EPA EVALUATION OF MARYLAND's 2018-2019 and 2020-2021 MILESTONES

Executive Summary

The seven jurisdictions (Delaware, the District of Columbia, Maryland, New York, Pennsylvania, Virginia, and West Virginia) in the Chesapeake Bay Program (CBP) partnership agreed to develop and implement a framework for holding each partner accountable for reducing nitrogen, phosphorus, and sediment loads to meet water quality standards in the Chesapeake Bay (Bay) and its tidal tributaries. The CBP partnership established the goal to have all practices in place by 2025 that were necessary to achieve applicable water quality standards in the tidal Bay. Part of the U.S. Environmental Protection Agency's (EPA's) role in the partnership's accountability framework is to evaluate and report each jurisdiction's progress toward meeting this goal every two years.

In that role, EPA has evaluated Maryland's progress toward attaining the goal of having practices in place by 2025. This evaluation includes an assessment of progress toward attaining this goal at the state and state-basin level and progress toward meeting sector-specific programmatic commitments for the 2018-2019 milestone period. This evaluation also provides an assessment of other sector-specific programmatic and numeric commitments (e.g., Best Management Practices or BMP implementation targets) for the 2020-2021 milestone period and the status of the relevant water quality monitoring trends.

In reviewing Maryland's final progress for the 2018-2019 milestones, the 2019 numeric progress, and the final 2020-2021 milestones, EPA found areas in which the state achieved the goals it had set. EPA also identified areas to address during the 2020-2021 period and beyond. According to the data provided by Maryland for the 2019 progress run, Maryland did not achieve its statewide 2019 targets for nitrogen and phosphorus. Maryland did achieve its statewide and state-basin 2019 targets for sediment.

Some notable strengths identified in this evaluation of the 2018-2019 milestones and the final 2020-2021 milestones for Maryland include:

- Developing specific numeric targets for each of the BMPs highlighted in Maryland's Phase III WIP and listed in EPA's evaluation of Maryland's Phase III WIP that account for significant reductions in nitrogen and increases in implementation.
- Linking the numeric goals for each priority BMP to the specific Phase III WIP programmatic goals that are set up to help achieve the numeric targets.
- Commitment to develop a Soil Health Program that will also help promote the benefits of cover crops in row crop production.
- Issuing final determinations (i.e., final permits) for both of its Phase II Municipal Separate Storm Sewer System (MS4) general permits in October 2018.
- Commitment to have each Phase I MS4 perform a Maximum Extent Practicable (MEP) analysis for each Phase I MS4 jurisdiction.
- Creating three programs to incentivize Publicly Owned Treatment Works (POTWs) to achieve concentrations lower than 4 mg/L of total nitrogen in wastewater effluent.
- Commitment to include forest conservation measures within the updated Accounting Guidance for the next generation of Phase I MS4 permits.

- Reviewing all Phase I MS4 Annual Reports, any new MEP analysis, and fiscal analyses on an annual basis for ensuring MS4 permit compliance.
- Providing programmatic and numeric commitments to demonstrate how Maryland plans to target implementation in those segment-sheds that are most out of attainment.

Some key areas that EPA recommends Maryland address during the 2020-2021 milestone period and beyond include:

- Describe how the two-year milestones and associated progress evaluations ensure growth in loads does not exceed its Phase III WIP planning targets.
- Provide additional detail describing how the local planning goals in the agricultural sector will be implemented.

Load Reduction Review

When evaluating 2018-2019 milestone implementation, EPA compared nutrient and sediment loads simulated using the 6.0 suite of the CBP partnership's modeling tools and wastewater discharge data reported by Maryland to the statewide and state-basin Phase III WIP planning targets.

