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

SEP 30 2011

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), Region III, is pleased to approve *Total Maximum Daily Loads (TMDLs) of Sediment in the Patuxent River Upper Watershed, Anne Arundel, Howard and Prince George's Counties, Maryland.* The Maryland Department of the Environment (MDE) submitted the TMDL report to EPA for review and approval on September 30, 2010. The TMDL was established and submitted in accordance with Section 303(d)(1)(c) and (2) of the Clean Water Act to address sediment impairments as identified in Maryland's Section 1996 303(d) List.

MDE has identified the waters of the Patuxent River Upper watershed as impaired by nutrients – phosphorus and nitrogen (1996); sediment (1996); bacteria (2002 and 2008); methylmercury – Cash Lake (2004); and impacts to biological communities (2006), on Maryland's 2008 Integrated Report. This TMDL will address the 1996 sediment listing only. A Water Quality Analysis for eutrophication to address the nutrients (nitrogen and phosphorus) listing was approved by EPA in 2007, and the watershed was delisted for bacteria in 2002 (relisted in 2008 – mainstem only from Queen Anne's Bridge to the river's confluence with the Little Patuxent River). A methylmercury TMDL for Cash Lake was approved by EPA in 2011.

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 instream water quality); and (7) be subject to public participation. In addition, the TMDL 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 TMDL for the Patuxent River Upper 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 María García, at 215-814-3199.

Sincerely,

Signed

Jon M. Capacasa, Director
Water Protection Division

Enclosure

cc: Lee Currey, MDE-TARSA
Melissa Chatham, MDE-TARSA

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Decision Rationale
Total Maximum Daily Load of Sediment in the Patuxent River Upper Watershed Anne Arundel, Howard and Prince George's Counties, Maryland

Signed

Jon M. Capacasa, Director
Water Protection Division

Date: 9/30/11

Upper watershed. The sediment TMDL also consists of allocations from loads generated upstream, which include the sediment loadings from the Little Patuxent River and the Rocky Gorge Reservoir watersheds. Overall, there are 28 active permitted point sources of sediment which are included in the WLA of the sediment TMDL. 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 presented in tons per day. The calculation of the long term daily TMDL is explained in Appendix C of the TMDL report. The average annual and long term maximum daily TMDLs are presented in Tables 1 and 2, respectively. Individual annual and maximum daily WLAs for permitted point sources are provided in Tables 3 through 5.

Table 1. Patuxent River Upper Watershed Average Annual TMDL of Sediment (ton/year)

TMDL (ton/year)	=	LA					+	WLA			MOS
56,607.1	=	LA_{LP}[1]	+	LA_{RG}[2]	+	LA_{UP}	+	NPDES Stormwater WLA_{UP}	+	Process Water WLA_{UP}	Implicit
		31,199.8	+	5,769.0	+	10,966.2		8,064.6	+	607.5	
		Upstream Load Allocations						Patuxent River Upper Watershed TMDL Contribution			

[1] For the Little Patuxent River watershed point and nonpoint source characterization, refer to the "Total Maximum Daily Load of Sediment in the Little Patuxent River Watershed, Howard and Anne Arundel Counties, Maryland" (MDE 2010).

[2] For the Rocky Gorge Reservoir point and nonpoint source characterization, refer to Appendix D of the TMDL.

Table 2. Patuxent River Upper Watershed Maximum Daily Load of Sediment (ton/day)

TMDL (ton/day)	=	LA					+	WLA			MOS
2,039.7	=	LA_{LP}[1]	+	LA_{RG}[2]	+	LA_{UP}	+	NPDES Stormwater WLA_{UP}	+	Process Water WLA_{UP}	Implicit
		1,067.3	+	225.0	+	427.7		314.5	+	5.2	
		Upstream Load Allocations						Patuxent River Upper Watershed TMDL Contribution			

[1] For the Little Patuxent River watershed point and nonpoint source characterization, refer to the "Total Maximum Daily Load of Sediment in the Little Patuxent River Watershed, Howard and Anne Arundel Counties, Maryland" (MDE 2010).

[2] For the Rocky Gorge Reservoir point and nonpoint source characterization, refer to Appendix D of the TMDL.

Table 3. Wasteload Allocations for Minor Process Water Point Sources in the Patuxent River Upper Watershed

Facility	NPDES ID Number	WLA (ton/year)	WLA (ton/day)
National Wildlife Visitor Center	MD0065358	1.0	0.008
U.S Air Force – Davidsonville Transmitter Site	MD0025631		
Chaney Enterprises – Crofton Concrete Plant	MDG499716		

* Minor process water point sources are facilities that have a design flow of less than one MGD.

