CITIZEN ENFORCEMENT IS ESSENTIAL TO PROTECT COMMUNITIES AND AMERICA'S DRINKING WATER FROM AGRICULTURAL POLLUTION, WHEN GOVERNMENT FAILS TO PROTECT US

Statement of Mr. Lynn Utesch, U.S. Navy Veteran, Owner of Guardians of the Field Farm LLC, and Co-Founder of Kewaunee Citizens Advocating Responsible Environmental Stewardship

U.S. House Subcommittee on the Environment and Commerce

November 7, 2017

Summary

As a dairyman and beef farmer, I am very familiar with the struggles farmers meet on a daily basis to make a living in today's food system. I am also familiar with the many federal and state and local laws and regulations that must be followed by agriculture, and the challenges farmers face to comply with these complex issues these laws address. I understand that some of these requirements have been passed over the years to ensure that bad practices do not endanger public health or the environment because, as every farmer well knows, manure and agricultural waste can cause serious pollution and public health threats if it is not properly managed. But these laws will not work unless citizens have the right to enforce them.

For us in Kewaunee County, Wisconsin, brown water events are not a question of "if", but a daily question of "when" and "where next". For over 13 years now, our community has had at least one infant admitted to the ICU poisoned with E. Coli, entire families including the family dog becoming poisoned after manure applications, and longtime residents moving to the city just so they can have clean water for their children.

My community has asked, over and over again, that state and federal agencies enforce laws designed to protect communities from the risks and pollution stemming from improperly managed agriculture; but over and over again, the governments have failed to protect us. They

lack the resources and the political will to take this animal agricultural industry on, and so communities like mine in Kewaunee County are left to deal with the mess, repetitively exposed to bad management practices that poison and pollute, even when that means we lack safe drinking water. So The Farm Regulatory Certainty Act is not giving me any certainty. If anything, it leaves me less certain of our community, and rural America's, ability to live in our communities safely.

This issue is close to my heart because I farm and live in Kewaunee County, which has some of the most contaminated drinking water in terms of nitrate and fecal bacteria in the state. A USDA researcher studying our water has said ours is the water of a Third World Country. Our county, and the town of Lincoln, are all on well water. In our county, cattle outnumber people five to one. This was not the case 10 years ago before the dairies became "industrial" size operations. Now, our drinking water literally runs brown with manure. A local County Supervisor is on his second well and still gets brown water when manure is applied just before a rain or snowmelt; and two years ago an older couple had to evacuate their home on the Christmas Holiday because the application fields surrounding their home caused manure to enter their well water. The contamination has been making people and calves sick in our community for years, and the majority of the problem comes from industrial animal agricultural operations. Approximately 34% of the wells tested in Kewaunee County are contaminated with E. Coli, nitrates, or both, and other contaminants. USDA has also recently found pathogenic E. Coli, salmonella, rotavirus, campylobacter, cryptosporidium, and giardia in our wells. When USDA found salmonella in the water near two schools, WDNR came out and tested only for E. Coli -- *the wrong* contaminant. Many community members no longer report brown water or contamination events to WDNR because the state provides no help. I worry that the effect of the

Farm Regulatory Certainty Act would allow agencies to sit on their hands, and for my community, and communities like ours, to have no recourse when we need it most.

This is about treating our neighbors respectfully and keeping those waters, that we all need, clean. As farmers, we do everything we can to make sure that we do not contribute to the problems that can be caused when waste is not well-managed. But there are folks out there who are more motivated by profit than concerned with people, and use bad practices. Many of these bad practices are not allowed by the law, but the already limited enforcement actions from the government means they get away with it, and that causes a real loss to rural American communities like mine. The Farm Regulatory Certainty Act would allow governments to do even *less* than they currently do, *and* take away our last avenue of legal recourse. Anyone who breaks the rules and hurts an entire community—especially children--should be held accountable for their actions. This can be painful because no one in a rural community wants to take their neighbor to court. We go to church together, and our kids go to school together, and we depend on one another in a way that is like nowhere else. But if someone pollutes the water our entire community relies on, and they refuse to change, and the government refuses to adequately fix the problem, this bill would destroy our last resort to protect our own drinking water.

Our Story of the Problem

I chose a life of farming. As a child, my extended family was in the dairy business. I began dairy farming in high school with my uncle until I served this great country in the Navy from 1981-1985, where I worked on cryptographic equipment and on submarines. As soon as I got home, I started working to save up money for my own farm. My wife and I bought our first farm on Washington Island in Door County, Wisconsin in 1993, and moved to a larger farm in Kewaunee County in 2004. We started with just three animals and grew into 85 head of

purebred Shorthorn beef on 150 acres that makes up Guardians of the Field Farm.[1] We raised our five children on our farm. Farming is not just a career choice, it is a way of life, and we have a passion for what we do. We love the land, this life, and our animals, which is why I am so concerned about the proposed bill by Rep. Dan Newhouse. Because, as agri*culture* turns into agri*business* in this County, the water in my county has become a danger to the people and the calves here.

At least 90 percent of nitrate inputs into groundwater come from artificial fertilizers and manure from farming operations, according to a WDNR Groundwater Coordinating Council 2015 report to the Legislature. A dairy farm with 2,500 cows produces as much waste as a city with around 411,000 residents. In Kewaunee County, there are 97,000 cows, heifers and calves, of which 45,500 are dairy cows. We have 15 mega-sized dairy farms in our county alone and concentrated animal feeding operations in our state are up by 400 percent from 2000. That means that the dairy cows *alone* produce as much waste as 7.48 million people, or more than the entire states Tennessee and West Virginia combined, only in the space of Fort Irwin. This is complicated in my region because our aquifer, which supplies all of our drinking water, moves through porous rock called karst, which allows any moisture from the surface, including liquid manure, to move quickly through the soil and into the aquifer, where it contaminates nearby wells. It happens so frequently it is almost predictable now. If one of the industrial dairy operations in our county applies manure before heavy rains or snowmelt, it washes directly into our community's wells and comes out of the tap brown and smelling like manure. I attached some pictures of my neighbor's water for you to see for yourself.[2]

[1] See attached Pictures 1 and 2 of the Utesch farm.
[2] See attached Pictures 3 and 4 of brown water in Kewaunee County.