According to the data provided by Maryland for the 2019 progress run[1], Maryland did not achieve its statewide 2019 targets for nitrogen and phosphorus. Maryland achieved its 2019 nitrogen targets for the Western Shore and Patuxent basins but did not achieve its 2019 targets for nitrogen in all other major basins (Eastern Shore, Potomac, and Susquehanna). Maryland achieved its 2019 phosphorus targets for the Potomac and Patuxent basins but did not achieve its 2019 targets for phosphorus in all other major basins (Eastern Shore, Western Shore, and Susquehanna). Maryland achieved its statewide and state-basin 2019 targets for sediment.

Although the phosphorus loading results from 2019 progress are significantly higher than in past years, Maryland has explained that this is due to unusually wet weather and known data errors that will be corrected in future reporting years. Maryland anticipates that the 2019 progress was an outlier for phosphorus and that Maryland's phosphorus loads will be closer to achieving the Phase III WIP planning targets in 2020 progress.

Maryland developed specific BMP implementation targets for the 2020-2021 milestone period for those practices recommended in EPA's evaluation of Maryland's Phase III WIP. Maryland also developed additional BMP implementation targets beyond those identified in EPA's evaluation. A summary of the 2019 progress, the 2020/21 commitments and the 2025 goals for these BMPs is listed below. The summary progress from the CBP partnership's modeling tools for 2009 and 2019 incorporate BMP credit duration. The CBP partnership decided to remove reported BMPs from the model simulation at the end of their established lifespans unless verified by the state as inspected and continuing to function as designed. Maryland provided

[1] Each year, jurisdictions in the CBP partnership report on the BMPs installed, tracked and verified and the pollutant load reductions from wastewater treatment plants. Using the Chesapeake Assessment Scenario Tool, this information (or "annual progress runs") provides an estimate of how much nitrogen, phosphorus and sediment pollution has been reduced.

programmatic milestones to support these BMP implementation targets and EPA, in the sector-specific sections below, provides its evaluation of these programmatic milestones.

BMP[2]	**2009 Progress**	**2019 Progress**	**2020/2021 Milestone Target**	**2025 WIP Target**
Cover Crops (acres)	146,839	357,117	470,000	464,191
Tillage Management – Continuous High Residue (acres)	548,015	632,798	643,000 acres annually	618,411
Soil Conservation and Water Quality Plans (acres)	780,852	883,953	1,000,000	1,022,031
Grass Buffers (acres)	37,930	30,028	605 additional acres annually	42,516
Nutrient Management Core Nitrogen (% compliance rate)	None reported[3]	66	70	63
Conservation Tillage (acres)	186,558	189,837	248,000 acres annually	238,856
Prescribed Grazing (acres)	6,911	10,287	3,232 additional acres	19,490
Horse Pasture Management (acres)	1,352	1,887	292 additional acres	2,741
Agricultural Drainage Management (acres)	5,434	10,826	4,156 additional acres	22,471
Animal Waste Management Systems – Poultry (animal units)	1,148,213	1,707,913	100% animal units	1,798,116
Animal Waste Management System –	59,214	58,301	50% animal units	99,654

[2] BMP levels are units reported or planned by the jurisdiction. The levels are calculated using the Phase 6.0 suite of modeling tools and include everything established or installed, reported, and functioning through the particular year, e.g. through 2009, or through 2019, etc., not just new reported implementation, unless otherwise noted.
[3] CBP partnership modeling tools evolve based on CBP partnership decisions. As a result, some BMPs have "none reported" listed since those particular BMP names were not available for reporting. These practices were often included in another BMP category before the refinement to be more specific in the naming convention.

Livestock (animal units)				
Urban Nutrient Management (acres)	283,735	751,200	285,000 acres – commercial applicator 466,000 – Do It Yourself (DIY) applicator	758,627
Oyster Reef Restoration (acres)	None reported	None reported	177.2	1,734

Agriculture

2018-2019 Milestone Achievements

Continued to support manure technologies and manure transport programs, which are priority items for managing manure nutrient surpluses.

