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SENIOR SCIENTISTS AND POLICYMAKERS FOR THE BAY NUTRIENT TRADING SUBCOMMITTEE

Nutrient Trading

Preliminary Investigation: Findings and Recommendations

Chesapeake Bay Action Plan

Senior Scientists & Policymakers for the Bay

AUTHORS AND RESEARCHERS

Dr. William Dennison
University of Maryland Center for Environmental Science

Michael Helfrich
Lower Susquehanna Riverkeeper

Erik Michelsen
South River Federation

Richard Pritzlaff
Biophilia Foundation

Fred Tutman
Patuxent Riverkeeper

INTRODUCTION

A Nutrient Trading Subcommittee of the Senior Scientists and Policymakers for the Bay was convened to investigate nutrient trading for Chesapeake Bay. This document is a summary of this preliminary investigation and findings and recommendations.

The immediate issues concerning nutrient trading are apparent.
1) There are a variety of different definitions for nutrient trading being used by the Environmental Protection Agency and the different jurisdictional agencies implementing nutrient trading. These differences in definitions could lead to difficulties in administering nutrient trading programs and many of these comments and recommendations are designed to ensure that a rigorous and credible nutrient trading program would be achieved for the Chesapeake Bay watershed;
2) Nutrient trading is an emotive issue, and highly charged terms are often used to describe the virtues or the problems associated with nutrient trading; and
3) The use of nutrient trading for water quality issues is not well developed and there is a lack of data and case studies to support or refute assertions about nutrient trading. The fact that nutrient trading is complicated, emotive and data poor leads to the strategy in this document of beginning a process of creating an informed debate.

Overall, there are potential positive and negative aspects to nutrient trading:

On a positive note, nutrient trading promises to unleash free market forces; provide maximum flexibility for regulatory action; increase stakeholder support (including local watershed organizations and citizens); improve the political climate; provide a new source of revenue for compensating Best Management Practices, incentivize annual verification/certification of credit generating practices; and capitalize on previous trading successes in air quality.

On a negative note, independent, rigorous verification is difficult; ecosystem services other than nutrients need to be considered, those that can be measured and non-quantifiable co-benefits such as improved biodiversity conservation through increased wildlife habitat; nutrient trading could promote large organizations and corporations over more local, grass-roots organizations; environmental justice issues may ensue; and previous success in air quality trading may not translate to water quality.

If restricted to permanent offsets, and not annual credit purchases, it is possible that the credit market could be used to promote wise planning for future growth. By balancing incentives and deterrents for development within and outside of sewered areas, based on their relative impacts on the Total Maximum Daily Load, nutrient trading could promote growth scenarios that result in positive nutrient results. For example, the credits can be used as a deterrent for development in unsewered areas by establishing more stringent compensation ratios than in sewered areas. There are various ways that the market can

be manipulated to achieve nutrient reductions and better overall environmental outcomes, and this should be the goal of nutrient trading, rather than just providing ways to meet regulatory requirements.

We urge caution in developing a nutrient trading approach, recognizing that a nutrient trading system on this scale is unprecedented. Given the lack of supporting evidence for such an approach, we encourage policymakers move cautiously and that they carefully consider the following concerns. There will be only one opportunity to develop a credible nutrient market, and loss of credibility would be an extremely difficult set back to overcome. As this is an emerging management strategy, it will require scrutinized trial and error, with mid-course adjustments and modifications needed.

TEN CAVEATS AND RECOMMENDATIONS FOR CHESAPEAKE BAY NUTRIENT TRADING ARE THE FOLLOWING:

1) Nutrient trading is a relatively new and untested technique for pollutant reductions in waterbodies that makes assumptions regarding short and long term effects.
2) All efforts should be made to improve and then preserve local water quality.
3) Independent, rigorous, and transparent verification is essential.
4) A policy of net improvement credit is needed to account for uncertainties in non-point sources reductions and runoff variability.
5) Nutrient trading should not be used to maintain discharges at technology levels below industry standards.
6) Nutrient trading may create environmental justice issues by moving problems to disadvantaged areas.
7) Trading could benefit large organizations and corporations without protecting the interests of local waterways and grassroots entities.
8) The total impacts of nutrient trades need to be measured and adequate compensation provided.
9) Credited practices and the models used to calculate the amounts of credits awarded need to be standardized.
10) Growth allocations should be based on demonstrated pollution reductions in other sectors, not on speculative, proposed

