC added mortality relocation to its existing manure relocation program in 2017. This was a natural expansion of the program. Whether the excess nutrients are in the form of manure or mortality, encouraging alternatives to land application is one of the commission's stated strategic goals.

Unlike other livestock operations, carcass disposal is a daily activity for commercial poultry operations, so the more difficult or time-consuming the disposal method is, the less likely it is that a safe and environmentally sound result will be achieved. Although there are no published data on the total tonnage of mortality generated on the Delmarva Peninsula, it is estimated to be more than 76,000 tons per year. This is a potentially large load contributor when, according to the CBP, a chicken carcass is 2.9% nitrogen and 0.49% phosphorous (Felton and Timmons 2019). Therefore, how that mortality is disposed of will determine how much of that potential nutrient load—about 4,429,000 lbs of nitrogen (2,215 tons) and about 748,000 lbs of phosphorus (374 tons)—is introduced into the watershed's ecosystem annually.

Like manure transport, mortality transport is a "load source input reduction practice," so its effect is to directly reduce the load in the county where the mortality was generated (CBP 2018a). Moreover, reductions in load source inputs are "taken into account before applying efficiency BMPs or load reduction practices," so the nutrient content of that material being transported is not discounted. Unless a county has a net deficit of a nutrient, the full nitrogen and phosphorus value is either (1) transferred on the books from the source county to the county where it is land applied or (2) eliminated as having been moved out of the watershed and/or recycled at an alternative use facility.

Farms using freezer units can on average reclaim more than 30% of their manure storage capacity because they will no longer need to store compost, thereby reducing the need for additional manure storage structures and/or transport services. In addition, the use of sealed freezer storage units reduces the risk of disease posed by scavenger animals and insects that are attracted to the composting sheds. Improved biosecurity means reducing mortality and, therefore, the amount of nutrient-rich material that must be disposed of. Storing mortality in sealed freezer units also eliminates the smells and flies associated with composting, improving the quality of life for the grower, the grower's family, and the grower's neighbors.

4.2.2.3 Environmental Stewardship Program

Since 2006 the DNMC and poultry integrators have annually awarded farmers with exceptional stewardship practices on their chicken farms. Criteria for the farms include proper manure storage, stormwater management, recordkeeping, and husbandry enrichments. These farms earn a cash prize, and the overall winner gets a $1,000 check. The competition is an opportunity to foster a culture of stewardship and promote practices beyond the CAFO regulations. Beginning in 2019, the award will be opened to other farm types and these commodity sectors will help sponsor and promote the annual award nominees for the DNMC to judge. With an increased outreach program focused on equine and dairy, among other animal types, rewards for pasture management and precision feed BMPs will be reinforced.

4.2.2.4 Phosphorus Fertility Index Value Reporting Program

The DNMC is taking submissions for the soil phosphorus (P) fertility index value (FIV) reporting program that helps estimate the soil P FIV throughout the state's farmed land. DDA strongly encourages all licensed consultants who have compiled their soil P FIV values to do so for aggregated data analysis. The reports received, in addition to the annual reports, are privacy-protected and could prove instrumental in demonstrating that Delaware is diligently working toward reducing its impact on the natural environment and is achieving water quality goals.

DDA is offering a waiver of the annual consulting license fee renewal cost for all consultants who turn in a report for all farms with current NMPs. Any consultant who participates in this reporting program will be contacted every 5–6 years for a resubmission and from those data points a trend for soil P FIV in Delaware can be established and perhaps inform future model simulations of soil phosphorus.

4.2.2.5 Ag Week Annual Report and Manure Sample Collection & Assistance

Agriculture Week (Ag Week), a conference held annually in January, consolidates farm-based educational meetings while recognizing and celebrating the industry's importance. The DNMC promotes this meeting focused on stewardship and profitability with both sponsorship and customer service. The Nutrient Management Program will continue to sponsor a booth where farmers can receive continuing education credit for seeking assistance and submitting their annual report all week during the event. At the same location, manure samples can be dropped off for free testing by the Delaware Agriculture Compliance Lab. This service helps keep Delaware farmers in compliance with rules and regulations governing nutrient management on the farm, but also helps drive attendance for the wide-ranging topics for which additional continuing education credits are available.

4.2.3 Delaware Agriculture Compliance Lab

The mission of Agriculture Compliance, a section of DDA, is to protect the consumer by administering a regulatory program for commercial feeds and pet foods, commercial fertilizers and soil conditioners, fertilizer and soil conditioners tonnage, liming materials, frozen desserts, and milk sold to commercial dairies. The Agriculture Compliance section inspects commercially available products offered for sale in the Delaware marketplace. Products are examined for accurate labeling and nutrient content to ensure that consumers receive what they expect. The state of Delaware is consumer protected, and the Agriculture Compliance program promotes fair competition among the industry. The lab partners with the DNMC to track and analyze fertilizer tonnage as well as fertility in manure samples. Trends in point of sale fertilizer tonnage can help indicate trends in NMP efficacy or crop production swings. Trends in manure analysis can help explain annual reporting shifts regarding total tons of manure in land application and provide the single most robust data source for Delmarva poultry litter nutrients.

4.2.4 CAFO and AFO Program

The Delaware CAFO regulations and program are promulgated and implemented jointly under the authority of DNREC (7 Del. C. §60) and DDA with the cooperation of the Nutrient Management Commission (3 Del. C. §2200). DNREC is the EPA delegated agency charged with NPDES CAFO oversight and administration. Through a Memorandum of Agreement (MOA) signed in 2010 with DNREC, DDA primarily manages the CAFO program under the supervision of DNREC. In accordance with the MOA, DDA is the initial point of contact with the regulated community, reviews and makes initial permit determinations, performs most inspections and enforcement actions if warranted, and reviews and makes NMP determinations. In accordance with the MOA, DNREC retains supervision and enforcement authority, jointly promulgates CAFO regulations, approves final permit issuance, and is the Delaware point of contact with EPA among other responsibilities. DDA and DNREC are committed to maintaining and updating a MOA to address the roles and responsibilities of both parties as appropriate for programmatic oversight. The DNMC oversees the Nutrient Management Law and Regulations that govern the content of NMPs and Animal Waste Management Plans, which are an integral component of the CAFO program. DDA and DNREC along with NRCS and other stakeholders work collaboratively to evaluate federal requirements for state CAFO permits and update state CAFO regulations. Delaware's regulations were first revised in 2010, but EPA expressed concerns related to definitions and inspection protocols in the 2010 version of the regulations. Delaware's revised CAFO regulations were published in the *Delaware Register of Regulations* on November 1, 2011, and became effective November 11, 2011.

In accordance with state CAFO regulations, AFOs include any operation in which animals have been, are, or will be stabled or confined, fed, or maintained for a total of 45 days or more in any 12-month period. The animal confinement area includes but is not limited to open lots, housed lots, feedlots, confinement houses, stall barns, free-stall barns, milk rooms, milking centers, cow yards, barnyards, medication pens, walkers, animal walkways, and stables. Two or more AFOs under the same ownership are considered to be one operation if the production areas adjoin each other or if they use a common area or system for the disposal of manure or wastes. Any owner or operator of an existing large, medium, or designated CAFO constructed before November 10, 2011, is required to apply for a NPDES CAFO permit if they discharge or propose to discharge directly or indirectly into Waters of the State. All animal production farms constructed after that date must apply for a CAFO permit in accordance with state CAFO regulations. The Departments can designate AFOs as CAFOs, requiring them to seek a CAFO permit. To help owners and operators assess their need to apply for a CAFO permit, DNREC and DDA have also made fact sheets available to the regulated community (DNREC - *NPDES CAFO General Permit Large, Medium, and Designated Poultry Operations without Land Application Fact Sheet* and DDA - *Delaware Nutrient Management Program, CAFO Fact Sheet*).

Delaware's first general NPDES permit (DE 5000N/11) went into April 1, 2016, covering large, medium, and designated poultry CAFOs that do not land-apply manure (GP1). Operations in this category transport manure off the farm to another location designated in their animal waste management plan or comprehensive NMP. Furthermore, EPA recently approved Delaware's second NPDES general permit that covers large, medium, and designated poultry CAFOs that land-apply manure generated on that farm (GP2). Operations classified under GP2 land-apply their manure onto fields in accordance with their NMP. On October 7, 2018, DNREC out the draft GP2 permit out for public notice to conform to applicable public notice requirements, ensuring public participation. Once issued, GP2 will cover approximately 25% of the CAFOs in Delaware. As with GP1, the GP2 will have an effective period of five years. The DNREC, with collaboration of DDA, are in the early phases of drafting a third permit that would cover all nonpoultry operations included in the CAFO regulations. The definitions of large and medium CAFOs are presented in Table 4-2 and Table 4-3, respectively.

Table 4-2. Large CAFO Definitions

Number of Animals	Species
≥1,000	Cattle other than mature dairy cows or veal calves. Includes but is not limited to heifers, steers, bulls, and cow/calf pairs
≥700	Mature dairy cattle (whether milked or dry cows)
≥2,500	Swine each weighing over 55 lbs
≥10,000	Swine weighing under 55 lbs
≥500	Horses
≥10,000	Sheep or lambs
≥55,000	Turkeys
≥30,000	Laying hens or broilers, if the AFO uses a liquid manure-handling system
≥125,000	Chickens except laying hens (if other than a liquid manure-handling system is used)
≥82,000	Laying hens (if other than a liquid manure-handling system is used)
≥1,000	Veal calves
≥30,000	Ducks (if the AFO uses other than a liquid manure-handling system)
≥5,000	Ducks (if the AFO uses a liquid manure-handling system)

Table 4-3. Medium CAFO Definitions (if the operation does or will directly or indirectly discharge pollutants)

Number of Animals	Species
300-999	Cattle other than mature dairy cows or veal calves. Includes but is not limited to heifers, steers, bulls, and cow/calf pairs
200-699	Mature dairy cattle (milked or dry cows)
750-2,499	Swine each weighing over 55 lbs
3,000-9,000	Swine weighing under 55 lbs
150-499	Horses
3,000-9,999	Sheep or lambs
16,500-54,999	Turkeys
9,000-29,000	Laying hens or broilers, if the AFO uses a liquid manure-handling system
37,500-124,999	Chickens except laying hens (if other than a liquid manure-handling system is used)
25,000-81,999	Laying hens (if other than a liquid manure-handling system is used)
300-999	Veal calves
10,000-29,999	Ducks (if the AFO uses other than a liquid manure-handling system)
1,500-4,999	Ducks (if the AFO uses a liquid manure-handling system)

As of February 2018, extensive educational push and outreach from DDA, DNMC, and DNREC has resulted in 132 permitted CAFOs under GP1, with even more farms projected once GP2 is issued. Table 4-4 provides a breakdown of the types of CAFOs in Delaware. In accordance with the Nutrient Management Law, NMPs are valid for no more than three years. The Nutrient Management Program, dependent upon staffing levels, has a goal to inspect every facility with an NMP at least once during its life cycle; therefore, at a minimum of once every three years. Furthermore, DDA and DNREC have committed to inspect permitted CAFOs at least once during the five-year effective period of the general permit. Challenges exist with compliance monitoring because of an increase in the ratio of CAFOs to program staff. With 514 total CAFOs within the state, more staff will need to be hired and trained to monitor the growing number of facilities. Section 9.5.6.1.1.6 of the revised Delaware CAFO Regulation states that violations of the terms of the NMP or Animal Waste Management Plan incorporated into the NPDES CAFO permit shall constitute a violation of the NPDES CAFO permit. Section 9.5.6.1.1.7.2 requires emergency notification of discharges, which will trigger an inspection or assessment. NMPs revised every three years will be reevaluated by the DDA Secretary for compliance with permit conditions.

Any CAFO that violates the permit and/or the CAFO regulations shall be subject to the fines and penalties established in 7 Del. C. §6000 and/or 3 Del. C. §2000 at the discretion of the DDA Secretary and appropriate court.

Table 4-4. Number of Delaware CAFO Permits, 2018

Permit Applicants	Number of Permit Applicants
Total active CAFO permit applicants	382
Poultry-broiler farms	365
Dairy farms	12
Horse farms	1
Beef farm	2
Swine farm	1
Poultry-layer farm	1
Permit coverage within the Chesapeake Bay watershed	
Poultry farm	229
Beef farm	2
Dairy farm	6

4.2.5 DNREC Drainage Program

The DNREC Drainage Program is a new program that was not included in the Phase II WIP. It provides technical assistance to landowners across Delaware to address constituent drainage concerns and issues. At times these drainage concerns are elevated to the RC&D list where funding might be available to design and construct drainage improvements. Specifically, there is a project on the RC&D list that allows for funding of Chesapeake Bay watershed channel and wetland restoration projects. To leverage this funding source, however, there must be a 10% match for implementation. In 2018, more than 140 drainage concerns were received from constituents with properties located in the Chesapeake Bay watershed. Additionally, the Drainage Program provides technical and administrative assistance to the 234 tax ditch organizations across the state, 155 of which are in the Chesapeake Bay watershed.

Through the Drainage Program, DNREC intends to support the BMPs outlined in the Phase III WIP by incorporating relevant BMPs into RC&D and tax ditch project design when applicable and approved by landowners. Additionally, Drainage Program staff will address drainage or tax ditch concerns and provide education and outreach to landowners on implementing relevant BMPs, when applicable. The Drainage Program will serve as a liaison between landowners and tax ditch officers in addressing requests to implement defined BMPs within or along tax ditch channels and rights-of-way.

4.2.6 New Castle Conservation District Cost-Share Program

The New Castle Conservation District (NCCD) provides cost-share funding, technical assistance, and outreach and education to assist landowners and land managers in designing and installing site-specific conservation practices on their property within New Castle County. Cost-share rates range from 30%–75% depending on the practice.

Although NCCD offers a suite of BMPs in their cost-share program, the amount of funding available is limited compared to NRCS EQIP funds. For more expensive structural water quality BMPs, the EQIP is a "better deal" for the agricultural producer; therefore, NCCD has concentrated funding on cover crops.

Increased participation in a cover crop program targeted at the Chesapeake Bay watershed will require additional funding. Overall producer participation in government-sponsored cost-share programs may be constrained because of the high percentage of tillable land in the Chesapeake Bay watershed that belongs to absentee owners.

Additional cost-share funding might provide the needed incentive to increase participation in the cover crop program. This item is expected to be included in the FY2020 Governor's budget (see Section 4.3.1.1).

4.2.7 Kent Conservation District Cost-Share Program

KCD provides assistance through cost-share funding, technical assistance, outreach, and education. The KCD Cost-Share Program assists landowners and land managers with design and installation of site-specific conservation practices on their property in Kent County. The cost-share rates and limitations vary according to the practice; cost-share rates range from 25%–75%.

KCD's Cost-Share Program can provide financial and/or technical assistance for any agricultural BMP as approved by the KCD's Board of Supervisors. Although KCD offers a suite of BMPs in its Cost-Share Program, however, the amount of funding is limited compared to NRCS EQIP funds. For more expensive structural water quality BMPs, the EQIP is a "better deal" for the agricultural producer; therefore, KCD has concentrated its funding on cover crops.

KCD received funding through the CBRAP grant to complete verification and compliance inspections on all water quality BMPs in Kent County's portion of the Chesapeake Bay watershed. These inspections included ensuring that all cover crops are planted and destroyed in a timely manner, and that all structural BMPs are being used and maintained for the required lifespan. In 2017–2018, 4,829 acres of cover crops were inspected for planting and destruction in Kent County. There were also 174 structural BMPs verified in the Kent County portion of the watershed during that time.

4.2.8 Sussex Conservation District Cost-Share Program

SCD provides assistance through cost-share funding, technical assistance, outreach, and education. The SCD Cost-Share Program provides financial assistance to landowners to implement BMPs to improve or enhance water quality, soil health, and other natural resource concerns. The cost-share rates range from 50%–75% depending on the practice.

Although SCD offers a suite of BMPs in its Cost-Share Program, the amount of funding is limited compared to NRCS EQIP funds (see Section 4.2.10.2). For more expensive structural water quality BMPs, the EQIP is a "better deal" for the agricultural producer; therefore, SCD has concentrated funding on cover crops.

SCD's verification and compliance inspectors conduct inspections of all BMPs in the county. The compliance rate is about 94%, up from 85% in 2012, for those conservation practices within the lifespan of their contract. In FY2018, SCD had $275,000 earmarked specifically for cover crops in the Chesapeake Bay watershed. Countywide, SCD had $745,992 allocated, of which a portion also went to the watershed.

The amount SCD cost-shared on cover crops in the Chesapeake Bay watershed during calendar year 2018 is presented in Table 4-5; however, to achieve the Chesapeake Bay watershed TMDL targets, additional funding will be needed. If funding were not an issue, SCD could spend $4,548,700 on cover crops based on the FY2018 cost-share enrollment.

Table 4-5. Sussex Conservation District Cost-Shared Cover Crops 2018

Conservation Practice	Area (acres)	Cost-Share
Cover crops (funded in 2018)	18,683	$569,879
Cover crops (potential with full funding)	90,974	$4,548,700

Over the past several years, SCD has attempted to bring in additional funding for conservation programs in the Chesapeake Bay watershed through various sources. This section describes each effort.

Chesapeake Bay Regulatory and Accountability Program Grant—SCD received funding through the CBRAP grant to complete verification and compliance inspections on all water quality BMPs in Sussex County's portion of the Chesapeake Bay watershed. These inspections included ensuring that all cover crops are planted and destroyed in a timely manner and that all structural BMPs are being used and maintained for the required lifespan. In 2017–2018, 28,195 acres of cover crops were inspected for planting and destruction in Sussex County. There were 414 inspections on poultry waste structures and composters in the Sussex County portion of the watershed in 2018. There were also 524 structural BMPs verified in the Sussex County portion of watershed during that time.

In addition, as part of the CBRAP grant, SCD received funding to develop a guidance document to clarify DSSR requirements when an agricultural producer develops land and their role as the owner preconstruction and post-construction activity. Over the past few years, there has been an increase in the number of new poultry operations constructed in Delaware. This guidance document will assist cooperators through the development and construction process. SCD published a brochure and developed an associated website titled DE Chicken Checklist (http://dechickenchecklist.com/) (SCD not dated).

SCD also received funding through the CBRAP for the development of a data tracking tool to be used by the conservation planning staff to develop whole farm conservation plans and to track water quality BMPs in the Chesapeake Bay watershed. The tracking tool, PracticeKeeper by Worldview Solutions, was recently tested by SCD planners who documented any issues or concerns. Corrections were made to the program, and a training session for all three conservation districts was held in December 2018. At the end of December, administrative accounts were set up and login permissions were distributed. Links to YouTube training videos were also distributed to planners to help troubleshoot any issues that might arise. The software program became fully operational in January 2019.

Chesapeake Bay Implementation Grant (CBIG) Signatory–For the past several years, SCD has received funding to implement cover crops within the watershed, develop comprehensive NMPs, fund a Rye Seed Incentive Program in connection to a SCD Regional Conservation Partnership Program (RCPP) project as well as funding to assist SCD with its Soil Health Initiative outreach and education efforts.

U.S. Department of Agriculture Natural Resources Conservation Service Programs—SCD and the Delaware Association of Conservation Districts have an agreement with NRCS that includes funding for conservation planning and implementation. Over the past five years, SCD has also participated in or been the lead partner on four different NRCS RCPP projects in the Chesapeake Bay watershed. Brief descriptions of the RCPP projects are provided below, but for a description of the NRCS RCPP, see Section 4.2.10.4.

- $500,000 in RCPP-EQIP financial assistance available to implement 2,000 linear feet of preferably bio-engineered bank stabilization practices along Sussex County tax ditches. Although this is a countywide project, a majority of the Sussex County tax ditches are in the Chesapeake Bay watershed.

- $1 million of RCPP-EQIP funds available for the implementation of animal mortality practices in Sussex County for beginning poultry farmers. This five-year project expended the $1 million in a little over one year.
- A joint project between the Maryland Department of Agriculture and SCD secured $528,000 in RCPP-EQIP financial assistance for the implementation of cover crops in the Chesapeake Bay watershed. DNREC, a partner in the project, provided an additional $25 per acre incentive to plant cereal rye or cereal rye seed mix in the watershed for a total of $173,750 towards the project. There was a total of 6,709 acres of cereal rye or cereal rye mix cover crops planted in the watershed in 2017–2018 through this program.
- A joint venture with the Maryland Association of Conservation Districts provided $800,000 in RCPP-EQIP financial assistance funds for the implementation of cover crops in the Delaware portion of the Chesapeake Bay watershed. SCD contracted 8,615 acres of cover crops, obligating $569,169 of the $800,000 available. The funding was expended in one year with the remaining funds spent in Kent and New Castle counties.

4.2.9 Soil Health Partnership Program

The Delaware Soil Health Partnership (DSHP), led by SCD, is a collaboration of farmers and NRCS, DNREC, University of Delaware, and Delaware State University. Tenants of the DSHP are promoting year-round soil cover, minimal tillage, nutrient management 4Rs, crop rotations, crop diversity, and integrated pest management. The focus of the DSHP is to bring science and practical applications from experts to farmers for continuing education credits and outreach as well as technical assistance through district staff outreach. The main tool used by DSHP is grower meetings, which provide a synergistic opportunity for the districts to also promote cost-shared practice announcements that align with the meeting topics. SCD coordinates four meetings per year and, over five years, has reached about 1,800 farmers and partners with these meetings. Topics have ranged from Nutrients and Soil Health, Economics of Soil Health, and Early Establishment of Cover Crops to Soil Health 101 and 201 and Vegetables and Soil Health. DSHP has used the National Association of Conservation Districts Soil Health Champions Network to bring in expert speakers from Ohio, Oklahoma, Missouri, Nebraska, and North Carolina as well as local Soil Health Champions and other experts from Delaware and Maryland. The DSHP has also brought in scientists from Georgia, Maryland, North Carolina, South Carolina, and Washington state as well as local experts from the University of Delaware and Delaware State University. This grassroots effort supported by NRCS is enjoying success like the no-till movement of the 1980s and virtually every BMP employed for improving soil health is both a benefit to water quality and climate resilience.

4.2.10 Natural Resources Conservation Service in Delaware

The NRCS is committed to "helping people help the land." Their mission is to provide conservation resources to farmers and landowners to help them achieve conservation sustainability. This effort is completed through a prescribed conservation planning process that will identify alternatives and prescribe BMPs that can be implemented through prescribed conservation programs. The programs help to reduce soil erosion, enhance water availability, improve water quality, increase wildlife habitat, reduce erosion and sedimentation caused by floods and other natural disasters, and establish healthy soils that are drought hardy and tolerant for additional weather variances.

The NRCS in Delaware administers a broad range of programs to assist landowners and communities with conserving and protecting natural resources. These programs are geared towards working farms, ranches, and forests and provide producers with many options for conservation. NRCS conservation programs are voluntary and provide technical and financial assistance for the planning and implementation of conservation systems. NRCS also administers several easement programs and grant programs aimed at collaborative conservation efforts. Each of the NRCS programs available to help meet the goals of Delaware's Phase III WIP are described in Sections 4.2.10.1 through 4.2.10.6.

4.2.10.1 Agricultural Conservation Easement Program—Wetland Reserve Easement Component

NRCS provides technical and financial assistance directly to private landowners to restore, protect, and enhance wetlands through the purchase of a wetland reserve easement. For acreage owned by an American Indian tribe, there is an additional option to enroll in a 30-year contract.

Through the wetland reserve enrollment options, NRCS may enroll eligible land through permanent easements, 30-year easements, term easements, and 30-year contracts for land owned by an Indian tribe. NRCS pays for a portion of the easement value for the purchase of the easement and a percentage of the restoration costs. NRCS also pays all costs associated with recording the wetland reserve easement in the local land records office, including recording fees, charges for abstracts, survey and appraisal fees, and title insurance.

All practices are applied according to NRCS standards and specifications. Restoration areas are reviewed annually, either on-site or remotely, using ortho-imagery; and any needed repairs or additional treatment is initiated as a result of the review.

4.2.10.2 Environmental Quality Incentives Program

NRCS's EQIP provides financial and technical assistance to agricultural producers to address natural resource concerns and deliver environmental benefits such as improved water and air quality, conserved ground and surface water, reduced soil erosion and sedimentation, and improved or created wildlife habitat. The former Wildlife Habitat Incentive Program (a program included in the Phase II WIP) has been folded into EQIP. Program participants receive financial and technical assistance to implement conservation practices or activities like conservation planning that address natural resource concerns on their land. Agricultural producers, owners of non-industrial private forestland, and tribes are eligible to apply for EQIP. Eligible land includes cropland, rangeland, pastureland, non-industrial private forestland, and other farm or ranch lands. The following are state resource priorities and management systems offered under the Delaware State EQIP:

1. Reduction of nonpoint source pollutants, including nutrients, sediment, and pesticides in impaired watersheds consistent with TMDLs as well as the reduction of groundwater contamination
   - Agricultural Waste Management Systems - Nutrients, Sediments
   - Integrated Crop Management Systems - Nutrients, Pesticides
   - Planned Grazing Management Systems - Nutrients, Sediments
2. Conservation of ground and surface water resources
   - Irrigation Water Management Systems - Water conservation
3. Reduction of emissions such as particulate matter and volatile organic compounds that contribute to air quality impairment
   - Agricultural Waste Management Systems - Volatile organic compounds
   - Poultry House Windbreak Management Systems - Particulate matter
4. Reduction in soil erosion and sedimentation from erodible land
   - Erosion Control Systems - Sediments
5. Promotion of at-risk species habitat recovery

- Biodiversity Management Systems - Habitat recovery

4.2.10.3 Conservation Stewardship Program

NRCS's Conservation Stewardship Program (CSP) offers enhancements for conservation practices that have already been implemented on an agricultural producer's land. For example, if a producer has been practicing prescribed grazing, CSP would provide options to enhance that practice with activities such as grazing management to improve plants for wildlife, reduce soil compaction, or improve riparian function.

The variety of CSP conservation activities offered give a producer freedom to select enhancements or practices that help meet their specific management goals. Once a producer chooses the enhancements that best fit their operation, CSP offers annual payments for installing these practices on the land. CSP also offers bundles from which a producer can select a suite of enhancements to implement and receive an even higher payment rate.

Agricultural producers and owners of non-industrial private forestland and tribes are eligible to apply for CSP. Eligible land includes cropland, rangeland, pastureland, non-industrial private forestland, and other farm or ranch lands.

All CSP contracts are for five years and have a minimum annual payment of $1,500.

4.2.10.4 Regional Conservation Partnership Program

The RCPP offers new opportunities for the NRCS, conservation partners, and agricultural producers to work together to harness innovation, expand the conservation mission, and demonstrate the value and efficacy of voluntary private lands conservation. The RCPP promotes coordination between NRCS and its partners to deliver conservation assistance to producers and landowners. NRCS provides assistance to producers through partnership agreements and through program contracts or easement agreements. RCPP combines the authorities of four former conservation programs: the Agricultural Water Enhancement Program, the Chesapeake Bay Watershed Program, the Cooperative Conservation Partnership Initiative, and the Great Lakes Basin Program. Assistance is delivered in much the same way as it is through EQIP, CSP, Agricultural Conservation Easement Program, and Healthy Forests Reserve Program.

RCPP encourages partners to join in efforts with producers to increase the restoration and sustainable use of soil, water, wildlife, and related natural resources on regional or watershed scales. Through RCPP, NRCS and its partners help producers install and maintain conservation activities in selected project areas. Partners leverage RCPP funding in project areas and report on the benefits achieved.

Eligible partners include agricultural or silvicultural producer associations, farmer cooperatives or other groups of producers, state or local governments, American Indian tribes, municipal water treatment entities, water and irrigation districts, conservation-driven nongovernmental organizations, and institutions of higher education.

Under RCPP, eligible producers and landowners of agricultural land and non-industrial private forestland may enter into conservation program contracts or easement agreements under the framework of a partnership agreement.

4.2.10.5 Conservation Reserve Program

The Conservation Reserve Program (CRP) is a voluntary program available to agricultural producers to help them safeguard environmentally sensitive land through funding, outreach, and education. Producers enrolled in CRP plant long-term, resource-conserving covers to improve the quality of water, control soil erosion, and enhance wildlife habitat.

The Farm Service Agency (FSA) administers CRP, while technical support functions are provided by NRCS, the Cooperative Extension Service, state forestry agencies, local soil and water conservation districts, and other nonfederal providers of technical assistance.

Participants and the offered land must meet certain eligibility requirements for land to be enrolled. FSA provides participants with payments on contracts with durations of 10–15 years. CRP payments consist of an annual rental payment based on the relative productivity of the soils and the average dry land cash rent, cost-share assistance of not more than 50% of the participants' costs in establishing approved practices, and other incentives in which the payment amount is based on the practice. The Delaware Conservation Reserve Enhancement Program (CREP) is a part of CRP and is administered under the same statutes and federal regulations.

4.2.10.6 Delaware Conservation Reserve Enhancement Program

The Delaware CREP is a state-federal partnership between DNREC and FSA that provides financial, technical, and education assistance to landowners willing to voluntarily implement conservation measures on marginal agricultural land rather than continue the land in agricultural production. The resulting stream buffers and restored wetlands reduce nutrient and sediment runoff, provide increased wildlife habitat, and help protect Delaware's valuable waterbodies.

The program is voluntary, incentive-based, and pays farmers and landowners for putting their least productive lands under a 10- or 15-year contract that requires the land to be put into the conservation practice the landowner chooses. Landowners can establish forest, native warm-season grasses, or cool season grasses. In return the landowner receives cost-share, annual rental payments, and generous bonus payments.

The agricultural land enrolled in the Delaware CREP must be adjacent to ditches, streams, or channels that ultimately lead to waterbodies identified as impaired. All of Delaware's waterbodies are identified as impaired under section 303(d) of the CWA because of excessive nutrient and bacteria, low dissolved oxygen, and degradation of biology and habitat.

Recently, the Delaware CREP increased the monitoring component of the program. Currently, 10%–20% of the active contracts are reviewed annually. Inspections are conducted in response to received complaints or through recommendations from the FSA field offices.

4.2.11 Supporting Programs

This section describes programs that support agriculture in Delaware, but do not directly fund or implement BMPs to assist in meeting the Phase III WIP goals. These programs reward BMP implementation, however, encouraging additional participation by landowners. This section also includes mechanisms to expand programs that protect or encourage active agricultural lands within the Chesapeake Bay watershed.

4.2.11.1 Delaware Agricultural Lands Preservation Program

The Delaware Agricultural Lands Preservation Program (DALPP) is a voluntary program that allows landowners to sell their "development rights" to the state, thus preserving the land forever for farming, forestry, and related activities. Although the program allows very limited residential use on the land, by purchasing the development rights, the state has effectively purchased any rights to develop the land for a residential subdivision or commercial/industrial use.

This program allows farmers to unlock some of the equity in their land while continuing to own it and farm it for income. Studies have shown that many farmers reinvest the money they receive for preserving their land back into the farm operation, stimulating local businesses that support agriculture. In addition, because the state owns the developments rights, if the land is sold, it is priced as farmland, not as developable land. Consequently, the program has created a "bank" of farmland that future farmers can afford to buy because they are not competing with developers, who can afford to pay a much higher price per acre to develop the land.

For taxpayers, preserving farmland supports and ensures a viable agricultural industry in Delaware. Agriculture is Delaware's number one industry with an $8-billion economic impact that provides employment, revenue, and a tax base. In addition, agricultural land use represents a much lower cost to taxpayers because it does not require the infrastructure and services residential and other land uses such as schools, roads, transit, and utilities require. Keeping agricultural areas rural—and steering population growth to existing urban areas that are prepared for growth—reduces government costs and minimizes the conflict between dissimilar land uses such as residential and agricultural.

Preserving agricultural farmland also has intangible benefits such as providing green space. A significant number of the parcels preserved through the program contain forestland and wetlands that provide wildlife habitat and trees to help sequester carbon from the atmosphere. Open farmland helps reduce impervious surface and runoff, and agricultural soils help filter the precipitation that replenishes the state's aquifers. These aquifers not only provide drinking water, they also replenish streams and ponds through base flow.

As of January 1, 2019, DALPP had permanently preserved over 125,000 acres of Delaware farmland, representing nearly 25% of all the available farmland in the state. The state has expended approximately $220 million of federal, state, and county funds to preserve these lands. The actual value of the preservation easements, however, is more than $500 million. Landowners' willingness to accept significantly less money to preserve their land is a substantial benefit to the state.

Delaware continues to strive to find additional funds to augment state funding. Delaware's three county governments have each, in total, provided more than $12 million to DALPP to help preserve farms in their respective counties. NRCS has provided more than $50 million—first through the Farm and Ranch Lands Protection Program and now through the Agricultural Lands Easement Program—and DALPP is now eligible for Department of Defense Readiness and Environmental Protection Integration funds to help purchase easements in southwestern Sussex County in cooperation with the Patuxent River Naval Air Station. DALPP will also continue to explore funding opportunities from other sources, including nongovernment organizations, to increase available funding.

4.2.11.2 Delaware Forestland Preservation Program

The Delaware Forestland Preservation Program was established in 2005 with the first funding for the program authorized in 2007 and the first forestland preservation easement settled in October 2009.

Forestry is a segment of agriculture recognized by both the federal government and the state of Delaware. Although partially and entirely forested parcels are accepted into DALPP that was drawing funding away from preserving traditional cropland. The Forestland Preservation Program was created to provide an additional preservation opportunity for parcels that are entirely covered with forest.

At the end of 2017, the program received a total of $ 1,450,000 of state and private funding and preserved nine properties encompassing 872 acres. The program is currently funded at $1million per year.

4.2.11.3 Delaware Young Farmer's Program

The Delaware Young Farmers Program helps young farmers with limited financial resources purchase farmland and begin careers as independent farmers. The program provides 30-year, no-interest loans through DALPP (see Section 4.2.11.1) to qualified young farmers to purchase farmland. While the program typically provides a substantial portion of the farm's purchase price, it usually does not provide the entire amount. The participant must secure a commercial loan, gift, or other monies for a portion of the purchase price. The participant first repays the commercial loan and then begins payment on the Young Farmer Loan. All loan payments are returned to the program to help other young farmers, and in that regard the program is self-perpetuating.

In addition to helping start new generations of farmers, farmland purchased through the program is placed into a permanent preservation easement as a condition of the loan, which provides the same benefits as DALPP. As of January 2019, Delaware had settled 34 Young Farmer Loans totaling $7.7 million that helped purchase (and permanently preserve) over 2,600 acres.

4.2.11.4 Non-Government Partners

Non-government partners involved in conservation in the Chesapeake Bay watershed in Delaware include the Nanticoke Watershed Alliance and The Nature Conservancy. These organizations have been engaged in promoting and implementing agricultural BMPs for a number of years and are valued partners.

4.3 Numeric Implementation for the Agricultural Sector

This section presents the numeric implementation commitments between 2018 and 2025 needed to achieve the Phase III WIP planning targets for agricultural lands in Delaware. Changes since the Phase II WIP are presented for each BMP type implemented in the Chesapeake Bay watershed in Delaware.

The CAST was used to determine the numeric planning goals for the Phase III WIP. The Agricultural Sector WIP Subcommittee was formed to help determine realistic and achievable BMP implementation levels for that sector (see Section 4.4.1). The committee chose BMPs based on which were the most effective for the lowest cost and which can be most readily implemented because of existing funding. Information on effectiveness and cost was downloaded from CAST during the summer of 2018 to support BMP choices for the Phase III WIP. BMPs are presented in sections 4.3.1 and 4.3.2 as practices recommended by the Agricultural Sector WIP Steering Committee and other practices necessary to achieve Phase III WIP goals.

