



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION III  
1650 Arch Street  
Philadelphia, Pennsylvania 19103-2029  
2/21/2007

Dr. Richard Eskin, Ph.D., Director  
Technical and Regulatory Services Administration  
Maryland Department of the Environment  
1800 Washington Boulevard, Suite 540  
Baltimore, MD 21230

Dear Dr. Eskin:

The U.S. Environmental Protection Agency (EPA) is pleased to approve the Total Maximum Daily Load (TMDL) for sediment in the Youghiogheny River Watershed, Garrett County, Maryland. The TMDL Report was submitted by the Maryland Department of the Environment (MDE) on October 3, 2006, to EPA for review and approval. This TMDL was established and submitted in accordance with Section 303(d)(1)(c) and (2) of the Clean Water Act to address impairments of water quality as identified in Maryland's Section 303(d) list. The non-tidal waters of the Youghiogheny River (basin number 05020201) were first identified on Maryland's 1996 Section 303(d) list as impaired by nutrients, sediments, pH, and bacteria with listings of impacts to biological communities added in 2002 and 2004. A Water Quality Analysis (WQA) for eutrophication to address the nutrient listing was approved by EPA in 2001. A TMDL to address low pH is currently in progress. The bacteria and biological impairments will be addressed by MDE at a future date. The TMDL described in this document was developed to address localized water quality impairments identified within the watershed, specifically excessive sediment in the Youghiogheny River Watershed.

In accordance with Federal regulations at 40 CFR §130.7, a TMDL must comply with the following requirements: (1) be designed to attain and maintain the applicable water quality standards; (2) include a total allowable loading and as appropriate, wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources; (3) consider the impacts of background pollutant contributions; (4) take critical stream conditions into account (the conditions when water quality is most likely to be violated); (5) consider seasonal variations; (6) include a margin of safety (which accounts for uncertainties in the relationship between pollutant loads and in-stream water quality); (7) consider reasonable assurance that the TMDL can be met, and (8) be subject to public participation. The enclosure to this letter describes how the sediment TMDL for the Youghiogheny River Watershed satisfies each of these requirements.



As you know, all new or revised National Pollutant Discharge Elimination System permits must be consistent with the TMDL WLA pursuant to 40 CFR §122.44 (d)(1)(vii)(B). Please submit all such permits to EPA for review as per EPA's letter dated October 1, 1998.

If you have any questions or comments concerning this letter, please do not hesitate to contact Mr. Thomas Henry at (215) 814-5752.

Sincerely,

*Signed*

Jon M. Capacasa, Director  
Water Protection Division

Enclosure

cc: Melissa Chatham, MDE-TARSA  
Nauth Panday, MDE-TARSA





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**Decision Rationale**  
**Total Maximum Daily Load of Sediment**  
**in the Youghiogeny River Watershed,**  
**Garrett County, Maryland**

*Signed*

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**Jon M. Capacasa, Director**  
**Water Protection Division**

**Date: 2/21/2007**



## Decision Rationale

### Total Maximum Daily Load of Sediment in the Youghiogeny River Watershed, Garrett County, Maryland

#### I. Introduction

The Clean Water Act (CWA) requires a Total Maximum Daily Load (TMDL) to be developed for those water bodies identified as impaired by the state where technology-based and other controls will not provide for attainment of water quality standards. A TMDL is a determination of the amount of a pollutant from point, nonpoint, and natural background sources, including a margin of safety (MOS), that may be discharged to a water quality-limited water body.

This document sets forth the U.S. Environmental Protection Agency's (EPA) rationale for approving the TMDL for sediment in the Youghiogeny River Watershed. The TMDL was established to address impairments of water quality, caused by sediment, as identified in Maryland's 1996 Section 303(d) list for water quality-limited segments. The Maryland Department of the Environment (MDE) submitted the report, *Total Maximum Daily Load of Sediment in the Youghiogeny River Watershed, Garrett County, Maryland* on October 3, 2006. The TMDL in this report addresses the sediment impairment in the Youghiogeny River Watershed as identified on Maryland's Section 303(d) lists. The basin identification for the Youghiogeny River Watershed is 05020201.

