

**Comment Response Document
Regarding the Total Maximum Daily Load of Sediment in the Little Youghiogheny
River Watershed, Garrett County, Maryland**

The Maryland Department of the Environment (MDE) has conducted a public review of the proposed Total Maximum Daily Load (TMDL) of Sediment in the Little Youghiogheny River Watershed, Garrett County, Maryland. The public comment period was open from July 13, 2006 through August 11, 2006. MDE received three 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
Todd Miller	Canaan Valley Institute	August 11, 2006	1
Jennifer Schaafsma	Maryland Department of Agriculture	July 26, 2006	2 through 8
Jennifer Sincock	U.S. Environmental Protection Agency Region 3	August 3, 2006	9 through 15

Comments and Responses

1. The commentor states that the model used in the TMDL does not account for stream bank or channel erosion, which can be major sources of sediment. The commentor continues by stating that there are several methods available for modeling stream bank erosion, which include Penn State's General Watershed Loading function and EPA's Watershed Assessment of River Stability and Sediment Supply (WARSSS)

Response: Maryland Department of the Environment (MDE) is aware of Penn State's General Watershed Loading Function model and the lateral erosion rate equation that is currently used to estimate stream bank erosion. MDE is also familiar with the EPA's Watershed Assessment of River Stability and Sediment Supply (WARSSS) model and the current research on the Suspended and Bedded Sediment (SABS) water quality criteria guidance. The latter provides several alternative techniques to developing sediment criteria. MDE has reviewed several of these techniques and decided on the approach outlined in the MDE sediment TMDL methodology report. This approach directly links the watershed sediment load to the accepted endpoint of biotic integrity of an aquatic community.

In the development of the Maryland sediment TMDLs, MDE applied the US EPA Chesapeake Bay Program Phase V (CBP P5) watershed modeling tools. MDE

chose this approach for the following reasons: (1) the geographic coverage of the model, (2) the consistency of model input information, and (3) the consistency with future analyses of downstream conditions (*i.e.*, Chesapeake Bay water clarity).

The CBP P5 watershed model is based on the edge of stream loading estimates, which result from land use specific edge of field targets and land use specific sediment delivery ratios. Within the next year, the CBP P5 watershed model reach segments (*i.e.*, streams) will be calibrated to observed flow and sediment information. The reach calibration accounts for scour and deposition in larger stream systems and may provide some more insight into the channel sources. However, based on current research, it is still very difficult to determine the contribution of stream bank erosion and legacy sediments to the total watershed sediment load. The CBP P5 reach calibration will only affect the instream processes; thus the current sediment TMDL, which is based on the edge of stream loads, will remain the same.

The CBP P5 watershed model is a lumped model, where land use specific sediment delivery ratios (ton/ac/year) are based on literature information. The model is defined as lumped because many physical processes are combined into a single value and/or factor. While this model does not explicitly capture the processes of stream bank or bed erosion, the effects of these processes are implicitly included in the underlying assumptions.

For example, in urban or developed land use areas, the sediment yield is estimated from the percentage of impervious area, where the yield increases with increasing imperviousness. Because the terrestrial sediment source decreases with a growing impervious area, it is assumed that the additional sediment yield is driven by increased flow, which results in channel erosion. In non-urban land uses, erosion from the landscape is considered to be the primary sediment source; however, it is widely recognized that not all eroded sediment is transported to the stream system. This depositional effect is captured using a sediment delivery ratio, which is the proportion of the terrestrial erosion that reaches the stream system.

It would be expected that during the implementation planning process additional site level information (e.g. bank stability, erosion extent, etc.) would be used to determine the appropriate type of best management practices. This information would determine whether upland or in-stream practices would best reduce the sediment loads and subsequently impact the stream's aquatic health.

2. The commentor states that in the introduction the TMDL document claims that the biological impairment listing for the watershed will be addressed at a later date. The commentor then asks whether this is different than the Index of Biological Integrity (IBI) that is used later in the analysis.

