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Technical Memorandum_____

Significant Phosphorus and Sediments Nonpoint and Point Sources in Lake Linganore Watershed

Annual TMDLs for phosphorus and sediments are being proposed in the Lake Linganore watershed. 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 point source (PS) and nonpoint source (NPS) loads among different source categories. These load contributions are conceptual values that are within the proposed TMDL threshold. They represent viable individual allocations to each source category. 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.

The NPS loads were determined using land use loading coefficients. The land use information was based on 2000 Maryland Department of Planning (MDP) 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 for forest, developed and agricultural areas were based on the results of the Chesapeake Bay Program Phase 4.3 Watershed Model (Segment 210), which is a continuous simulation model. The Chesapeake Bay Program nutrient loading rates account for atmospheric deposition,[1] 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 51,129 lbs/yr.

The computations of the phosphorus and sediments TMDLs are presented in the report entitled, "*Total Maximum Daily Loads of Phosphorus and Sediments for Lake Linganore*", MDE, September 2002. The annual TMDL for phosphorus is 5,288 lbs/yr and the TMDL for sediments is 7,073 tons/yr. The phosphorus TMDL NPS allocation is 4,150 lbs/year, and the PS allocation is 609 lbs/yr. Table 1 and Table 2 provide possible scenarios for the distribution of phosphorus among different NPS and PS source categories. The solid material from point sources is small in comparison to NPS sediments. Thus, a nominal allocation of 1% (707 tons/year)[2] is given to the point source, with the remainder of the allowable sediment load (6,346 tons/year) attributed to nonpoint sources. Table 3 and Table 4 provide possible scenarios for the distribution of sediment among different NPS and PS source categories.

The NPS load distribution under the TMDL 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 nonpoint source category

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1 Atmospheric deposition to the land surface is accounted for in the land use loading coefficients.

2 MDE recognizes that this nominal allocation exceeds the likely solids discharge of this facility at any time in the future. The allocation does not imply a future permitting allowance. Permitting decisions will consider the impact of discharge to the local portion of Linganore Creek as well as to Lake Linganore.

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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 (Current Load - Target Load)/(Current Load).

**Table 1: Phosphorus Loads Attributed to Significant Nonpoint Sources
For Average Annual Phosphorus TMDL**

Source Category	Percent of Nonpoint Source Load	Nonpoint Source Load (lbs/yr)
Agriculture	86.2%	3,577.5
Developed	13.2%	547.8
Forest and Herbaceous Cover	0.6 %	24.9
TOTAL	**100 %**	**4,150.2**

**Table 2: Phosphorus Loads Attributed to Significant Point Sources
For Average Annual Phosphorus TMDL**

Source Name	Permit Number	Percent of Point Source Load	Point Source Load (lbs/yr)	Current Avg. Flow (gpd)
Libertytown WWTP	**MD0060577**	**100 %**	**609**	**30,000**

MDE 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 be consistent with the TMDL goal.

The current load estimates are based on broad-scale simulation of land use loading rates. Efforts are underway to update the Chesapeake Bay Watershed model, and MDE anticipates that better estimates will be available in the future.

**Table 3: Sediment Loads Attributed to Significant Nonpoint Sources
For Average Annual Sediment TMDL**

Source Category	Percent of Nonpoint Source Load	Nonpoint Source Load (tons/yr)
Agriculture	89.2 %	5660.6
Developed	8.4%	533.1
Forest and Herbaceous Cover	2.4 %	152.3
TOTAL	**100 %**	**6,346**

**Table 4: Sediment Loads Attributed to Significant Point Sources
For Average Annual Sediment TMDL**

Source Name	Permit Number	Percent of Point Source Load	Point Source Load (tons/yr)	Current Avg. Flow (gpd)
Libertytown WWTP	**MD0060577**	**100 %**	**707**	**30,000**