FINAL

Comment Response Document
Regarding the Total Maximum Daily Load of Sediment in the Non-Tidal Upper Choptank River Watershed, Caroline, Talbot and Queen Anne's Counties, Maryland

The Maryland Department of the Environment (MDE) conducted a public comment period of the proposed Sediment TMDL for the Non-Tidal Upper Choptank River Watershed. The comment period was from July 17, 2019 to August 15, 2019. MDE received three set(s) of written comments.

In addition, MDE recognizes the importance of public participation in the development of TMDLs and goes beyond the minimum regulatory requirements to promote public involvement. In MDE's written materials and oral presentations, staff clearly solicit the proactive participation of anyone who wants to be involved in the technical aspects of the TMDL development process. The TMDL public communication process includes the following: 1) a data solicitation of all known data sources within the watershed ;2) letters are sent to all identified interested parties in the watershed at intervals during TMDL development: at the beginning (aka, Notice of Intent), during Interagency Review (aka, Notice of Availability), during the Public Notice, and at EPA Submittal and at EPA Approval, all providing an opportunity for discussion; 3) a 30 day public comment period announced in local papers, on MDE's website and available in libraries; the public comment period results in a Comment Response Document containing the comments and the Department's response to those comments.

Below is a list of the commenters, their affiliations, the date comments were submitted, and the number referenced to the comments. In the pages that follow, comments are summarized along with MDE's responses.

List of Commenters

Author	Affiliation	Date	Comment Number
Ms. Jillian Adair	U.S. Environmental Protection Agency Region 3	July 29, 2019	1-6
Mr. W.R. Carter, III	Citizen	July 30, 2019	7-12
Mr. Matt Pluta	Choptank Riverkeeper	August 15, 2019	13-15

Comments and Responses

1. The commenter references page 13, 2nd paragraph, 2nd sentence: The types of permits identified includes "general stormwater permits" perhaps as a mistake since the permits are identified as industrial, mining, or construction already in that sentence. Please delete or clarify.

   Response: The text has been corrected.

2. The commenter references page 22 stating MDE may consider adding reference to EPA's Framework for Developing Suspended and Bedded Sediments (SABS) Water Quality Criteria, as well as other information pertaining to water contact recreation, as this information is referenced in MDE's other non-tidal sediment TMDLs.

   Response: The text has been added.

3. The commenter references page 31, last paragraph: "Reductions to" seems to be an orphan phrase and typo in the last sentence. Please delete.

   Response: The text has been corrected.

4. The commenter references page 33, 3rd paragraph: "CHOTF and CHOOH" appears to be a typo. Please correct.

   Response: The text has been corrected.

5. The commenter states MDE may consider adding more reasonable assurance for agriculture.

   Response: The text has been modified.

6. The commenter states please note whether the TMDL watershed is located within the eastern or western coastal plains, as the associated reference watersheds differ between the two.

   Response: The text has been modified.

7. The commenter states the proposed TMDL for sediment reduction in the Upper Choptank watershed is inadequate. The commentor presents numerical calculations showing that the overall reduction of sediment in the watershed is equal to 8.4 lbs/ac/yr. The commentor goes on to state that the reduction from cropland is only about 2.75 pounds/acre/year and will be unnoticeable, probably unmeasureable, and most likely, unenforceable.

   Response: MDE confirms the numerical calculations presented by the commentor that the overall watershed reduction of sediment is 8.4 lbs/ac/yr and the reduction of sediment from cropland is 2.75 lbs/ac/yr. As stated in Table ES-4 and Table 7 of the TMDL, this amounts to an overall 8% reduction of sediment in the Upper Choptank watershed. Based on the reference watershed methodology used for this TMDL the forest normalized load of the Upper Choptank River watershed is 6.4 and the reference watershed forest normalized load threshold is 5.9. This is also equivalent to an 8% reduction in sediment loads. Therefore, MDE believes that based on the methodology used for this TMDL, the required sediment reduction is adequate.

8. The commenter continues with more numerical calculations stating that the 3% reduction from cropland (54% of the watershed), as indicated in the technical memorandum, compares

with a 36% reduction proposed for "unregulated" urban source sector, which constitutes about 10% of the watershed.

Response: As stated in the TMDL, reductions were calculated using the allocation methodology in the Chesapeake Bay TMDL and Maryland's Phase I and Phase II WIPs, which was designed to be equitable, effective, consistent with water quality standards and give credit for existing practices. The reductions were based on the concepts of the NA (No Action) and E3 (Everything, Everyone, Everywhere) scenarios, the difference between these being the *reducible load*. In the case of the Upper Choptank River watershed, per the CBP Phase 5.3.2 model, also the basis for the Bay TMDL and Phase II WIPs, the agriculture sector had achieved 60% of its reducible load, while the urban sector had achieved only 28%. Therefore, in calculating required reductions for this TMDL, the urban sector was assigned a higher reduction because it has made less progress towards its reducible load.

