

EPA EVALUATION OF DELAWARE'S 2022-2023 and 2024-2025 MILESTONES

Executive Summary

The Chesapeake Bay Program (CBP) partnership established the goal to have all practices and controls in place by 2025 that were necessary to meet applicable water quality standards in the Chesapeake Bay (Bay) and its tidal tributaries ("2025 Goal"). The CBP partnership, including the seven jurisdictions (Delaware, the District of Columbia, Maryland, New York, Pennsylvania, Virginia, and West Virginia) and the U.S. Environmental Protection Agency (EPA) agreed to develop and implement a framework for holding each partner accountable for reducing nitrogen, phosphorus, and sediment loads to meet the 2025 Goal. EPA is providing this evaluation of Delaware's 2022-2023 and 2024-2025 milestones to the CBP partnership and the public in accordance with its oversight role and responsibility under the CBP partnership's accountability framework.

In that role, EPA has evaluated Delaware's statewide progress toward attaining its portion of the 2025 Goal. This evaluation includes an assessment of progress toward attaining nutrient and sediment goals at the state and state-basin level and progress toward meeting sector-specific programmatic commitments for the 2022-2023 milestone period. This evaluation also provides an assessment of sector-specific programmatic and numeric commitments (e.g., Best Management Practices (BMP) or BMP implementation targets) for the 2024-2025 milestone period and the status of the relevant water quality monitoring trends.

In reviewing Delaware's final programmatic progress for the 2022-2023 milestones, the 2023 numeric progress, and the final 2024-2025 milestone commitments, EPA identified sector-by-sector strengths as well as areas for improvement. According to the data provided by Delaware for the 2023 progress run, Delaware did not achieve its statewide 2023 targets for nitrogen, phosphorus, or sediment. EPA stands ready to assist Delaware with implementing its 2024-2025 two-year milestone commitments.

Some notable strengths identified in this evaluation of Delaware's 2022-2023 milestone progress and the final 2024-2025 milestone commitments include:

- Provided several clear, concise, specific summaries of programmatic and numeric progress with clear links between program strategies and intended outcomes.
- Increased staff capacity to make more progress on key agricultural sector BMPs.
- Exceeded the 2025 Watershed Implementation Plan (WIP) goal for high and low tillage.
- Met 2025 WIP goal for pasture management,
- Reduced the National Pollutant Discharge Elimination System (NPDES) permit backlog in the urban/suburban stormwater sector by publishing the Tier 1 Phase II Municipal Separate Storm Sewer System (MS4) General Permit (GP) that became effective January 1, 2024.

Some key areas that EPA expects Delaware to address in the final 2024-2025 milestone period and beyond include:

- Accelerate BMP implementation in the agricultural sector, especially since several BMP implementation targets were not met in the 2022-2023 milestone period such as goals for

nutrient management plan, cover crops, and soil and water conservation plans. Include updates on specific programmatic efforts and associated BMP implementation in progress reporting.

- Issue the Tier 2 Phase II MS4 general permit, New Castle County Phase I MS4 Permit, and the Industrial Stormwater General Permit.
- Reissue Seaford wastewater treatment plant permit by April of 2024.

Looking Forward for Future Reviews of Progress

At the 2022 [Executive Council meeting](#), the Executive Council discussed the upcoming year of 2025—the target date the partnership set for achieving certain outcomes under the [2014 Chesapeake Bay Watershed Agreement](#). At that meeting, the Executive Council [charged the Principals' Staff Committee](#) (PSC) to recommend a critical path forward that prioritizes and outlines the next steps for meeting the goals and outcomes of the *Chesapeake Bay Watershed Agreement* leading up to and beyond 2025 with specific considerations for science, restoration, and partnership. Recommendations for actions beyond 2025 will be presented at the 2024 Executive Council meeting.

At the [September 2023 PSC meeting](#), the CBP partners agreed to define the targets to be met by 2025 as the Phase III planning targets, the 2025 targets for climate change, and Conowingo targets¹. Consistent with that decision, this evaluation measures progress toward the goal of meeting the 2025 planning targets and 2025 climate change targets. In doing so, this evaluation of Delaware's 2022-2023 progress and 2024-2025 commitments uses the Chesapeake Assessment Scenario Tool (CAST) 2019, as agreed to by the CBP partnership.

