

## ***Technical Memorandum***

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### ***Significant Nutrient Nonpoint Sources in the Breton Bay 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 (NPS) of nitrogen (TN), phosphorus (TP) and biochemical oxygen demand (BOD) in the Breton Bay watershed and their distribution between different land uses. Details are provided for allocating NPS loads for nutrients and BOD 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 Breton Bay watershed for both the growing season and average annual flow conditions. The NPS loads that were used in the model account for both “natural” and human-induced components. Growing season NPS loads were based on in-stream monitoring data. Sufficient data are not available to distribute the growing season 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 Office of Planning data. The total NPS load was calculated by the summation all of the individual lands use areas and multiplying by the corresponding land use loading coefficients. The loading coefficients were based on the results of the Chesapeake Bay Model<sup>1</sup>, which was a continuous simulation model. The Chesapeake Bay Program nutrient loading rates represent loads delivered to the waterbody 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 storm water in waste loads allocation (WLA). Tables 1A, 1B and 1C provide the distribution of average annual nitrogen, phosphorus and BOD NPS loads between different land use categories.

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<sup>1</sup> 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 Breton Bay Average Annual TMDLs**

<b>Land Use Category</b>	<b>Percentage of Nonpoint Source Load</b>	<b>Nonpoint Source Load (lbs/year)</b>
Mixed Agricultural	74.7 %	89,553
Forest and Other Herbaceous	21.3 %	25,470
Atmosphere Deposition <sup>2</sup>	4.0 %	4,879
<b>Total</b>	<b>100.0 %</b>	<b>119,902</b>

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

<b>Land Use Category</b>	<b>Percentage of Nonpoint Source Load</b>	<b>Nonpoint Source Load (lbs/year)</b>
Mixed Agricultural	89.6 %	6,510
Forest and Other Herbaceous	5.5 %	398
Atmosphere Deposition <sup>2</sup>	4.9 %	357
<b>Total</b>	<b>100.0 %</b>	<b>7,265</b>

<sup>2</sup> The atmospheric deposition load is attributable to deposition only to surface water, and atmospheric deposition to land surfaces is included in the loads attributed mixed agriculture, forest and other herbaceous, and urban land.

**Table 1C**  
**Nonpoint Source BOD Loads Attributed to**  
**Significant Land Uses for Breton Bay Annual Average TMDLs**

	Load (lbs/year)
<b>Non Point Source*</b>	202,520

\*Including loads allocated for urban stormwater.

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.