Overall, the Agricultural Sector in Delaware needs to meet the targets of 3.8 million lbs/year of nitrogen and 0.08 million lbs/year of phosphorus. The 2017 Progress Run showed that Delaware's Agricultural Sector has a current total nitrogen load of 5.02 million lbs/year, which requires a 24% reduction to meet the target of 3.8 million lbs/year. The 2017 Progress load for total phosphorus is 0.04 million lbs/year, which already meets the 2025 target of 0.08 million lbs/year. The agricultural loads of nitrogen and phosphorus include loads from all agricultural land uses and the natural load (forest, stream bed, and bank load) from Kent and Sussex counties.

Major changes in BMP implementation from the Phase II WIP to the Phase III WIP to meet the 2025 nitrogen and phosphorus targets include a decrease in the number of acres of planned forest buffers and an increase in cover crops and nutrient management. The Phase II WIP forest buffer goals were found to be unrealistic because of their cost, landowner interest, and the number of acres available for implementation. The Phase III WIP has a greater focus on cover crops and nutrient management to account for the loss in forest buffer area. Other implementation level changes were relatively minor.

Delaware is presenting its local numeric planning goals as quantities of implementation goals for particular BMPs. Sections 4.3.1.1 through 0 present the Phase III WIP (2025) goals for each Agricultural Sector BMP type implemented by Delaware for county portions in the Chesapeake Bay watershed as well as the progress that has been made toward reaching that goal. A tabular comparison of the Phase II WIP goals, 2017 Progress, and the Phase III WIP (2025) goals for each BMP is presented in Appendix E. Definitions for all BMPs are provided in Appendix D.

The following suite of BMPs represents voluntary activities recommended for both private and public lands (government agencies owning public lands). The funding mechanism for each BMP also is discussed. All BMPs on public land are owner-incurred costs except for cover crops, which are funded by cost-share programs offered to offset costs of BMP implementation.

4.3.1 Agricultural Sector WIP Steering Committee Recommended Practices

4.3.1.1 Cover Crops

Cover crops and commodity cover crops are a popular BMP in Delaware, although their implementation rates can be increased substantially. Because of weather and cropping patterns, area agriculture representatives feel that the most realistic goal for cover crops in any given year is 75% of the crop land grown in annuals. To accomplish this goal, several strategies were identified in the Phase II WIP, including obtaining additional funding for cover crop incentive payments; obtaining extra funds to increase the caps so more farmers will plant more acreage; continuing to allow harvesting of the crops - turning a cover crop into a commodity cover crop; modifying cost-share programs to provide further incentives for early plantings of the most efficient species; and increasing education on soil health to improve compliance with fertility applications. The Phase III WIP has identified additional funding for increased cover crop planting on all eligible land through the Chesapeake Bay Cover Crop Initiative's cost-share program with DDA and NRCS (see Section 4.2.1 for more details). The goal of this program is to enroll every eligible acre in some small grain or mixed cover. The push to increase cover crops is justified as cover crops are one of Delaware's most effective and visible methods of reducing the biggest nutrient loss risk: nitrogen leaching over winter.

In addition to the increased contributions to Delaware's Conservation Cost-Share Program and the NRCS Cost-Share Program, funding is also provided through the CBIG and the CWA Section 319 Program.

Table 4-6 presents the Phase III WIP 2025 goals for cover crops and commodity cover crops for New Castle, Kent, and Sussex counties. As mentioned earlier, the forest buffer goal was made more realistic and cover crops were increased (see Section 4.3.2). The number of cover crop acres was significantly increased so that the number of forest buffer acres could be reduced. The 2017 Progress values show that Delaware was already making progress toward the Phase II WIP goals for 2025. The goal for all cover crop acres is early planted aerial wheat.

Phase III WIP Goal: Enroll every eligible acre in some small grain or mixed cover.

Funding Mechanism: Cost-share funding to offset the costs of implementation to landowners is available from the Delaware Conservation Cost-Share Program, Conservation District Cost-Share Programs, and the various NRCS programs. Additional funding is provided through the Chesapeake Bay Grant and the CWA Section 319 Program. Additional sources are currently being pursued to allow for the increased BMP implementation schedule. A request for additional funding has been made through the Delaware Legislative Budget development process to increase contributions to the Delaware Conservation Cost-Share Program beginning in FY2020. The Governor's budget included $2.7 million and, generally, the funding has received favorable feedback from legislators.

Challenges: If the additional funding request to increase contributions to the Delaware Conservation Cost-Share Program is not approved, the Phase III WIP goals will not be supported at the level at they can be achieved.

Table 4-6. Phase III WIP 2025 Annual Goals for Cover Crops

BMP Name	County	Phase III WIP 2025 Goal (acres/year)	Progress to Date[a] (% of goal met)
Cover Crops	New Castle County	3,319	37%
Commodity Cover Crops	New Castle County	2,274	30%
Cover Crops	Kent County	24,665	48%
Commodity Cover Crops	Kent County	8,696	11%
Cover Crops	Sussex County	81,375	45%
Commodity Cover Crops	Sussex County	22,179	7%
TOTAL		**142,508**	**37%**

Note:
[a]Progress as of 2017 midpoint assessment.

4.3.1.2 Nutrient Management Compliance

The Phase II WIP included nutrient management goals for core nutrient management application of nitrogen and phosphorus as well as placement and timing goals for nitrogen and phosphorus. The 2017 Progress, however, shows progress only for the core nutrient management application efforts. The Phase III WIP goals incorporate adjusted nitrogen and phosphorus goals for core nutrient management and rate, timing, and placement levels.

The DNMC conducts nutrient management compliance desk audits on all submitted nutrient management annual reports. There are currently 144,536 acres of land under nutrient management compliance in the Chesapeake Bay watershed; Delaware's goal is to maintain this amount through 2025 with core nutrient management on 85% of the land (down 10% from the Phase II WIP) (Table 4-7). The combination of core nutrient management being a requirement of Delaware's Nutrient Management Law and the new compliance SOPs described in Section 0 make 85% an attainable goal. The supplemental nutrient management practices of nitrogen rate, nitrogen timing, phosphorus rate, and phosphorus placement are set to 60% of total available acres (Table 4-7). This is an attainable goal based on current practices increasing implementation (pre-sidedress nitrate test, split rate nitrogen application, phosphorus site index), but not currently captured by the annual reports. The new compliance procedures should result in a capture and verification of the enhanced levels of nutrient management (nitrogen and phosphorus placement, rate, and timing) over the core level. Delaware anticipates being successful in implementing new projects to capture these data both within and outside of the current annual reporting practices.

A phased approach will be implemented beginning with the reported enhancing elements of cost-shared NRCS nutrient management plans concurrently with regional surveys to approximate the extent of enhanced nutrient management practices. Following the results of the surveys, DNMC will proceed with discussions to either incentivize consultant-reported nutrient management enhancements or build out the annual reporting done by farmers with a voluntary questionnaire on implemented enhancements. The goal remains to collect the data as paid for by farmers and provide the data to agribusinesses and the Delaware-Maryland Agribusiness Association in collaboration with The Nature Conservancy, who continue to seek this information under their Delaware-Maryland 4R Alliance for which the Nutrient Management Administrator is a steering committee member.

Additionally, in 2019 and 2020, a web mapping tool and service will be rolled out to the nutrient management certified consultants across Delaware to identify areas requiring manure and fertilizer setbacks, traditionally accomplished by aerial imagery. Regulations in place since 2006 have required NMPs to include aerial photos as well as soil information, field boundaries, roads and lanes, surface water bodies, irrigation, physical BMPs, and other environmentally sensitive areas such as wells. Under the new Verification Audit SOPs for plan implementation, it was immediately clear that many plans were missing at least one element in the mapping. This fact did not substantiate noncompliance, but presented an opportunity to enhance the utility of the maps for farmers planning nutrient applications. Partners in the project demonstrated that much of the often-missing data were publicly available, but in no central location. The mapping tool pilot project was put together by centralizing the data and having them hosted on a web portal so no specialized computer hardware or expensive software would be required. The Nutrient Management Program plans to roll out this project in the 2019 season to select consultants as beta-testers. After necessary adjustments are made to ensure the product's ease-of-use, a free-access, first-of-its-kind planning tool will be unveiled for farmers to use to protect water quality not only from nutrients, but also from any of the chemicals regulated under agricultural use. The tool has an interface allowing consultants to pin BMPs directly to the service and could present another pathway of collecting supplemental nutrient management implementation.

Phase III WIP Goal: 85% core nutrient management compliance in the regulated community and 60% supplemental nutrient management practice adoption collected and reported through collaboration with local and regional agribusinesses and DDA.

Funding Mechanism: The amount of additional funding needed to maintain the current compliance rate is unknown. Nutrient management is a regulatory requirement in Delaware. Funding for plan development reimbursement is provided programmatically through the DNMC.

Challenges: Capturing enhanced nutrient management practices not required to be submitted with the nutrient management annual reports.

Table 4-7. Phase III WIP 2025 Annual Goals for Nutrient Management

BMP Name	County	Phase III WIP 2025 Goal (acres/year)	Progress to Date[a] (% of goal met)
Nutrient Application Management Core Nitrogen	New Castle County	6,882	70%
	Kent County	32,688	74%
	Sussex County	91,367	59%
Nutrient Application Management Rate Nitrogen	New Castle County	4,856	0%
	Kent County	23,074	0%
	Sussex County	64,494	0%
Nutrient Application Management Placement Nitrogen	New Castle County	4,856	0%
	Kent County	23,074	0%
	Sussex County	64,494	0%
Nutrient Application Management Timing Nitrogen	New Castle County	4,856	0%
	Kent County	23,074	0%
	Sussex County	64,494	0%
Nutrient Application Management Core Phosphorus	New Castle County	6,882	70%
	Kent County	32,688	74%
	Sussex County	91,367	59%
Nutrient Application Management Rate Phosphorus	New Castle County	4,856	0%
	Kent County	23,074	0%
	Sussex County	64,494	0%
Nutrient Application Management Placement Phosphorus	New Castle County	4,858	0%
	Kent County	23,074	0%
	Sussex County	64,494	0%
Nutrient Application Management Timing Phosphorus	New Castle County	0.0	0%
	Kent County	0.0	0%
	Sussex County	0.0	0%
TOTAL		**130,937**	**63%**

Note:
[a]Progress as of 2017 midpoint assessment.

4.3.1.3 Tillage—Conservation, High Residue and Low Residue

The Phase II WIP identified a goal of 119,648 acres in conservation tillage and 19,152 acres in high-residue tillage. The 2017 Progress showed that 61% of the conservation tillage goal had been met and the high-residue tillage goal was already exceeded by 48,941 acres. The Phase III WIP includes more conservative goals with most of the acres in conservation tillage and fewer acres in high- and low-residue tillage. By 2025, Delaware intends to have 90% of its cropland acres in the Chesapeake Bay watershed in tillage—60% conservation tillage, 15% high-residue tillage, and 15% low-residue tillage. Table 4-8 presents the Phase III WIP 2025 goals for tillage in the Chesapeake Bay watershed as well as the progress to date.

Phase III WIP Goal: 60% conservation tillage, 15% high-residue tillage, and 15% low-residue tillage, with an overall implementation rate of 90%.

Funding Mechanism: Cost-share funding to offset the costs is available from the various NRCS programs.

Challenges: No challenges are anticipated in capturing this goal with the existing Tillage Transect Survey. Rates of historic no-till will be reduced in this goal from present levels and two new levels of tillage can be captured and reported. This flexibility makes Delaware's goal 100% achievable and easily endorsed by the locally driven Phase III WIP Agricultural Sector WIP Steering Committee, which largely developed this plan. Climate variability and crop type and rotation affect conservation tillage implementation.

Table 4-8. Phase III WIP 2025 Annual Goals for Tillage

BMP Name	County	Phase III WIP 2025 Goal (acres/year)	Progress to Date[a] (% of goal met)
Conservation Tillage	New Castle County	4,314	100%
	Kent County	20,679	100%
	Sussex County	62,326	76%
High-Residue Tillage	New Castle County	1,078	100%
	Kent County	5,170	100%
	Sussex County	15,581	100%
Low-Residue Tillage	New Castle County	1,078	0%
	Kent County	5,170	0%
	Sussex County	15,581	0%
TOTAL		**130,977**	**100%**

Note:
[a]Progress as of 2017 midpoint assessment.

4.3.1.4 Pasture Management

Pasture management includes the practices of pasture alternative watering, prescribed grazing, and grass buffers on fenced pasture. These practices are typically either moving toward or exceeding their Phase II WIP goals; therefore, the Phase II WIP goals have been increased for the Phase III WIP (Table 4-9).

Phase III WIP Goal: An increase of 144 acres over the Phase II WIP goals (1,603 acres).

Funding Mechanism: Cost-share funding to offset the costs could be available from the various NRCS programs. Additionally, the DNREC Nonpoint Source 319 Grant and CBIG have funded this project through SCD.

Challenges: To increase implementation would require more technical assistance in the form of education and outreach to nonpoultry landowners.

Table 4-9. Phase III WIP 2025 Cumulative Goals for Pasture Management

BMP Name	County	Phase III WIP 2025 Goal (acres/year)	Progress to Date[a] (% of goal met)
Pasture Alternative Watering	New Castle County	155	19%
	Kent County	578	47%
	Sussex County	701	56%
Prescribed Grazing	New Castle County	55	18%
	Kent County	0.0	0%
	Sussex County	84	56%
Grass Buffers on Fenced Pasture Corridor	New Castle County	0.0	0%
	Kent County	10	40%
	Sussex County	20	85%
TOTAL		**1,603**	**48%**

Note:
[a]Progress as of 2017 midpoint assessment.

4.3.1.5 Soil and Water Conservation Plans

The Phase III WIP 2025 goals for land under soil and water conservation plans remain consistent with the Phase II WIP goals: 99% of the available land in all three counties (Table 4-10). While 100% of farms are required to have soil and water conservation plans, 99% was chosen to represent a small potential group that is in noncompliance.

Phase III WIP Goal: Maintain 164,917 acres in soil and water conservation plans through 2025, which represents 99% of available land.

Funding Mechanism: Cost-share funding to offset the costs of implementation to the landowners is available from the various NRCS programs. Additional funding is provided through the Chesapeake Bay Grant and the CWA Section 319 Program. The SCD offers an incentive for whole farm conservation planning using NRCS standards.

Challenges: Not all farmers participate in government programs. Conservation plans are only required of farmers participating in NRCS programs.

Table 4-10. Phase III WIP 2025 Annual Goals for Soil and Water Conservation Plans

BMP Name	County	Phase III WIP 2025 Goal (acres/year)	Progress to Date[a] (% of goal met)
Soil and Water Conservation Plans	New Castle County	8,705	100%
	Kent County	47,238	100%
	Sussex County	108,974	100%
TOTAL		**164,917**	100%

Note:
[a]Progress as of 2017 midpoint assessment.

4.3.1.6 Animal Waste Management Systems

These Phase III WIP goals for livestock and poultry waste management systems reflect the Phase II WIP goals (Table 4-11). 2017 Progress shows that significant movement has been made toward meeting the 2025 goals. Delaware feels that these continue to be attainable goals as waste management systems, although sometimes slow to implement, are cost-shareable BMPs that have widespread implementation.

Phase III WIP Goal: Maintain Phase II WIP goals with an increase in New Castle County to reflect 2017 Progress.

Funding Mechanism: Cost-share funding to offset the costs of implementation to the landowners is available from the Delaware Conservation Cost-Share Program and the various NRCS programs. Additional funding is provided through the Chesapeake Bay Grant and the CWA Section 319 Program. Additionally, funds are often available to landowners through the Delaware SRF.

Challenges: There is a current backlog of cost-share applications resulting from replacement of a large amount of poultry housing. The replacement has largely subsided, but applications are probably going to require two years of additional funding to catch up.

Table 4-11. Phase III WIP 2025 Cumulative Goals for Livestock and Poultry Waste Management Systems

BMP Name	County	Phase III WIP 2025 Goal (number of structures)	Progress to Date[a] (% of goal met)
Livestock Waste Management Systems	New Castle County	38	100%
	Kent County	5,459	18%
	Sussex County	5,487	41%
Poultry Waste Management Systems	New Castle County	20	100%
	Kent County	181,012	77%
	Sussex County	899,890	63%
TOTAL		**1,091,906**	**71%**

Note:
[a]Progress as of 2017 midpoint assessment.

4.3.1.7 Livestock and Poultry Mortality Composting (Mortality Composters and Freezers)

The numbers for livestock and poultry mortality composting reflect the Phase II WIP goals for 2025 in Kent and Sussex counties, which represent 100% mortality composting (Table 4-12). The Phase III WIP has added a 2025 goal of 100% mortality composting in New Castle County as well. Delaware feels the Phase II WIP goals are attainable as mortality composting systems, although sometimes slow to implement, are cost-shareable BMPs that have widespread implementation.

The Phase II WIP recommended dead bird composters/incinerators on all poultry operations for bird mortality. The Phase III WIP recommends encouraging/incentivizing the industry to switch from composting to freezing and recycling routine mortality. Recent trends in the industry such as increased bird size and reduction in antibiotic use, have caused composting to become more problematic. Mortality freezers have been cost-shared and promoted in Delaware; however, the implementation rate can be increased.

One of the goals of the Phase III WIP is to significantly increase implementation of mortality freezer use by 2025. Specifically, Delaware projects enough small (AFO) and large (CAFO) operations in each subwatershed to have adopted this technology to have enough freezer capacity in place to recycle about 20% of the mortality generated statewide. Based on prior Chesapeake Bay Watershed Model estimates of broiler carcass nutrient content, a 20% reduction in mortality as a load source input would mean almost 180,000 lbs of nitrogen and almost 31,000 lbs of phosphorous being diverted from land application in the watershed. To achieve this goal, Delaware expects to see growers add another 540 freezer units to the nearly 300 freezers currently in operation—at a total cost of approximately $2.9 million over the next six years.

Phase III WIP Goal: Maintain the implementation rate for Kent and Sussex counties and add 100% implementation for New Castle County. There is also a goal to encourage/incentivize the industry to switch from composting to freezing and recycling routine mortality.

Funding Mechanism: Cost-share funding to offset the costs of implementation to landowners is available through the NRCS EQIP and RCPP. This will be supported with additional EQIP funding during the phase of poultry house replacement over the most recent period. Additional funding is provided through the Chesapeake Bay Grant and the CWA Section 319 Program. Adequate state and federal incentive/funding mechanisms currently exist to meet both goals.

Challenges: High levels of EQIP and RCPP assistance need to be maintained. In addition, there is not enough funding to support beginning farmers with new poultry operations. Farmers must have a resource concern before cost-share can be provided by NRCS, which usually means chickens have to be in the house before cost-share can be used.

Table 4-12. Phase III WIP 2025 Cumulative Goals for Mortality Composters

BMP Name	County	Phase III WIP 2025 Goal (number of systems)	Progress to Date[a] (% of goal met)
Livestock Mortality Composting	New Castle County	1,293	0%
	Kent County	5,707	0%
	Sussex County	5,488	0%
Poultry Mortality Composting	New Castle County	77	0%
	Kent County	181,012	18%
	Sussex County	899,890	45%
TOTAL		**1,093,467**	**40%**

Note:
[a]Progress as of 2017 midpoint assessment.

4.3.1.8 Barnyard Runoff Control Structures

The Phase III WIP 2025 goals for barnyard runoff control structures reflect the Phase II WIP goals for 2025 (Table 4-13). 2017 Progress shows that the goal for New Castle County of nine structures has already been met and Kent and Sussex counties are nearing their goals of 109 and 371, respectively. Delaware feels the Phase II WIP goals are attainable as runoff control structures are cost-shareable BMPs that have widespread implementation.

Phase III WIP Goal: Maintain Phase II WIP goals. These goals represent 100% implementation.

Funding Mechanism: Cost-share funding to offset the costs available from the various NRCS programs.

Challenges: None.

Table 4-13. Phase III WIP 2025 Cumulative Goals for Runoff Control Systems

BMP Name	County	Phase III WIP 2025 Goal (number of systems)	Progress to Date[a] (% of goal met)
Barnyard Runoff Control Systems	New Castle County	9	100%
	Kent County	109	85%
	Sussex County	397	94%
TOTAL		**515**	**92%**

Note:
[a]Progress as of 2017 midpoint assessment.

4.3.1.9 Agriculture Stormwater Management

Poultry houses are constructed according to environmental standards that ensure water quality is protected. In Delaware, the building process involves state and federal permits administered through multiple agencies. Sediment and stormwater plans are required to be submitted to SCD and approved prior to site work being initiated. A structure on a farm used solely for agricultural purposes in which the use is exclusively in connection with the production, harvesting, storage, drying, or raising of agricultural commodities, including the raising of livestock, are considered agriculture structures. Structures used for human habitation, public use, or a place of employment where agricultural products are processed, treated, or packaged are not considered agriculture structures for the purposes of these regulations.

Phase III WIP Goal: Agriculture stormwater management has not been reported in the past; therefore, there are no Phase II goals or 2017 Progress for comparison to the Phase III WIP goals. The Phase III WIP goals are presented in Table 4-14.

Funding Mechanism: This is a regulated BMP; however, financial assistance is available for conservation and BMPs:

- SCD, KCD, and NCCD offer technical and financial assistance for conservation planning and practice implementation for poultry farmers.
- Delaware NRCS offers technical and financial assistance to farmers, including new poultry farmers.
- The SRF Agricultural Nonpoint Source Loan Program provides a source of low-interest financing for managing poultry manure, dead poultry, and other sources of poultry-related pollution in an environmentally sound and cost-effective manner. These loans help poultry farmers implement BMPs on their farms to reduce the potential for pollution from their farming operations. This program is managed jointly by the Financial Assistance Branch, the Division of Soil and Water Conservation, and the state's conservation districts.

Challenges: Implementing agricultural stormwater management practices is solely based on the rate of new poultry headquarters construction.

Table 4-14. Phase III WIP 2025 Cumulative Goals for Agriculture Stormwater Management

BMP Name	County	Phase III WIP 2025 Goal (number of systems/year)	Progress to Date[a] (% of goal met)
Agriculture Stormwater Management	New Castle County	8	0%
	Kent County	96	0%
	Sussex County	349	0%
TOTAL		**453**	**0%**

Note:
[a]Progress as of 2017 midpoint assessment.

4.3.1.10 Manure Transport

Excess manure is transported away from farms with high phosphorus levels to other farms or alternative facilities that can use the manure safely. The Nutrient Relocation Program is fully implemented. Currently, 80% of the manure relocated from Delaware's portion of the Chesapeake Bay watershed is sent out of the watershed to other farms or alternative facilities.

DDA and DNMC are currently considering methods for increasing total manure relocation, especially outside the Chesapeake Bay watershed. DNMC is considering raising the reimbursement paid per ton/mile and additional incentives to further encourage transport outside the watershed.

Phase III WIP Goal: The goal for manure transport has been kept the same as in the Phase II WIP (Table 4-15), but there is potential to optimize it through additional incentives and alternative uses such as the Clean Bay Renewables poultry waste recycling plant planned for 2019 (see section 4.2.2.1), mushroom facilities, and manure for the steam generation process. The Delaware Nutrient Management Program is committed to seeking out and approving alternative uses of manure if they prove effective in use and cost efficient in application.

Funding Mechanism: Private or exploratory grants as well as cost-share funding to offset the costs of implementation to the landowners is available from the Delaware Conservation Cost-Share Program and the various NRCS programs. Additional funding is provided through the Chesapeake Bay Grant and the CWA Section 319 Program.

Challenges: The nutrient relocation program is dependent on funding; it is impossible to have too much funding for this program. If there are funds, manure will be moved. Funding sources have already been diversified. More stringent phosphorus manure application recommendations or requirements developed in the state could limit the ability to transport and apply manure to other agricultural lands in the portion of the state in the Chesapeake Bay watershed and might require more to be transported out of the watershed or to alternative facilities, which could be more expensive. This assumption is not supported by the current modeling tools estimating phosphorus contributions from soil pools, and only one county in Delaware would benefit—to a limited degree—from manure transport as a result of the modeling method employed for this practice. DNMC currently monitors application rates and will be in the position to continue monitoring any change recommendations or requirements for application rates in the future.

Table 4-15. Phase III WIP 2025 Annual Goals for Manure Transport

BMP Name	County	Phase III WIP 2025 Goal (tons/year)	Progress to Date[a] (% of goal met)
Manure Transport Out of Watershed	New Castle County	153	92%
	Kent County	9,828	0.8%
	Sussex County	64,099	1%
TOTAL		**74,080**	**11%**

Note:
[a]Progress as of 2017 midpoint assessment.

4.3.1.11 Ammonia Emission Reductions

The Phase II WIP contained no goals for litter amendments. Because this practice was implemented on several acres in Kent and Sussex counties, however, the Phase III WIP goals are slightly higher than the 2017 Progress values. The Phase II WIP did include goals for biofilters, but because none were implemented, that goal has been removed from the Phase III WIP (Table 4-16).

Phase III WIP Goal: Hold near 2017 Progress.

Challenges: None

Table 4-16. Phase III WIP 2025 Annual Goals for Ammonia Emission Reductions

BMP Name	County	Phase III WIP 2025 Goal (acres/year)	Progress to Date[a] (% of goal met)
Litter Amendments	New Castle County	0.0	100%
	Kent County	969	98%
	Sussex County	6,300	99%
Biofilters	New Castle County	0.0	100%
	Kent County	0.0	100%
	Sussex County	0.0	100%
TOTAL		**7,269**	**99%**

Note:
[a]Progress as of 2017 midpoint assessment.

4.3.2 Other Agricultural Practices Necessary to Achieve Phase III WIP Goals

In addition to the previously described BMPs and programs that will be utilized to achieve Delaware's Agricultural Sector's 2025 planning targets in sections 4.1 through 4.3.1, the agricultural BMPs enumerated in this section are necessary to meet the planning targets for Delaware's Developed and Natural land uses. The planning targets, as described in section 2.2, were calculated by an approach consistent with the CBP Allocation Methodology and Delaware's Phase I and Phase II WIP sector allocation methods.

4.3.2.1 Forest and Grass Buffers

The Phase II WIP 2025 goal was to increase Delaware's forest buffers by 7,020 acres, but by 2017 only 9% (623 acres) of that goal had been implemented. Since the Phase II WIP was published, the state of Delaware has determined that the Phase II implementation goal for forest buffers was unrealistic. Full implementation of the forest buffer practice is limited by participants rather than funds. Forest buffers are not always an available practice for heavily tax-ditched areas, where access to ditches for maintenance purposes limits tree plantings in rights-of-ways. Further education and outreach opportunities will be pursued; however, the goal in the Phase III WIP has been reduced from the Phase II WIP goal. Cover crops, nutrient management, and grass buffer efforts have been increased to account for the change.

The strategy for New Castle and Sussex counties is to aim for 1% of available acres in grass buffers. The almost 8% implementation rate of grass buffers in Kent County reflects the presence of almost 9,000 existing acres in the 2017 Progress and the goal to have a few hundred acres more added to that progress. Table 4-17 presents the levels of forest buffer and grass buffer implementation for the Phase III WIP and the progress to date.

Phase III WIP Goal: Add 65 acres of forest buffers to the 623 acres seen in the 2017 Progress across the three counties. Implement grass buffers on 5% of available acres in New Castle County, 2% in Sussex County, and 20% in Kent County where the most progress has been made.

Funding Mechanism: Cost-share funding is available to offset the costs of implementing forest and grass buffers on private agricultural lands through Delaware and NRCS's CREPs.

Challenges: Finding land to take out of agricultural production and convert to buffers.

Table 4-17. Phase III WIP 2025 Cumulative Goals for Forest and Grass Buffers

BMP Name	County	Phase III WIP 2025 Goal (acres)	Progress to Date[a] (% of goal met)
Forest Buffers	New Castle County	4	13%
	Kent County	256	92%
	Sussex County	431	90%
Grass Buffers	New Castle County	497	2%
	Kent County	10,275	35%
	Sussex County	2,249	5%
TOTAL		**13,712**	**31%**

Note:
[a]Progress as of 2017 midpoint assessment.

4.3.2.2 Wetland Restoration, Creation, Rehabilitation and Enhancement

The Phase II WIP 2025 goals for wetland restoration in New Castle, Kent, and Sussex counties were 290, 1,660, and 3,775 acres, respectively. 2017 Progress shows that the Phase II WIP goals were exceeded in New Castle and Kent counties and nearly met in Sussex County; therefore, the Phase III WIP goals are higher (

Table 4-18). Wetland creation and wetland rehabilitation and enhancement have been implemented and tracked in recent years but were not being reported. The Phase III WIP includes new goals for these wetland practices as well.

Phase III WIP Goal: Wetland restoration goals were increased to 14,174 acres, while new goals for wetland creation and wetland rehabilitation and enhancement were added.

Funding Mechanism: Cost-share funding is available to offset the costs of implementing wetland restoration on private agricultural lands through the Delaware and NRCS's CREPs. Funding for wetland creation, restoration, and enhancement is also available from various federal sources, state and local government, and nonprofit organizations.

Challenges: Challenges to implementing wetland restoration, creation, and rehabilitation include **c**ompeting land uses (mainly cropland), which reduce opportunities, and lack of funding, especially if only cost-share is available. Fee-simple lands might need to be acquired to create, restore, and rehabilitate enough wetlands to approach the acreage goals.

Table 4-18. Phase III WIP 2025 Cumulative Goals for Wetland Restoration, Creation, and Enhancement and Rehabilitation

BMP Name	County	Phase III WIP 2025 Goal (acres)	Progress to Date[a] (% of goal met)
Wetland Restoration	New Castle County	1,540	21%
	Kent County	9,266	40%
	Sussex County	3,368	58%
Wetland Creation	New Castle County	59	0%
	Kent County	320	0%
	Sussex County	746	0%
Wetland Enhancement and Rehabilitation	New Castle County	2,462	0%
	Kent County	16,863	0%
	Sussex County	19,973	0%
TOTAL		**54,597**	**11%**

Note:
[a]Progress as of 2017 midpoint assessment.

4.3.2.3 Land Retirement

The Phase II WIP 2025 goals for land retirement in New Castle, Kent, and Sussex counties were 722, 304, and 784 acres, respectively, with a total goal of 1,810 acres. 2017 Progress shows that Kent and Sussex counties have made a lot of progress toward their goals, while New Castle County made less progress. The Phase III WIP goals were adjusted to reflect this progress by decreasing the Phase III WIP goal for New Castle County, while increasing the goals for Kent and Sussex counties (Table 4-19).

Phase III WIP Goal: Decrease the overall goal for land retirement from 1,810 acres to 1,742 acres to reflect progress occurring in the watershed.

Funding Mechanism: Cost-share funding to offset the costs could be available from the Delaware Conservation Cost-Share Program. Cost-share funds are available for the retirement of highly erodible agricultural lands through the NRCS's CREP or the Wetland Reserve Program.

Challenges: Participation is low due to competing land uses (mainly cropland) that reduce wetland opportunities. Additionally, there is not enough funding.

Table 4-19. Phase III WIP 2025 Cumulative Goals for Land Retirement

BMP Name	County	Phase III WIP 2025 Goal (acres)	Progress to Date[a] (% of goal met)
Land Retirement	New Castle County	260	22%
	Kent County	574	47%
	Sussex County	908	63%
TOTAL		**1,742**	**52%**

Note:
[a]Progress as of 2017 midpoint assessment.

4.3.2.4 Tree Planting

The Phase II WIP 2025 goals for tree planting on agricultural land in New Castle, Kent and Sussex counties were 47, 270, and 613 acres, respectively, with a total goal of 930 acres. 2017 Progress shows that the overall goal was exceeded; therefore, the Phase III WIP goal has been increased to 3,000 acres (Table 4-20).

Phase III WIP Goal: New Castle County is being held close to the Phase II WIP goal (45 acres), while the Phase III WIP goals for Kent and Sussex counties have been increased to meet an overall goal of 3,000. This is an increase of 1,123 trees over 2017 Progress.

Funding Mechanism: Property owner-incurred costs.

Challenges: Competing land uses (mainly cropland) reducing opportunities.

Table 4-20. Phase III WIP 2025 Cumulative Goals for Tree Planting

BMP Name	County	Phase III WIP 2025 Goal (acres)	Progress to Date[a] (% of goal met)
Tree Planting	New Castle County	45	22%
	Kent County	457	55%
	Sussex County	2,498	65%
TOTAL		**3,000**	**63%**

Note:
[a]Progress as of 2017 midpoint assessment.

4.3.2.5 Agricultural Drainage Management (Water Control Structures)

Delaware has long supported the practice of water control structures; however, a comprehensive database on existing structures does not currently exist. Through working with local contacts in DNREC's Drainage Program, NRCS, and county conservation districts, DNREC IT staff have started developing a database for tracking that information. The location of each structure, the date it was installed, and the date the structure was removed, if applicable, will be available fields. Then, using a program called StreamStat, the database will calculate the area draining to each structure and compare it to paper records, if they exist. Additionally, the land-use composition of the drainage area will be determined using the most recent Delaware land-use and land cover data set. Finally, we will determine if any of the existing structures exist on state-owned lands and identify potential opportunities for installing new structures on state lands first.

Phase III WIP Goal: The Phase III WIP 2025 goals for agricultural drainage management are presented in Table 4-21.

Funding Mechanism: Cost-share funding to offset the costs of implementation to the landowners is available from the Delaware Conservation Cost-Share Program and the various NRCS programs.

With the expansion funding for the Watersheds Program in the new Farm Bill, Delaware NRCS has agreed to support efforts to identify and prioritize appropriate projects such as planning for water quality components on tax ditches.

Challenges: Participation is low due to historic drainage management strategies and limited funding.

Table 4-21. Phase III WIP 2025 Cumulative Goals for Agricultural Drainage Management

BMP Name	County	Phase III WIP 2025 Goal (acres)	Progress to Date[a] (% of goal met)
Agricultural Drainage Management	New Castle County	13	23%
	Kent County	2	100%
	Sussex County	3,302	44%
TOTAL		**3,317**	**89%**

Note:
[a]Progress as of 2017 midpoint assessment.

4.3.2.6 Non-Urban Stream Restoration

The Phase III WIP 2025 goals for non-urban stream restoration have increased in Sussex County to reflect ongoing projects (Table 4-22). The Phase WIP III goals represent a 0.3% implementation rate in Sussex County, which reflects a conservative estimate that Delaware's agriculture stormwater management experts feel is attainable. More than 12,000 feet of stream restoration have already been implemented in Sussex County.

Phase III WIP Goal: 0.3% implementation rate in Sussex County.

Funding Mechanism: Cost-share funding to offset the costs of stream restoration projects is available from the Delaware Conservation Cost-Share Program and the various NRCS programs. Potential funding could be provided through the Chesapeake Bay Grant and the CWA Section 319 Program.

Challenges: Most non-urban stream restoration will occur within established tax ditch watersheds, so buy-in from the tax ditch managers could be a challenge. There would have to be a guarantee that there would be no change in current drainage rate/quantity.

Table 4-22. Phase III WIP 2025 Cumulative Goals for Non-Urban Stream Restoration

BMP Name	County	Phase II WIP 2025 Goal (feet)	Progress to Date[b] (% of goal met)
Non-Urban Stream Restoration	New Castle County[a]	0.0	NA
	Kent County	0.0	100%
	Sussex County	17,000	73%
TOTAL		**17,000**	**73%**

Notes: NA = not applicable.
[a]The goals for non-urban stream restoration for New Castle County are included in the Developed Sector (Section 3.3.2.5).
[b]Progress as of 2017 midpoint assessment.

4.3.2.7 Dairy Precision Feeding

The Phase II WIP included goals for dairy precision feeding, but Delaware has not been reporting this practice. The Phase III WIP retains the Phase WIP II goals for this practice (Table 4-23). Delaware feels these are still attainable goals as dairy precision feeding, although sometimes slow to implement, is a cost-shareable BMP that has widespread implementation.