2018-2019 Milestones Missed

- Did not issue the new General Discharge Permit for AFOs, which was delayed by an extension of the comment period.
- Did not register all CAFOs under the General Discharge Permit for AFOs prior to its expiration in 2019. The remaining facilities can no longer be registered under the expired 2014 permit. Maryland has committed to making the inclusion of these 19 facilities a priority for the new CAFO permit and its 2020-2021 milestone period.

2020-2021 Milestone Strengths

- Provided quantitative implementation goals for priority conservation practices (e.g., cover crops, tillage, animal waste management systems, conservation plans, grass buffers, and nutrient management) and identified specific programmatic actions to support implementation of these practices.
- Included programmatic milestones to support implementation of the Phosphorus Management Tool, such as continuing to fund the Manure Transport Program and animal waste storage facilities. In addition, Maryland will continue to work with the Delmarva Land to Litter Collaborative and Soil Conservation Districts to identify solutions to the challenges of managing litter and animal waste management.
- Commitment to develop a Soil Health Program that will also help promote the benefits of cover crops in row crop production.
- Included plans to reallocate funding from the Chesapeake and Atlantic Coastal Bays Trust Fund to support up to 53 state positions within Maryland that will provide direct technical assistance to farmers and boost Maryland's BMP verification program to support its Phase III WIP. In agreements between the Resource Conservation Program and Soil Conservation

Districts, funding distribution has been aligned with demonstrated progress towards WIP goals at the local level.

Key Areas to Address in the 2020-2021 Milestone Period and Beyond
None.

Urban/Suburban Stormwater
2018-2019 Milestone Achievements
- Developed a Geographic Information System (GIS) database for reporting BMP implementation by Phase I MS4s with the intent to make this a requirement for all reissued Phase I MS4 permits.
- Provided a Phase I MS4 permit template to EPA to provide enough review time and garner feedback for Phase I MS4 permit reissuance.
- Issued final determinations (i.e., final permits) for both of its Phase II MS4 general permits in October 2018.

2018-2019 Milestones Missed
- Did not issue final determinations for any large Phase I MS4 jurisdictions.
- Did not finalize the MS4 Accounting Guidance by June 30, 2019. Note that this milestone was rolled over to the 2020-2021 milestone period in conjunction with the Phase I MS4 permit reissuance schedule.
- Did not publish the tentative determination (i.e., draft permit) for its General Permit for Discharges from Stormwater Associated with Industrial Activity.
- Did not publish the tentative determination for its General Permit for Stormwater Associated with Construction Activity.

2020-2021 Milestone Strengths
- Commitment to have each Phase I MS4 permittee perform a Maximum Extent Practicable (MEP) analysis.
- Commitment to include an additional impervious acre retrofit requirement of approximately 2% in its MS4 permits each permit year from the date when the permit is issued.
- Commitment to reviewing all Phase I MS4 Annual Reports, any new MEP analyses, and fiscal analyses on an annual basis for ensuring MS4 permit compliance.
- Commitment to achieving 285,000 acres managed under its Urban Nutrient Management program for commercial applicators and 466,000 acres managed for Do-It-Yourself Applicators.

Key Areas to Address in the 2020-2021 Milestone Period and Beyond
None.

Wastewater Treatment Plants and Onsite Systems
2018-2019 Milestone Achievements
- Ninety-nine percent of National Pollutant Discharge Elimination Systems (NPDES) permitted facilities are using Network Discharge Monitoring Report (NetDMR) to improve point source data quality.

- Eight minor Wastewater Treatment Plants (WWTPs) have completed their Enhanced Nutrient Removal (ENR) construction. Nine of the 29 upgrades are completed.
- An amendment to Maryland's regulations was completed for on-site systems discharging greater than 5,000 gallons per day. This amendment includes loading rate decreases when Best Available Technology (BAT) is utilized.

