PROGRESS ON REDUCING POLLUTION FROM WASTEWATER FACILITIES

How many wastewater facilities are in the Chesapeake Bay watershed? There are 483 significant wastewater facilities – 402 are municipal wastewater facilities and 81 are industrial wastewater facilities. In total, these facilities **discharge more than 3 billion gallons** of treated wastewater every day. After treating water, even to the limit of technology, the discharge from these facilities contains nitrogen and phosphorus that add to the pollution problems in streams, creeks and rivers and the Chesapeake Bay.

How much progress has been made? During the past 25 years, significantly more progress has been made in reducing the amount of nitrogen and phosphorus from wastewater facilities than from any other sector. **Wastewater pollution has dropped 55 percent**, while agriculture pollution has decreased 31 percent and urban/suburban pollution has increased 15 percent..

These reductions were achieved despite the **population of the Bay watershed increasing by 25 percent** – from 13.5 million people to 17 million people – during the same time period.

Nitrogen has been reduced from 88 million pounds in 1985 to 49 million pounds in 2009, a drop of 39 million pounds for **a decrease of 44 percent**. As a result, the portion of the Bay's overall nitrogen pollution that is attributed to wastewater dropped from 26 percent in 1985 to 19 percent in 2009.

Phosphorus reductions are even more impressive, from 9 million pounds in 1985 to 3.1 million pounds in 2009, a drop of 6 million pounds for **a decrease of 67 percent**. As a result, the portion of the Bay's overall phosphorus pollution that is attributed to wastewater dropped from 35 percent in 1985 to 17 percent in 2009.

By 2015, when all 402 significant municipal wastewater facilities and many of the 81 significant industrial wastewater facilities will be upgraded to meet new stringent permit limits, wastewater loads to the Bay will be reduced by **an additional 11 million pounds of nitrogen and 100,000 pounds of phosphorus**.

How much progress does this represent toward Chesapeake Bay Program goals for wastewater? As of 2009, the Bay restoration partnership has met 78 percent of the goal to reduce nitrogen to 38 million pounds and 99 percent of the goal to reduce phosphorus to 3 million pounds from wastewater facilities.

How were these pollution reductions achieved? These reductions have resulted from a combination of a new permitting program instituted by EPA, phosphorus detergent bans, installation of aggressive treatment technologies and manufacturing process changes. From 2007 to 2010, $1.9 billion has been invested in upgrading wastewater treatment facilities.

Also, some states, including Pennsylvania and Virginia, have created nutrient trading programs that encourage wastewater treatment plants to design upgrades with greater nutrient reductions, then sell nutrient credits to other facilities.

What is the permitting program implemented by EPA? In 2005, Chesapeake Bay jurisdictions began to implement a new permitting program created by EPA that limited the amount of nitrogen and phosphorus that the Bay watershed's 483 significant wastewater treatment plants could discharge. To meet the nutrient limits, most of these facilities are being upgraded with biological and chemical nutrient reduction technology, some to the limits of current treatment technology. Most facilities will be upgraded by 2015.

To date, permits have been reissued for 305 of the 483 facilities. These permits cover 74 percent of the flow from significant wastewater facilities in the watershed, or 2.3 billion gallons of water per day.

What are the aggressive treatment technologies? Biological nutrient removal (BNR) uses microorganisms to remove nitrogen and phosphorus from wastewater during treatment. Wastewater treated at facilities using BNR contains, on an annual average, less than 8 milligrams per liter (mg/l) of nitrogen.

Enhanced nutrient removal (ENR), which is being used in Maryland and Virginia, improves upon the nutrient reductions achieved through BNR. Wastewater treated at facilities using ENR can contain as little 3 mg/l of nitrogen and 0.3 mg/l of phosphorus. In addition, Virginia regulations impose even more stringent limits for phosphorus (0.18 mg/l) for certain sensitive waters in the Potomac River basin. Maryland's Bay Restoration Fund – also known as the "Flush Fee" – and Virginia's Water Quality Improvement Fund provide partial funding for nutrient removal upgrades for major wastewater treatment plants that discharge to the Bay

What role have phosphate detergent bans played? Several laws have been passed that set strict limits on the amount of phosphorus in consumer cleaning products, including laundry and dishwasher detergents, to slow the flow of phosphates coming from Bay watershed homes and being sent to sewage treatment plants.

In the 1980s, five of the Bay jurisdictions (Maryland, New York, Pennsylvania, Virginia and the District of Columbia) banned laundry detergents containing phosphates. This move reduced the amount of phosphorus flowing to the watershed's wastewater treatment facilities by 25 to 30 percent, or an estimated 7.5 million pounds annually.

Maryland, New York, Pennsylvania and Virginia have recently passed bills to ban dishwasher detergents containing phosphorus. The phosphate dish detergent bans, which went into effect in July 2010, will remove an estimated 52,000 pounds of phosphorus that is currently being discharged from treatment facilities.

Additional Information

NPDES Permitting Approach for Discharges of Nutrients in the Chesapeake Bay Watershed
http://www.epa.gov/reg3wapd/npdes/pdf/ches_bay_nutrients.pdf

Chesapeake Bay Program Wastewater Treatment
http://www.chesapeakebay.net/wastewatertreatment.aspx