

**Comment Response Document  
Regarding the Total Maximum Daily Loads of Nutrients and  
Biochemical Oxygen Demand to Town Creek  
Talbot County, Maryland**

**Introduction**

The Maryland Department of the Environment (MDE) has conducted a public review of the proposed Total Maximum Daily Loads (TMDLs) of nutrients and biochemical oxygen demand to Town Creek. The public comment period was open from November 22, 2002 to December 21, 2002. 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**

<b>Author</b>	<b>Affiliation</b>	<b>Date</b>	<b>Comment Number</b>
W.R. Carter, III	Chairman, Eastern Shore Group , Maryland Chapter, Sierra Club	December 18, 2002	1 through 11
James M Stuhltrager, Esq. Amy Shellenberger James R. May, Esq.	Mid-Atlantic Environmental Law Center; Widener University School of Law	December 21, 2002	12 through 15
Ray Clarke, P.E.	Talbot County Department of Public Works	December 19, 2002	16 through 18

**Comments and Responses**

1. The commentor states that they find the draft TMDL document satisfactory and complete and do not suggest any major revisions.

**Response:** Comment is acknowledged.

2. The commentor stated they were under the impression that nitrogen is the controlling nutrient in saline/brackish waters and asks why a much greater proportion of reductions of phosphorus versus nitrogen is indicated in the TMDL.

**Response:** The proportional reduction for TN and TP are equal. The recommended total nitrogen (TN) and total phosphorus (TP) TMDL loads of 531.1 lbs/month and 59.3 lbs/month respectively include margin of safety (point source - 25% of difference between the weekly and monthly permit limits, and non-point - 5% nonpoint source loads). The reductions in TN and TP are 50% point sources and 35% non-point sources (see Table 2 in response #6). The ratio of recommended TMDL to the baseline loads are: TN = 468.4 /

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$936.7 = 0.50$  and  $TP = 52.0 / 104.1 = 0.50$  for the low flow conditions. Similarly, the ratio of recommended TMDL to the baseline loads for TN and TP is 0.50 for the annual average loads).

3. The commentor states that station OXF6 needs to be added to the text list cited for low dissolved oxygen (DO) on page 5 of the document.

**Response:** As suggested, OXF6 water quality monitoring station will be included in the text listing where low dissolved oxygen has been recorded during the 1986 and 1988 monitoring periods.

4. The commentor states that there are a number of references as to the creek being “poorly flushed” during the low-flow period. However, the commentor believes it is misleading to the reader to imply that there is a material difference between the average annual flow (approx. 0.04% of the creek’s volume) and the low flow (approximately 0.014% of the creek’s volume).

**Response:** We agree that the upper portion of Town Creek is poorly flushed even under average flow conditions. The inclusion of year round TMDL allocations similar to the monthly low flow allocation confirm that. The TMDL only states that we have accounted for what are typically critical conditions – the low flow, warm months of July-September.

5. The commentor believes that the label in the legend of Figure 11 should be average flow condition not low flow natural condition. The commentor further suggests a similar error occurs in Figure A-26 in Appendix A.

**Response:** Page 19, Figure 11 legend for scenario 6 has been corrected to read Average Flow Condition without WWTP.

6. The commentor suggests that in Table 2, Scenario 2 the average annual flow value of 0.168 mgd is a units error given the value of the average annual flow value in a Table A2 of 0.167536 cubic feet per second is correct.

**Response:** Table 2, scenario 2 (baseline), Table 5 and Table 6 have been corrected (see response #6).

7. The commentor asks why MDE chose to use two stream flow gages outside the Choptank River Basin to estimate runoff, instead of using one in the river basin such as the one permanent gage covering a large drainage area or the discontinued USGS gage with a smaller drainage area.

**Response:** There are two USGS gages located in the Choptank basin ( 01491500, Tuckahoe Creek near Ruthsburg, and 01492000, Beaverdam Branch at Matthews). However, these gages are not representative of flow characteristics found in Town Creek because following: USGS gage 01491500 has a large drainage area of 85.2 mi<sup>2</sup> and 7Q<sub>10</sub> flow of 7.8 cfs compared to 0.93 mi<sup>2</sup> area and 0.038 cfs 7Q<sub>10</sub> flow for Town Creek. USGS gage

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01492000 has been discontinued since September 1979. MDE chose two active stream flow gages in the vicinity of the study area that have stream flow characteristics more similar to those of Town Creek. (01489000 with drainage area of 7.1 mi<sup>2</sup> & 7Q<sub>10</sub> flow of 0.02 cfs, and 01490000 with drainage area of 15.0 mi<sup>2</sup> & 7Q<sub>10</sub> of 1.2 cfs).

