

Technical Memorandum

Significant Phosphorus and Sediment Nonpoint Sources in the Tony Tank Lake Watershed

TMDLs for phosphorus and sediment are being proposed in the Tony Tank Lake watershed for annual average conditions. EPA requires that TMDL allocations account for all significant sources including both “natural” and human-induced components. This technical memorandum identifies the distribution of maximum allowable nonpoint source (NPS) loads among different land use categories. These load contributions are conceptual values that are within the proposed TMDL thresholds. They represent viable individual allocations to each land use category. Maryland expressly reserves the right to allocate the TMDLs among different sources in any manner that is reasonably calculated to achieve water quality standards.

The NPS loads were determined using land use loading coefficients. The land use information was based on 1994 Maryland Office of Planning data and 1997 Farm Service Agency 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 (U.S. EPA, 1991), which was a continuous simulation model. The Chesapeake Bay Program nutrient loading rates account for atmospheric deposition¹, loads from septic tanks, and loads coming from urban development, agriculture, and land covered by forest or other herbaceous growth. The loading rates account for both “natural” and human-induced sources. The current total NPS phosphorus load is estimated to be 1,812 lb/yr, while the total NPS sediment load is estimated to be 275 tons/yr.

The computation of the phosphorus and sediment TMDLs are presented in the report *Total Maximum Daily Loads of Phosphorus and Sediments for Tony Tank Lake*. The annual TMDL for phosphorus is 735.7 lbs/yr and the TMDL for sediment is 188.3 tons/yr. Table 1 and Table 2 provide one possible scenario for the distribution of phosphorus and sediment NPS loads between different land use categories.

The NPS load distribution under the TMDL, which is attributed to specific land uses, is based upon estimated reductions needed to achieve the target NPS goal. For the purpose of illustrating one possible scenario, the percent reductions needed to achieve the NPS goal are applied equally to each land use category within the watershed. The percent reduction can be calculated by dividing the difference between the NPS target load and the current NPS load by the current NPS load (Target Load - Current Load)/(Current Load).

¹ Atmospheric deposition directly to the water’s surface was considered to be insignificant because the surface area of the water in the Tonytank Lake Basin accounts for less than 0.5% of the total surface area in the watershed. Atmospheric deposition to the land surface is accounted for in the land use loading coefficients.

Table 1
Nonpoint Source Phosphorus Loads Attributed to Significant Land Uses
For Average Annual TMDL

Land Use Category	Percent of Nonpoint Source Load	Nonpoint Source Load (lbs/yr)
Agriculture	55 %	364.1
Forest and Herbaceous Cover	2 %	13.2
Urban	43 %	284.8
TOTAL	100 %	662.1

Table 2
Nonpoint Source Sediment Loads Attributed to Significant Land Uses
For Average Annual TMDL

Land Use Category	Percent of Nonpoint Source Load	Nonpoint Source Load (T/yr)
Agriculture	66 %	124.3
Forest and Herbaceous Cover	6 %	11.3
Urban	28 %	52.7
TOTAL	100 %	188.3

Maryland anticipates that, when considering detailed implementation, opportunities and priorities for nonpoint source reductions will vary throughout the watershed. For example, giving consideration to transport losses from different parts of the watershed could suggest more cost-effective means of achieving the overall goal. In addition, cost-effectiveness will be considered in meeting the load reductions as part of any detailed implementation strategy. Any implementation strategy that might shift reductions among the land uses would be done in a manner that involves stakeholders and would not compromise the TMDL goal.

These loads are based on broad-scale estimates of land use and loading rates. Efforts are underway to update the Chesapeake Bay model, and Maryland anticipates that better estimates will be available in the future.