RECOMMENDATIONS

1.) NUTRIENT TRADING IS A RELATIVELY NEW AND UNTESTED TECHNIQUE FOR POLLUTANT REDUCTIONS IN WATERBODIES THAT MAKES ASSUMPTIONS REGARDING SHORT AND LONG TERM EFFECTS.

The Environmental Protection Agency needs to provide vigilant oversight and frequent re-evaluation of jurisdictional trading methods. The successes of the Clean Air Act trading program to reduce sulfur emissions from point sources are recognized, however, the qualities of air emissions trading may not translate to discharges to waterbodies. Chesapeake tributaries are each unique, in a confined area, and mostly flow in a single direction. Each type of effluent or runoff to be traded has different characteristics, with many other constituents (including endocrine disrupting compounds) beyond the three common Total Maximum Daily Load (TMDL) related pollutants; nitrogen, phosphorus, and sediment. The differences in the waterbodies and their unique load constituents must be considered in a trading program. The effects of trading between sources, a) agricultural runoff, b) increased stormwater, c) waterwater treatment plants discharge, or d) industrial discharge must be closely scrutinized as the programs develop.

2) ALL EFFORTS SHOULD BE MADE TO PRESERVE LOCAL WATER QUALITY.

Trading within a watershed may be very useful to reduce pollution in a local waterway and in the Chesapeake Bay. Inter-watershed trading could lead to diminished water quality in an individual waterway, for the sake of improving another. Nutrient trading and the Chesapeake Total Maximum Daily Load (TMDL) should not be used to maximize local waterway loads to the maximum allowable limit. The ideal trade, geographically speaking, is one where the reductions are made upstream of any new source. This "Upstream Reduction Policy" improves local waterways, as well as the Chesapeake Bay. For example, if an offset created by an increased nutrient load from a wastewater treatment plant (WWTP) occurs at mile marker 20 of a waterway (20 miles upstream from the Chesapeake Bay), and the increased WWTP load adds nutrients at mile marker 10, ten miles of waterway will have been improved as well as an overall reduced load to the Chesapeake Bay. To the contrary, if the new load is upstream at mile marker 20, and the offset is at mile marker 10, ten miles of a local waterway will have been degraded. The other benefit of an "upstream reduction" policy is that it may promote restoration of smaller agricultural waterways. Forested or reforested small waterways are responsible for large amounts of nutrient reduction (see Stroud Water Research Center, 2009)

3) INDEPENDENT, RIGOROUS VERIFICATION IS ESSENTIAL.

Market integrity must be established from the beginning for the nutrient trading program to maintain credibility. There are many advantages of using free market forces to advance pollutant reduction rates for the Chesapeake Bay, but free market forces must be regulated to deter the temptation of over-crediting or unverified credited practices. Without a third-party, independent verification, nutrient trading programs face a risk factor to buyers that could permanently damage the demand for credits. Additionally, permitting trading transactions only in those scenarios where the pollution reductions and watershed gains can be adequately quantified and documented will maintain market integrity. Aggregators of credits acting as verifiers of credits is unacceptable and could lead to disastrous results (e.g., the recent mortgage debacle). It is recognized that there will be real costs to obtain this verification, but it is needed for vigilant verification, and costs can be incorporated into other "transaction costs" paid at the time of transaction by buyer, seller, or split between the two. Independent, third-party verifiers create a buffer between the aggregators and sellers, who in many instances engage in other business together (e.g., agricultural consultants).