Phase III WIP Goal: Retain the Phase II WIP goals (100% implementation).

Funding Mechanism: Funding for this practice is available through NRCS cost-share programs.

Challenges: Declines in dairy industry affect practice implementation.

Table 4-23. Phase III WIP 2025 Annual Goals for Dairy Precision Feeding

BMP Name	County	Phase III WIP 2025 Goal (acres/year)	Progress to Date[a] (% of goal met)
Dairy Precision Feeding	New Castle County	3	0%
	Kent County	470	0%
	Sussex County	1,406	0%
TOTAL		**1,879**	**0%**

Note:
[a]Progress as of 2017 midpoint assessment.

4.3.2.8 Forest Harvesting Practices

Forest harvesting practices apply to BMPs applied to the load from forests. Data on forest harvesting practices are tracked by DFS. The acreage reported represents areas that underwent timber harvest, either clearcutting or selective harvest. DFS is the permitting agency for any logging operations that are 1 or more acres if the land is to remain as forest afterwards. If it is to be converted for development or agriculture, it passes to DNREC and conservation district jurisdictions. DFS approves or disapproves permits as they are submitted and verifies through field inspections that the BMP laws are adhered to during and after harvest. The primary laws enforced are water quality BMPs (all harvests) and adequate regeneration of commercial tree species (only when the Seed Tree Law is triggered by a harvest that is at least 10 acres, at least 25% pine and/or yellow-poplar, and not to be converted to a non-forest land use). Recommended practices include preharvest planning to properly locate access roads, avoiding stream crossings and wetlands, curtailing harvests during wet periods, and maintaining sufficient forest buffers near water.

Phase III WIP Goal: The implementation of forest harvesting practices is being maintained at 100% (1,309 acres per year) from the Phase II WIP to the Phase III WIP (Table 4-24).

Funding Mechanism: Landowners who undergo timber harvests profit from the sale of timber; therefore, cost-share opportunities for those BMPs are not available.

Challenges: All timber harvests greater than 1 acre are permitted by DFS. Delaware timber harvests achieved a 93% rate of compliance with BMPs designed to protect water quality and limit soil erosion, according to a study done with Maryland Department of Natural Resources.

Table 4-24. Phase III WIP 2025 Annual Goals for Forest Harvesting Practices

BMP Name	County	Phase III WIP 2025 Goal (acres/year)	Progress to Date[a] (% of goal met)
Forest Harvesting Practices	New Castle County	73	81%
	Kent County	281	97%
	Sussex County	1,028	99%
TOTAL		**1,309**	**99%**

Note:
[a]Progress as of 2017 midpoint assessment.

4.4 Local Engagement Strategies and Commitments for the Agricultural Sector

Local engagement for Delaware's Phase III WIP development began in March 2018 at the Chesapeake Bay WIP meeting hosted by DNREC in Dover, Delaware. This was an informational meeting focused on providing an update to stakeholders interested in the status of the Chesapeake Bay TMDL and WIP as well as Delaware's plans for Phase III WIP development. Stakeholders included federal, state, county, and municipal representatives, conservation districts, Delaware Nature Society, Nanticoke Watershed Alliance, DelDOT, Delaware Office of State Planning Coordination, University of Delaware WRC (WRC), and University of Delaware Cooperative Extension. Attendees were given the opportunity to participate in the WIP steering committees that were directly developing the planning goals.

Specific examples of local engagement in the development and implementation of the Phase III WIP are discussed in sections 4.4.1 through 4.4.4.

4.4.1 Agricultural Sector WIP Steering Committee

In addition to the larger informational WIP meeting in March, DNREC also hosted smaller, more interactive Agricultural Sector WIP Steering Committee planning meetings. The committee included farmers as well as representatives from state agencies, counties, nonprofits, and federal agencies including DDA, DNREC, NRCS, Delaware Cooperative Extension, Greener Solutions, Maryland Agriculture Associates, Perdue Farms, NCCD, KCD, SCD, and Willin Farms. Members from these organizations and communities were invited to attend monthly planning meetings from June through December 2018 to determine which BMPs were most efficient, where the implementation should be focused, and programs that can be best used to implement the selected BMPs. Delaware's Phase III WIP agricultural goals were developed by the Agricultural Sector WIP Steering Committee during these planning meetings.

Information on BMP effectiveness, based on both nutrient reduction and cost, was downloaded from CAST to support BMP selection by the Agricultural Sector WIP Steering Committee for the Phase III WIP. Information was pulled from the CBP's Modeling Workgroup's geographic isolation runs that identified subwatersheds in Delaware's portion of the Chesapeake Bay watershed that are out of attainment with Chesapeake Bay water quality standards. These subwatersheds were targeted for greater BMP implementation in the Phase III WIP (see Section 2.1).

4.4.2 Targeted Local Engagement

Specific local engagement activities occurring in the Chesapeake Bay watershed included outreach to local farmers and agricultural organizations and a new buffer initiative in Sussex County.

4.4.2.1 Ag Week

With the Agricultural Sector's focus on cover crops and nutrient management efforts to meet the 2025 WIP goals, Delaware's Ag Week from January 14 through 17, 2019, was an excellent opportunity for local engagement. The Agricultural Sector Steering Committee co-chairs presented the *Chesapeake Pollution Strategy for Agriculture* during the poultry and agronomy sessions, which discussed the progress made so far and Phase III WIP development. There were 174 attendees at the poultry session and 178 at the agronomy session. Several attendees reached out to the presenters to confirm that they understood the progress that has been made in the Chesapeake Bay watershed. Participants were asked to evaluate the programs to indicate knowledge gained and changes in views. Eighty-one participants at the agronomy session completed an evaluation. Of those turned in, 59 (73%) indicated that they learned something new about Chesapeake Bay pollution control strategies for agriculture and 49 (60%) indicated that their views on water quality issues in our region had changed.

In addition to the WIP presentations at Ag Week, the Agricultural Sector WIP Steering Committee worked with a contractor (Tetra Tech) to create a pamphlet that provided farmers with information on progress in meeting the Chesapeake Bay nutrient reduction goals to date and what they can do to make a difference (see Appendix I). The pamphlets were handed out at DDA's nutrient management booth and in the main meeting hall during Ag Week.

It was made clear through the WIP presentations and pamphlets that staff are available for speaking engagements and presentations regarding the Phase III WIP if there is interest. The presentations and pamphlet stressed that, to help meet the TMDL goals, Delaware has a new protocol for auditing nutrient management practices and is planning a new initiative to increase cover crops (see sections 4.2.1 and 4.2.2).

4.4.2.2 Additional Outreach to Farmers

In addition to the Ag Week presentations and pamphlets, several ongoing efforts are being made to reach out to local farmers and agriculture organizations in Delaware to inform them of the increased efforts in nutrient management reporting and cover crop implementation in support of meeting the 2025 targets. DDA held workshops with certified nutrient management consultants in September 2018 to brief them on new tools and pending changes to the Nutrient Management Program with an emphasis on the enhanced audit presence and push for enhanced nutrient management data collection. DDA also presented updates at the Delaware-Maryland 4R Alliance meeting in October 2018, the Delaware Maryland Agribusiness Association meeting in June 2018, and the Bridgeville Kiwanis Club *Farmer Appreciation Night* February 2019. Delaware's Secretary of Agriculture also provided a WIP update at the Delaware Association of Conservation Districts annual meeting in January 2019. DDA is also expected to present another discussion of the *Chesapeake Pollution Strategy for Agriculture* to the SCD board meeting in March 2019.

4.4.2.3 Sussex County Buffer/Setback Initiative

A new Sussex County buffers and wetlands working group will be meeting in 2019 for the first time to begin the process of reviewing county codes and ordinances to make recommendations to the County Council on buffer widths in the county (MacArthur 2019). Sussex County's buffer requirements are currently much less stringent than those in Kent and New Castle counties and the surrounding states of Maryland and New Jersey. Sussex County requires only a 50-foot buffer on tidal wetlands, while Kent and New Castle counties both require 100-foot buffers. Sussex County does not require any buffers along nontidal waterbodies while Kent and New Castle counties require 25- and 50-foot buffers, respectively. The working group will begin by reviewing definitions in the current buffer ordinance and, in summer 2019, will begin to write recommendations for any updates to the ordinance.

4.4.3 Commitments to Implementation for the Agricultural Sector

Delaware is already working with partners and has a fully funded and successful Nutrient Management Handler certification program that requires a minimum amount of credit hours for all nutrient handlers, including generators, applicators, consultants, and planners. DNMC is highly respected in the agricultural community and facilitates partnerships among all applicable state and local agencies as well as academic institutions and land grant universities. DNMC engages in full public information initiatives for all nutrient handlers, not just agricultural handlers.

SCD will continue to promote its Cost-Share Program to all of Sussex County, including the Chesapeake Bay watershed. Currently, cover crops are the number one priority of the program. SCD purchased an air seeder in 2015 to help accelerate the planting of cover crops in the county. The air seeder, which plants cover crops into standing cash crops, gives the cover crops a 30- to 60-day head start for establishment. When the cash crop is harvested, the cover crop is already established, providing water quality and soil health benefits. SCD is in its fourth year of providing custom application of cover crops to agricultural producers in Sussex County. The past three years, SCD has averaged about 5,000 acres of early-planted cover crops.

SCD is also advocating for whole-farm conservation plans rather than plans for only a portion of a farm. This approach would capture all existing BMPs on that farm (including BMPs that are not cost-shared). SCD has an ongoing incentive program that offers $250 cost-share for the first 100 whole-farm plans submitted.

4.4.4 Tracking, Reporting and Verification

Delaware's *Nonpoint Source Best Management Practice Implementation Data Quality Assurance and Verification Plan* (DNREC 2018b) provides details on the methods used to track, report, and verify all BMPs implemented in the Chesapeake Bay watershed. The plan was last updated in November 2018. See the *Nonpoint Source Best Management Practice Implementation Data Quality Assurance and Verification Plan* (DNREC 2018b) for more information on the BMP tracking, reporting, and verification methodology applied for all BMPs included in the Agricultural Sector portion of the Phase III WIP.

While tracking, reporting, and verification of cost-shared BMPs commonly occurs, Delaware farmers are also successfully using many other BMPs. DDA is asking farmers to report their voluntary (not cost-shared) practices to their nutrient management consultant so DDA can record that the practice exists and, during the next inspection, verify it is implemented correctly. These reports of noncost-shared BMPs will help Delaware measure success, adjust priorities, and ensure that BMPs are protecting agricultural profitability and local water quality.

5 Co-Benefits of BMPs Implemented on Developed and Agricultural Land

In 2014, the Chesapeake Bay Watershed Agreement was signed by representatives from the entire watershed, committing the bay states to full partnership in the CBP. The 2014 Watershed Agreement established 10 goals to advance the restoration and protection of the Chesapeake Bay watershed:

- Sustainable fisheries
- Vital habitats
- Improved water quality (of which the implementation of the Chesapeake Bay TMDL is one component)
- Toxic contaminants policy and prevention
- Healthy watersheds
- Stewardship (including diversity, local leadership, and citizen stewardship)
- Land conservation
- Public access
- Environmental literacy
- Climate resiliency.

The 10 goals are interrelated. For example, improvements in water quality can mean healthier fish and shellfish; the conservation of land can mean more habitat for wildlife; and a boost in environmental literacy can mean a rise in stewards of the Bay's resources (CBP 2018b). There are 31 management strategies and associated workplans with identified action items and indicators for these 10 goals. Delaware is committed to the following management strategies (CBP 2016):

- Black Duck
- Climate Resiliency
- Fish Habitat
- Forest Buffers
- Healthy Watersheds
- Protected Lands
- Public Access
- Stream Health
- Toxic Contaminants Policy and Prevention
- Tree Canopy
- Water Quality
- Wetlands

These goals, outcomes, and management strategies were incorporated into the Phase III WIP by using the Impact Scores Tool that was developed as part of a recent project funded by the Chesapeake Bay Trust that quantified the effects the Chesapeake Bay Watershed Model's BMPs have on each of the CBP's management strategies (Tetra Tech 2017). The Impact Scores Tool (a scoring matrix) was developed to assign an impact score to each BMP (or BMP type) for each management strategy. Each BMP was assigned a score on a scale of +5 (very beneficial) to -5 (very harmful) for a particular management strategy (Tetra Tech 2017).

The purpose of the Impact Scores Tool is to characterize the additional benefits of a BMP implementation strategy beyond nutrient and sediment reductions. The matrix can be used either to select priority BMPs or to identify the additional benefits of a BMP implementation strategy. The tool can also be used to make decisions about which BMPs to adopt based on management strategy priorities.

The selected BMPs will help jurisdictions develop WIPs that achieve the primary goal of reducing nutrient and sediment loads to the Chesapeake Bay, while also achieving additional benefits such as climate adaptation, flood control, and biodiversity and improved habitat. BMPs were chosen to be implemented in Delaware based on which practices are the most cost-effective and which practices can be readily implemented because of existing and potential funding and landowner interest.

Each of the Watershed Agreement goals that Delaware has committed to is discussed in this section with details about their co-benefits. The information on co-benefits can be used to help sell a restoration plan to local watershed groups and government officials by presenting the additional benefits that can be derived from allocating resources for BMP implementation to reduce nutrient and sediment loads. There are multiple benefits that can be achieved from the combining of available resources to more effectively restore and protect the Chesapeake Bay. The BMPs that provide the greatest benefit to the various management strategies (with a score of 2 or above) are presented in sections 5.1 through 5.11. The Water Quality management strategy is not included because all the BMPs implemented in the watershed have an effect on water quality.

5.1 Black Ducks

The goal of the Black Duck management strategy is to:

> …restore, enhance and preserve wetland habitats that support a wintering population of 100,000 black ducks, a species representative of the health of tidal marshes across the watershed. Refine population targets through 2025 based on best available science (CBP 2015a).

Developed Sector and Agricultural Sector BMPs with a co-benefit score of 2 or above for black duck habitat are shown in Table 5-1. In addition to benefitting black ducks, additional benefits provided by the selected BMPs include bacteria reduction, climate adaptation, drinking water protection, economic development/job creation, energy efficiency, flood control/mitigation, increased property values, increased recreational opportunities, toxic contaminants policy and prevention, and increased tree canopy. Urban stream restoration, wet ponds, and wetlands have the added benefit of energy efficiency. The agricultural BMPs have the added benefits of air quality and groundwater recharge.

Table 5-1. BMPs Implemented in Delaware to Meet Phase III WIP Goals and Provide Co-Benefit of Black Duck Habitat

Developed Sector BMPs that Benefit Black Ducks		Agricultural Sector BMPs that Benefit Black Ducks	
BMP	Co-benefit Score	BMP	Co-benefit Score
Urban Stream Restoration	3.0	Ag Forest Buffer	3.5
Wet Ponds	2.5	Ag Stream Restoration	3.5
Wetlands	3.5	Ag Tree Planting	2.0
		Ag Grass Buffers	3.5
		Wetland Restoration	4.5

5.2 Climate Resiliency

The goal of the Climate Resiliency management strategy is to:

> …increase the resiliency of the Chesapeake Bay watershed to withstand adverse impacts from changing environmental and climate conditions by increasing the protection of living resources and habitats, public infrastructure, and communities from the impacts of coastal erosion, coastal flooding, more intense and more frequent storms, and sea level rise (CBP 2015b).

Developed Sector and Agricultural Sector BMPs with a co-benefit score of 2 or above for climate adaptation are shown in Table 5-2. In addition to benefitting climate adaptation, additional benefits provided by the selected BMPs include air quality, bacteria reduction, drinking water protection, economic development/job creation, energy efficiency, flood control/mitigation, groundwater recharge, increased property values, increased recreational opportunities, toxic contaminants policy, and increased tree canopy.

Additional information on efforts to address climate resiliency in Delaware is presented in Section 8 and Section 8.4 presents specific projects that have occurred in the Delaware portion of the Chesapeake Bay watershed to address climate change.

Table 5-2. BMPs Implemented in Delaware to Meet Phase III WIP Goals and Provide Co-Benefit of Climate Adaptation

Developed Sector BMPs that Benefit Climate Adaptation		Agricultural Sector BMPs that Benefit Climate Adaptation	
BMP	Co-benefit Score	BMP	Co-benefit Score
Bioretention/Raingardens	2.0	Ag Stream Restoration	2.0
Bioswales	2.0	Ag Forest Buffer	2.5
Urban Stream Restoration	2.5	Ag Tree Planting	2.0
Urban Tree Planting	2.0	Forest-Harvesting Practices	3.0
Wet Ponds & Wetlands	2.0		

5.3 Fish Habitat

The goal of the Fish Habitat management strategy is to:

> …protect, restore and enhance finfish, shellfish and other living resources, their habitats and ecological relationships to sustain all fisheries and provide for a balanced ecosystem in the watershed and Bay (CBP 2015c).

Developed Sector and Agricultural Sector BMPs with a co-benefit score of 2 or above for fish habitat are shown in Table 5-3. In addition to benefitting fish habitat, additional benefits provided by the selected BMPs include air quality, bacteria reduction, climate adaptation, drinking water protection, economic development/job creation, flood control/mitigation, forest buffers, groundwater recharge, increased property values, increased recreational opportunities, toxic contaminants policy, and increased tree canopy. Urban stream restoration and urban tree planting have the added benefit of energy efficiency.

Table 5-3. BMPs Implemented in Delaware to Meet Phase III WIP Goals and Provide Co-Benefit of Fish Habitat

Developed Sector BMPs that Benefit Fish Habitat		Agricultural Sector BMPs that Benefit Fish Habitat	
BMP	Co-benefit Score	BMP	Co-benefit Score
Urban Tree Planting	2.0	Ag Forest Buffers	4.5
Septic Denitrification	2.5	Ag Stream Restoration	3.0
Erosion & Sediment Control	2.5	Ag Tree Planting	2.0
Filtering Practices	2.0	Grass Buffers	3.0
Urban Nutrient Management	2.0	Manure Transport	2.0
Urban Stream Restoration	4.0	Wetland Restoration	3.5
Wetlands & Wet Ponds	2.0	Forest Harvesting Practices	3.0

5.4 Forest Buffers

The Riparian Forest Buffers management strategy for the Chesapeake Bay watershed is to:

> …continually increase the capacity of forest buffers to provide water quality and habitat benefits throughout the watershed. Restore 900 miles per year of riparian forest buffer and conserve existing buffers until at least 70 percent of riparian areas throughout the watershed are forested (CBP 2015d).

Developed Sector and Agricultural Sector BMPs with a co-benefit score of 2 or above for forest buffers are shown in Table 5-4. In addition to benefitting forest buffers, additional benefits provided by the selected BMPs include air quality, bacteria reduction, climate adaptation, drinking water protection, economic development/job creation, flood control/mitigation, groundwater recharge, increased property values, increased recreational opportunities, toxic contaminants policy, and increased tree canopy. Urban forest buffers, urban tree planting, bioretention, and bioswales have the added benefit of energy efficiency.

Table 5-4. BMPs Implemented in Delaware to Meet Phase III WIP Goals and Provide Co-Benefit of Forest Buffers

Developed Sector BMPs that Benefit Forest Buffers		Agricultural Sector BMPs that Benefit Forest Buffers	
BMP	Co-benefit Score	BMP	Co-benefit Score
Bioretention/Rain Gardens	3.0	Ag Forest Buffers	5.0
Bioswale	3.0	Grass Buffers	2.0
Filtering Practices	2.0	Forest-Harvesting Practices	3.5
Urban Stream Restoration	3.0		
Urban Tree Planting	2.0		

5.5 Healthy Watersheds

The Healthy Watersheds management strategy goal is to sustain 100% of state-identified healthy waters and watersheds recognized for their high quality and/or high ecological value (CBP 2015e).

Developed Sector and Agricultural Sector BMPs with a co-benefit score of 2 or above for healthy watersheds are shown in Table 5-5. In addition to benefitting healthy watersheds, additional benefits provided by the selected BMPs include air quality, bacteria reduction, climate adaptation, drinking water protection, economic development/job creation, flood control/mitigation, forest buffers, groundwater recharge, increased property values, increased recreational opportunities, toxic contaminants policy, and increased tree canopy. Urban tree planting and urban stream restoration have the added benefit of energy efficiency.

Table 5-5. BMPs Implemented in Delaware to Meet Phase III WIP Goals and Provide Co-Benefit of Healthy Watersheds

Developed Sector BMPs that Benefit Healthy Watersheds		Agricultural Sector BMPs that Benefit Healthy Watersheds	
BMP	Co-benefit Score	BMP	Co-benefit Score
Urban Tree Planting	2.0	Ag Forest Buffers	4.0
Erosion & Sediment Control	2.0	Ag Tree Planting	2.0
Filter Strip	2.5	Barnyard Runoff Controls	2.0
Urban Stream Restoration	4.0	Forest-Harvesting Practices	3.0

5.6 Protected Lands

The Protected Lands management strategy outcome is to:

> …protect an additional two million acres of lands throughout the watershed—currently identified as high-conservation priorities at the federal, state or local level— including 225,000 acres of wetlands and 695,000 acres of forest land of highest value for maintaining water quality (CBP 2015f).

Developed Sector and Agricultural Sector BMPs with a co-benefit score of 2 or above for protected lands are shown in Table 5-6. In addition to benefitting protected lands, additional benefits provided by the selected BMPs include air quality, bacteria reduction, climate adaptation, drinking water protection, economic development/job creation, flood control/mitigation, forest buffers, groundwater recharge, increased property values, increased recreational opportunities, toxic contaminants policy, and increased tree canopy. Urban tree planting, bioretention, bioswales, and stream restoration have the added benefit of energy efficiency.

Table 5-6. BMPs Implemented in Delaware to Meet Phase III WIP Goals and Provide Co-Benefit of Protected Lands

Developed Sector BMPs that Benefit Protected Lands		Agricultural Sector BMPs that Benefit Protected Lands	
BMP	Co-benefit Score	BMP	Co-benefit Score
Urban Tree Planting	2.0	Ag Forest Buffer	3.5
Bioretention/Rain Gardens	2.5	Wetland Restoration	3.5
Bioswales	2.5		
Urban Stream Restoration	3.0		
Wet Ponds & Wetlands	3.5		

5.7 Public Access

The Public Access Site Development management strategy goal is to:

> …expand public access to the Bay and its tributaries through existing and new local, state and federal parks, refuges, reserves, trails and partner sites (CBP 2015g).

Developed Sector and Agricultural Sector BMPs with a co-benefit score of 2 or more for public access are shown in Table 5-7. The practices with the greatest benefit to public access are bioretention, bioswales, urban stream restoration, and agricultural forest buffers. In addition to public access, additional benefits provided by the selected BMPs include air quality, bacteria reduction, climate adaptation, drinking water protection, economic development/job creation, energy efficiency, flood control/ mitigation, forest buffers, groundwater recharge, increased property values, increased recreational opportunities, toxic contaminants policy, and increased tree canopy.

Table 5-7. BMPs Implemented in Delaware to Meet Phase III WIP Goals and Provide Co-Benefit of Public Access

Developed Sector BMPs that Benefit Public Access		Agricultural Sector BMPs that Benefit Public Access	
BMP	Co-benefit Score	BMP	Co-benefit Score
Urban Tree Planting	2.5	Ag Forest Buffer	4.0
Septic Connections	2.0	Ag Stream Restoration	2.0
Bioretention/Rain Gardens	3.0	Ag Tree Planting	2.0
Bioswales	3.0	Animal Waste Management Systems	2.0
Erosion & Sediment Control	2.0	Barnyard Runoff Controls	2.0
Filtering Practices	2.0	Cover Crops	2.0
Urban Stream Restoration	3.0	Dairy Precision Feeding	2.0
Wet Ponds & Wetlands	2.5	Grass Buffers	2.0
		Land Retirement	2.0
		Manure Transport	2.0
		Conservation Tillage	2.0
		Nutrient Management	2.0
		Wetland Restoration	2.0

5.8 Stream Health

The Stream Health management strategy goal is to:

> …restore, enhance and protect a network of land and water habitats to support fish and wildlife, and to afford other public benefits, including water quality, recreational uses and scenic value across the watershed (CBP 2015h).

Developed Sector and Agricultural Sector BMPs with a co-benefit score of 2 or above for stream health are shown in Table 5-8. In addition to stream health, additional benefits provided by the selected BMPs include air quality, bacteria reduction, climate adaptation, drinking water protection, economic development/job creation, energy efficiency, flood control/mitigation, forest buffers, groundwater recharge, increased property values, increased recreational opportunities, toxic contaminants policy, and increased tree canopy.

Table 5-8. BMPs Implemented in Delaware to Meet Phase III WIP Goals and Provide Co-Benefit of Stream Health

Developed Sector BMPs that Benefit Stream Health		Agricultural Sector BMPs that Benefit Stream Health	
BMP	Co-benefit Score	BMP	Co-benefit Score
Urban Tree Planting	2.5	Ag Forest Buffer	4.0
Septic Denitrification	2.5	Ag Stream Restoration	5.0
Septic Tank Pump-Out	2.0	Ag Tree Planting	2.0
Bioretention/Rain Gardens	3.0	Cover Crops	2.0
Bioswales	3.0	Grass Buffers	2.0
Erosion & Sediment Control	2.0	Land Retirement	2.0
Filtering Practices	2.5	Conservation Tillage	2.0
Infiltration Practices	3.0	Water Control Structures	2.0
Urban Nutrient Management	2.0	Forest-Harvesting Practices	4.0
Urban Stream Restoration	3.5		
Vegetated Open Channels	3.0		
Wet Ponds & Wetlands	2.0		

5.9 Toxic Contaminants Policy and Prevention

The Toxic Contaminants Policy and Prevention Outcome management strategy goal is to:

> …ensure that the Bay and its rivers are free of effects of toxic contaminants on living resources and human health" (CBP 2015i).

Developed Sector and Agricultural Sector BMPs with a co-benefit score of 2 or above for toxic contaminants policy and prevention are shown in Table 5-9. In addition to toxic contaminants prevention, additional benefits provided by the selected BMPs include air quality, bacteria reduction, climate adaptation, drinking water protection, economic development/job creation, flood control/mitigation, forest buffers, groundwater recharge, increased property values, increased recreational opportunities, and increased tree canopy. Urban stream restoration has the added benefit of energy efficiency.

Table 5-9. BMPs Implemented in Delaware to Meet Phase III WIP Goals and Provide Co-Benefit of Toxic Contaminants Prevention

Developed Sector BMPs that Benefit Toxic Contaminants Prevention		Agricultural Sector BMPs that Benefit Toxic Contaminants Prevention	
BMP	Co-benefit Score	BMP	Co-benefit Score
Septic Connections	4.0	Ag Forest Buffer	3.5
Septic Tank Pump-Out	2.0	Amendments for the Treatment of Agricultural Waste	3.0
Dry Detention Ponds	2.0	Animal Waste Management Systems	3.0
Filtering Practices	2.0	Barnyard Runoff Controls	3.0
Infiltration Practices	2.0	Grass Buffers	3.0
Street Sweeping	2.0	Wetland Restoration	2.0
Urban Stream Restoration	2.0		
Vegetated Open Channels	2.0		
Wet Ponds & Wetlands	2.0		

5.10 Tree Canopy

The Tree Canopy management strategy outcome is to:

> …continually increase urban tree canopy capacity to provide air quality, water quality and habitat benefits throughout the [Chesapeake Bay] watershed" (CBP 2015j). The specific goal for the Chesapeake Bay watershed is to expand urban tree canopy by 2,400 acres by 2025 (CBP 2015j).

Developed Sector and Agricultural Sector BMPs with a co-benefit score of 2 or above for tree canopy are shown in Table 5-10. In addition to tree canopy, additional benefits provided by the selected BMPs include air quality, bacteria reduction, climate adaptation, drinking water protection, economic development/job creation, flood control/mitigation, forest buffers, groundwater recharge, increased property values, increased recreational opportunities, and toxic contaminants policy. The Developed Sector BMPs have the added benefit of energy efficiency.

Table 5-10. BMPs Implemented in Delaware to Meet Phase III WIP Goals and Provide Co-Benefit of Tree Canopy

Developed Sector BMPs that Benefit Tree Canopy		Agricultural Sector BMPs that Benefit Tree Canopy	
BMP	Co-benefit Score	BMP	Co-benefit Score
Urban Tree Planting	4.0	Ag Forest Buffers	4.5
Bioretention/Rain Gardens	3.0	Ag Tree Planting	3.0
Bioswale	3.0	Forest-Harvesting Practices	2.0
Filtering Practices	2.0		
Urban Stream Restoration	2.0		

5.11 Wetlands

The Wetlands management strategy outcome is to "continually increase the capacity of wetlands to provide water quality and habitat benefits throughout the [Chesapeake Bay] watershed" (CBP 2015k).

Developed Sector and Agricultural Sector BMPs with a co-benefit score of 2 or above for wetlands are shown in Table 5-11. In addition to wetlands, additional benefits provided by the selected BMPs include air quality, bacteria reduction, climate adaptation, drinking water protection, economic development/job creation, flood control/mitigation, forest buffers, groundwater recharge, increased property values, increased recreational opportunities, toxic contaminants policy, and increased tree canopy. The Developed Sector BMPs have the added benefit of energy efficiency.

Table 5-11. BMPs Implemented in Delaware to Meet Phase III WIP Goals and Provide Co-Benefit of Wetlands

Developed Sector BMPs that Benefit Wetlands		Agricultural Sector BMPs that Benefit Wetlands	
BMP	Co-benefit Score	BMP	Co-benefit Score
Bioretention/Rain Gardens	3.0	Ag Forest Buffers	3.5
Bioswale	3.0	Ag Stream Restoration	3.0
Erosion & Sediment Control	2.0	Grass Buffers	2.0
Filtering Practices	2.0	Wetland Restoration	5.0
Infiltration Practices	2.0	Forest-Harvesting Practices	2.0
Nutrient Management Practices	2.0		
Urban Stream Restoration	3.5		
Vegetated Open Channels	2.0		
Wet Ponds & Wetlands	4.5/5.0		

6 Accounting for Growth

The CBP developed a 2025 projected land-use scenario that was incorporated into the Phase 6 Watershed Model and used as the basis for "accounting for growth" (e.g., land-use changes and population growth) in the development and implementation of Delaware's Phase III WIP. The projected land-use conditions for 2025 were based on current zoning with assumed growth directed toward areas zoned for growth and/or with the necessary infrastructure and capacity to support growth. Figure 6-1 shows where growth is expected in the Chesapeake Bay watershed by 2025. The developed acres are 61,365 acres in 2017 and 64,677 projected acres in 2025, resulting in an anticipated increase of 3,312 acres of developed land. Figure 6-2 presents the 2025 projected percent agricultural, natural, and developed land uses for each land river segment in the Chesapeake Bay watershed in Delaware.

Growth has been implicitly built into the scenario and is inherently accounted for in the Phase III WIP since the 2025 projected land use was included in the Phase 6 Watershed Model and used to run the Phase III WIP scenario. The 2025 forecasted conditions were used for the numeric implementation plan to account for growth and offset any increases in nutrient and sediment pollutant loads. Specific local, regional, and federal strategies to account for growth in Delaware are discussed in more detail below.

6.1 Offsetting New or Increased Nutrient Loads from New Development

The Phase II WIP indicated that Delaware intended to offset future nutrient loads from lands proposed for development through a combination of:

- Revised statewide stormwater regulations that are focused on water quantity but also achieve Chesapeake TMDL goals under a variety of development scenarios;
- A stormwater in-lieu fee to be applied if site constraints prevent the achievement of water quantity/quality goals on a specific parcel; and
- Providing an option that enables offsetting of residual pollutant loads on another site within the same basin.

Delaware's revised DSSR went into effect in February 2019. All new projects developed statewide under the revised Sediment and Stormwater Regulations are required to reduce their stormwater runoff from all storms up to the 99th percentile precipitation to an equivalent open space condition up to a maximum 1 inch of runoff management. Projects that are not able to use infiltrating or recharge practices must provide 48-hour detention of the equivalent stormwater runoff volume. Redevelopment projects are required to reduce their annual stormwater runoff and resultant pollutant loads to an equivalent of "15% of the existing effective imperviousness." This acts as a surrogate for more costly urban retrofits. Projects that cannot meet the minimum runoff reduction target are required to provide an offset.

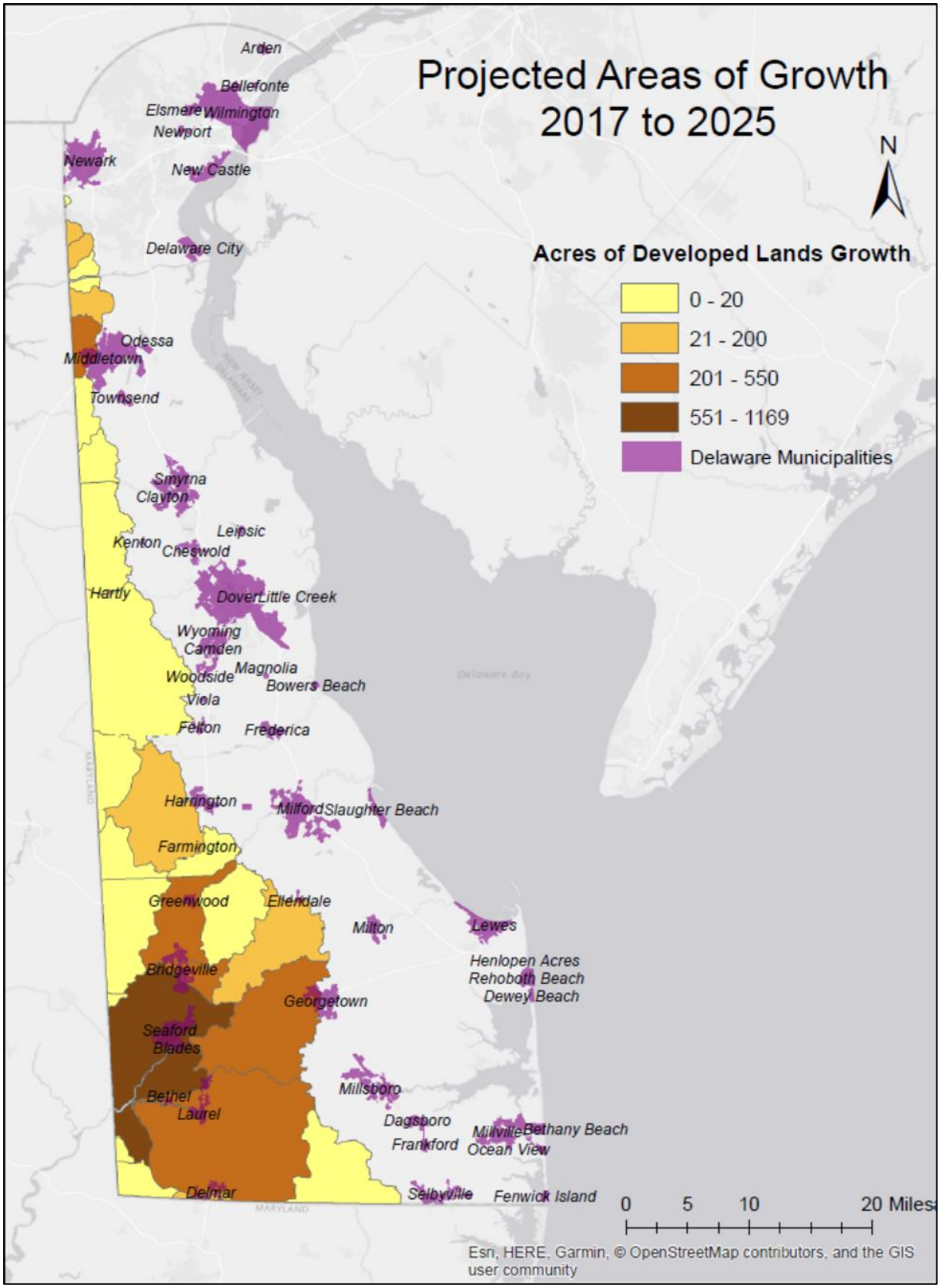

Figure 6-1. Projected Growth in the Chesapeake Bay Watershed by 2025.

