SFY 2022

Maryland's 319 Nonpoint Source Program Annual Report

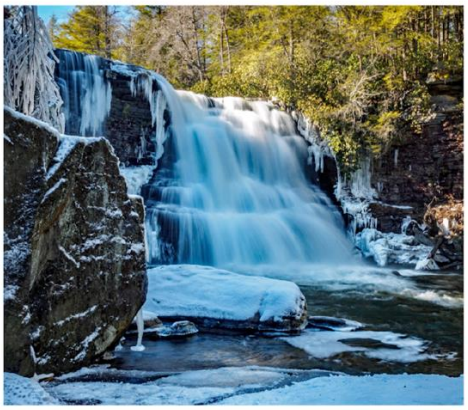

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Table of Contents

Main Document

Program Highlights | Maryland's Statewide NPS Management Program

Overview: Maryland's Clean Water Act Section 319 Nonpoint Source Management

Maryland's Nonpoint Source Management Program is required by the Federal Clean Water Act, Section 319, to protect the State's waterways from nonpoint source (NPS) pollution. Maryland has aligned this program with its commitments and responsibilities in the Chesapeake Bay Agreement[1], the Chesapeake Bay Total Maximum Daily Load (TMDL)[2], and Maryland's Phase III Chesapeake Bay Watershed Implementation Plan (WIP)[3]. This annual FY22 report covers 319 project implementation from July 1, 2021 through June 30, 2022.

Project Selection

To receive 319(h) Grant funding, projects must be implemented within a 319 Priority Watershed (**Figure 1**) that has an A-I Watershed Plan approved by the U.S. Environmental Protection Agency (EPA). A-I plans are submitted to EPA by any combination of Maryland State Agencies, local governments, and non-government organizations.

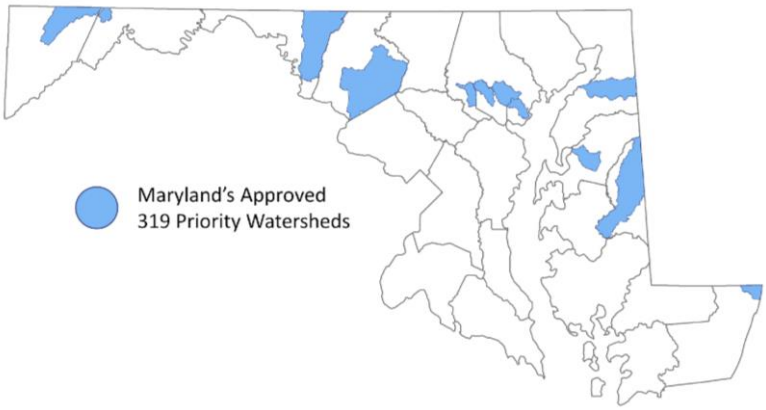


***Figure 1**: Maryland's 319 Priority Watersheds*

Program Administration

Maryland's 319 NPS Management Program, including the 319(h) Grant Program, is administered by Maryland Department of the Environment (MDE) with the assistance of the Maryland Departments of Agriculture and Natural Resources; implementation is carried out by Maryland's local governments. MDE coordinates with local partners to provide grant funding for in-ground projects and report annual progress to EPA.

[1] Chesapeake Bay Agreement: https://www.chesapeakebay.net/what/what_guides_us/watershed_agreement
[2] Chesapeake Bay TMDL: https://www.epa.gov/chesapeake-bay-tmdl/chesapeake-bay-tmdl-document
[3] MD P3 WIP: https://mde.maryland.gov/programs/Water/TMDL/TMDLImplementation/Pages/Phase3WIP.aspx

Annual Reporting for Maryland's 319 Program

EPA requires MDE to produce annual reports demonstrating progress of Maryland's 319 NPS Management Program that show how the State meets 319(h) Grant conditions while maintaining consistency with the U.S. Environmental Protection Agency (EPA) FY2022-2026 Strategic Plan Goal #5 "Ensure Clean and Safe Water for All Communities," and Objective 5.2 "Protect and Restore Waterbodies and Watersheds.

Integration of Environmental Justice Principles in the 319(h) Grant Program

The Commission on Environmental Justice and Sustainable Communities (CEJSC) defines environmental justice (EJ) as follows:

> *"Environmental justice seeks equal protection from environmental and public health hazards for all people regardless of race, income, culture and social class. Additionally, environmental justice means that no group of people including racial, ethnic or socioeconomic groups should bear a disproportionate share of the negative environmental consequences resulting from industrial, land-use planning and zoning, municipal and commercial operations or the execution of federal, state, local and municipal programs and policies."*

Maryland's 319(h) Grant Program is committed to addressing issues related to DEIJ by providing special consideration and technical assistance to disadvantaged communities (DACs). DACs are often especially vulnerable to nonpoint source pollution, as they frequently have limited capacity and resources to implement appropriate Best Management Practices (BMPs).

Areas of focus within Maryland that could be considered DACs have been identified using MDE's EJ Screening Tool[4]. MDE has partnered with organizations that work directly with citizens in DACs, including those in Caroline County and Baltimore County and are striving to develop relationships with other entities in Allegany County and Garrett County. A few examples of projects that have been funded in the last 5 years:

- FFY2018 Project #7 "Baltimore County Scotts Level at Upper Scotts Level Park Stream Restoration" - An implementation project that was partially funded with the 319(h) grant, which restored 3,383 linear feet of the middle reaches of Scotts Level Branch, a tributary of the Gwynns Falls watershed.
- FFY2020 Project #13 "Engagement, Capacity Building, and Implementation in a Disenfranchised Community in the Lower Choptank Watershed" - A project that funded the implementation of stormwater BMPs, septic upgrades, and community outreach and engagement in the community of Jonestown.
- FFY2021 Project #10 "Adding Capacity to Increase Implementation of Restoration Projects throughout the Choptank Watershed" - An outreach project that built local capacity and cooperation in these communities to assist with identification of additional community projects that would meet Maryland's nonpoint source pollution objectives.

[4] https://mdewin64.mde.state.md.us/EJ/

- FFY2021 Project #11 "Jonestown Community Park Implementation Project" - This project funded the installation of two rain gardens and conservation plantings in the Jonestown Community Park that will provide improved management and filtration of stormwater runoff before it reaches adjacent non-tidal wetlands and a tributary of the Choptank River, as well as demonstrating green, scalable, stormwater best management practices to the residents of the community of Jonestown.

Nonpoint Source Pollution Threatens Maryland's Waterways

Water is inextricably tied to Maryland's identity and culture. The State is traversed by innumerable rivers and streams that provide residents with drinking water, places for recreation, and critically important habitat for Maryland's abundant wildlife. The Chesapeake Bay supports a vibrant fishing industry that is valued at nearly $600 million per year[5] and provides over one third of the annual United States blue crab harvest. The primary nonpoint source pollutants that threaten this resource are Nitrogen and Phosphorus.

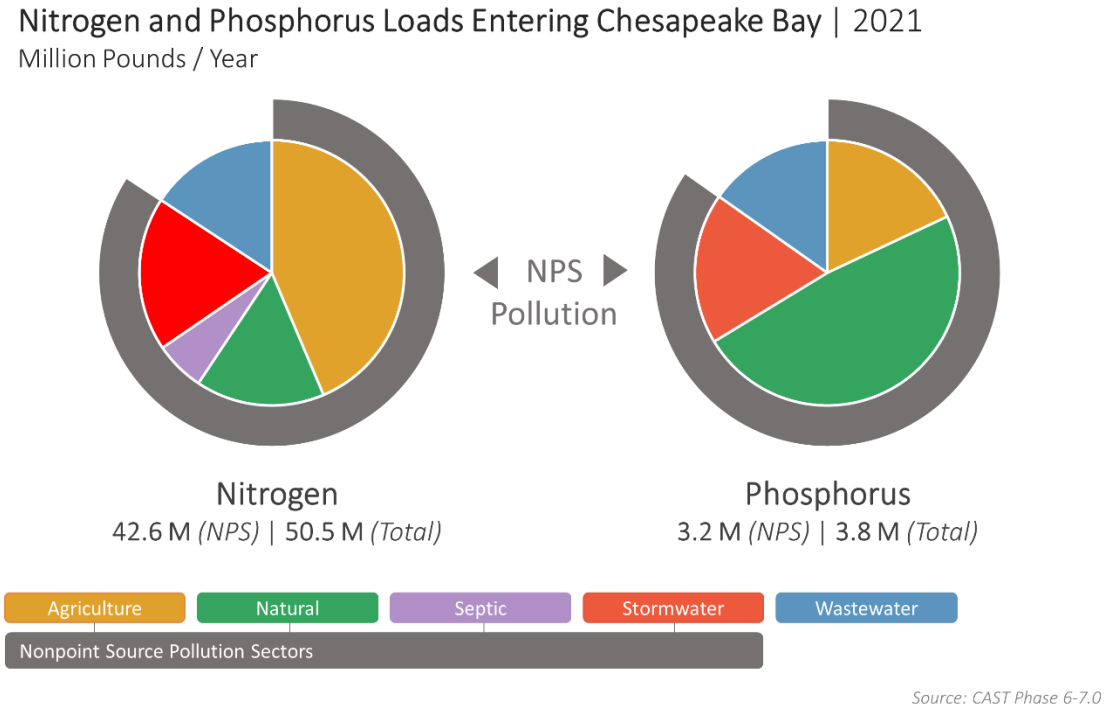


***Figure 2**: Maryland's nitrogen and phosphorus loads delivered to Chesapeake Bay in 2021*

NPS pollution threatens the health of Maryland's waterways and comes from both agricultural and developed areas (**Figure 2**). Natural loads include anthropogenic impacts within the natural system, like erosion flows from stormwater runoff that can scour stream banks, as well as true natural sources of nitrogen and phosphorus, such as forests, and wetlands. While the NPS pollution focus for Maryland's Chesapeake Bay watershed includes nitrogen, phosphorus, and sediment, those same watersheds are also impaired by other NPS pollution, such as acid mine drainage and toxic contaminates.

[5] https://msa.maryland.gov/msa/mdmanual/01glance/html/seafoodp.html

NPS pollution is costly to manage because it originates from diffuse sources across wide areas. The high cost and difficulty of managing this pollution is challenging for local governments that must balance local needs with protecting and restoring aquatic resources.

Reducing NPS pollution is accomplished through implementing best management practices (BMPs). This generic name for pollution reduction practices covers a collection of actions, policies, and physical structures that are used to reduce pollution entering waterways[6]. Funding for BMPs comes from local, state, federal, and NGO funding sources, including the 319(h) Grant.

Overall Progress: Maryland's 319 NPS Management Program | SFY 2022

Reporting Updates for SFY 2022

319 Project Funding:
Four watersheds received 319(h) Project Grant funding in SFY 2021: Antietam Creek, Gwynn's Falls, Upper Choptank, and Lower Choptank.

Document Accounting:
MDE simplified BMP accounting by tracking projects by funding date rather than project completion date. Further, this report now tracks funds allocated to projects rather than project expenditures to more accurately reflect the funds given to a particular watershed for restoration.

This approach was approved in the FFY19 annual report submission. Our modeling/loading results only include actual implementation. In the future we will still do this for overall expenditures in watersheds, but actual reductions will be from completed projects.

Watershed Modeling:
Since the past report, the Chesapeake Bay Program made significant updates to the Chesapeake Assessment Scenario Tool (CAST) model. MDE uses the CAST model to estimate nutrient and sediment reductions in this report. The CAST 2019 update has made significant changes to Maryland's nutrient and sediment loads.

[6] Examples of BMPs – Maryland's Chesapeake Cleanup Center: https://mde.maryland.gov/programs/Water/TMDL/TMDLImplementation/Pages/pollution-in-the-chesapeake.aspx

Funding: Federal and State Contributions

Maryland has spent about $49.7 million dollars in State grants over the past 16 years[7] along with about $11.6 million additional dollars from the 319(h) Grant to fund in the ground projects within 319 watersheds (**Figure 3**).

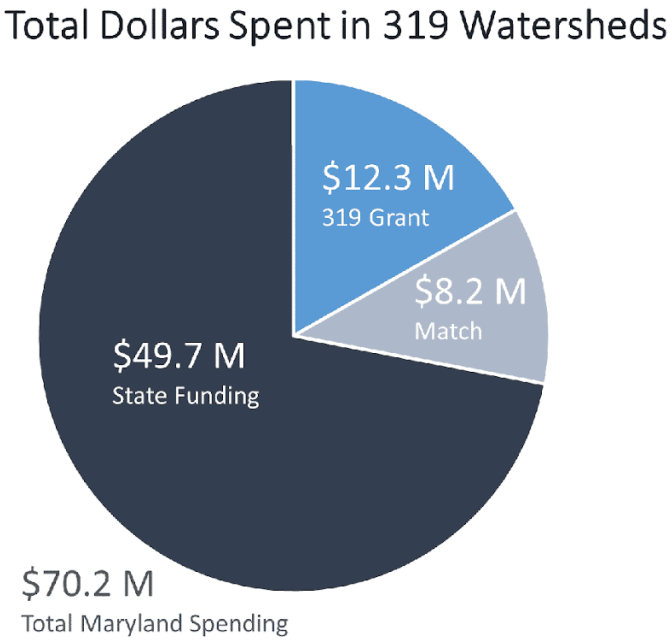


***Figure 3**: 319(h) Grant spending vs Maryland State spending on NPS pollution in 319 watersheds from SFY2004 - SFY2022.*

While the 319(h) Grant is a small part of Maryland's total spending on NPS pollution (**Figure 4**), it helps local governments leverage limited funds. Helping local governments maximize their potential resources is a core component of Maryland's Chesapeake Bay Phase III WIP, which was designed to be locally driven and achievable. For detailed funding information, see **Appendix A**.

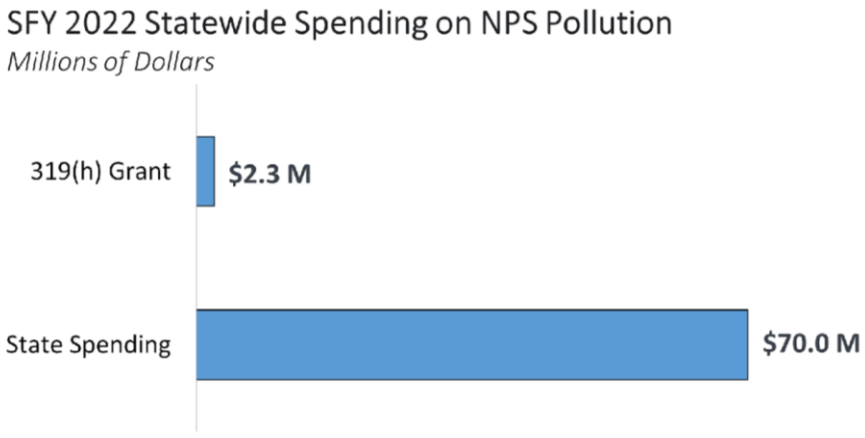


***Figure 4**: 319(h) Grant spending vs Maryland State spending on NPS pollution across the state of Maryland in SFY2022.*

[7]Maryland's first A-I Plan (*Corsica River)* was accepted in 2004.

Overall Load Reductions for Nitrogen, Phosphorus, and Sediment

The State's 319 Priority Watersheds continue to make steady progress in reducing nitrogen and phosphorus loads (Table 1); **Appendix B** tracks all NPS pollution in greater detail. When evaluating overall progress for 319 Priority Watersheds, some watersheds are farther along towards their goals while others have just started. For detailed information on individual watershed progress, please see the *Priority Watersheds* section of this report (*page 14*).

This is not solely an evaluation of installed 319 BMPs, but an assessment of all modeled aspects of a watershed including land use change, animal numbers, septic counts, etc. CAST was used to produce these numbers.

This includes everything nonpoint source related that is also within the CAST, or Chesapeake Bay Model and specifically for the watersheds identified in this report. The reductions are for FY21, FY22 progress is not made available until mid CY 2023, which comes way after the annual report is due.

In an effort to simplify reporting and align with regional goals, outcomes were modified to meet CB TMDL goals for the 319 watersheds. This meant using CAST, which is an amalgam of changes that affect loads on a year-to-year basis, to create a spreadsheet tool that allows for us to more consistently estimate the effects of BMPs implemented in 319 watersheds.

Table 1: Overall 2021 NPS pollution reductions in 319 Priority Watersheds (Million Pounds/Year)

	Target Reduction	Current Reduction	Percent Progress
Nitrogen	1.86M	0.420M	23%
Phosphorus	0.11M	0.03M	30%
Sediment	203M	17.58M	9%

Overall, Maryland and its partners made significant progress in addressing the seven programmatic NPS goals identified in the 2021-2025 Maryland Nonpoint Source Pollution Management Plan. This includes citing pollutant load reductions of 419,580 pounds per year of nitrogen, 31,791 pounds per year of phosphorus, and 17,579,940 pounds per year of sediment resulting from the implementation of all reported structural best management practices (BMPs) in 319 priority watersheds with EPA-accepted watershed-based plans (WBPs), regardless of funding source. Maryland's 2021 load reductions represent a slight increase from those achieved through implementation in 2020, although it is important to note that the 2021 load reductions only account for those achieved through BMPs expected to be cumulative and exclude annual practices (e.g., Cover crops) due to limitations in field BMP verification during the pandemic in 2020.

Maryland tracks nutrient and sediment reductions since 2010 to align with the start of the Chesapeake Bay Restoration Blueprint. Decreases in nitrogen, phosphorus, and sediment loads can be attributed to

land use changes and the implementation of BMPs, including BMPs funded by the 319(h) Grant (**Figure 5**).

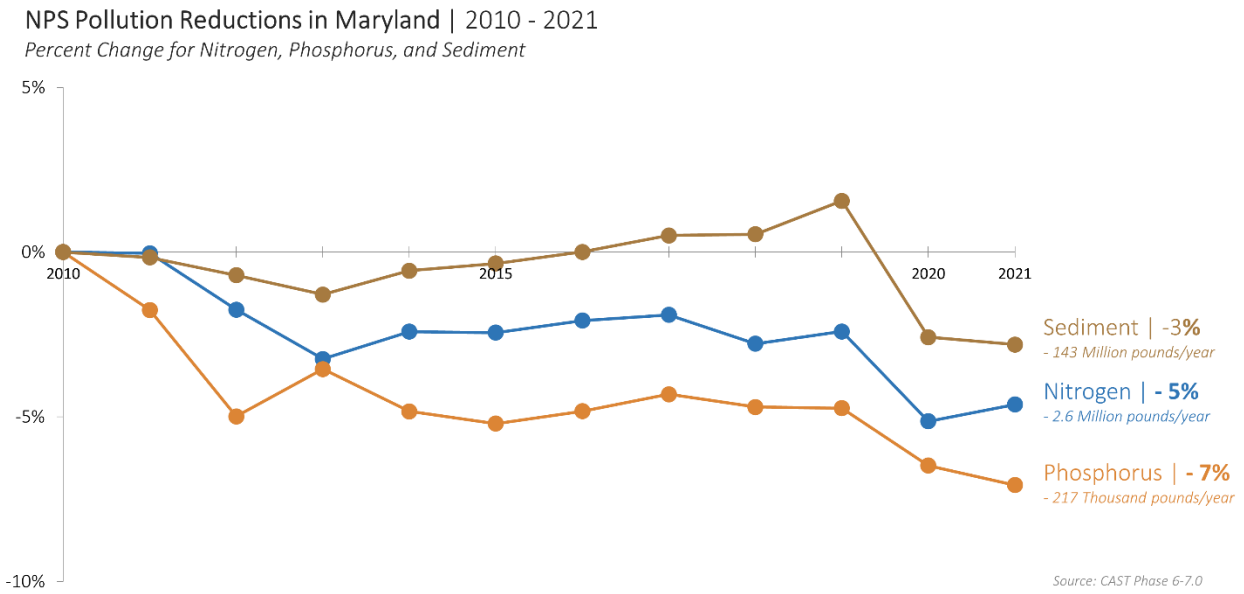


***Figure 5**: Maryland's statewide nitrogen, phosphorus, and sediment NPS reductions*

Summary

Maryland's 319 NPS Management Program is a core component of the State's watershed restoration and protection strategy and is designed to align with Maryland's Chesapeake Bay Phase III WIP, the Chesapeake Bay TMDL, and Chesapeake Watershed Agreement. The 319(h) Grant is a small but important portion of Maryland's spending on NPS pollution programs and BMPs. These grant funds are critical in supporting local governments by giving them additional financial leverage to protect local aquatic resources while also fulfilling the needs of residents.

Reductions in nutrient and sediment NPS pollution are a priority for Maryland's portion of the Chesapeake Bay, as detailed in the State's NPS Management Plan and Phase III WIP. Maryland has made significant strides in reducing NPS pollution from agricultural and urban sources. Under Maryland's Phase III WIP and 319 NPS Management Plan, the State will continue reducing NPS pollution to meet its 2025 Chesapeake Bay TMDL targets, protect and restore local waters, and sustain its aquatic resources into the future.

Progress | Maryland's 319 NPS Management Program

How Maryland Tracks Progress for its NPS Management Program

Maryland tracks its NPS Management Plan progress based on the funding allocated to NPS pollution programs, BMP implementation, and NPS pollution reductions. Starting in 2019, the State moved to tracking all nutrient and sediment reductions towards its Chesapeake Bay cleanup targets. The results can be found on Maryland's Chesapeake Bay Annual Progress website[8] and include both point source and nonpoint source sectors combined for the State's total progress toward Chesapeake Bay WIP goals.

Progress toward target reductions in nutrient loads derived from NPS sources is calculated using the CAST model and is separated by sector. The total 2025 target loads entering the Chesapeake Bay are 39,091,583 pounds per year and 2,955,951 pounds per year for nitrogen and phosphorus, respectively. Maryland has made strides toward these goals with loads for 2021 calculated to be 42,568,449 pounds per year for nitrogen and 3,212,412 pounds per year for phosphorus (Figure 6a and Figure 6b).

