

## Water Quality Outcome Justification

**Goal:** Restore water quality to achieve standards for DO, clarity/SAV, and chlorophyll-a in the Bay and its tidal waters as articulated in the Chesapeake Bay Total Maximum Daily Load (TMDL).

**2025 Watershed Implementation Plans (WIP) Outcome:** Have all controls installed by 2025 to achieve the Bay's DO, water clarity/SAV, and chlorophyll-a criteria.

**2017 WIP Outcome:** Have practices in place by 2017 that are expected to achieve 60 percent of the load reductions necessary to achieve applicable water quality standards compared to 2009 levels.

### Current Condition

89 of the 92 segments of the Bay and its tidal waters are impaired.

### Supporting Details

1. Why is this outcome important?

- Restoration of tidal water quality is central to bringing back a healthy Chesapeake Bay ecosystem.
- The water quality standards are supportive of other CBP goal areas including habitat (e.g. clarity for SAV) and fisheries (e.g. dissolved oxygen to support key species).
- The standards also provide benefit for protection of human health.

2. Generally, how was the outcome derived?

- This outcome actually combines a management output (100% of pollution reduction controls installed for nitrogen, phosphorus and sediment no later than 2025) with a water quality outcome (practices in place to achieve 60% of load reductions necessary to achieve WQ standards by 2017).
- The outputs will be measured through data collected from the jurisdictions annually through BayTAS and will require no further data collection or analysis other than what is done annually for Bay Barometer and other purposes.
- The Chesapeake Bay Program (CBP) has undertaken monitoring, modeling, and research to develop the water quality standards and calculate the nitrogen, phosphorus, and sediment load reductions needed to achieve the standards. The outcomes will be measured using monitoring information. It was derived using best professional judgment based on expected implementation progress made by 2017.

3. Which partners (state, federal agencies, goal teams, committees) were involved in creating this outcome?

The Bay jurisdictions; associated Partnership committees (PSC, MB) and goal teams (WQGIT)

4. Which partners (state, federal agencies, other GITs) need to be involved to achieve the outcome?

All Bay jurisdictions and federal agencies under the Chesapeake Bay Program partnership, including the PSC, MB, WQGIT, Fisheries GIT, Habitat GIT

5. What are major factors influencing ability to achieve outcome?

- Understanding the factors affecting the ecosystem response to pollutant load reductions:
  - The factors affecting the time it will take to see improvements (i.e. lag times) between implementation and responses in water quality;
  - Factors in addition to nitrogen, phosphorus, and sediment pollutant load reduction that affect response of DO, clarity, SAV, and chlorophyll;
  - The relationships among water quality improvements and the recovery of habitat and fish populations; and
  - The effect of healthy habitats and fisheries on water quality.
- Identifying the sources and their contributions toward nitrogen, phosphorus, and sediment pollutant loads
- Describing and quantifying the effects of pollution reduction practices:
  - Adopting principles to verify that reported practices are, indeed, in place and functioning as designed;
  - Further quantifying the effect of variations in watershed properties on controls;
  - Quantifying changes in BMP performance over time; and
  - Better understanding the potential future impacts of climate change on BMP performance.
- The capacity of governments and the private sector to implement practices

6. What is the basis for the target?

Based on model simulations, EPA estimated the nitrogen, phosphorus, and sediment loads delivered to the Bay tidal waters. Under EPA's written expectations for the jurisdictions' WIPs, the jurisdictions need to have the practices and technology implemented on the ground necessary to achieve 60 percent of the total nutrient and sediment reductions required to achieve their Bay TMDL allocations by 2017.

7. What management strategies will ensure the outcome is met?

The overall management efforts needed for reducing nitrogen, phosphorus, and sediment are provided in the Bay TMDL and elements of its accountability framework, including the WIPs and two-year milestones.

The midpoint assessment provides an opportunity for EPA to consider revising the Bay TMDL allocations and take any other necessary actions related to the WIPs or the accountability framework, including potential enhancements to the CBP models.

8. What data will be used to measure progress?

The CBP accountability framework provides the foundation to assess performance toward the TMDL and associated water quality standards. The established times in the accountability framework to assess performance include:

- Assessment of Phase II & III WIPs
- Assessment of Two-Year Milestones
- 2017 Midpoint Assessment