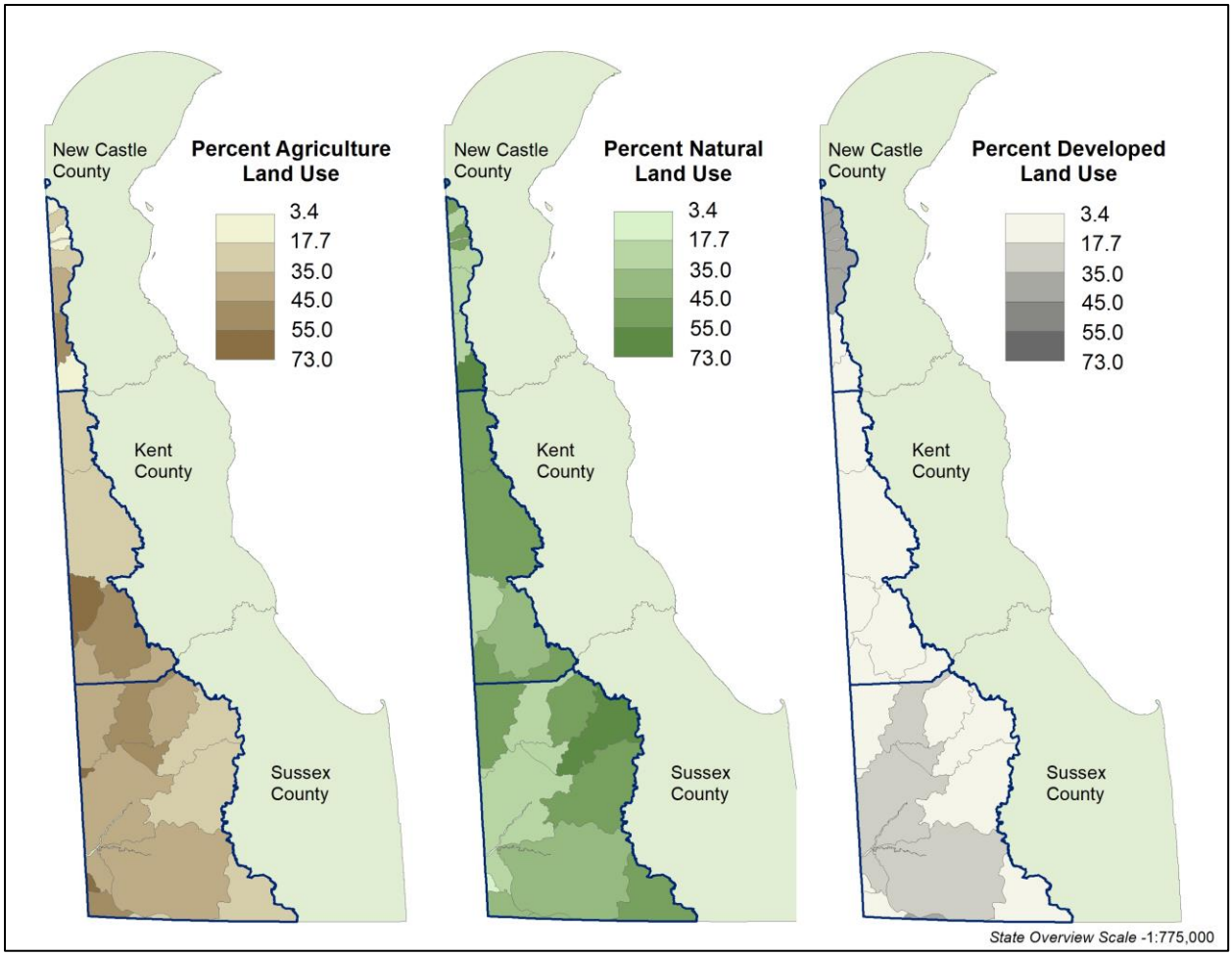

Figure 6-2. Delaware's projected 2025 land use for the Chesapeake Bay watershed's land river segments.

The DSSR's emphasis for both stormwater quality and stormwater quantity management is on runoff reduction techniques that encourage infiltration and recharge of stormwater runoff. This method both decreases pollutant loads and mitigates the hydrologic impacts to receiving waters often associated with land development.

Under current state law, DNREC has the authority to establish an in-lieu fee for post-construction stormwater management. DNREC has the responsibility to determine which entities may collect the fees, how the fees are to be collected and spent, and how projects are prioritized and implemented. Programs may be operated, and money spent, at the local government or conservation district level under guidelines established by DNREC. DNREC, in partnership with the WIAC, will also determine specific uses for the in-lieu fee.

The Phase II WIP identified Delaware's Nutrient Budget Protocol and the Delaware Urban Runoff Management Model (DURMM) as tools that can be used for tracking and reporting loads related to changes in land use. Both tools are currently being used for this purpose. DURMM is used to calculate the volume of stormwater runoff from a proposed development project and the associated nutrient and sediment loads. Information from DURMM is used as input for the Nutrient Budget Protocol, which calculates the total loads from a parcel pre-development and post-development. These tools have been incorporated into offset programs and are available for local use.

DURMM has been updated to version 2.5 to reflect the 2019 revisions to the DSSR. Notable changes from the previous version include the following:

- Maximum runoff for RPv (resource protection event volume) management capped at 1 inch
- Redevelopment criteria reduced from 30% to 15%
- WinSLAMM regression equations for calculating runoff volume for the RPv have been replaced with the NRCS runoff equation using Ia/S = 0.05
- New calculations for practices using 48-hour detention for RPv compliance that provide the average and maximum discharge rates to be used for design purposes
- Runoff reduction and detention credits have been updated for all practices to be consistent with the 2019 *Post Construction Stormwater BMP Standards & Specifications* (DNREC 2019)

DURMM v2.5 can be downloaded from the Sediment & Stormwater Program website, under the Engineering Resources header (DNREC 2019c).

As BMPs are installed on new projects, the practices are recorded in the Mudtracker database (DNREC 2018b). Description of data generation and acquisition, assessment and oversight, and data validation and verification are provided in Delaware's *Nonpoint Source Best Management Practice Implementation Data Quality Assurance and verification Plan* (DNREC 2018b), which was updated in September 2018.

6.1.1 Strategies for State Policies and Spending

Delaware's overall land-use policy directs growth to areas already prepared for it in terms of infrastructure, services, and intergovernmental planning. The *Strategies for State Policies and Spending* (OSPC 2015) document is the state's blueprint for growth. The document was published in 1999 and was updated in 2015. Figure 6-3 presents Delaware's strategies for state policies and spending. Much of the portion of Delaware in the Chesapeake Bay watershed, except for the relatively small municipalities, is in nongrowth areas where the state would like to limit investment to agriculture and land preservation.

6.1.2 More Proactive Comprehensive Planning

The state of Delaware has delegated land-use planning and regulatory authority to the county and local governments. The state requires municipal governments to develop and regularly update land use plans. Smaller cities and towns (those with a population under 2,000) are required to develop a municipal development strategy. Larger cities and towns are required to develop more detailed Comprehensive Land Use Plans. The local government's comprehensive plan articulates the goals and vision for each community. Based on this expression of community values, the plan guides the location, density, design, and character of growth, development, and preservation activities within that local jurisdiction. The local government is required to adopt land-use regulations that implement the adopted and certified comprehensive plan. Any land-development activity must be in compliance with comprehensive plans and meet all of the relevant codes and ordinances of local jurisdictions. These plans are reviewed by State Agencies through the Preliminary Land Use Service (PLUS) and certified by the Governor.

Counties evaluate their growth zones and make adjustments to accommodate though their comprehensive planning process. With the uses of EPA's tools and models DNREC can assist counties during their comprehensive plan updates. DNREC worked with Kent and Sussex counties to adopt new comprehensive plans in 2018. However, an opportunity exists with the development of New Castle County's comprehensive plan, which was last completed in 2012 and will be renewed in 2022.

State government provides over-all guidance and coordination for the counties and local governments. Delaware's Office of State Planning Coordination (OSPC) also provides a wide range of planning assistance including a Comprehensive Plan Checklist and Municipal Comprehensive Plan Guide (updated May 26, 2015) and county specific Comprehensive Plan Checklists. OSPC has a circuit-rider planner for each county that is available to help municipal governments through the planning process. The University of Delaware's Institute for Public Administration and private-sector planning and consulting firms may assist in developing Comprehensive Plans.

For the Delaware county areas and municipalities in the Chesapeake Bay watershed, DNREC will play a more proactive role in communicating TMDL requirements before the comprehensive plan is due, in addition to working with the jurisdiction on a compliance strategy. Many municipalities in the watershed are small and typically run by a limited staff of one or two individuals and/or volunteers. DNREC tries to work directly with them, providing technical support and expertise. DNREC representatives will meet with jurisdictions a year before their comprehensive plan update is due to explain the TMDL requirements and process, the allocation for that particular subwatershed, and a toolbox of methods for meeting the pollution reduction goals. DNREC will also provide model TMDL language for local governments to include in their comprehensive plans.

6.1.2.1 Bridgeville and Greenwood Master Plan

Bridgeville and Greenwood are western Sussex County communities in the Nanticoke River watershed with a strong agricultural tradition. They share a school district, a U.S. highway, a wastewater treatment plant and a watershed. The University of Delaware's Sustainable Coastal Communities Initiative coordinated the development of a Master Plan project through sponsored awards from the National Fish & Wildlife Foundation and DNREC. The plan yields many sustainable benefits for both towns and their citizens, water quality and the natural environment, farmers and agribusinesses, and the taxpayers of Delaware. The plan, title *A Master Plan for Bridgeville and Greenwood: Sustainable Growth in the Nanticoke Watershed*, was published in Augus, 2014 (CCSPS 2014).

6.1.2.2 Broad Creek Sustainability Report

The town of Laurel is located on Broad Creek, a tributary of the Nanticoke River and can be considered representative of western Sussex County municipalities. DNREC worked with University of Delaware's Sustainable Coastal Communities Initiative through funding from the CBRAP, to use Laurel's efforts to develop a snapshot of the conditions of Delaware's western Sussex County towns and develop a toolkit of recommendations to help them meet federal water quality goals. The resulting report *From Broad Creek to the Chesapeake: Guidance for growth in Laurel that protects our water quality* was published in 2016 (CCSPS 2016).

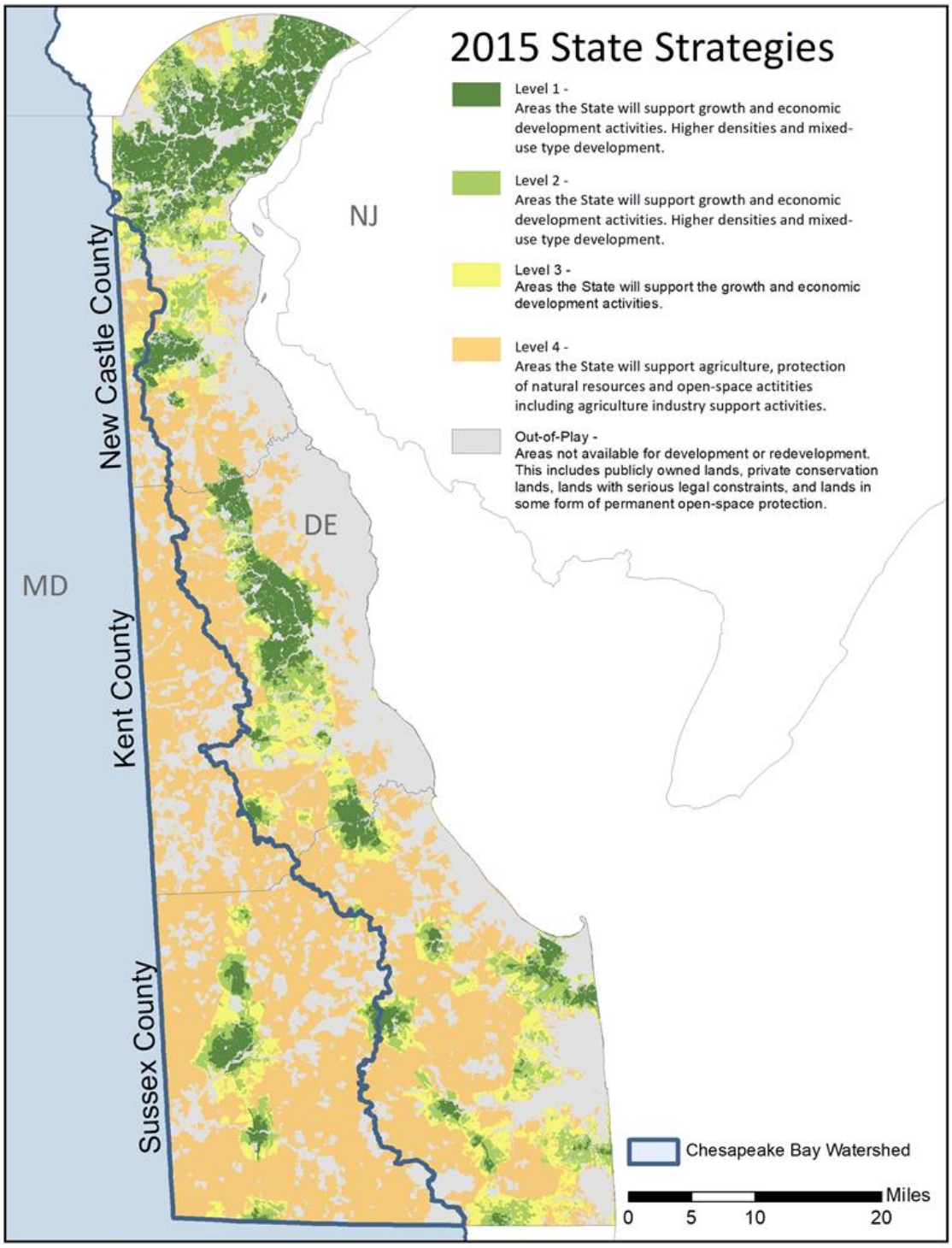

Figure 6-3. Delaware's Strategies for State Policies and Spending.

6.1.3 Tools and Resources for Locating Restoration and Preservation Opportunities

Several tools and documents are available to aid in locating restoration and preservation opportunities. These resources encourage the placement of practices in high-priority areas while optimizing the number of co-benefits the practice can perform. A science- and watershed-based strategy for prioritizing DNREC's work, called Conservation Opportunity Areas, was developed in 2012. Conservation Opportunity Areas are a means of identifying areas where different DNREC and environmental priorities such as habitat, water quality, wetlands protection, and forest preservation overlap to focus limited resources and build partnerships with local governments, federal agencies, individual landowners, and nonprofit organizations.

The Watershed Resources Registry, developed in 2018, is an online mapping tool that highlights natural resource areas that are a priority for preservation and restoration. The tool performs spatial analyses to find and score opportunities for wetland, riparian, and terrestrial habitat preservation and restoration, as well as natural stormwater infrastructure preservation and restoration of degraded stormwater infrastructure systems. The *Nanticoke River Watershed Restoration Plan* (NRWG 2009) and the *Chesapeake Bay Comprehensive Water Resources and Restoration Plan* (USACOE 2018) are two other resources that have focused efforts on restoration and preservation in the Nanticoke River watershed. The Nanticoke Restoration Plan focuses on three conservation targets: expanding headwater forests/ large forest blocks, restoring channelized streams, and expanding riparian and tidal wetland buffers. The static maps in this document show the conservation target areas prioritized based on three program goals, which are water quality, wildlife habitat, and stream habitat/ biology. The *Chesapeake Bay Comprehensive Water Resources and Restoration Plan* highlights stream restoration, wetland creation, and agricultural BMP opportunities in the Nanticoke watershed.

6.1.4 Livable Lawns Program

To help offset any increased fertilizer application as growth continues in the watershed, Delaware implemented a statewide voluntary program in 2012 called Delaware Livable Lawns (https://www.delawarelivablelawns.org/). The program is administered through the Delaware Nursery and Landscape Association and provides homeowner education on fertilizer application and a commercial lawn-care certification program.

6.1.5 New and Revised MS4 Permits

A small portion of the New Castle County/DelDOT Phase I MS4 (DE0051071) area falls in the Chesapeake Bay watershed. The permit is in the process of being updated and will include measures to address the Chesapeake Bay TMDL, which include the tracking and monitoring of BMPs in the watershed (see Section 3.2.2.2.1 for more details).

Middletown (DE 0051209) is the only existing permittee in the Chesapeake Bay watershed that has a Phase II MS4 permit. The Surface Water Discharges Section is currently in the process of implementing a Phase II General Permit that will replace the individual Phase II permits. The Phase II General Permit will be comprised of two separate Tiers (Tier I and Tier II). The Tier I General Permit (DE 0051195) will be issued to any MS4s that have an existing individual Phase II MS4 Permits, while the Tier II General Permit (DE0051217) will capture any newly identified (or designated) MS4s.

The Middletown (DE 0051209) Phase II MS4 permit will transition from their individual permit to the Tier I General Permit. The Tier I General Permit will require "clear, specific, and measurable" goals and practices for the permittees to follow. In addition, the Tier I General Permit will require a TMDL Plan that will require the implementation of BMPs to reduce pollutants associated with TMDLs in each respective watershed. As part of the Chesapeake Bay watershed, the town of Middletown will be implementing a TMDL Plan.

The Tier II General Permit (DE 0051217) is designed for newly identified or designated MS4s that need to establish an MS4 program. The Tier II General Permit will include all permittees identified by the 2010 Census as "urbanized areas" that do not currently have an MS4 permit. The Tier II Permit will cover areas of the Chesapeake Bay watershed, including Seaford, Laurel, and DelDOT's jurisdiction in the urbanized areas. The new Phase II MS4 permits provide additional opportunity for regulation of stormwater runoff in an area projected to have the most growth in the watershed from 2018 to 2025. The Tier I and Tier II permits focus on BMP implementation to address water quality concerns. It is DNREC's intent to refer to the DSSR for nearly all construction and post-construction stormwater management measures in all future MS4 permits.

6.1.6 Revised On-site Wastewater Regulations

DNREC's GWDS developed revisions to its on-site wastewater disposal regulations in 2014. The changes require new or replacement systems within 1,000 feet of tidal waters and associated tidal wetlands to comply with a 20 mg/L limit for total nitrogen. All larger on-site wastewater treatment systems are required to meet a performance standard based on the system size, age, and location. In addition, a statewide inspection and pump-out program requires individual OWTDSs to have their septic tanks pumped out once every three years. See Section 3.2.3 for more details on the revised on-site wastewater regulations as well as the methodology for tracking, reporting, and verifying the practices.

In addition to the revised OWTDS regulations, as of February 2019, New Castle County passed a one-year moratorium on septic systems in new developments. Major subdivisions (e.g., greater than five lots) in the Chesapeake Bay watershed in New Castle County will have to offer sewer connections rather than septic systems.

6.2 Offsetting New or Increased Nutrient Loads from NPDES-Permitted Sources

The Phase II WIP indicated that growth is expected across the Chesapeake Bay watershed impacting communities with wastewater treatment systems. The 2025 projected growth areas shown in Figure 6-1 support this expectation. All permitted communities have indicated that significant financial hardship will result if unfunded upgrades are mandated or required.

The Phase II WIP indicated that Bridgeville's WWTP was exceeding the proposed loads for total nitrogen and would not be able to support additional growth without upgrades to their WWTP facility. As discussed in Section 3.3.2.10, rather than complete upgrades, Bridgeville decided to retire the facility and direct the wastewater to the Seaford WWTP. The aging Bridgeville WWTP is anticipated to be taken off-line by the end of 2020 and the flows will be sent to the city of Seaford. Once Bridgeville's flow goes to Seaford and the WWTP is no longer in operation, Bridgeville's allocated TMDL loads will be transferred to Seaford and Bridgeville's NPDES permit for wastewater discharge will be terminated.

Short-term growth for Seaford and Laurel, which are both operating below their capacity, may be accommodated within the proposed allocated loads; however, longer term growth will be problematic for these communities without significant treatment plant upgrades. The Seaford WWTP is currently able to operate in compliance with its own allocated loads and, with the addition of Bridgeville's allocation, will continue to be able to operate in compliance with load limits after the additional flow is added.

Since the development of Phase II WIP, the Invista plant has scaled down operations based on market conditions and has invested in new, more efficient equipment at the facility (see Section 3.3.2.10). Invista is operating well under its total nitrogen load. They were provided zero phosphorus allocation in the Chesapeake Bay TMDL. Invista does not generate phosphorus. They demonstrate this by sampling influent and effluent water and showing no net addition of phosphorus. This is generally sufficient. Because of the natural variation of water, however, sampling occasionally shows a slight positive value, putting them out of compliance. To accommodate this artificial phosphorus load, Invista entered into a nutrient trading agreement with Seaford. This Nitrogen-Phosphorus Trading Agreement assigned 1,460 lbs/year of Seaford's total annual phosphorus load allocation to Invista in exchange for 27,431 lbs/year of Invista's total annual nitrogen load allocation. DNREC's Surface Water Discharges Section will be evaluating a request by Invista to make this trade permanent during the next permitting cycle.

The nutrient load from Mobile Gardens is insignificant and is proposed to remain at the current permitted levels.

Local water quality will be maintained and local TMDLs will be met despite these anticipated new or increased loads from point sources. The increasing loads from WWTPs will be routinely monitored through discharge monitoring reports, which are submitted monthly and reviewed by compliance staff. As growth occurs and the volume and loading from the facilities nears the levels proposed above, one of two scenarios is likely to play out. The facilities may include or transition to spray irrigation of their wastewater, which in Delaware, is considered a beneficial reuse. Alternatively, the facilities can engage in some sort of credit exchange program, which is currently being investigated and developed in the state.

For WWTPs, the compliance and participation rates are near 100% and are actively being maintained. No additional regulatory or enforcement authorities are needed to meet these compliance and implementation rates.

6.3 Offsetting New or Increased Nutrient Loads from Agriculture

Delaware maintains three very successful state-operated farmland and forest preservation programs—the DALPP, the Forestland Preservation Program, and the Young Farmers Program. These three programs are summarized here and discussed in greater detail in Section 4.2.11. In addition, DDA does not expect the number of poultry operations in the Chesapeake Bay watershed to increase between 2018 and 2025, and they may actually decrease.

The DALPP is a voluntary program that allows landowners to sell their "development rights" to the state, thus preserving the land forever for farming, forestry, and related activities. This program allows farmers to unlock some of the equity in their land, while continuing to own it and farm it for income. As of June 30, 2018, the program had permanently preserved over 125,000 acres of Delaware farmland, representing nearly 25% of all the available farmland in the state. The state has expended approximately $220 million of state, federal, and county funds to preserve these lands. The actual value of the preservation easements, however, is over $500 million. Delaware continues to strive to find additional funds to augment state funding. Delaware's three county governments have each, in total, provided over $12 million to the DALPP to help preserve farms in their respective counties. NRCS has provided over $50 million and the DALPP is now eligible for Department of Defense Readiness and Environmental Protection Integration funds to help purchase easements in southwestern Sussex County in cooperation with the Patuxent River Naval Air Station. The DALPP will also continue to explore funding opportunities from other sources, including nongovernment organizations, to increase available funding.

Although partially and entirely forested parcels are accepted into the DALPP, it was recognized that this drew funding away from preserving traditional cropland. The Delaware Forestland Preservation Program was created to provide an additional preservation opportunity to parcels that are entirely covered with forest. At the end of 2017, the program received a total of $ 1,450,000 of state and private funding and preserved nine properties encompassing 872 acres. The program is currently funded at $1 million per year.

The Delaware Young Farmers Program helps young farmers with limited financial resources purchase farmland and begin their careers as independent farmers. The program provides 30-year, no-interest loans to qualified young farmers to purchase farmland. In addition to helping start new generations of farmers, farmland purchased through the program is placed into a permanent preservation easement as a condition of the loan. As of October 2018, Delaware had settled 33 Young Farmer Loans totaling $7.4 million, which have helped to purchase and permanently preserve over 2,500 acres.

7 Conowingo Dam

When the Chesapeake Bay TMDL was established in 2010, it was estimated that the Conowingo Dam (a hydroelectric dam located in the lower Susquehanna River in Maryland) would trap sediment and nutrients through 2025 (EPA 2018). New research has shown, however, that the reservoir behind Conowingo Dam has reached dynamic equilibrium, meaning that it is at near-full capacity. This results in more sediment, nitrogen, and phosphorus entering the Chesapeake Bay than originally estimated. The CBP partnership estimates that, after fully implementing the Chesapeake Bay TMDL and Phase I and II WIPs, an additional reduction of 6 million pounds of nitrogen and 0.26 million pounds of phosphorus is needed to mitigate the water quality impacts of Conowingo Reservoir infill.

This loss of trapping capacity in the reservoir must be addressed to attain the applicable water quality standards downstream in the Chesapeake Bay. The additional nutrient and sediment loads resulting from Conowingo Dam infill have been addressed through a separate CBP partnership-developed WIP. The Conowingo Dam WIP will provide details on how to reduce adverse water quality impacts to the Chesapeake Bay resulting from Conowingo Dam infill, as well as a timeline for the WIP goals to be accomplished. The total pollutant load reduction targets attributed to Conowingo Reservoir infill will be assigned to a separate Conowingo planning target.

The State of Delaware is proud to share in the responsibilities to improve the water quality of the Chesapeake Bay. As a headwater state, DNREC and DDA have been making a concerted effort to meet Delaware's targets established for nitrogen and phosphorus. EPA's decision to reduce Chesapeake Bay grant funding in order to fund the Conowingo Request for Application is an issue that concerns the state. The Request for Application was released on February 4, 2019 with applications due March 20, 2019. It is expected that the cooperative agreement will be awarded to a third-party organization by July 8, 2019. Delaware continues to participate in the Conowingo WIP conference calls but does not support reductions in funding or increased load allocations.

8 Climate Change

Climate change is causing stronger storms, increased heavy precipitation events, increased air and water temperatures, and a rise in sea level in the Chesapeake Bay watershed (Johnson et al. 2018). These climate trends are altering the natural ecosystems and human communities of the Chesapeake Bay watershed and will likely result in the necessity to change the traditional programs, projects, and practices used to achieve restoration goals.

The future planning, siting, design, and implementation of BMPs will need to consider impacts associated with climate change and extreme weather events to increase effectiveness, decrease maintenance costs, and help to ensure TMDL requirements are met into the future (Johnson et al. 2018). The consideration of these impacts can reduce vulnerability to structural failure over the BMP's lifespan.

Preliminary Chesapeake Bay Watershed Model estimates for additional nutrient loads resulting from climate change by 2025 are "roughly an additional 9 million lbs of nitrogen and 0.5 million lbs of phosphorus" for the entire watershed (CBP PSC 2018). The CBP Partnership relayed preliminary modeling results of climate change in 2025 to the jurisdictions in the form of nutrient load projections as part of the midpoint assessment completed in July 2018. Preliminary numeric load targets due to 2025 climate change impacts for Delaware are 0.397 million lbs total nitrogen and 0.006 million lbs total phosphorus (CRW/WQ GIT 2018).

The Partnership also committed to the following strategy to address climate change between now and 2025:

Understand the Science:

- 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 CBP Partnership will consider results of updated methods, techniques, and studies and refine estimated loads due to climate change for each jurisdiction.
- The CBP PSC agreed that in September 2021, jurisdictions will account for additional nutrient and sediment pollutant loads due to 2025 climate change conditions in a Phase III WIP addendum and/or two-year milestones beginning in 2022.

Finally, in developing the narrative strategy, the following CBP Partnership-approved Guiding Principles were considered:

1. *Capitalize on co-benefits*—Maximize BMP selection to increase climate or coastal resiliency, soil health, flood attenuation, habitat restoration, carbon sequestration, or socioeconomic 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 selecting/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; Department of Defense Installation Natural Resource Management Plans; fisheries/habitat restoration programs, etc.

4. *Manage for risk* and p*lan 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.

8.1 Programmatic Commitments to Address Climate Change

Section 8.2 through Section 8.4 present a summary of the existing documentation, technical support, funding support, and projects related to climate change in Delaware that will assist in accounting for changing conditions caused by climate change by 2025. Source-specific programs and funding that can be used to address climate change are discussed below and summarized in Table 8-1.

In September 2013, Delaware's Governor Jack Markell signed Executive Order 41, *Preparing Delaware for Emerging Climate Impacts and Seizing Economic Opportunities from Reducing Emissions*. The executive order directed Delaware state government agencies to address the causes and consequences of climate change. The resulting document is titled *Climate Framework for Delaware* (DNREC 2014a) and identifies actions and strategies Delaware state agencies can take to prepare the state for the effects of climate change.

Recommendations developed through Executive Order 41 include guidelines and maps for use in reducing the risk of flood damage to state assets. *Avoiding and Minimizing Risk of Flood Damage to State Assets* is a guide for state agencies with step-by-step instructions for siting and design of state-funded projects (DNREC 2016b). The guidance and flood risk mapping tools can be a useful resource for siting of structural BMPs to reduce the risk of flood damage that could impair the effectiveness or function of the BMP.

Additional guidance developed under Executive Order 41 includes the *Green Infrastructure Primer* (DNREC 2016b), which provides an introduction to green infrastructure projects and their benefits as well as information on selecting, building, and maintaining them. The *Green Infrastructure Primer* includes a list of resources such as information and contacts for regulatory and permitting assistance, planning and technical help, and funding resources. Table 8-1 provides a link to the *Green Infrastructure Primer*.

In 2017, Delaware issued new sea level rise projections (Callahan et al. 2017). These projections can be used to support Chesapeake Bay watershed projects as well as projects in other areas of the state. Delaware first issued sea level rise planning scenarios in 2009. The 2009 scenarios served as the scientific foundation for *Preparing for Tomorrow's High Tide: Sea Level Rise Vulnerability Assessment for the State of Delaware* (DNREC 2012). This assessment led to the development of *Recommendations for Adapting to Sea Level Rise in Delaware* (DNREC 2013). These reports are relevant to understanding the near- and long-term risks to Delaware's resources, including its agricultural land, natural resources, and infrastructure.

Delaware is committed to addressing both the causes and consequences of climate change, including reducing vulnerability to climate impacts (climate adaptation or resiliency) and reducing greenhouse gas emissions that drive global climate change (climate mitigation). Many conservation strategies and BMPs used to improve water quality and ecosystem health can also provide important co-benefits of carbon sequestration and storage. For example, cover crops reduce nutrient runoff and erosion while also increasing carbon content that can improve capacity to retain soil moisture during periods of drought. This benefits soil health and provides added carbon storage value. Forested and vegetative buffers provide increased uptake of atmospheric carbon as well as reducing nutrient runoff and soil erosion. Many types of green infrastructure practices provide both climate mitigation and adaptation benefits that help make the landscape more resilient to the impacts of climate change. Delaware is actively participating in state and regional efforts to support climate mitigation in "natural and working lands" with strategies that will also contribute to the goals of the Phase III WIP. These compatible efforts should be aligned wherever possible.

8.2 Climate Change Technical and Financial Support Resources in Delaware

Several organizations and state agencies offer technical and financial support to Delaware communities as they adapt to the impacts of climate change. Information on these organizations and agencies is provided in this section.

8.2.1 Resilient and Sustainable Communities League (RASCL)

Delaware Resilient and Sustainable Communities League (RASCL) is a group of 14 organizations and agencies representing government, academic, and nongovernmental partners that collaborate to assist Delaware communities as they adapt to the impacts of climate change and work toward a more sustainable future. Outreach efforts include annual summit events, informational "coffee hours," and participation in Coast Day and similar events. Nearly 200 people attended the first annual Delaware RASCL Summit in November 2017, focusing on the community impacts of storms and extreme weather. The second annual summit was held in December 2018 and focused on funding opportunities for local communities to plan and implement climate resilience actions. The RASCL website (RASCL 2019) provides useful information on climate change, including links to informational documents and videos.

8.2.2 Division of Climate, Coastal & Energy

The DNREC Division of Climate, Coastal, & Energy provides technical and funding support to state agencies and local jurisdictions. It supports sustainable planning for local jurisdictions through technical assistance and planning grants as well as state agencies' progress toward implementing actions that will strengthen Delaware's preparedness and ability to adapt to current and future effects of climate change.

The division's Sustainable Communities Planning Grant Program provides funding to help communities plan for the impacts of a changing climate. Five Delaware municipalities received funding in 2017 as part of the program; however, none of them were in the Chesapeake Bay watershed.

Delaware Coastal Programs Section manages a Resilient Community Partnership that assists communities throughout Delaware that are threatened by the results of climate change, including inland flooding, coastal storms, sea level rise, and changing climate conditions. The partnership leverages federal funding provided by the National Oceanic and Atmospheric Administration (NOAA) to help Delaware communities improve their planning and preparation capabilities. As part of the partnership, the Coastal Programs Section provides direct staffing, technical support, public outreach, and training to support a community's efforts to be more resilient to coastal and climate hazards. There are no Resilient Community Partnerships in the Chesapeake Bay watershed currently.

Delaware's Coastal Training Program offers technical assistance, seminars, hands-on skill training, workshops, lectures, and technology demonstrations for local governments and planners. In partnership with the University of Delaware's Institute for Public Administration (IPA), Delaware Sea Grant and DNREC, the Coastal Training Program leads a training course that reviews the multiple sources of flood risks to Delaware communities that can be addressed and mitigated through planning, codes, and ordinances. The course covers floodplain requirements for municipalities and tools for adapting to flood risk. Sources of funding and technical assistance are also presented. Other training offered through the program include adaptation planning for communities and planning effective projects for coastal communities.

The division is also involved in the Comprehensive Plan certification process for local jurisdictions, recommending climate change language regarding impacts and strategies that municipalities and counties can adopt within the 20-year planning horizon of their Comprehensive Plans.

Additionally, the division supports DNREC's participation in the Preliminary Land Use Service (PLUS) in coordination with the Office of State Planning Coordination. PLUS provides for state agency review of major land-use change proposals prior to submission to local governments. The land-use change proposals are discussed at monthly PLUS meetings, during which applicants meet with state agency resource experts to discuss their plans and identify possible problems and solutions.

8.2.3 Division of Watershed Stewardship

Flood frequency and intensity are projected to increase as an effect of climate change. DNREC's Division of Watershed Stewardship provides flood management assistance for state agencies, which includes the following:

- *Avoiding and Minimizing Risk of Flood Damage to State Assets: A Guide for Delaware State Agencies* (DNREC 2016c). This guide for state agencies provides step-by-step instructions for evaluating and avoiding both existing flood risk and future risks posed by climate change during the planning and design of public building and infrastructure projects.

- *The Flood Planning Tool* is an interactive web map that gives state agencies, floodplain managers, engineers, planners, and citizens a tool to make informed decisions about flood risks for properties and projects (DNREC n.d.).

- *The Flood Risk Adaptation Map (FRAM)* is a web-based viewer to help state agencies protect infrastructure from the impacts of climate change and flooding (DNREC n.d.). FRAM combines current flood modeling with sea level rise projections to identify areas in Delaware that are vulnerable to flooding now and in the future. With awareness of these areas, planners can protect people and property, and prevent the need for costly repairs by building outside of future flood risk areas and better fortifying existing structures in high-risk areas.