In addition, a transparent and simple policy is needed, where the trades produce actual reductions and benefits for the resource, and are clearly authenticated. Toward that end, credits should only be generated by actual practices and reductions instead of on anticipated practices or speculative ones that have yet to occur. As an illustration, the awarding of credits for farmers who elect to farm their lands instead of selling it to developers should not automatically result in a nutrient credit, unless the farmers elect to install nutrient credit generating practices. Using trading to pre-empt hypothetical reductions is nearly impossible to track or quantify. There are many other funding programs designed to incentivize land conservation. Pollution trading has not been designed to specifically serve land conservation purposes which generally do not benefit water quality in any measurable way.

4) A POLICY OF NET IMPROVEMENT CREDIT IS NEEDED TO ACCOUNT FOR UNCERTAINTIES IN NON-POINT SOURCES REDUCTIONS AND RUNOFF VARIABILITY.

A trading source ratio of at least 2:1, and preferably 3:1 for units of nutrients gained vs. units of nutrients traded is needed, along with permanent retirement ratios. While minimum reserve and retirement ratios are worthwhile, they do not adequately reflect the uncertainty and variability of non-point source runoff. In recent years, it is easy to see the great uncertainty and variability that precipitation brings to non-point to point source nutrient trading. Best Management Practices (BMPs) in northern Pennsylvania and

in Lancaster County, Pennsylvania were reported to have failed during high precipitation events in March and September 2011, and the predicted reductions providing credits to industry for the same period have not been verified. This annual and seasonal precipitation uncertainty, and the uncertainty of BMP effectiveness, soil types, groundwater depths, and geology, to name a few of the variables, suggest that a robust ratio of predicted non-point source reductions be implemented. In addition, permanent increases should have permanent offsets, such as reforested lands, vegetated buffers, and restored wetlands with a permanent easement and adequate adaptive management language; conversion of septics to sewer; sewer upgrades; and even certain stormwater practices with a permanent easement.

5) NUTRIENT TRADING SHOULD NOT BE USED TO MAINTAIN DISCHARGES AT TECHNOLOGY LEVELS BELOW INDUSTRY STANDARDS.

Nutrient trading provides some communities and industries a degree of "breathing time" to come into compliance with technology standards. One important reason for nutrient trading is to provide some flexibility to facilitate discharge sources coming into compliance with the Clean Water Act. However, nutrient trading should not be used as a substitute for compliance. The overall aim of nutrient trading is to expediently reduce the loading of nutrients into our waterways, and to then maintain that level of water quality in our waterways. Nutrient trading should not be used as a first avenue for those wishing to institutionalize or monetize bad practice. Pollution sources seeking to trade must as a matter of good policy either already be in compliance, or on an enumerated schedule to come into compliance and the credits generated must be retired expediently so that resulting trade is a genuine mechanism for producing better practice on some specific timetable. For example, similar to a Total Maximum Daily Load schedule of compliance, a point source should create a schedule of upgrades before being allowed to offset loads in excess of National Pollutant Discharge Elimination System (NPDES) permitted effluent loads.

6) NUTRIENT TRADING MAY CREATE ENVIRONMENTAL JUSTICE ISSUES BY MOVING PROBLEMS TO DISADVANTAGED AREAS.

Nutrient trading provides opportunities to transfer funding to agricultural communities for much-needed Best Management Practices (BMPs). However, nutrient trading programs should not extend negative ecological impacts of human health effects and quality of life issues into locales already impaired for the constituent being traded. Environmental justice principles reveal that those economically disadvantaged already suffer lopsided consequences of onerous environmental practices. Allowing these practices to continue unabated by allowing perpetrators to pay fees to credit marketers or aggregators elsewhere only perpetuates an existing disparity and provides a

marketplace that sanctions disparity for economic gain. Communities suffering the impact of onerous environmental problems should share, as a matter of equity, the economic and ecological benefits of the regulatory activity that seeks to address those impairments. If any compounds beyond nutrients and sediments are considered for trading (e.g., toxins, endocrine disrupters), serious consideration of the environmental justice issues will need to be made.

7) TRADING COULD BENEFIT LARGE ORGANIZATIONS AND CORPORATIONS WITHOUT PROTECTING THE INTERESTS OF LOCAL WATERWAYS AND GRASSROOTS ENTITIES.

