

PENNSYLVANIA'S CHESAPEAKE BAY TRIBUTARY STRATEGY

In 2003, Chesapeake Bay Program partners agreed to steep cuts in the amount of nutrients and sediment flowing into the Bay and its rivers. The six Bay watershed states (Maryland, Virginia, Delaware, Pennsylvania, New York and West Virginia) and the District of Columbia committed to the following reductions:

- **Nitrogen** will be reduced from the 2000 levels of 285 million pounds entering the Bay to no more than 175 million pounds per year - an annual reduction of 110 million pounds.
- **Phosphorus** will be reduced from the 2000 levels of 19.1 million pounds entering the Bay to no more than 12.8 million pounds per year - an annual reduction of 6.3 million pounds.
- **Sediment** will be reduced from the 2000 levels of 5.04 million tons entering the Bay to no more than 4.15 million tons per year - an annual reduction of 0.89 million tons.

In Pennsylvania, the Susquehanna River and Potomac River watersheds, totaling 22,612 square miles, represent more than one-third of the Bay's 64,000 square mile drainage area. As the largest tributary flowing to the Bay, the Susquehanna River contributes about half of the fresh water and two-fifths of the nutrients delivered to the Bay.

To meet the goals set for 2010, Pennsylvania must reduce annual nitrogen loads from 109.2 million pounds to 71.9 million pounds, a 37.3 million pound reduction. Annual phosphorus loads must be reduced from 3.58 million pounds to 2.47 million pounds, a 1.11 million pound reduction.

On January 10, 2005, Governor Rendell unveiled the state's official plan to meet the Chesapeake 2000 Agreement goals entitled, "Pennsylvania's Chesapeake Bay Tributary Strategy." Pennsylvania's Tributary Strategy identifies a suite of nonpoint source Best Management Practices (BMPs) and point source management approaches that will be necessary to meet Bay water quality goals. The strategy document is available on the DEP website, www.dep.state.pa.us. Enter the keyword "Chesapeake Bay."

The following two charts show the sources of nitrogen and phosphorus. Point sources contribute 11 percent of the nitrogen and 18 percent of the phosphorus. Tables 1 and 2 show a comparison of nonpoint and point source "cap loads" and the resulting reductions that are required.

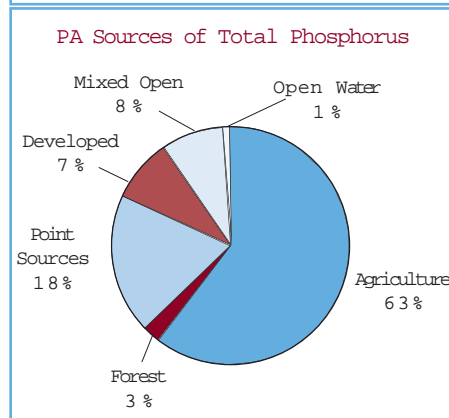
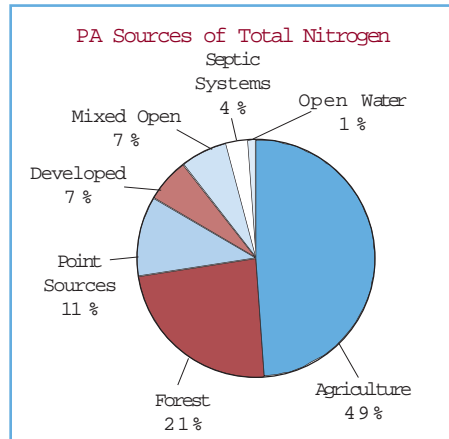


Table 1. PA Nitrogen Cap Load Allocations

	2002	2010 Goal	Needed Reduction
Non-Point Sources	96,722,000	61,356,000	35,366,000
Point Sources	12,487,000	8,299,000	4,188,000
	109,209,000	71,909,000	37,300,000

Table 2. PA Phosphorus Cap Load Allocations

	2002	2010 Goal	Needed Reduction
Non-Point Sources	2,949,800	1,906,000	1,043,800
Point Sources	630,200	501,700	128,500
	3,580,000	2,470,000	1,110,000

Nonpoint Source Control Plan

From the Tributary Strategy, the nonpoint nutrient and sediment control program includes the following:

- Agriculture Strategy - BMPs for nutrient management and conservation practices.
- Urban Strategy - Stormwater management (i.e. stormwater BMPs), septic system controls, and land use management.
- Air Strategy - Implementation of the Clean Air Act, including enhanced nitrogen oxides emission standards for new motor vehicles, emission standards for non-road vehicles, emission reductions from stationary sources, etc.
- Additional Nonpoint Strategies - Planting forest buffers, new wetlands, reclaiming abandoned mined land, etc.