Table 4. Wasteload Allocations for Major Process Water Point Sources in the Patuxent River Upper Watershed

Facility	NPDES ID Number	Baseline Load (ton/year)	WLA (ton/year)	WLA (ton/day)	Reduction (%)
Anne Arundel County – Maryland City Water Reclamation Facility	MD0062596	114.0	114.0	0.97	0
Bowie City of Wastewater Treatment Plant	MD0021628	150.5	150.5	1.28	0
WSSC – Parkway Wastewater Treatment Plant	MD0021725	342.0	342.0	2.91	0

Table 5. Wasteload Allocations for NPDES Regulated Stormwater Point Sources in the Patuxent River Upper Watershed

Facility	NPDES ID Number	Baseline Load (ton/year)	WLA (ton/year)	WLA (ton/day)	Reduction (%)
Anne Arundel County Phase I MS4	MD0068306	1,029.7	912.4	35.6	11.4
Howard County Phase I MS4	MD0068322	654.4	579.8	22.6	11.4
Prince George's County Phase I MS4	MD0068284	1,680.7	1,489.2	58.1	11.4
Phase II Jurisdictional MS4s	MDR055500	3,473.3	3,077.4	120.0	11.4
SHA Phase I MS4	MD0068276	714.8	633.3	24.7	11.4
Other NPDES Regulated Stormwater[1]	N/A	1,549.1	1,372.5	53.5	11.4

[1] A complete list of these permitted point sources can be found in Appendix B of the TMDL report and in Table 6 below.

Table 6. Other MDE NPDES Regulated Stormwater

Permit Number	Facility
02SW0761	Anne Arundel County – Maryland City Water Reclamation Facility
02SW1120	B&B Auto Salvage, LTD
02SW0859	United Parcel Service – Burtonsville
02SW0857	United Parcel Service – Remote Shop
02SW1049	Federal Express - Crofton
02SW0882	Washington Wilbert Vault Works
02SW0314	Sandy Hill Municipal Landfill
02SW0118	WSSC – Parkway WWTP
02SW0846	Bowie Used Auto Parts, Inc.
02SW0841	Central Small Car Salvage
02SW1738	WSSC – Laurel Garage
02SW1324	SHA – Laurel Shop
02SW0511	The Bechdon Company, Inc.
02SW0951	Balcon
02SW2089	First Transit, Inc #5315
N/A	MDE General Permit to Construct

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 accounts 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 Patuxent River Upper is a free flowing stream that originates at the discharge of the Rocky Gorge Reservoir and flows 28 miles in a southeasterly direction until it joins the Patuxent River. The watershed is located in the Patuxent River sub-basin of the Chesapeake Bay watershed within Howard, Anne Arundel and Prince George's Counties, Maryland and covers approximately 56,446 acres. Both the Little Patuxent River and the Rocky Gorge Reservoir empty into the Patuxent River Upper. The total population of the Patuxent River Upper watershed is approximately 165,898 (US Census Bureau 2000). The watershed consists primarily of forest (48.3%) and urban land uses (40.5%), with lesser amounts of crop (8.7%), pasture (2.3%), and extractive land uses (0.3%).

The Surface Water Designation Use for the Patuxent River Upper watershed is Use I *Water Contact Recreation and Protection of Aquatic Life* (COMAR 2009 a,b)[1]. There is one "high quality," or Tier II, stream segment in the Patuxent River Upper watershed: the mainstem of the Patuxent River Upper between the river's confluence with the unnamed tributary. This segment will require the implementation of Maryland's antidegradation policy. MDE has identified the waters of the Patuxent River Upper watershed as impaired by nutrients –

1 COMAR (Code of Maryland Regulations). 2009a. 26.08.02.02 B(1). http://www.dsd.state.md.us/comar/ (Accessed December, 2009).

phosphorus and nitrogen (1996); sediment (1996); bacteria (2002 and 2008); methylmercury – Cash Lake (2004); and impacts to biological communities (2006), on Maryland's 2008 Integrated Report.

