



Stewards of the Lower Susquehanna, Inc.
Lower Susquehanna RIVERKEEPER®

January 8, 2010

President Barack Obama

RE: Executive Order 13508 Draft Strategy for Protecting and Restoring the Chesapeake Bay

Dear Mr. President,

The members of Stewards of the Lower Susquehanna, Inc. and their representative, the Lower Susquehanna Riverkeeper, are grateful for your interest and actions to protect and restore the largest and most productive estuary in the United States, the Chesapeake Bay. After years of effort, the Chesapeake and many of the rivers that flow into it remain impaired, causing economic and cultural damage to our citizens and progeny. We hope that you will consider the following recommendations for your final strategy in addressing this crisis. Thank you.

Agricultural Sector

The most difficult issues that are not being addressed in the agricultural sector are the lack of oversight of most of the agricultural operations in Pennsylvania, the infiltration of nitrogen through Karst limestone geology, the lack of winter manure application restrictions in Pennsylvania, and the lack of efficient nutrient use standards anywhere in the Chesapeake Bay watershed.

Lack of oversight of most agricultural operations in Pennsylvania

Of the more than 5,100 farms in Lancaster County, PA, fewer than 100 are federally permitted Concentrated Animal Feeding Operations. The remaining 5,000 smaller farms go uninspected and virtually unregulated. PADEP and the PA Farm Bureau are quick to point out that Nutrient Management Plans have been developed for many of these operations. However, there is no real enforcement or system for assuring the public that these plans are protective of water quality or are being followed by the operators. The responsibility has been placed on the public, by PA DEP, to be the monitors of these 5,000 operations in Lancaster County (not to mention many thousands more throughout other counties in the Susquehanna watershed). PA DEP says they will respond to complaints, but this is a cumbersome system, and frequently

requires citizens to report their neighbors, something that is uncomfortable and disruptive to the personal lives of many citizens. Enforceable regulation of manure spreading practices, manure storage practices, and animal access to waterways must be put in place if we are to address the higher percentage of nutrient and sediment contributions that come from smaller operators. This should be followed up by random inspections to assure compliance.

Infiltration of nitrogen through Karst limestone geology

There is a definite need to reduce manure applications from many facilities. About half of Lancaster County, the source of most of the greatest inputs of nutrients to the Susquehanna, is on Karst limestone geology, a feature that is known to promote groundwater pollution by the rapid movement of water and pollutants through its pores, sinkholes, fissures, and caves. Some agricultural operations have no streams near their fields, another feature of Karst geology. In these fields the water pools into depressions, or flows rapidly through sinkholes and fissures. Nitrogen and other pollutants are passed directly into groundwater. The result is that the streams that spring forth from this groundwater are polluted before they begin. No streamside buffers or other BMP's will stop this, other than reduced application, or more efficient application (see "Lack of efficient nutrient use standards anywhere in the Chesapeake Bay watershed" below).

Lack of winter manure application restrictions in Pennsylvania

Contrary to Maryland's restrictions on manure application to frozen ground, Pennsylvania has no such restrictions, and winter is a prime time to apply all types of manure. On Christmas Day I noticed a dairy operation had spread cow manure on top of 12 inches of snow. By the time I returned the next day, we had received rain and high enough temperatures to melt the snow and the excess water allowed nitrogen leaching into the stream less than 10 feet away. A video of this has been posted on YouTube, titled, "Lancaster Dairy Christmas Present to the Chesapeake. Got manure?", and can be seen at <http://www.youtube.com/watch?v=xakm4riiZhA&feature=channel> .

Lack of efficient nutrient use standards anywhere in the Chesapeake Bay watershed

Winter applications and other inefficient uses of manure for crop uptake can be seen by reviewing the Penn State Agronomy Guide, <http://agguides.agronomy.psu.edu/> . In this guide you will find a chart that shows that the highest efficiency of manure use is when it is applied in the spring or summer, and incorporated into the soil the same day. For instance, if you had a poultry operation and needed 75 pounds of nitrogen per acre to grow your crops, you could place 100 pounds of litter onto the acre and incorporate it within 24 hours. This produces a 75% efficiency, leaving only 25%, or 25 pounds, available to the environment in the form of air and water pollution, with some nitrogen remaining in the soil for the next cycle of crops. On the other hand, if you were to wait 7 days or more to incorporate the chicken litter, you would drop to a 15% efficiency. That means that the 100 pounds you applied to the acre only provided 15 pounds for the crops. If you continue to use the "wait 7 days or more to incorporate" option, you must apply 4 more applications, each at an efficiency of 15%. That means you applied 500 pounds to get your 75 pounds needed for your crops. That leaves 425 pounds

unaccounted for, versus 25 pounds in the efficient scenario! For an operation with excess manure, they can plan their applications inefficiently to allow for greater manure disposal without burning their crops with too many nutrients. The chart used for these calculations is attached and can be found online at:

<http://agguide.agronomy.psu.edu/cm/pdf/table1-2-14.pdf> .

Sediments and the Lower Susquehanna River Dams

During 4 days in 1972, the flood waters of Tropical Storm Agnes transported 4 years worth of sediment and pollutants down the Susquehanna River from New York and Pennsylvania. When the flood waters reached Maryland and the Conowingo Dam, the waters scoured another 10 years of pollutant-bearing sediment that had been trapped in the reservoir behind the dam. This “catastrophic pulse” of 14 years worth, or 30 million tons, of sediments combined with the surge of freshwater to inflict the biggest single damaging event ever recorded in the Chesapeake Bay. Over the past 35 years this sediment has accumulated to a level exceeding 1972 levels and scientists agree that the question is not if this will occur again, but only a matter of when.