EPA's rationale is based on the information contained in the TMDL Report, the Appendices to the report, the Comment Response Document, and MDE's responses to EPA's comments. EPA's review determined that the TMDL meets the following eight regulatory requirements pursuant to 40 CFR Part 130.

1. The TMDLs are designed to implement applicable water quality standards.
2. The TMDLs include a total allowable load as well as individual waste load allocations (WLA) and load allocations (LA).
3. The TMDLs consider the impacts of background pollutant contributions.
4. The TMDLs consider the critical environmental conditions.
5. The TMDLs consider seasonal environmental variations.
6. The TMDLs include a MOS.
7. There is reasonable assurance that the TMDLs can be met.
8. The TMDLs have been subject to public participation.

#### II. Summary

The TMDL specifically allocates the allowable sediment loading to the Youghiogeny River Watershed. There are 19 permitted point sources of sediment within the watershed. Only 15 of these permitted point sources were included in the WLA since the sediment loads from the remaining four were considered *de minimis*. The fact that the TMDL does not assign WLAs to any other sources in the watershed should not be construed as a determination by either EPA or

MDE that there are no additional sources in the watershed that are subject to the National Pollutant Discharge Elimination System (NPDES) program. In addition, the fact that EPA is approving this TMDL does not mean that EPA has determined whether some of the sources discussed in the TMDL, under appropriate conditions, might be subject to the NPDES program. The sediment TMDL is presented as an average annual load in tons/year because it was developed to meet TMDL endpoints under a range of conditions observed throughout the year. The long term daily sediment TMDL is also presented in pounds/day. The average annual and long term daily TMDLs are presented in Tables 1 and 2, respectively.

**Table 1 – Average Annual Sediment TMDL for the Youghiogheny River Watershed**

<b>Area</b>	<b>Rate</b>	<b>TMDL</b>	<b>Wasteload Allocation (WLA)</b>	<b>Load Allocation (LA)</b>	<b>Margin of Safety (MOS)</b>
Maryland	Tons/year	9,866.8	144.6	9,722.2	Implicit
West Virginia (Upstream Gross Load)	Tons/year	3,833.5		3,833.5	Implicit
<b>Total</b>	<b>Tons/year</b>	<b>13,700.3</b>	<b>144.6</b>	<b>13,555.7</b>	<b>Implicit</b>

**Table 2 – Long Term Daily Sediment TMDL for the Youghiogheny River Watershed**

<b>Area</b>	<b>Rate</b>	<b>TMDL</b>
Youghiogheny River Watershed	pounds/day	75,070

The TMDL is a written plan and analysis established to ensure that a waterbody will attain and maintain water quality standards. The TMDL is a scientifically based strategy that considers current and foreseeable conditions, the best available data, and account for uncertainty with the inclusion of a MOS value. The option is always available to refine the TMDL for re-submittal to EPA for approval if environmental conditions, new data, or the understanding of the natural processes change more than what was anticipated by the MOS.

### **III. Background**

The Youghiogheny River is located in Garrett County, Maryland, and is a tributary of the Monongahela River. The Youghiogheny River is fast and free-flowing as it traverses mostly mountainous terrain that weaves back and forth from Maryland, where it originates, to West Virginia and again into Maryland before flowing to the Youghiogheny Reservoir. The Youghiogheny River flows northward into Pennsylvania, joining the Monongahela and Allegheny Rivers to form the Ohio River. The Youghiogheny River is approximately 125 miles long with nearly 75 miles in Pennsylvania, 44 miles in Maryland, and 6 miles in West Virginia. The watershed encompasses approximately 285 square miles (excluding Deep Creek Lake) before the river enters the Youghiogheny Reservoir. Approximately 68 square miles of the watershed is in West Virginia. The Chesapeake Bay Program Phase V (CBP P5) land use GIS

framework shows that the watershed in Maryland and West Virginia is predominantly forest (63.4%), pasture (19.1%), cropland (11.1%) and urban (6.3%). Section 2.0 of MDE's TMDL Report provides additional information about the Youghiogheny River Watershed, including land use information.

