UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029
11/24/2008

Richard Eskin, Ph.D.
Director, Technical and Regulatory Service Administration
Maryland Department of the Environment
1800 Washington Blvd., Suite 540
Baltimore, Maryland 21230-1718

Dear Dr. Eskin:

The U.S. Environmental Protection Agency (EPA) is pleased to approve Total Maximum Daily Loads (TMDLs) of sediment in the Conococheague Creek Watershed in Washington County, Maryland. The TMDL report was submitted via the Maryland Department of the Environment's (MDE) letter dated August 12, 2008, and received by EPA for review and approval on August 18, 2008. The 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 Conococheague Creek Watershed (MD-02140504) was first identified on Maryland's 1996 Section 303(d) List of water quality limited segments as impaired by sediments (1996), pH (2002), bacteria (2002), dissolved oxygen (1996), and impacts to biological communities (2004). This TMDL addresses the sediment impairment only. The pH, bacteria, dissolved oxygen and impacts to biological community's impairments will be addressed by MDE at a future date.

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 for point sources and load allocations 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); and (7) be subject to public participation. In addition, these TMDLs considered reasonable assurance that the TMDL allocations assigned to the nonpoint sources can be reasonably met. The enclosure to this letter describes how the sediment TMDLs for the Conococheague Creek 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 wasteload allocation 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. Kuo-Liang Lai at 215-814-5473.

Sincerely,

John Armstead for

Jon M. Capacasa, Director
Water Protection Division

Enclosure

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

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Decision Rationale
Total Maximum Daily Load of Sediment
Conococheague Creek Watershed
Washington County, Maryland

John Armstead for

Jon M. Capacasa, Director
Water Protection Division

Date: 11/24/2008

Decision Rationale
Total Maximum Daily Load of Sediment
Conococheague Creek Watershed, Washington County, Maryland

I. Introduction

The Clean Water Act (CWA) requires a Total Maximum Daily Load (TMDL) be developed for those waterbodies 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 waterbody.

This document sets forth the U.S. Environmental Protection Agency's (EPA) rationale for approving the TMDL for sediment in the Conococheague Creek 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 Conococheague Creek Watershed, Washington County, Maryland*, on August 18, 2008. The TMDL in this report addresses the sediment impairment in the Chonocheague Creek Watershed as identified on Maryland's Section 303(d) List. The basin identification for the Conococheague Creek Watershed is MD-02140504.

EPA's rationale is based on the TMDL Report and information contained in the computer files provided to EPA by MDE. EPA's review determined that the TMDLs meet the following seven regulatory requirements pursuant to 40 CFR Part 130.

1. The TMDL is designed to implement applicable water quality standards.
2. The TMDL includes a total allowable load as well as individual wasteload allocations (WLAs) and load allocations (LAs).
3. The TMDL considers the impacts of background pollutant contributions.
4. The TMDL considers critical environmental conditions.
5. The TMDL considers seasonal environmental variations.
6. The TMDL includes a MOS.
7. The TMDL has been subject to public participation.

In addition, these TMDLs considered reasonable assurance that the TMDL allocations assigned to nonpoint sources can be reasonably met.

II. Summary

The TMDL specifically allocates the allowable sediment loading to the Conococheague Creek Watershed. There are 6 permitted point sources of sediment which are included in the WLA. 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 per 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 calculation of the long term daily TMDLs is explained in Appendix C of the TMDL report. The average annual and long term daily TMDLs are presented in Tables 1 and 2, respectively.

Table 1. Average Annual Sediment TMDL for the Conococheague Creek Watershed

Area	Rate	TMDL	Wasteload Allocation (WLA)	Load Allocation (LA)	Margin of Safety (MOS)
Conococheague Creek Watershed	tons/year	94634.7	2,196.4	92,438.3	Implicit

Table 2. Long Term Daily Sediment TMDL for the Conococheague Creek Watershed

Area	Rate	TMDL	Wasteload Allocation (WLA)	Load Allocation (LA)	Margin of Safety (MOS)
Conococheague Creek Watershed	tons/day	3,496.1	75.9	3,420.2	Implicit

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 resubmittal 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 Conococheague Creek watershed is located in the Potomac River basin in Washington County, Maryland. Conococheague Creek is a free flowing stream that originates in Pennsylvania and empties into the Potomac River in Maryland. It is approximately 80 miles in length, with 22 miles in Maryland and 58 miles in Pennsylvania. The total watershed covers 568 square miles, with approximately 66 square miles in Maryland and 502 square miles in Pennsylvania. The Conococheague Creek watershed lies within the Ridge and Valley Province physiographic region of Western Maryland, between South Mountain in Washington County and Dans Mountain in western Allegany County. It has mountainous soils composed of clay, clay loams, and sandy and stony loams. The Chesapeake Bay Program Phase V (CBP P5) land use GIS framework shows that the Maryland portion of the watershed consists primarily of crop (35.6%) and urban (28.7%) land uses, with lesser amounts of forest (19.1%) and pasture (16.2%). Section 2.0 of MDE's TMDL Report provides additional information about the Conococheague Creek Watershed, including land use information.

The Conococheague Creek Watershed (MD-02140504) was first identified on Maryland's 1996 Section 303(d) List of water quality limited segments as impaired by sediments (1996),
pH (2002), bacteria (2002), dissolved oxygen (1996), and impacts to biological communities (2004). This TMDL addresses the sediment impairment only. The pH, bacteria, dissolved oxygen and impacts to biological community impairments will be addressed by MDE at a future date.

