



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

Mr. D. Lee Currey, Director
Water and Science Administration
Maryland Department of the Environment (MDE)
Montgomery Park
1800 Washington Blvd., Ste. 4502
Baltimore, MD 21230-1718

Dear Mr. Currey:

The U.S. Environmental Protection Agency, Region III (EPA) is pleased to approve the fecal coliform Total Maximum Daily Load (TMDL) in the Ellis Bay. The TMDL was established to address impairments of water quality as identified on Maryland's Section 303(d) List. The Maryland Department of the Environment submitted the report *Total Maximum Daily Load of Fecal Coliform in the Restricted Shellfish Harvesting Area of Ellis Bay in the Lower Wicomico River in Wicomico County, Maryland* (March 2021) to EPA for review and approval on April 23, 2021. A draft version of the TMDL report was public noticed on February 17, 2021 for a 30-day comment period.

The TMDL was established and submitted in accordance with Section 303(d)(1)(c) and 303(d)(2) of the Clean Water Act. EPA's review concludes that, once fully implemented, the load and wasteload allocations in the TMDL are established at levels necessary to lead to the attainment of the applicable water quality standard addressed by this TMDL. A copy of EPA's rationale for approval is enclosed.

Any new or revised National Pollutant Discharge Elimination System permits must be consistent with the assumptions and requirements of any available wasteload allocations pursuant to 40 CFR §122.44(d)(1)(vii)(B). Please continue to submit all such permits to EPA for review per EPA's letter dated October 1, 1998.

If you have questions regarding EPA's action, please contact me at 215-814-2737, or have staff contact Mr. Hunter Pates, Maryland TMDL Coordinator, at 215-814-3385 or pates.hunter@epa.gov.

Sincerely,

CATHERINE
LIBERTZ

Catherine A. Libertz, Director
Water Division

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Enclosure

cc : Melissa Chatham, MDE-WSA (via e-mail)



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Decision Rationale

Total Maximum Daily Loads of Fecal Coliform in the Restricted Shellfish Harvesting Area of Ellis Bay in the Lower Wicomico River in Wicomico County, Maryland

CATHERINE
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Catherine A. Libertz, Director
Water Division

Decision Rationale

Total Maximum Daily Loads of Fecal Coliform in the Restricted Shellfish Harvesting Area of Ellis Bay in the Lower Wicomico River in Wicomico County, Maryland

I. Introduction

The Clean Water Act (CWA) requires a Total Maximum Daily Load (TMDL) to be developed for those waterbodies identified as impaired by a state where technology-based effluent limits and other pollution controls do not provide for the attainment of water quality standards. A TMDL establishes a target for the total load of a particular pollutant that a water body can assimilate and divides that load into wasteload allocations (WLA), given to point sources, load allocations (LAs), given to nonpoint sources and natural background, and a margin of safety (MOS), which takes into account any uncertainty. Mathematically, a TMDL is commonly expressed as an equation, shown below.

$$TMDL = \sum WLA_s + \sum LA_s + MOS$$

This document sets forth the U.S. Environmental Protection Agency, Region III's (EPA's) rationale for approving the TMDL for fecal coliform in Ellis Bay. The TMDL was developed to address impairments of water quality standards as identified on Maryland's Section 303(d) list of water quality-limited segments. The Maryland Department of the Environment (MDE) submitted the report *Total Maximum Daily Loads of Fecal Coliform in the Restricted Shellfish Harvesting Area of Ellis Bay in the Lower Wicomico River in Wicomico County, Maryland* (March 2021) (hereinafter referred to as the "TMDL report") to EPA on April 23, 2021. EPA's decision is based upon its administrative record, which includes the TMDL report and information in supporting files provided to EPA by MDE. EPA has reviewed and determined that the TMDL meets the requirements of Section 303(d) of the Clean Water Act and its implementing regulations at 40 CFR Part 130 including but not limited to:

1. TMDLs are designed to implement applicable water quality standards.
2. TMDLs include wasteload allocations and load allocations.
3. TMDLs consider natural background sources.
4. TMDLs consider critical conditions.
5. TMDLs consider seasonal variations.
6. TMDLs include a margin of safety.
7. TMDLs have been subject to public participation.

In addition, EPA has considered and finds acceptable the reasonable assurances set forth in the TMDL Report.

From this point forward, all references in this rationale can be found in Maryland's TMDL Report unless otherwise noted.

II. Section 303(d) Listing Information

MDE established a fecal coliform TMDL for the restricted shellfish harvesting area of Ellis Bay in the Lower Wicomico River Basin. The TMDL applies to Ellis Bay in Lower Wicomico River Mesohaline Chesapeake Bay Segment (Assessment Unit MD-WICMH-Ellis_Bay). Table 1 presents the assessment unit and parameter from MDE's 2014 303(d) list of impaired waters that is addressed by this TMDL.