In the next round of two-year milestones, progress will be measured using [CAST-23](#) and will include progress toward unaccounted additional loads and 2025 climate change conditions. In September 2023, the PSC approved the finalization and use of CAST-23 (update released June 2024) for tracking progress until the Phase 7.0 suite of modeling tools is complete (estimated in 2028). The PSC also determined that unaccounted additional loads (i.e., modeled load increases identified after the PSC adopted the jurisdictions' Phase III planning targets in 2018) will be added to the jurisdictions' existing Phase III planning targets to create interim planning targets and that these will be addressed in the Phase 7.0 suite of modeling tools along with 2035 climate change loads.

In addition, in January 2024 the CBP partnership finalized the [Chesapeake Bay Total Maximum Daily Load \(TMDL\) indicator](#), which is a new indicator designed to combine monitored and modeled data to estimate the progress of annual pollutant loading rate reductions since 1995 in response to implemented management practices. This indicator was developed to address a CBP partnership interest to compare modeled and monitoring data. This indicator may be used in future evaluations of progress.

¹ The PSC approved a phased approach for what can be achieved at Conowingo by 2025. Conowingo has a separate WIP and milestones to meet those targets.

Detailed Evaluation of Overall Load Reductions and Source Sectors

Load Reduction Review – Statewide and by Major River-Basin²

Each year, jurisdictions in the CBP partnership report on BMPs installed, tracked, and verified and the pollutant load reductions from wastewater treatment plants. Using CAST-19, this information (or “annual progress runs”) provides an estimate of how much nitrogen, phosphorus, and sediment has been reduced. When evaluating Delaware’s 2022-2023 milestone implementation, EPA simulated nutrient and sediment loads using CAST-19³ and wastewater discharge data reported by Delaware and compared those simulated loads to where Delaware’s progress should be by 2023 (90% of the statewide and state-basin Phase III planning targets).

According to the data provided by Delaware for the 2023 progress run, Delaware did not achieve its statewide 2023 targets for nitrogen, phosphorus, or sediment. These targets include adjustments for 2025 climate change as approved by the PSC.

Table 1. Loads and Targets for Delaware based on CAST-19 and reported wastewater data.

Pollutant	2009 Progress Loads (M lbs/year)	2023 Progress Loads (M lbs/year)	2025 Planning Target Load (M lbs/year)	Additional Load due to 2025 Climate Conditions (M lbs/year)	2025 with Climate Target load (M lbs/year)	% of goal Achieved (90% is considered on track to meet 2025 with climate load)
Nitrogen	6.85	6.64	4.55	0.039	4.51	9%
Phosphorus	0.132	0.122	0.108	0.003	0.105	37%
Sediment	50.3	35	27	N/A	27	65%

Delaware developed specific BMP implementation targets for the 2022-2023 and final 2024-2025 milestones for those practices identified in Delaware’s Phase III WIP that account for the majority of the nitrogen reductions. Table 2 provides a summary of Delaware’s 2023 progress compared to the 2009 baseline and the 2025 targets, as well as the final 2024-2025 commitments, for these priority BMPs.

² Major river-basin refers to the eight major river basins draining to the Chesapeake Bay, some of which are shared by more than one Bay jurisdiction. For example, the Susquehanna River is shared by New York, Pennsylvania, and Maryland; Pennsylvania-Susquehanna refers to the Pennsylvania portion of the river. The phrase major river-basin is interchangeable with "state-basin" in this document.

³ CAST-19 is part of the Phase 6.0 suite of modeling tools for the Chesapeake Bay.

Table 2. Progress toward Targets for Delaware's priority BMPs (those that account for the majority of the nitrogen reductions).

