Reducing Mercury in Wastewater and Spreading the Word about Mercury in the Environment

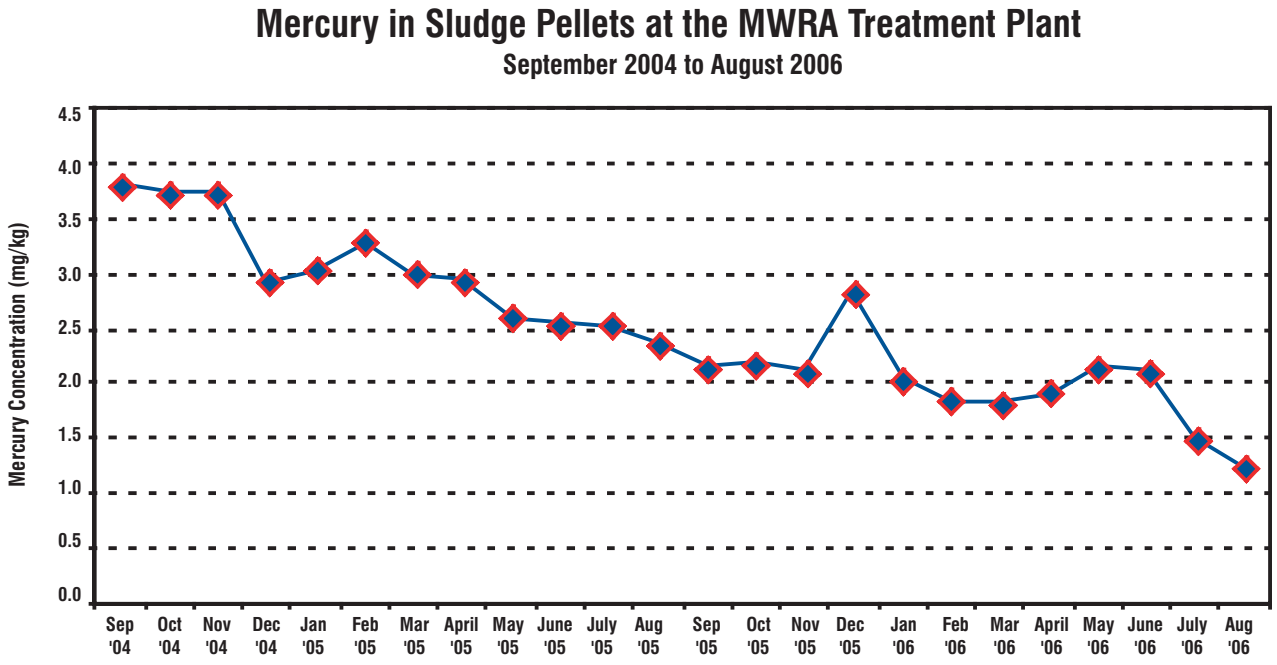
Compiled by the New England Interstate Water Pollution Control Commission

Mercury Reductions Resulting from Installation of Amalgam Separators

Mercury is a pollutant that is found in water and aquatic organisms, but it primarily originates from air and solid waste sources. Therefore, reduction programs are usually aimed at these sectors. However, one way to directly reduce mercury in wastewater is installation of amalgam separators. As such, the Northeast states have implemented voluntary and mandatory programs to install amalgam separators in dentists' offices in the region.

In August 2003, the NEG-ECP Mercury Task Force adopted a regional goal that 50 percent of dental offices in the region would install amalgam separators by the end of 2005. This goal has been exceeded and the Mercury Task Force now has new goals of 75 percent separator installation by the end of 2007 and 95 percent by the end of 2010. In 2005, it was estimated that the New England states had the following rates of amalgam separator installation: Connecticut – 65 percent, Maine – 95 percent, Massachusetts – 74 percent, New Hampshire – 95 percent, Rhode Island – 25 percent, and Vermont – 15 percent. All of the Northeast states now

FIGURE 1



Data provided by Massachusetts Water Resources Authority, 2006

have legislation or regulations that require installation of amalgam separators.

Prior to legislation, many of the states had voluntary programs to encourage dentists to install separators. For example, Massachusetts began a voluntary program in 2004 that allowed dentists who installed separators prior to legislation becoming effective in 2006 to be exempt from future Massachusetts DEP amalgam separator installation, operation, maintenance, and upgrade regulations and related fees until either 2007 or 2010, depending on the date of installation. This program resulted in approximately 75 percent of dentists installing separators. The environmental effects of this can be seen in the mercury concentrations in sewage sludge at the Massachusetts Water Resources Authority (MWRA) wastewater treatment plant, which receives sewage from homes, businesses, and industries in 43 greater Boston communities. Sludge mercury concentrations were measured at the MWRA treatment plant between September 2004 and August 2006 and the results demonstrated a clear reduction in mercury concentrations during this time period. The mercury concentration in the plant's sludge pellets in September 2004 was 3.8 mg/kg; by August 2006 it had decreased to 1.2 mg/kg. It was during this time period that the majority of amalgam separators now in operation were installed.