Table 1: Waterbodies and Impairments Addressed by the TMDL

| Assessment Unit | Waterbody Name | Parameter Addressed |
|--------------------|----------------|---------------------|
| MD-WICMH-Ellis_Bay | Ellis Bay | FECAL COLIFORM |

Ellis Bay is located at the mouth of Wicomico River in Wicomico County, Maryland. The total drainage area of the Ellis Bay restricted shellfish harvesting area is approximately 7,859 acres, and the land-use distribution consists primarily of forest (47 percent) and water/wetland (43 percent). There are no "high quality," or Tier II, stream segments (aquatic life assessment scores > 4 [scale 1-5]) located within the drainage area. Tier II segments require the implementation of Maryland's anti-degradation policy, which is designed to prevent degradation of high quality waters and requires a review of all upstream permitted activities.

For more information regarding the water quality characterization of the watershed, please refer to Section 2.2 of the TMDL report.

III. TMDL Overview

MDE has established a fecal coliform TMDL for Ellis Bay, which is presented as counts/day in Section 4.6 (Table 9) of the TMDL report and Table 1 (below).

Section 2.3 discusses the fecal coliform source assessments. MDE conducted scat and water column sampling over a one-year period in the shellfish harvesting areas of Lower Wicomico River and used bacteria source tracking (BST) to identify sources of fecal coliform. The nonpoint source assessment was conducted by analyzing BST results to quantify source loadings from humans, livestock, pets, and wildlife. In the Lower Wicomico River basin, wildlife contributions, both mammalian and avian, are considered natural conditions and may represent a background level of bacterial loading. Livestock contributions, such as those from mammalian and avian livestock, mainly result from surface runoff. Pet contributions usually occur through runoff from streets and land. Human sources mainly result from failure of septic systems. There are no National Pollutant Discharge Elimination System (NPDES)-regulated municipal wastewater treatment plants (WWTPs), industrial process water facilities or regulated stormwater discharges under Phase I or Phase II of the NPDES stormwater program within the drainage areas of any of the restricted shellfish harvesting areas. Therefore, there are no point source allocations for fecal coliform loads from the drainage areas of Ellis Bay.

Computational Procedures

Section 4.2 discusses the analysis framework and TMDL model. Concentrations of pollutants in tidal waters are heavily influenced by the flow of water into and out of the embayment through tidal exchange. The tide and amount of freshwater discharge into the embayment are the dominant influences on the transport of fecal coliform. The methodology used assumes that freshwater input, tidal range, and the first-order decay of fecal coliform are all constant. The TMDL is calculated based on the steady state tidal prism model. Compared to the volumetric method (EPA Shellfish Workshop 2002), the steady state tidal prism model provides improvements incorporating the influences of tidal induced transport, freshwater, and decay of fecal coliform in the embayment. A detailed description of the model is presented in Appendix A.

The most recent three-year (November 2016 to November 2019) median and 90th percentile fecal coliform concentrations in the restricted shellfish harvesting area were used to characterize the current (baseline) conditions. TMDL scenarios were run to estimate the maximum allowable loads the restricted shellfish harvesting area could receive from the responding drainage area in order to assure that the fecal coliform concentration within the embayment would not exceed the criteria. The load reductions needed for the attainment of the criteria for median and 90th percentile scenarios were determined by subtracting the allowable loads from the current loads. Source reductions were assigned by first managing controllable sources (human, livestock and pets) and were based on the source distribution determined using the BST analysis. If the total required reduction was not achieved after fully reducing controllable sources, wildlife was assigned reductions. Allocations of the TMDL are in Table 1.

Table 1: TMDL allocations

| Pollutant | Unit | TMDL | WLA | LA | MOS |
|------------------|-------------|-------------|------------|-----------|------------|
| Fecal Coliform | Counts/day | 5.99E+11 | 0 | 5.99E+11 | Implicit |

IV. Discussion of Regulatory Requirements

EPA has determined that the TMDL is consistent with statutory and regulatory requirements and EPA’s policy and guidance. EPA’s rationale for approving the TMDL is set forth according to the regulatory requirements listed below.

1) TMDLs are designed to meet the applicable water quality standards.

EPA regulations at 40 CFR 130.7(c)(1) state that TMDLs shall be established at levels necessary to attain and maintain the applicable narrative and numerical water quality standards. Water quality standards are state regulations that define the water quality goals of a waterbody. Water quality standards are comprised of three components: (1) designated uses, (2) criteria (numeric or narrative) necessary to protect those uses, and (3) antidegradation provisions that prevent the degradation of water quality.