2018-2019 Milestones Missed

- Sixty-three of the 67 major WWTPs have completed construction and are in operation; however, the cumulative total of 65 of 67 major WWTPs with completed ENR upgrades with Maryland State grant/loan support was not met. Three remaining WWTPs are in the construction phase and one WWTP is in the planning phase.
- The review of local problem areas relative to water quality issues and contaminated areas based on soil conditions and installation of BAT on-site system units is still in the development phase.

2020-2021 Milestone Strengths

- Commitment to modify permits for proposed non-significant WWTPs to allow for upgrades to ENR.
- Commitment to modify its Bay Restoration Fund (BRF) ranking tool to allow for smaller facilities to qualify for state grants.
- Continue to provide an inventory of WWTPs that have been upgraded and those scheduled for upgrades.
- Commitment to maintain significant facilities in aggregate at 3.25 milligrams per liter (mg/L) or lower for nitrogen.
- Commitment to funding 1,800 BAT upgrades to on-site systems in the Critical Area (i.e., land within a 1,000 feet of the tidal Chesapeake Bay).

Key Areas to Address in the 2020-2021 Milestone Period and Beyond

Ensure all the remaining facilities with NPDES permits that are required to adopt the NetDMR system complete their registration.

Growth, Offsets, and Trading

2018-2019 Milestone Achievements

- Created three programs with the potential to incentivize POTWs to achieve concentrations lower than 4 mg/L of total nitrogen in wastewater effluent – BRF Operations and Maintenance Grants, the Clean Water Commerce Act, and the Water Quality Trading Program with a goal of achieving 3.25 mg/L by 2025. The Clean Water Commerce Act and the Water Quality Trading Program have the potential to fund projects in non-regulated urban areas.
- Finalized its proposed regulations, Code of Maryland Regulations (COMAR 26.08.11), for the Maryland Water Quality Trading Program. COMAR 26.08.11 regulations were promulgated on July 16, 2018.
- Updated its April 2017 Maryland Trading and Offset Guidance Manual to be consistent with the adopted COMAR 26.08.11.
- Incorporated specific language on trading in NPDES permits, e.g., MS4s will be allowed to use trading credits to fulfill their permit restoration requirements and WWTPs can buy and/or

sell trading credits in the market. Seven Phase I MS4s and over 12 WWTPs have received modifications to their permits to participate in trading programs.

2018-2019 Milestones Missed
None.

2020-2021 Milestone Strengths
- Plans to evaluate the effectiveness of its wastewater incentives programs and other regulations toward meeting the average statewide operational goal of 3.25 mg/L.
- Commitment to provide new guidance documents that will help participants better understand the process for generating and transferring nutrient credits.
- Plans to implement an oyster harvest verification process to allow participation in its Water Quality Trading Program.
- Continues to provide projections of growth in the urban sector and its land preservation datasets to the CBP partnership for incorporation into the Phase 6 suite of modeling tools.

Key Areas to Address in the 2020-2021 Milestone Period and Beyond
- Continue to provide assessments at the end of each two-year milestone period on the effectiveness of wastewater incentive programs, and other regulations, toward meeting the average statewide operational goal of 3.25 mg/L.
- Report on further detail of how it will use its two-year milestones and associated progress evaluations to ensure any growth in loads does not exceed its Phase III WIP planning targets.

Other (BMP verification, Climate Resiliency, Segment-shed Goals for the Tidal Jurisdictions, Local Engagement, etc.)
2018-2019 Milestone Achievements
- BMP verification program is fully operational, and any updates to existing verification methodologies will be done on an annual basis.
- Approximately $21 million was awarded in summer 2019 to cost-effective non-point source pollution reduction projects under Maryland's Chesapeake and Atlantic Coastal Bays Trust Fund.
- The Memorandum of Understanding executed between Maryland Department of Natural Resources (DNR) and the State Highway Administration (SHA) in October 2016 was used to deliver restoration projects on DNR lands funded by SHA.
- Updated its BMP Calculator with the CBP partnership's Phase 6 Watershed Model. This calculator enables grant applicants and recipients to estimate the nitrogen, phosphorus, and sediment reductions expected from their implementation projects.

