November 20, 2007

To: Elected Officials of the Chesapeake Bay Watershed

Re: **Dangers of Ignoring the Sediments behind the Conowingo Dam**

Dear Elected Officials,

Almost a decade old, the *Chesapeake 2000* agreement was signed by the States of Maryland, Pennsylvania, Virginia, and the District of Columbia, the U.S. Environmental Protection Agency and the Chesapeake Bay Commission. All parties agreed to address the sediment retention capabilities of the lower Susquehanna River dams: "**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." As we near the year 2008, sufficient action has not been taken to address the sediment capacity of these dams. Of the lower Susquehanna River dams, Yorkhaven, Safe Harbor, Holtwood, and Conowingo, all but Conowingo, the furthest south, have reached "steady-state" and are no longer trapping sediment. Sediment behind Conowingo Dam and the loss of its sediment retaining capacity represent imminent and substantial threats to the Chesapeake Bay and we ask you to take action on this issue.

The first threat to the Chesapeake Bay is the reoccurrence of what is known as the "catastrophic pulse". 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 the lower Susquehanna River dams the waters scoured another 8 years of pollutant-bearing sediment that had been trapped in the reservoir behind the dams (most from Conowingo). This "catastrophic pulse" of 12 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 behind the dam to a level exceeding 1972 levels, creating a threat of damages even greater than that experienced in 1972. Scientists agree that the question is not if this will occur again, but only a matter of when.

The second threat occurs as the Conowingo Reservoir reaches sediment storage capacity and we see a massive increase of sediment and phosphorus to the Chesapeake Bay. The paradox of the Conowingo Dam is that it 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. Once sediment trapping capacity, or "steady state", is reached, the load of sediment from the Susquehanna to the Chesapeake Bay will increase by up 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 and costs, to feeding and breeding capabilities of aquatic species, to the size of "dead zones". The 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 scientific research stopped in 2000, leaving us short of any action or solution.

In 1999 a Sediment Task Force was organized by the Susquehanna River Basin Commission (SRBC). In 2001 SRBC published the findings of the Sediment Task Force (pub. 221). In these findings it was agreed that, "First, a feasibility study is recommended to determine if dredging the reservoirs is a viable option to maintain or reduce the volume of sediment currently trapped behind the dams. Other alternatives, including sediment bypassing, sediment fixing, and modified dam operations, were considered, but dismissed. The Commission is now working to secure the necessary Congressional support to allow the U.S. Army Corps of Engineers to begin such a study." (SRBC pub. 221, page 2). It is our understanding that although this statement of action was included in the Task Force's recommendations, the measures taken thus far have been to address reductions in upstream sediment loading and to take no action to address the existing sediments or the upcoming "steady state" that the Conowingo Dam is now predicted to reach in **10 to 20 years**. Water quality monitoring would suggest that an effort to address only the upstream sources of sediment would not be effective in halting the filling of the Conowingo Reservoir, as we continue to see sediment loading from the Susquehanna River into the Chesapeake Bay. But we cannot be sure of this as we have had no sediment quantity studies done on the sediment behind Conowingo in over a decade.

Steps need to be taken immediately to get us back on track to addressing the sediments and fulfilling the *Chesapeake 2000* agreement. We need funding for USGS studies of the current amount and locations of the sediments (bathymetry), and for the sediment transport curves that tell us where the sediment is coming from (also recommended in SRBC pub. 221). These two studies are expected to cost less than $250,000 (67% non-federal match) and could begin immediately. Please take action to investigate the capacity of the dam and ensure that we have the appropriate information to make timely management decisions.

The Chesapeake Bay Program, Susquehanna River Basin Commission, U.S. Geological Survey and university scientists all agree that we have an imminent and substantial threat to the Chesapeake Bay, a threat that could undermine the years of efforts that have been made to restore the Bay. We may have 10 years or less, or we may have 20 years or more, we don't know. We do know that we need more information. We need these studies as soon as possible to determine what can be done to remove or reduce this threat. The following signers are committed to addressing this issue and we need and appreciate your support. Thank you.

Sincerely, Michael R Helfrich
Lower Susquehanna RIVERKEEPER

Stewards of the Lower Susquehanna Inc.
Coalition of Concerned Pennsylvania Anglers
Foundation for Pennsylvania Watersheds
Citizens for Pennsylvania's Future (PennFuture)
Pennsylvania Forest Coalition
Watershed Alliance of York

WATERKEEPER ALLIANCE
Assateague COASTKEEPER
Patuxent RIVERKEEPER
Severn RIVERKEEPER
West/Rhode RIVERKEEPER
Fred Bohls, PA Angler

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.