Technical Memorandum

Significant Nutrient Nonpoint Sources in the Mattawoman Creek Watershed

The U.S. Environmental Protection Agency requires that Total Maximum Daily Load (TMDL) allocations account for all significant sources of each impairing pollutant. This technical memorandum identifies, in detail, the significant nonpoint sources of nitrogen (TN) and phosphorus (TP) in the Mattawoman Creek watershed and their distribution between different land uses. Details are provided for allocating NPS loads for nutrients to different land use categories. These are conceptual values that are within the TMDL thresholds. The Maryland Department of the Environment (MDE) expressly reserves the right to allocate the TMDLs among different sources in any manner that is reasonably calculated to achieve water quality standards.

TMDLs are being established in the Mattawoman Creek watershed for both low flow and average annual flow conditions. The nonpoint source (NPS) loads that were used in the model account for both "natural" and human-induced components. The low flow NPS loads were based on in-stream monitoring data. Insufficient data are available to distribute the low flow NPS load among different land use categories.

The average annual NPS loads were determined using land use loading coefficients. The land use information was based on 2000 Maryland Department of Planning data. The total NPS load was calculated by summing all of the individual land use areas and multiplying by the corresponding land use loading coefficients. The loading coefficients were based on the results of the Chesapeake Bay Model[1], which was a continuous simulation model. The Chesapeake Bay Program nutrient loading rates represent loads delivered to the stream for the year 2000 assuming Best Management Practice (BMP) implementation at levels consistent with current Maryland's Tributary Strategy progress, and account for atmospheric deposition, agriculture, and forestland. Loads from urban development in this watershed are allocated to municipal stormwater in waste load allocations (WLA). Tables 1A and 1B provide one possible scenario for the distribution of average annual nitrogen and phosphorus NPS loads between different land use categories.

[1] U.S. EPA Chesapeake Bay Program, "Chesapeake Bay Program: Watershed Model Application to Calculate Bay Nutrient Loadings: Final Findings and Recommendations," and Appendices, 1996.

Table 1A
Nonpoint Source Nitrogen Loads Attributed to
Significant Land Uses for Mattawoman Creek Average Annual TMDLs

Land Use Category	Percentage of Nonpoint Source Load	Nonpoint Source Load (lbs/yr)
Mixed Agricultural	51.0 %	59,478
Forest and Other Herbaceous	36.7%	42,868
Atmosphere Deposition[2]	12.3%	14,353
Total	100 %	116,699

*Loads from urban development in this watershed are allocated to municipal storm water in the waste load allocation (WLA) (see "Nutrient Point Sources in the Mattawoman Creek Watershed", December, 2003.

Table 1B
Nonpoint Source Phosphorus Loads Attributed to
Significant Land Uses for Mattawoman Creek Average Annual TMDLs

Land Use Category	Percentage of Nonpoint Source Load	Nonpoint Source Load (lbs/yr)
Mixed Agricultural	73.5 %	3,901
Forest and Other Herbaceous	10.7 %	567
Atmosphere Deposition[2]	15.8 %	836
Total	100 %	5,304

*Loads from urban development in this watershed are allocated to municipal storm water in the waste load allocation (WLA) (see "*Technical Memorandum: Nutrient Point Sources in the Mattawoman Creek Watershed*", December, 2003.

It must be noted that these loads are based on broad-scaled estimates. Efforts are underway to update the Chesapeake Bay model, and MDE anticipates that better estimates of land use and loading rates will be available in the future.

[2] The atmospheric deposition load is attributable to deposition only to surface water, atmospheric deposition to land surfaces is included in the loads attributed mixed agriculture, forest and other herbaceous, and urban land uses.