



Chesapeake Bay Foundation, Inc.

STATEMENT

OF

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BEFORE THE

SUBCOMMITTEE ON WATER RESOURCES AND ENVIRONMENT
COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE

CONCERNING
NONPOINT SOURCE POLLUTION: ATMOSPHERIC DEPOSITION AND WATER
QUALITY

PRESENTED ON
APRIL 17, 2007

Nonpoint Source Pollution: Atmospheric Deposition and Water Quality

This statement focuses on the impacts of air pollution on water quality in the Chesapeake Bay Region, Exhibit 1 (the Chesapeake Bay Watershed) & Exhibit 2 (the Chesapeake Bay Airshed), and the inability of the current statutory scheme to adequately control this pollution.

IMPACTS

Air pollutants such as mercury, sulfur dioxide (SO₂), and nitrogen oxides (NO_x) are emitted into the atmosphere from various sources and eventually fall directly into or run off the land into bodies of water. These pollutants lead to fish contamination, acidification, and excess algae blooms that block sunlight and deprive aquatic organisms of oxygen.

Acidification

Scientists, legislators, and policy makers have been aware for decades that air pollution can affect water quality. For example, the 1990 Title IV amendments to the Clean Air Act (better known as the Acid Rain amendments) were driven by the acidification of numerous lakes and streams throughout the Northeast caused by air pollution. 42 U.S.C. § 7651. The lowering of pH (acidification) in those bodies of water due to sulfur dioxide and nitrogen oxide air pollution had significant adverse impacts on fish and other aquatic wildlife. Despite a substantial body of evidence acquired over a long period of time, it took many years for this issue to be addressed.

Unfortunately, in many mountain lakes and streams, the reductions required by Title IV have not been sufficient. Acid Deposition Standard Feasibility Study Report to Congress, EPA 430-R-95-001a, U.S. Environmental Protection Agency, Office of Air and Radiation, Acid Rain Division, Washington, D.C (1995). In the Bay Region, four areas particularly susceptible to continued acidification are Shenandoah National Park (a 100-km segment of the Blue Ridge Mountains in western Virginia), St Mary's River Wilderness Area (the Saint Mary's River drains the western slope of the Blue Ridge Mountains in the George Washington National Forest), and the Otter Creek and Dolly Sods Wilderness areas (located in the Monongahela National Forest in north-central West Virginia). Exhibit 2. See Baker, L.A., A.T. Herlihy, P.R. Kaufmann, and J.M. Eilers, *Acidic lakes*

and streams in the United States: the role of acidic deposition, Science, 252: 1151 (1991).

For the Chesapeake Bay and its tributaries, mercury and nitrogen pollution from atmospheric deposition are significant problems.

Mercury

The problem air borne mercury presents is quite insidious. Mercury is emitted into the air in several chemical forms. One form, reactive gaseous mercury, falls to earth and through a complex biological process becomes methylmercury that is taken up by aquatic organisms. U.S. EPA, Mercury Study Report to Congress, EPA-452/R-97-005 (December 1997), Vol. I: Executive Summary & Vol. III: Fate and Transport of Mercury in the Environment. Eventually this form of mercury finds its way into fish tissue. People consume the fish and are exposed to the pollutant. Mercury is a harmful neurotoxin that is especially damaging to the unborn and small children. National Research Council, *Toxicological Effects of Methylmercury* (prepublication copy July 2000). Harm to biota such as birds and small mammals has also been well documented. See generally Biodiversity Research Institute, *Mercury Connections, The Extent and Effects of Mercury Pollution in Northeastern North America*, at 12-13, 16, 18 and 20 (2005).

What is insidious about this problem is that expectant mothers are encouraged to eat fish because it has well recognized health and cognitive benefits for their children. Unfortunately, one cannot simply look at a fish or a piece of fish in the market and determine whether it is contaminated or not. Further, surveys have determined that health advisories are ignored. CITE Thus, thousands of unborn babies and children are needlessly exposed to this danger every year and instead of promoting healthy food we are actually risking their health. Kathryn R. Mahaffey, *et al.*, *Blood Organic Mercury and Dietary Mercury Intake, National Health and Nutrition Examination Survey, 1999 and 2000*, 112 Env'tl Health Persp. 562 (April 2004); Mahaffey, *Methylmercury: Epidemiological Update*, Presentation at Fish Forum 2004).

The primary atmospheric sources of mercury pollution are coal burning power plants and waste incinerators. EPA has imposed strict standards on waste incinerators. Mercury levels in fish located in bodies of water

near those sources have been dramatically reduced since promulgation of those regulations. Florida Dept. of Environ. Pro., The Everglades Mercury TMDL Pilot Study: Final Report, 2003. Regrettably, EPA has failed to take similar action with respect to coal fired power plants.

In 2000, EPA found that mercury posed a serious health risk and should be governed by strict, maximum achievable control technology (MACT) standards, 42 U.S.C. § 7412. 65 Fed. Reg. 79,825. However, the Agency later reversed course and decided to remove power plants from the MACT list, 70 Fed. Reg. 15994 (Mar. 29, 2005), and, instead, subject those plants to a cap and trade program. 70 Fed. Reg. 28606 (May 18, 2005). The Chesapeake Bay Foundation, several other citizen groups, and numerous states have sued EPA over this flawed rule that does not fully address the local impacts associated with utility mercury emissions.