The Youghiogheny River Watershed (05020201) was first identified on Maryland's 1996 Section 303(d) list of water quality-limited segments as impaired by nutrients, sediments, pH, and bacteria with listings of biological impacts added in 2002 and 2004. This TMDL addresses the sediment impairments. A Water Quality Analysis (WQA) for eutrophication to address the nutrient listing was approved by EPA in 2001. A TMDL to address low pH is currently in progress. The bacteria and biological impairments will be addressed by Maryland (MDE) at a future date.

The Maryland water quality standards Surface Water Use Designation for the Youghiogheny River Watershed is Use III-P: Nontidal Cold Water and Public Water Supply (Code of Maryland Regulations, COMAR, 26.08.02.08S). Maryland currently does not have specific numeric criteria for sediment. Maryland's general water quality criteria prohibit pollution of waters of the State by any material in amounts sufficient to create nuisance or interfere in designated uses (COMAR, 26.08.02.03). Therefore, MDE determined the assimilative capacity of the Youghiogheny River Watershed by using a reference watershed approach that resulted in the establishment of a sediment loading threshold. This threshold is based on a detailed analysis of sediment loads from watersheds identified as supporting aquatic life based on Maryland's biocriteria. The sediment loading threshold was determined to be approximately 3.3 times the sediment load of an all forested watershed. This value is representative of watersheds in the Highland and Piedmont physiographic regions with land use distributions within the range of the reference watersheds.

The Youghiogheny River Watershed was evaluated using two watershed TMDL segments from the CBP P5 model, which include loads from both Maryland and West Virginia. The resulting forest normalized sediment loads are estimated as 5.1 and 3.7 for TMDL Segments 1 and 2, respectively. Sediment loads within both TMDL segments are well above the sediment loading threshold of 3.3. Figure 5 of the TMDL report shows the TMDL segmentation. This analysis indicates that sediment loads exceed levels that support aquatic health in both TMDL segments and confirms that the Youghiogheny River Watershed is impaired by elevated sediment loads.

CWA Section 303(d) and its implementing regulations require that TMDLs be developed for waterbodies identified as impaired by the state where technology-based and other required controls do not provide for attainment of water quality standards. The sediment TMDL submitted by MDE is designed to allow for the attainment of the designated uses and to ensure that there will be no sediment impacts affecting aquatic health in the Youghiogheny River Watershed. Refer to Tables 1 and 2 above for a summary of allowable loads.

For this TMDL analysis, Maryland used sediment load, embeddedness, and epifaunal substrate condition data collected in 2004 by the Maryland Biological Stream Survey (MBSS) program at 16 stations in the Youghiogheny River Watershed. The computational framework

utilized for the Youghiogheny River Watershed TMDL was the CBP P5 watershed model target edge-of-field (EOF) land use sediment loading rate calculations. The edge-of-stream (EOS) sediment load is calculated per land use as a product of the land use area, land use target loading rate, and loss from the EOF to the main channel. The spatial effect of sediment delivery from EOF to EOS is captured as a function of the average transport distance from individual land uses within the model segment. Therefore, each land use category will have a specific sediment delivery ratio. The spatial domain of the CBP P5 model segmentation aggregates to the Maryland 8-digit watersheds. The Youghiogheny River Watershed is represented by two CBP P5 model segments that include both the Maryland and West Virginia portions of the watershed.

A reference sediment yield approach was applied to determine the assimilative capacity of the watershed stream system. The reference yield was estimated from watersheds that are identified as supporting aquatic life based on Maryland's biocriteria. To reduce the variability when comparing watersheds within and across regions, the watershed sediment yield is normalized by a constant background condition. The normalized sediment yield for this TMDL is calculated as the current watershed sediment load divided by the forest sediment load expected from an all-forested condition. The current total sediment load from the Youghiogheny River Watershed is 17,938.4 tons/year. The sediment TMDL is 13,700.3 tons/year, a 23.6% reduction from the baseline sediment load. This TMDL incorporates a gross load of 3,833.5 tons/year given to West Virginia for upstream portions of the watershed. Section 4.0 of the TMDL Report provides a thorough description of the CBP P5 model and calculations.