In addition to these documented results in Massachusetts, similar results have been seen by the Western Lake Superior Sanitary District in Duluth, MN. Sludge mercury concentrations were measured between January of 1995 and January of 2006. In 1995, when there were no amalgam separators installed, sludge concentrations were over 2 parts per million (ppm). In January of 2006, when all of the 57 dental practices in the district had installed separators, sludge concentrations were less than 0.5 ppm (Tuominen 2006).

Reductions in wastewater mercury concentrations mean that less mercury is being released to water bodies and therefore less mercury is accumulating in fish. Concentrations in incinerated sludge will also be reduced, resulting in reduced mercury emissions from sewage sludge incinerators. This will lead to reduced deposition of mercury and therefore reduced mercury inputs to water bodies.

While the Massachusetts results provide evidence that amalgam separators reduce mercury in wastewater, the Northeast states would like to more closely examine mercury sludge concentrations in the entire region. The NEG-ECP Mercury Task Force plans to collect data on mercury in sludge from all of the Northeast states and examine the results prior to and following installation of amalgam separators. It is expected that the results for the region will be similar to what has been seen in Massachusetts.

Decreases in Fish Mercury Concentrations

In addition to significant reductions in fish mercury concentrations resulting from decreases in local emissions in Massachusetts (see NESCAUM's report, *Tracking Progress in Reducing Mercury Air Emissions)*, significant decreases in fish mercury concentrations have been observed in some locations of New York State. In a New York State Department of Environmental Conservation study, current fish mercury levels were compared to past levels. In the majority of locations, current mercury concentrations were significantly lower than they were 10 to 20 years ago (Simonin 2006). These decreases have not yet been explicitly linked to decreases in emissions from specific sources, but it is highly likely that declines in mercury emissions resulting from regional mercury reduction programs contributed to the decreases in fish tissue mercury concentrations.

Communication Efforts

Outreach to Policymakers

In late 2004, NEIWPCC, NESCAUM, and NEWMOA collaborated on writing *Mercury Pollution in the Northeast: A Guide for Policymakers*. The purpose of this document was to inform state and federal policymakers and their staff of the reasons to be concerned about mercury, the status of the mercury issues in the Northeast, and what needs to be done to address the mercury problem. The document contains background information about mercury, as well as sections on regional mercury control efforts, federal mercury programs, and further actions that need to be taken to control mercury. The document was sent to the congressional delegation for the Northeast states, as well as the environmental committees of the state legislatures of the Northeast states. Following the mailing, an article on the document was published in Inside EPA's *Water Policy Report,* a publication that reaches a national audience. The development of the document and other such outreach efforts mean that policymakers are better informed on mercury issues and are more likely to pass legislation for reducing mercury in the environment.

Sharing of Regional Research

There are a number of groups in the Northeast involved in mercury-related research, including universities, state and federal agencies, and private research organizations. Their research spans all aspects of the environmental and public health issues associated with mercury. It is important that these researchers have a forum to share the results of their work and that those involved in policymaking are also aware of their research. In April 2006, NEIWPCC, with assistance from NEWMOA, NESCAUM, and EPA New England, coordinated the Northeast Regional Mercury Science and Policy Conference. Meetings such as this allow for collaboration, which can lead to more effective research. They allow for the education of policymakers, who are then better informed when faced with decisions about mercury.

Coordination of State Outreach Efforts

NEIWPCC coordinates a Mercury-Fish Workgroup that is made up of representatives from the state environmental and public health agencies. The group meets semiannually to discuss issues related to monitoring mercury in fish, and outreach associated with fish consumption advisories. Through the workgroup, state staff have had the opportunity to share ideas, successes, and failures regarding their outreach efforts. This has avoided "reinventing the wheel" and allowed the states to have more confidence in the efforts to which they are devoting their resources. Improved outreach efforts by the states lead to improved public awareness, and ultimately reduced exposure to mercury.

References

Simonin, H., Loukmas, J., and Skinner, L. Mercury in Fish from New York State Lakes and Reservoirs. Presentation at the Northeast Regional Mercury Science and Policy Conference. Newport, RI.

Tuominen, T. 2006. Mercury Reduction Efforts at Wastewater Treatment Plants. Poster Presentation at the 8th International Conference on Mercury as a Global Pollutant. Madison, WI.