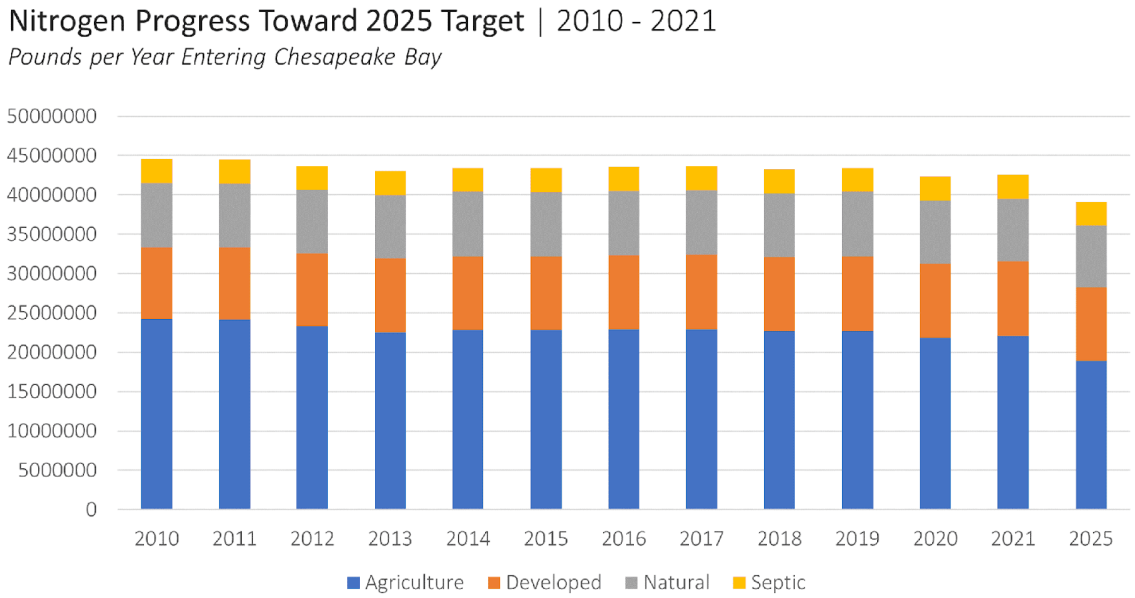


***Figure 6a**: Maryland's total nitrogen reduction progress towards its 2025 Chesapeake Bay cleanup target*

[8] Maryland's Chesapeake Bay Annual Progress: https://storymaps.arcgis.com/stories/234759335b7249d88442a7bff53a8784

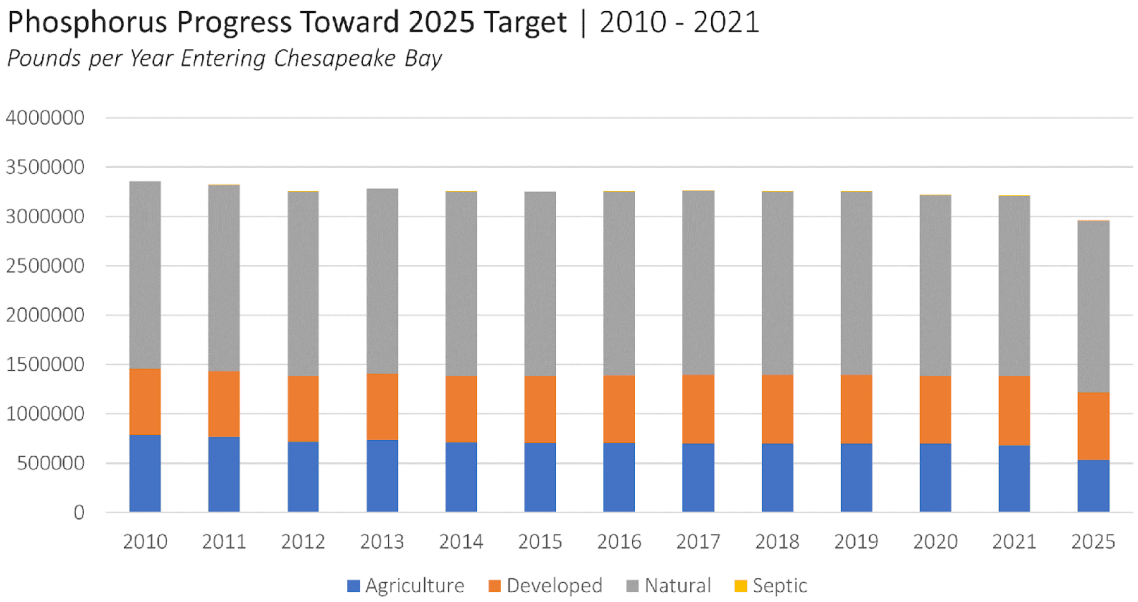


***Figure 6b**: Maryland's total phosphorus reduction progress towards its 2025 Chesapeake Bay cleanup target*

BMP Implementation

The State tracks progress towards its Phase III WIP BMP implementation goals for both point source and NPS pollution using the Chesapeake Assessment Scenario Tool (CAST), an online tool incorporating elements of the Bay model. Using CAST, MDE measures nutrient and sediment reductions. Sector specific information can be found on the State's Chesapeake Bay Annual Progress Website and includes Agriculture, Stormwater, Septic, Natural, and wastewater treatment plants. **Table 2** provides a summary of NPS BMPs implemented by category, for a full listing of the BMPs implemented in 319 watersheds, please see **Appendix B**.

***Table 2**: Summary of BMPs in 319 Priority Watersheds functioning in SFY21*

Measurement for each BMP	Unit	All 319 Watersheds
Agriculture Practices		
Ag Stormwater Management	Acres Treated	-
Alternative Crops	Acres	84.66
Ammonia Emission Reductions (Biofilters)	cumulative	-
Ammonia Emission Reductions (Lagoon Covers)	Animal Units	-

Ammonia Emission Reductions (Litter Amendments)	Animal Units	16,592.87
Barnyard Runoff Control & Loafing Lot Management	Acres	138.12
Broiler Mortality Freezers	Dry Tons (Carcasses)	-
Capture & Reuse	Acres	-
Cover Crop		
Commodity	Acres	21,499.55
Traditional	Acres	56,956.37
Crop Irrigation Management	Acres	-
Dairy Precision Feeding	Animal Units	-
Denitrifying Ditch Bioreactors	Acres	3,493.54
Forest Buffers	Acres in Buffers	2,375.87
Forest Buffers on Fenced Pasture Corridor	Acres in Buffers	115.38
Grass Buffers	Acres in Buffers	5,546.88
Grass Buffers on Fenced Pasture Corridor	Acres in Buffers	29.04
Horse Pasture Management	Acres	71.46
Land Retirement to Open Space	Acres	3,921.66
Land Retirement to Pasture	Acres	773.61
Manure Incorporation	Acres	16,162.57
Manure Transport	Dry Tons	6,270.53
Non Urban Shoreline Management	Feet	-
Non Urban Stream Restoration	Feet	9,936.32
Nutrient Management		
Core Nitrogen	Acres	137,050.56
Core Phosphorus	Acres	137,050.56
Placement Nitrogen	Acres	11,783.84

Placement Phosphorus	Acres	8,446.76
Rate Nitrogen	Acres	42,087.58
Rate Phosphorus	Acres	3,325.72
Timing Nitrogen	Acres	12,397.33
Timing Phosphorus	Acres	-
Alternative Watering	Acres	6,476.02
Prescribed Grazing	Acres	2,060.32
Saturated Buffer	Acres	3,493.67
Soil and Water Conservation Plan	Acres	167,526.40
Sorbing Materials in Ag Ditches	Acres	3,493.67
Tillage		
Conservation	Acres	29,020.97
Continuous High Residue	Acres	91,061.76
Low Residue	Acres	-
Tree Planting	Acres	627.83
Water Control Structures	Acres	3,493.67
Wetland Creation	Acres	137.48
Wetland Enhancement and Rehabilitation	Acres	2.43
Wetland Restoration	Acres	772.51
Urban/Suburban Practices		
BioRetention	Acres Treated	530.29
BioSwale	Acres Treated	159.09
Conservation Landscaping Practices	Acres Treated	-
Dry Ponds	Acres Treated	9,153.43
Erosion and Sediment Control	Acres	424.64
Extended Dry Ponds	Acres Treated	12,339.00

Filtering Practices	Acres Treated	418.99
Floating Treatment Wetlands	Acres Treated (Wet Pond)	-
Grey Infrastructure (IDDE)	Acres Treated	-
Impervious Disconnection	Acres Treated	0.25
Impervious Surface Reduction	Acres	12.96
Infiltration Practices	Acres Treated	1,537.90
Permeable Pavement	Acres Treated	8.99
Runoff Reduction Performance Standard	Acres Treated	2,887.55
Septic Connections	No. Systems	127.37
Septic Denitrification	No. Systems	992.75
Septic Pumping	No. Systems	-
Storm Drain Cleanout	Lbs of Sediment	123,749.74
Storm Water Treatment Performance Standard	Acres Treated	16,622.04
Street Sweeping	Acres	4,348.78
Urban Filter Strips	Acres Treated	-
Urban Forest Buffers	Acres in Buffers	112.55
Urban Forest Planting	Acres	190.21
Urban Nutrient Management	Acres	76,841.35
Urban Shoreline Management	Feet	3,096.95
Urban Stream Restoration	Feet	34,988.54
Urban Tree Planting	Acres	755.63
Vegetated Open Channel	Acres Treated	19.53
Wet Ponds & Wetlands	Acres Treated	6,880.04
Resource Practices		
Dirt&Gravel Road E&S	Feet	33.73
Forest Harvesting Practices	Acres	556.18

Non-Tidal Algal Flow-way	Acres	-
Tidal Algal Flow-way	Acres	-

MDE is the primary State agency for tracking point source and nonpoint source implementation. Urban BMP Implementation is tracked via several methods including municipal separate storm sewer system (MS4) permit reporting and Direct outreach with county/municipal communities. Forestry BMP data comes from our Department of Natural Resources, which maintains its own internal BMP database.

Similarly, agricultural BMPs come from the Maryland Department of Agriculture's Conservation Tracker database. These practices are assembled and put through a documented QA/QA process before being submitted to EPA for inclusion into the model using the National Environmental Information Exchange Network (NEIEN).

Urban BMPS and certain forestry BMPs are tracked using specific GPS coordinates, others are reported at the county scale. The Chesapeake Bay Program then uses a tool called scenario builder to distribute BMPS inside and outside of the Chesapeake Bay watershed. The BMP scenario is then combined with several other baseline inputs (i.e., animal counts, land use, atmospheric emissions) to come up with projected load reductions associated with all these factors accounted for.

The Maryland Coastal Bays Program is currently working on filling out the BMP tracking tool developed by MDE, based on CAST assumptions, to track BMPs and simulate loads the way CAST tracks progress towards load reduction goals in the Chesapeake Bay watershed. In the Casselman River and Upper Jennings Run, restoration efforts to remediate low pH impairment listings are reported by MDE's Abandoned Mine Land program in an annual report and summarized in the priority watershed chapter.

Other Progress Metrics

Other progress metrics, including tracking 319(h) Grant expenditures, is another way in which Maryland tracks NPS pollution reduction progress. You can find detailed information for individual watersheds in the *Priority Watersheds* section of this report (*page 14*). For more detailed information on statewide 319(h) Grant spending, please see **Appendix A**. For detailed information on individual 319(h) Grant funded projects in Priority Watersheds, see **Appendix D**.

319 Success Story

Section 319 nonpoint source pollution success stories highlight water bodies identified by states as being primarily nonpoint source-impaired and having achieved documented water quality improvements. Projects leading to Success Stories received funding from Clean Water Act (CWA) section 319 and/or other funding sources dedicated to solving nonpoint source (NPS) impairments. These stories also describe innovative strategies used to reduce NPS pollution, the growth of partnerships and a diversity of funding sources.

The success stories offer an opportunity for states to highlight where their restoration efforts have resulted in water quality improvements in NPS-impaired water bodies. Developing the stories also

allows EPA to track the number of NPS-impaired water bodies that are partially or fully restored—which is a key measure in the effort to document how NPS restoration efforts are improving water quality on a segment basis across the nation.

Each year, Maryland is required to demonstrate a successful watershed restoration project. The FY22 success story that Maryland published was entitled, "Baltimore County Stream Restoration Project Helps Restore Scotts Level Branch to its Natural State," and can be found posted, once available, on MDE's 319 website or on EPA's national website.

Additional Funding | Maryland's 319 NPS Management Program

In addition to 319(h) Grant funds, Maryland supplies significant State resources to finance programs and projects designed to reduce NPS pollution. In particular, Maryland's Chesapeake and Atlantic Coastal Bays Trust Fund (Trust Fund) is one of the State's primary funding sources for reducing NPS pollution. Maryland's Trust fund provides grant money to local governments and Non-profit Organizations for implementing NPS pollution water quality restoration projects.

Maryland's Trust Fund targets the most efficient and cost-effective nonpoint source projects. To date, the Trust Fund has provided more than $600 million for projects that have resulted in cumulative nitrogen, phosphorus, and sediment reductions of 1.28 million pounds, 197 thousand pounds, and 188 tons, respectively between SFY 2013 and SFY 2022. For further information, see the Chesapeake and Atlantic Costal Bays Trust Fund website[9].

National Water Quality Initiative | Maryland's 319 NPS Management Program

The National Water Quality Initiative (NWQI) is run by the U.S. Department of Agriculture - National Resources Conservation Services (USDA - NRCS). The NWQI helps farmers and forest landowners voluntarily improve water quality and aquatic habitat by focusing on watersheds with impaired streams. Maryland currently has two watersheds that are primarily agricultural with NWQI status: Catoctin Creek in Frederick County, and Prettyboy Reservoir in Baltimore and Carroll Counties. Surface waters in Catoctin Creek are impaired by sediments, nutrients, impacts to biological communities, and fecal coliform. Prettyboy Reservoir is impaired by mercury and phosphorus, while the streams draining to Prettyboy reservoir are impaired by fecal coliform and temperature.

Maryland was among the first States in 2012 to create a cooperative monitoring agreement to support the NWQI effort. MDE collaborated with NRCS to conduct in-stream monitoring in the Catoctin Creek watershed from 2013 through 2018. The State performed synoptic monitoring from 2013 through 2015 to determine which watersheds had the highest nutrient loadings. From 2016 through 2018, the State conducted bi-weekly ambient surface water monitoring at 25 stations throughout the watershed to assess the effectiveness of agricultural BMP implementation. Station locations were identified based on the results of the prior synoptic monitoring and where agricultural BMPs were implemented.

[9] Trust Fund Website: https://dnr.maryland.gov/ccs/Pages/funding/trust-fund.aspx

During SFY 2019, the bi-weekly sampling continued at the 25 stations throughout the watershed. Sampling concluded in December 2018. Results from the study can be found in Catoctin Creek Water Quality Monitoring Report, NWQI (MDE 2019). Study results indicate that nutrient loadings may have decreased at some stations downstream of implemented BMPs. However, based on a power analysis conducted to determine the minimum number of required samples to detect a change, two more years of data are needed to reach a statistically significant conclusion.

NRCS has continued these monitoring efforts to support the NWQI through its partnership with Hood College.

Maryland's Priority Watersheds | 319 Priority Watersheds

Current Status of Maryland's 319 Priority Watersheds

Maryland tracks progress for 319(h) Grant implementation funding and NPS pollution reductions in its 319 Priority Watersheds (**Table 3**). As of SFY 2022, twelve watersheds had accepted A-I Watershed Plans and were eligible for 319(h) Grant funding. An additional two watersheds are developing A-I plans to be eligible for future funding through the 319(h) Grant Program.

Maryland uses the Chesapeake Assessment and Scenario Tool (CAST) outputs to estimate its load reductions/increases as more of a "real time" assessment of how our efforts are going. CAST uses a number of data inputs that can affect the loads in our watersheds, BMP implementation being only one of them. Consequently, even with increased BMP implementation the model may assign greater loads to a watershed which offset any reductions achieved through BMP implementation. This variability is reflected in the tables and watershed profiles included in this section.

Another clarification is that the load calculations data used for this report that come from CAST include that which is up to SFY21, which ended on June 30, 2021. Data from SFY22 is still being finalized at the time this report is due. As such, load calculations data from SFY22 will be reported in the next annual report. Typically, our model inputs submission is due Dec. 1st of the following SFY so that there is time allowed to collect information, provide adequate quality assurance/control of the data, and to make sure there are no glaring errors in the modeling results. For detailed funding information, see **Appendix A**. MDE tracks nitrogen, phosphorus, and sediment reductions for all watersheds regardless of the watershed plan specifications; for all NPS pollution tracking and detailed nitrogen, phosphorus, and sediment loads tracking, see **Appendix B**. For detailed watershed 319(h) Grant funded project load reductions, see **Appendix D**.

Table 3[10,11]: Summary of changes in Maryland's 319 Priority Watersheds

Priority Watershed	Plan Start Date	**Funding** *(Total)* State | 319 | Total	**FY21 Load Change** *(lbs/yr)* TN | TP | TSS
Antietam Creek	2012	$ 1.2M | $ 3.5M | $ 4.7M	34.6K | -2.9K | 0.8M
Assawoman Bay	2020	$ 0.0M | $ 0.1M | $ 0.1M	11.4K | 0.4K | 0.8M
Back River - *Tidal*	2010	$6.0M | $ 0.6M | $6.6M	2.9K | 0.6K | 0.6M
Back River - *Upper*	2008	$ 12.7M | $ 1.2M | $ 13.9M	2.9K | 1.8K | 4.0M
Casselman River	2011	$ 0.0M | $ 0.1M | $ 0.1M	-348.1K | -26.1K | -98.7M
Choptank River - *Upper*	2010	$ 1.1M | $ 1.7M | $ 2.8M	151.1K | 9.8K | 4.9M
Corsica River	2004	$ 1.7M | $ 2.1M | $ 3.8M	31.0K | 3.7K | -1.2M
Gwynns Falls - *Middle*	2014	$ 13.8M | $ 1.1M | $ 14.9M	7.7K | 1.3K | 5.1M
Jennings Run - *Upper*	2019	$ 0.0M | $ 0.0M | $ 0.0M	2.6K | 0.0K | 0.3M
Jones Falls - *Lower*	2008	$ 6.8M | $ 0.5M | $ 7.3M	16.3K | 5.2K | 11.9M
Monocacy River - *Lower*	2008	$ 1.7M | $ 1.1M | $ 2.8M	102.5K | 11.3K | -11.8M
Sassafras River	2009	$ 4.6M | $ 0.4M | $ 5.0M	59.3K | 0.5K | 2.6M
Watershed Totals		**$49.7M | $12.3M | $62.0M**	**74.1K | 5.7K | -80.8M**

[10] The load changes in this report were calculated using CAST and are subject to variation as baseline conditions and BMP implementation levels in the model change on an annual basis. This is a representation of the implementation levels of BMPs and load changes based on conditions for FY21.

[11] The funding for Back River: Tidal and Upper is linked due to project overlap, even though it is separated in this table.

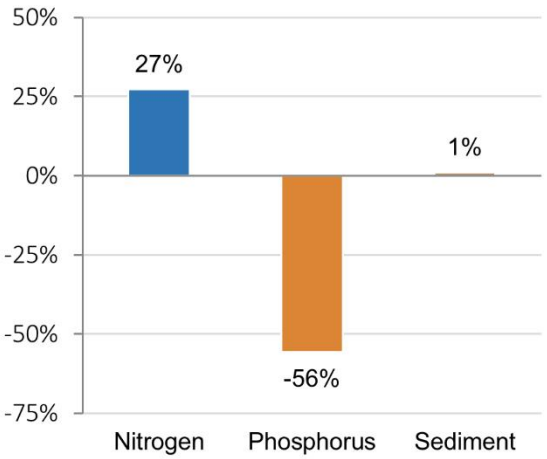
Antietam Creek – Plan Approved 2012 | 319 Priority Watersheds

Watershed Profile

Antietam Creek

Percent Progress Towards Target*

Nitrogen, Phosphorus, Sediment



Land Use

Total Acres | **119K**

Agriculture | **39%**

Developed | **22%**

Natural | **38%**

NPS Reduction Progress

From 2012 to 2021, Antietam Creek is 27% toward its 127K lbs/yr nitrogen reduction goal, -56% toward its 5K lbs/yr phosphorus reduction goal, and 1% toward its 71.3 M lbs/yr sediment reduction goal.

Watershed Funding | SFY12 – SFY22

Millions of Dollars

Total Funding Sources and NPS Reductions | *Nitrogen, Phosphorus, Sediment*

Funding Source	Funds	Nitrogen | lbs/yr	Phosphorus | lbs/yr	Sediment | lbs/yr
319(h) Grant	$3.5M	1.5K	0.7K	0.0M
All Else	$1.3M	33.1K	-3.6K	0.8M
Total	**$4.7M**	**34.6K**	**-2.9K**	**0.8M**

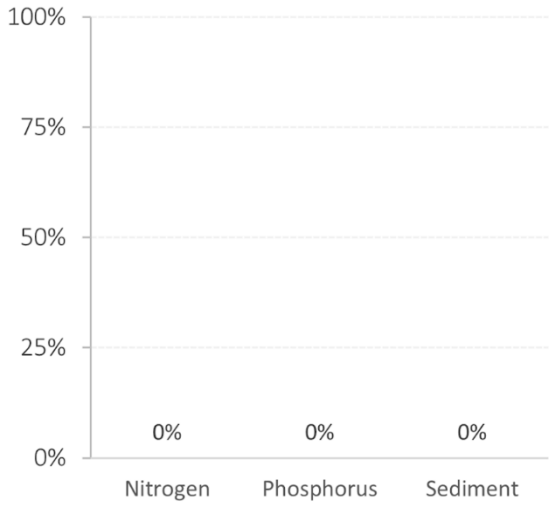
Assawoman Bay – Plan Approved 2020 | 319 Priority Watersheds

Watershed Profile

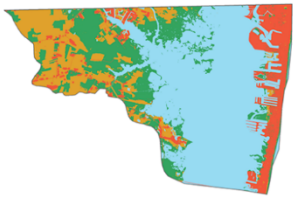
Assawoman Bay

Percent Progress Towards Target

Nitrogen, Phosphorus, Sediment



Land Use



Total Acres | **6K**

Agriculture | **21%**

Developed | **34%**

Natural | **45%**

NPS Reduction Progress

The watershed plan was conditionally approved in 2020. The first implementation project has not been installed yet, so any NPS reductions will be noted in future reports.