9. The commenter states that the proposed TMDL comes very close to ignoring the effects of sedimentation from cropland. The commenter continues that to bring the reduction for cropland into line with the 5.9 of the forest normalized sediment load, the reduction would have to be about 6.1 times as great (ie., a reduction of about 16.88 pounds/acre/year) as is proposed in the TMDL.

   Response: The goal of the TMDL is not to reduce each individual land use to the forest normalized load threshold (5.9), but to reduce the forest normalized load (FNL) of the overall watershed to that value. This is because the watershed is comprised of multiple land uses, some with an FNL higher than the threshold and some with an FNL lower than the threshold (e.g. forest). With the proper reductions, the total sediment contribution of all land uses combined will meet the forest normalized threshold. For more information on how reductions were assigned to individual land uses, see response to Comment #8.

10. The commenter states that the expectations for reduction of cropland source sedimentation suggested in Section 5 ("Assurance of Implementation: Implementation of Agricultural Best Management Practices" (p. 35) seem to be largely wishful thinking. The commentor also states that there are many agricultural ditches (stream channelizations) that run through cropland in the Upper Choptank that have crops planted literally up to the edges of the ditch or that have only a few feet of grasses between row crops and the edges of the ditch. The commentor goes on to state that plans CAN be developed to manage the cropland, but these potentials are not certain.

    Response: MDE recently published *Maryland's Phase III Watershed Implementation Plan to Restore Chesapeake Bay by 2025.* The WIP goals for Caroline, Talbot, and Queen Anne's Counties all include significant increase in agricultural best management practices (BMPs) over what is present today. Some of these BMPs include agricultural drainage management, conservation plans, and forest and grass buffers with exclusion fencing. The Phase III WIP model scenarios show agricultural sediment reductions for each county of over 20 percent from 2018 levels, well beyond what was specified in this TMDL. These WIPs have been developed and are expected to be implemented in order for the State to achieve its 2025

goals. They will provide considerable reductions to cropland source sedimentation. The Phase III WIP can be found at: https://mde.maryland.gov/programs/Water/TMDL/TMDLImplementation/Pages/Phase3WIP.aspx

11. The commenter states that the draft TMDL's proposed ~2 ¾ pounds/acre/year reduction suggests that little implementation is realistically expected.

    Response: See responses to Comments #7 and #10.

12. The commenter states that the proposed reductions in the TMDL ignore the effects of sedimentation from agricultural crop land in the non-tidal upper Choptank River watershed. The commenter continues, stating crop land covers 54% of the watershed and contributes 76% of the sediment load, yet the TMDL only calls for a 3% sediment reduction from crop land. Comparatively, unregulated urban stormwater covers 10% of the watershed and contributes 15% of the overall sediment load, and the TMDL calls for 8% reduction. Finally, regulated urban stormwater covers 0.3% of the watershed, contributes only 2.5% of the overall sediment load, and this TMDL calls for an 18% reduction – the majority of the reduction under this TMDL. The proposed allocations fail to consider the large and increasing impact that agricultural has on the non-tidal upper Choptank River watershed.

    The commenter references the nonpoint source technical memorandum stating that the technical memorandum for nonpoint sources of sediment states that "the reducible load for urban land is generally greater than that for agricultural land because the opportunity for reductions is greater for urban land in the model." Unfortunately, in this case, the model does not accurately represent the opportunity for reductions from agricultural land. As pointed out above, crop land is the greatest amount of land cover in the watershed and it contributes the greatest sediment load every year. In the non-tidal upper Choptank River watershed the reducible load for agriculture is greater than that for urban land.

    The TMDL report also points out that there are eight High Quality Tier II stream segments located in the Upper Choptank River watershed. The sub-watersheds for these stream segments have the same if not a greater ratio of crop land and associated sediment loads compared to urban loads.

    Finally, urban best management practices designed to reduce sediment and associated phosphorus are more expensive and more resource-intensive than agricultural best management practices. A 2018 presentation from the Chesapeake Bay Program's Water Quality Goal Implementation Team shows that the cost per pound of the most efficient agricultural BMPs (buffers and wetlands) are $95-$275/pound of phosphorus removal, whereas the most effective urban practices range from $1,900-$4,000/pound of phosphorus removal. Considering how phosphorus binds to sediment, these efficiencies are true for sediment removal as well.

This TMDL needs to show a greater emphasis on the effects of sedimentation from agricultural crop land. The TMDL needs to recognize that crop land presents the greatest opportunity to cost-effectively reduce the sediment load and protect the High-Quality Tier II streams in the upper Choptank River watershed. It is also recommended that MDE works with Maryland Department of Agriculture on this TMDL to better understand how to more effectively reduce sedimentation in this watershed and achieve the goals of this TMDL.