BMP⁴	2009 Progress	2023 Progress	2024-2025 Milestone Target	2025 WIP Target
Nutrient Application Management Core Nitrogen (acres)	34,669	143,136	None Identified	130,936
Nutrient Application Management Rate Nitrogen (acres)	None reported ⁵	None reported	None Identified	92,426
Nutrient Application Management Timing Nitrogen (acres)	None reported	None reported	None Identified	92,426
Cover Crops (acres)	32,717	75,214	142,508	109,360
Grass Buffers (acres)	2,430	4,903	8,066	13,021
Wetland Restoration (acres)	3,187	8,632	6,132	14,173
Soil Conservation and Water Quality Plans (acres)	69,781	24,463	None Identified	164,916
Livestock + Poultry Waste Management Systems (animal units)	629,287	1,078,950	884,176	1,091,906
Manure Transport Out of Area (dry tons)	14,200	19,248	72,000	74,080

The summary progress from the CBP partnership's modeling tools for 2009 and 2023 incorporate BMP credit duration. The CBP partnership decided to remove reported BMPs from the model simulation at the end of their established credit durations unless verified by the state as inspected and continuing to function as designed. Delaware is expected to provide detailed

⁴ BMP levels are units reported or planned by the jurisdiction. The levels are calculated using CAST-19 of 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 2023, etc., not just new reported implementation, unless otherwise noted.

⁵ 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.

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

Source Sector Review

Agriculture

Delaware is predominantly relying on agriculture BMP implementation to meet its 2025 targets based on its Phase III WIP. Delaware continues to make incremental progress toward its goals, but the current pace of implementation is not on track to meet its statewide nutrient targets. EPA expects Delaware to accelerate BMP implementation in the agricultural sector.

2022-2023 Milestone Achievements

- Increased in implementation and met 2025 goals with reported new implementation for some BMPs during this 2022-2023 Milestone period:
 - Forest Buffer – 709 new acres reported (498% increase)
 - Erosion and Sediment Control – 487 new acres reported (179% increase)
 - Pasture Management – 688 new acres reported (71% increase)
- Developed BMP guidebook for tax ditch management that is expected to contribute to up to 600 acres of grass buffers and 10 acres of BMP wetland enhancement.
- Completed analysis of tax ditch systems to target for water quality projects.
- Utilized Chesapeake Bay Implementation Grant (CBIG), state, and National Resource Conservation Service (NRCS) Environmental Quality Incentives Program (EQIP) funding, including the state Conservation Cost Share Program, to direct over \$800,000 to cover crop assistance.
- Met outreach milestones to implement advertising campaigns and to host workshops to promote the use of cover crops and other agricultural BMPs.
- Continued to support Sussex Conservation District effort to incentivize whole-farm conservation plans.

2022-2023 Milestones Not Achieved

- Did not achieve milestones for several BMPs including cover crop implementation, manure transport, nutrient management nitrogen rate, placement timing, and phosphorus placement, wetland restoration, creation, and rehabilitation, as well as soil and water conservation planning implementation, and crop irrigation management.
- Did not meet planned schedule and progress on Concentrated Animal Feeding Operation (CAFO) inspections following avian flu driven delays.
- Did not reissue CAFO general permit 1 or issue CAFO general permit 3.
- Did not complete planned Bridgeville Branch Tax Ditch restoration.

2024-2025 Milestone Strengths

- Includes a new milestone to track expansion of an anaerobic digestion facility.
- Expands milestone tracking progress of Forest Buffer Incentive Program, a program funded through Infrastructure Investment and Jobs Act (IIJA).

- Includes new milestone tracking expansion of Buffer Incentive Program to include Riparian Grass Buffers.
- Adds numeric target for forest buffers created through various initiatives including an ambitious goal of 177 acres of urban tree plantings in 2024 and 2025. Between 2014 and 2022, Delaware reported 7.7 acres of tree plantings annually.

Key Areas to Address in the Final 2024-2025 Milestone Period and beyond

- Report progress on efforts to accelerate BMP implementation in the agricultural sector and identify what programs were implemented to achieve the implementation targets, especially since several BMP implementation targets were not met in the 2022-2023 milestone period.
 - Utilize increased staff capacity to make more progress on Nutrient Management Plan implementation.
 - Increase acres with cover crops.
 - Increase soil and water conservation planning implementation.
 - Return to anticipated schedule and progress on CAFO inspections following avian flu driven delays.
- Consider including language about supporting implementation of Delaware's [Riparian Forest Buffer Action Strategy](#) in progress reporting.