Watershed Funding | SFY20 – SFY22

Millions of Dollars

Total Funding Sources and NPS Reductions | *Nitrogen, Phosphorus, Sediment*

Funding Source	Funds	Nitrogen | lbs/yr	Phosphorus | lbs/yr	Sediment | lbs/yr
319(h) Grant	$0.1M	0.1K	0.0K	0.0M
All Else	$0.0M	11.3K	0.4K	0.8M
Total	**$0.1M**	**11.4K**	**0.4K**	**0.8M**

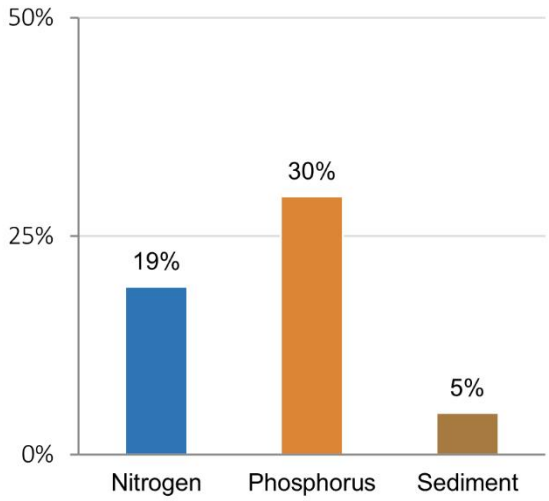
Back River: Tidal – Plan Approved 2010 | 319 Priority Watersheds

Watershed Profile

Back River: Tidal

Percent Progress Towards Target

Nitrogen, Phosphorus, Sediment



Land Use

Total Acres | **16K**

Agriculture | **3%**

Developed | **65%**

Natural | **33%**

NPS Reduction Progress

From 2010 to 2021, Back River: Tidal is 19% toward its 15K lbs/yr nitrogen reduction goal, 30% toward its 2K lbs/yr phosphorus reduction goal, and 5% toward its 13.3 M lbs/yr sediment reduction goal.

Watershed Funding | SFY10 – SFY22

Millions of Dollars *

* Back River: Tidal and Upper funding linked due to project overlap

Total Funding Sources and NPS Reductions | *Nitrogen, Phosphorus, Sediment*

Funding Source	Funds	Nitrogen | lbs/yr	Phosphorus | lbs/yr	Sediment | lbs/yr
319(h) Grant	$1.8M	0.3K	0.1K	0.0M
All Else	$18.8M	2.6K	0.5K	0.6M
Total	**$20.5M**	**2.9K**	**0.6K**	**0.6M**

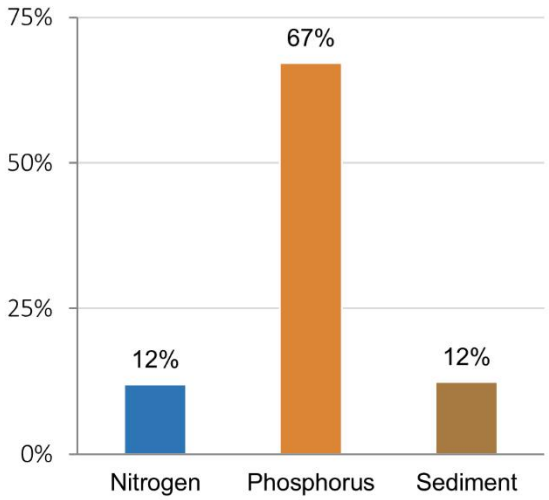
Back River: Upper – Plan Approved 2008 | 319 Priority Watersheds

Watershed Profile

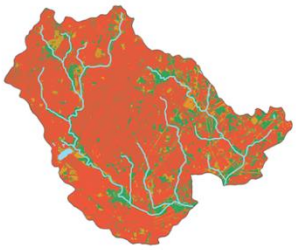
Back River: Upper

Percent Progress Towards Target

Nitrogen, Phosphorus, Sediment



Land Use



Total Acres | **20K**

Agriculture | **0%**

Developed | **85%**

Natural | **15%**

NPS Reduction Progress

From 2008 to 2021, Back River: Upper is 12% toward its 24K lbs/yr nitrogen reduction goal, 67% toward its 3K lbs/yr phosphorus reduction goal, and 12% toward its 32.6 M lbs/yr sediment reduction goal.

Watershed Funding | SFY08 – SFY22

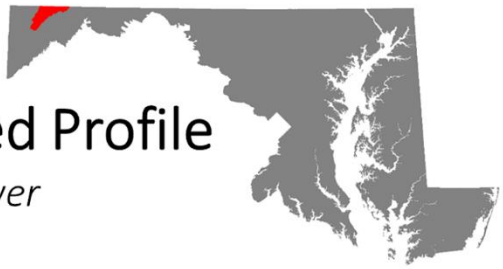
Millions of Dollars *

* Back River: Tidal and Upper funding linked due to project overlap

Total Funding Sources and NPS Reductions | *Nitrogen, Phosphorus, Sediment*

Funding Source	Funds	Nitrogen | lbs/yr	Phosphorus | lbs/yr	Sediment | lbs/yr
319(h) Grant	$1.8M	1.0K	0.3K	0.0M
All Else	$18.8M	1.9K	1.5K	4.0M
Total	**$20.5M**	**2.9K**	**1.8K**	**4.0M**

Casselman River – Plan Approved 2011 | 319 Priority Watersheds



Watershed Profile

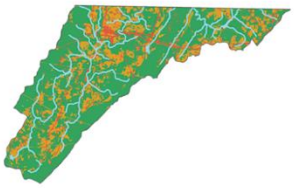
Casselman River

NPS Reduction Progress

The watershed-based plan for the Casselman River only addresses pH impairment. From 2011 to 2022, there has only been one project funded in this watershed greater than $10k, which was the implementation of limestone sand in multiple locations to address pH impairment. The cause of any reductions in nitrogen, phosphorus, and sediment loads are unknown and may result from natural variations or projects that were funded by organizations not recorded in this report.

Snyder Sand Application Site
Photo courtesy of MDE, Abandoned Mine Lands Division

Land Use



Total Acres | **59K**

Agriculture | **17%**

Developed | **9%**

Natural | **74%**

Watershed Funding | SFY11 – SFY22

Millions of Dollars

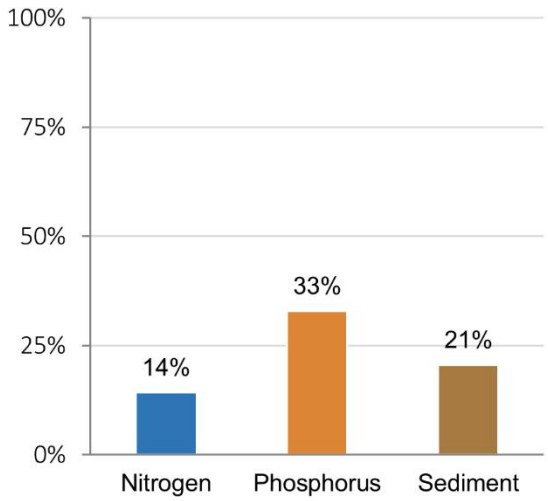
Choptank River: Upper – Plan Approved 2010 | 319 Priority Watersheds

Watershed Profile

Choptank River: Upper

Percent Progress Towards Target

Nitrogen, Phosphorus, Sediment



Land Use

Total Acres | **154K**

Agriculture | **54%**

Developed | **11%**

Natural | **36%**

NPS Reduction Progress

From 2010 to 2021, Choptank River: Upper is 14% toward its 1.1M lbs/yr nitrogen reduction goal, 33% toward its 30K lbs/yr phosphorus reduction goal, and 21% toward its 23.6 M lbs/yr sediment reduction goal.

Watershed Funding | SFY10 – SFY22

Millions of Dollars

Total Funding Sources and NPS Reductions | *Nitrogen, Phosphorus, Sediment*

Funding Source	Funds	Nitrogen | lbs/yr	Phosphorus | lbs/yr	Sediment | lbs/yr
319(h) Grant	$1.7M	1.1K	0.3K	0.0M
All Else	$1.1M	150.0K	9.5K	4.9M
Total	**$2.8M**	**151.1K**	**9.8K**	**4.9M**

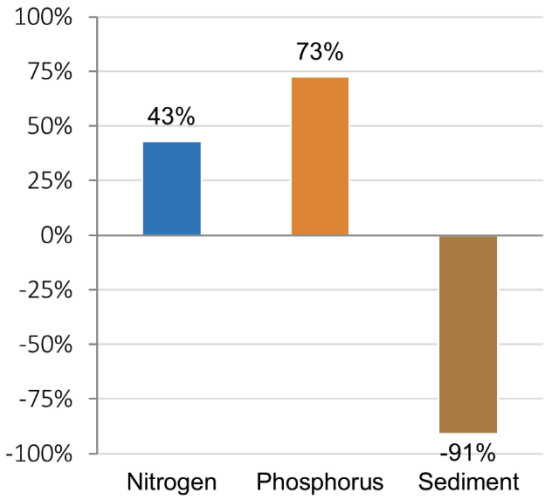
Corsica River – Plan Approved 2004 | 319 Priority Watersheds

Watershed Profile

Corsica River

Percent Progress Towards Target

Nitrogen, Phosphorus, Sediment



Land Use

Total Acres | **23K**

Agriculture | **55%**

Developed | **12%**

Natural | **33%**

NPS Reduction Progress

From 2004 to 2021, Corsica River is 43% toward its 72K lbs/yr nitrogen reduction goal, 73% toward its 5K lbs/yr phosphorus reduction goal, and -91% toward its 1.4 M lbs/yr sediment reduction goal.

Watershed Funding | SFY04 – SFY22

Millions of Dollars

Total Funding Sources and NPS Reductions | *Nitrogen, Phosphorus, Sediment*

Funding Source	Funds	Nitrogen | lbs/yr	Phosphorus | lbs/yr	Sediment | lbs/yr
319(h) Grant	$2.1M	4.9K	0.5K	0.0M
All Else	$1.7M	26.1K	3.2K	-1.3M
Total	**$3.8M**	**31.0K**	**3.7K**	**-1.3M**

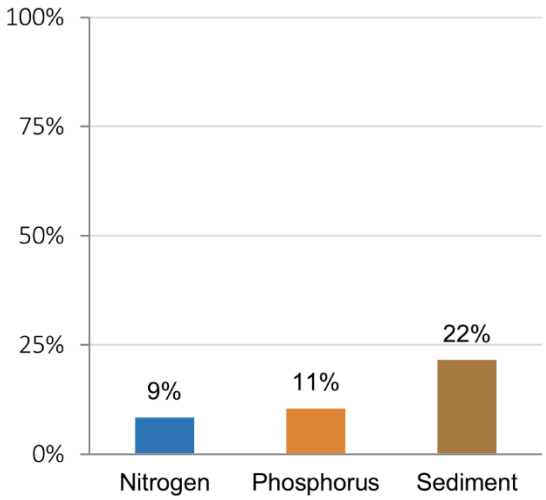
Gwynns Falls: Middle – Plan Approved 2014 | 319 Priority Watersheds

Watershed Profile

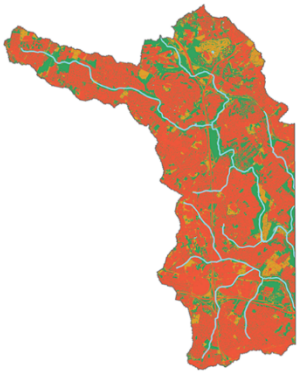
Gwynns Falls: Middle

Percent Progress Towards Target

Nitrogen, Phosphorus, Sediment



Land Use



Total Acres | **31K**

Agriculture | **1%**

Developed | **77%**

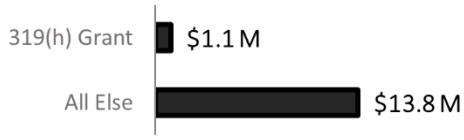
Natural | **22%**

NPS Reduction Progress

From 2014 to 2021, Gwynns Falls: Middle is 9% toward its 89K lbs/yr nitrogen reduction goal, 11% toward its 12K lbs/yr phosphorus reduction goal, and 22% toward its 23.5 M lbs/yr sediment reduction goal.

Watershed Funding | SFY13* – SFY22

Millions of Dollars



*Funding calculations include 2 projects starting in SFY2013. The watershed plan was being drafted in 2013 and was accepted by EPA in 2014.

Total Funding Sources and NPS Reductions | *Nitrogen, Phosphorus, Sediment*

Funding Source	Funds	Nitrogen | lbs/yr	Phosphorus | lbs/yr	Sediment | lbs/yr
319(h) Grant	$1.1M	3.9K	1.6K	0.0M
All Else	$13.8M	3.8K	-0.3K	5.1M
Total	**$14.9M**	**7.7K**	**1.3K**	**5.1M**

Jennings Run: Upper – Plan Approved 2019 | 319 Priority Watersheds

Watershed Profile

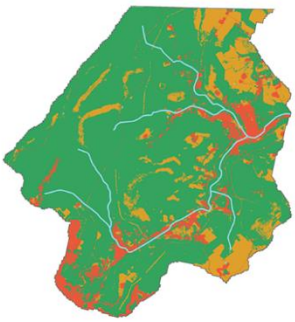
Jennings Run: Upper

NPS Reduction Progress

Currently, the watershed-based plan for the Upper Jennings Run only addresses pH impairment. From 2019 to 2022, there have been no implementation projects funded by the 319(h) grant or other state funding sources included in this report. The cause of any reductions in nitrogen, phosphorus, and sediment loads are unknown and may result from natural variations or projects that were funded by organizations not recorded in this report. MDE is working to establish relationships with the local government and other organizations in Allegany County to pursue future projects that may be funded by the 319(h) grant.

Photo courtesy of MDE, Upper Jennings Run Watershed Implementation Plan

Land Use



Total Acres | **19K**

Agriculture | **7%**

Developed | **12%**

Natural | **80%**

Watershed Funding | SFY19 – SFY22

Millions of Dollars

319(h) Grant	**$0.0 M**
All Else	**$0.0 M**

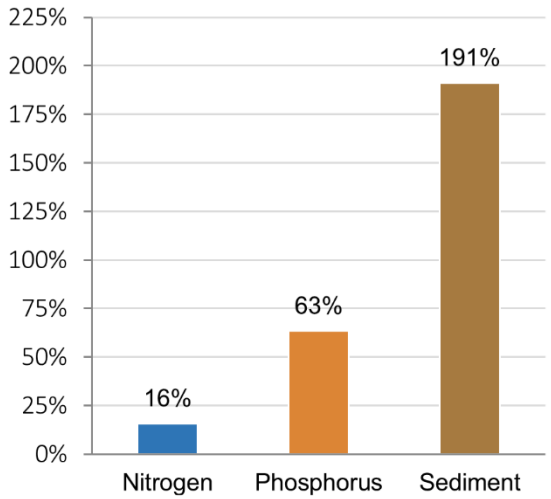
Jones Falls: Lower – Plan Approved 2008 | 319 Priority Watersheds

Watershed Profile

Jones Falls: Lower

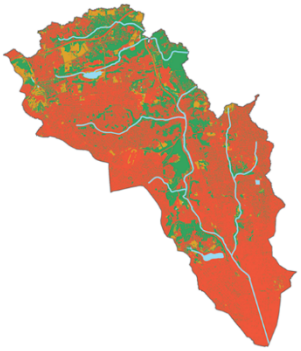
Percent Progress Towards Target*

Nitrogen, Phosphorus, Sediment



*Watershed plan includes bacteria – See Appendix B

Land Use



Total Acres | **37K**

Agriculture | **4%**

Developed | **67%**

Natural | **30%**

NPS Reduction Progress

From 2008 to 2021, Jones Falls: Lower is 16% toward its 103K lbs/yr nitrogen reduction goal, 63% toward its 8K lbs/yr phosphorus reduction goal, and 191% toward its 6.2 M lbs/yr sediment reduction goal.

Watershed Funding | SFY08 – SFY22

Millions of Dollars

Total Funding Sources and NPS Reductions | *Nitrogen, Phosphorus, Sediment*

Funding Source	Funds	Nitrogen | lbs/yr	Phosphorus | lbs/yr	Sediment | lbs/yr
319(h) Grant	$0.5M	0.1K	0.1K	0.0M
All Else	$6.8M	16.2K	5.1K	12.0M
Total	**$7.3M**	**16.3K**	**5.2K**	**12.0M**

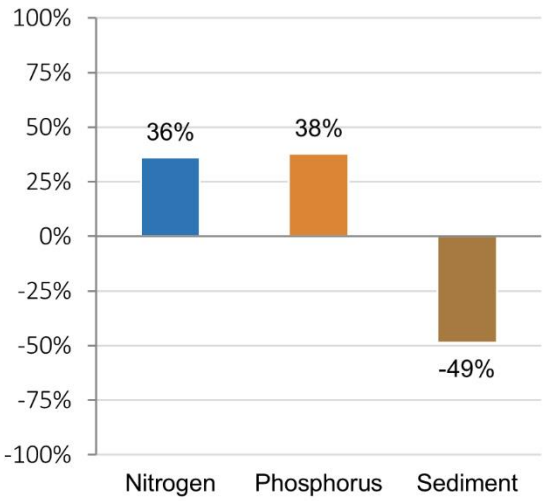
Monocacy River: Lower – Plan Approved 2008 | 319 Priority Watersheds

Watershed Profile

Monocacy River: Lower

Percent Progress Towards Target

Nitrogen, Phosphorus, Sediment



Land Use

Total Acres | **195K**

Agriculture | **34%**

Developed | **26%**

Natural | **39%**

NPS Reduction Progress

From 2008 to 2021, Monocacy River: Lower is 36% toward its 283K lbs/yr nitrogen reduction goal, 38% toward its 30K lbs/yr phosphorus reduction goal, and -49% toward its 24.4 M lbs/yr sediment reduction goal.

Watershed Funding | SFY08 – SFY22

Millions of Dollars

Total Funding Sources and NPS Reductions | *Nitrogen, Phosphorus, Sediment*

Funding Source	Funds	Nitrogen | lbs/yr	Phosphorus | lbs/yr	Sediment | lbs/yr
319(h) Grant	$1.1M	0.7K	0.2K	0.0M
All Else	$1.7M	101.8K	11.1K	-11.8M
Total	**$2.8M**	**102.5K**	**11.3K**	**-11.8M**

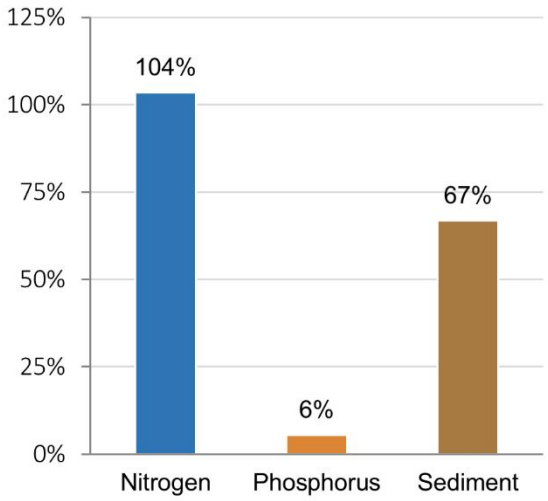
Sassafras River – Plan Approved 2009 | 319 Priority Watersheds

Watershed Profile

Sassafras River

Percent Progress Towards Target

Nitrogen, Phosphorus, Sediment



Land Use

Total Acres | **47K**

Agriculture | **58%**

Developed | **11%**

Natural | **31%**

NPS Reduction Progress

From 2009 to 2021, Sassafras River is 104% toward its 57K lbs/yr nitrogen reduction goal, 6% toward its 9K lbs/yr phosphorus reduction goal, and 67% toward its 3.8 M lbs/yr sediment reduction goal.

Watershed Funding | SFY09 – SFY22

Millions of Dollars

Total Funding Sources and NPS Reductions | *Nitrogen, Phosphorus, Sediment*

Funding Source	Funds	Nitrogen | lbs/yr	Phosphorus | lbs/yr	Sediment | lbs/yr
319(h) Grant	$0.4M	4.2K	0.3K	0.0M
All Else	$4.6M	55.1K	0.3K	2.6M
Total	**$5.0M**	**59.3K**	**0.5K**	**2.6M**

Appendix A | Financial Information

319(h) Grant Funding

Maryland tracks annual 319(h) Grant federal vs state contributions since 1990 (Table A - 1). However, tracking Priority Watershed progress did not begin until the first watershed plan for Corsica River was approved in 2004.

Table A - 1: *319(h) Grant funding by State Fiscal Year*

State Fiscal Year	319(h) Grant	Non-Federal Match	Total State and Federal Funds
1990 - 2003	$24,876,369	$16,584,247	$41,460,616
2004	$1,343,290	$895,527	$2,238,817
2005	$1,852,568	$1,235,045	$3,087,613
2006	$2,675,598	$1,783,730	$4,459,328
2007	$2,666,655	$1,777,776	$4,444,431
2008	$2,598,600	$1,732,401	$4,331,001
2009	$2,653,500	$1,769,000	$4,422,500
2010	$2,575,782	$1,717,188	$4,292,970
2011	$2,922,783	$1,948,522	$4,871,305
2012	$2,283,639	$1,522,426	$3,806,065
2013	$2,090,997	$1,393,998	$3,484,995
2014	$1,990,999	$1,327,333	$3,318,332
2015	$2,119,118	$1,412,745	$3,531,863
2016	$2,084,277	$1,389,518	$3,473,795
2017	$2,109,728	$1,406,486	$3,516,214
2018	$2,236,500	$1,491,000	$3,727,500
2019	$2,129,000	$1,419,335	$3,548,335
2020	$2,129,000	$1,419,335	$3,548,335
2021	$2,241,500	$1,494,334	$3,735,834
2022	$2,272,200	$1,514,800	$3,787,000
Post 2004 Totals	**$42,975,734**	**$28,650,499**	**$71,626,233**

Maintenance of Effort (MOE) vs Federal 319(h) Grant Funds

Maryland contributes more State funds to NPS pollution reduction on an annual basis compared to what it receives through 319(h) Grant funding (Figure A - 1). In SFY 2022, Maryland's NPS pollution control expenditures totaled over $67 million which is more than EPA's required minimum of $8.4 million in Maintenance of Effort spending. Much of the expenditure came from projects funded through the Chesapeake & Atlantic Coastal Bays Trust Fund.

