Technical Memorandum

Significant Sediment Nonpoint Sources in the Non-Tidal Lower Gunpowder Falls Watershed

The U.S. Environmental Protection Agency (EPA) requires that Total Maximum Daily Load (TMDL) allocations account for all significant sources of each impairing pollutant (CFR 2012). This technical memorandum identifies the significant nonpoint sources of sediment in the Lower Gunpowder Falls watershed. Detailed allocations are provided for those nonpoint sources included within the Lower Gunpowder Falls Sediment TMDL Load Allocations (LAs). These are conceptual values that are designed to meet the TMDL thresholds. The State reserves the right to allocate the sediment TMDL among different sources in any manner that is reasonably calculated to protect the designated uses of the non-tidal Lower Gunpowder Falls from sediment related impacts.

The non-tidal Lower Gunpowder Falls Sediment TMDL is presented in terms of an average annual load established to ensure the support of aquatic life. Since there are no specific numeric criteria in Maryland that quantify the impact of sediment on the aquatic life of non-tidal stream systems, a reference watershed approach was be used to establish the TMDL. In order to use a reference watershed approach for this TMDL, sediment loads are estimated using a watershed model. For this analysis, the Chesapeake Bay Program Phase 5.3.2 (CBP P5.3.2) watershed model was chosen. The nonpoint source sediment loads generated within the Lower Gunpowder Falls watershed are calculated as edge-of-stream (EOS) loads and represent a long-term average loading rate.

Individual land-use sector EOS baseline loads are calculated as a product of the land-use acreage and the average annual simulated sediment loading rates (lbs/ac/yr) from the 2009 Progress Scenario (US EPA 2010). The 2009 Scenario represents land-use, loading rates, and BMP implementation simulated using precipitation and other meteorological inputs from the period 1991-2000 to represent variable hydrological conditions. The 1991-2000 simulation period represents the baseline loading rates in the TMDL for Chesapeake Bay segments. Further details of the nonpoint source sediment load calculations can be found in Sections 2.2, 4.2, and 4.3 of the main TMDL report.

Individual LAs for each nonpoint land-use sector were calculated using the allocation methodology in the MD Phase I WIP, which was designed to be equitable, effective, and consistent with water quality standards. (MDE 2010) The allocations were calculated by applying equal reductions to the *reducible* loads of all predominant land use sectors. The *reducible* load is defined as the difference between the No Action (NA) scenario and the "Everything, Everyone, Everywhere" (E3) scenario. The NA scenario represents current land-uses without any sediment controls applied, while the E3 scenario represents application of all possible BMPs and control technologies to current land-use. For more detailed information regarding the calculation of the LA, please see "*Maryland's Phase I Watershed Implementation Plan for the Chesapeake Bay Total Maximum Daily Load.* "

In the Lower Gunpowder Falls watershed, harvested forest, crops, pasture, and nurseries were identified as predominant nonpoint sources. Other land uses that contributed less than 1% of the total load were not reduced as they would produce no discernible reductions. Forest is not assigned reductions, as it represents the most natural condition in the watershed. Sediment loads from urban lands are regulated under the National Pollutant Discharge Elimination System (NPDES) and are considered a point source that must be included in the Waste Load Allocation (WLA) portion of a TMDL (US EPA 2002). Therefore, the reductions required from urban land sediment loads are defined in the point source technical memorandum.

Table 1 provides one possible scenario for the allocations of the nonpoint source sediment loads that will allow the total TMDL to be met in the Lower Gunpowder Falls watershed. The percent reductions shown in Table 1 do not represent the reductions applied to reducible loads, but the required reduction between the LA and the baseline load. The reductions vary among sectors because they reflect that different sectors have different amounts of reducible loads and have made different progress from NA.

Table 1: Lower Gunpowder Falls Sediment TMDL Allocation by Nonpoint Source Category

General Land Uses[1]	Detailed Land-Use	Baseline Load	LA	Reduction
Forest	Forest	426	426	0%
	Harvested Forest	29	20	32%
AFOs	Animal Feeding Operations	10	10	0%
Pasture	Pasture	115	95	17%
Crop	Crop	1,959	1,242	37%
Nursery	Nursery	50	39	21%
Total		**2,589**	**1,832**	**29%**

[1]The source categories represent aggregates of multiple sources (e.g., crop is an aggregate of conventional till, conservation till, and hay).

REFERENCES

CFR (Code of Federal Regulations). 2012. *40 CFR* 130.2(i). http://edocket.access.gpo.gov/cfr_2011/julqtr/40cfr130.2.htm (Accessed April, 2012).

MDE. 2010. *Maryland's Phase I Watershed Implementation Plan for the Chesapeake Bay Total Maximum Daily Load*. Baltimore, MD: Maryland Department of the Environment. Also Available at: *http://www.mde.maryland.gov/programs/Water/TMDL/TMDLHome/Pages/Final_Bay_WIP_2010.aspx*.

US EPA (U.S. Environmental Protection Agency). 2002. *Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs*. Washington, DC: U.S. Environmental Protection Agency.

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