Urban/Suburban Stormwater

2022-2023 Milestone Achievements

- Worked with EPA to finalize the Tier 2 Phase II MS4 general permit. Delaware did publish the Tier 1 Phase II MS4 general permit, and it became effective January 1, 2024.
- Submitted a draft Industrial Stormwater general permit to EPA for review in December 2023. EPA provided minor comments to Delaware Department of Natural Resources and Environmental Control (DNREC) in January. The permit should be issued during next milestone period.
- Worked cooperatively with EPA on reducing permit backlog and made good progress throughout milestone period.

2022-2023 Milestones Not Achieved

- Did not meet targets for urban stream restoration, runoff reduction and stormwater treatment standards, conservation landscaping practices, urban tree planting, septic pumping, street sweeping, or urban nutrient management.
- Did not submit a draft of the New Castle County Phase I MS4 permit to EPA for review.

2024-2025 Milestone Strengths

- Used IJJA funds to establish Delaware Community Conservation Assistance Program (DeCAP) to assist landowners with implementation of BMPs in urban areas.
- Commits to reissue the following permits: Tier 2 Phase II MS4 general permit, New Castle County Phase I MS4 permit, and Industrial stormwater general permit.
- Commits to provide grant funding for the implementation of urban BMPs identified in the WIP specifically for non-agricultural properties.
- Commits to implement green infrastructure practices in Seaford and Laurel.

Key Areas to Address in the Final 2024-2025 Milestone Period and beyond

- Ensure that all areas to be regulated as MS4s as a result of the 2020 Census and regulations obtain permit coverage under the Tier 2 Phase II MS4 general permit when it becomes available.
- Delaware is expecting additional nutrient reductions from the stormwater sector by 2025 according to its Phase III WIP. EPA expects Delaware to accelerate BMP implementation in the urban/suburban stormwater sector through the urban/suburban stormwater milestones noted above.

Wastewater Treatment Plants and Onsite Systems

2022-2023 Milestone Achievements

- Continued to meet nutrient reduction targets for wastewater sector.
- Reissued the NPDES permit for the Laurel wastewater treatment plant in September 2023.
- Met target for installation of new advanced treatment denitrification septic systems.

2022-2023 Milestones Not Achieved

- Did not reissue Seaford permit by target date in 2023.
- Did not meet target for septic pump-outs.

2024-2025 Milestone Strengths

- Includes a goal of second quarter of 2024 for reissuance of the Seaford Permit.
- Commits to verify septic pump-outs on at least 4,000 septic systems annually within the Chesapeake Bay Watershed during the milestone period.

Key Areas to Address in the Final 2024-2025 Milestone Period and beyond

- None.

Growth, Offsets, and Trading

2022-2023 Milestone Achievements

- Continues to develop its implementation scenarios on 2025 forecasted growth conditions, per the CBP partnership decision, with assumed growth directed towards areas zoned for growth or with the necessary infrastructure and capacity to support growth.
- DNREC reported that Sussex County introduced a draft Buffer Ordinance requiring riparian buffers in new residential subdivisions. DNREC will work with the county to establish tracking and reporting mechanism as necessary. This effort supports WIP Section 6: Accounting for Growth. This ordinance was approved by the County Council on May 15, 2022.

2022-2023 Milestones Missed

- None

2024-2025 Milestone Strengths

- None. There were no milestones submitted for this sector.

Key Areas to Address in the Final 2024-2025 Milestone Period and beyond

- Continue to work with EPA in offsetting any new or increased nutrient and sediment loads in Delaware's portion of the Chesapeake Bay watershed.

Climate

In 2020, the PSC issued a directive that by 2022 all jurisdictions would account for the additional nutrient loads due to 2025 climate change conditions in a Phase III WIP addendum, or in the two-year milestones, if it had not already done so in its Phase III WIP. All Bay jurisdictions met this goal in 2022 to update Phase III WIPs or milestones to address the 2025 climate change conditions. Delaware addressed the 2025 climate change conditions in its Phase III WIP. The Bay jurisdictions maintained the commitment to meet the 2025 climate change conditions by 2025.

2022-2023 Milestone Achievements

- Continued to implement Delaware's Climate Action Plan.
- Conducted outreach activities highlighting climate smart agriculture with multiple state and federal agencies as partners.