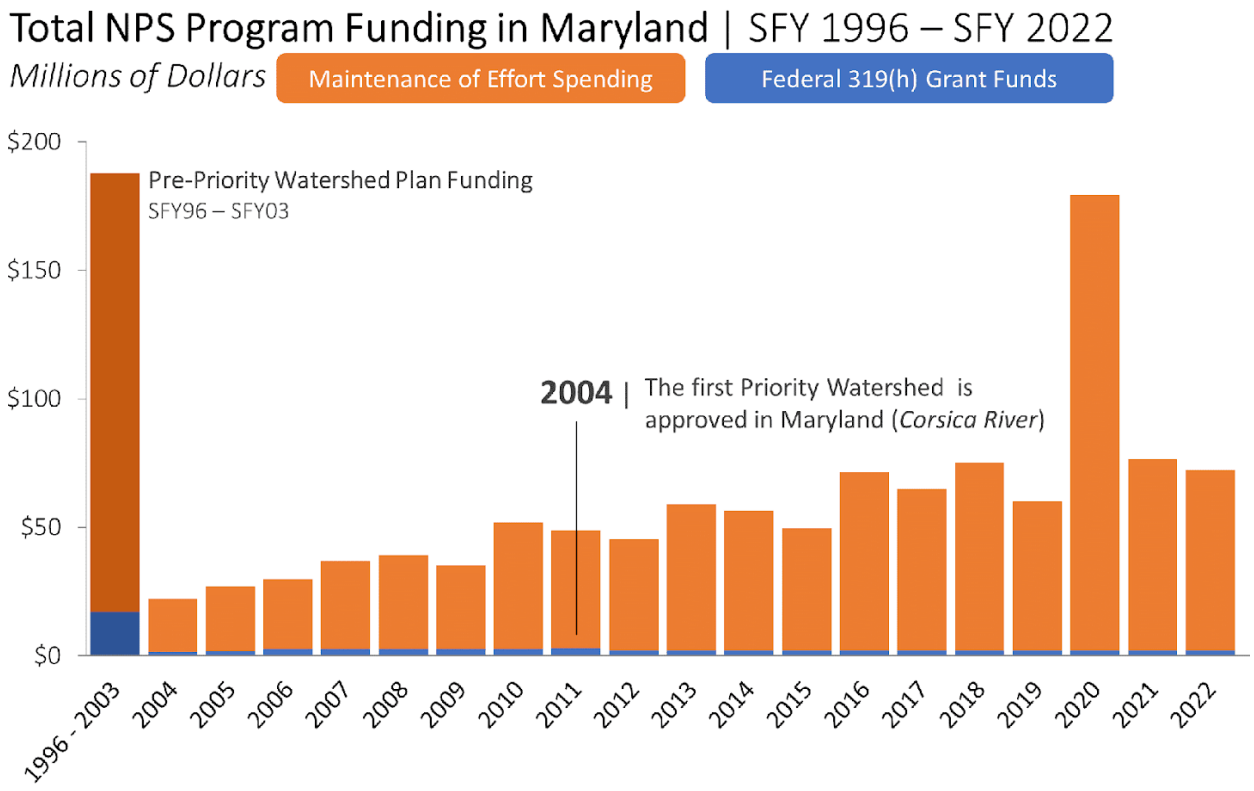


Figure A - 1: *Maryland's Maintenance of Effort funds (MOE) vs. Federal 319(h) Grant dollars received*

Spending Breakdown by Priority Watershed

Table A - 4[12]: *Spending by Priority Watershed by funding source*

Priority Watershed	Plan Start Date	Chesapeake and Atlantic Bays Trust Fund	State Revolving Fund	Total Non-319 Funds	319(h) Grant	Total Funds
Antietam Creek	2012	$824,469	$424,600	$1,249,069	$3,473,809	$4,722,878
Assawoman Bay	2020	-	-	-	$96,000	$96,000
Back River: Tidal	2010	$6,031,605	-	$6,031,605	$556,443	$6,588,048
Back River: Upper	2008	$0	$12,724,100	$12,724,100	$1,198,905	$13,923,005
Casselman River	2011	$6,440	-	$6,440	$83,619	$90,059
Choptank River: Upper	2010	$1,114,310	-	$1,114,310	$1,684,542	$2,798,852
Corsica River	2004	$1,659,485	-	$1,659,485	$2,137,406	$3,796,891
Gwynns Falls: Middle	2014	$4,248,000	$9,546,741	$13,794,741	$1,063,940	$14,858,681
Jennings Run: Upper	2019	-	-	-	-	-
Jones Falls: Lower	2008	$6,730,213	$100,664	$6,830,877	$462,309	$7,293,186
Monocacy River: Lower	2008	$1,682,018	-	$1,682,018	$1,143,305	$2,825,323
Sassafras River	2009	$4,584,724	-	$4,584,724	$425,748	$5,010,472
Watershed Totals		**$26,881,264**	**$22,796,105**	**$49,677,369**	**$12,326,026**	**$62,003,395**

[12] The funding for Back River: Tidal and Upper is linked due to project overlap, even though it is separated in this table.

Appendix B | NPS Load Tracking

Nutrient and Sediment Tracking

Maryland tracks nutrient and sediment reductions for 319 Priority Watersheds using the Chesapeake Assessment Scenario Tool (CAST). In the following tables (*B - 1 to B - 3*), *Reduction Source Document* refers to how the *Percent Reduction Required* (PRR) was determined. All loads are reported as Edge of Stream: the nutrient and sediment entering directly into local waterbodies from the adjoining land.

The percent reduction for *Watershed Plan* was taken from the approved watershed plan. If no such number was given, PRR was calculated as the percent reduction of the watershed's Plan Start Date (PSD) NPS load necessary to achieve the watershed's TMDL for nitrogen, phosphorus, or sediment. If no TMDL was available, or the TMDL was exceeded, PRR was calculated as the percent reduction required of the watershed's PSD NPS load to achieve the watershed's Phase III WIP nutrient or sediment goals.

Maryland uses the Chesapeake Assessment and Scenario Tool (CAST) outputs to estimate its load reductions/increases as more of a "real time" assessment of how our efforts are going. CAST uses a number of data inputs that can affect the loads in our watersheds, BMP implementation being only one of them. Consequently, even with increased BMP implementation the model may assign greater loads to a watershed which offset any reductions achieved through BMP implementation. This variability is reflected in the tables and watershed profiles included in this section. Baseline loads were extracted directly from CAST and represent the load during a watershed's PSD. Target loads were calculated as *((1 – PRR) * Baseline Loads)*. Current Loads represent 2021 Progress loads in CAST for each watershed.

As previously mentioned, the load calculations data from CAST is up to SFY21, which ended on June 30, 2021. SFY22 progress has yet to be finalized at the time that this report is due. Progress in SFY22 will be included in the next annual report.

319 Reductions come from the individual project calculations provided to MDE in the watershed work plans; **Appendix D** contains the source documentation for these reductions. Non-319 Reductions are calculated as *((PSD - Current Loads) - 319 Reductions)*.

Negative values in the charts below connotate increases in load. CAST is a dynamic model whose output may show variation from year to year due to BMP retirement or annual BMP variation that may increase loads in some areas based on land use conditions.

Table B - 1: *Nitrogen Tracking for 2021 (Edge of Stream loads - Pounds/Year)*

Priority Watershed	Plan Start Date	Reduction Source Document	Percent Reduction Required	Baseline Loads	Target Loads	Current Loads (2021)	319 Reductions	Non-319 Reductions	Total Reductions	Target Reductions	Percent Progress
Antietam Creek	2012	Phase III WIP	10%	1,319,242	1,192,629	1,284,657	1,519	33,065	34,584	126,613	27%
Assawoman Bay	2020	-	-	-	-	-	-	-	-	-	-
Back River: Tidal	2010	Watershed Plan	15%	99,130	84,261	96,275	280	2,575	2,855	14,870	19%
Back River: Upper	2008	Watershed Plan	15%	162,869	138,439	159,957	975	1,937	2,912	24,430	12%
Casselman River	2011	Phase III WIP	-	-	-	-	-	-	-	-	-
Choptank River: Upper	2010	Watershed Plan	39%	2,723,478	1,661,321	2,572,370	1,056	150,051	151,107	1,062,156	14%
Corsica River	2004	Local TMDL	22%	324,679	252,431	293,692	4,873	26,114	30,987	72,248	43%
Gwynns Falls: Middle	2014	Watershed Plan	29%	308,514	219,045	300,795	3,925	3,794	7,719	89,469	9%
Jennings Run: Upper	2019	Phase III WIP	-	-	-	-	-	-	-	-	-
Jones Falls: Lower	2008	Watershed Plan	22%	459,856	356,849	443,564	90	16,202	16,292	103,008	16%
Monocacy River: Lower	2008	Phase III WIP	8%	3,356,264	3,073,151	3,253,788	726	101,750	102,476	283,113	36%
Sassafras River	2009	Watershed Plan	9%	629,276	572,012	570,002	4,204	55,070	59,274	57,264	104%
Watershed Totals *(Nitrogen)*			**16%**	**9,600,969**	**8,045,363**	**9,526,905**	**17,648**	**56,416**	**419,580**	**1,864,731**	**23%**

Table B - 2: *Phosphorus Tracking for 2021 (Edge of Stream loads - Pounds/Year)*

Priority Watershed	Plan Start Date	Reduction Source Document	Percent Reduction Required	Baseline Loads	Target Loads	Current Loads (2021)	319 Reductions	Non-319 Reductions	Total Reductions	Target Reductions	Percent Progress
Antietam Creek	2012	Phase III WIP	7%	72,427	67,231	75,321	694	-3588	-2894	5,196	-56%
Assawoman Bay	2020	-	-	-	-	-	-	-	-	-	-
Back River: Tidal	2010	Watershed Plan	15%	13,304	11,309	12,715	94	495	589	1,996	30%
Back River: Upper	2008	Watershed Plan	15%	18,284	15,541	16,443	328	1513	1841	2,743	67%
Casselman River	2011	Phase III WIP	-	-	-	-	-	-	-	-	-
Choptank River: Upper	2010	Watershed Plan	28%	106,500	76,680	96,698	309	9494	9802	29,820	33%
Corsica River	2004	Local TMDL	35%	14,447	9,353	10,753	458	3236	3694	5,094	73%
Gwynns Falls: Middle	2014	Watershed Plan	45%	26,821	14,725	25,527	1,554	-259	1295	12,096	11%
Jennings Run: Upper	2019	Phase III WIP	-	-	-	-	-	-	-	-	-
Jones Falls: Lower	2008	Watershed Plan	30%	27,966	19,716	22,731	91	5,145	5,236	8,250	63%
Monocacy River: Lower	2008	Phase III WIP	26%	114,254	84,463	102,952	169	11,133	11,302	29,791	38%
Sassafras River	2009	Watershed Plan	34%	27,862	18,417	27,339	254	269	523	9,445	6%
Watershed Totals *(Phosphorus)*			**20%**	**432,792**	**348,204**	**427,079**	**3,951**	**1,762**	**31,791**	**105,340**	**30%**

Table B - 3: *Sediment Tracking for 2021 (Edge of Stream loads - Pounds/Year)*

Priority Watershed	Plan Start Date	Reduction Source Document	Percent Reduction Required	Baseline Loads	Target Loads	Current Loads (2021)	319 Reductions	Non-319 Reductions	Total Reductions	Target Reductions	Percent Progress
Antietam Creek	2012	Phase III WIP	52%	137,562,959	66,281,690	136,781,791	10,976	770,192	781,168	71,281,269	1%
Assawoman Bay	2020	-	-	-	-	-	-	-	-	-	-
Back River: Tidal	2010	Watershed Plan	68%	19,490,971	6,237,111	18,865,100	428	625,444	625,872	13,253,861	5%
Back River: Upper	2008	Watershed Plan	68%	47,994,452	15,358,225	43,962,774	203	4,031,475	4,031,678	32,636,227	12%
Casselman River	2011	Phase III WIP	-	-	-	-	-	-	-	-	-
Choptank River: Upper	2010	Watershed Plan	31%	76,132,326	52,485,476	71,280,537	1,062	4,850,728	4,851,789	23,646,850	21%
Corsica River	2004	Local TMDL	12%	11,026,744	9,658,555	12,273,534	1,520	-1,248,310	-1,246,790	1,368,188	-91%
Gwynns Falls: Middle	2014	Watershed Plan	37%	63,591,505	40,062,648	58,476,067	3,156	5,112,282	5,115,438	23,528,857	22%
Jennings Run: Upper	2019	Phase III WIP	-	-	-	-	-	-	-	-	-
Jones Falls: Lower	2008	Watershed Plan	8%	76,178,609	69,931,963	64,230,952	173	11,947,484	11,947,657	6,246,646	191%
Monocacy River: Lower	2008	Phase III WIP	9%	270,862,477	246,503,526	282,696,646	75	-11,834,244	-11,834,169	24,358,951	-49%
Sassafras River	2009	Watershed Plan	15%	25,829,495	22,006,729	23,274,159	187	2,555,148	2,555,335	3,822,765	67%
Watershed Totals *(Sediment)*			**17%**	**756,882,691**	**630,786,829**	**837,720,221**	**17,780**	**-80,855,309**	**17,579,940**	**203,242,803**	**9%**

Other NPS Pollution – Bacteria

MDE does not currently have a system for tracking bacteria reductions within priority watersheds. Bacteria concentrations and loads tend to be highly variable and difficult to track, particularly when assessing the effectiveness of restoration. The State will continue to evaluate new tools, technologies, and monitoring designs to track progress towards applicable bacteria TMDLs in the future. This largely applies to the Antietam Creek priority watershed plan, which addresses the Bacteria TMDL for the watershed.

Other NPS Pollution – pH Impairments

The Casselman River and Upper Jennings Run priority watershed plans were developed to address the low pH impairment listings due to acid mine drainage. Rather than directly tracking pH, Maryland tracks pH remediation by evaluating how many streams within these watersheds have been successfully delisted for a pH impairment (Table B - 4)., based on pre and post BMP implementation monitoring. Currently, four water quality segments within the Casselman River watershed have been delisted for pH.

Table B - 4: *Casselman River sub-watersheds delisted for pH impairments*

Casselman River | pH Delistings			
River Name	**HUC-12 Watershed**	**Impairment**	**Listing Category**
Alexander Run	050202040032	pH, Low	2 – Meets water quality criteria for the specified pollutant
Big Laurel Run	050202040033	pH, Low	2 – Meets water quality criteria for the specified pollutant
Spiker Run	050202040034	pH, Low	2 – Meets water quality criteria for the specified pollutant
Tarkiln Run	050202040032	pH, Low	2 – Meets water quality criteria for the specified pollutant

Estimating BMP reductions

The following tables provide information on active Best Management Practices that were accepted in the CAST tool. Many of the priority watersheds received funding and completed projects before any watershed plan was approved, and other BMPs will have been implemented through a number of different funding sources and partners. The results below use CAST BMP efficiency assumptions that have been altered by local delivery factors for the Priority watersheds to better simulate the potential reductions BMPs would be able to produce if no baseline changes altered. These tables also reflect active BMPS in SFY21 and will change in SFY22 as BMPs are not verified and no longer receive credit.

The BMP implementation numbers are taken from CAST inputs, which may vary year to year as BMPs fail, do not get verified, new reporting partners come online, or get included in other model data inputs (e.g. tree planting BMPs become forests). Annual variability is to be expected.

MD-02070004 10 - Antietam Creek				LBS Reduced		
Permit Approval 2012/Washington Co.	Duration	Unit	Measure	Nitrogen	Phosphorus	Sediment
Agriculture Practices						
Nutrient Management						
Core Nitrogen	annual	Acres	42,896.62	49,575.19	-	-
Rate Nitrogen	annual	Acres	7,799.68	3,029.63	-	-
Placement Nitrogen	annual	Acres	765.79	626.88	-	-
Timing Nitrogen	annual	Acres	791.89	651.74	-	-
Core Phosphorus	annual	Acres	42,896.62	-	2,887.37	-
Rate Phosphorus	annual	Acres	1,043.12	-	26.93	-
Placement Phosphorus	annual	Acres	945.96	-	11.96	-
Timing Phosphorus	annual	Acres	-	-	-	-
TOTAL				53,883.44	2,926.26	-
Tillage Management						
Conservation	annual	Acres	6,360.67	13,544.41	1,346.04	5,278,111.69
Continuous High Residue	annual	Acres	20,113.13	59,956.43	5,315.50	32,158,583.06
Low Residue	annual	Acres	-	-	-	-
TOTAL				73,500.83	6,661.54	37,436,694.75
Cover Crop						
Traditional	annual	Acres	9,704.08	44,542.27	94.04	453,553.48
Commodity	annual	Acres	4,634.11	8,223.17	-	-
TOTAL				52,765.44	94.04	453,553.48
Pasture Management						
Alternative Watering	cumulative	Acres	3,253.20	1,683.14	317.38	4,356.98
Prescribed Grazing	cumulative	Acres	1,340.82	1,312.12	392.44	5,446.66
Horse Pasture Management	cumulative	Acres	11.26	-	2.76	60.71
Forest Buffers on Fenced Pasture Corridor	cumulative	Acres in Buffers	74.01	6,063.64	1,303.39	923,569.10
Grass Buffers on Fenced Pasture Corridor	cumulative	Acres in Buffers	17.78	1,421.70	308.24	221,421.44
TOTAL				10,480.60	2,324.22	1,154,854.88
Forest Buffers	cumulative	Acres in Buffers	930.11	35,966.34	428.81	2,177,603.54
Wetland Restoration	cumulative	Acres	2.58	78.48	1.55	5,107.47
Wetland Creation	cumulative	Acres	6.61	111.31	2.11	7,986.49
Wetland Enhancement and Rehabilitation	cumulative	Acres	-	-	-	-
Land Retirement to Open Space	cumulative	Acres	913.30	11,262.88	-	1,184,736.70
Land Retirement to Pasture	cumulative	Acres	262.29	8,156.34	46.33	631,580.88
Grass Buffers	cumulative	Acres in Buffers	126.96	3,947.91	22.43	305,703.97
Tree Planting	cumulative	Acres	276.76	3,915.41	49.72	301,422.28
Alternative Crops	cumulative	Acres	-	-	-	-
Soil and Water Conservation Plan	cumulative	Acres	46,736.12	42,315.35	2,161.55	10,689,142.88
Crop Irrigation Management	cumulative	Acres	-	-	-	-
Manure Incorporation	annual	Acres	2,376.36	4,283.65	235.63	-
Capture & Reuse	annual	Acres	-	-	-	-
Non Urban Stream Restoration	cumulative	Feet	6,391.10	434.02	276.73	896,265.20
Non Urban Shoreline Management	cumulative	Feet	-	-	-	-
TOTAL				110,471.69	3,224.86	16,199,549.41
Agricultural Drainage Management						
Denitrifying Ditch Bioreactors	cumulative	Acres	25.01	106.71	-	-
Saturated Buffer	cumulative	Acres	25.01	1,308.47	-	50,158.87
Sorbing Materials in Ag Ditches	cumulative	Acres	25.01	-	4.11	-
Water Control Structures	cumulative	Acres	25.01	109.97	-	-
TOTAL			100.06	1,525.15	4.11	50,158.87
Animal Waste Management Systems						
Broiler Mortality Freezers	annual	Dry Tons (Carcasses)	-	-	-	-
Barnyard Runoff Control & Loafing Lot Management	cumulative	Acres	59.52	8,822.33	380.41	162,172.99
Ag Stormwater Management	cumulative	Acres Treated	-	-	-	-
Manure Transport	annual	Dry Tons	25.94	4.73	7.60	-
Dairy Precision Feeding	annual	Animal Units	-	-	-	-
Ammonia Emission Reductions (Litter Amendments)	annual	Animal Units	-	-	-	-
Ammonia Emission Reductions (Biofilters)	cumulative	Animal Units	-	-	-	-
Ammonia Emission Reductions (Lagoon Covers)	cumulative	Animal Units	-	-	-	-
TOTAL				8,827.06	388.01	162,172.99
Urban/Suburban Practices						
Stormwater Management						
Runoff Reduction Performance Standard	cumulative	Acres Treated	809.42	2,699.24	87.41	-
Storm Water Treatment Performance Standard	cumulative	Acres Treated	2,027.54	6,844.40	669.25	1,358,257.78
Wet Ponds & Wetlands	cumulative	Acres Treated	854.57	1,684.86	222.41	532,852.05
Floating Treatment Wetlands	cumulative	Acres Treated (Wet Pond)	-	-	-	-
Dry Ponds	cumulative	Acres Treated	4,227.38	876.94	156.72	339,608.46
Extended Dry Ponds	cumulative	Acres Treated	4,710.80	2,111.15	388.74	616,391.91
Infiltration Practices	cumulative	Acres Treated	613.64	1,100.78	101.27	481,744.77
Filtering Practices	cumulative	Acres Treated	202.34	1,496.73	141.54	251,516.29
BioRetention	cumulative	Acres Treated	320.48	1,149.37	158.27	335,458.25
BioSwale	cumulative	Acres Treated	19.39	101.41	10.90	19,026.95
Permeable Pavement	cumulative	Acres Treated	0.34	2.16	0.21	359.71
Vegetated Open Channel	cumulative	Acres Treated	17.82	74.54	7.33	16,319.49
Urban Filter Strips	cumulative	Acres Treated	-	-	-	-
Grey Infrastructure (IDDE)	annual	Acres Treated	-	-	-	-
Impervious Disconnection	cumulative	Acres Treated	0.10	0.00	0.00	-
Conservation Landscaping Practices	cumulative	Acres Treated	-	-	-	-
TOTAL				18,141.57	1,944.05	3,951,535.67
Erosion and Sediment Control	annual	Acres	-	-	-	-
Impervious Surface Reduction	cumulative	Acres	-	-	-	-
Urban Forest Buffers	cumulative	Acres in Buffers	14.07	70.06	-	31,434.92
Urban Tree Planting	cumulative	Acres	70.90	617.19	91.51	84,490.62
Urban Forest Planting	cumulative	Acres	10.38	9.29	1.34	1,053.92
Urban Nutrient Management	annual	Acres	16,981.53	112,723.43	15,470.52	10,734,219.55
Urban Stream Restoration	cumulative	Feet	1,244.65	3,604.86	143.66	-
Storm Drain Cleanout	annual	Lbs of Sediment	-	-	-	-
Street Sweeping	annual	Acres	-	-	-	-
Urban Shoreline Management	cumulative	Feet	-	-	-	-
Septic Connections	cumulative	No. Systems	2.99	0.26	0.18	490.84
Septic Denitrification	cumulative	No. Systems	274.50	3,426.78	-	-
Septic Pumping	annual	No. Systems	-	-	-	-
Resource Practices						
Forest Harvesting Practices	annual	Acres	0.08	0.37	0.00	20.57
Dirt&Gravel Road E&S	cumulative	Feet	-	-	-	-
Non-Tidal Algal Flow-way	annual	Acres	-	-	-	-
Tidal Algal Flow-way	annual	Acres	-	-	-	-
TOTAL				120,452.23	15,707.21	10,851,710.42
GRAND TOTAL				**450,048.00**	**33,274.31**	**70,260,230.46**

