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A copper mine in San Juan County wants to expand using a new method that would pump diluted acid into the ground



(Zak Podmore | Tribune file photo) A view of the Lisbon Valley Mining Company's open-pit copper mine in eastern San Juan County, Utah.



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Utah's second largest copper mine after Kennecott is seeking permits for an experimental method of extraction involving pumping diluted sulfuric acid underground that could potentially

extend the mine's life for another 26 years.

The plan has raised red flags for nearby residents reliant on groundwater for drinking and livestock and also for environmentalists, who warn of long-term water contamination. But officials with the Lisbon Valley Mine, located in San Juan County northeast of Monticello, say the project is safe, environmentally sound and will bring desperately needed jobs to the areas

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Lisbon Valley Mine first opened in 2005 and has been managed by the Lisbon Valley Mining Co. since its former owner declared bankruptcy in 2008.

After a number of productive years, the company idled its open-pit mines in 2016, when global copper prices dropped. Though prices have started to rebound, the company has since been hurt by the Trump administration's ongoing trade dispute with China, according to public comments made by a company executive in October.

Its financial struggle is reflected in the fact that it is five years' delinquent on property taxes totaling \$1.4 million and recently won the county's forgiveness of about \$250,000 in interest and

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penalties.

In an attempt to stabilize its operations in the volatile commodities market, the company submitted an operation plan to the Utah Division of Oil, Gas and Mining in October outlining a proposal to expand beyond the current 5,700-acre boundary and begin a method of in-situ recovery (ISR) mining that is being used in a handful of copper operations around the world.

The process involves pumping water and sulfuric acid into the ground through a ring of injection wells to dissolve copper from the rock. This solution is then pumped back through a central well to the surface, where the copper is separated. Ideally, the entire process is contained within the ring of wells and the solution does not mix with surrounding groundwater. Advocates for the method have touted its minimal surface impacts compared to open-pit mining.

Company representatives explained the method during a Dec. 5 outreach session in Monticello.

Alysen Tarrant, environmental manager for the Lisbon Valley Mining Co., said if the permits are approved, Lisbon Valley will be the first place in Utah to implement the ISR method. It will also be

the first time it has been used to extract copper from a sandstone-based deposit since most recoverable copper deposits worldwide are found in harder rock layers.

“We’re putting in ... millions and millions of dollars to prove up a technology that eliminates the need for open-pit mining ... and [that] could benefit the overall industry on a global scale,” Tarrant told people attending the Monticello meeting.

The operations plan predicts the first pilot project will be installed in 2021 and estimates 2,700 wells will eventually be drilled into the aquifer. The mining could continue to 2045, when the plan anticipates reclamation efforts will begin, including the “rinsing of aquifers” to reduce acidity.

Currently, ore is mined in the pits, crushed and then treated with an acidified solution on surface heap-leach pads.

“In general, the in-situ methods have lower operating costs,” said Michael Nelson, a professor of mining engineering at the University of Utah. “[The company has] been recovering the copper by leaching the ore after they mine it, so it makes sense to consider in-situ.”

Company representatives explained the area's geology was suited for the method since a layer of less-permeable clay separates the copper deposits from the deeper Navajo Aquifer, which supplies many communities with drinking water.

But Joan Wilcox, who lives on a nearby ranch that has been operated by the Wilcox family for over a century, said their drinking well taps the shallow aquifer where the solution mining will occur.

"It's our home, our drinking water," she said. "We make a living off of that ground."

Mine representatives said the shallow aquifer already has poor quality and the mining process could remove naturally occurring radionuclides and oil, potentially improving water quality.

Wilcox wasn't satisfied with that explanation, adding that she supports mining and multiple use but is concerned that the company hasn't paid its property taxes to the county since 2014. The San Juan County Commission, which is considering a property tax increase, recently agreed to waive \$250,000 in interest and penalties accrued over the past five years after the company asked for relief.

“They are running their business like a bunch of high school kids,” Wilcox said. “And they want us to trust that their acid tests are right?”

The proposed expansion area overlaps with 740 acres of private ranchlands, and the mining company has secured access to the separately held mineral rights. “If they’ve got to come in — which we understand, we can’t stop them — but they’ve got to compensate us,” she said, adding they have not yet come to an agreement with the company.

In-situ methods were used to mine about half the world’s uranium recovered in 2016, but it’s less common on copper deposits.

“The challenge with copper is that even the copper that dissolves easily has to be dissolved by an acidic solution,” Nelson, the mining professor, said. “Uranium, they can leach that with just an oxygenated water. If you’re putting an acidic solution down into the earth ... you have to be able to control carefully where that solution goes and make sure it goes where you want it to.”

John Weisheit, director of the Moab-based conservation nonprofit Living Rivers, said the plans raise concerns over both water quality and quantity. “Water is finite,” he said. “We’ve already reached that

limit [for the region] under current population stress. Groundwater takes millennia to replenish, so they're not just mining copper, they're mining groundwater, which is scarce. And the quality is endangered because of the heavy chemical use for in-situ mining.”

One new open-pit mine and heap leach facility is also being proposed as part of the expansion, but Tarrant, Lisbon's environmental manager, said the in-situ operations are preferable from an environmental perspective.

An alternative for the expansion that would use more traditional mining methods would mean “more pits, bigger pits, more waste dumps, bigger waste dumps, more leach pads, bigger leach pads,” Tarrant said. “Obviously, this isn't something that anyone wants.”

She encouraged attendees at the Dec. 5 meeting to not comment on the company's application with the Utah Division of Water Quality for an underground injection control permit, which is expected to be submitted in early 2020. If the application is found to be complete, the state agency will prepare and submit an aquifer exemption request to the EPA.

“If you do see a flyer or something to, you know, make a public comment on the plan to exempt the aquifer, don't say anything,” Tarrant said. “Because every comment has to be addressed: good, bad or indifferent.”

She later told The Salt Lake Tribune that the remark was “made more for jest than anything” because even positive comments can consume limited resources at government agencies.

“The context of this tongue-in-cheek statement was to discourage those comments that, although supportive, do not rise critical, actual, to-be-addressed issues with what is being proposed,” she said.

The in-situ methods allow for the recovery of deeper mineral deposits than open-pit mines, and that could bring more sustained economic benefits to the region.

San Juan County is the state’s “poorest in terms of actual economic growth,” Tarrant said. “So we are very excited to be members of this county because we feel that we can provide a lot of avenues for not only long-term sustainability, but also high-paying jobs and stewardship in this county.”

The mine currently employs 65 people, but that number is expected to increase if the expansion succeeds.

The operations plan estimates there are more than 500 million pounds of copper in the deposit, and company representatives noted the vast amounts of copper needed for renewable-energy projects, including wind and solar farms, make it likely that the Lisbon Valley Mine will continue to see extraction regardless of ownership.

The public will have an opportunity to comment on the proposed permit with the Division of Water Quality after it is submitted. The plan will also require an environmental assessment and approval from the Bureau of Land Management.

Zak Podmore is a Report for America corps member and writes about conflict and change in San Juan County for The Salt Lake Tribune. Your donation to match our RFA grant helps keep him writing stories like this one; please consider making a tax-deductible gift of any amount today.



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