

Technical Memorandum

Significant Sediment Point Sources in the Little Patuxent River 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 2009). This technical memorandum identifies the significant point sources of sediment in the Little Patuxent River 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 Little Patuxent River Watershed Sediment TMDL. These allocations are designed to meet the TMDL thresholds. The State reserves the right to allocate the TMDLs among different sources in any manner that protects aquatic life from sediment related impacts.

The Little Patuxent River Watershed Sediment TMDL is presented in terms of an average annual load established to ensure the support of aquatic life.

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 Little Patuxent River 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 14 process water permits in the Little Patuxent River watershed. They include three individual industrial permits, five individual municipal permits, and six general mineral mining permits. The WLAs for these 14 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.

The stormwater category includes all NPDES regulated stormwater discharges. There are 37 NPDES Phase I and Phase II stormwater permits identified throughout the Little Patuxent River watershed. These include the Anne Arundel County Phase I jurisdictional MS4 permit, the Howard County Phase I jurisdictional MS4 permit, 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 reductions to the urban land use. These calculations are described in more detail below.

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Individual WLAs have been calculated for the Anne Arundel County Phase I jurisdictional MS4 permit, the Howard County Phase I jurisdictional MS4 permit, and the Phase I SHA 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 Little Patuxent River 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 the urban land use nonpoint source loads. These loads are calculated as the sum of the urban land use *edge-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 2009). 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, reductions were only applied to the urban sediment sources, since urban land was identified as the only predominant controllable sediment source at 68% of the Little Patuxent River Baseline Load Contribution (see Table 4 of the main report). Additionally, all urban land in the Little Patuxent River watershed is considered to represent regulated stormwater sources (i.e., all urban stormwater is regulated via a permit).

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) within a 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 2009b). Theoretically, extending these permitting requirements to all urban stormwater sources (i.e., not solely those sources regulated via Phase I MS4 permits) 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 Anne Arundel County Phase I jurisdictional MS4 permit, the Howard County Phase I jurisdictional MS4 permit, the Phase I SHA MS4 permit, and “Other NPDES regulated stormwater”, 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 (MDE 2009a).

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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 Little Patuxent River Watershed, Anne Arundel and Howard Counties, 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 Little Patuxent River watershed. The reductions required to meet this TMDL would entail that at a 65% TSS reduction efficiency, 96% of the urban area (impervious and pervious) within the watershed that was developed prior to 1985 would need to be retrofit.

Table 1: Little Patuxent 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 (%)
PINEY ORCHARD WWTP	MD0059145	54.7	54.7	0.5	0.0
DORSEY RUN ADVANCED WASTEWATER TREATMENT PLANT	MD0063207	91.2	91.2	0.8	0.0
LITTLE PATUXENT WATER RECLAMATION PLANT	MD0055174	1,322.4	1,322.4	11.3	0.0
U.S. ARMY - FORT GEORGE G. MEADE	MD0021717	205.2	205.2	1.8	0.0
PATUXENT WATER RECLAMATION FACILITY	MD0021652	342.0	342.0	2.9	0.0
Minor Facilities ¹	See Table 2	17.3	17.3	0.09	0.0
Total		2,032.8	2,032.8	17.3	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 Minor Process Water Point Source WLA

Process Water Point Source	NPDES Permit Number
JOHN RITTER TRUCKING, INC.	MD0068713
BBSS, INC. - TURNER PIT	MD0068993
MARYLAND & VIRGINIA MILK PRODUCERS ASSOCIATION	MD0000469
AGGREGATE INDUSTRIES - CROFTON READY-MIX CONCRETE	MDG490344
CAMPBELL SAND & GRAVEL COMPANY	MDG492410
CUNNINGHAM EXCAVATING, INC.	MDG499709
RELIABLE CONTRACTING COMPANY, INC.-ASPHALT DIV.	MDG499725
DANIEL G. SCHUSTER INC.- JESSUP	MDG499739
LAFARGE - JESSUP CONCRETE PLANT	MDG499860

Table 3: Little Patuxent River 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 (%)
Anne Arundel County Phase I MS4	MD0068314	3,310.8	2,632.3	94.8	20.5
Howard County Phase I MS4	MDR05550	6,950.3	3,609.3	129.9	48.1
SHA Phase I MS4	MD0068276	1,371.3	875.8	31.5	36.1
“Other NPDES Regulated Stormwater” ¹	N/A	5,460.1	4,108.4	147.9	24.8
Total		17,092.5	11,225.8	404.1	34.3

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 94.2% of the Little Patuxent River Baseline Load Contribution. Thus, the required reduction percentage for the “Other NPDES Regulated Stormwater” stormwater source category is slightly lower than the other stormwater source categories. Additionally, the Anne Arundel County Phase I MS4 has a much smaller reduction percentage than the Howard County Phase I MS4, as a much greater percentage of the urban land use in Howard County is pre-1985.

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REFERENCES

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