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Comment Response Document Regarding the Phosphorus and Sediment TMDLs for Big Millpond Worcester County, MD

Introduction

The Maryland Department of the Environment (MDE) has conducted a public review of the proposed Total Maximum Daily Loads (TMDLs) for phosphorus and sediment loadings in Big Millpond. The public comment period was open from September 28, 2001 to October 29, 2001. MDE received two sets of written comments.

Below is a list of commentors, their affiliation, the date comments were submitted, and the numbered references to the comments submitted. In the pages that follow, comments are summarized and listed with MDE's response.

List of Commentors

Author	Affiliation	Date	Comment Number
John E. Bloxom	Worcester County Commissioners	October 23, 2001	1 through 6
James Stuhltrager & Taryn B. Kindred	Mid-Atlantic Environmental Law Center, on behalf of the Maryland Chapter of the Sierra Club, the American Littoral Society, and the American Canoe Association	October 29, 2001	7 through 13
Ilia Fehrer	Worcester Environmental Trust	November 2, 2001	14

Comments and Responses

1. The commentor questioned ownership of Big Millpond. The draft document states that Worcester County owns the pond; however, a preliminary review of property records indicated that several private individuals own the pond.

Response: Big Millpond was cited by the Maryland Department of Natural Resources (1985) as being owned by Worcester County. MDE is unaware of documented information to the contrary, but will follow up with the commentor on this issue.

2. The commentor questioned by whom the pond would be dredged to achieve its original design volume, as stated in the TMDL. Additionally, the commentor questioned the impact on the TMDL if the pond is not dredged.

Response: The subject TMDLs do not address the question of who will dredge the pond. Such implementation issues are beyond the scope of the TMDL process. However, Maryland is committed to enforcing applicable laws and supporting voluntary initiatives

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necessary to implement this and other TMDLs. State assistance for dredging is potentially available under several programs, including:

Clean Water Act Section 319 Non-Point Source Pollution Control Program (Maryland Department of Natural Resources);

Maryland Water Quality Revolving Loan Fund Program (Maryland Department of the Environment);

Waterway Improvement Program (Maryland Department of Natural Resources).

Dredging the pond to its original design volume is presented as one scenario to achieve water quality standards. However, even if the pond is not dredged, the sediment reduction recommended in the TMDL will still effectively slow the process of reducing the volume of the pond. Even without dredging, reduction of total phosphorus loads will still improve the water quality of the pond. A slight reduction in the allowable load (TMDL) would be necessary if the pond is not dredged. If that decision is made during stakeholder deliberations regarding implementation, the TMDL will be revised.

3. The commentor questioned the impact of natural nutrient sources and the role natural nutrient sources play in Big Millpond's water quality.

Response: Natural nutrient sources are included in the loading coefficients for forested land. Natural sources account for approximately 2.6 percent of the estimated load.

4. The commentor questioned how the TMDL would be implemented and enforced. The commentor additionally requested a clarification regarding the enforcement schedule.

Response: Neither the Clean Water Act nor current U.S. Environmental Protection Agency regulations direct states to develop a detailed implementation plan as part of the TMDL development and approval process. Although formal implementation planning is currently beyond the scope of the TMDL development process, Maryland is committed to enforcing applicable laws and supporting voluntary initiatives necessary to implement this and other TMDLs. Maryland has several well-established programs to draw upon as part of future implementation efforts. These include the State Water Quality Improvement Act of 1988, the federal Clean Water Action Plan framework, and the State's Chesapeake Bay Agreement Tributary Strategies for Nutrient Reduction. Additionally, Maryland has adopted a five-year cycling strategy to assure that future evaluations are conducted for all TMDLs that are established.

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5. The commentor questioned what is expected of the County in response to the TMDL.

Response: Although formal implementation planning is currently beyond the scope of the TMDL development process, Maryland encourages local governments and stakeholders to utilize existing planning tools, coordinating forums, pollution control programs, and financial assistance mechanisms to control pollutant loads. Maryland Department of Planning's "Red Book" is a valuable source of information regarding technical and financial assistance programs available through State agencies. The Red Book can be viewed at www.op.state.md.us/clhouse/redbook/redbook.html. Additional information resources include local Soil Conservation Districts, the Environmental Finance Center at University of Maryland (301-405-6383 or www.mdsg.umd.edu/EFC), and the Maryland Cooperative Extension (www.agnr.umd.edu/ces/pubs/topics/watreschesbay.html). Finally, local governments and stakeholders should document any best management practices or other efforts undertaken to control pollutant loadings into the waterbody of concern to facilitate future implementation tracking.

