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Aquifer mysteries hold key to effects of uranium mining

Tests could offer insight on potential for contamination

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The U.S. Environmental Protection Agency said Thursday a decision about whether Powertech USA will be permitted to conduct an aquifer pump test for its proposed Centennial Project uranium mine northeast of Fort Collins will be announced by mid-April.

If approved, Powertech will be allowed to test the feasibility of in situ leach mining for uranium at the Centennial Project site. The test could help regulators find answers to questions about how the underlying aquifer works and how any contamination from the mine could move through it and affect groundwater elsewhere.

Powertech's in situ leach mining method would pump a baking-soda-like fluid into the ground, which would loosen uranium from the underground rock formation, then pump the fluid back out of the ground, taking the uranium with it. The proposed pump test would allow Powertech to pump water out of the uranium-containing aquifer, store it and reinject it.

The mining could have the greatest impact on the Laramie-Fox Hills aquifer, which many surrounding landowners have tapped for their well water.

The councils of most of the surrounding cities and towns, including Fort Collins and Greeley, have said they oppose the mine, partly for fear it could pollute the groundwater.

How far any pollution from the mine could spread within the aquifer and how that could affect water wells in the area isn't well understood, but the pump test could shed some light on the matter, according to the EPA.

"If this project moves forward, the technical data collected will generate a geologic and aquifer model that can accurately predict groundwater movement at the site," said EPA spokesman Richard Mylott.

Information sparse

Information about the hydrogeology of the aquifer is sparse, and few people have studied how fast water moves in the aquifer to determine how pollutants could spread. The EPA's expert on the Centennial Project site, Valois Shea, was unavailable last week for comment.

For their part, neither the state nor the U.S. Geological Survey has studied the area extensively enough to say how the Laramie-Fox Hills aquifer works.

Vincent Matthews, state geologist and director of the Colorado Geological Survey, pointed only to a 1980 CGS study of hydrogeology and uranium resources northeast of the Centennial Project site, written at a time when Unocal and other companies were planning uranium exploration projects near Keota in Weld County.

The state sampled 104 water wells — many of which tapped the Fox Hills formation — near uranium deposits in northern Weld County. The study showed that the well water quality was extremely poor and much of the water contained high levels of uranium and vanadium.

The closer a well was to a uranium deposit, the more contaminated it was.

But, Matthews said, the study doesn't say much about what's happening in the same aquifer and rock formations near Nunn.

"One would need a lot of study, data and modeling to understand the intricacies of a particular area," he said.

Jay Davis, whose property abuts the Centennial Project site, said his well water is good now, but he doesn't want to see it contaminated.

"We've got fairly clean water, in a sense," Davis said. "When we've had our water tested for uranium in the past, it's actually below standard."

The USGS has no specific data on the Fox Hills aquifer near the Centennial Project, and any other studies conducted in the area wouldn't apply to that spot because each site has its own unique characteristics, said James K. Otton, a USGS geologist specializing in uranium.

Otton last year wrote a brief on in situ leach uranium mining, saying the mines have always left increasing contamination behind and no one has ever succeeded at fully cleaning up the groundwater after an in situ mine has shut down.

Attracting attention

The potential for groundwater contamination beneath in situ leach uranium mines in Colorado has attracted the attention of Denver Water, which in 2008 voiced concern about the mines' potential impact on groundwater quality while the Legislature was debating House Bill 1161.

The bill, signed into law the same year, requires companies doing in situ leach mining to prevent any mine contaminants from polluting the groundwater beyond the life of the mine.

"It's essentially a no degradation standard," said Jim Miller, a water treatment engineer for Denver Water, who testified before the Legislature partly about the agency's fear that exploitation of uranium mining claims in Park County could pollute the headwaters of one of its primary water sources.

He said the potential for water pollution from in situ leach mines could affect water suppliers across the state.

"There's a reason for water suppliers to watch this, besides which, we happen to be sitting on the Rocky Mountains, which are full of uranium," he said.

Though the Centennial Project won't have much impact on Denver Water, he said, "We have to be careful and watch what's going on."