Response: The sediment (1996) and impact to biological communities (2002) are two separate listings on the State's 303(d) List. While the sediment TMDL analysis is based on the IBI data, and while the 303(d) List identifies sediment as one of the stressors impacting the stream's biological community, this TMDL document does not directly address the biological impairment. Further analysis will be required to determine if additional stressors are also affecting the biological communities in the Little Youghiogheny River Watershed. Following the stressor identification analysis, the biological listing will be addressed.

3. The commentor questions whether or not there is a sediment impairment in the watershed. What measures demonstrate that the watershed is impaired? What were the Fish IBI (FIBI) and Benthic IBI (BIBI) scores? The text only states that a FIBI or BIBI score less than 3 indicates impairment, but the extent of the impairment of the watershed is not demonstrated. The magnitude of the sediment load to the watershed was stated but not its effect.

Response: The FIBI and BIBI scores are provided in Table A-4 of the TMDL report. In the absence of sediment criteria, the narrative standard of supporting aquatic health, as defined by the IBI scores, is used as the endpoint in determining a sediment impairment. The forest normalized sediment load is used to quantify the extent of sediment impairment and subsequently to develop the TMDL (see Section 2.3, p. 16).

A reference watershed (*i.e.*, a watershed supporting aquatic life) approach was used to determine sediment loads supportive of aquatic health. The reference watersheds were selected based on passing IBI scores as defined in Maryland's biocriteria. The sediment loads of the reference watersheds were normalized by the all forested condition to reduce the effect of variability between different background soil types. The Little Youghiogheny River watershed forest normalized sediment load is above the median value of the reference watershed loads and is therefore identified as impaired by elevated sediment loads.

Additional supporting evidence of a sediment impairment is the MBSS epifaunal substrate and embeddedness scores. A comparison plot (see Figure 4) illustrates the difference between the distribution of embeddedness and epifaunal substrate scores reported in the Little Youghiogheny compared to sites with a healthy benthic community. From this plot it can be seen that the Little Youghiogheny River watershed embeddedness scores are generally higher than the reference sites and the epifaunal substrates scores are generally lower than the reference sites, thus supporting that there is a sediment impact to the biological community.

4. The commentor references the second paragraph on page 15, which states "An elevated sediment load can be a result of increased TSS, which reduces water clarity". The commentor proceeds to ask whether "result" is the right word in this context. Should it be replaced with "cause", or is TSS being defined as a separate substance?

Response: This text has been changed to more accurately reflect the context of the statement.

5. The commentor states that the categories of land use and sediment source do not address legacy sediment mobilized from the banks and channel of the stream.

Response: See the Response to Comment 1.

6. The commentor questions why seasonality is limited to spring and summer.

Response: As stated in the TMDL document, the TMDL analysis captures seasonality in two components. First, seasonality is implicitly included in biological sampling, since results integrate the stress effects over the course of time. Second, the benthic and fish sampling used for this analysis is carried out in the spring and summer, respectively. The spring period is selected for the benthic assessment because during this time the aquatic macroinvertebrate community is most abundant, and many of the organisms reach body sizes that can be readily identified. This allows for the best characterization of the diversity found in the stream. Similarly, summer is selected to collect fish samples because fish community composition tends to be stable during summer, and low flow is advantageous for electrofishing. Summer collection is also representative of a critical low flow condition in the stream. However, it is important to recognize that the biological conditions are typically impacted by cumulative long-term effects and not acute events. Therefore, for the purpose of this TMDL, a long-term sediment load was used.

7. The commentor states that the allocation of storm water to the waste load allocation (WLA) and the load allocation (LA) is explained in a general context, but the document does not state whether storm water is allocated to the WLA or LA in this particular TMDL. Does precipitation driven erosion account for erosion from sewer overflows?

Response: Text has been added to Section 4.6 of the document stating “there are no MS4 permits in the Little Youghiogheny River watershed. Therefore all rainfall-driven TSS loads will be allocated to the LA.”

