



# Baseline testing before drilling: A commonsense practice that should be required in Wyoming

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Several residents of the tiny rural community of Pavillion, Wyoming, have said for years that their domestic water wells produced good, clean,

drinking water until an oil and gas company started hydraulically fracturing or “fracking” near their homes to produce natural gas.

Some of these residents became ill after drinking their water, and some reported strange symptoms including the loss of their sense of smell and taste.

These symptoms might have been caused by the contaminated water or by the air pollution created by the gas drilling, or something else entirely—they might never know.

Several of the affected residents are farmers and ranchers whose homes and operations are amid an industrial gas field, and the water contamination might well have completely destroyed their property values and their ability to continue to safely farm and raise livestock.

In August of 2010, after the Environmental Protection Agency initiated an investigation

into the water contamination in and around the Pavillion gas field, several residents were told by the federal Agency for Toxic Substances and Disease Registry not to drink their water or use it for cooking.

And if they used their well water for showering, they were told to leave the bathroom window open to vent the explosive gas.

We now know, thanks to the ongoing EPA investigation, that as many as 23 drinking water wells in the Pavillion area are contaminated by dangerous levels of methane and other chemicals.

Some residents’ water is flammable, potentially explosive, and perhaps carcinogenic.

The EPA released a draft report of its investigation in December 2011 that included details of the chemical contamination found in test water wells that were drilled by the agency, as well as information about contaminants found in existing domestic water wells.

The investigation found that dangerous levels of cancer-causing benzene, methane, diesel-range and gasoline-range compounds, and other chemicals often associated with

fracking had contaminated the water wells.

There were trace levels of exotic organic compounds in some domestic wells including adamantanes, 2-butoxyethanol phosphate, phenols, naphthalene, toluene, and various glycols.

**“Baseline testing makes sense to me. It protects industry and the environment.”**

**—Rep. Joseph M. Barbuto  
Wyoming House District 48  
House Minority Caucus Chairman**

Pavillion resident John Fenton, in an Op-Ed published in the *Casper Star-Tribune* in early January, described the situation this way: “The contamination from oil and gas development has made us sick and left our farms and homes worthless.”

Officials with Encana, the Canadian company that owns and operates the field, and has about 170 producing natural gas wells

**Continued on page 4**

**“Clearly, any time you are going to be drilling through an aquifer that is an important lifeblood for a community, you need to know what the [water quality] is now and what it is after [the drilling]. Not knowing is not an excuse anymore.”**

—Jim Ruby, head of the Laramie County Surface Owners Association, speaking to the *Cheyenne Tribune Eagle* in January

Continued from page 3

in the area, have argued that the methane and other chemicals found in the domestic water are not a result of gas drilling operations.

“[The EPA doesn’t] have a conclusion here; they have a probability — and we would argue that it is a very poor probability,” Douglas Hock, an Encana spokesman, said to the *Los Angeles Times* in December. “Encana didn’t put methane and benzene there in the water; nature did. And the synthetics they have found in the water, we would argue that they were likely introduced by EPA’s own testing procedures.”

Encana officials have also asserted, repeatedly, that the EPA investigation has been biased, unscientific, and politically motivated. Some Wyoming officials have also made these claims.

The Wyoming Outdoor Council, the EPA, and many others strongly disagree.

“The EPA draft report is a result of years of testing by over 20 Ph.D.s and scientists from across the country,” Fenton wrote in his January *Star-Tribune* piece. “The best known science and testing protocols were followed [and] the EPA samples were analyzed at multiple labs to ensure quality control.”

Regional EPA Administrator Jim Martin wrote, in a January 22 column in the *Star-Tribune*, that after thorough review he and the agency “stand behind the quality of our data and the validity of our scientific methods.”

“Our investigation of drinking water safety in Pavillion has been under way for three years,” Martin explained. “We have conducted four rounds of sampling. After the sampling phase, our career scientists conducted a meticulous evaluation of the

data. Their conclusions were thoroughly reviewed by EPA career managers and subjected to an initial peer review by independent experts.”

### **‘Not knowing is not an excuse anymore’**

The EPA’s report on its investigation is still in draft form. As this newsletter goes to print the scientific peer review process is still under way. Whether real or manufactured, the uncertainty about the cause of the contamination could linger on in the news media and in the courts for years to come.

“It didn’t have to be this way,” said Steve Jones, the Wyoming Outdoor Council’s watershed protection program attorney. “And it doesn’t have to be this way in the future in Wyoming.”

If companies were required to test domestic, stock, and irrigation water wells prior to drilling and fracking—a practice known as baseline water testing—many of these kinds of uncertainties can be eliminated, Jones said.