8.2.4 DNREC Environmental Finance Office

DNREC EF administers Delaware's CWSRF, which includes loan and grant programs for water quality projects. These projects include nonpoint source, watershed protection, restoration, green infrastructure, and estuary management projects, as well as traditional municipal wastewater treatment projects. The funding is available to municipalities, private organizations, nonprofit organizations, and private individuals.

8.2.5 University of Delaware

The University of Delaware's IPA and Sea Grant program both offer assistance in addressing climate change. The IPA maintains the Delaware Database for Funding Resilient Communities, which helps Delaware municipalities find financial assistance programs. Although several financial assistance programs are available to support the implementation of projects to prepare for the threats of climate change, municipalities are often unaware of them and the assistance goes unused. The IPA's database compiles relevant financial assistance programs into a searchable web database for Delaware's local governments.

The University of Delaware's Sea Grant program supports a Sustainable Coastal Communities Program. The program's mission is:

> …to coalesce expertise from across the university, and elsewhere, to provide science-based information, through applied research, outreach and training to help analyze and offer solutions to the issues and challenges facing coastal communities in the state of Delaware to help them achieve their sustainable development goals.

The program helps citizens, community leaders, and businesses recognize the interrelationships between social, economic, and environmental values in coastal areas (including rivers) and work together to plan communities that benefit from sustainable growth strategies and planning that is sensitive to climate change.

8.2.6 Irrigation System Conversion Grant Program

An Irrigation System Conversion Grant Program has been proposed for $500,000 in funding to help farmers convert irrigation systems from diesel power to electric power. The Delaware Electric Cooperative would supplement these state funds to further reduce the conversion cost to farmers. It is estimated that approximately 500 diesel irrigation systems remain in Delaware and replacing them with more energy-efficient electrical systems will greatly decrease carbon emissions, improve air quality (especially during high ozone days), reduce noise pollution, and increase farmers' long-term profitability and is easily adapted to smart technology. Cropland irrigation is one of several strategies for mitigating the effects of climate change, offsetting short-, medium-, and, with proper management, long-term droughts. This initiative promotes irrigation and converts existing systems to using cleaner energy.

8.3 Recent Climate Change Science in Delaware

Since the signing of Governor Markell's Executive Order 41 in 2013, there has been an expanding effort to assess climate change in Delaware. The *Delaware Climate Change Impact Assessment* (DNREC 2014b) summarizes the best available science on how climate change affects Delaware's people, places, and resources. The report breaks down past and projected climate trends in Delaware and what they mean for public health, water resources, agriculture, infrastructure, and ecosystems.

A useful tool for researchers and planners, the *Delaware Climate Projections Portal* is a web-based data library that gives users access to climate projection data developed for the state of Delaware (DNREC 2019d). The *Climate Projections Portal* provides data visualization, data downloads, and general information resulting from climate model runs conducted for the *Delaware Climate Change Impact Assessment* (DNREC 2014b). The *Climate Projections Portal* allows users to view both low- and high-emission scenarios through 2100 for nine different climate models statistically downscaled to 14 different weather stations in Delaware.

In 2008, DNREC's Coastal Programs Section instituted the Delaware Sea Level Rise Initiative to help the state assess, prepare for, and minimize the potential impacts of sea level rise. The Sea Level Rise Technical Workgroup was formed as part of the initiative and identified three scenarios of sea level rise (0.5, 1.0, and 1.5 meters) by the year 2100 based on 1992 levels. These scenarios were intended to be used by DNREC for planning purposes (Callahan et al. 2017). In 2016, the Delaware Geological Survey began working with the Coastal Programs Section and others to determine if Delaware's previously developed sea level rise planning scenarios (developed in 2009) should be updated based on more recent information. The state of Delaware issued new sea level rise projections in November 2017 (Callahan et al. 2017). Those projections can be used to support Chesapeake Bay watershed projects as well as projects in other areas of the state.

NOAA's National Center for Environmental Information has developed climate change summaries for each state. The *Delaware State Summary* (NOAA ND) consists of observed and projected climate change information.

8.4 Climate Adaptation Projects in the Chesapeake Bay Watershed

Currently three projects are either underway or planned in the Chesapeake Bay portion of Delaware that address climate change/climate adaptation. Two of the projects are in Seaford and one is in Laurel. All three projects are in Sussex County in the Nanticoke River area of interest.

8.4.1 Seaford WWTP Upgrades

The city of Seaford is currently planning upgrades to their wastewater treatment facility, which sits on the Nanticoke River. In 2015–2016, DNREC awarded the city a Coastal Management Assistance Program grant from DNREC's Delaware Coastal Programs Section to assess the vulnerability of the facility to sea level rise. The assessment included mapping the location of the facility and identifying and prioritizing the tanks, buildings, and pumps that were most at risk to influence the design of future upgrades.

8.4.2 Seaford's Green Infrastructure Upgrades to Address Flooding

The city of Seaford, located on the Nanticoke River, has experienced three extreme storms in a 10-year period (2001–2011) that resulted in major flooding. A traditional stormwater engineering solution was developed that included diverting stormflow to a new storm drain and rerouting it below a dam in the river. With the addition of green infrastructure retrofits, however, Seaford was able to reduce the peak discharge to the river, meet water quality goals, introduce educational opportunities, and open additional funding avenues. The project was funded through the Delaware CWSRF under the Green Project Reserve category.

The University of Delaware has been working with the city of Seaford and Foresite Associates on the green infrastructure plan for Riverview Park (Lewandowski 2018, personal communication). The plan was adopted and is being implemented as funding becomes available. The green infrastructure plan includes shoreline stabilization and waterfront redevelopment. More information about the green infrastructure retrofits being implemented in Seaford can be found at dnrec.alpha.delaware.gov/coastal-programs/planning-training/coastal-training/.

8.4.3 Laurel River Ramble

The town of Laurel is planning to use green infrastructure along Broad Creek, a tributary to the Nanticoke River, to reduce flooding and bring people and jobs back to downtown Laurel. The plan includes a river walk that incorporates green infrastructure such as filter strips, bioretention, a constructed wetland with tidal interaction, wharf planters, and living shorelines. As of December 2018, a Surface Water Matching Planning Grant, a Chesapeake Local Government Implementation Grant, and a Community Water Quality Improvement Grant were used to plan and install a bioswale and a constructed wetland in the Tidewater Park portion of the Ramble. More information can be found at dnrec.alpha.delaware.gov/coastal-programs/planning-training/coastal-training/.

8.5 Phase III WIP Implementation: BMP Evaluation Process

During the development of Delaware's Phase III WIP, BMPs were considered by the Developed and Agricultural Sector WIP Steering Committees for implementation that also provide the co-benefit of climate adaptation/resiliency. The practices planned for implementation in the Developed Sector that will benefit climate adaptation are urban stream restoration, tree planting, and the stormwater performance standard practices of bioretention, bioswales, and wetponds and wetlands (see section 5). Practices planned for implementation in the Agricultural Sector that benefit climate change include non-urban stream restoration, forest buffers, tree planting, and forest harvesting practices. Delaware will continue to consider BMPs that are resilient to future climate impacts over the intended design life of the BMP. The CBP will continue to consider new information on the performance of BMPs, including the contribution of seasonal, inter-annual climate variability and weather extremes. Jurisdictions are expected to assess this information and their support programs and to adjust plans through the two-year milestone process to implement their Phase III WIPs to better mitigate anticipated increases in nitrogen, phosphorus, or sediment resulting from climate change.

Efforts will be undertaken to reduce vulnerability by applying "climate-smart" principles (Tetra Tech 2018) to site and design BMPs to reduce the impact of sea level rise, coastal storms, increased temperature, and extreme precipitation events on BMP performance over time. Flexibility and adaptability will also be built in by allowing for changes in BMP selection or WIP implementation as new climate and ecosystem science, research, or data become available and understanding of the impact of climatic and weather conditions on the performance of watershed restoration practices improves. Information from implementation and reporting procedures, as well as from monitoring results and local feedback on performance, will be used to guide any changes in BMP selection.

Delaware has extensive planning, guidance, and mapping tools that have been developed to inform design and siting decisions to avoid and minimize risk of sea level rise and flood damage. The state has downscaled climate projections and sea level rise scenarios that municipalities should consider in the selection of BMPs to meet the goals of the Phase III WIP and to assess the long-term function of those BMPs.

Table 8-1. Link to resources for technical support and funding for climate adaptation in Delaware

Technical Support Documents	
Avoiding and Minimizing Risk of Flood Damage to State Assets: A Guide for Delaware State Agencies	www.dnrec.delaware.gov/energy/Pages/Flood-Avoidance.aspx
Climate Action in Delaware: 2016 Progress Report	Climate Action in Delaware-2016 Progress Report
Climate Change in Delaware	dnrec.alpha.delaware.gov/energy-climate/climate-change/
Climate Framework for Delaware	www.dnrec.delaware.gov/energy/Pages/Climate-Framework.aspx
Delaware Climate Change Impact Assessment	dnrec.alpha.delaware.gov/energy-climate/climate-change/
Delaware Climate Projections Portal	climate.udel.edu/declimateprojections/
Estimation of BMP Impact on Chesapeake Bay Program Management Strategies and Appendix E *Impact Score Tool*	www.chesapeakebay.net/channel_files/25159/draft_bmp_impact_scoring_report_-_20170421.pdf drive.google.com/file/d/1s9yBjiUMn_kSKc5h04EHbNA-sy7vIxnA/view
Flood Risk Adaptation Map (FRAM)	www.arcgis.com/home/item.html?id=b13b4d3720f54878b7d57444dc77e503
Flood Planning Tool	maps.dnrec.delaware.gov/FloodPlanning/default.html
Green Infrastructure Primer	dnrec.alpha.delaware.gov/climate-coastal-energy/sustainable-communities/green-infrastructure/
NOAA Delaware State Summary	statesummaries.ncics.org/de
Recommendation of Sea-Level Rise Planning Scenarios for Delaware	www.dgs.udel.edu/sites/default/files/projects-docs/de%20slr%202017%20technical%20report%20final.pdf
Technical Support Organizations or Programs	
Coastal Training Program	dnrec.alpha.delaware.gov/coastal-programs/planning-training/coastal-training/
DNREC Division of Climate, Coastal, & Energy	dnrec.alpha.delaware.gov/energy-climate/
Preliminary Land Use Service (PLUS)	stateplanning.delaware.gov/plus/
Resilient and Sustainable Communities League (RASCL)	dnrec.alpha.delaware.gov/coastal-programs/planning-training/resilient-communities/sustainable-communities-league/
Sea Grant Sustainable Coastal Communities Program	www.scc.udel.edu/
Technical Support and Funding Organizations	
Resilient Community Partnership	dnrec.alpha.delaware.gov/coastal-programs/planning-training/resilient-communities/
Funding Sources	
IPA's Delaware Database for Funding Resilient Communities	www.sppa.udel.edu/research-public-service/ddfrc
Delaware Environmental Finance	dnrec.alpha.delaware.gov/environmental-finance/
Sustainable Communities Planning Grant Program	dnrec.alpha.delaware.gov/energy-climate/sustainable-communities/sustainable-planning/

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Appendices

Appendix A – Phase III WIP History and WIP Steering Committee and Development Information

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Appendix I – WIP Pamphlet for Ag Week

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Appendix A

Phase III WIP History and WIP Steering Committee and Development Information

Phase III WIP History

Delaware

Phase III WIP Kickoff Meeting
Meeting with Phase II Sector Leads
March 21, 2017

2017

WIP Steering Committee Kickoff Meeting
February 28, 2018

2018

WIP Steering Committee 2nd Meeting
Approved methods for planning goals
March 8, 2018

Draft DE Local Planning Goals Developed
Sectors given local planning goals
March 14, 2018

WIP Steering Committee 3rd Meeting
May 7, 2018

Agricultural Sector Kickoff Meeting
June 28, 2018

Developed Sector Kickoff Meeting
June 28, 2018

Agricultural Sector 2nd Meeting
July 17, 2018

Developed Sector 2nd Meeting
July 30, 2018

Agricultural Sector 3rd Meeting
August 27, 2018

Developed Sector 3rd Meeting
September 20, 2018

DE Local Planning Goals Adjusted
September 2018

WIP Steering Committee 4th Meeting
October 29, 2018

Agriculture Sector 4th Meeting
December 11, 2018

Agriculture Week Presentations
Presented plan for the Agricultural Sector
January 17, 2019

2019

WIP Steering Committee Meeting
Draft WIP provided for comments
February 15, 2019

Draft WIP Due to EPA
Public Comment Period Opens
April 12, 2019

Public Comment Period Closes
June 7, 2019

Final WIP Due to EPA
August 9, 2019

EPA

Phase 6 Model Fatal Flaw Review
Identify and report model issues
June 1 – July 31, 2017

PSC 2-Day Retreat
Decisions on Conowingo, climate change, and draft planning targets
December 19 & 20, 2017

Draft Planning Targets Released
Review period begins
December 22, 2017

Draft Planning Targets Review Period Ends
May 11, 2018

Final EPA WIP Expectations Released
Template/requirements for the WIP document
June 20, 2018

PSC Approved Model Corrections
Included DE tax ditch issue
July 9, 2018

Final Planning Targets Released
Adjusted numbers based on model corrections and DE tax ditch issue
July 19, 2018

Executive Council Meeting
August 7, 2018

PSC Meeting
Presented DE's WIP approach
October 12, 2018

DE Receives Extra Conowingo Load Allocation
October 26, 2018

Government Shutdown
December 22, 2018

Government Reopens
January 28, 2019

Draft WIP Due
April 12, 2019

Comments from EPA
June 7, 2019

Final WIP Due
August 9, 2019

Delaware Chesapeake Bay Workgroup Attendees and Major Meeting Decisions

Delaware's Chesapeake Bay Phase III WIP Steering Committee

Name	Organization
Brittany Sturgis	DNREC
Brooks Cahall	DNREC
Bryan Ashby	DNREC
Chris Brosch	DDA
Clare Sevcik	DNREC
Clint Gill	DDA
Elaine Webb	DNREC
Eugenia Hart	Tetra Tech
Hassan Mirsajadi	DNREC
James Sullivan	DNREC
Jennifer Roushey	DNREC
Jennifer Volk	UD
John (Jack) Hayes	DNREC
Julia Moore	DDA
Kenneth Bounds	DDA
Lori Brown	DNREC
Marcia Fox	DNREC
Mark Biddle	DNREC
Olivia Devereux	Devereux Consulting
Randell Greer	DNREC
Ping Wang	DNREC

Delaware WIP Steering Committee – Meetings and Major Decisions

- Meeting #1
  - Date: 2/28/2018
  - Attendees: 14 attendees representing the following organizations – Devereux Consulting, Delaware Department of Agriculture (DDA), Delaware Department of Natural Resources and Environmental Control (DNREC), Tetra Tech, and University of Delaware (UD)
  - Actions/Major Decisions
    This first meeting reintroduced key Delaware WIP stakeholders to the WIP writing process. Attendees were shown graphs and data reflecting DE's progress and Phase III WIP goals. Two important topics were addressed at this meeting (how to divide loads between the counties and sectors, and how to divide the sectors for future meetings) and were agreed upon in later meetings (see below).
- Meeting #2
  - Date: March 8, 2018
  - Attendees: 11 attendees representing the following organizations – DDA, Devereux Consulting, and DNREC
  - Actions/Major Decisions
    During this meeting, attendees agreed to 1) divide the draft planning target loads by county and then by sector, 2) form two sector steering committees, Agricultural and Developed, to replace the multiple subcommittees in the Phase II WIP (an additional Communications committee will be utilized to support sector committees), 3) divide the funding and tracking of BMPs by land-river segment, and 4) employ the allocation method used by the CBP to divide the natural load between Delaware's three counties.
- Meeting #3
  - Date: May 7, 2018
  - Attendees: 20 attendees representing the following organizations – DDA, Devereux Consulting, DNREC, Tetra Tech, and UD
  - Actions/Major Decisions
    Attendees reiterated that the WIP planning groups shall be divided into two sector steering committees (Agricultural and Developed) and the draft planning target loads should be divided by county and then by sector. Both sector steering committees will meet three times between June and August 2018 to develop their portion of the WIP (i.e. identify funding sources, identify key BMPs and stakeholders, help draft WIP language, etc.). The Delaware WIP Steering Committee decided to reconvene after the sector meetings were completed to bring the two sectors' WIP plans together.
- Meeting #4
  - Date: October 29, 2018
  - Attendees: 15 attendees representing the following organizations – DDA, Devereux Consulting, DNREC, and Tetra Tech
  - Actions/Major Decisions
    Committee members were updated on the progress from the two sector committees and a Tetra Tech contractor will assist in writing the Phase III WIP. The planning targets for load reductions changed since the last Steering Committee meeting – the loads were finalized by the PSC in July and then updated due to modifications of the E3 scenario, such as the removal of Tax Ditches as bufferable land and fixed stormwater BMP errors (the new loads increased the DE Developed load and decreased the Agricultural). Based on earlier decisions by the Steering Committee, the DE developed sector now cannot meet the new targets, even under extreme BMP implementation. Meeting attendees decided to continue moving forward with previously decided load allocations.

- Meeting #5
    - Date: February 15, 2018
    - Attendees: 14 attendees representing the following organizations – Devereux Consulting, DDA, DNREC, and UD
    - Actions/Major Decisions
      Meeting attendees reviewed, revised, and discussed the updated BMP implementation levels and numbers in the proposed Phase III WIP scenario. It was agreed upon that a timeline for reviewing and commenting on the draft WIP document by Steering Committee members and department secretaries would be beneficial prior to submitting the draft WIP to the EPA in April.

Developed Sector Steering Committee

Name	Organization
Beau Croll	DNREC
Brenna Goggin	DNS
Brian Urbanek	DelDOT
Brittany Sturgis	DNREC
Brooks Cahall	DNREC
Bryan Ashby	DNREC
Chris Klarich	DNS
Clare Sevcik	DNREC
David Baird	DNREC
Elaine Webb	DNREC
Ellie Mortazavi	New Castle County
Emily Seldomridge	DelDOT
Eugenia Hart	Tetra Tech
Hans Medlarz	Sussex County
James Sullivan	DNREC
Jamie Rutherford	DNREC
Janelle Cornwell	Sussex County
Jared Adkins	DNREC
Jennifer Roushey	DNREC
Jennifer Walls	Sussex County
Jessica Watson	DNREC
John (Jack) Hayes	DNREC
Laura Miller	DNS
Lisa Wool	NWA
Lori Brown	DNREC
Marcia Fox	DNREC
Mark Biddle	DNREC
Martha Narvaez	DWRC
Mike Harris	New Castle County
Olivia Devereux	Devereux Consulting
Ping Wang	DNREC
Randell Greer	DNREC
Robert Moore	DNREC
Robert Palmer	DNREC
Sara Esposito	DelDOT
Sean Miller	DNREC
Tricia Arndt	OMB
Sarah Keifer	Kent County
Charles D. Anderson	City of Seaford
John Ashman	Sussex County

Developed Sector WIP Steering Committee - Meetings and Major Decisions

- Meeting #1
  - Date: June 28, 2018
  - Attendees: 26 attendees representing the following organizations – Delaware Department of Transportation (DelDOT), Devereux Consulting, DNREC, Delaware Nature Society (DNS), Delaware Water Resources Center (DWRC), New Castle County (NCC), Nanticoke Watershed Alliance (NWA), Office of Management and Budget (OMB), and Tetra Tech
  - Actions/Major Decisions
    Committee members developed potential funding sources to possibly fund implementation of Phase III WIP BMPs, discussed areas where Phase II over and under committed with respect to BMP implementation goals, and Phase II areas where data may be lacking and potentially be added.
- Meeting #2
  - Date: July 30, 2018
  - Attendees: 20 attendees representing the following organizations – DelDOT, Devereux Consulting, DNREC, DNS, DWRC, NCC, SCD, and Tetra Tech
  - Actions/Major Decisions
    The Phase III WIP timeline was finalized at the PSC meeting on July 9, 2018. In response, the Delaware Phase III WIP timeline was revised to accommodate the new deadlines. Committee members discussed the following topics: a revised public comment period format (public comments will be received online via email), local engagement strategies, and the most cost-effective developed sector BMPs by county.
- Meeting #3
  - Date: September 20, 2018
  - Attendees: 19 attendees representing the following organizations – DelDOT, Devereux Consulting, DNREC, DWRC, NCC, NWA, OMB, Sussex County, and Tetra Tech
  - Actions/Major Decisions
    The Developed Sector will have their BMPs finalized by the end of November. Since the last Developed Sector meeting, the planning targets were revised and it will be more difficult for the Developed Sector to meet their nutrient reduction targets. BMP implementation levels have been based on the draft planning targets that were finalized at the PSC meeting on July 9, 2018. To help meet the nutrient reduction goals, committee members discussed, corrected, added to, and revised a proposed list of Developed BMPs to include in the Developed Sector section of the Phase III WIP.

Agricultural Sector Steering Committee

Name	Organization
Allison Wheatley	DNREC
Adrianna Berk	Tetra Tech
Brittany Sturgis	DNREC
Brooke Jones	USDA
Brooks Cahall	DNREC
Chris Brosch	DDA
Clare Sevcik	DNREC
Clint J. Gill	DDA
David Baird	DNREC
Debbie Absher	SCD
Eugenia Hart	Tetra Tech
Jennifer Volk	UD
Jennifer Walls	DNREC
Julia L. Moore	DDA
Kasey Taylor	NRCS
Kerin Hume	DNREC
Kevin C. Donnelly	DNREC
Laurie Gandy	USDA
Lindsay (Dodd) Thompson	Maryland Agriculture Associates
Lori M. Brown	DNREC
Marcia Fox	DNREC
Marianne Hardesty	USDA
Melissa A. Hubert	DNREC
Olivia Devereux	Devereux Consulting
Paul M. Petrichenko	USDA
R. C. Willin	Farmer (Willin Farms)
Sally Kepfer	NRCS
Timothy Riley	DNREC
Victor Clark	Greener Solutions
Wayne Hudson	Perdue

Agricultural Sector WIP Steering Committee – Meetings and Major Decisions

- Meeting #1
  - Date: June 28, 2018
  - Attendees: 18 attendees representing the following organizations – DDA, Devereux Consulting, DNREC, Willin Farms, Greener Solutions LLC., Natural Resources Conservation Service (NRCS), Sussex Conservation District (SCD), Tetra Tech, UD, and United States Department of Agriculture (USDA)
  - Actions/Major Decisions
    Committee members reviewed the Phase II WIP Agriculture section and a condensed list of the Phase II funding and implementation programs. Attendees were then asked to correct and revise the document for the next meeting with updated programs, BMPs, and language.
- Meeting #2
  - Date: July 17, 2018
  - Attendees: 12 attendees representing the following organizations – DDA, DNREC, Willin Farms, Greener Solutions LLC., Maryland Agriculture Associates, SCD, Tetra Tech, UD, and USDA
  - Actions/Major Decisions
    During this meeting, the most cost effective BMPs by county were discussed. Committee members identified a few BMPs that were being under reported, BMPs that will be difficult to expand or increase for Phase III, and the potential to utilize other funding mechanisms to increase BMP implementation and reporting. The planning targets and timeline were finalized by the PSC on July 9, 2018, and Phase III WIP scenarios will be run for the next meeting.
- Meeting #3
  - Date: August 27, 2018
  - Attendees: 15 attendees representing the following organizations – DDA, Devereux Consulting, DNREC, Willin Farms, Perdue, SCD, Tetra Tech, UD, and USDA
  - Actions/Major Decisions
    A preliminary DE Agricultural Sector Phase III WIP scenario was presented to meeting attendees. This scenario decreased implementation levels for BMPs that have been historically difficult to implement; implementation levels were increased for BMPs that have gained popularity (such as cover crops and nutrient management plans) and/or have existing funding sources for incentive programs (such as cover crops). Meeting attendees were asked to provide feedback and prepare to discuss more BMP implementation and options at the next meeting.
- Meeting #4
  - Date: October 30, 2018
  - Attendees: 8 attendees representing the following organizations – DDA, Devereux Consulting, DNREC, SCD, Tetra Tech, and UD
  - Actions/Major Decisions
    The planning target numbers changed between Meeting #3 and #4. The Developed Sector will now be unable to meet their planning targets without a significant increase in BMP implementation. Meeting attendees discussed new Phase III WIP BMP scenarios and gave feedback on BMPs that needed to be adjusted, added, replaced, or corrected. A fact sheet for Delaware's Ag Week to highlight specific BMPs and funding/incentive opportunities to local farmers was supported by meeting attendees, and a draft (by Tetra Tech) will be shared at the next meeting.

- Meeting #5 (Webinar)
    - Date: December 11, 2018
    - Attendees: 11 attendees representing the following organizations – DDA, DNREC, SCD, Tetra Tech, UD, and USDA
    - Actions/Major Decisions
      A draft of the Ag Week Fact Sheet was shared and discussed; edits and suggestions will be noted and added to the Sheet before Ag Week in mid-January 2019. The revised Phase III WIP Agricultural Sector scenario was shared and, with the proposed edits and BMP implementation levels, the Agricultural Sector will be able to achieve their load allocations per decisions made on draft planning targets. Ag did not assume any new loads after final planning targets were released.

Delaware Chesapeake Bay WIP-Related Local Engagement Meetings

- Quarterly Chesapeake Bay WIP General Meeting #1
    - Date: March 8, 2017
    - Attendees: Invited attendees representing the following organizations – DDA, DelDOT, DNREC, DNS, DWRA, NWA, SCD, UD, and USDA
    - Actions/Decisions
      Meeting attendees heard updates from the sector workgroups and updates to other important topics, such as grants and progress data. The next steps for developing the Phase III WIP were introduced, including the draft planning targets, and they will be further discussed by the Planning Committee on March 21, 2017.
- Phase III WIP Planning Session (Kick off meeting)
    - Date: March 21, 2017
    - Attendees: 19 attendees representing the following organizations – DDA, DNREC, DWRA, and UD
    - Actions/Major Decisions
      This meeting brought together key stakeholders who worked on and influenced the Phase II WIP document. Meeting attendees defined what worked and what didn't work during the development of the Phase II WIP and identified other stakeholders who should be included in future meetings to develop the Phase III WIP. Attendees compiled a list of areas where Phase II fell short and areas that can be revised and improved for the Phase III document. Attendees decided to task the previously formed subcommittees with revising their own sections of the Phase II WIP.
- Quarterly Chesapeake Bay WIP General Meeting #2
    - Date: June 6, 2017
    - Attendees: 26 attendees representing the following organizations – DDA, DNREC, DWRA, Kent Conservation District (KCD), NWA, and UD
    - Actions/Decisions
      The results from the March 21, 2017, Planning Committee meeting were discussed and subcommittee members were again asked to revise their Phase II WIP sections. Subcommittees provided updates for their programs. A beta version of CAST was available for use, with the final version becoming available on June 16. Members were asked to familiarize themselves with the tool in order to use it for developing sector plans to meet the Phase III WIP planning targets
- Quarterly Chesapeake Bay WIP General Meeting #3
    - Date: September 5, 2017
    - Attendees: Invited attendees representing the following organizations – DDA, DelDOT, DNREC, DNS, DWRA, NWA, SCD, UD, and USDA
    - Actions/Decisions
      Meeting attendees were updated on the CBIG and CBRAP grants' activity since the previous meeting. Attendees heard updates from the WIP subcommittees, BMP updates and corrections in the model, and a review of upcoming WIP deadlines and needed actions.

- Quarterly Chesapeake Bay WIP General Meeting #4
    - Date: December 5, 2017
    - Attendees: Invited attendees representing the following organizations – DDA, DelDOT, DNREC, DNS, DWRA, NWA, SCD, UD, and USDA
    - Actions/Decisions
      Meeting attendees discussed numerous important topics pertaining to the development of the Phase III WIP: EPA expectations (i.e. accounting for growth), subcommittee updates, grant funding, local planning targets, and the proposed approach to writing the Phase III WIP.
- 2018 Chesapeake Bay WIP Meeting
    - Date: March 6, 2018
    - Attendees: 34 attendees representing the following organizations – DDA, DelDOT, DNREC, DNS, DWRA, Environmental Protection Agency (EPA), NWA, National Wildlife Foundation (NWF), OMB, SCD, and Tetra Tech
    - Actions/Major Decisions
      This meeting was intended to inform and refresh Delaware WIP stakeholders on the WIP development process, the Chesapeake Bay TMDLs, WIP development timeline, and the current status of Delaware's nutrient load reduction progress since the Phase II WIP. No major decisions occurred during this meeting, but meeting attendees were invited and encouraged to sign up to be on committees to help develop the Phase III WIP throughout 2018.

Appendix B

Chesapeake Bay Implementation Grant RFP for Targeted Implementation and Chesapeake Bay Implementation Grant Press Release

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
Chesapeake Bay Implementation Grant Program
Fiscal Year 2019
Implementation Funding Grant
Request for Proposals (RFP)

Synopsis

In fiscal year 2019, $600,000 will be made available in grants for implementation of Best Management Practice (BMP) projects that will improve water quality by reduction of nutrient and sediment loads within Delaware's portion of the Chesapeake Bay watershed. Proposals will be selected by the Department of Natural Resources and Environmental Control (DNREC) Chesapeake Bay Implementation Grant Program through a competitive grant process. The Department of Natural Resources and Environmental Control Chesapeake Bay Implementation Grant Program will administer the grant application process and provide technical and financial guidance during the grant application and project period.

Contents

Important Dates

September 17, 2018	Issuance of RFP.
October 17, 2018	Proposals due to the DNREC's NPS Program office no later than 4:30 p.m. Applications received after that time will not be reviewed.
November 2018	Grant awards announced and recipients notified.

DNREC, State Street Commons
100 W. Water Street
Division of Watershed Stewardship
Nonpoint Source Program, Suite 6B
Dover, DE 19904
(302) 739-9922

1. INTRODUCTION AND PROGRAM GOALS

Purpose

The Delaware Chesapeake Bay Implementation Grant Program, within the Nonpoint Source Program of the Delaware Department of Natural Resources and Environmental Control, is announcing a Request for Proposals (RFP) for Implementation Funding Grants to support the implementation of Best Management Practice (BMP) projects within Delaware's portion of the Chesapeake Bay watershed to improve water quality by reduction of nutrient and sediment loads.

Program Goals and Priorities

Competitive grants will be available from the Delaware's Chesapeake Bay Implementation Grant Program which will administer the grant application process and provide technical and financial guidance during the grant application and project period.

Goal Statement:

The Implementation Funding Grant is intended for use by local entities within Delaware's portion of the Chesapeake Bay watershedfor BMP implementation projects that will improve water quality by reduction of nutrient and sediment loads.

In undertaking these projects, it is the intent that surface and ground water quality throughout the State of Delaware's Chesapeake Bay watershed is measurably improved and that citizen education and actions regarding the waters of the State are benefited. The available funding should be used to assist with implementation of BMP projects identified in Delaware's Chesapeake Bay Phase II Watershed Implementation Plan (WIP) or Appendix A. It is desired to fund project/program implementation with a priority for projects that promote community involvement, leverage additional resources, further education and outreach, demonstrate innovative science, policy, and technology, and provide a project/program approach that is both measurable and transferable in water quality improvements.

The proposal should be designed to demonstrate water quality improvements to local impaired waters, or targeted areas as identified in Appendix B, on developed and non-developed landscapes with traditional and/or innovative, yet sustainable and cost-effective approaches. In addition, these projects should lead to ways of approaching nonpoint source load reductions, while also contributing knowledge of cost effective, sustainable new ways of doing business.

Examples of possible uses of this funding by local entities for reducing nutrient and sediment loads that would also support Delaware's Chesapeake Bay Phase II Watershed Implementation Plan (WIP) implementation are below:

- Local implementation of priority, structural agricultural, and/or resource BMPs identified in Delaware's Phase II WIP or Appendix A.
- Installation of green stormwater BMP's within municipalities.

- Local urban/surburban stormwater improvements.
- Structural Agricultural BMP's that address urban stormwater.

For a proposal to be considered eligible for funding, all work included in the proposals must take place within the State of Delaware.

Programs and projects selected will demonstrate innovative and/or environmentally beneficial and sustainable methods, techniques, and/or practices for water quality improvements with cost effective and measurable results.

Important Dates and Grant Schedule

September 17, 2018	RFP Issued
October 17, 2018	Proposals due to the DNREC Nonpoint Source Program office no later than 4:30 p.m. Applications received after that time will not be reviewed.
November 2018	Grant Awards announced and recipients notified.

2. ELIGIBILITY

Applicant Requirements

Applicants may be state, county, municipality, city, town, conservation district, not-for-profit organization representing local governments, watershed organizations, community organization, and/or homeowner's association within the State of Delaware's portion of the Chesapeake Bay watershed. Preference is given to projects involving cooperative partnerships.

Agricultural operations and private for profit firms are not eligible for these funds. Interested parties may enter into working arrangement with eligible applicants.

DNREC requires an appropriate licensed professional seal construction plans. This applies to implementation projects that include construction. Grant reimbursement will not occur if sealed plans are not submitted prior to construction. DNREC reserves the right to waive the requirement on a case by case basis after review of the grant proposal.

Projects with over 5,000 square feet of disturbance must comply with the Delaware Sediment and Stormwater Regulations.

Projects must comply with any State and/or Federal permits.

Insurance: There are **insurance requirements for grant recipients**. Applicants should review their existing insurance coverages and determine if their existing insurance coverage meets the requirements set out below. If the Applicant's current insurance does not meet the requirements set out below, please explain in your submittal how any deficiencies in the required insurance coverages will be handled. Certificate of Insurance and/or copies of the insurance policies will be required before a grant agreement is executed.

Grant recipients shall maintain the following insurance during the grant term:

- Worker's Compensation and Employer's Liability Insurance in accordance with applicable law, and
- Comprehensive General Liability - $1,000,000.00 per occurrence/$3,000,000 general aggregate, and
- Medical/Professional Liability - $1,000,000.00 per occurrence/$3,000,000 general aggregate; or
- Miscellaneous Errors and Omissions - $1,000,000.00 per occurrence/$3,000,000 general aggregate, or
- Product Liability - $1,000,000.00 per occurrence/$3,000,000 general aggregate, and

If required to transport state employees, Automotive Liability Insurance covering all automotive units used in the work with limits of not less than $100,000 each person and $300,000 each accident as to bodily injury and $25,000 as to property damage to others.

Award Information

Funding for projects receiving a grant award in this grant cycle will be subject to a minimum $5,000 Urban / $25,000 Agricultural grant with a maximum of $100,000 Urban/ $300,000 Agricultural. The award made under this RFP will support lasting water quality improvementsnecessary in impaired watersheds to meet water quality limits as identified by Total Maximum Daily Loads and/or identified in Delaware's Chesapeake Bay Phase II Watershed Implementation Plan (WIP) or Appendix A.

At least 90 percent of the award must be utilized for implementation of the project. Construction costs, project materials, and labor cost related directly to the construction/ implementation would be included. Up to 10 percent of the funds provided by this award may be used for administrative costs (personnel salaries and indirect costs), planning and/or design costs.

DNREC reserves the right to reject all proposals and make no awards under this announcement.

DNREC reserves the right to make additional awards under this announcement, consistent with Department policy and guidance, if additional funding becomes available after the original selections are made. Any additional selections for awards will be made no later than 6 months after the original selection decisions.

Matching Requirements

This grant requires a 1:1 match which may be a combination of state or local cash, or in-kind services. In-kind services may be used for up to 25% of the match. Proposals will be evaluated on leveraging and preference is given to projects that include additional match, cost share, or leveraging by, local, or other state funds. If using volunteer hours for additional match, the dollar value for volunteer hours that should be used is $24.69/hour[1].