Maryland conducted a nonpoint source assessment by reviewing land use data to estimate the contributions of sediment from agricultural activities, urban (developed), extractive land, and forest. Agricultural activities include various cropland, pasture, and feeding operations. Developed land includes both pervious urban, impervious urban, and construction areas. Extractive land use includes active and unclaimed mines, gravel pits, etc. Forest land use includes both natural undisturbed woodland areas and harvested forest lands. The largest portions of the combined Maryland and West Virginia sediment load are from pasture and crop land uses (43.8% and 36.9%, respectively) followed by forest (11.7%), urban (7.5%), and extractive (0.1%) land uses. Permitted point sources of sediments account for 1.2% of the Maryland sources. Detailed explanations of the nonpoint source assessment and estimated sediment budget for each land use are described in Section 2.2.1 and Table 3 of the TMDL Report. The results of the nonpoint source assessment allowed Maryland to calculate the percent contribution for each of the five major types of nonpoint sources. This method is further described in Section IV of this Decision Rationale.

#### **IV. Discussion of Regulatory Conditions**

EPA finds that MDE has provided sufficient information to meet all of the eight basic requirements for establishing a sediment TMDL for the Youghiogheny River Watershed. EPA therefore approves this sediment TMDL for the Youghiogheny River Watershed. This approval is outlined below according to the eight regulatory requirements.

- 1) *The TMDLs are designed to implement applicable water quality standards.*

Water Quality Standards consist of three components: designated and existing uses; narrative and/or numerical water quality criteria necessary to support those uses; and an anti-degradation statement. The Maryland water quality standards Surface Water Use Designation for the Youghiogheny River is Use III-P: *Nontidal Cold Water and Public Water Supply* (COMAR, 26.08.02.08S). Maryland does not currently have numeric criteria for sediments. Maryland's general water quality criteria prohibit pollution of waters of the State by any material in amounts sufficient to create nuisance or interfere in designated uses (COMAR, 26.08.02.03). Excessive sedimentation in the Youghiogheny River Watershed beyond a level to support aquatic life has led to violations of the narrative criteria. The limiting sediment load was estimated using reference watersheds, where the assimilative capacity is determined to be approximately 3.3 times the sediment load assuming an all forested condition. The current sediment load of the Youghiogheny River Watershed is approximately 5.1 times the all forested condition for TMDL Segment 1 and approximately 3.7 times the all forested condition for TMDL Segment 2. The sediment loads in both TMDL segments are beyond levels to support aquatic health. The overall objective of the TMDL is to reduce the sediment loadings in order to meet the narrative water quality criteria to support the Use III-P designation. EPA believes that this is a reasonable and appropriate water quality goal.

- 2) *The TMDLs include a total allowable load as well as individual waste load allocations and load allocations.*

#### Total Allowable Load

As described above, the allowable load for the impaired watershed is calculated as the product of the normalized reference sediment yield (determined from watersheds with a healthy benthic community), the Youghiogheny River Watershed forest sediment yield, and the watershed drainage area. This load is considered the maximum allowable load the watershed can assimilate and still attain water quality standards. The sediment TMDL was developed for the Youghiogheny River Watershed based on this endpoint. The sediment TMDL and allocations are presented as mass loading rates of tons/year for the average annual load and pounds per day for the long term daily load. Expressing TMDLs as annual and daily mass loading rates is consistent with Federal regulations at 40 CFR § 130.2(i), which state that TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure. The average annual and long term daily sediment TMDLs are presented in Tables 1 and 2, respectively.

EPA regulations at 40 CFR § 130.2(i) state that the total allowable load shall be the sum of individual WLAs for point sources, LAs for nonpoint sources, and natural background concentrations. The TMDL for sediment for the Youghiogheny River Watershed is consistent with 40 CFR § 130.2(i) because the total loads provided by MDE equal the sum of the individual WLAs for point sources and the land-based LAs for nonpoint sources. Pursuant to 40 CFR § 130.6 and § 130.7(d)(2), this TMDL and the supporting documentation should be incorporated into Maryland's current water quality management plan.

