Technical Memorandum

Significant Sediment Point Sources in the Gwynns 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 2008). This technical memorandum identifies the significant point sources of sediment in the Gwynns Falls 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 Gwynns Falls Watershed Sediment TMDL. These are conceptual values that are designed to meet the TMDL thresholds. The State reserves the right to allocate the TMDLs among different sources in any manner that is reasonably calculated to protect aquatic life from sediment related impacts.

The Gwynns Falls Watershed Sediment TMDL is presented in terms of an average annual load established to ensure that there will be no sediment impacts affecting aquatic health. The watershed was evaluated using two TMDL segments (4.2 – 4.6 of the main report for further details).

WLAs have been calculated for NPDES regulated individual industrial, individual municipal, individual municipal separate storm sewer systems (MS4s), general mineral mining, general industrial stormwater, and general MS4 permits in the Gwynns Falls 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 5 process water permits in the Gwynns Falls watershed. These include 1 individual municipal, and 4 general mineral mining permits. The WLAs for these 5 process water permits are calculated based on their TSS limits and corresponding flow information (See Sections 2.2.2, 4.6, and Appendix B of the main report for further details).

The stormwater category includes all NPDES regulated stormwater discharges. There are 52 NPDES Phase I and Phase II stormwater permits identified throughout the Gwynns Falls watershed. These include 2 Phase I jurisdictional MS4 permits, the Phase I State Highway Administration (SHA) 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 urban land use within the watershed. The associated WLAs are calculated by applying the entirety of the reductions required to meet the TMDL to the regulated stormwater, since urban land is identified as the most extensive predominant controllable sediment source in the watershed. These calculations are described in more detail below.

Individual WLAs have been calculated for both of the Phase I jurisdictional MS4 permits and the SHA Phase I 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 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 Gwynns Falls watershed TMDL was the Chesapeake Bay Program Phase 5 (CBP P5) watershed model. Within this TMDL, the NPDES regulated stormwater baseline sediment loads are represented by the urban land use nonpoint source loads. These loads are calculated as the sum of the urban land use e*dge-of-stream* (EOS) loads and represent a long-term average loading rate. 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 2008). Further details regarding general nonpoint source sediment load calculations can be found in Section 2.2.1 of the main report.

TMDL allocations are developed for TMDL Segments 1 and 2 independently. In order to attain the TMDL loading cap, reductions are applied within both TMDL segments to solely the urban sediment sources (i.e., regulated stormwater), since urban land was identified as the most extensive predominant controllable sediment source in the segment.

Currently, MDE requires that large and medium MS4s retrofit 10% of existing urban land area where there is failing or no stormwater management every permit cycle (5 years). This level of restoration, in addition to an estimated 65% TSS reduction efficiency from future stormwater BMPs, has been determined to be the current maximum feasible, regulated stormwater reduction scenario (Claytor and Schueler 1997; Baldwin et al. 2007; Baish and Caliri 2009). Therefore, the reductions in both TMDL Segments were only applied to urban areas developed prior to 1985 (i.e., approximate areas with no stormwater management) assuming a 65% TSS reduction efficiency from future BMPs. This is consistent with MS4 permit requirements for retrofitting existing urban areas at a rate of 10% every 5 years (See Sections 4.5 and 4.6 for further description of current maximum feasible).

In order to determine the individual and aggregate WLAs to both Phase I jurisdictional MS4s, SHA MS4, and "Other NPDES regulated stormwater", Maryland Department of Planning (MDP) urban land use was applied to further refine the CBP P5 urban land use. This methodology associates MDP urban land use classifications with the different types of NPDES regulated stormwater Phase I and II permits (MDE 2009).

Tables 1 and 2 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 Gwynns Falls watershed. Additionally, Tables 3 and 4 provide possible scenarios for the distribution of the annual point source loads attributed to the NPDES regulated stormwater point sources in both TMDL Segments 1 and 2 (See Sections 4.2 - 4.6 of the main report for further details).

Table 1: Gwynns Falls TMDL Allocations for Process Water Point Sources

Process Water Point Source	NPDES Permit Number	Baseline Load (ton/yr)	WLA (ton/year)	Reduction (%)
ASHBURTON WATER FILTRATION PLANT	MD0003034	212.8	212.8	0.0
ARUNDEL CORPORATION - DELIGHT QUARRY	MDG490975	0.046	0.046	0.0
LARRY E. KNIGHT, INC.	MDG499722	0.046	0.046	0.0
S & G CONCRETE - GRANTLEY	MDG499831	0.228	0.228	0.0
AJO CONCRETE CONTRACTING, INC.	MDG499866	0.046	0.046	0.0
Total		**213.2**	**213.2**	**0.0**

Table 2: Gwynns Falls TMDL Allocations for NPDES Regulated Stormwater Point Sources

NPDES Regulated Stormwater Point Source	NPDES Permit Number	Baseline Load (ton/yr)	WLA (ton/year)	Reduction (%)
Baltimore County Phase I MS4	MD0068314	7,844.2	4,990.7	36.4%
Baltimore City Phase I MS4	MD0068292	7,205.4	3,711.8	48.5%
SHA Phase I MS4	MD0068276	648.9	409.2	36.9%
"Other NPDES Regulated Stormwater"	N/A	4,377.4	2,912.1	33.5%
Total		**20,076.0**	**12,023.7**	**40.1%**

Table 3: Gwynns Falls TMDL Segment 1 Allocations for NPDES Regulated Stormwater Point Sources

NPDES Regulated Stormwater Point Source	NPDES Permit Number	Baseline Load (ton/yr)	WLA (ton/year)	Reduction (%)
Baltimore County Phase I MS4	MD0068314	5,271.0	3,618.6	31.3
SHA Phase I MS4	MD0068276	408.8	281.0	31.3
"Other NPDES Regulated Stormwater"	N/A	1,287.9	1,074.6	16.6
Total		**6,967.7**	**4,974.2**	**28.6**

Table 4: Gwynns Falls TMDL Segment 2 Allocations for NPDES Regulated Stormwater Point Sources

NPDES Regulated Stormwater Point Source	NPDES Permit Number	Baseline Load (ton/yr)	WLA (ton/year)	Reduction (%)
Baltimore County Phase I MS4	MD0068314	2,573.2	1,372.1	46.7%
Baltimore City Phase I MS4	MD0068292	7,205.4	3,711.8	48.5%
SHA Phase I MS4	MD0068276	240.1	128.2	46.6%
"Other NPDES Regulated Stormwater"	N/A	3,089.5	1,837.5	40.5%
Total		**13,108.3**	**7,049.5**	**46.2%**

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.

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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.

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