Facts About…
Nutrient Trading

FROM THE CHESAPEAKE BAY FOUNDATION

NUTRIENT TRADING

Nutrient trading programs are market-based programs that involve the exchange of pollution allocations between sources. Most programs involve exchanges between different point sources. Less common are programs that allow point source to nonpoint source trades.

A "point source" is a source of pollution that can be attributed to a specific physical location, such as wastewater treatment plants. A "nonpoint source" cannot be attributed to a specific location. This includes the nitrogen and phosphorus that runs off the ground from any land use (e.g., cropland, feedlots, lawns, parking lots, streets, and forests) and enters our waterways. It also includes nitrogen and phosphorus that enter through air pollution, groundwater, or septic systems.

Conceptually, pollution trading is appealing as a cost-effective and flexible way to achieve and maintain water quality goals. Critics of nutrient trading will argue that trading allows point sources to "pay to pollute" rather than cleaning up their own effluent. However, the reality is that the region's population will continue to grow, and trading programs provide a potential framework to offset the inevitable additional pollution loads.

Pollution trading in the United States started in the air arena – most notably in the Clean Air Act's Acid Rain Program "cap and trade" of sulfur dioxide emissions. Beginning as early as the 1980s, we find examples of nutrient trading, also known as water quality trading, programs. The most well-known examples of trading programs along the East Coast are the Long Island Sound program in Connecticut and the Tar-Pamlico Basin program in North Carolina. However, there have only been a few actual trades accomplished under these and other programs.

NUTRIENT TRADING IN THE CHESAPEAKE BAY WATERSHED

In 2001, the Chesapeake Bay Program published nutrient trading principles and guidelines that were endorsed by the Bay Program partners. Some of the key principles, designed to serve as the foundation for trading programs developed within the Bay watershed, are:

- Trades must not impair water quality or violate water quality standards or criteria, or adversely impact living resources and habitat;
- Trading can occur only within each major Bay tributary;
- Any trading program must be consistent with federal, state, and local laws and regulations; and
- Traders must be in substantial compliance with all local, state, and federal environmental laws, regulations and programs.

In 2005, Virginia and Pennsylvania announced plans to develop trading programs to meet and/or maintain Tributary Strategy nutrient load allocations. Virginia's program is based in legislation, while Pennsylvania proposed policy and guidelines. Pennsylvania and Virginia also set up advisory groups to help them address the technical and policy issues surrounding the implementation of trading. The Chesapeake Bay Foundation (CBF) is an active participant on these committees.

In December 2006, the Pennsylvania Department of Environmental Protection finalized its policy for nutrient trading. Virginia promulgated trading regulations and is in the process of developing guidelines that will govern point source to nonpoint source trades.

In both states, trading is restricted to within major waterways (e.g., Potomac River, James River, and the Susquehanna River). Also, in both states, responsibility for oversight of enforcement and compliance resides with the state. However, there are some fundamental differences between the proposed trading programs in Pennsylvania and Virginia, as noted below:

1.) Eligibility Requirements

Virginia's legislation establishes a watershed permit with load allocations to individual point sources. Facilities may meet these allocations by reducing loads, through point source to point source trading, or, as a last resort, payment into the Virginia Water Quality Improvement Fund. Nonpoint source trading is restricted to new or expanding point source facilities to offset new loads that are over and above a Tributary Strategy load allocation. Also, these facilities have to meet certain nutrient removal technology requirements that are determined by the location and size of the new or expanding facility.

In Pennsylvania, existing point sources were also given pollution load allocations (based on their Tributary Strategies) that will become part of their individual discharge permits. In order to meet those allocations, the guidelines would allow trading among point source, nonpoint source, or third parties. There are no restrictions on a point source before becoming eligible to trade with a nonpoint source.

The Virginia trading legislation stipulates that the only nonpoint source credits available for trading are for those best management practices that would result in "…reductions beyond those already required by…the Virginia tributaries strategies plans…." Details of how to implement this policy are being developed, but likely will mean that a farmer has to implement a suite of best management practices (e.g., riparian buffers, cover crops, and conservation tillage). Urban landowners are likely to have to comply with a list of regulatory programs (e.g., erosion and sediment control, stormwater, and buffer requirements) as a parcel-specific baseline before they are eligible to participate in trading.

In Pennsylvania, farmers have to achieve a baseline compliance and threshold to be eligible for the program. The baseline is defined as complying with all applicable regulations. The threshold for trading is defined as a set of best management practices requirements (e.g., a 35-foot permanent vegetative buffer or a 20 percent reduction in the farm's overall nutrient balance beyond that achieved by meeting baseline compliance). Once a farm demonstrates it has met the baseline and the threshold, it can participate in the trading program.

2.) Credits for Land Conversions

Subject to certain rules, land conversions may also generate credits. In Virginia, conversion of forest, farms, or other undeveloped lands to new development is not eligible to generate credits. In Pennsylvania, credits cannot be generated from the purchase and idling of whole or substantial portions of farms.

3.) Reductions through Government Funded Programs

In Virginia, nonpoint source pollution reductions achieved through government funded programs (e.g., forested buffers through the Conversation Reserve Enhancement Program) are not eligible for trading. In Pennsylvania's policy, they are included.

CBF'S STANCE ON NUTRIENT TRADING

One of the greatest challenges facing the Chesapeake Bay watershed is how to maintain the nitrogen and phosphorus pollution caps – once achieved – while negative land uses changes associated with population

increases occur. CBF supports the idea that a properly designed and implemented nutrient trading program offers a way to achieve and maintain pollution reductions in a cost-effective and environmentally-beneficial manner. Pollution trading provides a mechanism that can be used in "cap maintenance" whether the nutrient loads to be offset are from point sources or nonpoint sources.

