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## Many private, rural wells in Wisconsin not tested for contamination

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When Diane Tomlinson turns on her kitchen tap to fill a glass or a cooking pot, she takes a moment to appreciate the water flowing from the faucet.

In the spring of 2008, tests of the private well that serves her rural home near Poynette showed unsafe levels of atrazine, an agricultural herbicide linked to numerous health impacts including reproductive problems and cancer, in her home's water. Eventually, Tomlinson found that her income qualified her for money from the state's well compensation fund and she was able to have a new well built in January.

Today, Tomlinson no longer takes safe drinking water for granted.

"It's made me very aware. Every time I get a glass of water from the faucet, I think, 'This is nice.'"

Throughout Wisconsin, more than 750,000 private wells such as Tomlinson's provide drinking water in mostly rural areas with no municipal water systems. About one-third of Wisconsin's residents get their water from these wells, according to the state Department of Natural Resources.

Yet, despite such widespread dependence, federal and state oversight of private wells is scant, especially compared with the rigorous regulation of municipal wells. The federal Safe Water Drinking Act, for example, does not apply to private wells, only public water supplies.

And while the DNR regulates the construction of private wells, the wells receive little or no scrutiny after they are installed. A private well can go uninspected and untested for years because there is no requirement that private wells be tested, even when a home is sold. Only about 10 percent of those who rely on private wells ever get them tested, according to the DNR, even though contamination is widespread. Last year, the state spent nearly \$150,000 from its well compensation fund to replace private wells that had been poisoned by bacteria, herbicides such as atrazine, nitrates and arsenic.

Ken Bradbury, a hydrogeologist with the Wisconsin Geological and Natural History Survey, said he has numerous concerns about the state's private wells, including the lack of awareness and oversight.

"If you own a rural home," Bradbury said, "next to your house, your well is the most valuable piece of the property. It's almost shocking to me how little people know about their wells. And it's your responsibility. Nobody

from the government is going to come out and test it for you.”

### **Pollution problem**

The importance of safe drinking water and the dangers of contamination become most apparent when water from a private well suddenly causes somebody to get sick. It's not difficult to find examples.

In early March of 2004, the water coming from the faucet in the home of Judy and Scott Tremel, near Kewaunee, sickened the entire family, including their 7-month-old baby who required emergency medical care because of severe diarrhea. Just days before, the owners of Stahl Farms, a 900-cow concentrated animal feeding operation across the road, spread 10,000 gallons of manure on a field adjacent to the Tremel home.

The Tremels sued Stahl Farms and in January 2006, a federal judge ruled the family was entitled to \$80,000 in damages because studies showed the manure had contaminated their groundwater.

“I don't think I'll ever turn on my tap and not think about it,” Judy Tremel said. “Not think about when I turned on the water and manure came out. It's been five years and I still think about it.”

Pollution of private wells by manure is a growing problem, according to Mark Putra, section chief of private water supply for the DNR. Putra said a survey of 49 groundwater samples was conducted in 2007 using new tests that differentiate between human and animal bacteria. Of those samples, he said, 28 had animal bacteria while three had bacteria exclusive to humans.

Tom Riewe, a hydrogeologist with the DNR, said manure is of greater concern now because of the increasing number of factory farms and also the growing number of even smaller farms that spread liquid manure, which is more of a threat to streams and groundwater.

“We've seen many more problems with manure contamination in the last five years,” Riewe said. “There is much more liquid manure being produced. They just don't know what to do with it.”

The state recently passed stricter manure regulations for large, factory-like farms. But Judy Tremel pointed out that wells can also be polluted by manure spread on smaller farms, which aren't always subject to as many manure-handling rules. After watching her family get sick from a manure-contaminated well, she suggests that the owners of private wells pay close attention to what is being spread on the land around them.

### **Septic systems**

Septic systems also remain a source of contaminants that poison private wells. In June of 2007, 257 people became sick after drinking water from a private well that serves the Log Den Restaurant in Egg Harbor in Door County. Eventually, the illnesses were traced to norovirus from a leaking septic tank. The restaurant repaired a leaking valve on the septic tank and the water now tests safe.