To foster more of a regional approach, the Tributary Strategy was developed using 13 Watershed Team areas in Pennsylvania's Chesapeake Bay watershed. The Watershed Team areas were previously created by the DEP for the Environmental Futures planning process. Twelve areas are within the Susquehanna basin and one area for the Potomac Basin. Map 1 displays Pennsylvania's watershed areas. This map can be viewed on page 52 of the Tributary Strategy (<http://www.dep.state.pa.us/hosting/pawatersheds/chesapeakebay/docs/TribStrategy.pdf>).

Map 1. Pennsylvania Tributary Strategy Watersheds



- | | |
|--------------------------|------------------------------|
| Team 1—Central Penn | Team 8—Wyoming Valley |
| Team 2—Upper West Branch | Team 9—Lackawanna |
| Team 3—Susquehannock | Team 23—Lower Susquehanna E. |
| Team 4—Lower N. Branch | Team 24—Lower Susquehanna W. |
| Team 5—Big Bend | Team 25 Juniata |
| Team 6—Bradford/Tioga | Team 25—Potomac |
| Team 7—Upper Susquehanna | |

Point Source Control Program

From the Tributary Strategy, the major focus of the point source nutrient control program is regulating approximately 142 "significant" point sources in the Chesapeake Bay watershed through nutrient load limits. The Strategy assumes that all of the sediment loads originate from nonpoint sources. Therefore, sediment cap loads are not established.

For this program, a significant point source is defined as a wastewater treatment plant with a design flow of 0.4 million gallons per day (mgd) or greater. Collectively, these significant sources account for 95 percent of the total point source nutrient load. Dischargers included as a significant point source are listed in Appendix D of the Strategy Document.

A significant point source is defined as a wastewater treatment plant with a design flow of 0.4 mgd or greater.

The point source strategy will establish annual Total Nitrogen (TN) and Total Phosphorus (TP) load limits for the wastewater dischargers, not monthly or weekly concentration limits.

Specific permitted loads for each of the significant dischargers will be based on achieving 8.0 mg/l TN at flows equal to those projected for the year 2010. Annual load limits for TP will generally be based upon achieving a 1.0 mg/l discharge concentration at year 2010 flows, except for any facilities identified as causing impacts from their TP discharges. These few dischargers will require a specific refinement of the annual TP load limit and a concentration limit.

The method used for projecting 2010 flows to be used in the annual load calculations are not included or described in the Tributary Strategy document.

Twenty (20) significant industrial waste facilities have been identified and will generally be allocated loads based upon their current loadings with an additional margin for growth.

Point source TN and TP cap loads will be enforced through National Pollutant Discharge Elimination System (NPDES) individual permits or a general watershed permit.

To discharge in excess of 2010 projected flows, dischargers will be required to evaluate

wastewater reuse and recycle options, install more advanced nutrient reduction technology, or otherwise provide offsets through trading or other mechanisms approved by the DEP. Any increase in the discharge volume will necessarily result in a commensurate reduction in the nutrient concentration in order to stay below the annual load allocation.

Any increase in the discharge volume greater than the 2010 projected flow will result in a commensurate reduction in the nutrient concentration in order to stay below the annual load allocation.

Point sources that can reliably and consistently treat to below 2010 cap loads, and are willing to

accept those reduced loads as NPDES permit conditions, will be eligible to receive authorized nutrient reduction credits. Those facilities unable to achieve and maintain their established 2010 cap loads may opt to purchase available authorized nutrient credits. These types of trading activities will be administered through a trading program.

