

Oconee routinely releases tritium

Duke officials say discharges pose no risks, within regulatory limits

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The Oconee Nuclear Station routinely discharges water contaminated by radioactive tritium into the Keowee River that flows into Lake Hartwell, a source of recreation and drinking water — discharges regulators say are within safe limits and critics say can increase cancer risk.

Oconee makes routine releases of diluted concentrations, said Sandra Magee, a Duke Energy spokeswoman. The releases are safe, well below the Environmental Protection

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View lab results for the Lake Keowee and Oconee Nuclear Station area as well as DHEC's groundwater and surface water screening report at GreenvilleOnline.com.

Agency ceiling for drinking water, and are reported to the Nuclear Regulatory Commission, Magee said.

Oconee's most recent annual report, for 2009, shows an average of 4,700 picocuries per liter. The highest single sample result was 9,760 picocuries.

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The federal EPA and state limit for tritium in drinking water is 20,000 picocuries per liter, according to the state Department of Health and Environmental Control.

"The tritium levels that we are releasing are not a health threat to the public or our workers. There is no impact to the public health," Magee said.

High doses of tritium over a long time can increase cancer risk, though regulated tritium releases from nuclear plants pose a negligible risk, said Dr. Paul Kountz, a nuclear specialist with Upstate Carolina Radiology.

Tritium, a naturally occurring radioactive form of hydrogen, is a byproduct of nuclear power operations.

Small amounts of tritium are present normally in the atmosphere due to interactions with cosmic rays, said Dan Zuroskey, director of radiation safety and a professor in the radiology department at the University of South Carolina's School of Medicine.

"Tritium is a very low energy beta particle emitter and it is one of the few isotopes that can't be detected with a Geiger counter," he said. It has a half-life of 12 years in the water and can accumulate in just about any part of the body.

Oconee's reported tritium levels "are not insignificant," said Bob Guild, a Columbia attorney involved in litigation regarding tritium and other nuclear waste and vice chairman of South Carolina's chapter of the Sierra Club.

Colorado has a limit of 500 picocuries per liter in drinking water, and California has a public health goal of 400 picocuries, he said.

"Radiation is a long-term threat to people's health," Guild said. "No additional dose of radiation is safe or good for you. Radiation is all around you, but any dose of radiation can increase the risk of cancer over the long term. You want to avoid any additional exposure."

Discharges are released slightly below Duke's Keowee hydroelectric dam downstream from Lake Keowee and not into Lake Keowee, Magee said.

Greenville Water System draws water from Lake Keowee, upstream from Oconee's discharge point. The most recent test results, from 2009, detect no tritium in the water, said David Bereskin, general manager of the system. Duke Energy conducts the testing, and it is federally regulated, Bereskin said.

Duke samples water continuously from Lake Keowee and from the Keowee River downstream from the hydroelectric dam, Magee said. Samples are collected in a single container, and a composite sample is pulled from the container for analysis each quarter.

Releases are controlled and scheduled during normal operations, Magee said. Most of the tritium comes from boron that is added to the water that cools the reactors. Tritium also is produced by the uranium in the fuel.

The NRC oversees Oconee's radiological environmental sampling and monitoring, Magee said.

Sample results are submitted to the state and the NRC and are publically available, Magee said.

All U.S. nuclear power plants report tritium levels under a voluntary industry program, said Roger Hannah, spokesman for the Nuclear Regulatory Commission, which monitors environmental sampling done by plant employees.

"Our goal is to keep exposures as low as possible and certainly within regulatory limits," Hannah said.

Tritium doses from nuclear power plants is much lower than the exposures attributable to natural background radiation and medical procedures, Ma-



gee said, citing NRC data.

Duke monitors the water on and off the plant site and also tests at the discharge point on the Keowee River. The releases "are strictly controlled and maintained within our operating license requirements," Magee said.

DHEC tests for tritium from Duke Energy's Catawba Nuclear Station near Rock Hill, but not Oconee. That's because two nuclear power plants are upstream from Lake Wylie — Cataw-

ba and Duke's McGuire Nuclear Station in North Carolina, posing two potential sources, while Oconee is alone on its watershed, said Mary Nguyen Bright, a DHEC spokeswoman.

DHEC receives Oconee's reports, as it does from all nuclear power plants in the state, and any spikes could prompt DHEC testing, Bright said.

Catawba's average was 3,930 picocuries per liter and the highest single sample result was 4,420 picocu-

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ries per liter, Magee said. McGuire's average was 1,181 picocuries per liter, and the highest single sample result was 1,610 picocuries per liter.

Elevated levels of 42,760 picocuries per liter have been found at one of 66 monitoring wells on the Oconee Nuclear site. The well is for monitoring and not for drinking water.

"Our investigation leads us to believe the source is related to previous discharges into a former yard

drain on the property that is no longer used for that purpose," Magee said.

Duke has installed an additional well near the elevated well to gather more data. Routine sampling is done quarterly, and the additional test well is being monitored continuously.

There is no indication tritium is moving off the plant site or into ground water, Hannah said.

In 2008, DHEC tested for tritium around Oconee Nuclear Station and all nuclear

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power plants in the state after an industry initiative showed release of tritium at Oconee and Catawba.

Samples were tested from Lake Keowee and from drinking water wells at homes near Oconee.

The tests indicated no adverse effect on the quality of groundwater surrounding the plant, according to a DHEC report. The 2008 testing is the most recent water testing for tritium done by DHEC in the vicinity of Oconee Station.