Trading should not sanction Clean Water Act violations or non-abatement of ongoing violations of Federal or State water quality protection laws. Most nutrient trades are likely to be advanced by business interests or municipalities concerned primarily with economic considerations. Meanwhile small local and grassroots champions of water quality are much more likely to be concerned about local impacts of trading and how such trades will accrue to better water quality in their communities and waterways as opposed to economic development or even Chesapeake Bay considerations. These local groups may not have the resources to be parties to these trades. Trading programs provide an additional tool for regulators and for polluters but there is the risk of creating a scenario that greatly undermines the tributary teams, the Waterkeepers and other local watershed advocacy groups. Providing the option of trading in lieu of compliance would greatly hinder the opportunity for citizens to engage, overhaul or intervene in problematic or unjust trades. For example, allowing violations of wastewater treatment plant discharges by purchasing nutrient credits could lead to localized "hot spots" while reductions are made elsewhere, potentially in another watershed. For these reasons, trading geographies must be carefully analyzed and chosen, and robust independent and transparent third party oversight is needed that includes the active participation of local watershed groups and citizenry in overall program performance audit and credit stewardship/annual verification and certification. The oversight "authority" may be best provided by a public/private partnership as opposed to leaving it in the realm of public agencies subject to changing political, industry interest and economic development pressures. In addition, water quality standards for local waterways or narrative criteria for "swimmable and fishable" conditions would help develop objective criteria for nutrient trading.

8) THE TOTAL IMPACTS OF NUTRIENT TRADES NEED TO BE MEASURED AND ADEQUATE COMPENSATION PROVIDED.

Various development activities may have multiple impacts that transcend the impacts from nutrients and sediments. For example, even though the construction of wastewater treatment facilities can vastly reduce nutrient pollution (e.g. septic to small WWTP),

nonetheless this still creates impacts (e.g., loss of riparian vegetation, increased impervious surfaces with associated runoff) that can lead to deleterious impacts. These multiple impacts provide another reason to have adequate compensation ratios. Some Best Management Practices have highly variable application efficiencies which lead to divergent nutrient results and nutrient credits need to reflect the actual nutrient savings. For example, transport of animal manure can be highly variable and difficult to assign credit. The length of time and conditions that animal manure is stored and the distance that it is transported will affect the nutrient removal efficiency. In Pennsylvania, credits appear to be provided inversely to the logical agronomic use and practices that were the worst are given more credit, i.e. if an agricultural operation previously incorporated manure within two days to maximize nutrient efficiency they receive fewer credits for manure export than an operation that allowed manure to sit in the field and release nutrients to the environment. Also, manure transport does not properly account for ammonia volatilization rates, potential for redeposition within the Chesapeake Watershed, or the nitrogen emissions from the vehicles transporting the manure. A more rigorous mass-balance approach must be used when crediting all practices.

9. CREDITED PRACTICES AND THE AMOUNTS OF CREDITS AWARDED NEED TO BE STANDARDIZED.

Discrepancies in the amount of credits awarded for different practices can lead to inequities across jurisdictional boundaries. Non-point source practices are particularly difficult to standardize (see recent PennFuture report) and highly variable crediting can undermine the nutrient trading program. The standardization, like the verification process, needs to be conducted by independent, third parties in a scientifically rigorous manner. This standardization of nutrient credits should not curtail innovation and creativity of nutrient reduction practices.

10: "GROWTH ALLOCATIONS" REPRESENT AN UNMITIGATED GIVEAWAY OF POLLUTION AND SHOULD BE ELIMINATED OR, RECOGNIZING THE POLITICAL DIFFICULTY IN WITHDRAWING AN ALLOCATION PREVIOUSLY AWARDED, SEVERELY CURTAILED.

In order for a market system to function effectively, a firm pollution cap needs to be put in place, and growth allocations effectively extend that cap date well into the future, harming the development of the market. The granting of extra pollution capacity to wastewater treatment plants should be based on demonstrated pollution reductions in other sectors, and should not be granted on speculative, proposed reductions in those sectors.