MD-02060002040 9 - Corsica River				LBS Reduced		
Permit Approval 2006/Queen Anne's Co.	Duration	Unit	Measure	Nitrogen	Phosphorus	Sediment
Agriculture Practices						
Nutrient Management						
Core Nitrogen	annual	Acres	10,500.12	19,711.77	-	-
Rate Nitrogen	annual	Acres	4,282.33	2,514.63	-	-
Placement Nitrogen	annual	Acres	2,696.93	3,909.41	-	-
Timing Nitrogen	annual	Acres	1,161.04	1,443.71	-	-
Core Phosphorus	annual	Acres	10,500.12	-	2,194.74	-
Rate Phosphorus	annual	Acres	109.23	-	7.44	-
Placement Phosphorus	annual	Acres	1,884.43	-	63.24	-
Timing Phosphorus	annual	Acres	-	-	-	-
TOTAL				27,579.52	2,265.41	-
Tillage Management						
Conservation	annual	Acres	2,422.67	2,105.08	390.99	398,239.12
Continuous High Residue	annual	Acres	7,862.15	20,494.50	1,771.74	2,490,203.68
Low Residue	annual	Acres	-	-	-	-
TOTAL				22,599.58	2,162.73	2,888,442.80
Cover Crop						
Traditional	annual	Acres	6,526.18	31,453.29	30.81	7,701.54
Commodity	annual	Acres	1,462.87	2,966.95	-	-
TOTAL				34,420.25	30.81	7,701.54
Pasture Management						
Alternative Watering	cumulative	Acres	48.20	21.55	5.07	7.60
Prescribed Grazing	cumulative	Acres	16.64	13.57	6.13	6.56
Horse Pasture Management	cumulative	Acres	4.64	-	1.46	2.44
Forest Buffers on Fenced Pasture Corridor	cumulative	Acres in Buffers	1.28	67.67	21.00	11,957.66
Grass Buffers on Fenced Pasture Corridor	cumulative	Acres in Buffers	0.38	19.21	6.02	3,515.23
TOTAL				-	-	-
Forest Buffers	cumulative	Acres in Buffers	103.14	7,445.30	114.66	85,603.86
Wetland Restoration	cumulative	Acres	142.27	6,375.99	170.71	97,741.05
Wetland Creation	cumulative	Acres	65.36	1,684.82	52.93	28,046.05
Wetland Enhancement and Rehabilitation	cumulative	Acres	-	-	-	-
Land Retirement to Open Space	cumulative	Acres	218.63	4,110.67	10.97	86,607.62
Land Retirement to Pasture	cumulative	Acres	21.82	410.29	1.10	8,644.42
Grass Buffers	cumulative	Acres in Buffers	1,320.84	73,619.93	820.00	1,094,850.60
Tree Planting	cumulative	Acres	17.42	385.86	10.89	6,820.79
Alternative Crops	cumulative	Acres	3.14	66.34	0.36	1,247.58
Soil and Water Conservation Plan	cumulative	Acres	12,196.77	18,768.88	953.30	1,066,163.62
Crop Irrigation Management	cumulative	Acres	-	-	-	-
Manure Incorporation	annual	Acres	892.26	1,801.63	82.96	-
Capture & Reuse	annual	Acres	-	-	-	-
Non Urban Stream Restoration	cumulative	Feet	-	-	-	-
Non Urban Shoreline Management	cumulative	Feet	-	-	-	-
TOTAL				114,669.72	2,217.88	2,475,725.59
Agricultural Drainage Management						
Denitrifying Ditch Bioreactors	cumulative	Acres	65.42	285.03	-	-
Saturated Buffer	cumulative	Acres	65.42	4,195.23	8.68	26,443.50
Sorbing Materials in Ag Ditches	cumulative	Acres	65.42	-	14.88	-
Water Control Structures	cumulative	Acres	65.42	423.67	-	-
TOTAL				4,903.93	23.56	26,443.50
Animal Waste Management Systems						
Broiler Mortality Freezers	annual	Dry Tons (Carcasses)	-	-	-	-
Barnyard Runoff Control& Loafing Lot Management	cumulative	Acres	2.93	540.95	48.08	788.20
Ag Stormwater Management	cumulative	Acres Treated	-	-	-	-
Manure Transport	annual	Dry Tons	239.60	610.35	23.03	-
Dairy Precision Feeding	annual	Animal Units	-	-	-	-
Ammonia Emission Reductions (Litter Amendments)	annual	Animal Units	-	-	-	-
Ammonia Emission Reductions (Biofilters)	cumulative	Animal Units	-	-	-	-
Ammonia Emission Reductions (Lagoon Covers)	cumulative	Animal Units	-	-	-	-
TOTAL				1,151.31	71.11	788.20
Urban/Suburban Practices						
Stormwater Management						
Runoff Reduction Performance Standard	cumulative	Acres Treated	1.78	9.13	1.14	394.11
Storm Water Treatment Performance Standard	cumulative	Acres Treated	1,114.98	3,337.86	564.51	229,976.61
Wet Ponds & Wetlands	cumulative	Acres Treated	620.19	1,091.75	278.58	107,394.43
Floating Treatment Wetlands	cumulative	Acres Treated (Wet Pond)	-	-	-	-
Dry Ponds	cumulative	Acres Treated	33.16	14.64	3.27	956.99
Extended Dry Ponds	cumulative	Acres Treated	0.69	1.21	0.14	118.81
Infiltration Practices	cumulative	Acres Treated	12.50	90.81	10.61	3,427.18
Filtering Practices	cumulative	Acres Treated	2.92	10.28	1.75	673.55
BioRetention	cumulative	Acres Treated	23.46	120.53	16.02	5,079.07
BioSwale	cumulative	Acres Treated	45.03	277.55	33.79	10,396.49
Permeable Pavement	cumulative	Acres Treated	2.04	8.38	1.02	412.25
Vegetated Open Channel	cumulative	Acres Treated	-	-	-	-
Urban Filter Strips	cumulative	Acres Treated	-	-	-	-
Grey Infrastructure (IDDE)	annual	Acres Treated	-	-	-	-
Impervious Disconnection	cumulative	Acres Treated	-	-	-	-
Conservation Landscaping Practices	cumulative	Acres Treated	-	-	-	-
TOTAL				4,962.14	910.84	358,829.50
Erosion and Sediment Control	annual	Acres	81.98	-	-	195,041.93
Impervious Surface Reduction	cumulative	Acres	-	-	-	-
Urban Forest Buffers	cumulative	Acres in Buffers	1.82	15.61	2.81	506.60
Urban Tree Planting	cumulative	Acres	0.46	0.45	0.08	42.11
Urban Forest Planting	cumulative	Acres	2.02	13.23	2.19	318.05
Urban Nutrient Management	annual	Acres	1,833.33	1,141.34	81.03	-
Urban Stream Restoration	cumulative	Feet	-	-	-	-
Storm Drain Cleanout	annual	Lbs of Sediment	-	-	-	-
Street Sweeping	annual	Acres	-	-	-	-
Urban Shoreline Management	cumulative	Feet	-	-	-	-
Septic Connections	cumulative	Number of Systems	0.47	3.81	-	-
Septic Denitrification	cumulative	Number of Systems	42.17	222.01	-	-
Septic Pumping	annual	Number of Systems	-	-	-	-
Resource Practices						
Forest Harvesting Practices	annual	Acres	-	-	-	-
Dirt& Gravel Road E&S	cumulative	Feet	-	-	-	-
Non-Tidal Algal Flow-way	annual	Acres	-	-	-	-
Tidal Algal Flow-way	annual	Acres	-	-	-	-
TOTAL				1,396.46	86.12	195,908.69
GRAND TOTAL				**211,682.91**	**7,768.46**	**5,953,834.82**

MD-N24510WM0_3650_0001 - Lower Jones Falls				LBS Reduced		
Permit Approval 2008/Baltimore City & Co.	Duration	Unit	Measure	Nitrogen	Phosphorus	Sediment
Agriculture Practices						
Nutrient Management						
Core Nitrogen	annual	Acres	-	-	-	-
Rate Nitrogen	annual	Acres	-	-	-	-
Placement Nitrogen	annual	Acres	-	-	-	-
Timing Nitrogen	annual	Acres	-	-	-	-
Core Phosphorus	annual	Acres	-	-	-	-
Rate Phosphorus	annual	Acres	-	-	-	-
Placement Phosphorus	annual	Acres	-	-	-	-
Timing Phosphorus	annual	Acres	-	-	-	-
TOTAL				-	-	-
Tillage Management						
Conservation	annual	Acres	-	-	-	-
Continuous High Residue	annual	Acres	-	-	-	-
Low Residue	annual	Acres	-	-	-	-
TOTAL				-	-	-
Cover Crop						
Traditional	annual	Acres	-	-	-	-
Commodity	annual	Acres	-	-	-	-
TOTAL				-	-	-
Pasture Management						
Alternative Watering	cumulative	Acres	-	-	-	-
Prescribed Grazing	cumulative	Acres	-	-	-	-
Horse Pasture Management	cumulative	Acres	-	-	-	-
Forest Buffers on Fenced Pasture Corridor	cumulative	Acres in Buffers	-	-	-	-
Grass Buffers on Fenced Pasture Corridor	cumulative	Acres in Buffers	-	-	-	-
TOTAL				-	-	-
Forest Buffers	cumulative	Acres in Buffers	-	-	-	-
Wetland Restoration	cumulative	Acres	-	-	-	-
Wetland Creation	cumulative	Acres	-	-	-	-
Wetland Enhancement and Rehabilitation	cumulative	Acres	-	-	-	-
Land Retirement to Open Space	cumulative	Acres	-	-	-	-
Land Retirement to Pasture	cumulative	Acres	-	-	-	-
Grass Buffers	cumulative	Acres in Buffers	-	-	-	-
Tree Planting	cumulative	Acres	-	-	-	-
Alternative Crops	cumulative	Acres	-	-	-	-
Soil and Water Conservation Plan	cumulative	Acres	-	-	-	-
Crop Irrigation Management	cumulative	Acres	-	-	-	-
Manure Incorporation	annual	Acres	-	-	-	-
Capture & Reuse	annual	Acres	-	-	-	-
Non Urban Stream Restoration	cumulative	Feet	-	-	-	-
Non Urban Shoreline Management	cumulative	Feet	-	-	-	-
TOTAL				-	-	-
Agricultural Drainage Management						
Denitrifying Ditch Bioreactors	cumulative	Acres	-	-	-	-
Saturated Buffer	cumulative	Acres	-	-	-	-
Sorbing Materials in Ag Ditches	cumulative	Acres	-	-	-	-
Water Control Structures	cumulative	Acres	-	-	-	-
TOTAL				-	-	-
Animal Waste Management Systems						
Broiler Mortality Freezers	annual	Dry Tons (Carcasses)	-	-	-	-
Barnyard Runoff Control& Loafing Lot Management	cumulative	Acres	-	-	-	-
Ag Stormwater Management	cumulative	Acres Treated	-	-	-	-
Manure Transport	annual	Dry Tons	-	-	-	-
Dairy Precision Feeding	annual	Animal Units	-	-	-	-
Ammonia Emission Reductions (Litter Amendments)	annual	Animal Units	-	-	-	-
Ammonia Emission Reductions (Biofilters)	cumulative	Animal Units	-	-	-	-
Ammonia Emission Reductions (Lagoon Covers)	cumulative	Animal Units	-	-	-	-
TOTAL				-	-	-
Urban/Suburban Practices						
Stormwater Management						
Runoff Reduction Performance Standard	cumulative	Acres Treated	27.89	72.40	7.85	12,088.88
Storm Water Treatment Performance Standard	cumulative	Acres Treated	115.08	174.38	25.50	46,514.88
Wet Ponds & Wetlands	cumulative	Acres Treated	-	-	-	-
Floating Treatment Wetlands	cumulative	Acres Treated (Wet Pond)	-	-	-	-
Dry Ponds	cumulative	Acres Treated	60.86	22.08	4.16	6,270.59
Extended Dry Ponds	cumulative	Acres Treated	2.49	3.62	0.34	1,539.33
Infiltration Practices	cumulative	Acres Treated	0.26	1.56	0.15	254.49
Filtering Practices	cumulative	Acres Treated	1.48	4.30	0.61	1,219.92
BioRetention	cumulative	Acres Treated	0.97	4.11	0.46	749.58
BioSwale	cumulative	Acres Treated	0.96	4.88	0.49	791.30
Permeable Pavement	cumulative	Acres Treated	0.02	0.07	0.01	14.42
Vegetated Open Channel	cumulative	Acres Treated	-	-	-	-
Urban Filter Strips	cumulative	Acres Treated	-	-	-	-
Grey Infrastructure (IDDE)	annual	Acres Treated	-	-	-	-
Impervious Disconnection	cumulative	Acres Treated	-	-	-	-
Conservation Landscaping Practices	cumulative	Acres Treated	-	-	-	-
TOTAL				287.41	39.57	69,443.40
Erosion and Sediment Control	annual	Acres	37.49	-	-	35,837.55
Impervious Surface Reduction	cumulative	Acres	0.02	0.08	(0.00)	26.08
Urban Forest Buffers	cumulative	Acres in Buffers	-	-	-	-
Urban Tree Planting	cumulative	Acres	105.61	10.95	2.09	1,695.63
Urban Forest Planting	cumulative	Acres	2.25	10.27	1.80	733.12
Urban Nutrient Management	annual	Acres	4,090.78	605.22	33.06	-
Urban Stream Restoration	cumulative	Feet	1,361.83	82.06	71.19	169,888.11
Storm Drain Cleanout	annual	Lbs of Sediment	116,336.00	252.80	58.17	58,520.03
Street Sweeping	annual	Acres	1,361.50	220.60	43.33	192,009.11
Urban Shoreline Management	cumulative	Feet	-	-	-	-
Septic Connections	cumulative	Number of Systems	-	-	-	-
Septic Denitrification	cumulative	Number of Systems	-	-	-	-
Septic Pumping	annual	Number of Systems	-	-	-	-
Resource Practices						
Forest Harvesting Practices	annual	Acres	-	-	-	-
Dirt& Gravel Road E&S	cumulative	Feet	-	-	-	-
Non-Tidal Algal Flow-way	annual	Acres	-	-	-	-
Tidal Algal Flow-way	annual	Acres	-	-	-	-
TOTAL				1,181.97	204.64	458,709.62
GRAND TOTAL				**1,469.38**	**244.21**	**528,153.03**

MD-0207000907 - Lower Monocacy Permit Approval 2008/Frederick Co.	Duration	Unit	Measure	LBS Reduced Nitrogen	 Phosphorus	 Sediment
Agriculture Practices						
Nutrient Management						
Core Nitrogen	annual	Acres	20,621.63	27,742.28	-	-
Rate Nitrogen	annual	Acres	6,578.86	3,023.65	-	-
Placement Nitrogen	annual	Acres	513.63	482.38	-	-
Timing Nitrogen	annual	Acres	760.31	751.85	-	-
Core Phosphorus	annual	Acres	20,621.63	-	1,701.90	-
Rate Phosphorus	annual	Acres	358.02	-	13.41	-
Placement Phosphorus	annual	Acres	553.98	-	10.08	-
Timing Phosphorus	annual	Acres	-	-	-	-
TOTAL				32,000.16	1,725.39	-
Tillage Management						
Conservation	annual	Acres	4,331.38	11,695.63	907.94	2,985,405.78
Continuous High Residue	annual	Acres	13,717.99	51,851.81	3,717.99	18,218,455.81
Low Residue	annual	Acres	-	-	-	-
TOTAL				63,547.43	4,625.93	21,203,861.58
Cover Crop						
Traditional	annual	Acres	8,609.02	46,895.37	65.29	149,391.98
Commodity	annual	Acres	3,095.63	7,699.97	-	-
TOTAL				54,595.34	65.29	149,391.98
Pasture Management						
Alternative Watering	cumulative	Acres	2,170.39	1,102.23	165.04	2,063.00
Prescribed Grazing	cumulative	Acres	320.01	350.24	72.13	926.44
Horse Pasture Management	cumulative	Acres	33.25	-	6.23	127.77
Forest Buffers on Fenced Pasture Corridor	cumulative	Acres in Buffers	20.64	1,226.44	320.29	203,240.67
Grass Buffers on Fenced Pasture Corridor	cumulative	Acres in Buffers	4.69	268.17	70.58	46,198.72
TOTAL				2,947.07	634.27	252,556.59
Forest Buffers	cumulative	Acres in Buffers	792.94	48,904.58	608.80	1,849,969.82
Wetland Restoration	cumulative	Acres	-	-	-	-
Wetland Creation	cumulative	Acres	-	-	-	-
Wetland Enhancement and Rehabilitation	cumulative	Acres	-	-	-	-
Land Retirement to Open Space	cumulative	Acres	1,021.43	17,559.07	49.03	1,211,923.56
Land Retirement to Pasture	cumulative	Acres	170.42	2,929.63	140.64	166,865.13
Grass Buffers	cumulative	Acres in Buffers	145.75	7,017.87	42.74	346,199.42
Tree Planting	cumulative	Acres	44.21	874.54	18.35	46,335.66
Alternative Crops	cumulative	Acres	-	-	-	-
Soil and Water Conservation Plan	cumulative	Acres	30,335.72	-	5,514.73	-
Crop Irrigation Management	cumulative	Acres	-	-	-	-
Manure Incorporation	annual	Acres	1,328.49	2,750.05	143.05	-
Capture & Reuse	annual	Acres	-	-	-	-
Non Urban Stream Restoration	cumulative	Feet	123.65	6.88	5.35	15,965.21
Non Urban Shoreline Management	cumulative	Feet	-	-	-	-
TOTAL				80,042.60	6,390.23	3,672,595.85
Agricultural Drainage Management						
Denitrifying Ditch Bioreactors	cumulative	Acres	89.35	483.36	-	-
Saturated Buffer	cumulative	Acres	89.35	6,117.26	8.52	149,779.19
Sorbing Materials in Ag Ditches	cumulative	Acres	89.35	-	16.24	-
Water Control Structures	cumulative	Acres	89.35	527.96	-	-
TOTAL				7,128.58	24.76	149,779.19
Animal Waste Management Systems						
Broiler Mortality Freezers	annual	Dry Tons (Carcasses)	-	-	-	-
Barnyard Runoff Control& Loafing Lot Management	cumulative	Acres	36.24	3,089.49	85.90	101,905.83
Ag Stormwater Management	cumulative	Acres Treated	-	-	-	-
Manure Transport	annual	Dry Tons	640.33	324.38	281.55	-
Dairy Precision Feeding	annual	Animal Units	-	-	-	-
Ammonia Emission Reductions (Litter Amendments)	annual	Animal Units	-	-	-	-
Ammonia Emission Reductions (Biofilters)	cumulative	Animal Units	-	-	-	-
Ammonia Emission Reductions (Lagoon Covers)	cumulative	Animal Units	-	-	-	-
TOTAL				3,413.87	367.46	101,905.83
Urban/Suburban Practices						
Stormwater Management						
Runoff Reduction Performance Standard	cumulative	Acres Treated	900.77	3,254.55	217.79	558,522.29
Storm Water Treatment Performance Standard	cumulative	Acres Treated	5,780.13	12,213.13	1,098.69	3,339,038.97
Wet Ponds & Wetlands	cumulative	Acres Treated	4,863.88	10,691.29	1,427.50	3,600,552.20
Floating Treatment Wetlands	cumulative	Acres Treated (Wet Pond)	-	-	-	-
Dry Ponds	cumulative	Acres Treated	1,661.88	913.57	108.67	205,039.94
Extended Dry Ponds	cumulative	Acres Treated	3,697.14	8,126.69	483.51	2,736,860.70
Infiltration Practices	cumulative	Acres Treated	814.75	7,387.26	451.60	954,963.36
Filtering Practices	cumulative	Acres Treated	171.45	753.75	67.14	169,230.44
BioRetention	cumulative	Acres Treated	140.42	900.22	62.57	129,937.72
BioSwale	cumulative	Acres Treated	60.14	462.63	29.40	59,357.02
Permeable Pavement	cumulative	Acres Treated	0.60	3.10	0.20	521.23
Vegetated Open Channel	cumulative	Acres Treated	0.001	0.003	0.000	0.748
Urban Filter Strips	cumulative	Acres Treated	-	-	-	-
Grey Infrastructure (IDDE)	annual	Acres Treated	-	-	-	-
Impervious Disconnection	cumulative	Acres Treated	-	-	-	-
Conservation Landscaping Practices	cumulative	Acres Treated	-	-	-	-
TOTAL				44,706.21	3,947.06	11,754,024.64
Erosion and Sediment Control	annual	Acres	206.97	-	-	1,477,204.54
Impervious Surface Reduction	cumulative	Acres	0.92	5.78	-	1,870.07
Urban Forest Buffers	cumulative	Acres in Buffers	8.74	90.56	8.71	9,126.21
Urban Tree Planting	cumulative	Acres	137.18	144.43	14.13	-
Urban Forest Planting	cumulative	Acres	78.93	625.03	54.98	42,476.00
Urban Nutrient Management	annual	Acres	14,688.06	12,084.89	500.86	-
Urban Stream Restoration	cumulative	Feet	7,513.02	417.95	325.16	970,061.62
Storm Drain Cleanout	annual	Lbs of Sediment	-	-	-	-
Street Sweeping	annual	Acres	-	-	-	-
Urban Shoreline Management	cumulative	Feet	-	-	-	-
Septic Connections	cumulative	Number of Systems	4.08	42.61	-	-
Septic Denitrification	cumulative	Number of Systems	294.81	1,990.43	-	-
Septic Pumping	annual	Number of Systems	-	-	-	-
Resource Practices						
Forest Harvesting Practices	annual	Acres	0.69	2.92	0.05	179.66
Dirt& Gravel Road E&S	cumulative	Feet	-	-	-	-
Non-Tidal Algal Flow-way	annual	Acres	-	-	-	-
Tidal Algal Flow-way	annual	Acres	-	-	-	-
TOTAL				15,404.59	903.90	2,500,918.10
GRAND TOTAL				**303,785.86**	**18,684.29**	**39,785,033.77**

