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Keetac expansion would mean more mercury

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Increasing production at U.S. Steel's Keewatin taconite plant will mean an accompanying increase in mercury pollution, state regulators said Friday.

Taconite plants are a major source of mercury emissions, second only to coal-fired power plants in Minnesota.

"Emissions are tied to production. If you increase [taconite] production, you increase mercury emissions," said Mike Berndt, lead taconite mercury researcher for the Minnesota Department of Natural Resources.

Researchers like Berndt have found promising technology in small-scale tests to reduce mercury pollution from taconite plants by capturing the metal before it vaporizes into the air. But so far those technologies haven't been installed at the commercial level.

"We are definitely going in specific directions and there have been some promising test results," Berndt said.

State officials note that, even if all mercury was re-moved from taconite plant air emissions, it would make only a small difference in the mercury levels in Minnesota fish. That's because much of Minnesota's taconite plant mercury blows to other states and nations, and much of the mercury that falls here comes from far away.

Moreover, most of the mercury emitted by taconite plants, as with coal-fired power plants, is elemental mercury which scientists say is unlikely to cause contamination problems close to its source.

Still, the taconite industry and state agencies are work-ing to reduce mercury pollution as part of ongoing efforts to reduce the state's overall contribution of mercury to the environment.

"Even though we say the immediate local contribution [to mercury levels in Minnesota lakes and fish] may not be measurable, taconite emissions still are contributing to the global load of mercury in the atmosphere, and some of that is probably coming back around to add to the problem here," said Anne Jackson, principal engineer for the Minnesota Pollution Control Agency's air policy unit.

Capturing mercury

Minnesota already has mandated significant cuts in mercury emissions from coal-fired electric plants — from 1,706 pounds in 2005 to fewer than 400 pounds by 2014, and utilities like Minnesota Power and Xcel are spending millions of dollars to meet that state law.

No such law applies to taconite plants and, by 2014, taconite production probably will become the state's single largest source of mercury unless a major new reduction technology can be found, Jackson said.

"I'm not sure we can get taconite to that kind of reduction that we'll see with energy," Jackson said. "But I think we'll see overall mercury reductions of maybe 50 percent from taconite production in the not too distant future.... It [taconite production] will remain a significant source, however."

Berndt said existing air pollution control devices at taconite plants, aimed at capturing sulfur pollution, also are catching some mercury. So-called scrubbers designed to remove sulfur dioxide from the smokestacks are catching 10 percent to 30 percent of total mercury.

New technologies, such as adding salts like calcium bromide or sodium bromide, have removed as much as 60 percent of the remaining mercury in tests, Berndt said.

Minnesota Steel is expected to use a technology that injects ozone into flue gases to reduce federally regulated nitrogen oxides with an added benefit of significantly reducing mercury. U.S. Steel on Friday announced plans to increase production at the Keewatin Taconite plant by 60 percent, from 6 million tons per year to 9.6 million tons. The company will need pollution permits for that expansion, and reducing mercury will be part of those permit discussions, Jackson said.

The Keetac expansion will add an estimated 49 pounds of additional mercury to the atmosphere — if no new control measures are taken, Jackson said.

Mercury emissions from taconite plants hit 737 pounds in 2005 — one-third of all mercury emissions in the state — and are expected to hit 889 pounds by 2018, when Keetac's expansion and other iron ore plants, like Mesabi Nugget and Minnesota Steel, come online.

That compares to about 1,706 pounds emitted from coal-fired power plants in the state in 2005 and 256 pounds at smelters.

Though there are no specific state or federal mercury limits written in law, Jackson said Keetac almost certainly will need to incorporate mercury reduction into their expansion plans. The plant also must comply with federal regulations on sulfur dioxide and other pollutants.

“We know we will see that in the public comments during permitting process and I know there will be significant time spent on mercury in our [PCA] discussions with the company,” Jackson said.

John Goodish, U.S. Steel executive vice president and chief operation officer, said this week that U.S. Steel intends to go “beyond compliance” with environmental rules. The company is trying to identify the best available technology to control emissions, he said.

Keetac has been the subject of several recent mercury reduction tests. The taconite plant already has taken some action to reduce mercury by disposing of its iron fines, or dust, instead of reusing it. That dust can contain higher levels of mercury, Berndt said, and plants that reuse the iron dust in making taconite pellets can increase mercury emissions.

“Keetac now is getting about a 28 to 30 percent reduction,” Berndt said. “It seems to make a big difference to get that mercury [captured in iron dust] out of the system rather than recycling it.”

Berndt said mercury in water discharges from taconite plants has not been a significant issue because iron in taconite tailings captures the mercury so it's not re-released in the water.

Berndt declined to speculate when a specific technology might be ready for commercial application, or if Keetac may be ready to add mercury reducing technology as they expand operations.