Response: See response to Comment #8 and #10.

13. The commenter states the 2009 Progress Scenario is not a sufficient tool to accurately [simulate] precipitation conditions. The commenter continues the 2009 Progress Scenario uses a simulation period of 1991-2000 to determine loading rates and to address annual changes in hydrology during wet, average and dry years. As stated by the TMDL report, the intent of considering seasonality and critical conditions when developing this TMDL is to ensure that the water quality and designated use is protected during times when it is most vulnerable. The critical conditions experienced today are more intense and more frequent than they were pre-2000s and because of the impacts of climate change that pattern is expected to continue.

    2018 was the wettest year on record for the upper Choptank River watershed and according to NOAA's National Center for Environmental Information Climate Summaries for Maryland, annual mean precipitation has been above average for the last two decades. The annual number of extreme precipitation events, or days with more than 2 inches of rain, averaged 2.5 days per year during 2005-2014 compared to 1.8 days per year during 1950-2004. And also, the average annual precipitation is projected to increase in Maryland over the 21st century, particularly during winter and spring when sediment on agricultural lands are more likely to be exposed. Because of these changes in precipitation patterns and the predictions from climate change we ask that MDE use an updated progress scenario in order to accurately understand the annual changes in hydrology. And if a new analysis shows an increase in overall sediment load we ask that MDE update the overall reductions be greater than the currently proposed 8% under this draft TMDL.

    Response: The 2009 Progress Scenario of the Chesapeake Bay Model Phase 5.3.2 was used in the development of the Upper Choptank Sediment TMDL in order to maintain compatibility with the approved 2010 Chesapeake Bay TMDL. MDE recognizes that this scenario does not include impacts from climate change and is working, through the Phase III WIP process, to develop a climate change model scenario to account for this. MDE is committed to continually assessing the trends and likely impacts of changing climatic and sea-level conditions. MDE recently published *Maryland's Phase III Watershed Implementation Plan to Restore Chesapeake Bay by 2025*, which provides information on the actions and commitments needed to meet Bay restoration goals and includes consideration for climate change. As stated in the TMDL, the time period of the model, over 9 years, as well as the endpoint based on the biology of reference watersheds with similar features and rainfall, does cover interannual variability and accounts for the critical condition.

14. The commenter states the TMDL fails to acknowledge the amount of dirt roadways as a concentrated sediment load. Caroline County alone has an estimated 75 miles of dirt roadways. With precipitation, sediment on these roadways washes into roadside ditches and eventually in to local streams. Caroline County spends a significant amount of capital and resources to resurface these roadways after major sediment loss occurs. As an effort to meet this TMDL local governments should be encouraged to address the runoff and sedimentation resulting from the large amount of dirt roadways. Roadside ditch restoration opportunities are plentiful in this watershed, and if hard-surfacing these dirt roadways is not feasible, roadside ditches provide another opportunity for the agricultural community to work with local counties to address the sediment loss from these roadways.

    Response: MDE acknowledges that the TMDL does not specifically mention the sediment load from dirt roadways. This level of specificity is outside the scope of the TMDL analysis. Sediment loads from dirt and gravel roads are accounted for in the Chesapeake Bay model under developed land and so urban reductions from that land use would be applied. Improvement to dirt roads could be a good way to reduce the urban loads required by the TMDL. The Chesapeake Bay model recognizes three types of BMPs for dirt and gravel roads. Information on the BMPs can be found on the CAST home page in the spreadsheet under 'source data': http://cast.chesapeakebay.net.

15. The commenter asks was the Chesapeake Bay Program Phase 6.0 watershed model considered as part of the analysis for this draft TMDL? The report references the use of the Chesapeake Bay Watershed Model 5.3.2 to determine sediment loading to the watershed. The Chesapeake Bay Program watershed model was updated to version 6.0 in 2017. If the 2017 model is capable of performing the necessary analysis to develop this sediment TMDL it is asked that MDE rerun the analysis using the best available information.

    Response: MDE used the best readily available data and modeling methodology at the time of TMDL development. This TMDL was developed based on modeling (the Phase 5 Chesapeake Bay Model) and allocation methodologies consistent with the 2010 Chesapeake Bay TMDL and the Maryland's Phase I and Phase II WIPs. Maryland's Phase III WIP, based on the Phase 6.0 Chesapeake Bay Model was finalized on August 23, 2019. It should also be noted that in this watershed, that both models perform equally well at estimating sediment loads. The calibrated loads from the Phase 5 model show a slightly better correlation (based on the log10 R^2 between simulated and observed in segment EM2_3980_0001) than the Phase 6 model.