Research in the Chesapeake Bay airshed has confirmed that mercury emitted from coal fired electric utilities contributes to local deposition. Mark Cohen, NOAA, *Modeling the Fate and Transport of Atmospheric Mercury in the Chesapeake Bay Region* (May 17, 2004); Mark Cohen, NOAA, *Modeling the Deposition and Transport of Atmospheric Mercury to the Great Lakes (and the Chesapeake Bay)* (June 27 – July 2, 2004). Keeler, *et al.*, *Sources of Mercury Wet Deposition in Eastern Ohio, USA*, Environ. Sci. Technol. 2006, 40,5874-5881. In response, many states have enacted legislation much stricter than the federal standard. See *e.g.*, Maryland Healthy Air Act, 2006.

As you can see from Exhibit 3, mercury pollution is the number one source of water impairment in the nation. In the Chesapeake Bay region, one hundred and forty-one bodies of water are impaired due to mercury contamination in fish. [http://oaspub.epa.gov/waters/national_rept.control#IMP STATE](http://oaspub.epa.gov/waters/national_rept.control#IMP_STATE) A health advisory is listed for Maryland's state fish, the rockfish, throughout Maryland's portion of the Chesapeake Bay. All water bodies in Pennsylvania are impaired for mercury. According to a Virginia Health Department official, other state waters are not listed simply because they have not been tested. Given the population within the Bay region, the potential health effects and impacts to recreational and commercial fishing are tremendous.

Nitrogen

Nitrogen deposition to the Chesapeake Bay and its tributaries causes excessive algae blooms. Some of this alga is toxic to humans and wildlife. However, the most deleterious effect of these blooms is how they deplete the water of oxygen necessary for aquatic life. Hardest hit are sessile benthic organisms such as oysters and plants that cannot swim to more oxygenated waters. However, if the area of depletion is large, even mobile organisms can be adversely affected. Crab “jubilees” where crabs run on to the land for air have been reported in several areas of the Bay. In 2003, the Chesapeake Bay Program identified the largest area of anoxic water in the mainstem of the Bay ever recorded. Exhibit 4, Chesapeake Bay Oxygen Levels July 7-9, 2003.

It is estimated that approximately one fourth of the total nitrogen load to the Bay comes from air pollution. http://www.chesapeakebay.net/air_pollution.htm The sources of nitrogen air pollution include mobile sources such as automobiles, trucks, and shipping. Stationary sources like power plants and industrial manufacturing also contribute to the load. In addition, cattle and poultry production contribute nitrogen to the air in the form of ammonia emitted as a gas from manure. *Id.*

CURRENT REGULATORY SCHEME

Unfortunately, there is no clear statutory way in which to control air pollution that harms water quality.¹

The Clean Air Act sets ambient air standards. That is, standards that protect health and visibility due to pollution in the air, not on the land or in the water. 42 U.S.C. § 7409. While there are secondary standards that can address impacts to natural resources, they are typically only triggered when a new air pollution source or a source that wants to increase emissions affects a national park or wilderness area. 42 U.S.C. §§ 7475, 7491.

¹ In its “Atmospheric Deposition and the Chesapeake Bay” power point presentation available on-line, the Chesapeake Bay Program, an arm of US EPA, recognizes that the Clean Air Act and the Clean Water Act “were written without any consideration of the relationship between air and water.” http://www.chesapeakebay.net/air_pollution.htm

The Clean Water Act sets effluent limits for discharges directly to water from point sources. Point sources are defined as “any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged.” 33 USC § 1362(14). While it could be argued that this definition includes emissions from a power plant stack, for example, that is not how the act has been interpreted. Thus, air pollution cannot be directly addressed via the Clean Water Act.

Some states and regions have attempted to address water pollution by formulating Total Maximum Daily Loads (TMDL) for specific water bodies or all similarly impaired waters within a state. For example, several Northeast states recently drafted a region wide TMDL for mercury impaired waters in their respective jurisdictions. While section 303 of the Clean Water Act requires states to identify waters impaired by a particular pollutant and to then propose TMDLs for those waters that are designed to remove the impairment, 33 USC § 1313(d), there is no statutory requirement that they implement a plan to stop the pollution. *See Sierra Club v. Meiburg*, 11th Circuit.

Although the Northeast states have done much to reduce mercury pollution from sources within their borders, they readily admit that the bulk of the problem is coming from out of state sources. They further recognize that current federal Clean Air Act programs such as the Clean Air Mercury Rule and the Clean Air Interstate Rule will not entirely alleviate the problem. Tacitly recognizing they are powerless to address this issue under the current statutory structure, these states call upon EPA to implement plant specific MACT limits for mercury from coal fired power plants under section 112(d) of the Clean Air Act. Thus, they have thrust the ball back into EPA’s court.²

Given this statutory “gap,” citizen groups have had to be creative in their attempts to control the impact of air pollution on water. For example, the Waterkeeper Alliance petitioned the NAFTA Commission for Environmental Cooperation to investigate why US EPA has failed to enforce the Clean Water Act to address mercury pollution from coal fired electric utilities. <http://www.waterkeeper.org/mainarticledetails.aspx?articleid=207>

² These same states are parties to the suit against EPA for removing power plants from the MACT list and promulgating CAMR.

They have also sued a US utility for allegedly polluting Canadian waters with mercury. <http://www.waterkeeper.org/mainarticledetails.aspx?articleid=286> To date, no similar action has been successfully brought in a United States court.

POSSIBLE SOLUTION

A possible solution to this dilemma is to regulate stationary air sources like point source water pollution. There are several models that can determine the deposition patterns of these pollutants from individual or multiple sources. *E.g.*, AERMOD, CALPUFF and CMAQ. <http://www.epa.gov/scram001/> These models can be used to determine the estimated pollutant loads to a specific watershed by each source. Modeled estimates could be verified by air pollution deposition monitors located in each watershed. As states develop and implement pollutant load allocations for specific bodies of water, each significant air source's contribution to that allocation can be determined and their emissions limited via an air pollution permit.