8. The commentor would appreciate an explanation of how the loads going into the creek are quantified in the model for processes such as phytoplankton activity. The commentor expresses concern that these processes are not taken into account because the model is calibrated to water column data which is residual or unused material of these processes.

**Response:** It is true that the measured values of certain parameters such as ammonia reflect only the residual amounts of nutrients measured in the water columns. However, the nutrients that have been incorporated into the algae are measured in the analysis for parameters such as TKN, organic nitrogen, total nitrogen, organic phosphorus, and total phosphorus. They are then used in the input to the WASP model. This fact, along with the observed calibration and verification of the model for chlorophyll-a, assures that the types of nutrients in Town Creek are accounted for in the TMDL.

9. The commentor asks if on page 14, paragraph 6, line 4 should say Scenario 1 rather than Scenario 2..

**Response:** Page 14, paragraph 6, line 4 referenced as Scenario 2 is incorrect, and has been corrected to read as Scenario 1.

10. The commentor states that on page 17 in Table 2 there appear to be small rounding errors involved in the flow-based scaling up on nonpoint source (NPS) loads in Scenario 2 and subsequently in Scenario 5. The commentor suggests that these errors do not cause major changes in the TMDL but makes it difficult for the reader to follow through the calculations. The commentor further states similar difficulties are encountered in following the NPS allocations in Table 4 on page 22.

**Response:** The typographical error in Table 2 for total annual average stream background flows will be corrected. However, the computed loadings in the table are not affected. Detailed annual average non-point sources loads computation for Scenario 2 and Scenario 5 are provided in the table below. Please note that the scaling up of non-point loads in Scenario 2, compared to Scenario 5 is as a result of 35% reduction in Scenario 5 (43.54-27.88/43.54 ~ 35%).

Table 4, page 22, average annual allocation loads in lb/year, are the same loads as in Table 2, Scenario 5 (BOD: 27.88 x 12 = 334.56 lb/year, TN: 12.01 x 12 = 144.1 lb/year and TP: 1.36 x 12 = 16.3 lb/year).

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**Scenario 2: Average Annual Flow Conditions**

Model segments →	<b>8</b>	<b>9</b>	<b>12</b>	<b>14</b>	Total
Flow into segment (mgd) →	0.03	0.017	0.044	0.017	0.108
BOD conc. in Segment (mg/l) →	0.97	1.17	0.97	1.4	
Loads in segments (lb/month) →	10.92	7.46	16.0	8.93	43.31

**Scenario 5: Average Annual Flow Conditions with 50%PS %35%NPS reductions**

Model segments →	<b>8</b>	<b>9</b>	<b>12</b>	<b>14</b>	Total
Flow into segment (mgd) →	0.03	0.017	0.044	0.017	0.108
BOD conc. in Segment (mg/l) →	0.63	0.76	0.63	0.91	
Loads in segments (lb/month) →	6.91	4.69	10.45	2.62	27.88

**Table 2: Scenario Load Comparisons**

Parameters	Low Flow			Annual Average Flow		
	Scenario 1 Baseline	Scenario 3 No WWTP	Scenario 4 50% PS, 35%NPS reduction (MOS)	Scenario 2 Baseline	Scenario 5 50%PS, 35% NPS reduction (MOS)	Scenario 6 No WWTP
Point Source						
BOD (lb/month)	1,561.2	0.0	780.6 (130.1)	1,561.2	780.6 (130.1)	0.0
TN (lb/month)	936.7	0.0	468.4 (58.3)	936.7	468.4 (58.3)	0.0
TP (lb/month)	104.1	0.0	52.0 (6.8)	104.1	52.0 (6.8)	0.0
Flows (mgd)	0.208	0.0	0.208	0.208	0.208	0.208
Non-point Source						
BOD (lb/month)	15.22	15.22	9.85 (0.49)	43.54	27.88 (1.4)	43.54
TN (lb/month)	6.55	6.55	4.24 (0.21)	18.74	12.01 (0.6)	18.74
TP (lb/month)	0.73	0.73	0.48 (0.02)	2.1	1.36 (0.07)	2.1
Total Background Flows (mgd)	0.038	0.038	0.038	0.1084	0.1084	0.1084

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11. The commentor states that there seems to be a typographical error in the value for the runoff rate for the 7Q10 flow condition. The commentor states the value should be 0.06335 instead of the printed 0.6335. The commentor further states that the number is not carried through the calculations so it does seem to just be a typographical error.

**Response:** Page A-3, the typographical error has been corrected to read 0.06335 instead of 0.6335.

12. The commentor states that the draft TMDL fails to ensure compliance with water quality standards by using a chlorophyll *a* threshold of 50µg/l. The commentor cites that the draft Chesapeake Bay Chlorophyll *a* criteria from the Chesapeake Bay Program suggests that chlorophyll *a* levels must remain below 25-30 µg/l to protect against algal blooms.