6. The commentor expressed doubt regarding the ability of the TMDL to achieve a 65% reduction in sediment (with a resulting reduction in phosphorus), given efficiency rates of best management practices cited on page 16 of the document, and the high percentage of existing tree cover surrounding the pond and its tributaries. In conclusion, the commentor requested that the recommended TMDL be reconsidered.

Response: The purpose of a TMDL analysis is to determine the maximum loading limit that meets current water quality standards. It is a goal-setting analysis. Moreover, although the analysis considers possible implementation scenarios in order to provide assurance that the TMDL can be achieved, the TMDL does not determine 'how' to reach that goal (See Comment 4 regarding implementation of pollution controls). Maryland believes that separating the TMDL analysis from the implementation process helps to assure objectivity by insulating TMDL development from the pressures of the subjective implementation process.

That said, during the TMDL implementation process, the water quality standards are open to scrutiny. The CWA provides a feed-back process by which the results of a TMDL analysis can motivate the re-evaluation of water quality standards. Specifically, the CWA requires a periodic review of the standards commonly referred to as a "triennial review". The triennial review process includes an opportunity for public involvement. If the standards are significantly revised as a result of the triennial review process, the TMDL analysis will be revised to reflect the revised water quality endpoint.

7. The commentor stated that the proposed TMDL is not designed to achieve the appropriate water quality standards. The commentor additionally suggested that MDE set a more aggressive goal for trophic status and annual mean phosphorus concentration.

Response: The TMDL for Big Millpond sets as a goal a reasonable trophic status for an impoundment in the Coastal Plain. EPA guidelines acknowledge significant variability in water quality as a function of geography, morphometry, lake origin and climate, as well as variations in user perceptions based on geography and land use. For these reasons, the EPA

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does not advocate the establishment of a single, national nutrient standard for lakes (U.S. EPA, 2000).

A chlorophyll *a* concentration of 20 µg/l corresponds approximately to 60 on Carlson's Trophic Status Index, which is within the lower range of eutrophic conditions (Carlson 1977). This is compatible with Big Millpond's designated use. It should also be noted that the TMDL document provides an estimate that a 65% reduction in the phosphorus load will be needed to achieve this water quality goal. This significant reduction goal suggests that the water quality goal (standard) is fairly stringent.

8. The commentor stated that the proposed TMDL fails to establish daily loads; instead, the document establishes a maximum annual load.

Response: The EPA provides in its regulations (40 CFR 130.2(i)) that "TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure." Accordingly, no explicit time period is required. In this case, annual loads make more sense than daily loads. From a technical standpoint, nutrient and sediment loads are both highly variable. Most of the loads are generated during a small number of storm events. Thus, it is essentially infeasible to establish a meaningful daily load for nutrients and sediments. To do so, in view of the large daily variability, would require the daily loading caps to be very large to accommodate the large natural peak in loading events. More importantly, nutrients and sediments do not have an impact on the temporal scale of a day; rather, they act over long periods of time. In the case of nutrients, it does not matter if a large quantity goes in one day, and a small amount goes in the next; rather, it is the accumulation over a time scale of weeks that is significant. In the case of sedimentation, it is the long-term accumulation of sediments—and the resultant loss in lake volume—that is significant. For these reasons, the Department has elected to establish the sediment and phosphorus TMDLs on the timeframe that it has. Nevertheless, the TMDLs are expressed within the TMDL documentation both as annual loads and average daily loads, in order to assist the reader in understanding the magnitude of the loads involved.

9. The commentor stated that the proposed TMDL does not fully consider all background contributions to Big Millpond. The commentor suggested that Maryland conduct a study specifically focusing on nonpoint source contributions for the purpose of assessing their impact on Big Millpond.

Response: The TMDL analysis methodology considers all sources, including background contributions. Specifically, the Vollenweider method determines the assimilative capacity (TMDL) for nutrients as a function of the physical characteristics of the impoundment. It sets a limit on nutrients irrespective of the specific source of the loads, including natural background loads.

The TMDL analysis is limited to determining the loading limit. The development of an implementation plan for achieving the loading goal established by the TMDL analysis is beyond the scope of this undertaking (see responses to Comments 4 and 5). The suggestion

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to conduct a study of specific sources would be more appropriate in the context of identifying the most cost effective nonpoint source controls as part of an implementation planning effort.