Precipitation driven erosion accounts for non-point source solids loads originating from various land uses but does not directly include any sewer overflow release. However, based on analyses from other Maryland sediment TMDLs, it is expected that the sewer overflow solids contribution is negligible compared to the non-point source loads.

8. The commentor states that Section 5 Assurance of Implementation should include the Maryland Agriculture water quality cost share program as a potential funding

source for the implementation of Best Management Practices (BMPs), because more than 30% of the watershed is comprised of agricultural use.

Response: The Maryland Agriculture water quality cost share program has been added as a potential funding source for the implementation of BMPs in Section 5 Assurance of Implementation.

9. The commentor asks that any technical memoranda prepared for point and nonpoint sources, or any other information, data, and modeling reports used to support the TMDL be sent to the Environmental Protection Agency (EPA).

Response: Sediment TMDLs do not have any point source or nonpoint source technical memoranda. The sediment TMDL methodology and supporting information will be included in the submittal package to the EPA. The methodology document is also available online at http://www.mde.state.md.us/Programs/WaterPrograms/TMDL/Pub_Notice/index.asp.

10. The commentor states that Section 2.2.2 Point Source Assessment should include more specific information about the point sources in the watershed. For example, the section should address what the different types of permitted sources are, where they are located, what their limits are, and whether or not there are any MS4 permits in the watershed. Many of these issues are touched on in Appendix B and Section 4.6, but they should also be included in Section 2.2.2.

Response: It was determined by several reviewers that this large amount of data should be included in an appendix, rather than in the body of the document. However, Section 4.6 has been amended to provide more detailed information regarding allocations to point and non-point sources.

11. The commentor states that Section 4.6 should be divided into two separate sections for point and nonpoint sources. Furthermore, the commentor asks how National Pollutant Discharge Elimination System (NPDES) permits are treated in the model, and states that there should be more information in Section 4.6 as to how WLAs are allocated instead of simply having a list in Appendix B. Finally, the commentor says that Appendix B should be referenced in this section.

Response: Section 4.6 has been revised to include a background section describing how loads are allocated between the WLA and LA, sections specifically describing the WLA and LA for the Little Youghiogheny, and a section on the load reductions.

A reference to Appendix B has been added.

12. In reference to the second and third paragraphs of Section 4.6, the commentor asks for an explanation as to why loads related to process water are added to the

nonpoint source loads. The commentor states that process water sounds like a point source. Does it mean process water from mining activities? The commentor continues to say that if there are NPDES permits for process water, then they should have WLAs.

Response: The complete sentence in questions reads, “Loads related to process water are added to the non-point source loads estimated from the watershed model **to estimate the total sediment/solids load to the stream system.**” This sentence was meant to convey that point source and non-point source loads are added together to estimate the total sediment load. Section 4.6 has been edited to more clearly express the relationship between point and non-point source loads and their allocations.

13. The commentor states that paragraph five of Section 4.6 of the document discusses MS4 permits, but it does not state whether any are present in the watershed.

Response: There are no MS4 permits in the Little Youghiogeny River Watershed. The document has been revised accordingly to explicitly indicate this in the text (Section 4.6).

14. The commentor says that a reduction of 0.0% should be added to the permitted load allocation in Table 5.

Response: Table 5 has been revised, and a reduction of 0.0% has been added to the permitted load allocation.

15. The commentor wants an explanation as to why four of the permitted point sources (Peter’s Fuel Corporation and three industrial storm water permits) in the permit summary table (Table B-1) are not included in Table B-2 and not given WLAs.

Response: These permits were not given WLAs based on decision rules regarding permits that do not contain total suspended solid (TSS) limits and permits for stormwater. The text has been edited to more clearly explain the decision rules.

Additionally, MDE Water Management Administration has informed the authors that the Peter’s Fuel Corporation permit has been terminated, and, therefore it has been completely removed from the document.