

## Technical Memorandum

### ***Significant Sediment Nonpoint Sources in the Patapsco River Lower North Branch Watershed***

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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 nonpoint sources of sediment in the Patapsco River Lower North Branch watershed. Detailed allocations are provided for those nonpoint sources included within the Load Allocation (LA) portion of the Patapsco River Lower North Branch TMDL Contribution (See Executive Summary of the main report for further description of the watershed TMDL Contribution). 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 Patapsco River Lower North Branch 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 (See Sections 2.3, 2.4, and 4.2 – 4.6 of the main report for further details) with consideration of additional upstream loads from the South Branch Patapsco River (See Sections 2.1 and 2.2.3 of the main report for further details). The computational framework chosen for the Patapsco River Lower North Branch watershed TMDL was the Chesapeake Bay Program Phase 5 (CBP P5) watershed model. The nonpoint source sediment loads generated within the Patapsco River Lower North Branch watershed are calculated as the sum of corresponding land use *edge-of-stream* (EOS) loads within the watershed and represent a long-term average loading rate. Individual 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 of the 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 and the South Branch Patapsco River watershed independently. No reductions are applied to the upstream South Branch Patapsco River watershed, since it was concluded that sediment loads from the watershed do not have a negative impact on the aquatic health of the Patapsco River Lower North Branch mainstem. Additionally, since the current *forest normalized sediment load* for TMDL segment 1 is below the reference watershed *sediment loading threshold*, no reductions in sediment loads were needed within the segment (See Sections 4.2 - 4.6 of the main report for further details). Thus, in order to attain the TMDL loading cap, reductions are solely applied within TMDL Segment 2 to the urban sediment sources, since urban land was identified as the most extensive predominant controllable sediment source in the segment. However, within this TMDL, the urban load is used to represent the National Pollutant Discharge Elimination System (NPDES) regulated stormwater load, which is considered a point source that must be included in the Waste Load Allocation (WLA) portion of a TMDL (US EPA 2002). Therefore, the reductions to the urban load are defined in the point source technical memorandum. When reductions are applied to the urban load using the current regulated stormwater maximum feasible reductions as a basis, no further reductions are required from the LA

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portion of the Patapsco River Lower North Branch TMDL Contribution within TMDL Segment 2. No reductions are required from the LA as the reductions associated with the current regulated stormwater maximum feasible scenario result in sediment loading reductions greater than those needed to achieve the TMDL (See Sections 4.5 and 4.6 of the main report for further description of current maximum feasible and the nonpoint source allocations). Thus, there are no nonpoint source reductions applied to achieve this TMDL.

Table 1 provides one possible scenario for the distribution of the annual nonpoint source loads between different land use categories in the Patapsco River Lower North Branch watershed. Additionally, Table 2 provides one possible scenario for the distribution of the annual nonpoint source loads between different land use categories in TMDL Segment 2 only, as both TMDL Segment 1 and the South Branch Patapsco River watershed received an informational allocation equivalent to their baseline loads (See Sections 4.2 - 4.6 of the main report for further details). The source categories in Tables 1 and 2 represent aggregates of multiple sources (e.g. crop source is an aggregate of high till, low till, hay, animal feeding operations, and nursery sources).

**Table 1: Patapsco River Lower North Branch TMDL Allocation by Nonpoint Source Category**

<b>Nonpoint Source Category</b>	<b>Baseline Load (ton/yr)</b>	<b>LA (ton/yr)</b>	<b>Reduction (%)</b>
Crop	3,835.5	3,835.5	0.0
Extractive	191.0	191.0	0.0
Forest	2,697.1	2,697.1	0.0
Pasture	436.9	436.9	0.0
<b>Total</b>	<b>7,160.4</b>	<b>7,160.4</b>	<b>0.0</b>

**Table 2: Patapsco River Lower North Branch TMDL Segment 2 Allocations by Nonpoint Source Category**

<b>Nonpoint Source Category</b>	<b>Baseline Load (ton/yr)</b>	<b>LA (ton/yr)</b>	<b>Reduction (%)</b>
Crop	1,196.3	1,196.3	0.0
Extractive	135.8	135.8	0.0
Forest	1,286.2	1,286.2	0.0
Pasture	141.7	141.7	0.0
<b>Total</b>	<b>2,760.0</b>	<b>2,760.0</b>	<b>0.0</b>

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## REFERENCES

CFR (Code of Federal Regulations). 2008. *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 December, 2008).

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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