MD-02060003090 - Middle Gwynns Falls (Dead Run)				LBS Reduced		
Permit Approval 2014/Baltimore City	Duration	Unit	Measure	Nitrogen	Phosphorus	Sediment
Agriculture Practices						
Nutrient Management						
Core Nitrogen	annual	Acres	131.02	-	-	-
Rate Nitrogen	annual	Acres	18.15	-	-	-
Placement Nitrogen	annual	Acres	2.14	-	-	-
Timing Nitrogen	annual	Acres	2.69	-	-	-
Core Phosphorus	annual	Acres	131.02	-	-	-
Rate Phosphorus	annual	Acres	0.76	-	-	-
Placement Phosphorus	annual	Acres	2.81	-	-	-
Timing Phosphorus	annual	Acres	-	-	-	-
TOTAL				-	-	-
Tillage Management						
Conservation	annual	Acres	19.65	-	-	-
Continuous High Residue	annual	Acres	65.49	-	-	-
Low Residue	annual	Acres	-	-	-	-
TOTAL				-	-	-
Cover Crop						
Traditional	annual	Acres	28.23	-	-	-
Commodity	annual	Acres	9.76	-	-	-
TOTAL				-	-	-
Pasture Management						
Alternative Watering	cumulative	Acres	17.73	-	-	-
Prescribed Grazing	cumulative	Acres	3.64	-	-	-
Horse Pasture Management	cumulative	Acres	2.16	-	-	-
Forest Buffers on Fenced Pasture Corridor	cumulative	Acres in Buffers	0.02	-	-	-
Grass Buffers on Fenced Pasture Corridor	cumulative	Acres in Buffers	-	-	-	-
TOTAL				-	-	-
Forest Buffers	cumulative	Acres in Buffers	1.05	-	-	-
Wetland Restoration	cumulative	Acres	0.19	-	-	-
Wetland Creation	cumulative	Acres	0.01	-	-	-
Wetland Enhancement and Rehabilitation	cumulative	Acres	-	-	-	-
Land Retirement to Open Space	cumulative	Acres	0.89	-	-	-
Land Retirement to Pasture	cumulative	Acres	2.71	-	-	-
Grass Buffers	cumulative	Acres in Buffers	1.47	-	-	-
Tree Planting	cumulative	Acres	0.12	-	0.00	3.99
Alternative Crops	cumulative	Acres	-	-	-	-
Soil and Water Conservation Plan	cumulative	Acres	156.44	-	-	-
Crop Irrigation Management	cumulative	Acres	-	-	-	-
Manure Incorporation	annual	Acres	0.86	-	-	-
Capture & Reuse	cumulative	Acres	-	-	-	-
Non Urban Stream Restoration	cumulative	Acres	943.06	59.88	52.86	139,802.38
Non Urban Shoreline Management	cumulative	Feet	-	-	-	-
TOTAL				59.88	52.86	139,806.37
Agricultural Drainage Management						
Denitrifying Ditch Bioreactors	cumulative	Acres	0.13	-	-	-
Saturated Buffer	cumulative	Acres	0.13	-	-	-
Sorbing Materials in Ag Ditches	cumulative	Acres	0.13	72.27	5.97	426.88
Water Control Structures	cumulative	Acres	0.13	-	-	-
TOTAL				72.27	5.97	426.88
Animal Waste Management Systems						
Broiler Mortality Freezers	annual	Dry Tons (Carcasses)	-	-	-	-
Barnyard Runoff Control& Loafing Lot Management	cumulative	Acres	0.24	-	-	-
Ag Stormwater Management	cumulative	Acres Treated	-	-	-	-
Manure Transport	annual	Dry Tons	4.78	-	-	-
Dairy Precision Feeding	annual	Animal Units	-	-	-	-
Ammonia Emission Reductions (Litter Amendments)	annual	Animal Units	-	-	-	-
Ammonia Emission Reductions (Biofilters)	cumulative	Animal Units	-	-	-	-
Ammonia Emission Reductions (Lagoon Covers)	cumulative	Animal Units	-	-	-	-
TOTAL				-	-	-
Urban/Suburban Practices						
Stormwater Management						
Runoff Reduction Performance Standard	cumulative	Acres Treated	340.37	898.33	100.87	163,638.19
Storm Water Treatment Performance Standard	cumulative	Acres Treated	1,737.50	2,676.52	405.31	779,052.38
Wet Ponds & Wetlands	cumulative	Acres Treated	129.50	190.37	42.18	91,090.58
Floating Treatment Wetlands	cumulative	Acres Treated (Wet Pond)	-	-	-	-
Dry Ponds	cumulative	Acres Treated	2,161.72	792.85	155.41	253,425.06
Extended Dry Ponds	cumulative	Acres Treated	2,661.16	3,911.96	382.59	1,871,879.57
Infiltration Practices	cumulative	Acres Treated	56.05	339.98	34.45	62,424.15
Filtering Practices	cumulative	Acres Treated	2.34	6.88	1.02	2,194.21
BioRetention	cumulative	Acres Treated	5.51	28.64	2.73	4,846.70
BioSwale	cumulative	Acres Treated	8.63	44.39	4.68	8,092.45
Permeable Pavement	cumulative	Acres Treated	5.08	17.43	1.84	4,169.11
Vegetated Open Channel	cumulative	Acres Treated	1.67	3.37	0.33	1,172.36
Urban Filter Strips	cumulative	Acres Treated	-	-	-	-
Grey Infrastructure (IDDE)	annual	Acres Treated	-	-	-	-
Impervious Disconnection	cumulative	Acres Treated	0.14	0.13	0.01	25.60
Conservation Landscaping Practices	cumulative	Acres Treated	-	-	-	-
TOTAL				8,905.84	1,131.42	3,242,010.37
Erosion and Sediment Control	annual	Acres	-	-	-	-
Impervious Surface Reduction	cumulative	Acres	2.99	11.35	-	4,134.81
Urban Forest Buffers	cumulative	Acres in Buffers	4.22	25.09	5.04	3,594.33
Urban Tree Planting	cumulative	Acres	203.24	-	-	-
Urban Forest Planting	cumulative	Acres	71.55	311.27	62.01	25,120.84
Urban Nutrient Management	annual	Acres	11,466.77	-	-	-
Urban Stream Restoration	cumulative	Feet	8,775.81	557.26	491.88	1,300,955.06
Storm Drain Cleanout	annual	Ibs of Sediment	2,989.14	6.85	1.46	1,786.79
Street Sweeping	annual	Acres	1,652.21	261.45	55.82	250,143.54
Urban Shoreline Management	cumulative	Feet	1.09	0.09	0.07	179.40
Septic Connections	cumulative	Number of Systems	50.98	353.41	-	-
Septic Denitrification	cumulative	Number of Systems	10.21	46.79	-	-
Septic Pumping	annual	Number of Systems	-	-	-	-
Resource Practices						
Forest Harvesting Practices	annual	Acres	7.42	20.44	-	1,058.20
Dirt& Gravel Road E&S	cumulative	Feet	-	-	-	-
Non-Tidal Algal Flow-way	annual	Acres	-	-	-	-
Tidal Algal Flow-way	annual	Acres	-	-	-	-
TOTAL				1,594.00	616.28	1,586,972.96
GRAND TOTAL				**10,632.00**	**1,806.53**	**4,960,216.59**

MD-0206000203 - Sassafras River				LBS Reduced		
Permit Approval 2010/Cecil & Kent Co.	Duration	Unit	Measure	Nitrogen	Phosphorus	Sediment
Agriculture Practices						
Nutrient Management						
Core Nitrogen	annual	Acres	19,229.25	24,112.91	-	-
Rate Nitrogen	annual	Acres	8,175.05	3,713.60	-	-
Placement Nitrogen	annual	Acres	1,304.45	1,296.52	-	-
Timing Nitrogen	annual	Acres	1,290.58	1,275.89	-	-
Core Phosphorus	annual	Acres	19,229.25	-	2,580.31	-
Rate Phosphorus	annual	Acres	177.89	-	9.45	-
Placement Phosphorus	annual	Acres	1,223.28	-	32.09	-
Timing Phosphorus	annual	Acres	-	-	-	-
	TOTAL			30,398.91	2,621.84	-
Tillage Management						
Conservation	annual	Acres	5,632.06	5,888.79	978.81	1,611,432.15
Continuous High Residue	annual	Acres	17,472.70	43,055.95	4,124.86	9,632,722.20
Low Residue	annual	Acres	-	-	-	-
	TOTAL			48,644.74	5,103.67	11,244,154.35
Cover Crop						
Traditional	annual	Acres	16,161.79	71,711.22	132.58	55,909.10
Commodity	annual	Acres	3,156.05	6,314.25	-	-
	TOTAL			78,025.47	132.58	55,909.10
Pasture Management						
Alternative Watering	cumulative	Acres	340.98	160.56	47.33	174.15
Prescribed Grazing	cumulative	Acres	188.08	163.43	76.44	299.20
Horse Pasture Management	cumulative	Acres	5.87	-	1.97	12.32
Forest Buffers on Fenced Pasture Corridor	cumulative	Acres in Buffers	2.32	227.60	60.94	32,477.60
Grass Buffers on Fenced Pasture Corridor	cumulative	Acres in Buffers	7.85	448.79	116.13	68,490.97
	TOTAL			1,000.38	302.81	101,454.23
Forest Buffers	cumulative	Acres in Buffers	223.03	13,865.74	217.56	293,565.08
Wetland Restoration	cumulative	Acres	66.41	2,821.92	75.83	76,238.41
Wetland Creation	cumulative	Acres	52.61	1,139.97	35.01	34,817.91
Wetland Enhancement and Rehabilitation	cumulative	Acres	-	-	-	-
Land Retirement	cumulative	Acres	1,639.04	25,701.15	106.70	1,024,895.91
Grass Buffers	cumulative	Acres in Buffers	835.31	39,963.35	338.18	1,099,309.19
Tree Planting	cumulative	Acres	97.18	1,799.74	47.64	57,840.76
Alternative Crops	cumulative	Acres	81.29	1,552.12	-	54,522.26
Soil and Water Conservation Plan	cumulative	Acres	27,390.46	35,115.71	1,981.80	3,627,066.04
Crop Irrigation Management	cumulative	Acres	-	-	-	-
Manure Incorporation	annual	Acres	3,058.25	5,252.94	287.08	-
Capture & Reuse	annual	Acres	-	-	-	-
Non Urban Stream Restoration	cumulative	Feet	885.22	58.40	48.48	95,347.18
Non Urban Shoreline Management	cumulative	Feet	-	-	-	-
	TOTAL			127,271.03	3,138.27	6,362,802.74
Agricultural Drainage Management						
Denitrifying Ditch Bioreactors	cumulative	Acres	2,693.84	10,804.36	-	-
Saturated Buffer	cumulative	Acres	2,693.84	141,474.32	66.42	2,220,900.18
Sorbing Materials in Ag Ditches	cumulative	Acres	2,693.84	-	585.57	-
Water Control Structures	cumulative	Acres	2,693.84	14,901.54	-	-
	TOTAL			167,180.22	651.99	2,220,900.18
Animal Waste Management Systems						
Broiler Mortality Freezers	annual	Dry Tons (Carcasses)	-	-	-	-
Barnyard Runoff Control& Loafing Lot Management	cumulative	Acres	21.41	2,774.08	295.69	33,916.16
Ag Stormwater Management	cumulative	Acres Treated	-	-	-	-
Manure Transport	annual	Dry Tons	5,271.36	(1,643.74)	2,084.86	-
Dairy Precision Feeding	annual	Animal Units	-	-	-	-
Ammonia Emission Reductions (Litter Amendments)	annual	Animal Units	-	-	-	-
Ammonia Emission Reductions (Biofilters)	cumulative	Animal Units	-	-	-	-
Ammonia Emission Reductions (Lagoon Covers)	cumulative	Animal Units	-	-	-	-
	TOTAL			1,130.35	2,380.55	33,916.16
Urban/Suburban Practices						
Stormwater Management						
Runoff Reduction Performance Standard	cumulative	Acres Treated	20.20	99.15	14.06	9,384.56
Storm Water Treatment Performance Standard	cumulative	Acres Treated	880.77	2,520.97	481.36	380,750.09
Wet Ponds & Wetlands	cumulative	Acres Treated	105.55	179.29	50.21	39,410.13
Floating Treatment Wetlands	cumulative	Acres Treated (Wet Pond)	-	-	-	-
Dry Ponds	cumulative	Acres Treated	2.33	0.99	0.25	145.25
Extended Dry Ponds	cumulative	Acres Treated	25.79	43.81	5.46	9,629.24
Infiltration Practices	cumulative	Acres Treated	2.65	18.58	2.38	1,567.71
Filtering Practices	cumulative	Acres Treated	0.05	0.15	0.03	22.52
BioRetention	cumulative	Acres Treated	0.12	0.60	0.09	56.61
BioSwale	cumulative	Acres Treated	0.01	0.04	0.01	3.25
Permeable Pavement	cumulative	Acres Treated	-	-	-	-
Vegetated Open Channel	cumulative	Acres Treated	-	-	-	-
Urban Filter Strips	cumulative	Acres Treated	-	-	-	-
Grey Infrastructure (IDDE)	annual	Acres Treated	-	-	-	-
Impervious Disconnection	cumulative	Acres Treated	-	-	-	-
Conservation Landscaping Practices	cumulative	Acres Treated	-	-	-	-
	TOTAL			2,863.58	553.83	3,417.41
Erosion and Sediment Control	annual	Acres	8.78	-	-	36,600.56
Impervious Surface Reduction	cumulative	Acres	-	-	-	-
Urban Forest Buffers	cumulative	Acres in Buffers	1.62	13.35	2.64	927.62
Urban Tree Planting	cumulative	Acres	0.61	0.57	0.11	17.19
Urban Forest Planting	cumulative	Acres	1.14	7.24	1.31	359.69
Urban Nutrient Management	annual	Acres	3,753.97	2,359.18	187.20	-
Urban Stream Restoration	cumulative	Feet	-	-	-	-
Storm Drain Cleanout	annual	Lbs of Sediment	-	-	-	-
Street Sweeping	annual	Acres	-	-	-	-
Urban Shoreline Management	cumulative	Feet	-	-	-	-
Septic Connections	cumulative	Number of Systems	0.70	6.40	-	-
Septic Denitrification	cumulative	Number of Systems	155.35	920.91	-	-
Septic Pumping	annual	Number of Systems	-	-	-	-
Resource Practices						
Forest Harvesting Practices	annual	Acres	84.32	317.72	6.94	7,544.25
Dirt& Gravel Road ES&	cumulative	Feet	-	-	-	-
Non-Tidal Algal Flow-way	annual	Acres	-	-	-	-
Tidal Algal Flow-way	annual	Acres	-	-	-	-
	TOTAL			3,625.36	198.20	45,449.31
Sassafras River Watershed Load Reduction Summary				460,140.04	15,083.76	20,068,003.49

MD-02060003070 3 - Tidal Back River (Head: Cove)				LBS Reduced		
Permit Approval 2010/Baltimore City	Duration	Unit	Measure	Nitrogen	Phosphorus	Sediment
Agriculture Practices						
Nutrient Management						
Core Nitrogen	annual	Acres	174.22	-	-	-
Rate Nitrogen	annual	Acres	50.22	-	-	-
Placement Nitrogen	annual	Acres	5.91	-	-	-
Timing Nitrogen	annual	Acres	7.44	-	-	-
Core Phosphorus	annual	Acres	174.22	-	-	-
Rate Phosphorus	annual	Acres	2.12	-	-	-
Placement Phosphorus	annual	Acres	7.77	-	-	-
Timing Phosphorus	annual	Acres	-	-	-	-
TOTAL				-	-	-
Tillage Management						
Conservation	annual	Acres	58.72	-	-	-
Continuous High Residue	annual	Acres	182.17	-	-	-
Low Residue	annual	Acres	-	-	-	-
TOTAL				-	-	-
Cover Crop						
Traditional	annual	Acres	66.07	-	-	-
Commodity	annual	Acres	28.52	-	-	-
TOTAL				-	-	-
Pasture Management						
Alternative Watering	cumulative	Acres	41.91	-	-	-
Prescribed Grazing	cumulative	Acres	8.87	-	-	-
Horse Pasture Management	cumulative	Acres	1.05	-	-	-
Forest Buffers on Fenced Pasture Corridor	cumulative	Acres in Buffers	0.05	-	-	-
Grass Buffers on Fenced Pasture Corridor	cumulative	Acres in Buffers	-	-	-	-
TOTAL				-	-	-
Forest Buffers	cumulative	Acres in Buffers	2.94	-	-	-
Wetland Restoration	cumulative	Acres	0.47	-	-	-
Wetland Creation	cumulative	Acres	0.03	-	-	-
Wetland Enhancement and Rehabilitation	cumulative	Acres	-	-	-	-
Land Retirement to Open Space	cumulative	Acres	2.13	-	-	-
Land Retirement to Pasture	cumulative	Acres	8.19	-	-	-
Grass Buffers	cumulative	Acres in Buffers	3.75	-	-	-
Tree Planting	cumulative	Acres	0.28	-	0.01	9.84
Alternative Crops	cumulative	Acres	-	-	-	-
Soil and Water Conservation Plan	cumulative	Acres	400.08	-	-	-
Crop Irrigation Management	cumulative	Acres	-	-	-	-
Manure Incorporation	annual	Acres	1.75	-	-	-
Capture & Reuse	annual	Acres	-	-	-	-
Non Urban Stream Restoration	cumulative	Feet	618.36	39.27	34.66	91,667.22
Non Urban Shoreline Management	cumulative	Feet	-	-	-	-
TOTAL				39.27	34.67	91,677.06
Agricultural Drainage Management						
Denitrifying Ditch Bioreactors	cumulative	Acres	0.37	-	-	-
Saturated Buffer	cumulative	Acres	0.37	-	-	-
Sorbing Materials in Ag Ditches	cumulative	Acres	0.37	199.98	16.51	1,181.14
Water Control Structures	cumulative	Acres	0.37	-	-	-
TOTAL				199.98	16.51	1,181.14
Animal Waste Management Systems						
Broiler Mortality Freezers	annual	Dry Tons (Carcasses)	-	-	-	-
Barnyard Runoff Control& Loafing Lot Management	cumulative	Acres	0.57	-	-	-
Ag Stormwater Management	cumulative	Acres Treated	-	-	-	-
Manure Transport	annual	Dry Tons	12.39	-	-	-
Dairy Precision Feeding	annual	Animal Units	-	-	-	-
Ammonia Emission Reductions (Litter Amendments)	annual	Animal Units	-	-	-	-
Ammonia Emission Reductions (Biofilters)	cumulative	Animal Units	-	-	-	-
Ammonia Emission Reductions (Lagoon Covers)	cumulative	Animal Units	-	-	-	-
TOTAL				-	-	-
Urban/Suburban Practices						
Stormwater Management						
Runoff Reduction Performance Standard	cumulative	Acres Treated	717.24	1,893.01	212.56	344,828.80
Storm Water Treatment Performance Standard	cumulative	Acres Treated	2,372.97	3,655.41	553.54	1,063,977.08
Wet Ponds & Wetlands	cumulative	Acres Treated	32.27	47.43	10.51	22,696.82
Floating Treatment Wetlands	cumulative	Acres Treated (Wet Pond)	-	-	-	-
Dry Ponds	cumulative	Acres Treated	423.19	155.21	30.42	49,612.16
Extended Dry Ponds	cumulative	Acres Treated	1,087.12	1,598.09	156.30	764,689.24
Infiltration Practices	cumulative	Acres Treated	9.89	60.01	6.08	11,018.40
Filtering Practices	cumulative	Acres Treated	12.78	37.58	5.55	11,988.38
BioRetention	cumulative	Acres Treated	0.28	1.20	0.14	245.86
BioSwale	cumulative	Acres Treated	1.20	6.18	0.65	1,126.39
Permeable Pavement	cumulative	Acres Treated	0.50	1.70	0.18	407.57
Vegetated Open Channel	cumulative	Acres Treated	-	-	-	-
Urban Filter Strips	cumulative	Acres Treated	-	-	-	-
Grey Infrastructure (IDDE)	annual	Acres Treated	-	-	-	-
Impervious Disconnection	cumulative	Acres Treated	0.01	0.01	0.00	1.05
Conservation Landscaping Practices	cumulative	Acres Treated	-	-	-	-
TOTAL				7,455.83	975.93	2,270,591.77
Erosion and Sediment Control	annual	Acres	49.65	-	-	87.85
Impervious Surface Reduction	cumulative	Acres	5.73	21.75	-	7,928.32
Urban Forest Buffers	cumulative	Acres in Buffers	2.40	14.24	2.86	2,039.95
Urban Tree Planting	cumulative	Acres	60.93	-	-	-
Urban Forest Planting	cumulative	Acres	7.24	31.51	6.28	2,543.31
Urban Nutrient Management	annual	Acres	4,814.17	-	-	-
Urban Stream Restoration	cumulative	Feet	3,287.26	208.74	184.25	487,314.04
Storm Drain Cleanout	annual	lbs of Sediment	-	-	-	-
Street Sweeping	annual	Acres	5.47	0.87	0.18	827.68
Urban Shoreline Management	cumulative	Feet	3,067.36	264.77	187.17	503,046.61
Septic Connections	cumulative	Number of Systems	54.65	378.86	-	-
Septic Denitrification	cumulative	Number of Systems	8.01	36.69	-	-
Septic Pumping	annual	Number of Systems	-	-	-	-
Resource Practices						
Forest Harvesting Practices	annual	Acres	5.51	15.17	-	785.46
Dirt& Gravel Road E&S	cumulative	Feet	-	-	-	-
Non-Tidal Algal Flow-way	annual	Acres	-	-	-	-
Tidal Algal Flow-way	annual	Acres	-	-	-	-
TOTAL				972.61	380.74	1,004,573.22
GRAND TOTAL				**8,667.69**	**1,407.85**	**3,368,023.18**