Ineligible Costs and Projects

Projects required by enforcement action taken by DNREC, punitive or penalty related requirements, and required mitigation are ineligible for these funds. However, projects (with the exception of agricultural) that plan for improvements that may meet a permit condition are acceptable.

Expenses incurred prior to the issuance of a Purchase Order are not reimbursable.

Project Duration

The project implementation should not extend beyond **2 years** of the date of the issuance of a purchase order.

Award recipients will be required to submit regular 6-month status reports and a final report. Applicants receiving a grant award will be notified of specific reporting requirements in the grant award agreement.

3. HOW TO APPLY

Submission of Proposals

An electronic copy of the proposal and supporting materials (e.g. project support letters from partners) in pdf format AND a copy in Microsoft Word must be submitted to the Nonpoint Source Program **no later than 4:30 pm, on October 17, 2018**. The emailed proposal must be less than 10 megabytes in size. Proposals will not be accepted by facsimile machine submission. Project proposals selected for awards will need to sign grant agreements prior to receiving grant award.

Jim Sullivan
James.Sullivan@state.de.us
Subject: Chesapeake Bay Implementation Funding Grant

[1] Based on 2018 State of Delaware Value of Volunteer Time. https://independentsector.org/value-of-volunteer-time-2018/

Grant Application Format

Applicants should describe, within your application, how the project meets the program goals and priorities, the geographic scope of the project, cost effectiveness of the project, technical merit and feasibility, and organizational capacity to complete the project. The recommended length (not including cover page, signature page, and exhibits) of the proposal is 5-6 pages. Applicants may be contacted if the selection committee has any questions regarding your proposal.

Cover Page: The cover page should include the proposal title, partners/sponsor(s), point of contact information, period of time the proposal will cover (e.g. 6 months, 1 year, etc.), project cost, requested amount of funding, and information contained in the below summary table.

- Total drainage area being treated (acres) and associated runoff curve number
- % Impervious Area
- Best Management Practice(s) Proposed
    - Total runoff reduction proposed and/or nutrient reduction. Applicants may use the Chesapeake Assessment and Scenario Tool (CAST, http://cast.chesapeakebay.net/) or Delaware Urban Runoff Management Model version 2 (DURMM v.2), to estimate the total pounds of nutrient/sediment reduction and/or volume of runoff reduction based on the site parameters. Applicants are encouraged to use the Chesapeake Bay tools.

Signature Page: **This page should contain the signatures of the grant applicant, landowner(s) on which the project will occur, and the responsible party for any matching funds. Letters of support from the landowners may be included in this section.**

Background and Justification: Briefly describe the issue or problem to be addressed by the grant proposal, why the work is necessary, and how it fits with the grant program criteria. For implementation projects, describe where the project is located including its watershed, municipality, and site location, and its geographic characteristics such as recharge feasibility, TMDL reduction requirements, etc.

Scope of Work: This section should describe an objective and what is to be accomplished, location where the work will take place, who will complete the work, organizational capacity to complete the project, a work plan to accomplish your task, and description of environmental and multiple benefits resulting from your project.

Time Schedule and Benchmarks: This section should break down the Scope of Work into tasks with target dates for completion of each task. It should list target milestones, timelines, and describe how each milestone addresses project objectives.

Project Budget: This section should provide a detailed budget description and a brief narrative justification of the budget. It should include the amount requested and itemize all expenditures such as personnel/salaries; travel, equipment, supplies, contractual costs, indirect costs, and match sources and amounts.

Maintenance: This section should include all management practices addressing the proper operation and maintenance requirements after implementation of the project. Include the number of years the plan will be in effect.

Qualifications: This section should include a list of applicant's qualifications to complete the project.

Insurance: There are insurance requirements for grant recipients. Applicants should review their existing insurance coverages and determine if their existing insurance coverage meets the requirements described herein. If the Applicant's current insurance does not meet the requirements set out below, please explain in your submittal how any deficiencies in the required insurance coverages will be handled. Certificate of Insurance and/or copies of the insurance policies will be required before a grant agreement is executed.

4. SELECTION PROCESS

Proposals will be reviewed for threshold eligibility purposes as described in this announcement. A team of resource experts will conduct a merit evaluation of each eligible proposal, rank them, and submit recommendations for funding to the Division of Watershed Stewardship Director.

Proposal Review and Ranking Criteria

The following evaluation criteria will be employed when reviewing and screening applications. Information on how each one of these will be fulfilled should be included in the proposal.

1. **Geographic Scope (10 points)**
    - The proposal shall thoroughly identify the geographic setting of the project.
        - The watershed and sub-watershed shall be identified (i.e., Deep Creek subwatershed within the Chesapeake Bay watershed).
        - The municipality contained within (i.e., county or town/city).
        - The site specific information (i.e., street location, parcel identification, waterbody draining to, etc.)
        - Any site reconnaissance information, including but not limited to: recharge feasibility mapping, soils mapping and/or soils testing, contours via Lidar data or survey, drainage area/acres treated, % impervious cover.
        - Any Land/River segment identified in Appendix A.

- An aerial of the project area must be included within the limits and important features clearly noted. Additional exhibits are encouraged.

- The impairments of the watershed and/or site area should be noted, including management plans that have been developed:
  - The TMDL reduction requirements established
  - Local factors and concerns (i.e., in a CSO area, in a highly impervious area with no stormwater controls, in a highly eroding stream channel, etc.).
  - Projects identified in Delaware's Chesapeake Bay Phase II Watershed Implementation Plan (WIP) or Appendix A

- Points will be awarded based on the thoroughness of the answers (while being concise), as well as the connection to the watershed/sub-watershed's degradation.

2. **<u>Meets Program Goals and Priorities (40 Points)</u>**

   The project proposal may address either agricultural or urban projects:

   - Implement non-regulatory recommendations, strategies, projects identified in Delaware's Phase II Chesapeake Bay Watershed Implementation Plan or Appendix A. The proposal should specify the activity and how it will be implemented in order to qualify for points under this criterion (10 points);
   - Agricultural Practices [for Urban practices, see below] (30 points)
     - Install structural agriculture best management practices within the watershed. (10 points);
     - Install agricultural best management practices within the targeted Land/ River Segments as defined in Appendix B (10 points);
     - Install nonstructural agricultural best management practices within the watershed (10 points);
       1. What type of practices are being proposed and what are the square footage of practice area and/or cubic footage of storage being proposed?
       2. What are the nutrient/sediment reduction and runoff reduction efficiencies for the practice(s)?
       3. Applicants may use the Chesapeake Assessment and Scenario Tool (CAST), or Delaware Urban Runoff Management Model version 2 (DURMM v.2), to estimate the total pounds of nutrient/sediment reduction and/or volume of runoff reduction based on the site parameters. Applicants are encouraged to use the Chesapeake Bay tools.
       4. What is the expected lifespan of the improvement as proposed?
       5. Will nutrient/sediment reduction and/or runoff reduction remain a constant over the lifespan of the improvement or will there be a diminishing return?

6. Who will design the project?

OR

- Urban Practices. Install community stormwater management improvements or retrofits in existing developments and municipalities or provide restoration for water quality benefits (30 points);
    - What type of practices are being proposed and what are the square footage of practice area and/or cubic footage of storage being proposed?
    - What are the nutrient/sediment reduction and runoff reduction efficiencies for the practice(s)?
        - Applicants may use the Chesapeake Assessment and Scenario Tool (CAST), or Delaware Urban Runoff Management Model version 2 (DURMM v.2), to estimate the total pounds of nutrient/sediment reduction and/or volume of runoff reduction based on the site parameters. Applicants are encouraged to use the Chesapeake Bay tools.
    - What is the expected lifespan of the improvement as proposed?
    - Will nutrient/sediment reduction and/or runoff reduction remain a constant over the lifespan of the improvement or will there be a diminishing return?
    - Who will design the project?

3. **Leveraging/Co-funding (10 points)**
    - The proposal should identify cooperative partnerships with stakeholders, creation of sustainable and effective commitments, and should demonstrate strong support from partners and other relevant agencies and organizations. The applicant may attach letters of support from cooperating agencies identifying how they intend to support the project. Applicants will be evaluated based on the extent they demonstrate how the applicant will coordinate/leverage the funding with other sources of funds (i.e., funding entities, project partners, surrounding communities, and businesses). (10 points).

***Note**: Applicants are required to use a match or cost share, or in-kind services above the minimum to receive points under this criterion for leveraging. Applicants may choose to demonstrate leveraging by pledging their own funds above the minimum match requirement or other resources for a voluntary match or cost share. Applicants who choose to cost share voluntarily must meet their cost share obligations if their proposals are selected for award. Please note that only eligible and allowable costs may be used for matches or costs shares. Federal grants may not be used as matches or cost shares.*

4. Technical Merit and Project Feasibility (30 Points)
    - The proposal will be evaluated on the technical feasibility given the proposed budget and timeline. The proposal should identify the applicant's (and partners) ability to undertake and successfully complete this project.

The Review Team will evaluate the applicant's technical ability to successfully complete and manage the proposed project taking into account the applicant's organizational capacity, experience, facilities and technical expertise to accomplish the proposed plan of work and its likely success (10 points).

- Give a timetable for the implementation of project. Include any monitoring time as applicable.
- Give a detailed budget for project implementation and monitoring.

- Cost effectiveness (10 points)
  - Give the amount of dollars spent for the pounds of nutrients/sediment removed and/or volume of runoff reduced.
  - Describe how the longevity of the practice relates to the initial cost.
- Maintenance (10 points)
  - Describe who will be accountable for the maintenance of the practice after the grant has ended and what funding is available for maintenance.
  - A letter of agreement for future maintenance for the life cycle of the BMP(s) must be included.
  - Periodic inspection by the DNREC, or their designee, is required for the life cycle of the BMP.

5. <u>Programmatic Capability (10 Points)</u>

- Organizational experience of applicant, partners and consultants/contractors (if known). If any necessary consultants or contractors are not known at the time of grant preparation, than the means of selecting a qualified candidate should be described. **An appropriate licensed professional is required to seal construction plans for implementation projects.**
- Plan for timely and successful achievement of the project objectives.
- Other similar grant awards

5. GRANTEE RESPONSIBILITIES

Grantees are responsible for submitting detailed invoices at a period of no more than once per month for disbursement of funds. Disbursement procedures will be provided at the time of grant award notification.

Grant award recipients will be required to submit regular reports during the project period and a final report at the end of the project period. Specific reporting requirements will be provided in the grant award agreement. Grant award recipients will be required to sign a grant agreement with the Department. All award recipients are required to comply with all state and federal laws and guidelines pertaining to the use of grant funds.

6. CONTACT INFORMATION

For further details regarding the Chesapeake Bay Local Implementation Funding Grant applicants are encouraged to contact:

- Jim Sullivan, Nonpoint Source Program, James.Sullivan@state.de.us
- For technical or WIP related questions, contact Brittany Sturgis, Nonpoint Source Program, Brittany.Sturgis@state.de.us

The Department of Natural Resources and Environmental Control solicits and encourages Minority Business Enterprises (MBE), Women's Business Enterprises (WBE), and Small Business Enterprises (SBE) in all service contracts and is committed to affirmative action, equal opportunity, and diversity of its workforce.

APPENDIX A

Prioritized list of cost-effective BMPs in the Chesapeake Bay watershed portion of Delaware

1. **Forest Buffers**
   Forest buffers are linear wooded areas that help filter nutrients, sediments and other pollutants from runoff as well as remove nutrients from groundwater. The recommended buffer width is 100 feet, *with a 35 feet minimum width required.*

2. **Water Control Structures**
   Installing and managing boarded gate systems in agricultural land that contains surface drainage ditches.

3. **Tree Plantings**
   Tree planting includes any tree planting, except those used to establish riparian forest buffers, targeting lands that are highly erodible or identified as critical resource areas.

4. **Grass Buffers**
   Grass buffers are linear strips of grass or other non-woody vegetation maintained to help filter nutrients, sediment and other pollutants from runoff. The recommended buffer width for buffers is 100 feet, **with a 35 feet minimum width required**.

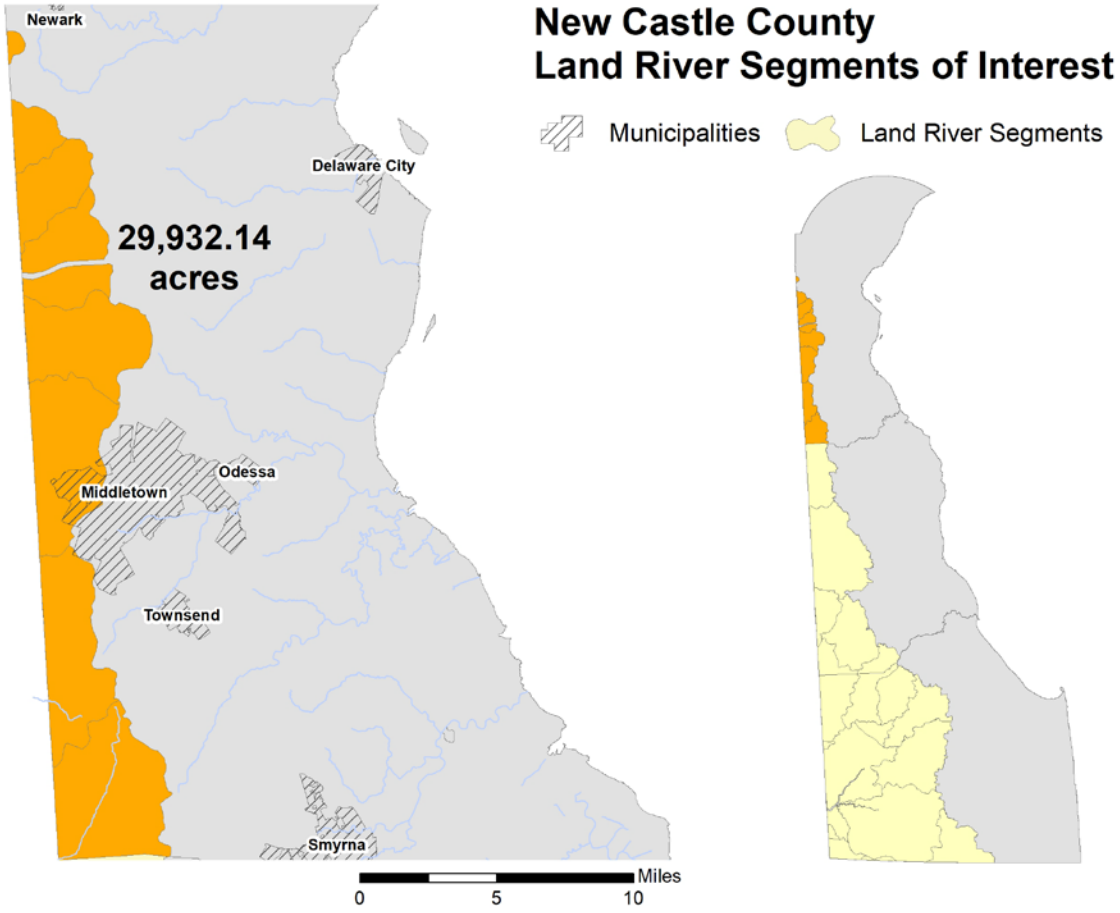
5. **Cover crops** (in order of priority):
   - Traditional Rye Normal Other
   - Traditional Barley Normal Drilled
   - Traditional Barley Early Drilled
   - Traditional Rye Normal Drilled
   - Traditional Rye Early Other
   - Traditional Brassica Early Other
   - Traditional Barley Normal Other
   - Traditional Wheat Normal Other
   - Traditional Wheat Early Other

6. **Wetland Restoration – Floodplain**
   Re-establish wetlands in a floodplain by manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former wetland. Changes acres from existing land use to the wetland land use. Enter unit of total acres or percent of acres.

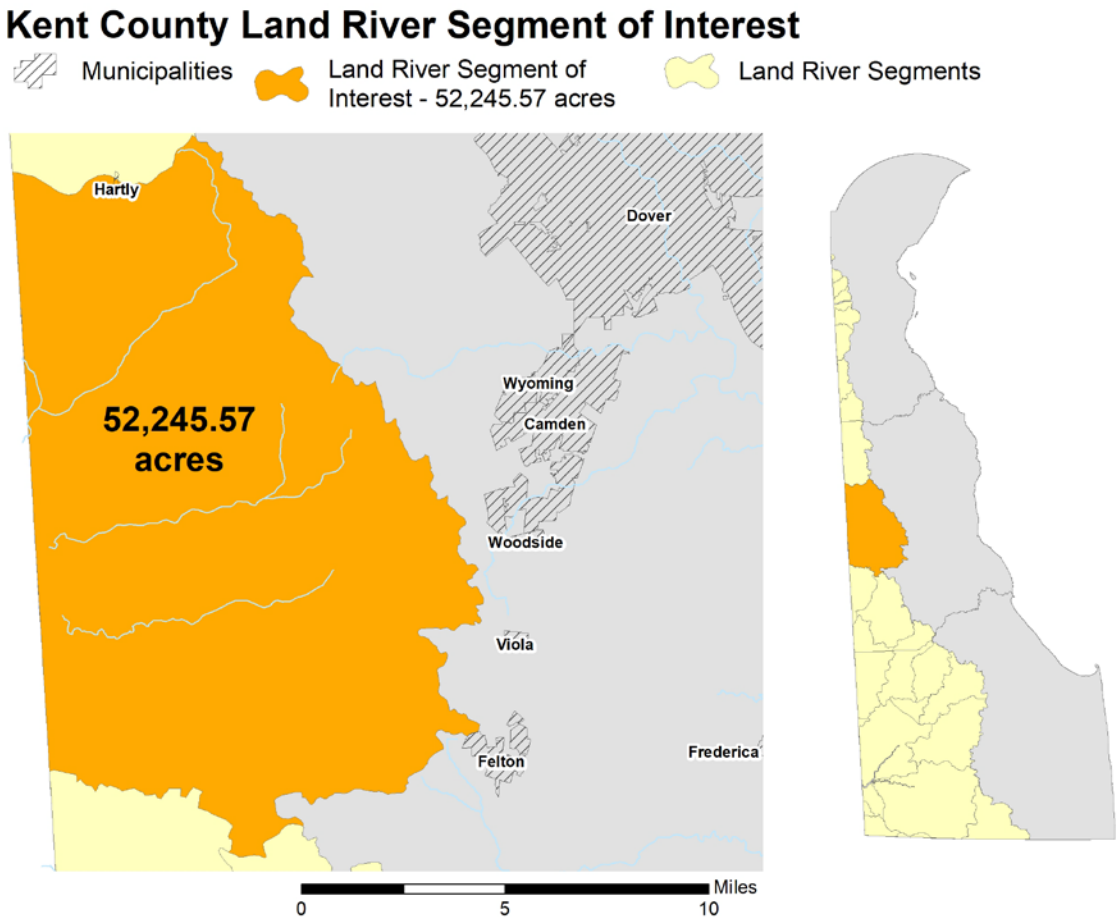
APPENDIX B

Targeted segments for BMP implementation within the Chesapeake Bay watershed portion of Delaware

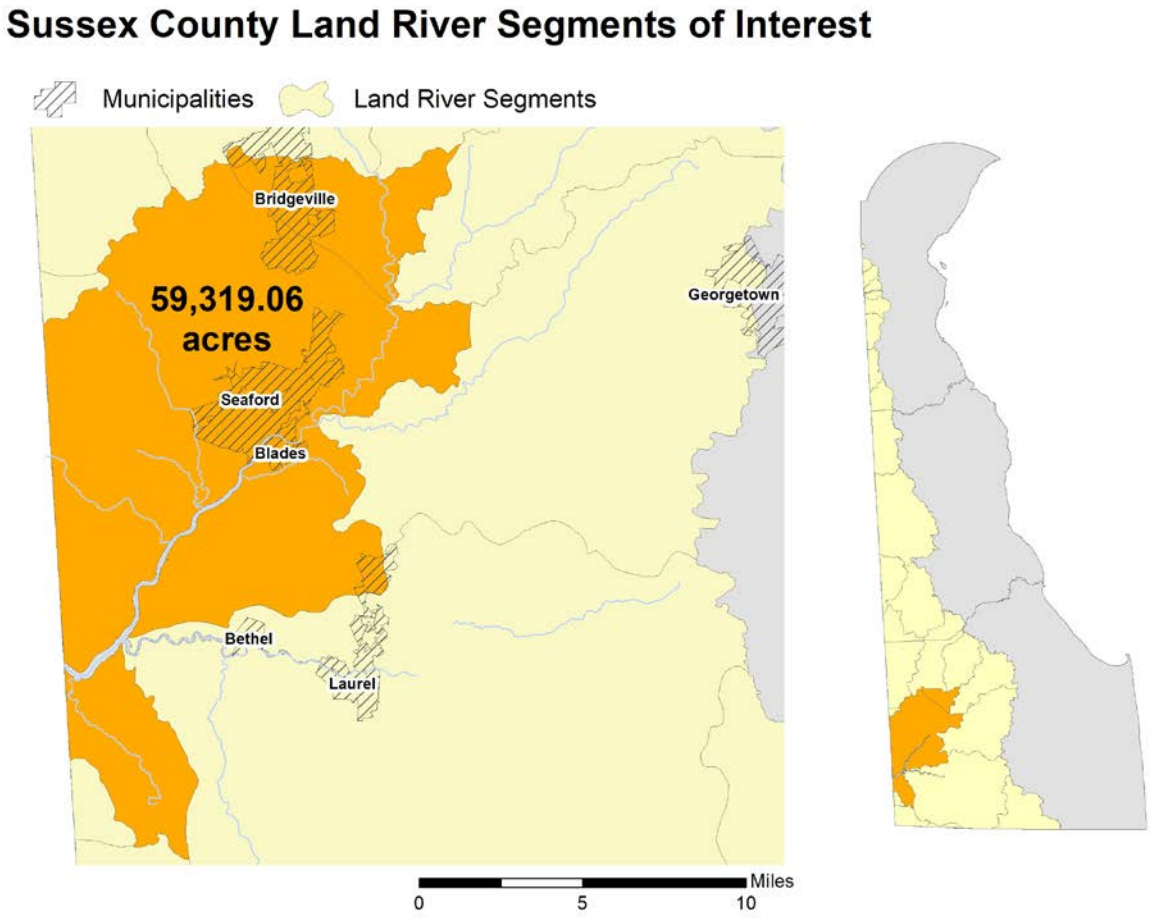
New Castle County



Kent County


Kent County Land River Segment of Interest
Municipalities
Land River Segment of Interest - 52,245.57 acres
Land River Segments
Hartly
Dover
Wyoming
Camden
52,245.57 acres
Woodside
Viola
Felton
Frederica
Miles
0
5
10

Sussex County



NEWS FROM THE DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Contact: Michael Globetti, DNREC Public Affairs, 302-739-9902

DNREC now accepting grant proposals for Delaware Chesapeake Bay watershed implementation projects

DOVER (Sept. 17, 2018) – DNREC's Division of Watershed Stewardship is now accepting project proposals from any State of Delaware agency, county, municipality, city, town, conservation district, not-for-profit organization representing local government, watershed organization, community organization, and/or homeowner's association, for water quality improvement projects within Delaware's portion of the Chesapeake Bay watershed. Proposals for the Chesapeake Bay Implementation Funding Grant must be received by 4:30 p.m. Oct. 17, 2018.

The Implementation Funding Grant is an annually-determined set-aside within Delaware's Chesapeake Bay Implementation Grant from the Environmental Protection Agency. Funding is intended for use by Delaware entities within the Chesapeake Bay watershed for Best Management Practice (BMP) implementation projects that will improve water quality by reducing nutrient and sediment loads. The competitive grant process is administered by Delaware's Chesapeake Bay Implementation Grant Program, which provides technical and financial guidance during the grant application and project period.

Grant requests of up to $300,000 (from $600,000 in total funding for fiscal year 2019) will be considered with a one-to-one non-federal match requirement. Up to 10 percent of the grant funds may be used for administrative costs.

The grant guidelines and application instructions can be found online at Chesapeake Bay Implementation Funding Grant. Proposals must be submitted by email to James.Sullivan@state.de.us and must be less than 10 MB.

For more information, please contact Jim Sullivan, Division of Watershed Stewardship, at 302-739-9922.

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Appendix C

Industrial Stormwater Sites in the Chesapeake Bay Watershed

Industrial Stormwater Sites in the Chesapeake Bay Watershed

Facility Name	Location	Comments
Allan Myers Materials, Inc., Seaford	Seaford	
Allen Harim Farms, LLC	Seaford	
Allied Waste Services of Delmar	Felton	
Amick Farms LLC	Delmar	
Auto Parts of Greenwood	Greenwood	
Bridgeville Auto Center	Bridgeville	
Cairo Auto Recycling Services, LLC	Harrington	
Cannon Cold Storage Co., Inc.	Bridgeville	
Christiana Materials, LLC Plant 2	Farmington	
Concrete Building Systems	Delmar	
Crystal Steel Fabricators, Inc.	Delmar	
DELDOT, Laurel, Maintenance Area 1	Laurel	
DelDOT, Maintenance Area 2, Seaford	Bridgeville	
Donovan Salvage Works, Inc.	Georgetown	
Dover Scrap Metal	Hartly	
DSWA, Central Solid Waste Management Center	Felton	
DSWA, Southern Solid Waste Management Center	Georgetown	
Farmington Transfer Station	Greenwood	
Foxs Bus Service	Hartly	
Gardner Asphalt, Inc.	Seaford	
Gardner-Gibson	Seaford	
Gillespie Precast, LLC Plant #3	Greenwood	
Growmark FS, LLC, Laurel	Laurel	
JBS Souderton, Inc., Seaford Blending Facility	Seaford	
Kroegers Recycling LLC	Seaford	
McGinnis Auto	Clayton	
Mitchells Auto & Truck Salvage	Laurel	
Murray Motors, Inc.	Seaford	
Nanticoke River Marina Park	Blades	
Orient Corp. of America	Seaford	
Peninsula Oil Co., INC.	Seaford	
Perdue AgriRecycle, LLC	Seaford	
Perdue Farms, Inc., Bridgeville	Bridgeville	Not active but maintaining permit
Perdue Venture Milling	Seaford	
Pictsweet	Bridgeville	
Polar Explorer LLC DBA West Side Auto Parts	Laurel	
Procino Plating, Inc.	Blades	
R&M Buses, Inc.	Bridgeville	

Facility Name	Location	Comments
Ralph and Paul Adams, Inc.	Bridgeville	
River Asphalt II, LLC	Delmar	
Sussex Scrap Metal, Inc.	Delmar	
Vulcan Construction Materials, LLC	Seaford	Permitted but not operational yet
Vulcan Construction Materials, LLC- James Pit	Georgetown	
Vulcan Construction Materials, LLC Seaford Sales Yard / The Arundel Company, LLC	Seaford	
Vulcan Construction Materials, LLC-Laurel Plant	Seaford	
Waste Recycling	Seaford	
Willard Agri-Service of Greenwood	Greenwood	
XPO Logistics Freight, INC.-XSA	Seaford	
YRC, Inc., Seaford	Seaford	
Anderson Recycling, Inc.	Delmar	DNREC is awaiting NOTs - Not operational - Not maintaining permit coverage
DSWA, Bridgeville Collection Station	Bridgeville	DNREC is awaiting NOTs - Not operational - Not maintaining permit coverage
DSWA, Ellendale Collection Station	Ellendale	DNREC is awaiting NOTs - Not operational - Not maintaining permit coverage
Kroegers Recycling - Master's Way	Seaford	DNREC is awaiting NOTs - Not operational - Not maintaining permit coverage
Mike Davidson Enterprise, LLC (same as Perdue Agricycle)	Camden	DNREC is awaiting NOTs - Not operational - Not maintaining permit coverage
Seaford AgriSoil, LLC Compost Facility	Seaford	DNREC is awaiting NOTs - Not operational - Not maintaining permit coverage

Appendix D

BMP Definitions

BMP Definitions

Developed Sector BMPs

Conservation Landscaping – The conversion of managed turf into actively maintained perennial meadows, using species that are native to the Chesapeake Bay region.

Erosion and Sediment Control Practices – Erosion and sediment control practices applied to construction land. Acres in excess of available construction land rolls to other urban land uses. Protects water resources from sediment pollution and increases in runoff associated with land development activities. By retaining soil on-site, sediment and attached nutrients are prevented from leaving disturbed areas and polluting streams.

Runoff Reduction Practices – Runoff Reduction is the total post-development runoff volume that is reduced through canopy interception, soil amendments, evaporation, rainfall harvesting, engineered infiltration, extended filtration, or evapo-transpiration. Stormwater practices that achieve at least a 25 percent reduction of the annual runoff volume are classified as *Runoff Reduction (RR) practices* and therefore earn a higher net removal rate.

Septic Connections – When septic systems get converted to public sewer. This reduces the number of systems because the waste is sent into the sewer and treated at a wastewater treatment plant.

Septic Pump-out – Septic systems achieve nutrient reductions through several types of management practices, including frequent maintenance and pumping. On average, septic tanks need to be pumped once every three to five years to maintain effectiveness. The pumping of septic tanks is one of several measures that can be implemented to protect soil absorption systems from failure. When septic tanks are pumped and sewage removed, the septic system's capacity to remove settable and floatable solids from wastewater is increased.

Septic System Denitrification – Septic denitrification represents the replacement of traditional septic systems with more advanced systems that have additional nitrogen removal capabilities. Traditional septic systems usually consist of a large tank designed to hold the wastewater, allowing grits and solids time for settling and decomposition. Wastewater then flows to the second component, the drainfield. An enhanced septic system can provide further treatment of nitrogen through processes that encourage denitrification of the wastewater.

Stormwater Treatment Practices – Stormwater practices that employ a permanent pool, constructed wetlands, or sand filters are classified as *Stormwater Treatment (ST) practices* that have less runoff reduction capability and therefore lower removal rates than Runoff Reduction practices.

Street Sweeping (Mechanical Broom Technology) – Researchers have found that while mechanical sweepers are effective in picking up coarse-grained particles, they leave behind fine-grained particles, which are then subject to future wash-off. Therefore, mechanical broom sweepers are useful in removing gross solids, trash, and litter from streets but have very limited capabilities to reduce nutrients and fine sediment.

Urban Nutrient Management – The proper management of major nutrients for turf and landscape plants on a property to best protect water quality.

Urban Stream Restoration – Urban Stream Restoration refers to any natural channel design, legacy sediment removal, regenerative stream channel, or other restoration project that meets the qualifying conditions for credits, including environmental limitations and stream functional improvements.

Urban Tree Planting – The planting of trees in an urban area that are not part of a riparian forest buffer, structural BMP (e.g., bioretention, tree planter), or do not conform to the definition of the Urban Forest Planting BMP. The land use area conversion factor is based on the panel's recommendation of 144 square foot average of canopy per tree planted. Thus, 300 newly planted trees are equivalent to one acre of tree canopy land use; however, this is not a planting density requirement and each tree converts 1/300 of an acre of either pervious or impervious developed area to tree canopy land uses. This BMP does not require trees to be planted in a contiguous area.

Agricultural Sector BMPs

Agricultural Drainage Management –Agricultural drainage management is the process of managing water discharges from surface and/ or subsurface agricultural drainage systems with water-control structures, based on the premise that the same drainage intensity is not required at all times during the year. Installing these BMPs can possibly improve water quality and increase production benefits. Water quality benefits are derived by minimizing unnecessary tile drainage and reducing the amount of nitrate that leaves farm fields. These BMPs can also retain water in fields that could be used for crop production later in the season.

Agriculture Stormwater Management – Agricultural stormwater runoff is generated from structures and paved areas associated with confined animal production such as dairy facilities, poultry houses, hog raising facilities, and similar areas. Management practices utilized are designed, constructed, and maintained to treat stormwater from these animal production facilities, such as ponds, constructed wetlands, and grass swales, often configured in a treatment train.

Alternative Crops – Accounts for those crops that are planted and managed as permanent, such as warm season grasses, to sequester carbon in the soil.

Ammonia Emission Reductions (Biofilters, Litter Amendments) – Ammonia emission reduction includes housing ventilation systems that pass air through a biofilter media with a layer of organic material, typically a mixture of compost and wood chips or shreds that supports a microbial population. The ammonia emissions are reduced by oxidizing volatile organic compounds into carbon dioxide, water and inorganic salts. Litter amendments are the surface application of alum, an acidifier, to poultry litter to acidify poultry litter and maintain ammonia in the non-volatile ionized form (ammonium).

Barnyard Runoff Control Structures – Barnyard runoff control includes the installation of practices to control runoff from barnyard areas. This includes practices such as roof runoff control, diversion of clean water from entering the barnyard, and control of runoff from barnyard areas. Loafing lot management is the stabilization of areas frequently and intensively used by people, animals, or vehicles by establishing vegetative cover, surfacing with suitable materials, and/or installing needed structures. This does not include poultry pad installation.

Cover Crops –

> **Traditional Cover Crop** – A short-term crop grown after the main cropping season to reduce nutrient losses to ground and surface water by sequestering nutrients. This type of cover crop may not receive nutrients in the fall and may not be harvested in the spring.
>
> **Commodity Cover Crops** – A winter cereal crop planted for harvest in the spring which does not receive nutrient applications in the fall. Any winter cereal crop which did receive applications in the fall is not eligible for nutrient reductions.

Dairy Precision Feeding – Reduces the quantity of phosphorus and nitrogen fed to livestock by formulating diets within 110% of Nutritional Research Council recommended level in order to minimize the excretion of nutrients without negatively affecting milk production.

Forest Buffers – Linear wooded areas that help filter nutrients, sediments, and other pollutants from runoff as well as remove nutrients from groundwater. The recommended buffer width is 100 feet, with a 35 feet minimum width required.

Forest Harvesting Practices – Forest harvesting practices are a suite of BMPs that minimize the environmental impacts of road building, log removal, site preparation, and forest management. These practices help reduce suspended sediments and associated nutrients that can result from forest operations.

Grass Buffers – Linear strips of grass or other non-woody vegetation maintained to help filter nutrients, sediment, and other pollutants from runoff. The recommended buffer width for buffers is 100 feet, with a 35 feet minimum width required.

Land Retirement – Agricultural land retirement takes marginal and highly erosive cropland out of production by planting permanent vegetative cover such as shrubs, grasses, and/or trees.

Manure Transport – Transport of excess manure in or out of a county. Manure may be of any type — poultry, dairy, or any of the animal categories. Transport should only be reported for county to county transport. Movement within the same county should not be included.

Mortality Composting (Livestock and Poultry) – A physical structure and process for disposing of any type of dead animals. Composted material land applied using nutrient management plan recommendations.

Non-urban Stream Restoration – Non-urban Stream Restoration refers to any natural channel design, legacy sediment removal, regenerative stream channel, or other restoration project that meets the qualifying conditions for credits, including environmental limitations and stream functional improvements.

Nutrient Management – The implementation of a site-specific combination of nutrient source, rate, timing, and placement into a strategy that seeks to optimize agronomic and environmentally efficient utilization of nitrogen and phosphorus.

Pasture Management –

Pasture Alternative Watering – This BMP requires the use of alternative drinking water sources, such as permanent or portable livestock water troughs, placed away from the stream corridor. Implementing off-stream shade for livestock is encouraged where applicable. The water supplied to the facilities can be from any source, including pipelines, spring developments, water wells, and ponds. In-stream watering facilities, such as stream crossings or access points, are not considered in this definition. The modeled benefits of alternative watering facilities can be applied to pasture acres in association with improved pasture management systems such as rotational grazing.

Prescribed Grazing – This practice utilizes a range of pasture management and grazing techniques to improve the quality and quantity of the forages grown on pastures and reduce the impact of animal travel lanes, animal concentration areas, or other degraded areas. PG can be applied to pastures intersected by streams or upland pastures outside of the degraded stream corridor (35 feet width from top of bank). Pastures under the PG systems need to have a vegetative cover of 60% or greater.