“The practice of testing water before oil and gas development happens makes sense because it would protect residents and oil and gas companies alike,” he said. “It would also arm residents, regulators, and oil and gas companies with the information necessary to determine if water contamination exists prior to any drilling.”

This is a conclusion that the Wyoming Outdoor Council and many others have arrived at.

Jim Ruby, head of the Laramie County Surface Owners Association (he is also the executive secretary of the Wyoming Environmental Quality Council), told the *Cheyenne Tribune Eagle* in January that the controversy over the EPA’s report on

Continued on page 6

## How might water contamination happen?

If aquifers were to be contaminated by the hydraulic fracturing process it is more likely, under most circumstances, that the contamination would occur as a result of a mishandling of the fluids on the surface or because of a problem with a well casing at or near the surface—rather than from a migration of the fracking fluids from deep underground.

Another way that aquifers could be contaminated by the hydraulic fracturing process is if new fissures or pathways are created for the methane (rather than the fracking fluids) to travel up to the aquifer.



If gas wells are not properly cased or if water wells in the vicinity are not properly cased—or if unused wells are not properly plugged and abandoned—drillers could unintentionally contaminate an aquifer during the hydraulic fracturing process.

—Steve Jones

## Understanding groundwater is important

In addition to baseline water testing, groundwater characterization is also an important part of the puzzle, especially with new oil and gas field development. Knowing the depth and direction of the flow of groundwater can serve to inform public officials, and the public, of the movement of any underground pollution that may occur as a result of spills, accidents, or poor management practices.

—Steve Jones



Continued from page 4

Pavillion reinforces “the need to have proper water-quality monitoring in places where fracking might occur.”

Mr. Ruby’s association formed in response to the potential drilling boom in the Niobrara shale play in southeast Wyoming.

“Clearly, any time you are going to be drilling through an aquifer that is an important lifeblood for a community, you need to know what the [water quality] is now and what it is after [the drilling],” he said. “Not knowing is not an excuse anymore.”

**“The need for baseline data has been underscored on a number of fronts in the past year ... the collection and analysis of baseline testing is a direction we need to explore.”**

—Wyoming Gov. Matt Mead

Tom Doll, head of the Wyoming Oil and Gas Conservation Commission, has advocated baseline water testing as a best management practice for oil and gas companies, but one that can be achieved on a voluntary basis.

The oil and gas commission has been recommending for more than a year now that companies test water supply wells within a quarter mile of drilling locations.

In December of 2010, Mr. Doll told Wyoming Public Radio that the recommendation is partly in reaction to public concern.

“People have heard all kind of horror stories,” he said. “The perception is that, ‘you’re going to go out there and ruin my water well.’ This way you can certainly allay some fear by saying, ‘We now know what your well is capable of producing. We know what the water quality is.’”

But so far Doll has maintained that he believes a rule requiring baseline testing is not necessary.

The Wyoming Outdoor Council disagrees.

“We believe baseline water testing can and should be required by the state,” Jones said. “And we’re definitely not alone on this.”

### **Gov. Mead, other officials, willing to consider required baseline testing**

Many lawmakers and state officials have, publicly and behind the scenes, indicated support for moving toward a statewide requirement.

Rep. Joseph M. Barbuto, for example, who represents Wyoming House District 48, said in an email to the Wyoming Outdoor Council that he supports a requirement for baseline water testing.

“Baseline testing makes sense to me,” Mr. Barbuto wrote. “It protects industry and the environment.”

Wyoming Gov. Matt Mead, in a written statement to the Wyoming Outdoor Council, suggested that the idea is at least worthy of consideration.

The “collection and analysis of baseline testing is a direction we need to explore,” he said.

But the governor also suggested that the devil would be in the details:

“The best counter to bad politics is good science,” Mr. Mead said. “The need for baseline data has been underscored on a number of fronts in the past year. That said, when we talk about baseline testing requirements, we must first come to a common understanding of the what-when-where-why’s of a baseline. Some constituents in water are naturally occurring. These may be present in trace amounts or large quantities. Baseline testing using the Clean Water Act as the benchmark (chemicals at parts per million) may not detect the contamination that is documented in parts per billion.”

The Wyoming Outdoor Council is encouraged that Wyoming’s leaders seem ready to have the conversation about baseline water testing, Jones said.

“We believe that when legislators, regulators, and decision makers have had a chance to consider the facts and to hear the arguments for and against required baseline water testing in Wyoming, they’ll conclude, as we have, that it makes sense,” he said. “It’s a matter of public health and public trust and it’s the best path forward.”