Phase III Planning Targets – Methodology

Background

- In preparation for the Phase III WIPs in 2018, **EPA anticipates releasing the final Phase III planning targets in December 2017 (draft targets in Spring 2017),** considering the Chesapeake Bay Program (CBP) partnership's-vetted methodology and any necessary adjustments to meet applicable water quality standards.
- **In 2010, the Partnership reached agreement on a methodology and scenario year** for dividing up responsibility for achieving the basinwide load reflecting the assimilative capacity of the Bay at which it could still meet the states' water quality standards.
- A question before the Partnership is: are any changes to that existing methodology and scenario year needed to reflect what we know now that we did not know five years ago?
- To begin the discussion with the Partnership on the need to make changes to the Partnership's existing, agreed-to methodology, an **informational briefing on the Phase III planning target methodology** will be provided during a face-to-face meeting with the Water Quality Goal Implementation Team (WQGIT) on December 14-15, 2015.

Key Considerations for Setting the Phase III Planning Targets

- The **current Phase II planning targets <u>will</u> change** based on new data (e.g., updated land use) and methods introduced in the Phase 6 modeling tools, an additional decade worth of expanded monitoring network data, and partnership decisions on how to spread the level of effort due to issues such as Conowingo Dam, James River chlorophyll criteria re-evaluation, and climate change.
- The **nitrogen and phosphorus basin-jurisdiction allocation methodology used in the 2010 Bay TMDL was developed using the following guidelines adopted by the partnership**:
    - "The allocated loads should protect the living resources of the Bay and its tidal tributaries and result in all segments of the Bay mainstem, tidal tributaries, and embayments meeting WQS for DO, chlorophyll a, and water clarity.
    - Major river basins that contribute the most to the Bay water quality problems must do the most to resolve those problems (on a pound-per-pound basis).
    - All tracked and reported reductions in nitrogen and phosphorus loads are credited toward achieving final assigned loads." [Cited on Page 6-16 in the 2010 Chesapeake Bay TMDL Report]
- A number of **critical concepts are important in understanding the major river basin by jurisdiction nitrogen and phosphorus allocation methodology**. They include the following:
    - Accounting for the geographic and source loading influence of individual major river basins on tidal water quality termed relative effectiveness
    - Determining the controllable load
    - Relating controllable load with relative effectiveness to determine the allocations of the basinwide loads to the basin-jurisdictions.

- A methodology should be used that following these partnership-adopted guidelines and **allows the jurisdictions to make shifts in their source sector targets[1] based on new information** such as monitoring data and Phase 6 modeling tools and lessons learned in implementation of the Phase I and Phase II WIPs.

Default Methodology in Setting the Phase III Planning Targets

- The **default approach (i.e., the same methodology that was used in the development of the 2010 Bay TMDL)**, which used a relationship between the No Action and E3 scenarios and the relative effect of a basin on changing water quality, should be used unless the CBP partnership can agree to an alternative approach.
- Potentially, the **fairest method of setting targets since it follows the existing and agreed-to system of rules** (**see the partnership-adopted principles above**) and fully considers and factors in all the better data information (e.g. BMPs, updates to atmospheric deposition, and land use changes) developed during the midpoint assessment.
- A majority of the jurisdictions agreed to this methodology for the 2010 Bay TMDL. Two jurisdictions – West Virginia and New York – did not agree with all parts of determining/calculating the planning targets.
- Could **provide a consistent framework for equitable distribution of state-basin targets to a more local level**, if local area targets are a part of a jurisdiction's plans (e.g., Maryland in its Phase II WIP).
- The load reduction effort could shift among jurisdictions which would create situations where some would have to modify their overall state WIPs to include more stringent reductions and others would be able to relax their planned efforts.

If this existing, approved methodology is used in the establishment of the Phase III planning targets, then the next step will be to determine the year to use for model scenarios for setting the Phase III planning targets.

Key Considerations for Selecting the Scenario Year for the Phase III Planning Targets

- Setting the scenario year for the Phase III planning targets **reflects the base set of conditions upon which we will build the planning targets**. Using the best available data should be a goal.
- The choice of a scenario year for the Phase III planning targets is also an **equity issue: accounting for growth and determining what pollutant loads will need to be offset**.

Proposed Recommendation: 2010[2] – Scenario year for the Bay TMDL as "backcasted" from 2012 data

- Using 2010 as backcasted from 2012 doesn't violate the best available data principle of TMDLs because we'd be **using the best available data from 2012 and backcasting to 2010**.
- **The 2010 scenario year will not change through time**, since it reflects actual data and not a future projection (where data will change as you get closer to that future year).

