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Status of Efforts to Restore Chesapeake Bay Water Quality

For decades, Chesapeake Bay jurisdictions (Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia, and the District of Columbia), multiple federal and local agencies, and others have worked to improve water quality in the Bay. Nonetheless, poor water quality in the Bay and its tidal tributaries persisted, prompting litigation that ultimately required the U.S. Environmental Protection Agency (EPA) to establish a Total Maximum Daily Load (TMDL)—or a "pollution budget" for the Bay. Established in 2010, the TMDL includes interim and final goals for each jurisdiction to achieve by 2017 and 2025, respectively. As the target date for the final TMDL goals approaches, stakeholders are examining the progress toward these goals and the continuing challenges Bay jurisdictions and others face in improving the Bay's water quality.

What Is a TMDL?

The Clean Water Act (CWA) requires states to identify waters that are "impaired" by pollution (i.e., not meeting state water quality standards). For those waters, the act directs states to establish a TMDL, which is a calculation of the amount of a pollutant that can enter a waterbody and still allow the waterbody to meet state water quality standards for that pollutant. TMDLs include a quantitative assessment of the pollutant sources and reductions required to attain water quality standards. TMDLs address both point sources of pollution (e.g., wastewater or industrial discharges) and nonpoint sources (e.g., urban runoff and agricultural runoff). The CWA directs states to submit TMDLs to EPA for approval. If EPA disapproves, the act directs EPA to develop a TMDL for the waterbody.

Chesapeake Bay TMDL

EPA established a Chesapeake Bay TMDL in 2010 pursuant to consent decrees resolving litigation over impairment of Bay waters in Virginia and the District of Columbia. The TMDL was also a key feature of a 2010 strategy to restore the Chesapeake Bay. The Federal Leadership Committee for the Chesapeake Bay, chaired by EPA, created the strategy in response to Executive Order 13508, issued in May 2009.

The Chesapeake Bay TMDL is the largest single TMDL developed to date in terms of area covered. It addresses all segments of the Bay and its tidal tributaries that are impaired from discharges of nitrogen, phosphorus, and sediment. The TMDL set two broad goals: an interim goal of having 60% of pollution control measures needed to attain water quality standards in place by 2017 and a final goal of having 100% of the measures in place by 2025. EPA is using an accountability framework to implement the TMDL. This framework includes four elements: watershed implementation plans (WIPs), two-year milestones, EPA tracking and assessment, and backstop federal actions if Bay jurisdictions do not meet their commitments. Examples of potential backstop federal actions include expanding CWA permit coverage to unregulated sources, conditioning or redirecting EPA grants, and requiring additional pollutant load reductions from point sources.

WIPs

Bay jurisdictions each created WIPs, which detailed specific steps they planned to take to meet and maintain their pollutant allocations under the TMDL. Bay jurisdictions developed WIPs in three phases and submitted them to EPA in 2010 (Phase I), 2012 (Phase II), and 2019 (Phase III). Phase I and II WIPs described specific actions and controls to be implemented by 2017 and 2025 to achieve applicable water quality standards. Phase II WIPs built upon Phase I WIPs by including more specific local actions. Phase III WIPs include refined actions and controls the jurisdictions intend to take through 2025 to meet the goals of the TMDL (see "Phase III WIPs").

Milestones

Bay jurisdictions submitted their first set of milestones to EPA in 2012. These milestones identify short-term goals on an interim two-year basis, which can be used to assess progress toward the longer-term goals. The most recent set of milestones covers 2022-2023.

2017 Midpoint Assessment

The Chesapeake Bay TMDL called for a midpoint assessment in 2017 to review jurisdictions' progress toward meeting the goals established in the TMDL. According to data submitted by Bay jurisdictions and assessed by EPA, jurisdictions collectively surpassed the 2017 interim goals for reducing phosphorus and sediment, but they did not achieve the 2017 interim goal for reducing nitrogen. Reductions of specific pollutants in individual Bay jurisdictions varied widely.

EPA also assessed the Bay jurisdictions' implementation of programs to achieve pollution reductions across sectors and found that achievements and shortfalls varied. The wastewater sector in particular had much success, achieving its 2025 load reduction goals 10 years ahead of schedule through treatment plant upgrades, technology advances, and nutrient discharge limitations in CWA discharge permits. Efforts to reduce nitrogen deposition from atmospheric sources (e.g., power plants and vehicles) were also on track to meet the 2025 TMDL goals. However, while jurisdictions had improved their urban/suburban stormwater regulatory programs, EPA reported that overall loads in the sector continued to increase due to population growth and development. EPA also found that, in some cases, jurisdictions were not making sufficient progress in implementing their planned policies and programs in the

agricultural sector and were falling short of meeting the pollution reduction goals in that sector.

As part of the 2017 assessment, EPA identified Delaware's agricultural sector, Maryland's urban/suburban stormwater sector, New York's wastewater sector, and Pennsylvania's trading/offsets sectors as needing enhanced oversight. This means EPA identified specific concerns with the jurisdictions' implementation of strategies to meet TMDL goals. The agency may take additional actions to ensure that the jurisdiction stays on track.