**Response:** States are required to make water quality determinations based on existing water quality standards. Those cited in the comments are all proposed values, and they do not address poorly flushed tidal waters. Threshold values of chlorophyll *a* have been used for over a decade, under authority of the State's narrative criteria, to evaluate eutrophic conditions and set water quality endpoints consistent with the designated uses of a water body. This has allowed the State to make water quality management decisions that support the mandatory water quality standards and are consistent among the regulated community. Through common usage and public review, literature and other published material, and site-specific data, Maryland has found that 50 µg/l provides adequate protection of a water body's designated uses in poorly flushed tidal systems, which applies to the present case (Thomann, R.V. and Mueller, J.A. 1987. Principles of Surface Water Quality Modeling and Control. Harper and Row, Publishers, New York).

Draft criteria for chlorophyll *a*, being considered by the EPA Chesapeake Bay Program, are not going forward as numeric criteria at this time due to technical considerations. EPA will pursue numeric criteria in future.

13. The commentor states that the TMDL is not stated in terms of a daily load.

**Response:** The Code of Federal Regulations (40 CFR 130.2(i)) states that "TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure". No explicit time period is required. The Environmental Protection Agency (EPA) acknowledges this in the preamble to their proposed TMDL regulations published in the Federal Register, August 23, 1999 (Volume 64, Number 162, Page 46031).

14. The commentor states that the draft TMDL does not contain an adequate margin of safety (MOS).

**Response:** TMDLs are required to include a MOS to account for uncertainties in a manner that is conservative toward protecting the environment. There are no strict guidelines or methodologies provided by the EPA for selecting a MOS, except to suggest that a MOS may be an explicit value held aside or conservative assumptions built into the analysis. The

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margin of safety proposed in this TMDL analysis is based on other TMDLs approved by EPA and was adopted in consideration of built-in conservative assumptions of the analysis. The MOS for the TMDL was selected with the understanding that the analysis and the MOS may be revised in the future as better information comes available. The MOS at the tributary boundaries of the model was 5% of the total nonpoint load allocation. The MOS at the Town of Oxford was calculated as 25% of the difference between the weekly and monthly effluent permit limits. This is considered an appropriate MOS because it is unlikely that the Oxford WWTP will go above its monthly limit more than a quarter of the time during a month. Please note that the nonpoint source loading is ~ 0.6% of the total nitrogen and phosphorus loading into Town Creek. Even with a MOS of 100% for the non-point source (twice the NPS load), the overall loads to Town Creek would increase only ~ 1%.

In addition to the set-aside total nitrogen and total phosphorus MOS, the critical condition of the consecutive 7-day low-flow expected to occur once every 10 years was used to determine the final TMDL load allocations. Because the 7Q<sub>10</sub> flow constitutes a worst case scenario, its use builds a conservative assumption into the TMDLs. Finally, all of the modeling was done using the NPDES monthly permit limits for effluent concentrations. The monthly limits are conservative because they represent an upper limit that the WWTP will strive not to exceed.

15. The commentor states that the TMDL does not have an implementation plan.

**Response:** Neither the Clean Water Act nor current EPA regulations direct states to develop a detailed implementation plan as part of the TMDL development and approval process. Implementation measures, therefore, are beyond the scope of this process. (See also Comment 17.)

16. The commentor requests that MDE explore grant funding possibilities to conduct water quality testing for the Town of Oxford Wastewater Treatment Plant (WWTP) and that MDE develop strategies to assist small WWTPs upgrade their existing systems to employ the best available technology in nutrient removal thus assisting small communities comply with the TMDL program.

**Response:** The Department acknowledges the commentor's interest in future water quality monitoring. The State's water quality monitoring plans include sampling every 5-years as part of the watershed cycling strategy. Because this topic is beyond the scope of the TMDL analysis for which comments are being solicited, we invite the commentor to engage us in further discussions on the matter outside of this comment process.

17. The commentor requests that some level of financial assistance be provided to local governments to comply with the TMDLs.

**Response:** The Department is committed to following through on the implementation of TMDLs in coordination with the many stakeholders who will have a role. Because this topic is beyond the scope of the TMDL analysis for which comments are being solicited, we invite

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the commentor to engage us in further discussions on the matter outside of this comment process.

18. The commentor requests that a standard procedure be established by MDE for reporting water quality results to the County and the Town of Oxford in relation to the TMDLs.

**Response:** The Department acknowledges the commentor's interest in obtaining water quality monitoring results in the future. The Department would be happy to discuss a specific procedure by which future monitoring results can be shared with the County and the Town of Oxford.