Minnesota Pollution Control Agency

Reducing mercury emissions from power plants in Minnesota

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Since the 1990s, the Minnesota Pollution Control Agency (MPCA) has been working to reduce emissions of mercury from Minnesota sources. Mercury is an environmental problem because it accumulates in fish and can adversely affect the health of the people and wildlife that eat the fish.

Mercury contamination of fish is a widespread problem in Minnesota. The Minnesota Department of Health advises people to limit consumption of some fish species from all lakes and rivers in Minnesota. Nearly two-thirds of the state's waters listed as "impaired" under provisions of the federal Clean Water Act are on the list due to mercury.

The mercury that contaminates Minnesota's fish comes almost entirely from atmospheric deposition. Rain and snow transport mercury to the state's land, lakes and rivers, and mercury can also fall from the atmosphere as dry deposition. About 30 percent of the mercury that is deposited from the air comes from natural sources, such as volcanoes and the weathering of rock.

But 70 percent of the deposited mercury results from human activities that release mercury from the geological materials in which it had been locked up. These activities include the mining of mercury ores, using mercury in products and manufacturing, and the release of trace concentrations of mercury naturally present in coal, crude oil and metallic ores.

About 90 percent of the mercury that falls on Minnesota originates from sources outside the state. If Minnesota fish are ever to be safe to eat, we must significantly reduce all sources of mercury, not just the 10 percent of mercury deposition that is from Minnesota sources.

Power plants are the main source of mercury emissions.

MPCA staff estimates that 58 percent of the mercury emissions from Minnesota sources is from electrical power plants. Therefore, reducing mercury emissions from power plants has been, and continues to be, a top objective for the agency. Toward that end, the MPCA has worked with electrical utilities in the state.

Voluntary agreements yield first cuts in power plant emissions

Since the establishment of the MPCA's voluntary mercury-reduction agreement program in 1999, electrical utilities in Minnesota have initiated or fully implemented four actions that will reduce annual mercury emissions from their facilities by 275 pounds (lb.):

- In 2000, Minnesota Power switched to low-mercury coal, reducing its annual mercury emissions by 70 lb.

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- In 2003, Excel Energy replaced two coal-burning units at its Black Dog plant with a natural-gas-fired turbine generator, reducing annual emissions from that plant by 35 lb.
- By 2009, an agreement, known as the Metropolitan Emissions Reduction Project or MERP, will result in reductions of mercury emissions from Xcel Energy's Allen S King, High Bridge and Riverside plants of 170 lb. This will be achieved by converting the High Bridge and Riverside plants from coal-fired plants to plants that burn natural gas, and adding scrubbers and fabric filters to the King plant.

Minnesota Mercury Emissions Reduction Act will yield the largest cuts in emissions.

In February 2006, Governor Tim Pawlenty directed the MPCA to bring together the stakeholders — electrical utilities, environmental groups, ratepayers, and government agencies — to develop mercury-reduction legislation.

The resulting legislation, the Minnesota Mercury Emissions Reduction Act of 2006, was carefully crafted to take into account the unique situation that existed in the state, including:

- wet scrubbers are in operation at a number of large coal-fired power plants in the state; and
- Minnesota's coal-fired power plants burn western coal, which while it has a lower mercury concentration than eastern coal, is emitted in a form that is more difficult to capture.

As a result of the negotiations coordinated by the MPCA, Governor Pawlenty was able to sign the act into law on May 11, 2006. The act, when fully implemented, will result in a 90 percent reduction of emissions from six generating units at Minnesota's three largest coal-fired power plants: Xcel Energy's Sherco and Allen S. King plants and Minnesota Power's Clay-Boswell plant.

These reductions will occur in two phases, depending on the type of emissions control equipment currently in use at the plants. Units with dry scrubbers (for which mercury-control technology is more advanced) will have to be modified to capture more mercury by the end of 2009. Units with wet scrubbers will have until 2014 to reduce emissions.

When fully implemented in 2014, these plants will have reduced annual emissions by 90 percent, or about 1,200 lb. This amount is more than one-third of the total annual mercury emissions in the state, and over 70 percent of the emissions from the state's electric power industry. The reductions will be accomplished well before 2018, the deadline established by the U.S. Environmental Protection Agency (EPA) to reduce mercury emissions.

The legislation provides that the utilities' plans to reduce mercury emissions will be reviewed by the MPCA for technical feasibility and that the Minnesota Public Utilities Commission will review the plans to ensure that the cost to ratepayers is not excessive.

Other sources

MPCA has established a goal of reducing annual mercury emissions by about 2,500 lb. from current levels. To meet this goal all sources in Minnesota will need to reduce. MPCA will work with stakeholders to develop a reduction plan over the next year or two.

For more information

For more information about the MPCA's efforts to reduce mercury emissions in Minnesota, call Ned Brooks, MPCA mercury coordinator, at (651) 296-7242 or e-mail him at ned.brooks@pca.state.mn.us.

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