The paradox is that the Conowingo Dam currently collects and retains an average of 60-70% of the annual load of sediment being transported down the Susquehanna. This essentially makes the Conowingo Dam the biggest single mitigation tool, or “Best Management Practice”, in the Chesapeake Bay. However the pollution-control value of the dam is reaching its end as the sediment fills in behind the dam, removing its ability to trap sediment. Once this “steady state” is reached, the load of sediment from the Susquehanna to the Chesapeake Bay will increase by 150 to 250% (from 1.2 million tons to 3.2 million). Along with this sediment, we will see an additional 30 to 40% increase in phosphorus (from 5.2 million pounds to 8.7 million). These increases will affect aspects of Chesapeake Bay management from channel dredging frequency to size of the “dead zones”.

Research has already been conducted to determine the effects of the increases in sediment and phosphorus loading, and this was summarized in the Chesapeake Bay Program’s Science and Technology Advisory Committee (STAC) report entitled “**The Impact of Susquehanna Sediments on the Chesapeake Bay**”. However that is where the research stopped in 2000.

The Chesapeake 2000 Agreement specifically documented the need to address this problem: “**Water Quality Protection and Restoration: Nutrients and Sediments**, Goal 5. By 2003, work with the Susquehanna River Basin Commission and others to adopt and begin implementing strategies that prevent the loss of the sediment retention capabilities of the lower Susquehanna River dams.” In the Preamble of the Chesapeake 2000 Agreement all signers agreed to address this problem: “In affirming our recommitment through this new *Chesapeake 2000*, we recognize the importance of viewing this document in its entirety with no single part taken in isolation of the others. This Agreement reflects the Bay’s complexity in that each action we take, like the elements of the Bay itself, is connected to all the others.”

Given proper funding, a minimum of 2 million dollars, the U.S. Army Corps of Engineers, the U.S. Geological Survey and other partners are prepared to conduct the needed studies to determine the feasibility of various strategies for reducing this threat. We need these studies as soon as possible to determine what can be done to remove or reduce this threat. We have received a federal commitment, and the 25% non-federal match may soon be announced by the states of Maryland and Pennsylvania. The Executive Order must contain a commitment to funding the preliminary studies, AND a commitment to play a major role in funding solutions that are produced from these studies.

See the following for a brief of some of the findings of previous scientific study of the lower Susquehanna River dam sediments.

Excerpts of the CBP STAC Report on Susquehanna Sediments

The Objective of the Workshop was to survey the possible consequences of the increased delivery of sediments from the Susquehanna River to the Chesapeake Bay as a result of the loss of retention of sediment storage in the reservoirs behind the existing dams on the river.

The material presented emphasized **the complexity of the possible effects** of increases in sediment discharge to the Bay and of the increase in severity of scouring events. This is compounded by our inability to forecast the timing or intensity of these scouring events in the river and reservoirs. Detailed predictions are therefore not possible but the consequences that can be predicted with most confidence are:

- 1) Increased loading of phosphorus in the Middle Bay below the Estuarine Turbidity Maximum zone (the ETM) from sediments that move beyond this zone during large-flow scouring events.
- 2) Increased needs for dredging the navigation channels in the Upper Bay as the overall load of sediment deposition in the Upper Bay increases. Past information shows that almost all of the sediment delivered by the Susquehanna River is deposited north of the Baltimore area. There is a tendency for high rates of accumulation of finer materials in the deeper channels. These areas are those where the greatest impacts from increased sediment delivery can be expected. If channel dredging continues it will have to be more frequent, and with increased costs.
- 3) Higher turbidity and faster sedimentation everywhere, but especially in the navigation channels. The range of flow dynamics will be increased, especially during storms. Without channel dredging there will be rapid channel filling, downstream displacement of the salt front, and possible major changes in circulation and sedimentation patterns.
- 4) Adverse effects on the recovery of Submerged Aquatic Vegetation (SAV) due to decreased light penetration. Most SAV species in the bay have high light requirements. Sediment solids are always a major factor and any increase in the amount present will be a

serious hindrance to the recovery and re-establishment of the SAV population and the habitat which this provides for many of the Bay biota.

5) Benthic organisms will be adversely affected by increased sediment loads that increase the energetic costs from burial. Episodic deposition also rapidly increases mortality and recruitment. Young oysters are sensitive to increased sediment deposition and long-term community structures will be changed by the impoverishment of the macrofauna.

6) Potential effects of increased sediment loading on fish populations in the Upper Bay and the ETM include:

- 1) direct effects of feeding, clogged gill tissues and smothering of eggs;
- 2) indirect effects on the abundance of planktonic prey of larval and juvenile fish, and
- 3) habitat alterations through increased silting and sedimentation with changes in the location and mode of operation of the ETM.

To the extent that increased sediment loading in the Upper Chesapeake Bay will require more dredging and associated activities to maintain channels there may be an increased threat to spawning and nursery habitats for anadromous fishes: this may become an issue in the future.

Thank you for considering these comments and for having your administration play an active role in protecting the public interest, and preserving our resources to meet the needs of generations of Americans yet to be born.

From the Mighty Susquehanna,



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