Technical Memorandum

Significant Sediment Point Sources in the Potomac River Washington County 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 2010). This technical memorandum identifies the significant point sources of sediment in the Potomac River Washington County watershed. Detailed allocations are provided for those point sources included within the Process Water Waste Load Allocation (WLA) and National Pollutant Discharge Elimination System (NPDES) Regulated Stormwater WLA of the Potomac River Washington County Watershed Sediment TMDL. These allocations are designed to meet the TMDL threshold. The State reserves the right to allocate the TMDLs among different sources in any manner that protects aquatic life from sediment related impacts.

The Potomac River Washington County Watershed Sediment TMDL is presented in terms of an average annual load established to ensure the support of aquatic life. The watershed was evaluated using a single TMDL segment (See Sections 2.3, 2.4, and 4.2 – 4.6 of the main report for further details). It was determined that the mainstem Potomac River in Washington County is not impaired by sediment (See Sections 2.3-2.4). Therefore, this sediment TMDL will be restricted to the tributaries in the watershed draining to the Potomac River and will exclude the mainstem of the Potomac River itself.

WLAs have been calculated for NPDES regulated individual industrial, individual municipal, individual municipal separate storm sewer systems (MS4s), general mineral mining, and general MS4 permits in the Potomac River Washington County watershed. The permits can be grouped into two categories, process water and stormwater.

The process water category includes those loads generated by continuous discharge sources whose permits have Total Suspended Solids (TSS) limits. There are six process water permits in the Potomac River Washington County watershed. These include one industrial discharge, three municipal discharges, and two mineral mine discharge. The WLAs for these six process water permits are calculated based on their TSS limits (average monthly or weekly concentration values) and corresponding flow information (See Sections 2.2.2, 4.6, and Appendix B of the main report for further details). The process water permits are further divided into minor and major facilities, based on whether their design flow is greater or less than 1.0 Millions of Gallons per Day (MGD). The minor facilities are calculated as an aggregate WLA. Two facilities, the R. Paul Smith Power Station (MD0000582) and Sharpsburg WTP (MD0067784), discharge into the mainstem Potomac River and have been given informational WLAs based on their design flow and permitted sediment concentrations.

The stormwater category includes all NPDES regulated stormwater discharges. These include the Washington County NPDES Phase II jurisdictional MS4 permit and other general Phase I and II stormwater permits. These stormwater permits are regulated based on Best Management Practices (BMPs) and do not include TSS limits. In the absence of TSS limits, the baseline loads for these NPDES regulated stormwater discharges are calculated using the nonpoint source loads from the portion of the urban land use within the watershed representative of these sources, and the associated WLAs are calculated by applying reductions to the same portion of the urban land use. These calculations are described in more detail below.

An individual WLA has been calculated for the Washington County NPDES Phase II jurisdictional MS4 permit. An aggregate WLA has been calculated for the other general Phase I and II NPDES stormwater permits. Other NPDES regulated Phase I and Phase II stormwater permits include non-jurisdictional general MS4s, all industrial facilities permitted for stormwater discharges, and general construction permits. This aggregate WLA is referred to as the "Other NPDES regulated stormwater" WLA.

The computational framework chosen for the Potomac River Washington County watershed TMDL was the Chesapeake Bay Program Phase 5.2 (CBP P5.2) watershed model. Within this TMDL, the NPDES regulated stormwater baseline sediment loads are represented by a portion the urban land use nonpoint source loads. These loads are calculated as the sum of the applicable urban land use e*dge-of-stream* (EOS) loads and represent a long-term average loading rate. The applicable urban land use EOS loads are calculated 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 (US EPA 2010). Further details regarding general nonpoint source sediment load calculations can be found in Section 2.2.1 of the main report.

In order to attain the TMDL loading cap calculated for the watershed, reductions were applied equally to the predominant controllable sediment sources, which were identified as urban land, high till crops, low till crops, hay, and pasture. Since the majority of the urban land use in the Potomac River Washington County watershed is considered to be representative of the regulated stormwater sources (i.e., most urban stormwater is regulated in some fashion via a permit), the NPDES stormwater WLA is equivalent to the loads from the portion of the urban land use representative of these sources resultant from applying reductions to all of the predominant land uses.

Relative to the estimated sediment load reductions applied to urban land, which are necessary to achieve the TMDL, MDE currently requires that Phase I MS4s retrofit 10% of their existing impervious area where there is failing, minimal, or no stormwater management (estimated to be areas developed prior to 1985) every permit cycle (five years) (i.e., Phase I MS4s need to install/institute stormwater management practices to treat runoff from these existing impervious areas) (MDE 2010). Washington County, however, is a Phase II MS4 jurisdiction. While Phase II MS4 permits require improved stormwater management programs, quantification of the effort similar to the 10% required in Phase I MS4s has not been enumerated. Theoretically extending the Phase I MS4 permitting requirements to all urban stormwater sources (i.e., Phase II MS4s, industrial facilities regulated for stormwater discharges, other regulated urban stormwater

sources, and even unregulated urban stormwater sources) would require that all impervious areas developed prior to 1985 be retrofit at this pace. Additionally, MDE estimates that future stormwater retrofits will have, on average, a 65% TSS reduction efficiency (Claytor and Schueler 1997; Baldwin et al. 2007; Baish and Caliri 2009). By default, these retrofits will also provide treatment of any adjacent urban pervious runoff within the applicable drainage area (See Sections 4.5 and 4.6 of the main report for further details).