MD-02060003070 2 - Upper Back River (Redhouse Creek)				LBS Reduced		
Permit Approval 2009/Baltimore City	Duration	Unit	Measure	Nitrogen	Phosphorus	Sediment
Agriculture Practices						
Nutrient Management						
Core Nitrogen	annual	Acres	4.60	-	-	-
Rate Nitrogen	annual	Acres	1.31	-	-	-
Placement Nitrogen	annual	Acres	0.15	-	-	-
Timing Nitrogen	annual	Acres	0.19	-	-	-
Core Phosphorus	annual	Acres	4.60	-	-	-
Rate Phosphorus	annual	Acres	0.06	-	-	-
Placement Phosphorus	annual	Acres	0.20	-	-	-
Timing Phosphorus	annual	Acres	-	-	-	-
TOTAL				-	-	-
Tillage Management						
Conservation	annual	Acres	1.56	-	-	-
Continuous High Residue	annual	Acres	4.88	-	-	-
Low Residue	annual	Acres	-	-	-	-
TOTAL				-	-	-
Cover Crop						
Traditional	annual	Acres	1.72	-	-	-
Commodity	annual	Acres	0.78	-	-	-
TOTAL				-	-	-
Pasture Management						
Alternative Watering	cumulative	Acres	1.36	-	-	-
Prescribed Grazing	cumulative	Acres	0.24	-	-	-
Horse Pasture Management	cumulative	Acres	0.03	-	-	-
Forest Buffers on Fenced Pasture Corridor	cumulative	Acres in Buffers	0.00	-	-	-
Grass Buffers on Fenced Pasture Corridor	cumulative	Acres in Buffers	-	-	-	-
TOTAL				-	-	-
Forest Buffers	cumulative	Acres in Buffers	0.08	-	-	-
Wetland Restoration	cumulative	Acres	0.01	-	-	-
Wetland Creation	cumulative	Acres	0.00	-	-	-
Wetland Enhancement and Rehabilitation	cumulative	Acres	-	-	-	-
Land Retirement to Open Space	cumulative	Acres	0.07	-	-	-
Land Retirement to Pasture	cumulative	Acres	0.21	-	-	-
Grass Buffers	cumulative	Acres in Buffers	0.10	-	-	-
Tree Planting	cumulative	Acres	0.01	-	0.00	0.26
Alternative Crops	cumulative	Acres	-	-	-	-
Soil and Water Conservation Plan	cumulative	Acres	10.15	-	-	-
Crop Irrigation Management	cumulative	Acres	-	-	-	-
Manure Incorporation	annual	Acres	0.04	-	-	-
Capture & Reuse	annual	Acres	-	-	-	-
Non Urban Stream Restoration	cumulative	Feet	366.77	28.29	20.56	54,370.79
Non Urban Shoreline Management	cumulative	Feet	-	-	-	-
TOTAL				28.29	20.56	54,371.05
Agricultural Drainage Management						
Denitrifying Ditch Bioreactors	cumulative	Acres	0.01	-	-	-
Saturated Buffer	cumulative	Acres	0.01	-	-	-
Sorbing Materials in Ag Ditches	cumulative	Acres	0.01	5.21	0.43	30.76
Water Control Structures	cumulative	Acres	0.01	-	-	-
TOTAL				5.21	0.43	30.76
Animal Waste Management Systems						
Broiler Mortality Freezers	annual	Dry Tons (Carcasses)	-	-	-	-
Barnyard Runoff Control& Loafing Lot Management	cumulative	Acres	0.01	-	-	-
Ag Stormwater Management	cumulative	Acres Treated	-	-	-	-
Manure Transport	annual	Dry Tons	0.15	-	-	-
Dairy Precision Feeding	annual	Animal Units	-	-	-	-
Ammonia Emission Reductions (Litter Amendments)	annual	Animal Units	-	-	-	-
Ammonia Emission Reductions (Biofilters)	cumulative	Animal Units	-	-	-	-
Ammonia Emission Reductions (Lagoon Covers)	cumulative	Animal Units	-	-	-	-
TOTAL				-	-	-
Urban/Suburban Practices						
Stormwater Management						
Runoff Reduction Performance Standard	cumulative	Acres Treated	78.89	208.21	28.38	37,927.15
Storm Water Treatment Performance Standard	cumulative	Acres Treated	622.19	958.45	145.14	278,975.76
Wet Ponds & Wetlands	cumulative	Acres Treated	62.60	92.02	20.39	44,032.78
Floating Treatment Wetlands	cumulative	Acres Treated (Wet Pond)	-	-	-	-
Dry Ponds	cumulative	Acres Treated	67.38	24.71	4.84	7,899.49
Extended Dry Ponds	cumulative	Acres Treated	142.84	209.98	20.54	100,476.97
Infiltration Practices	cumulative	Acres Treated	0.62	3.74	0.38	687.53
Filtering Practices	cumulative	Acres Treated	24.28	71.40	10.55	22,775.44
BioRetention	cumulative	Acres Treated	2.76	11.84	1.37	2,428.35
BioSwale	cumulative	Acres Treated	2.06	10.59	1.12	1,930.87
Permeable Pavement	cumulative	Acres Treated	0.15	0.51	0.05	122.67
Vegetated Open Channel	cumulative	Acres Treated	-	-	-	-
Urban Filter Strips	cumulative	Acres Treated	-	-	-	-
Grey Infrastructure (IDDE)	annual	Acres Treated	-	-	-	-
Impervious Disconnection	cumulative	Acres Treated	-	-	-	-
Conservation Landscaping Practices	cumulative	Acres Treated	-	-	-	-
TOTAL			-	1,591.47	227.75	497,257.02
Erosion and Sediment Control	annual	Acres	1.02	-	-	1.81
Impervious Surface Reduction	cumulative	Acres	1.00	3.78	-	1,378.43
Urban Forest Buffers	cumulative	Acres in Buffers	1.45	8.61	1.73	1,233.77
Urban Tree Planting	cumulative	Acres	131.29	-	-	-
Urban Forest Planting	cumulative	Acres	9.82	42.73	8.51	3,448.15
Urban Nutrient Management	annual	Acres	8,378.30	-	-	-
Urban Stream Restoration	cumulative	Feet	12,495.97	793.49	700.40	1,852,444.17
Storm Drain Cleanout	annual	Lbs of Sediment	4,424.61	10.13	2.17	2,644.85
Street Sweeping	annual	Acres	1,329.61	210.40	44.92	201,301.70
Urban Shoreline Management	cumulative	Feet	17.14	1.48	1.05	2,810.69
Septic Connections	cumulative	Number of Systems	3.46	23.98	-	-
Septic Denitrification	cumulative	Number of Systems	2.33	10.68	-	-
Septic Pumping	annual	Number of Systems	-	-	-	-
Resource Practices						
Forest Harvesting Practices	annual	Acres	0.80	2.20	-	114.11
Dirt& Gravel Road E&S	cumulative	Feet	-	-	-	-
Non-Tidal Algal Flow-way	annual	Acres	-	-	-	-
Tidal Algal Flow-way	annual	Acres	-	-	-	-
TOTAL				1,107.49	758.77	2,065,377.68
GRAND TOTAL				**2,727.46**	**1,007.51**	**2,617,036.51**

MD-0206000502 - Upper Choptank River				LBS Reduced		
Permit Approval 2010/Talbot, Caroline, & Queen Anne's Co.	Duration	Unit	Measure	Nitrogen	Phosphorus	Sediment
Agriculture Practices						
Nutrient Management						
Core Nitrogen	annual	Acres	37,835.01	99,668.34	129.68	-
Rate Nitrogen	annual	Acres	12,771.00	10,411.42	-	-
Placement Nitrogen	annual	Acres	5,603.44	11,512.00	-	-
Timing Nitrogen	annual	Acres	8,157.78	14,149.17	-	-
Core Phosphorus	annual	Acres	37,835.01	-	9,442.52	-
Rate Phosphorus	annual	Acres	1,361.17	-	175.44	-
Placement Phosphorus	annual	Acres	3,366.57	-	210.97	-
Timing Phosphorus	annual	Acres	-	-	-	-
TOTAL				135,740.93	9,958.61	-
Tillage Management						
Conservation	annual	Acres	10,098.66	11,361.50	2,605.92	1,514,141.34
Continuous High Residue	annual	Acres	31,329.76	105,742.33	11,718.73	9,051,134.40
Low Residue	annual	Acres	-	-	-	-
TOTAL				117,103.83	14,324.65	10,565,275.75
Cover Crop						
Traditional	annual	Acres	16,459.70	102,733.03	190.83	28,011.23
Commodity	annual	Acres	9,157.27	23,206.37	-	-
TOTAL				125,939.40	190.83	28,011.23
Pasture Management						
Alternative Watering	cumulative	Acres	95.75	49.86	14.19	188.58
Prescribed Grazing	cumulative	Acres	71.88	66.71	30.42	432.09
Horse Pasture Management	cumulative	Acres	11.24	-	4.01	90.01
Forest Buffers on Fenced Pasture Corridor	cumulative	Acres in Buffers	2.85	145.67	46.54	22,273.22
Grass Buffers on Fenced Pasture Corridor	cumulative	Acres in Buffers	0.03	1.39	0.44	194.18
TOTAL				263.62	95.60	23,178.08
Forest Buffers	cumulative	Acres in Buffers	174.08	14,707.93	372.08	132,575.82
Wetland Restoration	cumulative	Acres	549.05	29,645.25	1,159.82	324,038.74
Wetland Creation	cumulative	Acres	11.31	377.12	17.51	4,388.51
Wetland Enhancement and Rehabilitation	cumulative	Acres	2.43	10.05	0.87	80.01
Land Retirement to Open Space	cumulative	Acres	283.02	7,336.03	91.77	98,183.35
Land Retirement to Pasture	cumulative	Acres	99.12	2,569.32	32.14	48,432.44
Grass Buffers	cumulative	Acres in Buffers	3,117.50	204,491.97	4,170.52	2,354,319.29
Tree Planting	cumulative	Acres	120.35	3,454.95	144.04	42,611.12
Alternative Crops	cumulative	Acres	0.20	5.44	0.07	70.64
Soil and Water Conservation Plan	cumulative	Acres	48,157.32	94,454.95	7,069.46	3,784,089.47
Crop Irrigation Management	cumulative	Acres	-	-	-	-
Manure Incorporation	annual	Acres	9,031.17	24,733.68	1,588.16	-
Capture & Reuse	annual	Acres	-	-	-	-
Non Urban Stream Restoration	cumulative	Feet	1,092.17	67.45	57.86	62,462.73
Non Urban Shoreline Management	cumulative	Feet	-	-	-	-
TOTAL				381,854.12	14,704.30	6,851,252.12
Agricultural Drainage Management						
Denitrifying Ditch Bioreactors	cumulative	Acres	804.04	4,536.52	-	-
Saturated Buffer	cumulative	Acres	804.04	66,548.78	310.99	293,164.08
Sorbing Materials in Ag Ditches	cumulative	Acres	804.04	-	345.18	-
Water Control Structures	cumulative	Acres	804.04	6,661.74	-	-
TOTAL				77,747.05	656.17	293,164.08
Animal Waste Management Systems						
Broiler Mortality Freezers	annual	Dry Tons (Carcasses)	-	-	-	-
Barnyard Runoff Control& Loafing Lot Management	cumulative	Acres	16.05	3,732.28	190.65	902.68
Ag Stormwater Management	cumulative	Acres Treated	-	-	-	-
Manure Transport	annual	Dry Tons	483.62	591.54	219.34	-
Dairy Precision Feeding	annual	Animal Units	-	-	-	-
Ammonia Emission Reductions (Litter Amendments)	annual	Animal Units	16,592.87	7,795.13	10.07	-
Ammonia Emission Reductions (Biofilters)	cumulative	Animal Units	-	-	-	-
Ammonia Emission Reductions (Lagoon Covers)	cumulative	Animal Units	-	-	-	-
TOTAL				12,118.94	420.06	902.68
Urban/Suburban Practices						
Stormwater Management						
Runoff Reduction Performance Standard	cumulative	Acres Treated	7.62	45.36	3.55	566.48
Storm Water Treatment Performance Standard	cumulative	Acres Treated	1,958.24	6,795.61	718.33	243,050.76
Wet Ponds & Wetlands	cumulative	Acres Treated	186.66	410.57	66.44	21,311.41
Floating Treatment Wetlands	cumulative	Acres Treated (Wet Pond)	-	-	-	-
Dry Ponds	cumulative	Acres Treated	2.45	1.35	0.19	36.60
Extended Dry Ponds	cumulative	Acres Treated	2.94	6.47	0.47	206.90
Infiltration Practices	cumulative	Acres Treated	0.31	2.84	0.21	44.91
Filtering Practices	cumulative	Acres Treated	0.29	1.27	0.14	44.19
BioRetention	cumulative	Acres Treated	1.14	7.28	0.61	155.70
BioSwale	cumulative	Acres Treated	1.13	8.70	0.67	156.89
Permeable Pavement	cumulative	Acres Treated	0.02	0.11	0.01	2.81
Vegetated Open Channel	cumulative	Acres Treated	0.04	0.12	0.01	4.60
Urban Filter Strips	cumulative	Acres Treated	-	-	-	-
Grey Infrastructure (IDDE)	annual	Acres Treated	-	-	-	-
Impervious Disconnection	cumulative	Acres Treated	-	-	-	-
Conservation Landscaping Practices	cumulative	Acres Treated	-	-	-	-
TOTAL				7,279.68	790.62	265,581.23
Erosion and Sediment Control	annual	Acres	35.71	-	-	27,896.14
Impervious Surface Reduction	cumulative	Acres	-	-	-	-
Urban Forest Buffers	cumulative	Acres in Buffers	1.89	19.86	2.24	403.99
Urban Tree Planting	cumulative	Acres	0.12	0.13	0.02	12.25
Urban Forest Planting	cumulative	Acres	6.81	54.39	5.59	567.31
Urban Nutrient Management	annual	Acres	8,419.24	7,079.89	359.00	290,579.02
Urban Stream Restoration	cumulative	Feet	-	-	-	-
Storm Drain Cleanout	annual	lbs of Sediment	-	-	-	-
Street Sweeping	annual	Acres	-	-	-	-
Urban Shoreline Management	cumulative	Feet	0.13	0.01	0.01	18.31
Septic Connections	cumulative	Number of Systems	2.49	24.41	-	94.03
Septic Denitrification	cumulative	Number of Systems	201.62	1,276.78	-	-
Septic Pumping	annual	Number of Systems	-	-	-	-
Resource Practices						
Forest Harvesting Practices	annual	Acres	344.58	1,563.02	47.27	6,557.77
Dirt& Gravel Road E&S	cumulative	Feet	-	-	-	-
Non-Tidal Algal Flow-way	annual	Acres	-	-	-	-
Tidal Algal Flow-way	annual	Acres	-	-	-	-
TOTAL				10,018.48	414.12	326,128.83
GRAND TOTAL				**868,066.07**	**41,554.97**	**18,353,493.99**

Appendix C | Milestones and BMP Goals

The following annual milestones coincide with Maryland's NPS Management Program objectives presented in Chapter 2 of Maryland's 2021-2025 Nonpoint Source Management Plan (Plan). The Management Plan is intended to achieve and maintain water quality standards and to maximize water quality benefits among other broad strategic goals presented in Chapter 1 of the Plan. These milestones, in concert with the Plan's goals and objectives, address Key Component #1 of EPA's Section 319 Program Guidance entitled, "Key Components of an Effective State Nonpoint Source Management Program (November 2012).

Each year, the following tables are included in Maryland's 319 Annual Report with updates to reflect annual progress. These results show what was accomplished in SFY2021 and SFY2022 (unless otherwise noted).

Objective 3: Pollutants & Stressors	Lead	2021	2022	Cumulative Progress
Annual Nitrogen Nonpoint Source Loads to Bay: (lbs/yr)	MDE	42,327,312 (SFY2020)	42,568,449 (SFY2021)	-
Nitrogen: For all watersheds with EPA-accepted plans, overall total annual reduction by NPS implementation completed during the past year: (Cumulative lbs/yr from plan start, includes annual practices)	MDE	1,807,545 (SFY2020)	2,127,740 (SFY21)	-
Annual Phosphorus Nonpoint Source Loads to Bay: (lbs/yr)	MDE	3,221,451 (SFY2020)	3,212,412 (SFY2021)	-
Phosphorus: For all watersheds with EPA-accepted plans, overall total annual reduction by NPS implementation completed during the past year: (Cumulative lbs/yr from plan start, includes annual practices)	MDE	360,015 (SFY2020)	134,070 (SFY2021)	-
Sediment: 319-funded projects Estimated annual reductions in pounds	MDE	17,614,000 (SFY2020)	17,859,000 (SFY2021)	-

of sediment to local water bodies (lbs/yr)				
Sediment: For all watersheds with EPA-accepted plans, overall total annual reduction by NPS implementation completed during the past year: (Cumulative lbs/yr from plan start, excludes annual practices)	MDE	54,404,252 (SFY2020)	56,617,338 (SFY2021)	-
Bacteria: Annual Report on Monitoring Results for Maryland Beaches	MDE	https://mde.maryland.gov/programs/water/Beaches/Documents/2022_MD_Beach_Report.pdf		
Bacteria: Conduct Annual Meetings of County Beach Management Programs	MDE	Annual meetings conducted. Most recent meeting was March 30, 2022.		
Bacteria: Conduct annual Shoreline Field Surveys near Shellfish Waters to identify pollutant sources of concern (part of a 7-year cycle).	MDE	15 Surveys	14 Surveys	29 Surveys
Bacteria: Conduct annual Sanitary Surveys of relevant data for all shellfish growing areas. These are reviews of all potential pollution sources in a shellfish growing area, which are informed by Shoreline Field Surveys.	MDE	49 Surveys/year		
Chloride: Development of a Statewide Implementation Strategy in the form of a 5S plan to address chloride impairments in a consistent manner across the State. This path was discussed with Region 3 staff, and MDE's ultimate goal is a 4b plan.	MDE	Begin in 2022	A draft of the 4b plan was submitted to EPA HQ and Region 3 staff.	-
Chloride: Certify 150 individuals over the life of this 5-year NPS State Management Program Plan through the Annual Parking lots and Sidewalks Salt Application Management Training	MDE	Begin in 2022	The pilot program is set to begin in summer 2023.	-

by MDE designee.				
Chloride: Track and report the # of personnel trained through the Annual Road Salt Application Management Training by State Highway Administration.	MDE	81 people	94 people	175 people
Chloride: Update Maryland's 319 Program webpage to summarize Maryland's existing chloride mitigation activities, information about chloride pollution, and partnerships established within and outside of the State.	MDE	Updates in late 2021, additional updates ongoing.		
PCBs: Develop one new PCB TMDL over the life of this 5-year NPS State Management Program Plan.	MDE	TBD, none this year	TBD, none this year	TBD
Temperature: Update Maryland's 319 Program webpage to summarize state initiatives designed to reduce temperature. Project Summer 2022 for completion.	MDE	Begin in 2022	MDE is developing hydrology and temperature models for a TMDL for the Prettyboy Reservoir Watershed	https://mde.maryland.gov/programs/water/TMDL/WaterQualityStandards/Pages/Protecting-Cold-Water-Resources-in-Maryland.aspx
Trash: Update Maryland's 319 Program webpage to summarize status of TMDLs designed to reduce trash. Project Summer 2022 for completion.	MDE	Begin in 2022	MDE is partnering with Morgan State University to develop a public survey, which will result in the establishment of the endpoint of the revised TMDL	https://mde.maryland.gov/programs/water/TMDL/DataCenter/Pages/TMDLMapTrash.aspx
Objective 4: Pollutant Sources	Lead	2021	2022	Cumulative Progress
Maintain Annual Cover Crop Implementation Acreage Levels	MDA	602,826 acres (SFY2020)	557,647 acres (SFY2021)	-
Maintain Annual Nutrient Management	MDA	894,284 acres (SFY2020)	1,028,035 acres (SFY2021)	-

Plan Acreage Levels				
Maintain Annual Soil Conservation and Water Quality Plan Acreage Levels	MDA	861,876 acres (SFY2020)	824,578 acres (SFY2021)	-
Maintain Annual Manure Transported out of Chesapeake Bay watershed (tons)	MDA	Manure Transport out of the WS increased by 23,649 tons in FY20	Manure Transport out of the WS increased by 10,329 tons in FY21	-
Maintain Annual Conservation Tillage (Inc. High Residue) Acreage Levels	MDA	Conservation Tillage levels were maintained in FY20 at 824,584 acres.	Conservation Tillage levels were maintained in FY21 at 824,942 acres.	-
Plant Riparian Forest Buffers (Acres/year; cumulative)	MDA	17,211 ft. of buffer planted	15,597 ft. of buffer planted	32,808 ft. of buffer planted
Wetland Restoration (Acres/year)	MDA	193 acres created	77 acres created	270 acres created
Phosphorus Management Tool – Maintain use of PMT for operations in the high-risk group, medium-risk group, and low-risk group. (# of operations utilizing the tool by risk group)	MDA	20% of MD farm fields require use of the PMT, that translates to roughly 200,000 acres of fields.		
Upgrade septic systems to nitrogen removal technology (systems/year; figures may vary from year to year due to edits to the BATMN database resulting from BAT units being replaced with sewer connection or conventional septic tanks, vacancy, catastrophe, error, etc.)	MDE	1,042 BAT upgrades	1,063 BAT upgrades	-
Stormwater retrofits of land without sufficient controls (cumulative pounds of nitrogen reduced/year). (May be refined in future Chesapeake Bay 2-Yr Milestones.)	MDE	https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Documents/FAP-WPRP/2022%20Stormwater%20Financial%20Assurance%20Plan%20Annual%20Report%20to%20Governor_%20MSAR%20%23%2010954%2010.18.2022.pdf		
Complete the redevelopment of the MS4 geodatabase that will aid MDE in the assessment of management programs and improve current Phase I	MDE	Ongoing, a final database shell and instructions for reporting were sent to all Phase I MS4s on August 6,	Phase I database is being beta tested by all permittees, more updates will occur as needed.	-

MS4 stormwater data tracking, collection, and validation of BMPs:		2022 to begin incorporating into future reports.		
Online BMP Reporting Tool for Non-MS4 local governments:	MDE	Complete: a tool has been created that can be used for these jurisdictions.		
SMART Homeowner BMP Tracking Tool: Track number of BMPs	UMD	438 BMPs	490 BMPs	490 BMPs
Online BMP Reporting Tools for Phase II MS4 and Non-MS4 local governments: Make the tool available to users.	MDE	No Progress	No Progress	No Progress
Local Stormwater WLA Implementation Plans: Review Plans submitted as part of Phase I MS4 requirements. (Number of jurisdictions, which may include multiple plans for each jurisdiction) Anticipate salt plans in 2024.	MDE	6 (2 PCB plans, 4 sediment plans)	1 (1 PCB plan) - this was not a typical year, as Large Phase 1 MS4 permits were renewed and consequently TMDL plans were overhauled. MDE mostly drafted and delivered guidance to the jurisdictions for their renewed plans.	-
Erosion and Sediment site "inspection compliance rate" conducted by MDE (Source: Annual Enforcement & Compliance Report)	MDE	89.50%	90.49%	https://mde.maryland.gov/Documents/FY22%20MDE%20Annual%20Enforcement%20and%20Compliance%20Report.pdf
Lawn-to-Woodland Program: Track and report the number of landowners assisted and acres forested through the Lawn-to-Woodland Program, which provides landowners with trees, tools and technical assistance for planting and maintaining a healthy tree canopy that will support a myriad of environmental, economic and recreational benefits.	DNR	0 – No funding this year	waiting on response	https://dnr.maryland.gov/forests/Pages/tree-planting.aspx#:~:text=Lawn%20to%20Woodland%20helps%20Maryland,tree%20shelters%20by%20a%20contractor.