The TMDL established herein by MDE will address the 1996 sediment listing, for which a data solicitation was conducted and all readily available data from the past five years has been considered. A Water Quality Analysis (WQA) for eutrophication to address the nutrients (nitrogen and phosphorus) listing was approved by EPA in 2007, and the watershed was delisted for bacteria in 2002 (relisted in 2008 – mainstem only from Queen Anne's Bridge to the river's confluence with the Little Patuxent River). A methylmercury TMDL for Cash Lake was approved by EPA in 2011.

MDE uses the *Biological Stressor Identification* (BSID) methodology to identify the most probable cause(s) of observed biological impairments in Maryland's 8-digit watersheds. The BSID ranks the likely stressors affecting a watershed using a suite of available physical, chemical, and land use data. In the Patuxent River Upper watershed, the primary dataset for the BSID analysis was data collected by the Maryland Biological Stream Survey (MBSS) (collected between 2000 and 2004). The results of the BSID analysis concluded that sediment related impacts and/or an altered hydrological regime are currently contributing to the biological impairments within the Patuxent River Upper watershed.

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 the attainment of water quality standards. In the Patuxent River Upper watershed, a TMDL was developed through computer modeling based on data collected throughout the watershed. The purpose for developing the TMDL is to reduce sediment loadings under existing conditions so that water quality standards can be met. Refer to Tables 1 and 2 for a summary of allowable loads.

The computational framework utilized for the Patuxent River Upper sediment TMDL was the Chesapeake Bay Program Phase 5.2 (CBP P5.2) watershed model. The CBP P5.2 watershed model generated edge-of-stream (EOS) loading rates which were used to develop baseline sediment loads for the watershed. The EOS loads were calculated for the Patuxent River Upper watershed as the product of the land use area, land use target loading rate, and loss from the edge-of-field (EOF) to the main channel. The land use target loading rate was quantified through the use of flow duration curves and a type of statistical analysis known as quantile regression. The loss from the EOF to the main channel was determined through the sediment delivery ratio which is defined as the ratio of the sediment load reaching a basin outlet to the total erosion within the basin. A sediment delivery ratio was estimated for each land use type based on the proximity of the land use to the main channel.

In order to quantify the impact of sediment on the aquatic health of the Patuxent River Upper watershed, a reference watershed approach was used. Six reference watersheds were selected from the Highland and Piedmont physiographic regions based on similarities in physical and hydrological characteristics. A sediment-loading threshold was developed from the reference watersheds and was normalized by a constant background condition, the all-forested

watershed condition of the Patuxent River Upper watershed. The resulting load, defined as the *forest normalized sediment load* represents how many times greater the current watershed sediment load is than the *all forested sediment load* of the Patuxent River Upper watershed. The median and 75th percentile of the reference watershed *forest normalized sediment load* was then calculated and found to be 4.8 and 5.1, respectively. The values derived through this method are considered to be environmentally conservative as compared to more complex methods used to determine sediment loading thresholds.

The TMDL for the Patuxent River Upper watershed was calculated based on the product of the median forest normalized sediment load and the Patuxent River Upper all-forested sediment load. The resulting load is considered the maximum allowable load the watershed can sustain without causing any sediment related impacts to aquatic health. The formula for calculating the TMDL is as follows:

$$TMDL = Yn_{ref} \times y_{forest}$$

where

TMDL = allowable load for impaired watershed (ton/year)
Yn_{ref} = forest normalized reference sediment load (4.8)
y_{forest} = all forested sediment load

To attain the TMDL loading cap, the reductions allocated in the TMDL were applied to the predominant and controllable sediment sources in the watershed. If these predominant sources are controlled, water quality standards can be achieved in the most effective, efficient, and equitable manner. In the Patuxent River Upper watershed, urban land, high till crops, low till crops and hay were identified as the predominant controllable sources of sediment. Therefore, constant reductions were applied to these sources in order to achieve the TMDL loading cap.

Sediment loads from two upstream watersheds were included in the Patuxent River Upper TMDL due to the hydrologic connectivity of the watershed. The identified watersheds are the Little Patuxent River and the Rocky Gorge Reservoir. The sediment loads from the upstream watersheds were calculated based on the same methodology presented in Section III of this Decision Rationale and includes both point and nonpoint source sediment loads. The sediment loads for the upstream watersheds are provided in Tables 1 and 2.

