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Fermilab must get new permits after radiation release

By **Dave Fornell**

City editor

The public will have a chance to air any concerns about Fermi National Accelerator Laboratory's release of small amounts of radioactive tritium into the ponds on its campus and neighboring Indian Creek outside its property.

After low-level releases in November and December, the lab must now revise its hazardous waste management permit to include tritium, which is a radioactive isotope of hydrogen. The permit must be renewed through the Illinois Environmental Protection Agency and the U.S. EPA.

Tritium is usually associated with cooling water from nuclear reactors, where radiation from the reactor causes changes in the hydrogen atoms that make up the water in the water cooling system. Tritium releases from the cooling system of the Braidwood Nuclear Power Plant in Braidwood, Ill., recently made headlines around the state. However, the levels were much higher than those released at Fermilab, which officials say were barely detectable.

Fermilab spokesman Mike Perricone said since the 1970s Fermilab has maintained a comprehensive environmental monitoring program. In the history of the lab, he said, tritium was never detected in any of the streams that leave the site until last November, when very small amounts of tritium were detected in Indian Creek, at the southwest corner of Fermilab's property. He said the levels found posed no threat to human health or to the environment.

Rod Walton, an ecologist who works in the lab's engineering department, said the amounts of tritium were far lower than the federal drinking water standards of 20 picocuries per milliliter of water, or the federal limit for tritium in surface water at 2,000 picocuries. A picocurie is a measure of radiation.

"At Fermilab, our highest release was about three picocuries, so we are well below drinking water standards," Walton said.

He said levels below one picocurie are not detectable, so it is likely lower levels of tritium have been present at Fermilab for some time but could never be seen. Walton said the levels probably increased to detectable levels because the proton beams used at the lab have increased in intensity the past few years.

Walton said Fermilab scientists tracked down the source of the tritium to production of neutrinos for the lab's ongoing MINOS neutrino experiment. He said a beam of protons is shot at a metal target in a long, underground tunnel at

the lab. The target breaks down the protons into smaller subatomic particles that continue down the tunnel and through 400 miles of bedrock to a neutrino detector in an underground mine in northern Minnesota.

However, Walton said the protons in the beam are also colliding with airborne water molecules, of which there are a lot since the tunnel acts as a well and underground water must constantly be pumped out of the MINOS facility. This water is pumped into the cooling system for the beam and circulated into a network of ponds around the Fermilab property. Walton said these ponds also have a connection to Indian Creek.

Since the discovery of tritium, he said the lab has taken measures to secure leaks in the cooling system and the connections between the ponds and the creek. The water from the MINOS experiment will also be diluted to keep tritium levels below detectable levels.

Perricone said the tritium has been back to undetectable levels since January.

"Our environmental permit to operate does not allow for a discharge of tritium," Perricone said. "Now that we know it is part of the process, we need to monitor for it."

For that reason, Fermilab now must get new permits from the federal and Illinois EPAs to allow it to monitor for, contain and handle tritium, which is considered a hazardous waste by the EPA.

Copies of the EPA permit application are available at the Batavia Public Library, 10 S. Batavia Ave. (Route 31). Written public comments on the application can be sent to Mara McGinnis, Illinois Environmental Protection Agency, 1021 N. Grand Ave. East, Springfield, IL 62794-9276, by midnight Monday, May 15.

Fermilab has information about the tritium release on its Web site at www.fnal.gov/pub/about/community/IndianCreek.html.

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