In order to determine the individual and aggregate WLAs to the Washington County Phase II MS4 and "Other NPDES regulated stormwater,", as well as the unregulated urban stormwater LA (see the nonpoint source technical memorandum), Maryland Department of Planning (MDP) urban land use was applied to further refine the CBP P5.2 urban land use. This methodology associates MDP urban land use classifications with the different types of NPDES regulated stormwater Phase I and II permits and unregulated stormwater sources (MDE 2009).

In addition to the WLA value, a Maximum Daily Load (MDL) is also presented in this document for individual major process water facilities, the aggregation of minor process water facilities, and individual, as well as aggregate, NPDES stormwater sources. The calculation of the MDL is explained in Appendix C of *Total Maximum Daily Load of Sediment in the Potomac River Washington County, Washington County, Maryland.*

Tables 1 and 3 provide one possible scenario for the distribution of the average annual point source loads attributed to the process water and NPDES regulated stormwater point sources, respectively, in the Potomac River Washington County watershed. The reductions required to meet this TMDL would entail that at a 65% TSS reduction efficiency, approximately 35% of the urban area (impervious and pervious) within the watershed that was developed prior to 1985 (both regulated and unregulated) would need to be retrofit.

Table 1: Potomac River Washington County TMDL Allocations for Process Water Point Sources

Process Water Point Source	NPDES Permit Number	Baseline Load (ton/year)	WLA (ton/year)	MDL (ton/day)	Reduction (%)
R. PAUL SMITH POWER STATION	MD0000582	54.7	54.7	0.5	0.0
Minor Facilities[1]	See Table 2	21.2	21.2	0.09	0.0
Total		**75.9**	**75.9**	**0.6**	**0.0**

Note: [1] Minor facilities are those with less than 1.0 MGD design flow. These facilities are not given individual allocations. Rather, an aggregate allocation is provided for all of the minor facilities.

Table 2: Facilities Included in the Minor Point Source WLA

Process Water Point Source	NPDES Permit Number
R. C. WILLSON WATER FILTRATION PLANT	MD0003484
SHARPSBURG WTP	MD0067784
CLEAR SPRING WTP	MD0069132
MARTIN MARIETTA - PINESBURG QUARRY	MDG491405
C. WILLIAM HETZER, INC - SHALE PIT	MDG499832

Table 3: Potomac River Washington County TMDL Allocations for NPDES Regulated Stormwater Point Sources

NPDES Regulated Stormwater Point Source	NPDES Permit Number	Baseline Load (ton/year)	WLA (ton/year)	MDL (ton/day)	Reduction (%)
Washington County Phase II MS4	MD0068306	961	815	2.6	15.2
"Other NPDES Regulated Stormwater"[1]	N/A	288	245	0.8	15.2
Total		**1,250**	**1,062**	**3.4**	**15.2**

Note: 1. The "Other NPDES Regulated Stormwater" Baseline Load and WLA include sediment loadings from Urban Barren land use, which represents the permitted construction site baseline sediment load and WLA within the watershed. No reductions were applied to Urban Barren land use because such controls would produce no discernable water quality benefit, when the remaining point and nonpoint sources within the watershed comprise 99.5% of the total sediment load. Thus, the required reduction percentage for the "Other NPDES Regulated Stormwater" stormwater source category is slightly lower than the other stormwater source categories.

FINAL

REFERENCES

Baish, A. S., and M. J. Caliri. 2009. *Overall Average Stormwater Effluent Removal Efficiencies for TN, TP, and TSS in Maryland from 1984-2002*. Baltimore, MD: Johns Hopkins University.

Baldwin, A. H., S. E. Weammert, and T. W. Simpson. 2007. *Pollutant Load Reductions from 1985-2002*. College Park, MD: Mid Atlantic Water Program.

Claytor, R., and T. R. Schueler. 1997. *Technical Support Document for the State of Maryland Stormwater Design Manual Project*. Baltimore, MD: Maryland Department of the Environment.

CFR (Code of Federal Regulations). 2010. *40 CFR* 130.2(i). http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr;sid=43ac087684bf922499af8ffed066cb09;rgn=div5;view=text;node=40%3A21.0.1.1.17;idno=40;cc=ecfr#40:21.0.1.1.17.0.16.3 (Accessed May, 2010).

US EPA (U.S. Environmental Protection Agency). 2010. In Preparation. *Chesapeake Bay Phase V Community Watershed Model*. Annapolis, MD: U.S. Environmental Protection Agency with Chesapeake Bay Program.

MDE (Maryland Department of the Environment). 2009. *Memorandum: Maryland's Approach for Calculating Nutrient and Sediment Stormwater Wasteload Allocations in Local Nontidal Total Maximum Daily Loads and the Chesapeake Bay Total Maximum Daily Load*. Baltimore, MD: Maryland Department of the Environment.

_____. 2010. *Maryland's NPDES Municipal Stormwater Permits – Phase I*. http://www.mde.state.md.us/Programs/WaterPrograms/SedimentandStormwater/storm_gen_permit.asp (Accessed May, 2010).