#### Waste Load Allocations

According to the TMDL Report, there are nineteen permitted point source facilities in the



Youghiogheny River Watershed. Fifteen of these permitted sources have explicit total suspended solids (TSS) limits including nine municipal wastewater treatment plants (WWTP), two industrial facilities, and four mining permits. The estimated TSS loads from these sources were assigned to the WLA using the current permit limits. No reductions were applied to the permitted point sources. There are no MS4 permits in the Youghiogheny River Watershed. Therefore, all rainfall-driven TSS loads were allocated to the LA. The sediment loads from two industrial facilities and two industrial stormwater permits were considered *de minimis* and do not have explicit TSS limits; therefore, their sediment loads were included in the LA. Based on the permit information shown in Section 4.6 and Appendix B of MDE's TMDL Report, the total permitted load is 144.6 tons/year and will be included as the WLA for the Maryland portion of the Youghiogheny River Watershed. No reductions were applied to the permitted point sources. MDE did not include permitted point sources from West Virginia in this TMDL. Instead, a gross allocation was provided to the upstream West Virginia portions.

### Load Allocations

The TMDL summary in Table 1 contains the LA for the Youghiogheny River Watershed. According to Federal regulations at 40 CFR § 130.2(g), LAs 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. Wherever possible, natural and nonpoint source loadings should be distinguished. As described above in Section III, Maryland conducted a nonpoint source assessment in order to estimate the contributions of cropland, pasture, urban (developed), extractive land, and forest to the overall nonpoint source loadings. Table 3 of the TMDL Report provides a breakdown of the existing average annual sediment load from the five nonpoint source categories (cropland, pasture, urban, extractive land, and forest) as well as point sources. A similar breakdown was developed for the allocations, which are shown in Table 5 of the TMDL Report. For the purpose of TMDL development, reductions are estimated for predominant controllable nonpoint sources. In this watershed, forest is considered to be the only non-controllable source since it represents the most natural condition in the watershed.

Federal regulations at 40 CFR § 122.44(d)(1)(vii)(B) require that, for an NPDES permit for an individual point source, the effluent limitations must be consistent with the assumptions and requirements of any available WLA for the discharge prepared by the state and approved by EPA. EPA has authority to object to the issuance of an NPDES permit that is inconsistent with WLAs established for that point source. To ensure consistency with this TMDL, if an NPDES permit is issued for a point source that discharges one or more of the pollutants of concern in the Youghiogheny River Watershed, any deviation from the WLAs set forth in the TMDL Report and described herein for a point source must be documented in the permit Fact Sheet and made available for public review along with the proposed draft permit and the Notice of Tentative Decision. The documentation should: 1) demonstrate that the loading change is consistent with the goals of the TMDL and will implement the applicable water quality standards; 2) demonstrate that the changes embrace the assumptions and methodology of the TMDL; and 3) describe that portion of the total allowable loading determined in the state's approved TMDL Report that remains for any other point sources (and future growth where included in the original TMDL) not yet issued a permit under the TMDL. It is also expected that Maryland will provide

this Fact Sheet for review and comment to each point source included in the TMDL analyses as well as any local and state agency with jurisdiction over land uses for which LA changes may be impacted. It is also expected that MDE will require periodic monitoring of the point source(s) for total suspended solids, through the NPDES permit process, in order to monitor and determine compliance with the TMDLs WLAs.

In addition, EPA regulations and program guidance provides for effluent trading. Federal regulations at 40 CFR § 130.2(i) state: “if Best Management Practices (BMP) or other nonpoint source pollution controls make more stringent LAs practicable, then WLAs may be made less stringent. Thus, the TMDL process provides for nonpoint source control tradeoffs.” The state may trade between point sources and nonpoint sources identified in the TMDL as long as three general conditions are met: 1) the total allowable load to the waterbody is not exceeded; 2) the trading of loads from one source to another continues to properly implement the applicable water quality standards and embraces the assumptions and methodology of the TMDL; and 3) the trading results in enforceable controls for each source. Any changes such as these should be subject to public comment. Any revisions to WLAs and/or LAs should be submitted to EPA for review. Final control plans and loads should be identified in a publicly available planning document. These final plans must be consistent with the goals of the approved TMDLs.