Beyond the cap loads established for existing significant point source dischargers, similar cap loads will be established for new systems and existing small systems when flows are projected to grow above 0.4 mgd. These new significant sources will be required to offset their nutrient loads through nutrient reduction treatment technology, the purchase of nutrient credits, documented septic system retirement credits, and wastewater reuse and land application credits. Point sources with flows below the 0.4 mgd will also receive an annual nutrient load cap. These will be based upon design flow and existing performance.

Nutrients that are released from by-passed, blended or partially treated discharges, including combined sewer overflows (CSOs), sanitary sewer overflows (SSOs) and high flow bypasses, must be monitored and accounted for against the discharger's permitted cap load.

To improve overall tracking of cap loads and reliable projection of flows, modifications to the annual wasteload management requirements will be initiated. Further, the sewage facilities planning program will be strengthened to document the septic system relief credit that must be captured and tracked for the period 1985 thru 2010. This will create a TN "reduction pool" for those point sources that remove these systems. (The strategy assumes that phosphorus is not discharged from septic systems.)

Financial Considerations

The total capital costs to implement the Chesapeake Bay initiatives are \$28 billion. The total capital costs to implement Pennsylvania's Tributary Strategy are estimated to be \$8.2 billion, \$735 million on an annualized basis. Estimates for annualized costs for operation and maintenance are \$703 million per year. Capital costs for only the point source nutrient reduction are estimated to be \$376 million.

Currently 10 percent of the Growing Greener grants (approximately \$4 million annually) are set aside for water and sewage system infrastructure improvements. In the past two years, applications proposing nutrient reduction modifications have been eligible for these grants. This has resulted in eleven grants to these types of proposals. The PA DEP proposes to maintain this eligibility.

Act 218 recently signed by Governor Rendell provides \$250 million in bond money for sewer and water infrastructure. Of this \$250 million in bond money, \$200 million will be used to provide grants and loans to upgrade, rehabilitate, and

expand wastewater and water supply systems that are connected to economic development projects. Point sources within the Chesapeake Bay watershed meeting the stated criteria can apply for this money.

The Act transfers the remaining \$50 million of the Water and Sewer Bond authorization to PENNVEST, which will be allowed to issue up to \$100 million in new bonds under its existing authority to provide grants and loans for targeted environmental problems. The new fund within PENNVEST will be at least \$100 million and at most \$150 million. This money can assist point sources in the Chesapeake Bay watershed to achieve the cap loads.

The Growing Greener II bond initiative proposed by Governor Rendell will make available \$80 million over a 4-year period to "improve the health of our rivers and streams affected by runoff from mines and other pollution, restoring these waters to full use for our communities and our businesses, as well as anglers and boaters." Point source nutrient reduction projects will be eligible.

Many specifics on how the PA strategy will be implemented and financed have yet to be determined. We recommend that you stay informed and involved.

What to Do?

1. Get familiar with the Tributary Strategy from the DEP website.
2. Attend public meetings and workshops that present and discuss specifics on how the strategy will be implemented. PMAA (www.municipalauthorities.org) is hosting such a meeting on February 18, 2005.

PMAA STP Nutrient Reduction Workshop February 18, 2005 Radisson Penn Harris Hotel Camp Hill, PA

8:00-8:45 - Registration & Opening Remarks
8:45-9:30 - Nutrient Reductions Issues for the Bay
9:30-10:15 - Point Source Nutrient Reduction Technologies
10:30-11:00 - Nonpoint Source Nutrient Reduction Efforts
11:00-11:45 - Watershed Based Nutrient Reduction Process

3. Become familiar with current influent and effluent TN and TP concentrations specific to your facility.
4. Maintain open communication with your consulting engineer regarding updates to implementation of the Tributary Strategy and how it will impact your facility.
5. Gather information and become familiar with nutrient reduction treatment technology options.
6. Contact your regional DEP office with questions and concerns you may have regarding the Tributary Strategy.

CET Engineering Services is part of Commonwealth Engineering & Technology Inc., a full-service environmental engineering firm providing its services to guide your project from planning through operation. CET is composed of professional engineers, environmental scientists, planners and infrastructure management consultants.

For more information about CET, call us at 1-800-CET-ENGG (1-800-238-3644) or visit us at www.cet-inc.com.

Published by CET Engineering Services, Raymond H. Myers, P. E., Editor, rmyers@cet-inc.com.