[1] As articulated in the Bay TMDL, a jurisdiction continues to have the option of proposing revisions to portions of the Bay TMDL that apply within its boundaries and submitting those revisions to EPA for approval.

[2] Using the base year for the Bay TMDL as forecasted from 2007 data is not a viable option since that information cannot be used in Phase 6 of the Watershed Model. The Phase 6 Watershed Model is using the best available data from 2012.

- Maintains a stable scenario year with the Bay TMDL which **will remove any inequities caused by states that grew from 2010 to 2012 or 2017 or any other forecasted year**.
- Consistent with EPA's **expectation to offset all loads beyond the scenario year for the original TMDL**.

Alternative Methodologies for the Phase III Planning Targets

➢ **Running Phase II WIP input through Phase 6.0 Watershed Model and the Water Quality Sediment Transport Model (*same level of effort*)**

- This approach is consistent with the level-of-effort approach taken when moving from the 2010 Bay TMDL to the Phase II planning targets.
- The Phase II planning targets (i.e., as expressed in the Phase 6.0 Watershed Model) – that are the same level-of-effort as Phase I WIPs and the Bay TMDL – may not meet water quality standards since the overall 2025 target (assimilative capacity) will be based on new scientific data and information (e.g., the Phase 6 modeling tools). By April 2016, the CBP Modeling Workgroup expects to have the models available to determine if the Phase II planning targets will meet water quality standards.
- EPA expects the Bay jurisdictions to request that their Phase II WIPs be run through the Phase 6 model (during the 2016 review period) to determine if their existing planned "level of effort" will need to be increased (or decreased) in Phase III, and, if so, by how much and where.

➢ **Use the Phase II planning targets but in the Phase III WIP expectations, ask the states to develop their Phase III WIPs using the Phase 6.0 Watershed Model (*same numeric planning targets*)**

- Although there would be stability with the Phase II planning targets, the Phase II WIPs are unlikely to meet water quality standards since the overall 2025 target (assimilative capacity) will be based on new scientific data and information (e.g., the Phase 6 modeling tools).
- Phase III WIP input decks and the Phase II planning targets will have been developed on different assumptions and data (e.g. the latter on Phase 5.3.2 and the former on Phase 6).
- Although the target numbers would be the same as the current ones, the load reduction effort to meet those targets would be different – to various degrees.
    - For example, based on new science and monitoring data, the phosphorus loads from the Eastern Shore are expected to be much higher in Phase 6 for the calibration period. Keeping the Phase II planning targets would mean a much greater percentage reduction (i.e., if the jurisdiction is polluting more, it will have to do more).
    - This approach has caused problems in the past – in 1997, the 1992 goals were kept while the model was changed from the Phase II model to the Phase III model. The result was that the Susquehanna was only required to have a 10% reduction in nitrogen rather than the 16% reduction previously agreed to.

Appendix 1. Alternative Scenario Years for the Phase III Planning Targets using the Default Approach

- **Select 2012 – Year with Best Available Data – as the Scenario Year**
  - Although 2012 reflects current data, it would potentially allow higher planning targets for jurisdictions that experienced growth between 2010 and 2012[3] and slightly lower planning targets for those that did not. (NOTE: Lower planning targets could potentially occur in those areas where low-density residential housing occurred on previously intense animal agricultural areas.)
  - Using any year other than 2010 (especially if a jurisdiction grows), could contradict the CBP-agreed principle of the TMDL which states that "Major river basins that contribute the most to the Bay water quality problems must do the most to resolve those problems".

- **2017 – Midpoint Assessment Year**
  - Process is consistent with how the base year was set for the 2010 Bay TMDL (i.e., a forecasted base year condition from a year with actual data which, in this case, is 2012).
  - Potentially allows higher planning targets for jurisdictions that experienced growth between 2010 and 2017[4] and lower planning targets for those that did not. This contradicts one of the principles of the TMDL which states that "major river basins that contribute the most to the Bay water quality problems must do the most to resolve those problems".

[3] Recall that the TMDL allocations were set based on a percentage between No Action and "E3" (everything everywhere by everybody). If a jurisdiction grew from 2010 to 2012 by replacing forest with urban, both its No Action and E3 levels would increase. Using the same percentage to calculate their reduction requirements, the jurisdiction would receive a higher planning target (i.e., would have to do less even though it discharges more).

[4] See footnote 3.