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 Patuxent River Upper watershed. EPA, therefore, approves this sediment TMDL for the Patuxent River Upper 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: (1) designated and existing uses; (2) the narrative and/or numerical water quality criteria necessary to support those uses; and

(3) an anti-degradation statement. The Surface Water Designation Use for the Patuxent River Upper and its tributaries is Use I *Water Contact Recreation and Protection of Aquatic Life* (COMAR 2009 a,b). There is one "high quality," or Tier II, stream segment (Benthic Index of Biotic Integrity (BIBI) and Fish Index of Biotic Integrity (FIBI) aquatic life assessment scores > 4 (scale 1 – 5)), which is the mainstem of the Patuxent River Upper between the river's confluence with Horsepen Branch to the immediate downstream confluence with the unnamed tributary.

Maryland does not currently have numeric criteria for sediments. Therefore, the allowable load for the Patuxent River Upper watershed was calculated as the product of the normalized reference load (determined from watersheds with a healthy benthic community) and the Patuxent River Upper watershed sediment load expected from an all-forested condition. 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 Patuxent River Upper watershed based on this endpoint.

Reductions in sediment loads are expected to result in the Patuxent River watershed from decreased watershed and streambed erosion, which will then lead to improved benthic and fish habitat conditions. Specifically, sediment load reductions are expected to result in an increase in the number of benthic sensitive species present, an increase in the available and suitable habitat for a benthic community, a possible decrease in fine sediment (fines), and improved stream habitat diversity, all of which will result in improved water quality.

The sediment TMDL, however, will not completely resolve the impairment to biological communities within the watershed. Since the BSID watershed analysis identifies other possible stressors (i.e., acute ammonia toxicity, chlorides, and sulfates) as impacting the biological conditions, this impairment remains to be fully addressed through the Integrated Report listing process and the TMDL development process, such that all impairing substances identified as impacting biological communities in the watershed are reduced to levels that will meet water quality standards, as established in future TMDLs for those substances.

2) The TMDLs include a total allowable load as well as individual wasteload allocations and load allocations.

Total Allowable Load

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 Patuxent River Upper 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. The average annual and long term maximum daily sediment TMDLs are presented in Tables 1 and 2, respectively.

Load Allocations

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.

The LAs for the Patuxent River Upper watershed were computed using the CBP P5.2 watershed model. Table 5 presents the load allocations developed for the Patuxent River Upper watershed by nonpoint source category. As indicated in Section III of this Decision Rationale, urban land, high till crops, low till crops and hay were identified as the predominate controllable sediment sources in the watershed. Therefore, reductions were applied only to the crop land use sources and the urban stormwater sources (8,064.6 ton/year) in the watershed.

Table 7. Patuxent River Upper Watershed Load Allocation

Nonpoint Source Category	Baseline Load (ton/year)	LA (ton/year)	Reduction (%)
Crop	8,891.8	7,901.8	11.1
Extractive	474.3	474.3	0
Forest	2,225.3	2,225.3	0
Pasture	364.8	364.8	0
Total	11,956.1	10,966.2	8.3

Wasteload Allocations

As indicated in the TMDL report, there are 28 active permitted point sources that contribute to the sediment load in the Patuxent River Upper watershed. The types of permits include individual municipal, individual municipal separate storm sewer systems (MS4s), general mineral mining, general industrial stormwater, and general MS4s. These permits can further be grouped into two categories, process water and stormwater. The process water category includes loads generated by continuous discharge sources whose permits have total suspended solids (TSS) limits. The stormwater category includes all NPDES regulated stormwater discharges.

The sediment loads for the six process water permits were calculated based on their TSS limits and corresponding flow information. The twenty-two NPDES Phase I or Phase II stormwater permits identified throughout the Patuxent River Upper watershed are regulated based on Best Management Practices and do not include TSS limits. In the absence of TSS limits, the NPDES regulated stormwater load is calculated using CBP P5.2 urban sediment edge-of-stream target values. WLAs for the permitted point sources are presented in Tables 3 through 5.

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. There is no express or implied statutory requirement that effluent limitations in NPDES permits necessarily be expressed in daily terms. The CWA definition of "effluent limitation" is quite broad (effluent limitation is "any restriction ... on quantities, rates, and concentrations of chemical, physical, biological, and other constituents which are discharged from point sources ...)." See CWA 502(11). Unlike the CWA's definition of TMDL, the CWA definition

of "effluent limitation" does not contain a "daily" temporal restriction. NPDES permit regulations do not require that effluent limits in permits be expressed as maximum daily limits or even as numeric limitations in all circumstances, and such discretion exists regardless of the time increment chosen to express the TMDL. For further guidance, refer to Benjamin H. Grumbles memo (November 15, 2006) titled *Establishing TMDL Daily Loads in Light of the Decision by the U.S. Court of Appeals for the D.C. Circuit in Friends of the Earth, Inc. v. EPA, et al., No. 05-5015 (April 25, 2006) and implications for NPDES Permits.*

EPA has authority to object to the issuance of an NPDES permit that is inconsistent with WLAs established for that point source. It is expected that MDE will require periodic monitoring of the point source(s), through the NPDES permit process, in order to monitor and determine compliance with the TMDL's WLAs. 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.