The Surface Water Use Designation for the Conococheague Creek is Use IV-P: *Recreational Trout Waters and Public Water Supply* (Code of Maryland Regulations, COMAR, 2007a, b). The water quality impairment of the Conococheague Creek Watershed consists of an elevated sediment load beyond a level to support aquatic health, where aquatic health is evaluated based on benthic index of biotic integrity (BIBI) and fish index of biologic integrity (FIBI) scores. Applicable BIBI and FIBI scores indicate that the Conococheague watershed is exhibiting a negative deviation from reference conditions. Additional benthic and fish-based sediment stream disturbance index (SSDI) scores indicate that sediment is a stressor to the aquatic community. Therefore, it is concluded that a sediment TMDL is required.

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 Conococheague Creek Watershed. Refer to Tables 1 and 2 above for a summary of allowable loads.

For this TMDL analysis, Maryland used embeddedness, instream habitat, bank stability, epifaunal substrate and benthic tolerant species data collected in 2002 by the Maryland Biological Stream Survey (MBSS) program at 12 stations in the Conococheague Creek Watershed. The computational framework utilized for the Conococheague Creek Watershed TMDL was the Chesapeake Bay Program Phase V (CBP P5) long-term average annual watershed model edge-of-stream (EOS) loading rate calculations. The 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 edge-of-field (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 Conococheague Creek Watershed is represented by two CBP P5 model TMDL segments. Segment 1 represents the sediment loads transported from Pennsylvania to the Maryland state line via the Conococheague mainstem and also includes a small area within the Maryland portion of the watershed. TMDL Segment 2 represents the sediment loads generated in Maryland and also includes the sediment loads from two small areas of Pennsylvania. It has been determined that TMDL Segment 1 is not impaired, but to protect downstream water quality, it will be given an informational allocation equivalent to its current baseline loads. TMDL Segment 2 requires a reduction in sediment loads.

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 Conococheague Creek Watershed is 100,610.3 tons per year. The sediment TMDL for the Conococheague Creek watershed is 94,634.7 tons per year, which represents a 5.9 percent reduction. Section 4.0 of the TMDL Report provides a thorough description of the CBP P5 model and calculations.

Maryland conducted a source assessment by reviewing land use data to estimate the contributions of sediment from crop, extractive, forest, pasture, and urban (developed) land uses. The largest portion of the sediment load in both Maryland and Pennsylvania is from cropland (58.3% of the total sediment budget in Maryland and 75.8% in Pennsylvania). In Maryland, the next largest sediment sources are urban (25.4%), pasture (9.8%) and forest (3.5%). Detailed explanations of the source assessment and estimated sediment budget for each land use are described in Section 2.2 and Table 4 of the TMDL Report. The results of the source assessment allowed Maryland to calculate the percent contribution for each land use.

IV. Discussion of Regulatory Conditions

EPA finds that MDE has provided sufficient information to meet all seven of the basic requirements for establishing a sediment TMDL for the Conococheague Creek Watershed. EPA therefore approves this sediment TMDL for the Conococheague Creek Watershed. This approval is outlined below according to the seven 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 Surface Water Use Designation for the Conococheague Creek is Use IV-P: *Recreational Trout Waters and Public Water Supply* (Code of Maryland Regulations, COMAR, 2007a, b). 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, 26.08.02.08B). Excessive sedimentation in the Conococheague Creek Watershed beyond a level to support aquatic health 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 Conococheague Creek Watershed is approximately 7.5 times the all-forested condition. 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 IV-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 wasteload 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 Conococheague Creek 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 Conococheague Creek Watershed based on this endpoint. The sediment TMDL and allocations are presented as mass loading rates of tons per 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 states 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 Conococheague Creek 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.

Wasteload Allocations

According to the TMDL Report, there are 26 permitted point source facilities in the Conococheague Creek Watershed; including three municipal facilities, two mineral mines, and 21 stormwater discharges. Based on the permit information shown in Section 4.6 and Appendix B of MDE's TMDL Report, the total permitted load is 2196.4 tons per year and will be included as the WLA for the Conococheague Creek Watershed. The TMDL requires an overall reduction of 45.3 percent from the NPDES stormwater portion of the WLA.

Load Allocations

The TMDL summary in Table 1 contains the LA for the Conococheague Creek 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 source assessment in order to estimate the contributions of cropland, pasture, extractive land, and forest to the overall nonpoint source loadings. Tables 3 and 4 of the TMDL Report provide a breakdown of the existing average annual sediment load from the five source categories (cropland, pasture, urban, extractive land, and forest). A similar breakdown was developed for the allocations, which are shown in Table 11 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 noncontrollable source since it represents the most natural condition in the watershed.

Federal regulations at 40 CFR §122.44(d)(1)(vii)(B) requires 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 Conococheague Creek 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 TMDL's 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.

Based on the foregoing, EPA has determined that the TMDLs are consistent with the regulations and requirements of 40 CFR part 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) requires 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[1]. 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 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 percent of the reference watersheds have a normalized reference sediment yield less than 3.6, and 50 percent 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 percent of the reference watersheds have a normalized sediment yield above this value. This reference sediment yield results in an implicit MOS of approximately 8 percent.

[1]*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.*

7) The TMDLs have been subject to public participation.

MDE provided an opportunity for public review of and comment on the sediment TMDL for the Conococheague Creek Watershed. The public review and comment period was open from May 1, 2008 through May 30, 2008. MDE did not receive any comments on this TMDL.

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

V. Discussion of Reasonable Assurance

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 (Section 319 of the Clean Water Act), Buffer Incentive Program (BIP), State Water Quality Revolving Loan Fund, and Stormwater Pollution Cost Share Program.