2018-2019 Milestones Missed
None.

2020-2021 Milestone Strengths
- Commitment to include forest conservation measures within the updated Accounting Guidance for the fifth generation of Phase I MS4 permits.
- Plans to provide economic incentives through the "Marylanders Plant Trees" program which encourages citizens to plant individual trees on residential properties.

- Plans to identify riparian forest buffer priority projects in the Lower Susquehanna watershed (specifically Cecil and Harford Counties).
- Plans to implement the 2019 Coast Smart Construction legislation to update siting and design criteria that maximizes resiliency benefits for the construction or reconstruction of certain state and local capital projects.
- Plans to increase the percentage of shoreline management projects that use Living Shoreline practices.
- Commitment to implement a Resiliency through Restoration Initiative with the goal of completing 15 nature-based community resilience projects.
- Plans to target the removal of Polychlorinated Biphenyls as part of its Construction and Industrial Stormwater permits.
- Plans to conduct a technical assistance provider survey to those organizations providing technical assistance to support Chesapeake Bay restoration efforts. Key questions include understanding unmet needs that represent barriers to achieving restoration goals. Results of the survey will be used to identify opportunities for synergy and collaboration, and to prioritize gaps for further exploration.
- Provided numeric and programmatic milestones that demonstrates how it will target implementation in the Pocomoke and Wicomico Rivers which have some of the highest levels of summer dissolved oxygen open water criteria exceedances in Maryland.

Key Areas to Address in the 2020-2021 Milestone Period and Beyond
Report further detail on how the local planning goals in the agricultural sector will be implemented.

Potential Federal Actions and Assistance
As noted in its Phase III WIP evaluations, EPA remains prepared to assist each of the seven watershed jurisdictions in implementing the 2020/2021 milestones. EPA will work with each jurisdiction to develop a specific oversight and assistance activities to provide prioritized support for implementation efforts, including funding, technical assistance and analysis, training, and regulatory reviews.

2009-2018 Monitoring Trends Summary
The CBP partnership's Chesapeake Bay Program Nontidal Water Quality Monitoring Network, supported by EPA, the U.S. Geological Survey (USGS), the Susquehanna River Basin Commission (SRBC), and the Bay jurisdictions, generates water quality monitoring data in freshwater rivers and streams throughout the watershed that is analyzed by USGS for nutrient and sediment loads and trends. The most recent USGS results (https://cbrim.er.usgs.gov/summary.html) over the period of 2009-2018 were made available in March 2020. While identifying drivers behind individual trends is often complex, the monitoring results are worthy of Maryland's consideration as it develops the programs and BMPs planned for the next two years. EPA's initial summary of how the monitoring results in Maryland's watersheds can potentially inform planning are below.

- Trends are improving in the majority of Maryland's highest loading monitored watersheds for nitrogen and phosphorus. Implementing efforts in high loading areas can potentially yield the greatest nutrient reduction benefits. Most of Maryland's highest loading monitored

watersheds for nitrogen and phosphorus are agricultural, but the top two highest loading monitored watersheds for phosphorus are developed watersheds on the Western Shore. This information can be used to inform implementation efforts by sector and/or geographically.

- Trends in Maryland's monitored agricultural watersheds show that nitrogen and phosphorus are improving in some areas but degrading in others. While more information would be needed to determine what is driving individual trends, Maryland could continue to focus on agricultural areas, especially in those watersheds showing degrading trends.
- Trends in Maryland's monitored developed watersheds show that nitrogen and phosphorus are improving. More exploration on what is occurring in these monitored watersheds can potentially reveal successful programs, policies, or practices.
- Trends at the two monitored watersheds on the Eastern Shore continue to degrade for phosphorus, and one for nitrogen. While groundwater can contribute to a delayed response in nitrogen levels, phosphorus loads are most associated with overland runoff. This suggests the Eastern Shore could be explored as an area of focus for future milestones.