The key is to ensure net environmental benefits and public accountability. In this regard, trades involving nonpoint sources are more problematic because quantifying the nutrient reductions is difficult. Also, legal, monitoring, and enforcement mechanisms are not yet fully tested and developed. Consequently, our recommendations described below focus on issues related to nonpoint source trading.

1.) Nutrient trading shall not result in degradation of local water quality

A viable trading program must ensure that we don't create or worsen local pollution "hotspots" by allowing watershed-wide trading. This tenet is explicitly stated in the U.S. Environmental Protection Agency's trading guidelines and the trading program policies/regulations in Pennsylvania and Virginia, but the language in the Pennsylvania policy is weak and ambiguous.

2.) ***Nutrient reduction benefits from government-funded nonpoint source practices should not be eligible for trading***

Allowing publicly funded best management practices to generate pollution credits on private lands to be sold to offset loads from other sources provides little or no reduction in the overall load. The public funding has already accomplished the reduction. It also wastes financial resources because it provides double payment to the private sector for the same reductions. This not only hurts pollution reduction goals, but also distorts the market by artificially deflating the price of a pollution credit. Entities receiving cost-share funds can undercut others who did not receive such funds by selling credits at a lower cost. This places those who cannot or could not receive public money at a competitive disadvantage. This will likely limit participation in the market to a relatively small number of entities.

3.) Nonpoint source entities must achieve a baseline of compliance before being eligible to trade

A nonpoint source cannot sell pollution credits until it has implemented a baseline or minimum threshold of practices. The process for setting the minimum threshold should encourage the implementation of conservation practices and allow flexibility to ensure a variety of agricultural producer types would be eligible.

4.) The use of developed lands for credit generation should be restricted

The purpose of nutrient trading is to maintain and improve water quality. Consequently, trading programs should provide a system for credit generation that will preclude the generation of nutrient credits from practices that will increase impervious surface (e.g., the conversion of farmland to suburban development). Comparing the pollutant loads from an acre of farmland to an acre of developed land is not a valid approach. An acre of development doesn't occur "alone." Accompanying the acre of development are many more acres of supporting development (e.g., roads, shopping centers, churches, fire stations), additional nitrogen and phosphorus loads from sewer or septic systems, and the increased use of automobiles and electricity. The effects of these changes on water quality are not captured in an acre to acre analysis. Therefore, to preempt an endless debate about different types of land uses and their associated pollutant loads in the context of nutrient credit trading, trading programs should restrict credit generation from certain types of land conversion practices.

5.) A nutrient credit bank may facilitate trading in the Bay region

For a trading program to succeed, there needs to be a demand for credits and a fairly straightforward and simple way to obtain them. The Pennsylvania policy proposes that point sources seeking pollution credits would need

to enter into contractual agreements with individual nonpoint source entities or third-party aggregators to which the state would be a signatory party. This approach may be overly burdensome and could discourage participation in the trading program. The Virginia regulations do not stipulate the mechanism of point source to nonpoint source trades, other than to state that nonpoint source credits would be acquired via a "public or private entity acting on behalf of the landowner." The conditions of the trade would then be included as part of the point source's Virginia Pollutant Discharge Elimination System (NPDES) permit.

CBF supports the concept of a nutrient credit bank. Under this scenario, buyers would purchase pollution credits from a revolving fund/bank managed by the state or a third party. These funds would be used to implement nonpoint source best management practices to generate additional pollution credits. This would streamline and simplify the trading process. The State or third party would manage the fund and track the generated pollution credits. There would likely be a need to "kick start" the process by implementing best management practices that generate the initial credits. In fact, Pennsylvania announced it will be investing close to $1 million in agricultural best management practices to generate credits for its trading program. Virginia has similar plans to install best management practices in advance in order to "bank" some credits in the Water Quality Improvement Fund for each watershed. This approach does not remove legal liability from point sources to meet the pollution allocation stipulated in the NPDES permit.

6.) Credits must be verifiable and enforceable

State regulations should include design elements and legal accountability for trades between point sources and nonpoint sources. Also, the NPDES permit should reflect the number of credits expected to be used to offset pollution loads. Agreements between the "bank" and nonpoint source entities to implement and maintain best management practices would be similar to those currently used in landowner agreements for agricultural practices and should include a provision that allows the public to pursue enforcement and compliance. The state would be responsible for auditing the credits to ensure the expected pollution reductions are achieved.

7.) Public notification of trades

Public access to information and the opportunity to provide input on proposed trades is essential. Including trading provisions in NPDES permits is one mechanism that will ensure public notification and access. In addition, all trades should be publicly noticed at least once per year. Eventually, trades should be publicly accessible through a web-based nutrient tracking database similar to the Environmental Protection Agency's "Clean Air Markets" used to track air trading. One such possibility is "Nutrient Net," a web-based tracking system developed by the World Resources Institute.

8.) A minimum of a 2:1 ratio should be used for point source to nonpoint source trades

The best management practices efficiencies and delivery ratios[1] of the Chesapeake Bay watershed model provide a sound justification for deriving expected pollution reductions from the implementation of nonpoint source controls. However, it is widely acknowledged that there is a great deal of uncertainty associated with these model parameters. It is critical to include a "margin of safety" to account for these uncertainties. Consequently, we recommend a minimum credit ratio of 2:1 for trades between nonpoint and point sources (i.e., 2 pounds of pollution reductions from nonpoint sources are needed for every pound of pollution from a point source).

[1] *Delivery ratios apply discount factors to account for the attenuation of a pollutant on its way through tributaries to the main stem of the Bay. The ratio varies depending on the distance the pollutant has to travel. Generally, the greater the distance, the greater the pollutant loss and the lower the delivery ratio.*