10. The commentor stated that the proposed TMDL fails to allocate loadings to specific nonpoint sources.

Response: The calculated NPS allocation is implicitly the sum of the individual load allocations. The sub-allocation of the allowable NPS load to individual sources is a detailed implementation issue, which is beyond the scope of the TMDL. A technical memorandum, entitled *Significant Nutrient and Sediment Nonpoint Sources in the Big Millpond Watershed*, describes viable individual load allocations to each land use category. The technical memorandum provides information that is intended to facilitate future stakeholder dialogue on implementation planning. Neither the Clean Water Act nor current EPA regulations require states to develop a detailed implementation plan as part of the TMDL development and approval process. Maryland's rationale for not including a detailed implementation plan within the TMDL documentation is to allow flexibility for those other government programs and stakeholders currently developing mechanisms to reduce nutrient and sediment loads to Big Millpond and other waters of the state.

11. The commentor stated that the proposed TMDL does not adequately consider the effects of seasonal variations.

Response: The Clean Water Act, Section 303(d)(1)(C) states that the TMDL load "... shall be established at a level necessary to implement the applicable water quality standards with seasonal variations..." This TMDL establishes a maximum load that meets water quality standards during all seasons of the year. Exceedances of the relevant water quality standards occur almost exclusively in the summer season, when increased water temperatures and solar radiation are most conducive to the growth of algae. This is also the period when dissolved oxygen saturation levels, inversely related to water temperature, are lowest. The water quality standard thresholds were established with this critical season in mind. However, the TMDL analysis does not focus solely on the summer season.

The TMDL analysis uses the Vollenweider Relationship. This empirical method relates long-term loading of phosphorus to trophic status (primarily chlorophyll levels). Another analysis makes use of the Vollenweider results as inputs to a computation of the expected dissolved oxygen values under critical conditions of maximum chlorophyll and water temperature. The Vollenweider Relationship considers long-term loading, which accounts for wet seasons (Winter/Spring) when loading rates are higher. It also accounts for the recycling of nutrients, introduced in the wet season, which has the potential to affect water quality during the warm, sunny season, typically associated with peak algal growth and low dissolved oxygen.

In summary, the analysis considers both the seasonal aspects of the water quality endpoint (standards), and the seasonal aspects of the loads and their resultant fate in the water body system. Thus, the analysis is comprehensive with regard to consideration of seasonal variations.

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12. The commentor stated that the proposed TMDL does not adequately consider critical conditions.

Response: See response to Comment 11 above.

13. The commentor stated that the proposed TMDL fails to address implementation.

Response: Maryland has several well-established programs that will be drawn upon as part of the future implementation effort. These include the State Water Quality Improvement Act of 1988, the federal Clean Water Action Plan framework, and the State's Chesapeake Bay Agreement Tributary Strategies for Nutrient Reduction. Also, Maryland has adopted procedures to assure that future evaluations are conducted for all TMDLs that are established. While formal implementation planning is currently beyond the scope of the TMDL development process, Maryland is committed to enforcing applicable laws and supporting voluntary initiatives necessary to implement this and other TMDLs. See also the response to Comment 10 above.

14. The commentor provided information regarding past uses of Big Millpond. The commentor suggested that the influx of sediments be controlled through the installation of a weir or other device. The commentor additionally questioned whether the benefits of dredging Big Millpond would outweigh the associated costs. Finally, the commentor asked to be kept informed regarding the future of Big Millpond.

Response: MDE recommends that the commentor's suggestions regarding sediment control be considered during the development of an implementation plan. The costs and benefits associated with dredging would necessarily be addressed during that phase of the implementation plan. MDE will include the commentor on appropriate distribution lists.

Reference

Carlson, R.E. 1977. A Trophic State Index for Ponds. Limnology and Oceanography 22:361-369.

Code of Federal Regulations, 40 CFR 130.2(i)

Maryland Department of Natural Resources, Inventory of Dams and Assessment of Hydropower Resources, 1985.

U.S. EPA, "Nutrient Criteria Technical Guidance Manual, Lakes and Reservoirs," Office of Water/Office of Science and Technology, Publication Number EPA-822-B00-001, April 2000

U.S. EPA, Guidance Manual on Lakes