But Brian Forest, a conservationist with Door County, said the incident shed new light on the susceptibility of private wells to contamination from failed septic systems, especially in the northeast part of Wisconsin where the fractured bedrock underlying the area is covered by just a few inches of dirt and contaminants can be transported quickly without the benefit of

filtering by the soil. Tests at the restaurant showed that dye put in the toilets turned up in the restaurant well within six days, Forest said.

Forest said a big part of the problem is that the state Department of Commerce, which regulates septic systems, does not set more rigorous standards for septic tanks in such sensitive areas. Ironically, he added, the restaurant's well had tested safe just before the outbreak.

And it's likely not just the restaurant that is affected. Testing of nearby residential private wells showed that of 81 wells tested, 23 were positive for bacteria. Also, Marshfield Clinic tested four private wells in the area for viruses and three tested positive for low levels of adenovirus, which can cause intestinal or lung infections, and enterovirus, which is linked to meningitis and other infections.

"The whole process should be looked at to see if we're protecting the resource in such a sensitive area," said Forest of the state's inadequate septic rules.

### **Other 'huge' issues**

Other contaminants that continue to threaten private wells include nitrate, from fertilizer, and atrazine, a herbicide.

Nitrate contamination of private wells is widespread throughout Wisconsin, although the percentage of wells with levels above the federal health standard of 10 parts per million is higher in heavily farmed counties. The contaminant is a concern for pregnant women and infants younger than six months because it can cause blue-baby syndrome, in which the oxygen-carrying capacity of the blood is greatly reduced. Exposure also has been shown to be associated with lymphoma, gastric cancer, hypertension and thyroid disease.

Statewide, the percentage of wells with levels above the standard is about 13 percent. But wells in agricultural areas are more likely to be affected. Data from the Center for Watershed and Education at UW-Stevens Point, for example, show that 46.2 percent of private wells sampled in Rock County have nitrate levels above the 10 parts per million health standard.

"You can't grow corn without nitrogen fertilizer," said Jeff Postle, a hydrologist with the Wisconsin Department of Agriculture, Trade and Consumer Protection. "Nitrate is a huge issue."

Some studies have shown that nitrate levels in wells will only increase as older, cleaner water in the aquifer is replaced by water being now being contaminated.

Atrazine — the herbicide that poisoned Tomlinson's well near Poynette — is yet another contaminant that is especially a problem in agricultural areas. Exposure to the chemical herbicide in drinking water has been linked in some studies to cancer in rats. Data from the Center for Watershed and Education at UW-Stevens Point show atrazine was detected in 36.4 percent of private wells sampled statewide. Postle said that because of the dangers of atrazine and the prevalence of polluted wells, the state prohibits its use in 102 areas totalling 1.2 million acres.

### **'Out of sight, out of mind'**

With so many contaminants threatening private wells, why don't more people get their wells tested? Although firm numbers are hard to come by,

officials with the DNR's private well program say they believe 10 percent or less of those who own private wells get them tested.

"I imagine part of it is education," said the DNR's Putra. "It's out of sight, out of mind."

A 2008 survey of 1,447 private well owners by the state Division of Public Health showed that one-third of the families had never sent their water to a lab for analysis. The primary reasons people gave for not testing their water, according to Lynda Knobloch, senior toxicologist, were because the water looked and tasted fine or because they had water filters, which do not work for many contaminants plaguing private wells.

Testing for nitrates and bacteria is not expensive, according to the U.S. Environmental Protection Agency, and should cost no more than \$20 or so. But testing for pesticides and other organic chemicals is more expensive and can run from several hundred to several thousand dollars.

Some states, such as New York and New Jersey, require that private wells be tested when a home is sold. In Wisconsin, according to Putra, the state does not have such a requirement although many lenders do ask for test results before a home loan is approved.

Putra said such a requirement would certainly provide more data on the status of private wells but it would also overwhelm the agency's private water staff which is already struggling to keep up with inspections and other work.

So those who rely on private wells in Wisconsin are mostly on their own. But, with 10 percent or less testing their wells, it appears most are leaving their health to chance.

"There's just an assumption that the water is good," said Bradbury, with the Wisconsin Geological and Natural History Survey.

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