2022-2023 Milestones Not Achieved

- None.

2024-2025 Milestone Strengths

- States ongoing commitment to initiatives included in Delaware's Climate Action Plan.

Key Areas to Address in the Final 2024-2025 Milestone Period and beyond

- None.

Other (BMP verification, Segment-shed Goals for the Tidal Jurisdictions, Local Engagement, etc.)

2022-2023 Milestone Achievements

- Planted 40 sites through Tree for Every Delawarean initiative (TEDI).
- Continued efforts to improve BMP Tracking and Reporting Tool. Provided updated inspection data in 2022.

2022-2023 Milestones Not Achieved

- None.

2024-2025 Milestone Strengths

- No new milestones proposed for 2024-25. Continuing milestones from 2022-23 period.

Key Areas to Address in the Final 2024-2025 Milestone Period and beyond

- Consider incorporating reference to Delaware's brand new [Tree Canopy Action Plan](#) into progress reporting for the Tree for Every Delawarean milestone.

Potential Federal Actions and Assistance

EPA remains prepared to assist each of the seven watershed jurisdictions in implementing the 2024-2025 milestones. EPA will work with each jurisdiction to develop specific oversight and assistance activities to provide prioritized support for implementation efforts, including funding, technical assistance and analysis, training, and regulatory reviews.

EPA plans to continue to commit staff, contractual and funding resources to support the seven watershed jurisdictions in implementing the 2024-2025 milestones and future two-year milestones. This support includes evaluation of the most-effective practices and locations, annual funding assistance to address priority implementation needs, evaluation of Bay jurisdictions' implementation capacity under various staffing, funding, regulatory and programmatic scenarios, local planning outreach, legislative and regulatory gap analysis, and monitoring trend analyses.

At the sector level, every jurisdiction, except the District of Columbia, is significantly off track in meeting its Phase III WIP commitments in the urban/suburban stormwater sector. Recognizing this, and that the stormwater sector supplies a significant portion of the nutrient and sediment loads to the Bay, EPA is exploring opportunities for increased oversight in this sector.

In addition, EPA will continue to work with federal partners to provide leadership and coordinate with Bay jurisdictions on WIP and two-year milestone implementation to reduce pollutants from federal lands. EPA will continue its commitment to track annual progress of the Bay jurisdictions and make those results available to the partnership and the public. [See:

<https://www.epa.gov/chesapeake-bay-tmdl/epa-oversight-watershed-implementation-plans-wips-and-milestones-chesapeake-bay> and <https://www.chesapeakeprogress.com/>

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, 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 (www.usgs.gov/CB-wq-loads-trends) over the long-term 1985-2020 and short term 2011-2020 were made available in January 2023. The analysis below mainly focuses on the short term 2011-2020 trends.

While identifying drivers behind individual trends is often complex, the monitoring results are worthy of Delaware'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 Delaware's watersheds can potentially inform planning are below.

- Of the three monitored stations to which Delaware's watershed contributes, all are degrading for both nitrogen and phosphorus. These watersheds are all high-loading areas within the Chesapeake Bay watershed and implementing efforts in these high loading areas can potentially yield the greatest nutrient reduction benefits.
- All of Delaware's monitored watersheds are dominated by agricultural loads. While more information would be needed to determine what is driving individual trends, agricultural areas should be a continued focus for both nitrogen and phosphorus.

- Additional exploration of these trends can help elucidate what may be sources and drivers, which can in turn help inform adaptation of programs, policies, or practices.
- While groundwater can contribute to a delayed response in nitrogen levels, phosphorus loads are most associated with overland runoff. The degrading phosphorus trends at these monitored stations suggest that the Eastern Shore continues to be important places to focus implementation.

A comprehensive effort has been made to compile and analyze data sets for the watersheds of the Chesapeake Bay Program Nontidal Water Quality Monitoring Network stations. For the first time, station-level monitoring and modeling results, available through the [Monitored and Expected Total Reduction Indicator for the Chesapeake \(METRIC\) tool](#), can be compared to help resource managers gauge expectations on the trajectory and pace of reduction progress at a local scale.