**Virginia Nutrient Removal Program for Chesapeake Bay**

Virginia is part of the Chesapeake Bay watershed and the majority of the wastewater treatment plants in the state discharge into Chesapeake Bay through one of 5 major basins (James River, Potomac River, Rappahannock River, York River and the eastern Shore). In 2010, after decades of voluntary efforts to fully restore the Chesapeake Bay, the United States Environmental Protection Agency (EPA) established pollution load limits (annual mass based load limits) to restrict three major pollutants fouling the Bay’s waters: nitrogen and phosphorus (nutrients) and sediment (soil). These loading limits, which set clear goals for reducing excess pollution, are science-based estimates of the amount of each substance the Chesapeake Bay and its tributaries can receive and still meet standards for clean, healthy water. The goals, or pollution reduction targets, require the seven jurisdictions in the Chesapeake Bay watershed (Maryland, Virginia, Pennsylvania, Delaware, West Virginia, New York and the District of Columbia) to reduce their nutrient and sediment loadings to the Bay until these protective limits are met, within a specific time frame.

In response to the new pollution limits, also known as the Total Maximum Daily Load (TMDL), the seven Bay jurisdictions created individual Watershed Implementation Plans (WIPs), or restoration blueprints that detail specific actions each would take to meet their pollution reduction goals by 2025. The blueprints guide local and state Bay restoration efforts through the next decade and beyond.

EPA requires that the six states and the District of Columbia each reach 60 percent of their 2025 restoration targets for nitrogen, phosphorus and sediment pollution reduction by the year 2017. This progress is measured from the baseline established in the TMDL and compared to full blueprint implementation, which must be achieved by the year 2025.

The Nitrogen removal portion of the Chesapeake Bay TMDL for Virginia includes 101 municipal wastewater treatment plants that are > 0.1 million gallons per day average design flow. The Virginia program also includes 25 industrial dischargers with nitrogen limits the most significant being the poultry processing industry. Approximately 27 % of the entire nitrogen load entering Chesapeake Bay comes from Virginia with 39% of the load from point source wastewater treatment plam The Virginia nitrogen removal program also includes a portion of the 370 million gallon per day Blue Plains Wastewater Treatment plant that is operated by the District of Columbia Water and Sewer Authority.

As of March 2015, 60 Virginia publically owned wastewater treatment plants have received grant funding for nitrogen removal improvements from the Virginia Water Quality Improvement Fund. The majority of the facilities have completed nitrogen removal projects with 9 projects still under construction with all to be completed by 2017. Nitrogen removal limits range from a low of 3 mg/l total nitrogen up to 6 mg/l. Most treatment plants with the lower 3 mg/l limit utilize supplemental carbon to consistently achieve the limit. The higher 6 mg/l permit limits generally do not need to use supplemental carbon on a consistent basis. Virginia also has a nutrient trading program that allows dischargers to buy and sell credits and some communities has only installed modest nitrogen removal technologies and purchase credit to achieve compliance.

37 treatment plants are listed in the Virginia database that are > 1 million gallons per day in average design flow and are using or are in design for nitrogen processes that will require supplemental carbon. Of the 37 facilities all of the largest treatment facilities of 25 million gallons per day average flow use methanol as the supplemental carbon source for denitrification with the exception of the 75 mgd Henrico WWTF that uses glycerin. Reclaimed methanol is only used at the Hampton Roads Sanitation District Nansomond WWTF. This facility formally used up to 1,500 gpd of reclaimed methanol however, recent process improvements have greatly reduced the reclaimed methanol use to <200 gpd.