

## ***Technical Memorandum***

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### ***Significant Nutrient Nonpoint Sources in the Back River Watershed***

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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 Back River 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 Back River watershed for both low flow and average annual flow conditions. The nonpoint source (NPS) loads that were used in the model account for all sources, including both “natural” and human-induced components. The low flow NPS loads and the average annual flow NPS were both estimated using the HSPF model. As explained in the main document, the simulation of the Back River Watershed used the following assumptions: (1) variability in patterns of precipitation were estimated from existing National Oceanic and Atmospheric Administration (NOAA) meteorological stations; (2) hydrologic response of land areas were estimated for a simplified set of land uses in the basin; and (3) agricultural information was estimated from the Maryland Department of Planning (MDP) land use data, the 1997 Agricultural Census Data, and the Farm Service Agency (FSA). The nutrient loads account for contributions from atmospheric deposition, septic tanks, cropland, pasture, feedlots, and forest. Urban land contributions are included in the point sources technical memorandum. The land use information was based on 1997 Maryland Department of Planning data. These percentages were then applied to the TMDL loads estimated from MDE observed data.

Tables 1A and 1B provide one possible scenario for the distribution of average annual nitrogen and phosphorus NPS loads between different land use categories.

**Table 1A**  
**Nonpoint Source Nitrogen Loads Attributed to**  
**Significant Land Uses for Back River Average Annual TMDLs**

<b>Land Use Category</b>	<b>Percentage of Nonpoint Source Load</b>	<b>TN Nonpoint Source Load (lbs/yr)</b>
Mixed Agricultural	13 %	3,379
Forest and Other Herbaceous	57 %	15,096
Septics	30 %	7,855
<b>Total</b>	<b>100 %</b>	<b>26,330</b>

**Table 1B**  
**Nonpoint Source Phosphorus Loads Attributed to**  
**Significant Land Uses for Back River Average Annual TMDLs**

<b>Land Use Category</b>	<b>Percentage of Nonpoint Source Load</b>	<b>TP Nonpoint Source Load (lbs/yr)</b>
Mixed Agricultural	8 %	103
Forest and Other Herbaceous	92 %	1,131
Septics	0 %	0
<b>Total</b>	<b>100 %</b>	<b>1,234</b>

Atmospheric deposition to land surfaces is included in the loads attributed mixed agriculture, forest and other herbaceous, and urban land uses.