Maryland's 5 million trees by 2030 initiative (Report status of program and # of trees planted)	MDE	Starts in CY 2022	The plan for the program was finalized on October 28, 2022. 156,256 trees were planted. https://mde.maryland.gov/programs/air/ClimateChange/Documents/FINAL_Plan-for-Growing-5-Million-Trees-in-Maryland_10.28.22%20%281%29.pdf	156,256 trees
Planting Forests on 38,000 acres (annually) by 2030 from baseline as part of Maryland's revised 2021 Greenhouse Gas Reduction Act (GGRA) plan goals.	DNR	45,096 acres	50,327 acres	Page 31 https://mde.maryland.gov/programs/air/ClimateChange/Documents/GGRA%20PROGRESS%20REPORT%202022.pdf
Coal Mining site "inspection coverage rate" conducted by MDE	MDE	100%	100%	-
Non-Coal Mining site "inspection coverage rate" conducted by MDE	MDE	93%	85%	-
Non-tidal wetlands and floodplains permit site "inspection coverage rate"	MDE	18%	19%	-
Tidal wetlands permit site "inspection coverage rate"	MDE	5.60%	3%	-

Objective 5: Types of Waterbodies	Lead	2021	2022
Statewide Lakes and Reservoirs			
Lakes/Reservoirs: Triadelphia and Liberty chlorides/temperature monitoring Study (Trends analysis to help determine if we can see drops in salt levels, started in 2019)	MDE	Currently there is not enough data to make meaningful assessments forecast 2025	Data is being compiled up to December 2022; MDE is planning internal discussions to determine the best analyses for this data.
Patuxent Reservoirs Annual Report of the Technical Advisory Committee	WSSC	2020 Annual Report	2021 Annual Report

Central Maryland – Chesapeake Bay Drainage	Watersheds with EPA-accepted watershed plans that are eligible for 319(h) Grant implementation funding.		
Antietam Creek Watershed. Water quality goal is to reduce annual pollutant loads: 12,923 tons/yr sediment, approx. 3 million-billion E. coli MPN. (see the Washington County Soil Conservation District's 2012 watershed plan Tables 8, 10, 13, 18, and 19)			
Watershed plan milestones: Report progress in the 319 Annual Report.	WCSCD	MDE's NPS program has funded 14 projects in this watershed, the most of any watershed in MD	MDE's NPS program has funded 15 projects in this watershed, the most of any watershed in MD
Assess Implementation Progress toward sediment and bacteria reduction watershed plan milestones and update plan if needed.		Plan needed updates, those were completed in 2021 and undergoing internal MDE review.	Revisions are still under internal review at MDE.
Update watershed implementation plan		Draft completed, submitting to EPA in 2022	Draft completed, submitting to EPA in 2023
Back River – Tidal Watershed. Water quality goal is to reduce annual nutrient loads: 6,498 lbs/yr nitrogen and 679 lbs/yr phosphorus. (see Baltimore County's 2010 watershed plan Table 3-2 and Appendix A-1)			
Watershed plan milestones: Report progress in the 319 Annual Report.	Baltimore County	No new progress	No new progress
Assess action items progress: Stormwater retrofit and Stream restoration		No action for 2021	No action for 2021
Back River – Upper Watershed. Water quality goal is to reduce annual nutrient loads: 48,189.6 lbs/yr nitrogen and 6,055.8 lbs/yr phosphorus. (see Baltimore County's 2008 watershed plan Table 3-2 and Appendix A Table A-2)			
Watershed plan milestones: Report progress in the 319 Annual Report.	Baltimore County	No new progress	No new progress
Assess plan implementation progress, particularly: open space tree planting, impervious area removal on institutional land.		No action for 2021	No action for 2021
Choptank River – Upper Watershed. Water quality goal is to reduce nutrient loads from 2002 levels by 39% for nitrogen (704,000 lbs/yr) and 28% for phosphorus (34,5000 lbs/yr). (see Caroline County's 2010 watershed plan, Table 11)			
Watershed plan milestones: Report progress in the 319 Annual Report.	Caroline County	Complete an increase in BMP implementation was observed for most BMP categories. DO monitoring in the Choptank indicates healthy waters according to the Chesapeake Bay Report Card.	BMP implementation continues for most BMP categories, such as stormwater BMPs, stream restoration, wetland creation. Future projects plan to install additional BMP types, including rain gardens and septic upgrades.

Assess BMP implementation progress and update plan if needed.		Several projects occurring in North County Park and Greensboro Volunteer Fire company. Working with Envision the Choptank to provide additional capacity to expand BMP implementation	North County Park and Greensboro VFC projects are finishing up. MDE is working with Caroline Co, Envision the Choptank, and CBF to develop work plans for SW BMP installation and a Technical Assistance Circuit Rider.
Greater Choptank Watershed Plan (Tuckahoe and Lower Choptank)		-	MDE has started drafting the Watershed Plan and plans to submit a draft to EPA for review in 2023.
Jonestown SW BMP installation		-	Caroline Co and Envision the Choptank are drafting a work plan for the installation of several BMPs to reduce flooding and repair failing septic systems. MDE plans to petition to use "project" funds for this project, even though it is outside an area with a WBP, citing flexibility given to projects in FFY23 and FFY24 that benefit EJ communities.
Technical Assistance Circuit Rider project		-	Envision the Choptank and the Chesapeake Bay Foundation are drafting a workplan to fund a Technical Assistance Circuit Rider position that will identify future projects and add capacity to implement BMPs in the watershed. MDE plans to petition to use "project" funds for this project, even though it is an outreach position, citing flexibility given to projects in FFY23 and FFY24 that benefit EJ communities.
Conococheague Creek Watershed			

Plan is being drafted and will come to MDE for review. MDE anticipates review in Spring 2022 and submission to EPA in late summer of 2022 for review. Milestones for implementation will be added upon acceptance.	Washington County	Plan received, but is undergoing internal review in 2022	Plan is undergoing county review after MDE sent the first round of comments
Corsica River Watershed. Water quality goal is to continue meeting the Corsica TMDL for nitrogen and phosphorus.			
Watershed plan milestones: Conduct outreach to the owners of this plan to increase 319 project implantation and Report progress in the 319 Annual Report.	Centreville	MDE is in contact with members of the Corsica River management team	No response to RFP for FFY23 funding
Assess implementation progress for BMP goals and update plan if needed.		This plan has stalled for several years, but we anticipate new changes in the next year or two	Monitoring to continue this year, but future projects are not expected.
Gwynns Falls – Middle Watershed. Water quality goal for 2017 is to reduce annual nutrient loads: 35,350 lbs/yr nitrogen and 5,915 lbs/yr phosphorus. (see Baltimore County's 2014 watershed plan Table 3-24 and Appendix A Table A-2)			
Report implementation progress in the 319 Annual Report.	Baltimore County	Most recent project in Scott's Level Branch is expected to finish construction in 2022.	Scott's Level Branch project to be finished in 2023.
Jones Falls – Lower Watershed. Water quality goal is to reduce annual pollutant loads: 23,146 lbs/yr nitrogen, 3,887 lbs/yr phosphorus, 204.9 tons/yr sediment. (see Baltimore County's 2008 watershed plan Table 5.4)			
Watershed plan milestones: Report progress in the 319 Annual Report.	Baltimore County	No new 319 projects in this watershed	No new 319 projects in this watershed
Monocacy River – Lower Watershed. Water quality goal is to reduce annual pollutant loads: 649,998 lbs/yr nitrogen, 68,952 lbs/yr phosphorus, 10,345 tons/yr sediment. (see Frederick County's 2008 watershed plan page 16 and Table "X" p34)			
Watershed plan milestones: Conduct outreach to the owners of this plan to increase 319 project implantation and Report progress in the 319 Annual Report.	Frederick County	Outreach effort in 2022	No response to RFP for FFY23 funding
Assess implementation progress and update plan if needed.		No new 319 projects in this watershed	No new 319 projects in this watershed
Sassafras River Watershed. Water quality goal is to reduce annual pollutant loads: 462,225 lbs/yr nitrogen, 12,602 lb/yr phosphorus, 1,143			
tons/yr sediment. (see the Sassafras River Association's 2009 watershed plan Table 5.4)		Outreach effort in 2022	No response to RFP for FFY23 funding

Central Maryland – Chesapeake Bay Drainage	Plans not designed to seek 319(h) implementation funds.		
Phase III Watershed Implementation Plan for the Chesapeake Bay TMDL.			
Evaluate 2025 progress for pollutant load reductions to be achieved for nonpoint sources of nitrogen, phosphorus, and sediment. Report Annually.	MDE	FY20 NPS annual progress: Nitrogen and phosphorus loads decreased due to BMP implementation, which is steadily increasing in Maryland.	FY21 NPS annual progress: Nitrogen loads increased slightly due to annual variability. Phosphorus loads decreased due to BMP implementation, which is steadily increasing in Maryland.
Western Maryland – Casselman River and Youghiogheny River	Watersheds with EPA-accepted watershed plans that are eligible for 319(h) grant implementation funding.		
Casselman River Watershed Management Plan Water quality goal is to meet the pH water quality standard. (see MDE's 2011 watershed plan Chapter 3.2)			
Watershed plan milestones: Report progress in the 319 Annual Report, including, number/percentage of pH-impaired stream segments, NPS Program Success Stories and implementation progress.	MDE	Complete, 10 stream segments were orginally impaired, now 5 are meeting WQ Standards for pH and sand dumps were refreshed.	Project completed and results reported in FY21
Percentage of impaired stream segments remediated and meet the State water quality standard for pH.[46] [47]	MDE	50%	50%
Report 303(d) stream segments that achieve pH criteria via Maryland's Integrated Report.	MDE	In text; complete	In text; complete
Cherry Creek Watershed Protection Plan Water quality goal to be determined when the plan is finalized.			
Plan completion anticipated in 2022. Potential milestones TBD.	MDE	Drafted, waiting review, but may not be submitted due to influx of BIL money into our Abandoned Mine Lands program.	Plan will not be submitted due to influx of BIL money into our Abandoned Mine Lands program (no projects to be funded by 319 grant in near future).
Upper Jennings Run Watershed Plan Water quality goal to be determined when the plan is finalized.			

Tentatively accepted pH mitigation Plan is being updated to include sediment. Report progress in the 319 Annual Report.	MDE	NA – Plan update to begin in 2022 (Same as Cherry Creek WS Plan) Sampling expect to continue as BIL money will fund projects identified in the 319 watershed plan for pH.	MDE will work with Allegany County if they want to update the WS Plan to include other sources of impairment. Sampling by MDE will continue through 2023; the Abandoned Mines Division is expected to take over sampling efforts after 2023.
Coastal Region – Coastal Bays and Atlantic Ocean			
Coastal Bays Conservation and Management Plan Water quality goal to be determined when plans are finalized.			
Assawoman Bay is conditionally approved: Report progress in the 319 Annual Report.	MCBP	No Progress (paperwork for grant award being processed)	No Progress (paperwork for grant award being processed)
Next steps are to create plans for Assateague, Isle of Wight, Newport, and Sinepuxent Bays. Report progress on creation of these plans and incorporate updates to milestones for any new plans in updates to this NPS plan.	MCBP	No Progress	No Progress

Appendix D | Priority Watershed Details

This appendix provides details for projects funding by the 319(h) Grant (*pages D - 2 to D - 6*).

For details on total spending by priority watershed, see **Appendix A**; for details on total NPS reduction by watershed, see **Appendix B**. Projects generally take two years to complete from the initial funding date.

Maryland uses the Chesapeake Assessment and Scenario Tool (CAST) outputs to estimate its load reductions/increases as more of a "real time" assessment of how our efforts are going. CAST uses a number of data inputs that can affect the loads in our watersheds, BMP implementation being only one of them. Consequently, even with increased BMP implementation the model may assign greater loads to a watershed which offset any reductions achieved through BMP implementation. This variability is reflected in the tables and watershed profiles included in this section.

Project Details | 319(h) Grant Funded Projects

The following tables (*D - 1 to D - 12)* provide detailed project information for different 319(h) Grant funded projects occurring between the watershed plan approval date and SFY 2022. Estimated load reductions come from the approved watershed plans.

Table D - 1: *Antietam Creek 319(h) Grant funded projects*

Antietam Creek | Watershed Plan Approved 2012							
Project	State Fiscal Year	Grant Funding Source	319(h) Grant	Nitrogen (lbs/yr)	Phosphorus (lbs/yr)	Sediment (Thousand lbs/yr)	Bacteria (Billion/yr)
Shank/Anderson Project Phase 2 of 3	2012	319 FFY11	$64,266	28	3	7,134	166
Devils Backbone Park Stream Restoration	2012	319 FFY11	$267,964	300	102	465	0
Kiwanis Park Stream Stabilization Phase 2	2013	319 FFY12	$46,000	34	10	36	0
Greensburg Rd Little Antietam Creek Restoration	2013	319 FFY12	$240,000	110	37	171	0
Barr Property Stream Restoration Ph1	2014	319 FFY13	$148,930	24	5	6	0
Kiwanis Park Stream Stabilization Phase 1	2015	319 FFY14	$124,998	34	10	34	0
Devils Backbone Park Stream Restoration	2015	319 FFY14	$390,000	300	102	465	0
Barr Property Stream Restoration Ph2	2016	319 FFY15	$139,257	24	5	6	0
Shank/Anderson Project Phase 3 of 3	2016	319 FFY15	$448,365	158	57	1,590	0
WCSCD Winders Ph2 of 3	2017	319 FFY16	$39,480	0	0	0	0
Little Grove Creek Stream Restoration	2019	319 FFY18	$221,178	71	65	42	0
Winders Property Phase 2 of 3	2019	319 FFY18	$52,585	126	17	2	105
Antietam-Beaver Creek Clagett Property	2020	319 FFY19	$400,000	128	116	423	0
Antietam Creek Mayo Property	2020	319 FFY20	$488,286	132	120	437	0
WCSCD Little Antietam Creek (South) Stream Restoration, Keedysville	2022	319 FFY21	$402,500	50	45	165	0
Watershed Totals			**$3,473,809**	**1519**	**694**	**10976**	**271**

Table D - 2: *Assawoman Bay 319(h) Grant funded projects*

Assawoman Bay | Watershed Plan Approved 2020							
Project	State Fiscal Year	Grant Funding Source	319(h) Grant	Nitrogen (lbs/yr)	Phosphorus (lbs/yr)	Sediment (lbs/yr)	Bacteria (Billion/yr)
Grey's Creek Project	2020	319 FFY20	$96,000	50	16	1,105	-
Watershed Totals			**$96,000**	**50**	**16**	**1,105.00**	**-**

Table D - 3: *Back River: Tidal 319(h) Grant funded projects*

Back River: Tidal | Watershed Plan Approved 2010							
Project	**State Fiscal Year**	**Grant Funding Source**	**319(h) Grant**	**Nitrogen (lbs/yr)**	**Phosphorus (lbs/yr)**	**Sediment (Thousand lbs/yr)**	**Bacteria (Billion/yr)**
Bread & Cheese Creek stream restoration & stormwater control	2011	319 FFY10	$556,443	280	94	428	0
Watershed Totals			**$556,443**	**280**	**94**	**428**	**0**

Table D - 4: *Back River: Upper 319(h) Grant funded projects*

Back River: Upper | Watershed Plan Approved 2008							
Project	**State Fiscal Year**	**Grant Funding Source**	**319(h) Grant**	**Nitrogen (lbs/yr)**	**Phosphorus (lbs/yr)**	**Sediment (Thousand lbs/yr)**	**Bacteria (Billion/yr)**
Redhouse Run/St. Patricks stream restoration	2008	319 FFY07	$418,500	609	32	11	0
Upper Back River Stormwater conversions	2009	319 FFY08	$422,373	52	12	4	0
Herring Run/Overlook Park stream restoration & buffer planting	2015	319 FFY14	$358,032	314	284	188	0
Watershed Totals			**$1,198,905**	**975**	**328**	**203**	**0**

Table D - 5: *Casselman River 319(h) Grant funded projects*

Casselman River | Watershed Plan Approved 2012							
Project	**State Fiscal Year**	**Grant Funding Source**	**319(h) Grant**	**Nitrogen (lbs/yr)**	**Phosphorus (lbs/yr)**	**Sediment (Thousand lbs/yr)**	**Bacteria (Billion/yr)**
AMD pH Remediation GIS Tool	2012	319 FFY11	$83,619	0	0	0	0
Watershed Totals			**$83,619**	**0**	**0**	**0**	**0**

Table D - 6: *Choptank River: Upper 319(h) Grant funded projects*

Choptank River: Upper | Watershed Plan Approved 2010							
Project	**State Fiscal Year**	**Grant Funding Source**	**319(h) Grant**	**Nitrogen** (lbs/yr)	**Phosphorus** (lbs/yr)	**Sediment** (Thousand lbs/yr)	**Bacteria** (Billion/yr)
DPW Stormwater Retrofits	2011	319 FFY10	$46,440	11	8	2	0
U. Choptank Watershed Restoration	2013	319 FFY12	$140,001	8	1	0	0
Volunteer Fire Comp. SWM upgrades	2013	319 FFY12	$37,834	1	0	0	0
U. Choptank Watershed Restoration	2014	319 FFY13	$140,001	16	3	0	0
Dept. Emergency Services Porous Parking	2015	319 FFY14	$137,770	5	0	94	0
Lockerman School SWM Retrofit	2018	318 FFY17	$100,000	0	1	0	0
Morton Farm Bio-Retention/Swale	2018	318 FFY17	$88,220	598	33	23	0
North County Park Design	2021	319 FFY20	$80,800	409	262	942	0
Jonestown Stormwater BMPs	2021	319 FFY20	$349,424	64	24	78	0
Greensboro VFC Stream Restoration	2022	319 FFY21	$305,000	7.8	0.54	0.58	0
Jonestown Park Rain Gardens	2022	319 FFY21	$20,000	0.49	0.04	0.018	0
Choptank Technical Assistance Circuit Rider	2022	319 FFY21	$239,052	0	0	0	0
Watershed Totals			**$1,684,542**	**1,120**	**333**	**1,140**	**0**

Table D - 7: *Corsica River 319(h) Grant funded projects*

Corsica River | Watershed Plan Approved 2004							
Project	State Fiscal Year	Grant Funding Source	319(h) Grant	Nitrogen (lbs/yr)	Phosphorus (lbs/yr)	Sediment (Thousand lbs/yr)	Bacteria (Billion/yr)
Agricultural Technical Assistance	2005	319 FFY04	$32,380	0	0	0	0
Watershed Restoration	2006	319 FFY05	$232,666	0	0	0	0
Agricultural Technical Assistance	2006	319 FFY05	$145,554	767	79	0	0
Watershed Restoration	2007	319 FFY06	$241,975	62	6	0	0
Agricultural Technical Assistance	2007	319 FFY06	$14,273	2,413	233	0	0
Corsica and Beyond	2007	319 FFY06	$124,281	0	0	0	0
Agricultural Technical Assistance	2008	319 FFY07	$48,472	286	10	1,510	0
Agricultural Technical Assistance	2009	319 FFY08	$50,780	46	3	0	0
Bioretention Swale	2009	319 FFY08	$50,000	0	0	1	0
Watershed Restoration	2010	319 FFY09	$270,427	5	1	1	0
Agricultural Technical Assistance	2010	319 FFY09	$58,539	149	10	0	0
Agricultural Technical Assistance	2011	319 FFY10	$61,590	887	84	0	0
Watershed Restoration	2012	319 FFY11	$298,998	58	5	2	0
Agricultural Technical Assistance	2012	319 FFY11	$69,546	127	17	0	0
Board of Education Bioretention	2012	319 FFY11	$93,198	5	0	0	0
Watershed Restoration	2013	319 FFY12	$115,002	7	1	0	0
Agricultural Technical Assistance	2013	319 FFY12	$67,512	0	0	0	0
Board of Ed. Phase 2: Kramer Center	2013	319 FFY12	$114,276	61	8	6	0
Agricultural Technical Assistance	2014	319 FFY13	$47,937	0	1	0	0
Watershed Totals			**$2,137,406**	**4,873**	**458**	**1,520**	**0**

Table D - 8: *Gwynns Falls: Middle 319(h) Grant funded projects*

Gwynns Falls: Middle | Watershed Plan Approved 2014							
Project	State Fiscal Year	Grant Funding Source	319(h) Grant	Nitrogen (lbs/yr)	Phosphorus (lbs/yr)	Sediment (Thousand lbs/yr)	Bacteria (Billion/yr)
Scotts Level McDonogh Road Watershed Restoration Project	2013	319 FFY12	$320,004	415	136	612	0
Scotts Level Marriottsville Road Stream Restoration	2017	319 FFY16	$613,940	2,127	728	1,386	0
Scotts Level Upper Scotts Level Park Stream Restoration	2019	319 FFY18	$450,000	1,798	826	1,770	0
Watershed Totals			**$1,383,944**	**4340**	**1690**	**3768**	**0**

Table D - 9: *Jennings Run: Upper 319(h) Grant funded projects*

Jennings Run: Upper | Watershed Plan Approved 2019							
Project	State Fiscal Year	Grant Funding Source	319(h) Grant	Nitrogen (lbs/yr)	Phosphorus (lbs/yr)	Sediment (Thousand lbs/yr)	Bacteria (Billion/yr)
No 319(h) Projects as of SFY 2020							
Watershed Totals			-	-	-	-	-

Table D - 10: *Jones Falls: Lower 319(h) Grant funded projects*

Jones Falls: Lower | Watershed Plan Approved 2008							
Project	State Fiscal Year	Grant Funding Source	319(h) Grant	Nitrogen (lbs/yr)	Phosphorus (lbs/yr)	Sediment (Thousand lbs/yr)	Bacteria (Billion/yr)
Roland Run Stream Restoration	2020	319 FFY19	$462,309	90	91	173	0
Watershed Totals			**$462,309**	**90**	**91**	**173**	**0**

Table D - 11: *Monocacy River: Lower 319(h) Grant funded projects*

Monocacy River: Lower | Watershed Plan Approved 2008							
Project	State Fiscal Year	Grant Funding Source	319(h) Grant	Nitrogen (lbs/yr)	Phosphorus (lbs/yr)	Sediment (Thousand lbs/yr)	Bacteria (Billion/yr)
Urban Wetlands, Bennett Creek Pilot	2008	319 FFY07	$223,364	101	19	3	0
Urban Wetlands, Bennett Creek Pilot	2009	319 FFY08	$234,545	150	31	6	0
Green Infrastructure	2011	319 FFY10	$318,396	351	34	8	0
Neighborhood Green Infrastructure	2014	319 FFY13	$97,000	30	0	2	0
Rock Creek Stream Restoration	2018	319 FFY17	$270,000	94	85	56	0
Watershed Totals			**$1,143,305**	**726**	**169**	**75**	**0**

Table D - 12: *Sassafras River 319(h) Grant funded projects*

Sassafras River | Watershed Plan Approved 2009							
Project	State Fiscal Year	Grant Funding Source	319(h) Grant	Nitrogen (lbs/yr)	Phosphorus (lbs/yr)	Sediment (Thousand lbs/yr)	Bacteria (Billion/yr)
Galena Elementary School stormwater wetland	2013	319 FFY12	$15,000	1	0	0	0
Phipps Treatment Wetlands & sediment traps	2014	319 FFY13	$50,000	99	20	5	0
Harbor View / Colchester Farms	2018	319 FFY17	$216,234	2,220	136	111	0
Starkey Farm Watershed Restoration	2018	319 FFY17	$144,514	1,884	98	71	0
Watershed Totals			**$425,748**	**4,204**	**254**	**187**	**0**