Grass Buffers on Fenced Pasture Corridor – This BMP is only applicable to buffers planted in agricultural pasture settings that include fencing. Linear strips of grass or other non-woody vegetation maintained to help filter nutrients, sediment, and other pollutants from runoff. The recommended buffer width for buffers is 100 feet, with a 35 feet minimum width required.

Tillage –

Conservation Tillage – A conservation tillage routine that involves the planting, growing, and harvesting of crops with minimal disturbance to the soil in an effort to maintain 30 to 59 percent crop residue coverage immediately after planting each crop.

High Residue Tillage – A conservation tillage routine that involves the planting, growing, and harvesting of crops with minimal disturbance to the soil in an effort to maintain at least 60 percent crop residue coverage immediately after planting each crop.

Low Residue Tillage – A conservation tillage routine that involves the planting, growing, and harvesting of crops with minimal disturbance to the soil in an effort to maintain 15 to 29 percent crop residue coverage immediately after planting each crop.

Tree Planting – Includes any trees planted on agricultural land, except those used to establish riparian forest buffers, targeting lands that are highly erodible or identified as critical resource areas.

Soil and Water Conservation Plans – For CBP purposes, these are farm conservation plans that involve a combination of agronomic, management, and engineered practices that protect and improve soil productivity and water quality and prevent deterioration of natural resources on all or part of a farm. Plans must meet applicable NRCS technical standards.

Waste Management Systems (Livestock and Poultry) – Any structure designed for collection, transfer, and storage of manure and associated wastes generated from the confined portion of animal operations and complies with NRCS 313 (Waste Storage Facility) or NRCS 359 (Waste Treatment Lagoon) practice standards. Manure conserved through reduced storage and handling losses associated with AWMS implementation are available for land application or export from the farm.

Water Control Structures – Installing and managing boarded gate systems on agricultural land that contains surface drainage ditches.

Wetland Creation – The manipulation of the physical, chemical, or biological characteristics present to develop a wetland that did not previously exist at a site.

Wetland Enhancement – The manipulation of the physical, chemical, or biological characteristics of a wetland to heighten, intensify, or improve a specific function(s).

Wetland Rehabilitation – The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded wetland.

Wetland Restoration – The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former wetland.

Sources:

Chesapeake Bay Program. 2018. Chesapeake Bay Program Quick Reference Guide for Best Management Practices (BMPs): Nonpoint Source BMPs to Reduce Nitrogen, Phosphorus and Sediment Loads to the Chesapeake Bay and its Local Waters. CBP DOC ID.

DNREC (Delaware Department of Natural Resources and Environmental Control). 2018. Nonpoint Source Best Management Practice Implementation Data Quality Assurance Project and Verification Plan. Division of Watershed Stewardship Nonpoint Source Program. Dover, DE.

Expert Panel Establishment Group. 2018. Agricultural Stormwater Management Practices. Recommendations to the Agriculture Workgroup.

NRCS (natural Resources Conservation Service). 2019. Drainage water management Practice code 554. Accessed March 8, 2019. https://www.nrcs.usda.gov/wps/portal/nrcs/detail/?cid=nrcs144p2_027166

Appendix E

Comparison of Phase II WIP Implementation Goals, 2017 Progress, and Phase III WIP Implementation Goals for the Developed and Agricultural Sectors

Comparison of Phase II WIP Implementation Goals, 2017 Progress, and Phase III WIP Implementation Goals for the Developed and Agricultural Sectors

Developed Sector BMPs

BMP Name	County	Phase II WIP 2025 Goal	2017 Progress	Phase III WIP 2025 Goal
Runoff Reduction[a] (acres treated)	New Castle County	7	414	104
	Kent County	37	95	248
	Sussex County	1,085	1,567	1,725
Stormwater Treatment Practices[b] (acres treated)	New Castle County	849	281	1,170
	Kent County	494	895	1,157
	Sussex County	6,917	9,088	9,088
TOTAL (acres treated)		**9,389**	**12,340**	**13,494**
Conservation Landscaping (acres)	New Castle County	NA[c]	NA	343
	Kent County	NA	NA	709
	Sussex County	NA	NA	2,155
TOTAL (acres)		**NA**	**NA**	**3,207**
Erosion and Sediment Control Practices (acres)	New Castle County	92	92	91
	Kent County	5	5	5
	Sussex County	438	438	433
TOTAL (acres)		**535**	**535**	**529**
Urban Tree Planting (acres)	New Castle County	99	2	0
	Kent County	0.0	0.14	100
	Sussex County	0.0	2	266
TOTAL (acres)		**99**	**4.14**	**366**
Urban Nutrient Management (acres)	New Castle County	4,809	0.0	2,623
	Kent County	10,161	0.0	5,353
	Sussex County	28,771	0.0	15,580
TOTAL (acres)		**43,741**	**0.0**	**23,556**
Urban Stream Restoration (feet)	New Castle County	0.0	0.0	5,691
	Kent County	0.0	0.0	289
	Sussex County	200	575	29,637
Non-urban Stream Restoration	New Castle County	3,207	0.0	0.0
TOTAL (feet)		**3,407**	**575**	**35,617**
Street Sweeping (Mechanical Broom Technology) (acres)	New Castle County	406	0.0	92
	Kent County	570	0.0	133
	Sussex County	2,167	24	178
TOTAL (acres)		**3,143**	**24**	**403**
Septic Connections (number of systems)	New Castle County	354	4	19
	Kent County	464	304	147
	Sussex County	5,477	67	434
TOTAL (number of systems)		**6,295**	**375**	**600**

BMP Name	County	Phase II WIP 2025 Goal	2017 Progress	Phase III WIP 2025 Goal
Septic System Denitrification (number of systems)	New Castle County	1	5	122
	Kent County	0	57	954
	Sussex County	1,022	197	2,817
TOTAL (number of systems)		**1,023**	**259**	**3,983**
Septic System Pumping (number of pump-outs)	New Castle County	279	145	161
	Kent County	4,481	797	1,260
	Sussex County	8,097	3,932	3,719
TOTAL (number of pump-outs)		**12,857**	**4,874**	**5,140**
Forest Harvesting Practices (acres)	New Castle County	73	59	73

Notes:
[a] Runoff reduction practices included in the Phase II WIP, 2017 Progress, and Phase III WIP include bioretention, bioswale, impervious disconnection, urban infiltration practices, urban filter strips, and vegetated channels.
[b] Stormwater treatment practices included in the Phase II WIP, 2017 Progress, and Phase III WIP include dry ponds, filtering practices, and wet ponds and wetlands.
[c]NA = Not Applicable. Conservation Planning is a new BMP that can be included in the Phase III WIP.

Wastewater	County	Phase II WIP 2025 Goal		2017 Progress		Phase III WIP 2025 Goal	
		TN	TP	TN	TP	TN	TP
WWTPs (lbs/year)	Sussex County	217,057	10,983	43,824	7,419	165,051	10,983

Agricultural Sector BMPs

BMP Name	County	Phase II WIP 2025 Goal	2017 Progress	Phase III WIP 2025 Goal
Cover Crops (acres)	New Castle County	2,583	1,219	3,319
Commodity Cover Crops (acres)	New Castle County	1,004	674	2,274
Cover Crops (acres)	Kent County	17,722	11,825	24,665
Commodity Cover Crops (acres)	Kent County	6,892	980	8,696
Cover Crops (acres)	Sussex County	40,627	36,462	81,375
Commodity Cover Crops (acres)	Sussex County	15,139	1,475	22,179
TOTAL (acres)		**83,967**	**52,635**	**142,508**
Nutrient Application Management Core Nitrogen (acres)	New Castle County	7,940	4,794	6,882
	Kent County	46,280	24,338	32,688
	Sussex County	98,701	53,981	91,367

BMP Name	County	Phase II WIP 2025 Goal	2017 Progress	Phase III WIP 2025 Goal
Nutrient Application Management Rate Nitrogen (acres)	New Castle County	0.0	0.0	4,856
	Kent County	0.0	0.0	23,074
	Sussex County	0.0	0.0	64,494
Nutrient Application Management Placement Nitrogen (acres)	New Castle County	7,940	0.0	4,856
	Kent County	46,280	0.0	23,074
	Sussex County	98,701	0.0	64,494
Nutrient Application Management Timing Nitrogen (acres)	New Castle County	7,940	0.0	4,856
	Kent County	46,280	0.0	23,074
	Sussex County	98,701	0.0	64,494
Nutrient Application Management Core Phosphorus (acres)	New Castle County	7,940	4,794	6,882
	Kent County	46,280	24,338	32,688
	Sussex County	98,701	53,981	91,367
Nutrient Application Management Rate Phosphorus (acres)	New Castle County	0.0	0.0	4,856
	Kent County	0.0	0.0	23,074
	Sussex County	0.0	0.0	64,494
Nutrient Application Management Placement Phosphorus (acres)	New Castle County	7,940	0.0	4,858
	Kent County	46,280	0.0	23,074
	Sussex County	98,701	0.0	64,494
Nutrient Application Management Timing Phosphorus (acres)	New Castle County	7,940	0.0	0.0
	Kent County	46,280	0.0	0.0
	Sussex County	98,701	0.0	0.0
TOTAL (acres)		**152,921**	**83,113**	**130,937**
Conservation Tillage (acres)	New Castle County	6,119	4,894	4,314
	Kent County	35,884	21,444	20,679
	Sussex County	77,645	47,057	62,326
High Residue Tillage (acres)	New Castle County	979	4,001	1,078
	Kent County	5,741	20,084	5,170
	Sussex County	12,423	44,008	15,581

BMP Name	County	Phase II WIP 2025 Goal	2017 Progress	Phase III WIP 2025 Goal
Low Residue Tillage (acres)	New Castle County	0.0	0.0	1,078
	Kent County	0.0	0.0	5,170
	Sussex County	0.0	0.0	15,581
TOTAL (acres)		**138,791**	**141,488**	**130,977**
Forest Buffers (acres)	New Castle County	356	0.5	4
	Kent County	2,035	236	256
	Sussex County	4,629	387	431
Grass Buffers (acres)	New Castle County	400	9	497
	Kent County	2,420	3,573	10,275
	Sussex County	5,477	111	2,249
TOTAL (acres)		**15,317**	**4,317**	**13,712**
Pasture Alternative Watering (acres)	New Castle County	31	29	155
	Kent County	113	270	578
	Sussex County	181	391	701
Prescribed Grazing (acres)	New Castle County	110	10	55
	Kent County	393	0.0	0.0
	Sussex County	631	47	84
Grass Buffers on Fenced Pasture Corridor (acres)	New Castle County	0.0	0.0	0.0
	Kent County	0.0	4	10
	Sussex County	0.0	17	20
TOTAL (acres)		**1,459**	**768**	**1,603**
Wetland Restoration (acres)	New Castle County	290	330	1,540
	Kent County	1,660	3,744	9,266
	Sussex County	3,775	1,940	3,368
Wetland Creation (acres)	New Castle County	0.0	0.0	59
	Kent County	0.0	0.0	320
	Sussex County	0.0	0.0	746
Wetland Enhancement and Rehabilitation (acres)	New Castle County	0.0	0.0	2,462
	Kent County	0.0	0.0	16,863
	Sussex County	0.0	0.0	19,973
TOTAL (acres)		**5,725**	**6,014**	**54,597**
Land Retirement (acres)	New Castle County	722	57	260
	Kent County	304	268	574
	Sussex County	784	576	908
TOTAL (acres)		**1,810**	**901**	**1,742**
Tree Planting (acres)	New Castle County	47	10	45
	Kent County	270	250	457
	Sussex County	613	1,617	2,498
TOTAL (acres)		**930**	**1,877**	**3,000**
Soil and Water Conservation Plans (acres)	New Castle County	9,233	9,257	8,705
	Kent County	50,661	52,071	47,238
	Sussex County	106,998	115,300	108,974
TOTAL (acres)		**166,892**	**176,628**	**164,917**

BMP Name	County	Phase II WIP 2025 Goal	2017 Progress	Phase III WIP 2025 Goal
Agricultural Drainage Management (acres)	New Castle County	183	3	13
	Kent County	5,047	1,506	2
	Sussex County	5,616	1,446	3,302
TOTAL (acres)		**10,846**	**2,955**	**3,317**
Non-urban Stream Restoration (feet)	New Castle County	3,207	0.0	0.0
	Kent County	18,321	0.0	0.0
	Sussex County	41,675	12,493	17,000
TOTAL (feet)		**63,203**	**12,493**	**17,000**
Livestock Waste Management Systems (number of structures)	New Castle County	0.0	41	38
	Kent County	5,459	986	5,459
	Sussex County	5,487	2,235	5,487
Poultry Waste Management Systems (number of structures)	New Castle County	0.0	25	20
	Kent County	181,012	140,058	181,012
	Sussex County	899,890	567,752	899,890
TOTAL (number of structures)		**1,091,848**	**711,097**	**1,091,906**
Livestock Mortality Composting (number of systems)	New Castle County	0.0	0.0	1,293
	Kent County	5,707	0.0	5,707
	Sussex County	5,488	0.0	5,488
Poultry Mortality Composting (number of systems)	New Castle County	0.0	0.0	77
	Kent County	181,012	33,256	181,012
	Sussex County	899,890	400,052	899,890
TOTAL (number of systems)		**1,092,097**	**433,308**	**1,093,467**
Barnyard Runoff Control Systems (number of systems)	New Castle County	9	10	9
	Kent County	109	93	109
	Sussex County	397	371	397
TOTAL (number of systems)		**515**	**474**	**515**
Agriculture Stormwater Management (number of systems)	New Castle County	NA[a]	NA	8
	Kent County	NA	NA	96
	Sussex County	NA	NA	349
TOTAL (number of systems)		**NA**	**NA**	**453**
Manure Transport out of watershed (tons)	New Castle County	153	140	153
	Kent County	9,828	80	9,828
	Sussex County	64,099	7,707	64,099
TOTAL (tons)		**74,080**	**7,927**	**74,080**
Dairy Precision Feeding (acres/year)	New Castle County	3	0.0	3
	Kent County	470	0.0	470
	Sussex County	1,406	0.0	1,406
TOTAL (acres/year)		**1,879**	**0.0**	**1,879**
Litter Amendments (acres/year)	New Castle County	0.0	0.0	0.0
	Kent County	0.0	953	969
	Sussex County	0.0	6,258	6,300

BMP Name	County	Phase II WIP 2025 Goal	2017 Progress	Phase III WIP 2025 Goal
Biofilters (acres/year)	New Castle County	8	0.0	0.0
	Kent County	18,101	0.0	0.0
	Sussex County	89,989	0.0	0.0
TOTAL (acres/year)		**108,098**	**7,211**	**7,269**
Forest Harvesting Practices (acres/year)	New Castle County[b]	0.0	0.0	0.0
	Kent County	281	273	281
	Sussex County	1,028	1,022	1,028
TOTAL (acres/year)		**1,309**	**1,295**	**1,309**

Notes:

[a]NA = Not Applicable. Agriculture Stormwater has not been reported in the past, therefore, there are no Phase II goals or 2017 Progress.

bThe goals for forest harvesting practices for New Castle County are included in the developed sector.

Appendix F

Municipal Ordinance Review Survey Letter, Ordinance Survey Example, and Ordinance Survey Summary

UNIVERSITY OF DELAWARE | School of Public Policy & Administration
INSTITUTE FOR PUBLIC ADMINISTRATION

180 Graham Hall
Newark, DE 19716-7380
Phone: 302-831-8971
Fax: 302-831-3488
Email: ipa@udel.edu

September 17, 2018

Mr. Charles Anderson
City Manager
City of Seaford
414 High Street
P.O. Box 1100
Seaford, DE 19973

RE: Request for Updates to 2011 Chesapeake Bay Watershed Ordinance Review

Dear Mr. Anderson:

The University of Delaware Water Resource Center (WRC), a unit of the Institute for Public Administration, is assisting the Delaware Department of Natural Resources and Environmental Control (DNREC) in engaging local towns and jurisdictions in the Chesapeake Bay Phase III Watershed Implementation Plan (WIP). In 2009 and 2011 Delaware developed the Phase I and Phase II WIPs to accompany the Chesapeake Bay nutrient and sediment total maximum daily loads (TMDLs). The WIPs lay out plans for addressing the existing pollutant load to the Bay as well as new pollutant loads from future land use changes. DNREC is currently working collaboratively with multiple partners to develop the Draft Phase III WIP by April 2019.

As part of the Phase III WIP development the USEPA has directed Delaware (one of the seven Chesapeake Bay jurisdictions) to engage local governments in the WIP implementation and to describe local planning goals below the state-major basin scales and in a form best suited to engage local governments in improving water quality in the Chesapeake Bay watersheds. Engagement of and outreach to Delaware's local governments was also an important piece of the Phase I and II WIPs. In 2011, DNREC tasked Tetra Tech with assisting local Delaware municipalities in the Chesapeake Bay watershed to conduct a review of existing local municipal ordinances with regulations pertaining to new development. The goal of the ordinance review was to provide a service to local governments in Delaware by reviewing existing land use ordinances to look for barriers to implementing the Chesapeake Bay WIP as well as to identify potential opportunities for improving communities and allowing more techniques to be used to help property owners address nutrient and sediment loads from new developments. These include techniques such as green infrastructure, low impact development, conservation design, and performance standards that can allow flexibility. Note that the resulting recommendations for consideration of code revisions were not mandatory. They were intended only to provide more flexibility and effectiveness in meeting resource protection goals and regulations. I have attached a copy of the recommendations for your reference.

To further engage local governments, assess progress and identify potential opportunities, WRC will be following up on Tetra Tech's 2011 ordinance assessment and evaluation. This follow-up will take the form of an electronic survey of your choice that will be administered to the towns and jurisdictions located in the Chesapeake Bay watershed. This survey will help to identify any ordinance changes that have been made since the 2011 assessment and recommendations. Again, it is important to note that the recommendations for consideration of code revisions were not mandatory and only intended to provide more flexibility and effectiveness in meeting resource protection goals and regulations.

It is our goal that in partnering with your town and with your completion of the survey we can achieve the development goals of the Phase III WIP and identify opportunities for stormwater management improvements in local towns and jurisdictions. I will be following up with you by providing a survey in the next week. I ask that the survey be completed by October 5, 2018.

Thank you for your time and please contact me at mcorrozi@udel.edu or 302-831-4931 if you have any questions or concerns.

Sincerely,

Martha Corrozi Narvaez
Policy Scientist
Water Resources Center
Institute for Public Administration
University of Delaware

City of Seaford Ordinance Assessment

Start of Block: Introduction

Introduction

In 2011, DNREC hired Tetra Tech, Inc. to review existing land use ordinances to look for barriers to implementing the Chesapeake Bay Phase II WIP. To follow up this assessment, the University of Delaware Water Resources Center is distributing a survey to identify the recommendations that have been implemented or followed-up on by towns.*

Review Doc: Municipal ordinance review for Seaford

*These code revision recommendations were not mandatory and only intended to provide a service to local governments in Delaware. With your cooperation, the state aims to assess the progress toward the development goals of the Phase III WIP and identify opportunities for stormwater management improvements in local towns and jurisdictions.

End of Block: Introduction

Start of Block: Minimize EIA

GOAL 1: Minimize Effective or Connected Impervious Area

Section: **Mitigation of Runoff from Effective Impervious Area**
Does Seaford reference the State of Delaware Sediment and Stormwater Regulations in the subdivision ordinance, or has a formal MOU been developed with the Sussex Conservation District?

[hover to see recommendation]

- ○ Yes (1)
- ○ No (2)
- ○ Not sure (3)

Please provide comments below

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Section: **Mitigation of Runoff from Effective Impervious Area**
Have the zoning and subdivision ordinances been amended accordingly to provide more certainty regarding the allowance of pervious parking surfaces, with special attention to appropriate use, design and installation of pervious parking surfaces in environmentally sensitive areas?

[hover here to see recommendations]

- ○ Yes (1)
- ○ No (2)
- ○ Not sure (3)

Please provide comments below

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Section: **Flexibility in Locating BMP Techniques On-Site**

Does your ordinance explicitly allow LID BMPs in street and parking areas?

[hover to see recommendation]

- ○ Yes (1)
- ○ No (2)
- ○ Not sure (3)

Please provide comments below

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Section: **Street and Right-of-Way Widths**

Have subdivision regulations been amended to allow minor streets to have narrow street pavement and travel lanes widths to help minimize impervious area?

[hover here to see recommendations]

- ○ Yes (1)
- ○ No (2)
- ○ Not sure (3)

Please provide comments below

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Section: **Minimum Parking Requirements**

Does Seaford apply the 9 ft width in non-residential parking areas as well as residential areas?

[hover here to see recommendations]

- ○ Yes (1)
- ○ No (2)
- ○ Not sure (3)

Please provide comments below

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Section: **Incentives for Infill Development and Redevelopment of Existing Areas Over "Greenfield" Development**

Have local zoning and subdivision requirements been amended to include less stringent runoff reduction requirements for proposed development in existing developed areas?

[hover here to see recommendations]

- ○ Yes (1)
- ○ No (2)
- ○ Not sure (3)

Please provide comments below

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End of Block: Minimize EIA

Start of Block: Hydrologic Function

GOAL 2: Preserve and Enhance the Hydrologic Function of Unpaved Areas

Section: **Encouraging or Requiring Stream Buffers**

Have local zoning and subdivision requirements been amended to encourage or require buffers of 60 feet for secondary waterbodies and 100 feet for primary waterbodies for new development proposals?

[hover here to see recommendations]

- ○ Yes (1)
- ○ No (2)
- ○ Not sure (3)

Please provide comments below

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Section: **Minimizing Disturbance in Environmentally Sensitive Areas**

Have local zoning and subdivision requirements been amended to address the protection of environmentally sensitive areas such as riparian areas, erodible soils, steep slopes, and areas of high soil infiltration where feasible?

[hover here to see recommendations]

- ○ Yes (1)
- ○ No (2)
- ○ Not sure (3)

Please provide comments below

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End of Block: Hydrologic Function

Start of Block: Harvest Rainwater

GOAL 3: Harvest Rainwater

Section: **Explicitly Allowing or Encouraging Rainwater Harvest**
Is rainwater harvesting explicitly allowed in ordinances?
[hover here to see recommendation]

- ○ Yes (1)
- ○ No (2)
- ○ Not sure (3)

Please provide comments below

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End of Block: Harvest Rainwater

Start of Block: Allow and Encourage Multi-Use Stormwater Controls

GOAL 4: Allow and Encourage Multi-Use Stormwater Controls

Section: **Flexibility in Locating BMP Techniques On-site**

Does your ordinance explicitly allow LID BMPs in street and parking areas?

[hover here to see recommendations]

- ○ Yes (1)
- ○ No (2)
- ○ Not sure (3)

Please provide comments below

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End of Block: Allow and Encourage Multi-Use Stormwater Controls

Start of Block: Manage Stormwater to Meet WIP and DNREC Regulations

GOAL 5: Manage Stormwater to Meet WIP and DNREC Regulations

Section: **Meeting New DNREC Stormwater Regulations**

Does Seaford reference the State of Delaware Sediment and Stormwater Regulations in the subdivision ordinance or has a formal MOU been developed with the SCD?

[hover here to see recommendations]

- ○ Yes (1)
- ○ No (2)
- ○ Not sure (3)

Please provide comments below

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Section: **Off-site Mitigation**

Does Seaford require developers to use DNREC's Nutrient and Sediment Loading Assessment Protocol tool during the planning process before presenting the site plan to the planning and zoning commission for review?

[hover here to see recommendations]

- ○ Yes (1)
- ○ No (2)
- ○ Not sure (3)

Please provide comments below

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End of Block: Manage Stormwater to Meet WIP and DNREC Regulations

Start of Block: Manage Construction Site Stormwater to Meet WIP and DNREC Regulations

GOAL 6: Manage Construction Site Stormwater to Meet WIP and DNREC Regulations

Section: **Meeting New DNREC Sediment and Erosion Control Regulations**
Does Seaford reference the State of Delaware Sediment and Stormwater Regulations in the subdivision ordinance or has a formal MOU been developed with the SCD?

[hover here to see recommendations]

- ○ Yes (1)
- ○ No (2)
- ○ Not sure (3)

Please provide comments below

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End of Block: Manage Construction Site Stormwater to Meet WIP and DNREC Regulations

Start of Block: Manage On-Site Wastewater Systems to Met WIP and DNREC Regulations

GOAL 7: Manage On-Site Wastewater Systems to Met WIP and DNREC Regulations

Seaford does not have specific on-site wastewater regulations as all new developments are connected to public water and sewer.

Please provide comments below

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End of Block: Manage On-Site Wastewater Systems to Met WIP and DNREC Regulations

Start of Block: Respondent Info

Respondent information

Your name

_____

Your position/title

_____

Your email

_____

Your phone number

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End of Block: Respondent Info

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TO: Jim Sullivan, DNREC

FROM: Martha Narvaez, Water Resources Center, University of Delaware

CC: Brittany Sturgis, Marcia Fox, Eugenia Hart

DATE: October 19, 2018

RE: University of Delaware, Water Resources Center, Chesapeake Bay WIP III Assistance: Updates to 2011 Chesapeake Bay Watershed Ordinance Review

At the request of DNREC staff (Jim Sullivan, Brittany Sturgis and Marcia Fox) the University of Delaware Water Resources Center (WRC) assisted DNREC in engaging local towns and jurisdictions in the Chesapeake Bay Phase III Watershed Implementation Plan (WIP).

In 2011, DNREC tasked Tetra Tech with assisting local Delaware municipalities in the Chesapeake Bay watershed to conduct a review of existing local municipal ordinances with regulations pertaining to new development. The goal of the ordinance review was to provide a service to local governments in Delaware by reviewing existing land use ordinances to look for barriers to implementing the Chesapeake Bay WIP as well as to identify potential opportunities for improving communities and allowing more techniques to be used to help property owners address nutrient and sediment loads from new developments. It is important to note that the recommendations for consideration of code revisions were not mandatory and only intended to provide more flexibility and effectiveness in meeting resource protection goals and regulations.

To further engage local governments, assess progress and identify potential opportunities, WRC reviewed Tetra Tech's 2011 ordinance review data, developed an electronic survey for each town/county and provided a summary (via this memo) of the information collected from the responses. It is the goal of this local government outreach and with the completion of the survey DNREC can achieve the development goals of the Phase III WIP and identify opportunities for stormwater management improvements in Delaware's local towns and jurisdictions in the Chesapeake Bay watershed.

METHODOLOGY

WRC reviewed Tetra Tech's 2011 ordinance review and recommendations. These included the following towns/counties:

- Bethel
- Blades
- Bridgeville
- Delmar
- Georgetown
- Greenwood
- Kent County
- Laurel
- Seaford
- Sussex County

WRC implemented a survey to the ten towns/counties that were identified in Tetra Tech's 2011 ordinance and assessment evaluation. The intent of the survey was to identify any ordinance changes that have been made since Tetra Tech's 2011 assessment and recommendations.

WRC sent an initial email and letter to the towns/counties named above on September 17, 2018. The email included an attached letter that clearly described WRC's role in the project and DNREC's goals for engaging local towns in the Chesapeake Bay WIP process (the letter has been provided to DNREC previously in an email attachment). The letter was also sent via USPS mail in order to ensure all recipients received the letter.

A follow-up to the initial email (September 17, 2018) was sent on October 1, 2018. In this email, WRC requested the towns/counties complete and return the survey (survey link was provided in email) by October 5, 2018. The survey for each town has been provided as a separate document.

RESPONSES
WRC received the following responses from the ten towns.

Survey Completion
- Bethel
- Delmar
- Georgetown
- Kent
- Laurel
- Seaford

Alternative Responses
Greenwood:
October 10, 2018, Martha Narvaez (WRC) spoke with Hal Godwin (Greenwood). Hal has only been in his position (Town Manager) since February 2018. He stated he does not have the knowledge to complete the survey since he has been there a limited amount of time. It would take extensive research and work to find the answers. According to Hal, Greenwood's comprehensive plan has not been updated since 2008. Roy Lopata will begin updating the comprehensive plan in the next few weeks/months. Hal cannot fill out the survey, but it is his best guess that no ordinance changes have been made since 2008. According to Hal, stormwater management is not an issue in the town "because it's flat."

Recommendation: Have Roy review Tetra Tech's recommendations to identify if any of these recommendations can be incorporated into the comprehensive plan updates.

Bridgeville:
Jesse Savage responded via email and noted that he was not the Town Manager when Tetra Tech did their study. He noted, he will have to review things and see what has been done in response to Tetra Tech's findings. At this time, completing the survey is not something Jesse/Bridgeville can do.

Recommendation: Follow up with Bridgeville in a few months to see if any changes have been made.

No Responses
- Sussex County
- Blades

SUMMARY OF SURVEY RESPONSES

Six out of ten towns completed the survey. Detailed information summarizing the responses is included below. The detailed answers are also available in the submitted excel file. Recommendations that have been incorporated by the town/county are highlighted in blue.

BETHEL

According to Bethel's responses, most (9 of 15) were that no changes have been made based on Tetra Tech's recommendations. There were three recommendations that have since been incorporated/updated, these include:

- **Onsite Wastewater: Have there been discussions with Sussex County about a central sewer?**
  Response: Yes.
- **Onsite Wastewater: Do you encourage community systems and/or require advanced treatment for all new and replacement systems?**
  Response: Yes. The State requires upgraded septics for all properties within 1000 feet of Broad Creek.
- **Onsite Wastewater: Does the Town of Bethel confirm that a septic system can be placed on a parcel before it is subdivided and recorded?**
  Response: Yes.

There were three answers that respondent answered "unsure" on the survey, these include:

- Flexibility in Locating BMP Techniques On-Site: Does your ordinance explicitly allow LID BMPs in street and parking areas?
- Incentives for Infill Development and Redevelopment of Existing Areas Over "Greenfield" Development: Are there less stringent runoff reduction requirements for proposed development in existing developed areas?
- Encouraging or Requiring Stream Buffers: Have local zoning and subdivision requirements been amended to encourage or require buffers of 60 feet for secondary waterbodies and 100 feet for primary waterbodies for new development proposals?

DELMAR

According to Delmar's responses, most (11 of 14) were that no changes have been made based on Tetra Tech's recommendations. There were three recommendations that have since been incorporated/updated, these include:

- **Clustering and Open Space Development Design: Has Delmar narrowed the setback requirements?**
  Response: Yes. A minimum of 20% of the entire project must be retained in open area and deeded for the common use of residents of the development.

- **Off-Site Mitigation: Does Delmar require developers to use DNREC's Nutrient and Sediment Loading Assessment Protocol tool during the planning process before presenting the site plan to the planning and zoning commission for review?**
  Response: Yes. The Town Engineers require DNREC's protocol, although it is not formally included in the Town's zoning code. The reference will be included in the next code amendment review.

- **Meeting New DNREC Sediment and Erosion Control Regulations**
  Does Delmar reference the State of Delaware Sediment and Stormwater Regulations in the subdivision ordinance or has a formal MOU been developed with the Sussex Conservation District?
  Response: Yes. The Town follows the State's regulations. Will be included in the next code amendment

There were several comments included on several questions where Delmar provided further clarification to a "no" answer, these include:

- Mitigation of Runoff from Effective Impervious Area: Does Delmar reference the State of Delaware Sediment and Stormwater Regulations in its planning and zoning regulations?
  Response: No, comment: Sussex Conservation District reviews all of the town's stormwater management project plans.
- Street and Right-of-Way Widths: Have planning and zoning regulations been amended to allow minor streets to have narrow street pavement and travel lane widths to help minimize impervious area?
  Response: No, comment: To be reviewed and further consideration given during the next code amendment.
- Meeting New DNREC Stormwater Regulations: Does Delmar reference the State of Delaware Sediment and Stormwater Regulations in the Planning and Zoning Regulations?
  Response: No, comment: Will be making the reference in the next amendment, scheduled for 2019.

Note: In the section titled, "Manage Construction Site Stormwater to Meet WIP and DNREC Regulations" Delmar commented: The Town primarily require annexation to be connected to it's central wastewater system. When annexation is not achievable, on rare occasions when a property experiencing failing septic system is just outside of the Town boundaries, and in close proximity to our mains or pump stations, the Town will grant permission to connect at an out of Town service rate.

GEORGETOWN

According to Georgetown's responses, most (12 of 13) were that no changes have been made based on Tetra Tech's recommendations. One recommendation has since been incorporated/updated, and includes:

- **Mitigation of Runoff from Effective Impervious Area: Does Georgetown reference the State of Delaware Sediment and Stormwater Regulations in its planning and zoning ordinance? Response: Yes. The regulations are referenced in Article XXVII Source Water Protection Areas Section 230-227 regarding Redevelopment. No reference has been made in the Subdivision Ordinance, Chapter 194.**

There was one comment included on a question where Georgetown provided further clarification to a "no" answer, this includes:

- Minimum Parking Requirements: Has Georgetown amended their high minimum parking space and drive aisle requirements?
  Response: No, comment: The Town has added the ability to apply for a reduction of required parking, up to 20%, from the Town Manager per Section 230-148.1.

KENT COUNTY

According to Kent County's responses, most (14 of 15) were that no changes have been made based on Tetra Tech's recommendations. One recommendation has since been incorporated/updated, and includes:

- **Mitigation of Runoff from Effective Impervious Area: Does Kent County reference the State of Delaware Sediment and Stormwater Regulations in its subdivision ordinance? Response: Yes.**

There was one comment included on a question where Kent County provided further clarification to a "no" answer, this includes:

- Minimizing Disturbance in Environmentally Sensitive Areas: Have local subdivision provisions regarding passive open space been amended to include erodible soils, steep slopes, and areas of high soil infiltration as among those that could count toward satisfaction of passive open space requirements?
  Response: No, comment: There is no minimum passive open space requirement. 180-67.D(4) provides: Within the growth zone, as identified by the Kent County Comprehensive Plan, the Commission may require that up to 15% maximum of the gross area in the development be so dedicated or reserved. The Commission may require that up to 35% of the gross area in the development be so dedicated or reserved in residential development outside of the growth zone.

LAUREL

According to Laurel's responses, most (9 of 13) were that no changes have been made based on Tetra Tech's recommendations. One recommendation, the answer was "unsure" while there were two recommendations that have since been incorporated/updated, these include:

- **Flexibility in Locating LID Techniques in Designated Landscape and Open Space Areas: Has flexibility been provided in locating LID techniques in required landscape and open space areas, as well as right-of-ways, where they can be most effective in managing water quality, drainage, and flooding impacts?**
  Response: Yes.

- **Meeting New DNREC Stormwater Regulations: Does Laurel reference the State of Delaware Sediment and Stormwater Regulations in the subdivision ordinance?**
  Response: Yes, the reference is to all State of Delaware Regulations.

There were several comments included on several questions where Laurel provided further clarification to a "no" or "unsure" answer, these include:

- Mitigation of Runoff from Effective Impervious Area: Does Laurel reference the State of Delaware Sediment and Stormwater Regulations in its subdivision ordinance?
  Response: No, comment, we do however require on all site plans submitted that state and local laws/requirements are mandated.

- Minimum Parking Requirements: Has Laurel amended their high minimum parking space and drive aisle requirements?
  Response: No, comment: We will be updating our zoning ordinance in the near future and will look at this when completing updates.

- Explicitly Allowing or Encouraging Rainwater Harvest: Is rainwater harvesting explicitly allowed in ordinances?
  Response: No, comment: We do permit this, however it is not in the subdivision or zoning ordinance, this is something that we permitted separately.