Based on the foregoing, EPA has determined that the TMDLs are consistent with the regulations and requirements of 40 CFR Section 130.

3) *The TMDLs consider the impacts of background pollutant contributions.*

The TMDLs consider the impact of background pollutants by considering the sediment load from natural sources such as forested land. The CBP P5 model also considers background pollutant contributions by incorporating all land uses.

4) *The TMDLs consider critical environmental 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. The intent of the regulations is to ensure that: 1) the TMDLs are protective of human health; and 2) the water quality of the waterbodies is protected during the times when they are most vulnerable.

Critical conditions are important because they describe the factors that combine to cause a violation of water quality standards and will help in identifying the actions that may have to be undertaken to meet water quality standards<sup>1</sup>. Critical conditions are a combination of environmental factors (e.g., flow, temperature, etc.), which have an acceptably low frequency of occurrence. In specifying critical conditions in the waterbody, an attempt is made to use a reasonable worst-case scenario condition. The biological monitoring data used to determine the reference watersheds integrates the stress effects over the course of time and thus inherently

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<sup>1</sup>EPA memorandum regarding EPA Actions to Support High Quality TMDLs from Robert H. Wayland III, Director, Office of Wetlands, Oceans, and Watersheds to the Regional Management Division Directors, August 9, 1999.

addresses critical conditions.

5) *The TMDLs consider seasonal environmental variations.*

Seasonality is considered in two components. First, it is implicitly included in the biological monitoring data, since results integrate the stress effects over the course of time as discussed in Requirement 4 above. Second, the MBSS sampling included benthic sampling in the spring and fish sampling in the summer to incorporate both spring and summer flow conditions.

6) *The TMDLs include a margin of safety.*

The requirement for a MOS is intended to add a level of conservatism to the modeling process in order to account for uncertainty. Based on EPA guidance, the MOS can be achieved through two approaches. One approach is to reserve a portion of the loading capacity as a separate term, and the other approach is to incorporate the MOS as part of the design conditions. MDE has adopted an implicit MOS for this TMDL. Sediment yield analysis of the reference watersheds indicates that approximately 75% of the reference watersheds have a normalized reference sediment yield less than 3.6, and 50% of the normalized sediment yields are less than 3.3. The reference sediment yield was set at the median value of 3.3. This is considered an environmentally conservative estimate, since 50% of the reference watersheds have a normalized sediment yield above this value. This reference sediment yield results in an implicit MOS of approximately 8%.

7) *There is reasonable assurance that the TMDLs can be met.*

EPA requires that there be a reasonable assurance that the TMDLs can be implemented. WLAs will be implemented through the NPDES permit process. According to 40 CFR § 122.44(d)(1)(vii)(B), the effluent limitations for an NPDES permit must be consistent with the assumptions and requirements of any available WLA for the discharge prepared by the state and approved by EPA. Furthermore, EPA has the authority to object to issuance of an NPDES permit that is inconsistent with WLAs established for that point source.

Nonpoint source controls to achieve LAs will be implemented in an iterative process that places priority on those sources having the largest impact on water quality, with consideration given to ease of implementation and cost. BMPs can be implemented through a number of existing programs and funding sources, including: Water Quality Improvement Act of 1998 (WQIA), Federal Nonpoint Source Management Program (§ 319 of the Clean Water Act), Buffer Incentive Program (BIP), Maryland Agriculture water quality cost share program (MACS), State Water Quality Revolving Loan Fund, and Stormwater Pollution Cost Share Program.

8) *The TMDLs have been subject to public participation.*

MDE provided an opportunity for public review of and comment on the sediment TMDL for the Youghiogheny River Watershed. The public review and comment period was open from July 27, 2006 through August 28, 2006. MDE received one set of comments for this TMDL

which were addressed in MDE's Comment Response Document.

Copies of the reports were sent to the U.S. Fish and Wildlife Service and National Marine Fisheries Service pursuant to Section 7(c) of the Endangered Species Act, requesting the Services' concurrence with EPA's findings that approval of this TMDL does not adversely affect any listed endangered and threatened species and their critical habitats.