The designated use of the restricted shellfish harvesting area of Ellis Bay is *Use II—Support of Estuarine and Marine Aquatic Life and Shellfish Harvesting* (COMAR 2017b). MDE’s Shellfish Certification Program is responsible for classifying shellfish harvesting waters

to ensure oysters and clams are safe for human consumption. MDE conducts shoreline surveys and collects routine bacteria water quality samples in the shellfish waters of Maryland to assure that Maryland's shellfish waters are properly classified.

The fecal coliform criteria applicable to *Use II shellfish harvesting waters* in Maryland are listed below. These criteria are more stringent than those bacteria criteria designed to protect water contact recreation.

- (a) The median fecal coliform MPN of at least 30 water sample results taken over a 3-year period to incorporate inter-annual variability does not exceed 14 per 100 milliliters; and:
 - (i) In areas affected by point source discharges, not more than 10 percent of the samples exceed an MPN of 43 per 100 milliliters for a five tube decimal dilution test or 49 MPN per 100 milliliters for a three tube decimal dilution test; or
 - (ii) In other areas, the 90th percentile of water sample results does not exceed an MPN of 43 per 100 milliliters for a five tube decimal dilution test or 49 MPN per 100 milliliters for a three tube decimal dilution test (COMAR 2017d).

TMDL scenarios were run to estimate the maximum allowable loads the restricted shellfish harvesting area could receive from the responding drainage area in order to assure that the fecal coliform concentrations within the embayment would not exceed the criteria. When comparing the median and the 90th percentile scenario results, the scenario that required greater load reductions was chosen for the final TMDL. For the restricted area, the 90th percentile scenario required greater percent reduction to meet the criterion, therefore, the 90th percentile scenario results were chosen as the final TMDL and were used for source allocations. Based on the foregoing, EPA finds the TMDL is designed to meet the applicable water quality standards.

2) TMDLs include wasteload allocations and load allocations.

EPA regulations at 40 CFR §130.2(i) define TMDL as the sum of the WLAs for point sources and LAs for nonpoint sources and natural background. The development of the WLAs and LAs is further discussed below.

Wasteload Allocations

According to federal regulations at 40 CFR §130.2(h), a WLA is the portion of a receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution. As described in Section 2.3., there are no NPDES-regulated municipal WWTPs, industrial process water facilities or regulated stormwater discharges under Phase I or Phase II of the NPDES stormwater program within the drainage area of the restricted shellfish harvesting area. Therefore, there are no point source allocations for fecal coliform loads from the drainage

area of Ellis Bay and the WLA is 0¹. Based on the foregoing, EPA finds that the WLA included in the TMDL satisfy the regulations at 40 CFR Part 130.

MDE is authorized to administer the National Pollutant Discharge Elimination System (NPDES) Program, which, among other duties, includes issuing NPDES permits to existing or future point sources subject to the NPDES program. The effluent limitations in any new or revised NPDES permits must be consistent with “the assumptions and requirements of any available [WLA]” in an approved TMDL pursuant to 40 CFR §122.44 (d)(1)(vii)(B). EPA has authority to object to the issuance of an NPDES permit that is inconsistent with the assumptions and requirements of WLAs established for that point source. It is expected that MDE will require periodic monitoring of any point source(s), through the NPDES permit process, in order to monitor and determine compliance with the TMDL’s WLAs.

Load Allocations

According to Federal regulations at 40 CFR §130.2(g), a LA is the portion of a receiving water’s loading capacity that is attributed either to one of its existing or future nonpoint sources of pollution or to natural background sources. Load allocations are best estimates of the loading, which may range from reasonably accurate estimates to gross allotments, depending on the availability of data and appropriate techniques for predicting the loading. As described in Section 2.3, LAs were assigned to fecal coliform sources from humans, livestock, pets, and wildlife². It is expected that application of best management practices to controllable sources may result in the reduction of some wildlife sources.

Table 8 of the TMDL Report provides daily LAs per source category for the restricted shellfish harvesting area of Ellis Bay. It is also important to note that post-TMDL monitoring to determine the effectiveness in meeting the TMDL should use a three-year averaging period with a minimum of 30 samples collected consistent with the water quality standard. Based on the foregoing, EPA finds that daily LAs included in the TMDL satisfy the regulations at 40 CFR Part 130.

3) TMDLs consider natural background sources.

According to Federal regulations at 40 CFR §130.2(g & i), natural background sources of pollutants are part of the LA and, wherever possible, natural and nonpoint source loads should be distinguished. In the Lower Wicomico River basin, wildlife contributions, both mammalian and avian, are considered natural conditions and may represent a background level of bacterial loading. Wildlife represents the dominant source of fecal coliform in the restricted shellfish

¹ The fact that the TMDL does not assign WLAs to any sources in the watershed should not be construed as a determination by either EPA or MDE that there are no sources in the watershed that are subject to the NPDES program.