In addition, EPA identified two sectors in Pennsylvania—agriculture and urban/suburban stormwater—as requiring backstop action levels, meaning the agency had substantial concerns with actions taken to meet the TMDL goals. For these two sectors, EPA has taken actions intended to get the jurisdiction on track, such as establishing an expectation for more frequent and detailed reporting and an expectation that Chesapeake Bay funds provided to Pennsylvania would be applied to specific priority watersheds.

Phase III WIPs

In 2019, EPA received final Phase III WIPs from Bay jurisdictions specifying actions they plan to implement between 2019 and 2025 to achieve the TMDL goals. Bay jurisdictions incorporated midpoint assessment results and new science and data, such as improved modeling tools, higher-resolution land cover data, additional monitoring data, and greater variety of approved best management practices (BMPs) in their Phase III WIPs. Bay jurisdictions also considered other factors, such as population growth, land use changes, and climate change. In 2018, a committee composed of EPA and other Bay partners revised nitrogen and phosphorus targets to reflect refinements to the most recent version of the Chesapeake Bay watershed model. Some of the revised targets require additional pollution reductions beyond the original 2025 goals, whereas other targets require lesser reductions. The new targets reflect that pollution controls in some areas may be more effective than similar controls in other areas.

EPA's evaluations of the Bay jurisdictions' Phase III WIPs indicated that both New York's and Pennsylvania's plans were deficient in certain areas. While New York submitted an amended plan, which EPA found would meet the state's portion of the 2025 goal, EPA found that Pennsylvania's amended plan did not meet the state's portion of the 2025 goal. Other Bay jurisdictions and the Chesapeake Bay Foundation sued EPA in 2020 for failing to enforce provisions of the CWA by not requiring Pennsylvania to develop a plan to fully meet pollution reduction goals. (The lawsuit initially included claims regarding New York's plan and EPA's review of that plan, but those claims were dismissed after EPA approved New York's amended plan.) In April 2023, EPA reached a tentative settlement with the plaintiffs in which EPA proposed to increase compliance and enforcement efforts, prioritize its efforts in certain Pennsylvania jurisdictions that contribute the most pollution or have the largest impacts, and determine whether certain stormwater dischargers or animal feeding operations should be designated as significant contributors of pollutants that are therefore subject to permitting requirements.

Progress Toward 2025 Goals

Although the Bay jurisdictions have made progress in implementing practices and controls to achieve TMDL goals, EPA indicates that the jurisdictions are "off course" in meeting their goals. Bay jurisdictions have reported that, as of 2021, they have BMPs in place to achieve 49% of the nitrogen reductions, 64% of the phosphorus reductions, and 100% of the sediment reductions needed to attain applicable water quality standards when compared to the 2009 baseline established in the Bay TMDL. In FY2024, EPA plans to evaluate progress toward meeting the 2022-2023 milestone commitments.

Challenges

EPA and other stakeholders acknowledge that, despite progress in reducing pollutants to the Bay, challenges in achieving the TMDL goals and improving the Bay's water quality remain. While jurisdictions' efforts have prevented a significant increase in pollution, they face challenges in meeting targets due to factors such as land use changes, population growth, changes in climate, and the voluntary nature of BMPs implemented to address nonpoint source pollution. EPA's Chesapeake Bay Program (CBP) estimates that 27% of the Bay area met water quality standards in 1985, improving to the mid-30% range by 2020.

In May 2023, the CBP's Scientific and Technical Advisory Committee (STAC), an independent entity that provides scientific and technical advice to CBP, found that (1) efforts to reduce nonpoint sources of nutrients have not resulted in sufficient levels of BMP implementation to meet the TMDL, and (2) the implementation that has occurred has not been as effective at producing the pollutant reductions as expected, meaning more controls would be needed to achieve the target pollutant reductions. In addition, while nutrient and sediment reductions have led to some water quality improvements in some portions of the Bay, no significant improvement has been measured in the majority of the water quality standards established for the various Bay habitats (especially in deep waters), suggesting a lagging response. STAC concluded that ongoing changes may require thinking differently about what constitutes a "restored" Chesapeake Bay. It also suggested potential opportunities for improvements. For example, prioritizing management actions in areas or habitats where pollution reduction limits might be achieved first and yield more immediate impacts on living resources may magnify the impacts of TMDL implementation.

Congressional Interest

Congress has funded Bay restoration efforts through EPA and other agencies for decades. In FY2023, Congress appropriated $92.0 million to EPA for the CBP. In addition, Congress provided $238.0 million in supplemental appropriations through the Infrastructure Investment and Jobs Act (P.L. 117-58) to be provided in equal amounts in each of FY2022 through FY2026. The President's FY2024 budget requests $92.1 million for CBP. Congress may consider additional oversight of the CBP and its efforts to restore the Bay as the 2025 TMDL goal approaches.

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