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[2]. 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 (that was used to determine the reference watersheds in the TMDL) was used to account for critical conditions in the Patuxent River Upper watershed. The biological monitoring data reflects the impacts of stressors (i.e., sediment impacts to stream biota) over the course of time and, therefore, depicts an average stream condition (i.e., captures all high and low flow events). Since the TMDL endpoint is based on the median of forest normalized loads from watersheds assessed as having good biological conditions (i.e., passing Maryland's biocriteria), by the nature of the biological data described above, it must inherently include the critical conditions of the reference watersheds. Therefore, since the TMDL reduces the watershed sediment load to a level compatible with that of the reference watersheds, critical conditions are inherently addressed.

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[2] 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.

5) The TMDLs consider seasonal environmental variations.

In the Patuxent River Upper watershed sediment TMDL, seasonality is captured in two components. First, it is implicitly included through the use of the biological monitoring data as biological communities reflect the impact of stressors over time. Second, the MBSS dataset included benthic sampling in the spring (March 1 - April 30) and fish sampling in the summer (June 1 - September 30). Benthic sampling in the spring allows for the most accurate assessment of the benthic population, and therefore provides an excellent means of assessing the anthropogenic effects of sediment impacts on the benthic community. Fish sampling is conducted in the summer when low flow conditions significantly limit the physical habitat of the fish community, and it is therefore most reflective of the effects of anthropogenic stressors as well.

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. The estimated variability around the reference watershed group used in the analysis accounts for such uncertainty. Analysis of the reference group forest normalized sediment loads indicates that approximately 75 percent of the reference watersheds have a value of less than 5.1, and that 50 percent of the reference watersheds have a value of less than 4.8. Based on this analysis, the forest normalized reference sediment load was set at the median value of 4.8. This is considered an environmentally conservative estimate, since 50 percent of the reference watersheds have a load above this value, which when compared to the 75 percent value, results in an implicit MOS of approximately six percent.

7) The TMDLs have been subject to public participation.

MDE provided an opportunity for public review and comment on the sediment TMDL for the Patuxent River Upper watershed. The public review and comment period was open from August 19, 2010 through September 17, 2010. MDE received no public comments.

A letter was 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

To provide the basis for reasonable assurances that the Patuxent River Upper Sediment TMDL will be achieved and maintained, Maryland has several well established programs to

draw upon including the Water Quality Improvement Act of 1998 (WQIA) and the Federal Nonpoint Source Management Program (§319 of the Clean Water Act).

Potential funding sources available for local governments for implementation include the Buffer Incentive Program, the State Water Quality Revolving Loan Fund, and the Stormwater Pollution Cost Share Program. Details of these programs and additional funding sources can be found at: http://www.dnr.state.md.us/bay/services/summaries.html.

The various Best Management Practices (BMPs) can be used to reduce sediment loads in the Patuxent River Upper watershed: comprehensive soil conservation plans can be utilized to make changes in crop rotations and tillage practices in agriculture; structural and long-term measures can be made in the watershed to increase grass waterways (in areas with concentrated flow); and livestock can be controlled via stream fencing and rotational grazing (MDE estimates that the sediment reduction efficiencies of the methods applicable to pasture land use range from 40% to 75%).

Additional BMPs that can be employed to reduce the effects of the sediment/flow stressor in the Patuxent River Upper watershed include: stormwater retrofits, the modification of existing stormwater structural practices, inlet cleaning, increases in the urban tree canopy, stream restoration, and street sweeping.

For the implementation of the WLA component, MDE estimates that future stormwater retrofits (which are expected to be implemented as part of the 10 percent retrofit goal to existing impervious land every five years) will reduce TSS by approximately 65 percent, which is subject to change over time. Additionally, any new development in the watershed will be subject to the Stormwater Management Act of 2007, and will be required to use environmental site design to the maximum extent practicable.

In summary, through the use of the aforementioned funding mechanisms and BMPs, there is reasonable assurance that this TMDL can be implemented.