FINAL

Technical Memorandum_____

Significant Nutrient Nonpoint Sources in the Swan Creek Watershed

EPA 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 Swan Creek watershed and their distribution between different land uses. Details are provided for allocating nonpoint source 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 Swan Creek watershed for both low-flow and average annual conditions. The nonpoint source loads that were used in the model account for both "natural" and human-induced components. Low-flow nonpoint source loads were based on in-stream monitoring data. Insufficient data are available to distribute the low-flow nonpoint source load among different land use categories.

The average annual nonpoint source loads were determined using land use loading coefficients. The land use information was based on 1997 Maryland Office of Planning data. The total nonpoint source 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, loads from septic tanks, and loads coming from urban development, agriculture, and forestland. Tables 1A and 1B provide one possible scenario for the distribution of average annual nitrogen and phosphorus nonpoint source loads between different land use categories.

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[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.

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

Land Use Category	Percentage of Nonpoint Source Load	Nonpoint Source Load (lbs/yr)
Mixed Agricultural	52.1%	63,514
Urban	36.7%	44,740
Forest and Other Herbaceous	5.7%	6,949
Atmosphere Deposition[2]	5.5%	6,704
Total	100 %	121,907

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

Land Use Category	Percentage of Nonpoint Source Load	Nonpoint Source Load (lbs/yr)
Mixed Agricultural	38.4%	3,753
Urban	58.7%	5,737
Forest and Other Herbaceous	0.6%	59
Atmosphere Deposition[2]	2.3%	225
Total	100 %	9,774

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