

EPA report: Pavillion water samples improperly tested

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DAN CEPEDA

A gas wellhead owned by Encana sits on land owned by John Fenton outside of Pavillion. Landowners claim hydraulic fracturing in the area has contaminated well water they rely on.

Year Tracker

What happened in 2011: In December, the Environmental Protection Agency released a controversial draft report tying hydraulic fracturing to water contamination in Pavillion shortly after a Texas-based company decided not to buy the Pavillion natural gas field from Encana Corp.

Where things stand: Encana Corp. and the oil and natural gas industry slammed the EPA report, although environmentalists trumpeted it as offering proof hydraulic fracturing can contaminate groundwater. Wyoming officials have said they're concerned with the report's quality and Gov. Matt Mead has asked the EPA to consider Wyoming expertise in an independent peer review.

Coming in 2012: The EPA's public comment period on the report will end Jan. 27. After considering comments from the public and getting a scientific review, the EPA will release a final version of the report.

From the moment the Pavillion water samples were bottled by testers with the U.S. Environmental Protection Agency, the clock began to tick.

The testers zipped the bottles tightly in clear plastic bags, surrounded them with ice in two small coolers, and shipped them overnight to the agency's laboratory in Golden, Colo., for analysis.

There, the samples waited as the deadline neared for them to be accurately tested. By the time the samples were tested, the EPA-mandated hold times had come and gone.

"Maintenance of the laboratory floor" caused the hold, according to the EPA's lab data report on the April 2011 samples.

The overdue analysis of those samples was part of the data that underpinned the EPA's eventual conclusions, released in a draft report in early December. The agency's key conclusion: Natural gas wells in the area, most developed using hydraulic fracturing, might have harmed groundwater.

The report was quickly slammed by the oil and gas industry but trumpeted by environmental groups. Yet the EPA's own data — including details not mentioned in the draft report — indicates the agency's conclusions are partially based on improperly analyzed samples from six private drinking-water wells and two EPA-drilled deep monitoring wells in Pavillion.

The EPA also found contamination in pure water control samples, didn't purge the test wells properly before gathering samples and didn't mention in its report whether it tested water carried by a truck used in well drilling, say officials with the Wyoming Water Development Commission who, because of their expertise on water wells, reviewed the EPA's publicly available information.

"They didn't follow their own protocol they would've required of other people doing this same type of work," said Mike Purcell, director of the water development commission staff, which does water planning and infrastructure development in the state.

EPA officials don't dispute the samples went past due for testing, but they stand by the report's overall conclusions, which suggest hydraulic fracturing might be responsible for Pavillion's tainted water.

The data and report included flaws and omissions that could torpedo the EPA's conclusions, said Keith Clarey, water development commission program manager and professional geologist with three decades of experience — including six with the Wyoming state government — working or consulting on environmental issues for energy-related companies

Typically outdated samples such as those analyzed by the EPA must first be replaced with fresh samples, but that wasn't done. Instead, estimates of the sample data were included in the EPA's collection of information used in the draft report, and only referenced in lab data notes.

"Basically if you want to have valid laboratory results, you want to have them sampled within that certain time period," Clarey said.

That flawed analysis contributed to half of the EPA's testing of its deep monitoring wells. While the private drinking water wells got additional testing, the deep wells that provided critical data for the EPA's conclusions were only tested twice, in October 2010 and April 2011.

Usually such reports are based on many more samples, Clarey said.

"Statistically you need to have 8-10 data points at a minimum," Clarey said. "To only have those two — it's not really a scientifically valid study."

To properly test such water wells, they must be first purged three times to make sure fresh water from the surrounding formation flows in for testing, Clarey said.

"We're not sure they produced out all the water that may have seeped out of the formation during the drilling process or well development," Clarey said. "So we're not even sure they're getting an accurate formation sample."

The EPA data indicates the agency only flushed the wells one-quarter of the amount needed, he said.

"Which is a no-no," Clarey said. "That can invalidate the results and force someone from a regulatory agency to go back" to re-test.

Clarey also pointed out a photo in the draft report that shows a water truck that provided water for drilling the well. The report doesn't indicate if the truck was tested for any contaminants before its water was used.

Also, several samples of distilled water placed with the well water samples showed some contamination — contamination that shouldn't be in the samples and could indicate the well samples are marred, Clarey said.

The Star-Tribune submitted a series of questions to the EPA regarding Clarey's questions and conclusions, the water truck photo and the agency's own lab data report describing the outdated samples and contaminated control samples. The EPA didn't directly answer the questions but reiterated its conclusion that hydraulic fracturing might have been responsible for some of the contamination found in the Pavillion wells.

"EPA's analysis is that the best explanation for the chemical signature seen in monitoring wells is the release of hydraulic fracturing fluids into the aquifer above the production zone," said EPA spokesman Rich Mylott in an email. "Hydraulic fracturing fluids were injected directly into the deeper part of the aquifer. The synthetic substances found in monitoring wells are known to be used in hydraulic fracturing fluids, are not naturally occurring, and many of them were used in the Pavillion field."

Substances found in the samples from the monitoring wells — including acetone, tert-butyl alcohol, trimethylbenzenes and glycols — weren't from materials used by the EPA in constructing the wells, Mylott said.

"The evidence indicates that EPA's drilling activity did not contaminate the aquifer," he said. "EPA and its contractor used stringent standards for the installation and development of the two monitoring wells, practices that addressed the possibility of influencing sampling results."

The EPA is in the the midst of the public comment period and members of a follow-on peer review panel not affiliated with the EPA will be picked by a contractor using "criteria provided by the EPA," said Mylott.

Clarey said the EPA's data and its draft reports show there needs to be more investigation and sampling of the wells.

Gov. Matt Mead has called for a broader, state-led investigation along with the EPA, and has asked the EPA to consider including Wyoming expertise in its peer review.

"There's some unusual things about the wells and people are asking some questions," Clarey said. "The EPA has to come forth with some answers or at least some explanation."