² EPA’s approval of this TMDL does not mean that EPA has determined there are no point sources within the land use categories that are assigned load allocations in the TMDL. EPA’s review and approval of this TMDL does not represent a determination whether some of the sources discussed in the TMDL, under appropriate conditions, might be subject to the NPDES program.

harvesting area. Based on the foregoing, EPA finds the TMDL accounts for natural background sources consistent with the regulations at 40 CFR §130.2(g & i).

4) TMDLs consider critical conditions.

EPA regulations at 40 CFR §130.7(c)(1) require TMDLs to account for critical conditions for stream flow, loading, and water quality parameters. Critical conditions are discussed in Section 4.3 of the TMDL report. The 90th percentile criteria concentration, which is dictated in the Code of Maryland Regulations (COMAR), Surface Water Quality Criteria 26.08.02.03-3.C(2), is the concentration exceeded only 10 percent of the time. Data used to calculate the 90th percentile were collected over the most recent three-year period and included over 30 samples per TMDL area incorporating a range of conditions; therefore, the critical condition is implicitly included in the value of the 90th percentile. Based on the foregoing, EPA finds that the TMDL accounts for critical conditions consistent with the regulations at 40 CFR §130.7(c)(1).

5) TMDLs consider seasonal variations.

EPA regulations at 40 CFR §130.7(c)(1) require TMDLs to consider seasonal variations. Seasonal variations are discussed in Section 4.3 of the TMDL report. Seasonality is also implicitly included in the analysis due to the averaging required in the water quality standards, which incorporates three years of data over all seasons. The MDE shellfish-monitoring program uses a systematic random sampling design that was developed to cover inter-annual variability. The monitoring design and the statistical analysis used to evaluate water quality attainment therefore implicitly includes the effect of seasonality. Based on the foregoing, EPA finds the TMDL has been established at levels necessary to attain and maintain the applicable water quality standards with seasonal variations consistent with the regulations at 40 CFR §130.7(c)(1).

6) TMDLs include a margin of safety.

EPA regulations at 40 CFR §130.7(c)(1) require TMDLs to include a margin of safety (MOS). The MOS is an accounting of uncertainty about the relationship between pollutant loads and receiving water quality. It can be provided implicitly through analytical assumptions or explicitly by reserving a portion of loading capacity. The MOS is discussed in Section 4.5 of the TMDL report. Based on previous analysis (VIMS 2004), it was determined that the most sensitive parameter is the decay rate. The value of the decay rate varies from 0.7 to 3.0 per day in salt water (Mancini 1978; Thomann and Mueller 1987). A decay rate of 0.7 per day was used as a conservative estimate in the TMDL calculation. Therefore, the MOS is implicitly included in the calculation. Based on the foregoing, EPA finds that MDE has incorporated a MOS into the TMDL consistent with the regulations at 40 CFR §130.7(c)(1).

7) TMDLs have been subject to public participation.

EPA regulations at 40 CFR §130.7(c)(1)(ii) require TMDLs to be subject to public review and the State to implement a process for involving the public in development of TMDLs. MDE provided an opportunity for public review and comment on the TMDL from February 17, 2021 through March 18, 2021. MDE received one comment from EPA. EPA commented on the

reasonable assurance section of the report and recommended adding language on pet waste. Our review included evaluating how MDE addressed each comment, including whether any changes were made to the final TMDL as a result. MDE addressed the comment by adding the recommended text to the Assurance of Implementation Section. EPA finds that the added language sufficiently addressed the original comment. Based on the foregoing, EPA finds that this TMDL was subject to MDE's public participation process.

Additionally, in reaching its conclusions on approving the fecal coliform TMDL for Ellis Bay, EPA appropriately considered information on the endangered and threatened species and their critical habitat in Maryland's waters, as identified by the National Marine Fisheries Service and the U.S. Fish and Wildlife Service.

V. Discussion of Reasonable Assurance

The CWA section 303(d) requires that a TMDL be "established at a level necessary to implement the applicable water quality standard". Documenting adequate reasonable assurance increases the probability that regulatory and voluntary mechanisms will be applied such that the pollution reduction levels specified in the TMDL are achieved and, therefore, applicable water quality standards are attained.

MDE has identified actions that may reduce bacteria pollution from humans, wildlife, livestock, and pets, which includes: upgrading failing septic systems to Best Available Technology (BAT) across the state, agricultural stream protection practices such as fencing, remote watering holes, and riparian forest and grass buffers, reducing watercraft pollution via pumpout stations at marinas, and pet waste removal education programs.

Reasonable assurance is discussed further in Section 5.0 of the TMDL Report. Based on the foregoing, EPA finds acceptable the reasonable assurances set forth in the TMDL Report.