- Off-Site Mitigation: Does Laurel require developers to use DNREC's Nutrient and Sediment Loading Assessment Protocol tool during the planning process before presenting the site plan to the planning and zoning commission for review?
  Response: Not Sure

- Meeting New DNREC Sediment and Erosion Control Regulations: Does Laurel reference the State of Delaware Sediment and Stormwater Regulations in the subdivision ordinance?
  Response: No, comment: We mention all State of Delaware Regulations are required to be met.

SEAFORD

According to Seaford's responses, most (10 of 11) were that no changes have been made based on Tetra Tech's recommendations. There was one recommendation that has since been incorporated, this includes:

- **Mitigation of Runoff from Effective Impervious Area: Does Seaford reference the State of Delaware Sediment and Stormwater Regulations in the subdivision ordinance, or has a formal MOU been developed with the Sussex Conservation District?**
  Response: Yes, We have an MOU with SCD - they review development projects in Seaford.

There were two comments included on questions where Seaford provided further clarification to a "no" answer, these include:

- Minimum Parking Requirements: Does Seaford apply the 9 ft width in non-residential parking areas as well as residential areas?
  Response: No, comment: Minimum parking space = 10'x20'
- Minimizing Disturbance in Environmentally Sensitive Areas: Have local zoning and subdivision requirements been amended to address the protection of environmentally sensitive areas such as riparian areas, erodible soils, steep slopes, and areas of high soil infiltration where feasible?
  Response: No, comment: We have adopted a well head and excellent groundwater recharge ordinance.

Note: In the section titled, "Manage Construction Site Stormwater to Meet WIP and DNREC Regulations" Seaford commented: All new development must connect to central sewer system.

RECOMMENDATIONS

WRC recommends the following actions based on the survey results:

- Overwhelmingly, the towns have not incorporated Tetra Tech's ordinance recommendations. Reach out to the towns/counties and identify reasons/obstacles to changing/updating ordinances.

- Follow up with the four towns/county that did not complete the survey to identify ways that DNREC can assist.

- Follow up with the towns on specific changes that can be made or on specific comments noted in the survey results.

- Continue to work with the Chesapeake Bay Program's Local Leadership Workgroup to use the available resources and implement the practices identified by the workgroup in the local governments in Delaware.

- Identify if there is a need for the local governments to participate in a Chesapeake Bay Local Government Training. This training would discuss issues relevant to the towns/counties (TMDLs, WIPs, MS4s, etc.) and also engage them in actions they can help achieve the Chesapeake Bay WIP goals as well as secure the necessary funding.

WRC is willing to continue work with the local governments as it relates to the Chesapeake Bay Phase III WIP and DNREC's needs regarding local government outreach and pollution reduction in the Chesapeake Bay watershed.

Appendix G

Local Government Mailer

DELAWARE'S PHASE III WIP INFORMATION FACT SHEET

LOCAL GOVERNMENTS' ROLE IN THE CHESAPEAKE BAY CLEANUP EFFORT

On Dec. 29, 2010, the U.S. Environmental Protection Agency (EPA) established the Chesapeake Bay Total Maximum Daily Load (TMDL), a historic and comprehensive cleanup plan with accountability features to guide federal, state and local actions as they clean up the Chesapeake Bay and the streams, creeks and rivers that feed into it. Specifically, the TMDL calls for a 25% reduction in nitrogen, 24% reduction in phosphorus and 20% reduction in sediment delivered to the bay. The TMDL was required under the federal Clean Water Act and responded to consent decrees in Virginia and the District of Columbia from the late 1990s.

THE CHESAPEAKE BAY WATERSHED:
Spans 64,000 square miles and includes the District of Columbia and portions of New York, Pennsylvania, Delaware, Maryland, Virginia and West Virginia.

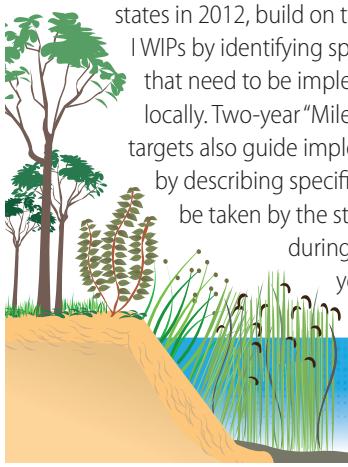
POPULATION:
18 million residents
(2010 Census)

UNITS OF LOCAL GOVERNMENT:
+/- 1,800

Local governments throughout the Chesapeake Bay watershed, along with federal and state government, nonprofit organizations, private businesses and citizens, are making significant progress restoring and protecting the health of local waterways and the bay. By taking actions such as upgrading wastewater treatment plants, reducing stormwater runoff and restoring streambanks to reduce erosion, local governments are ensuring that waterways are less polluted, communities can attract new businesses, home values increase and drinking water quality is protected. Although this progress is commendable, many waterways throughout the region remain impaired. Stakeholders must continue working to meet the pollution-reduction targets established in the Chesapeake Bay TMDL.

Actions Guided by State-Developed Watershed Implementation Plans

Watershed Implementation Plans (WIPs) created by each state serve as a guide for meeting the pollution-reduction targets in the TMDL. Phase I WIPs, developed in 2010, describe actions the states need to take by 2017 and 2025. Phase II WIPs, developed by the states in 2012, build on the initial Phase I WIPs by identifying specific activities that need to be implemented locally. Two-year "Milestone" targets also guide implementation by describing specific actions to be taken by the state or others during the next two-year period.



How Are We Doing?

Bay Program partners have conducted a "Midpoint Assessment" to evaluate progress toward the 2017 goal of having practices in place to meet 60% of the overall nitrogen, phosphorus and sediment reductions required in the TMDL. As part of this assessment, the suite of computer analysis models that informs ongoing restoration actions, commonly referred to as the Chesapeake Watershed Model or "Model," was enhanced. The revised model allows reporting of newly approved pollution-reduction practices, and now includes updated land use and land cover data that more accurately represent what's happening on the ground. Finally, the Model has been calibrated using almost three decades' worth (1985 to 2013) of water quality monitoring data from a watershed-wide network of more than 200 monitoring stations (tidal and nontidal).

What Do Local Governments Need to Do?

Ensure local actions are reported to the state. Each state must inform EPA about actions taken during the last year to reduce nutrient and sediment pollution. States in turn need local governments, farmers and others working at the local level to report actions they've taken so the state can report the full extent of actions taken within its boundaries. This information, along with other data such as agricultural census information and the number and type of septic systems, is fed into the Model to assess progress made towards the overall pollution-reduction targets and to inform development of the next set of two-year milestones.

Help develop the state's WIP. Local governments play a vital role in implementing a state's WIP. EPA expects each state to establish measurable local planning goals. These local planning goals, and strategies for achieving them, will be articulated in each state's Phase III WIP.

It is critical that local government leaders are involved in developing the WIP to ensure the plans are realistic, reflect local priorities, will benefit local communities and clearly identify the resources (e.g., funding, technical support) that are needed to get the job done.

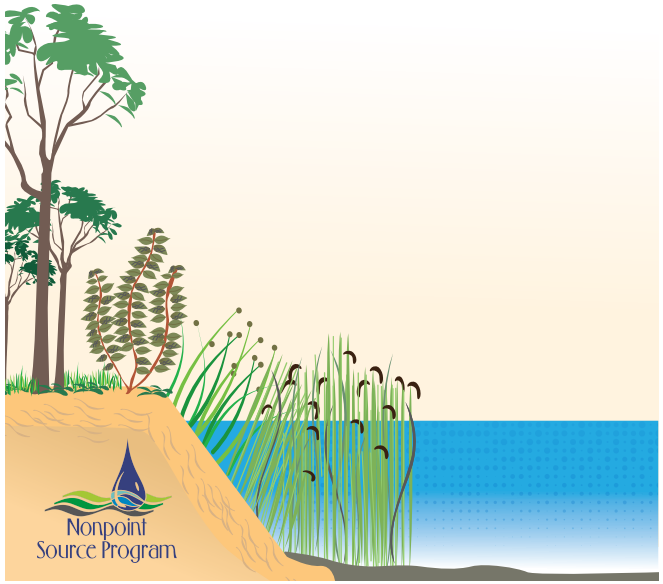
For more information contact James Sullivan at James.Sullivan@state.de.us or (302) 739-9153

DELAWARE

CHESAPEAKE

PROGRESS

Cleaner
Water for Delaware's
Future



Enter Return
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Addressee
City, State, Zip

Local Government's role in cleaning Delaware's waterways leading to the Chesapeake Bay

In this together!

Phase III Chesapeake Bay Watershed
Implementation Plan (WIP)
General Information Fact Sheet

Appendix H

Communications Subcommittee Members and Strategic Communications Plan

Communications Subcommittee

Communications Subcommittee Members

Name	Organization
Abby L. Shepard	DNREC
Alex Huey	DNREC
Alice Mohrman	NWA
Beth Wasden	NWA
Brenna Goggin	DNS
Brittany Sturgis	DNREC
Carol Riggs	DNREC
Clare Sevcik	DNREC
Dastina Wallace	USDA
Emily Seldomridge	DelDOT
James C. Sullivan	DNREC
Jen Nelson	Resource Smart LLC
Jennifer Volk	UD
John Petersen	DDA
Kesha Braunskill	DDA
Lori Brown	DNREC
Marcia Fox	DNREC
Matt Babbitt	DNS
Philip Miller	DNREC
Sara L. Wozniak	DNREC
Sharon Webb	DNREC
Tyler S. Monteith	DNREC

Chesapeake Bay Phase III WIP
Strategic Communications Plan

Mission: Create an informed, diverse community of citizens and local leaders with the knowledge and resources to achieve the goals of the Chesapeake Bay Phase III Watershed Implementation Plan (WIP).

Communications Subcommittee: This group was created to meet quarterly (or as needed) to implement the Phase III WIP Strategic Communications Plan. The subcommittee consists of various local, state, and federal partners that share information and resources for conducting public outreach efforts that support the goals of the Phase III WIP. The subcommittee has worked together to develop this Strategic Communications Plan and encourages the involvement and input of other organizations and agencies with similar goals.

Communication Channels:
Methods for sharing information and reaching the public and stakeholders.

- Websites
- Social Media
- Written Press
- Handouts
- Email
- Events
- Workshops
- Presentations
- Interviews
- TV/Radio
- Newsletter
- Mail

Partners:
List of partners that have been actively involved or invited to participate in the Communications Subcommittee as well as partners who will be invited for future participation.

- Chesapeake Bay Program (CBP)
- Community Leaders
- DE Department of Agriculture (DDA)
- DE Department of Transportation (DelDOT)
- Delaware Master Gardeners
- Delaware Nature Society (DNS)/Abbotts Mill Nature Center
- Delaware State University (DSU)
- Delmarva Poultry Industry
- Elected Officials
- Environmental Protection Agency (EPA)
- Farm Service Agency
- Friends of the Bohemia
- Kent Conservation District (KCD)
- Nanticoke Watershed Alliance (NWA)
- Nanticoke Watershed Conservancy
- Natural Resources Conservation Service (NRCS)
- New Castle Conservation District (NCCD)
- Salisbury University
- Shore Rivers
- Sussex Conservation District (SCD)
- The Nature Conservancy
- Trap Pond State Park
- University of Delaware (UD)
- US Department of Agriculture (USDA)
- Delaware Local Governments
  - Bethel
  - Blades
  - Bridgeville
  - Delmar
  - Farmington
  - Georgetown
  - Greenwood
  - Hartly
  - Laurel
  - Middletown
  - Kent County
  - New Castle County
  - Seaford
  - Sussex County

Goal I: Citizen Stewardship - Increase the number of informed and mobilized citizen volunteers that have the understanding, knowledge, and skills needed to enhance the health of their local watersheds.

Audience: Community members/stakeholders

Messages:

- Define nutrient and sediment pollution and their impacts on water quality.
    - Nutrient and sediment pollution can lead to the poor health of waterways and aquatic life.
    - There are ways everyone can reduce nutrient and sediment pollution.
    - Human activity directly affects the water quality in rivers, streams, ponds, lakes, and bays.
- Provide opportunities for learning about voluntary activities that support the WIP.
- Provide resources with information on voluntary activities that support the WIP.
    - Creating rain gardens
    - Planting buffers and trees
    - Installing pervious surfaces
    - Volunteering for stream cleanups or monitoring
    - Maintaining, upgrading, or replacing septic systems
    - Reducing use of lawn chemicals and fertilizers
    - Using rain barrels
    - Stop pouring harmful chemicals down the drain
    - Cleaning up pet waste
    - Composting
    - Choosing native plants
    - Increasing pollinator habitat
- Quantify the value of voluntary activities (share numbers with local officials when possible).
- Encourage the use of available funding to support voluntary activities.

Strategy:

- Websites
    - Regularly update DNREC, Delaware Watersheds, and Nanticoke Watershed Alliance (NWA) websites with information identifying ways the public can improve water quality personally and how those efforts aid in reaching our WIP Phase III goals.
    - Regularly update DNREC, Delaware Watersheds, and NWA websites with funding opportunities, projects, and programs that can assist stakeholders in implementing practices that aid in reaching the goals of the Phase III WIP.
    - Request materials/information from partners and provide them with updated materials for their websites.
- Social Media
    - Maintain an active social media presence through DNREC, Delaware Watersheds, and NWA social media platforms.
    - Share appropriate messaging from partners through DNREC, Delaware Watersheds, and NWA social media platforms.
    - Utilize innovative social media campaigns and/or contests to increase impressions and interactions with the public through DNREC, Delaware Watersheds, and NWA social media platforms.
- Outreach
    - Participate/exhibit at public events, such as the Reclaim Our River Program, Clean Water Rally, Delaware State Fair, Coast Day, and the Blackbird Creek Fall Festival.
    - Host workshops and lectures about practices that would interest the public and serve as a tool to improve water quality.
    - Host workshops and/or informative lectures for groups and organizations explaining the purpose and goals of the Phase III WIP, the tools available, and the benefits of implementing practices that improve water quality and help get us closer to meeting Phase III WIP Goals.

    - Provide innovative opportunities for citizens and local leaders to connect with and understand the importance of Delaware's waterways and the need to improve them.
- Press
    - Issue media alerts and press releases about upcoming events.
    - Participate in interviews with local media as requested.
- Email
    - Share a quarterly newsletter highlighting events and activities going on in the Chesapeake Bay (CB) Watershed, both locally and regionally.
    - Deliver updates from the CB Communications Committee to the Communications Subcommittee and stakeholders.
- Communications Materials
    - Update existing materials
    - Distribute materials at outreach events, libraries, and to State Service Centers.
- Hold contests, such as the Delaware Watersheds Photo Contest, to raise awareness about the importance of improving water quality.

Strategy	**Description**	**Status**	**Responsible Organization(s)**	**Outputs/Goals/ Timing**
Website Updates	Maintain and update their websites with information that support the goals of the Phase III WIP.	Existing and continuous	DNREC NWA	Each partner will complete this biannually.
Social media	Maintain and update their social media accounts with information that support the goals of the Phase III WIP	Existing and continuous	DNREC NWA	All partners combined will host three social media campaigns or contests per year. Each partner will complete weekly posts.
Outreach	Host or participate in workshops, events, contests, and presentations	Existing and continuous	DNREC NWA	All partners combined will participate in 12 outreach activities annually.
Press	Issue media alerts and press releases and participate in interviews pertaining to the Phase III WIP	Existing and continuous	DNREC	DNREC will participate in six media related activities annually.
Email	Share information that supports the goals of Phase III WIP via email	Existing and continuous	DNREC NWA	All partners combined will share information through email on a quarterly basis.
Communications materials	Distribute updated Phase III WIP related communications materials	Existing and continuous	DNREC NWA	All partners combined will evaluate annually and update as needed.

Goal II: Diversity - Identify minority stakeholder groups not currently represented in the leadership, decision-making, or implementation of current conservation and restoration activities. Create meaningful opportunities and programs to recruit and engage these groups.

Audience: Minorities and underserved communities

Messages:

- All messages listed in Goal I: Citizen Stewardship (see above).
- Provide access and meaningful opportunities and programs that reach underserved communities.
- Develop non-English materials for distribution (i.e. Spanish fish consumption advisory signs and Spanish nonpoint source pollution reduction materials).

Strategy:

- All strategies listed in Goal I: Citizen Stewardship (see above).
- Utilize tools like EJ Screen to identify underserved communities for targeted efforts.
- Provide outreach opportunities and programs that foster hands-on involvement, such as tree plantings and cultivating/planting submerged aquatic vegetation.
- Utilize diversity sign in sheets at workshops and meetings to track diversity participation.
- Include optional diversity demographic questions on volunteer forms, surveys, questionnaires, etc. NWA will include these types of questions on their online volunteer registration forms.
- Develop non-English communications materials to post on websites and distribute.

Strategy	**Description**	**Status**	**Responsible Organization(s)**	**Outputs/Goals/ Timing**
Identify and prioritize underserved communities	Use EJ Screen tool to identify and rank communities in CB	Existing and continuous	DNREC	DNREC will reassess annually.
Create outreach activities targeted to underserved communities	Evaluate efforts to target underserved communities when conducting outreach activities	Existing and continuous	DNREC	DNREC will reassess annually.
Use diversity sign-in sheets	Partners collect gender and ethnicity of meeting, workshop, and presentation participants	Existing and continuous	DNREC NWA	All partners combined will use as outreach opportunities are scheduled.
Develop and/or distribute non-English communications materials	Partners will determine what is currently available and distribute; Partners will determine feasibility of creating new non-English materials	Existing and continuous	DNREC DelDOT NWA	All partners combined will reassess annually.

Goal III: Local Leadership – Continue to inform local leaders and officials about the Phase II WIP and process, the role they can play, and potential funding available to them. Provide them with information about the potential benefits to water resources though the implementation of best management practices and how efforts will benefit their community and the watershed.

Audience: Local officials and leaders

Messages:

- Water quality related messaging
    - Provide current data on the status of Delaware water quality.
    - Help them understand the reasons for improved management of activities that impact water quality.
    - Help them understand the value of improved water quality for Delawareans (i.e. Healthy watersheds are good for the economy, enhance the quality of local human life, and improve public health).
- Phase III WIP related messaging
    - Provide opportunities for learning about the Phase III WIP and for public involvement in the process.
    - Clearly define the Phase III WIP goals and the necessary activities, regulations, and policies to accomplish those goals.
    - Help local governments understand the importance of their involvement during Phase III WIP efforts so their local priorities and constraints are considered.
    - Provide information about available funding.
    - Provide information and resources for stakeholders affected by regulations and/or policies that are included in the Phase III WIP.
    - Encourage the use of EPA tools developed for planning and being used as part of the Phase III WIP process.
    - Make the results of the Phase III WIP available, when possible.
- BMP implementation and funding related messaging
    - Inform local governments that they may be able to take credit for existing practices and programs that aren't yet captured though progress.
    - Explain the changes and improvements to the current Bay Model. The model now better reflects more refined local land use data and has an improved and constantly updating suite of available BMPs to reflect the most current science.
    - Encourage the use of available tools developed by the EPA to help with implementation planning and the decision-making processes.

Strategy:

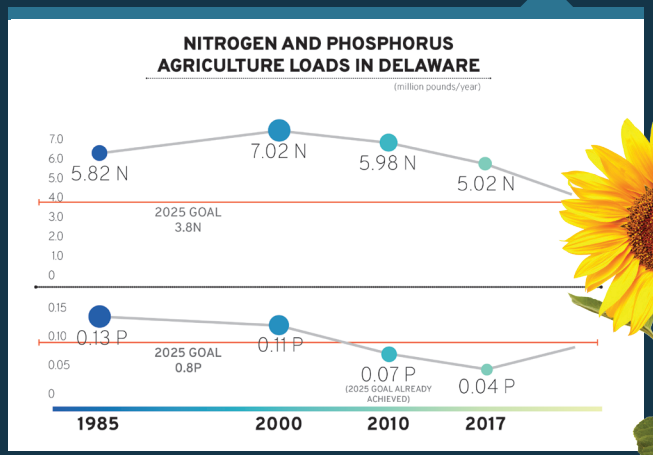
- Hold Phase III WIP meetings at different scales to encourage stakeholder understanding and involvement.
    - Large watershed-wide informational meetings to provide updates and opportunities for involvement in targeted groups.
    - WIP Steering Committee meetings to determine the directions that sectors will take in the development of the Phase III WIP.
    - Agricultural and Developed Sector Steering Committee meetings for stakeholders to be directly involved with determining goals and methods to reach them.
- Provide an online public comment period for the Phase III WIP.
- Use the following decision support tools to develop strategies and target efforts:
    - CAST

    - Tableau visualization
    - Co-benefits tool
    - EJ Screen
- Produce local government mailers on what local governments need to know about the Phase III WIP.
- Serve on Local Engagement Action Team (WEAT), Chesapeake Bay Communications Committee (CBCC), and Local Government Advisory Committee (LGAC).
- Meet one-on-one with local government officials to discuss their role and voluntary activities that support the Phase III WIP as necessary.
- Host or share webcasts and/or webinars that support the goals of the Phase III WIP.
- Website Communication:
    - Update DNREC and Delaware Watersheds websites to inform local leaders of how their efforts can aid Delaware in reaching the Phase III WIP goals.
    - Update DNREC and Delaware Watersheds websites with information about programs and funding resources that could aid local governments in implementing projects that support the Phase III WIP.

Strategy	**Description**	**Status**	**Responsible Organization(s)**	**Outputs/Goals/ Timing**
Stakeholder meetings	Host WIP Steering Committee and Sector meetings	Existing and continuous	DNREC	DNREC will host these meetings biannually.
Direct mailings	Send informational mailings to local governments	Existing and continuous	DNREC	DNREC will send mailings biannually.
WIP committees	Serve on WEAT, LGAC, and CBCC	Existing and continuous	DNREC	DNREC will participate in these committee meetings as scheduled and will reassess its participation annually.
Meet one-on-one with local government officials	Discuss with local officials their role in the Phase III WIP and voluntary activities that support the Phase III WIP	Existing and continuous	DNREC	DNREC will meet with local government officials as necessary and as requested.
Host or share webcasts	Provide local leaders and officials with viewings and/or information on webcasts that support the goals of the Phase III WIP	Existing and Continuous	DNREC	DNREC will provide information on webcasts four times a year.
Websites	Provide resources on support, guidance, and funding pertaining to the Phase III WIP	Existing and continuous	DNREC	DNREC will reassess the content of its websites biannually.

Appendix I

WIP Pamphlet for Ag Week



You're Making a Difference!

DE farmers have been implementing BMPs for over 30 years—and pollution prevention efforts are paying off. By 2017, DE had already met some (75% N) or all (100% P) of its 2025 reduction goals (see graph). Even though farmers doubled production since 1985, they have effectively controlled the N and P levels during this 30-year period[1]. This shows that DE farmers' accelerated rate of BMP installation is keeping up with production.

1 Keisman, J.L.D., Devereux, O.H., LaMotte, A.E., Sekellick, A.J., and Blomquist, J.D., 2018, Manure and fertilizer inputs to land in the Chesapeake Bay watershed, 1950–2012: U.S. Geological Survey Scientific Investigations Report 2018–5022, 37 p., https://doi.org/10.3133/sir20185022.

Cover Crops

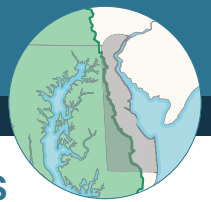
DE also encourages farmers to install more cover crops, which can trap leftover nutrients during the off-season while providing other benefits (see below). To help enroll and establish cover crops (small grain or mixed cover) on every eligible acre, DE is launching a new cost-share program in combination with cover crop programs sponsored by the Natural Resources Conservation Service. Cost share reduces the expense of essential inputs such as seed, fuel, time and mechanical equipment. Farmers can apply for as much as $50/acre to grow mixed stands of soil-conditioning plants and up to $30/acre for grains that will perform a similar function as a commodity harvested in time to plant soybeans.

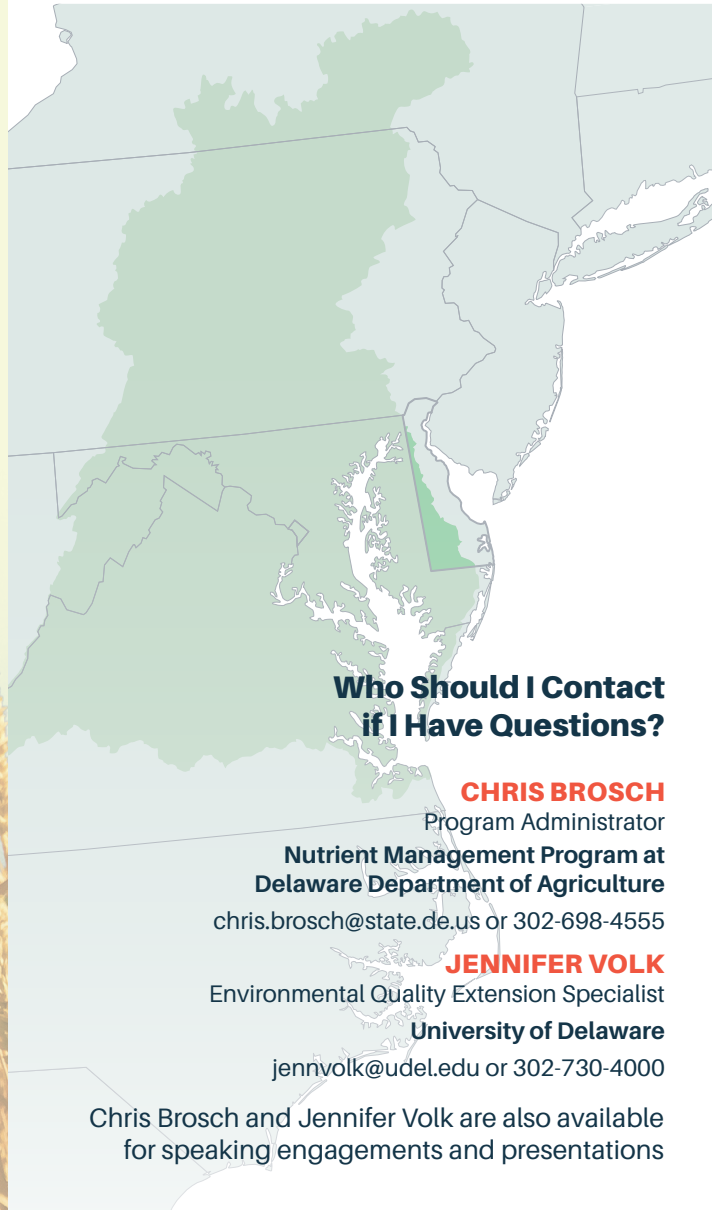
Benefits of Cover Crops

- Protect soil from water runoff
- Protect soil from erosion by harsh winter winds and rains
- Reduce or suppress weed growth
- Manage certain insect pests and plant pathogens
- Decomposing plants add organic matter to soil
- Organic matter improves soil structure
- Reduce soil crusting and soil compaction
- Provide ideal conditions/habitats/food for earthworms and other beneficial soil organisms
- Roots increase soil aeration and water infiltration
- Return mineral and nutrients to the soil (nutrient cycling)
- Legumes add nitrogen to the soil
- Reduce nitrogen leaching

DELAWARE'S

Agricultural Progress in Meeting Chesapeake Bay Nutrient Reduction Goals





Who Should I Contact if I Have Questions?

CHRIS BROSCH
Program Administrator
Nutrient Management Program at Delaware Department of Agriculture
chris.brosch@state.de.us or 302-698-4555

JENNIFER VOLK
Environmental Quality Extension Specialist
University of Delaware
jennvolk@udel.edu or 302-730-4000

Chris Brosch and Jennifer Volk are also available for speaking engagements and presentations

What are the Chesapeake Bay Nutrient Reduction Goals?

Delaware (DE) is committed to protecting and improving the Chesapeake Bay and tributary waters and is working to meet the Chesapeake Bay Program's restoration goals. In 2010, the U.S. Environmental Protection Agency established the Chesapeake Bay Total Maximum Daily Load (TMDL), a comprehensive cleanup plan to restore the health of the Bay and its local creeks and rivers. The TMDL set watershedwide pollution reduction goals of 25% nitrogen (N), 24% phosphorus (P) and 20% sediment by 2025.

Watershed Implementation Plans (WIPs) detail how and when the jurisdictions (six Bay states and the District of Columbia) draining to the Chesapeake Bay will meet their pollution reduction goals. Phase I and II WIPs (developed in 2010 and 2012, respectively) described actions that the states needed to take by 2017 and will need to take by 2025 to achieve the goals of the Bay TMDL. Phase III WIPs (to be completed in 2019) will provide information on actions states intend to implement by 2025 to meet the Bay TMDL restoration goals.

How Will Delaware's Phase III WIP Affect Me?

Phase III WIPs will specify states' conservation actions needed to achieve the 2025 pollution reduction goals. Example commitments include providing technical assistance for conservation plans, offering incentives for relocating poultry litter, providing cost share for nutrient management planning, verifying voluntary measures, and pursuing policy actions. Phase III WIPs will also detail best management practices (BMPs) that not only improve water quality but also provide other benefits such as improving wildlife habitats, conserving land and encouraging stewardship.

DE's Phase III WIP will encourage farmers to focus on cover crops and nutrient management in addition to 30 other practices already identified in the Phase II WIP. DE's Phase II WIP identified 40 BMPs that can reduce the movement of N and P. Goals for planting riparian forest buffers were reduced, but improved estimates of effectiveness of BMPs surrounding the Soil Health Initiative have compensated for that loss. The Phase III WIP will also include information on cost-share incentives that can be used to encourage these practices.

What Can I Do to Help?

Submit Your Annual Reports and Increase Cover Crops

To help meet the TMDL goals, DE has a new protocol for auditing nutrient management practices and is planning a new initiative to increase cover crops. Delaware's Department of Agriculture (DDA) Nutrient Management Program inspection protocol is the most robust verification system in the Bay watershed. All DE farms have nutrient management plans that require farmers to file annual reports. In the reports, farmers note their acres of nutrient management activities. Farmers also list nutrient/manure transfer details. After receiving the reports, DE inspects 18% of farms reporting nutrient management to calculate a representative compliance rate. Submitting your annual report to DE is vital!

Please Report Your BMPs

Amy Shober and Jennifer Volk of UD Extension work with nutrient management issues impacting DE

DE farmers are successfully using many BMPs in addition to nutrient management and cover crops. Please report your voluntary (not cost-shared) practices to your nutrient management consultant so DDA can record that the practice exists and, during your next inspection, verify it is implemented correctly. Your report will help DE measure success, adjust priorities, and ensure that BMPs are protecting agricultural profitability and local water quality.

Sussex Conservation District (SCD) Cover Crop Air Seeder Program

SCD uses an air seeder to help farmers in the early establishment of cover crops. While a farmer's cash crop is still in the field, the air seeder drops seed below the canopy, allowing for better seed-to-soil contact and even seed distribution.

When the cash crop is harvested, the cover crop is already established and provides water quality and soil health benefits. SCD averaged about 5,000 acres of early planted cover crops in Sussex County for the past three years.

Appendix J

Public Comments

NEWS FROM THE DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Contact: Joanna Wilson, DNREC Public Affairs, 302-739-9902

DNREC seeks public comment and input sought for Delaware's Phase III Chesapeake Bay Watershed Implementation Plan (WIP)

DOVER (April 12, 2019) – The Department of Natural Resources and Environmental Control (DNREC) is seeking public comment and input for the Delaware Draft Phase III Watershed Implementation Plan (WIP), the long-range plan for reducing pollutants that enter the state's waterways and drain into the Chesapeake Bay. Delaware is among six Chesapeake Bay Watershed jurisdictions – along with Maryland, Virginia, West Virginia, Pennsylvania, New York, and the District of Columbia – that have committed to a federal-state initiative to develop and implement an overall plan that will help restore the water quality of the Bay and its tidal waters by 2025.

The U.S. Environmental Protection Agency is leading the effort to reduce pollution and has developed a Total Maximum Daily Load (TMDL) that sets limits for major sources of nutrients and sediment entering the Chesapeake Bay and its tidal branches. A TMDL is the maximum amount of a pollutant that a body of water can receive and still meet water quality standards that protect humans and aquatic life. As part of the TMDL, each jurisdiction is required to develop a WIP that details specific steps to be taken to reduce nutrient and sediment and actions to maintain water quality standards in the future.

Currently, Delaware's rivers and streams that flow into the Chesapeake Bay are burdened with pollution that depletes the health of these waterways and the Bay, and affects their productivity. Restoring water quality to the Chesapeake Bay Watershed will have far-reaching benefits for Delaware's economic and environmental health.

PROPOSED SECRETARY QUOTE: "Delaware remains committed to making improvements necessary for restoring our Chesapeake Bay tributaries. We continue to search for innovative ways to manage our stormwater and to continue improving the quality of our waterways," said DNREC Secretary Shawn M. Garvin. "A thriving watershed means our state is a healthy, vibrant place to live, work, and play. Protecting Delaware's aquatic resources boosts our economy, provides recreational opportunities and improves overall quality of life for our citizens."

There have been three phases of Delaware's Chesapeake Bay WIP. Phase I and Phase II WIPs were developed and submitted to EPA in 2010 and 2012, respectively. Both the Phase I and Phase II WIPs describe actions and controls to be implemented by 2017 and 2025 to achieve applicable water quality standards. The Phase II WIP builds on the initial Phase I WIP by providing more specific local actions. Delaware met

EPA requirements for both those WIP phases. The Phase III WIP has been developed based on a midpoint assessment of progress and scientific analyses. The Phase III WIP provides information on actions Delaware intends to implement between 2019 and 2025 to meet the Bay restoration goals. All three plans consider aspects of watershed management including ecological restoration, sustainability, conservation practices, stewardship, and training and outreach.

To develop Delaware‘s Draft Phase III WIP for the watershed’s future, a Phase II review and revision was led by an interagency workgroup made up of representatives from numerous stakeholder groups, including Delaware’s Department of Agriculture (DDA), Department of Transportation (DelDOT), the state’s Soil and Water Conservation districts, the University of Delaware and the Nanticoke Watershed Alliance. The draft plan identifies partners, program locations, actions, and the resources needed to reach milestones and meet implementation goals for 2025. The wide-ranging collaboration and cooperation that went into the plan continues with DNREC seeking additional public participation and input on the Draft Phase III WIP.

Public comments will be accepted from April 12 through DNREC close of business (4:30 p.m.), Friday, June 7 by time-stamped email to DNREC_DelawareCBWIP@delaware.gov, or by US Postal Service mail postmarked no later than June 7 to: Attn. Chesapeake WIP, DNREC Nonpoint Source Program, 100 Water Street, Suite 6B, Dover, DE 19904.

More information about the Phase III WIP can be found on the DNREC website [Link to come]. Click here [Link to come] to download a draft of Delaware’s Draft Chesapeake Bay Phase III WIP. Click here [Link to come] to provide comments and input.

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-End-

Phase III WIP Public Comment Web Form

Delaware's Chesapeake Bay Watershed Implementation Plan - Comment Form

Thank you for your interest and involvement in Delaware's Phase III Watershed Implementation Plan (WIP) process. Please use this form to submit written comments. Users can submit multiple comments by filling out the appropriate section and clicking submit.
Emails can also be sent directly to DNREC_DelawareCBWIP@delaware.gov

* Required

Email address *

Your email

Name *

Your answer

Organization

Your answer

Specific Comments

Please use this section to provide specific comments or questions relating to a line, page, or section within the Draft WIP document.

Page Number

Your answer

Section

Your answer

Specific Comment

Your answer

Chapter Comments

Please use this section to provide comments relating to a specific chapter.

Chapter Name

Your answer

Chapter Comment

Your answer

Overall Comments

Please use this section to provide overall comments relating to the WIP.

WIP Comments

Your answer

SUBMIT