Understanding and Implementing TMDLs and WIPs

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Supporting of the Chesapeake Bay TMDL using traditional assessment programs and non-traditional partner efforts

The U.S. Environmental Protection Agency has established the Chesapeake Bay Total Maximum Daily Load (TMDL), a historic and comprehensive "pollution diet" with rigorous accountability measures to initiate sweeping actions to restore clean water in the Chesapeake Bay and the region's streams, creeks and rivers. The TMDL identifies the necessary pollution reductions of nitrogen, phosphorus and sediment across Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia, and the District of Columbia, and sets pollution limits necessary to meet application water quality standards (i.e. dissolved oxygen, water clarity, underwater Bay grasses and chlorophyll-a, an indicator of algae levels) in the Bay, its tidal rivers and embayments. Watershed Implementation Plans detail how and when the six States and District of Columbia will meet pollution reduction allocations. The Chesapeake Bay Partnership (CBP) tidal and nontidal monitoring networks collect physical, chemical and biological data annually that is used to evaluate Bay water quality against water quality impairment standards, track changes in response to management actions, and target areas for further management actions. This presentation will further discuss the evolution of the CBP monitoring programs including the use of Nontraditional partner data in regulatory assessments, informing the status of waterways, supporting management action targeting tools and in the development of health and restoration indicators.

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Effective Ag BMPs for Shenandoah River Chesapeake Bay TMDL Effort

The hydrology and geology of the Shenandoah River Valley (SRV) are major factors controlling the nitrogen and phosphorus yield of the River. The mountains surrounding the SRV are not karst. The mountain streams yield high storm runoff, very low base flow and little nitrogen or phosphorus as documented by Friends of the Shenandoah River (FOSR) data. The karst carbonate rocks that cove most the Valley between the mountains have limited periods of overland runoff, low storm peaks, high base flow that supports the low flow of the Shenandoah River and yield 2+ mg/L of dissolved nitrate as N. Because most the base flow of the Shenandoah River is from the karst rocks one would expect that the main stem of the River would contain about 2 mg/L of dissolved nitrate and the concentrations would decrease with increasing flow. USGS data collected from the North Fork at Strasburg VA and the South Fork at Front Royal VA show that the dissolved and total nitrogen increase with flow up to about 1 cfs

per square mile. The apparent loss of nitrogen may be as much as 400 tons per year for the SRV. If photosynthetic up take is the cause of the loss are the plants measured in samples collected at high flow? Could denitrification be the cause? Because most the nonpoint source nitrogen comes from ground water in the karst areas the most effective Ag BMPs are those that limit nitrogen application to the land. Because 2/3 the phosphorus is transported during the 5% of the time when there is overland flow from the karst areas the most effective Ag BMPs are those that maintain soil on the land.

Note: Also speaking in this session is Jim George, MD Dept. of the Environment