In Kewaunee County, we are all very familiar with the problems associated with animal manure in our water. Our county's three major rivers — the Ahnapee, East Twin, and Kewaunee — all violate state standards for phosphorus pollution and are on the EPA's impaired waters listing. In Wisconsin, one in five wells in heavily agricultural areas is now too polluted with nitrate for safe drinking, according to our Department of Agriculture. Soon after we moved to Kewaunee County, one of our community member's six-month old daughter was rushed to intensive care due to e-coli poisoning from their homestead's well water. One of our community members suffered chronic diarrhea for years before he knew he should get his well tested; once he started doing that, E. Coli showed up regularly in his water. Another community member is surrounded by manure fields; his first wife died of cancer and his second wife is now sick with the same cancer. His well has tested positive for salmonella and other contaminants. After the USDA studied wells in our county in the last few years, the parasite Crypto was found in 12 percent of the sampled wells, and bovine-specific rotavirus A was in 14 percent. The concentration of bovine-specific rotavirus A was extremely high, as compared to the concentration of human-specific ones. Other pathogens USDA found included E. coli, Salmonella and rotavirus C. We were told that the pathogens in the wells could lead to severe or life-threatening illness. Of the 12,200 people in my county using private wells, the scientists who did the study estimated that around 140 people and 1,700 calves a year are infected with Cryptosporidiosis from contaminated well water.

We have lost local businesses because of the polluted water. Our beautiful Lake Michigan beaches now stink and the water is filled with Cladaphora algae, caused by nutrient runoff. In 2014, our public beaches in Algoma were closed 20 of the 90 open days because of the algae and E. Coli. A local café and outdoor garden on Lake Michigan closed in 2017

because of water quality issues, and the stench from their lakeshore frontage. Also, our community's home and property values are plummeting. A home with 900' of lakefront recently sold at a major loss, and I have heard stories of offers on homes and property for only 50% of their value. Families that have owned property in our community for decades, and that have been farm families, are now moving away to the city in order to avoid the problems here.

When we lose our water, many of us have no recourse, and no way to get clean water. A new well costs about $10,000 - $15,000. Household treatment systems in our area run about $17,000 per home, and even a single faucet system costing $500 is too much for some of us. Several community members came together, and it took us 3 years, but we finally got a clean public water kiosk installed at the local high school. Now people in the community can access clean water; we have about 80-90 families that use it now. The kiosk remains the *only* community source of clean water for anyone with a contaminated well on an ongoing basis. But, our community is proud, and people do not want others knowing their water is dirty, so unfortunately a lot of people are ashamed to be seen using it. One of the local dairies tried to start a clean water program. But can you imagine going to a polluter and having to *beg* for clean water? Or allowing the polluter into your home, and giving them information about your family, just to access clean water? This is something most people in Kewaunee County will not do. Many people in the community work for the dairies as farm hands, crop haulers, combine drivers. These people are hostage to the situation. How can they speak out against the entity that provides their paycheck?

Witnessing the degradation of the water quality of local rivers and streams—and the high contamination rate of tested wells in Kewaunee County spurred my family into advocacy. In 2011, my wife and I, along with fellow residents in Kewaunee, established Kewaunee Citizens

Advocating Responsible Environmental Stewardship for concerned residents to have a voice in the local and statewide debate over the need for greater water protection and sustainable farming. It allows us to stand together and to try to hold the WDNR accountable when they refuse to do enough to hold the dairies accountable, or to clean up our drinking water. But even though concerned county residents can find support through the citizen action group, taking on the risks and costs of a lawsuit against the state government over pollution problems demands significantly more than most people are willing to take on. It is very difficult to spend your time, money and energy over a lawsuit. This is a very rural community. We do not want to be bad neighbors. We prefer to work with our community.

Our community has done a lot to try and stop the pollution in our water.[3] In 2015, we voted overwhelmingly to support an ordinance implementing commonsense manure management measures that would have the effect of protecting our water. These included restricting manure spreading in winter and early spring on fields with 20 feet or less of soil, which was the first time a Wisconsin county took such action. A local town recently passed a one-year moratorium on new operations coming in. And we are working on banning manure spray irrigation – large, tall sprinklers that fire manure across a field. But that has not been nearly enough to make dent in the problem. We need state agencies to take strong action to improve our conditions, but while they take some action, they will not do enough to stop the problem or require cleanup. In 2017, the WDNR quietly announced a well program, but the income requirements and testing requirements and procedural hurdles to qualify for the program make it a joke for the community to participate. USDA is conducting a study of the water, but the study only provides a snapshot; it is not tracing the pollution back to its source. My biggest concern is that under this bill, citizen enforcement would be stopped where there is a threat to

3 Attachment 5 (selected articles regarding Kewaunee County problems and efforts.

public health simply because an agency is taking *some* kind of action related to the facility's manure management, even if that action does not fix our problem or makes even less of an impact than we could do on our own. If this bill gets passed, a broader range of actions that an agency has taken will shut the courthouse doors in my community's face even though our water is still contaminated and the agency's actions do not stop the pollution or cleanup the mess.

Let me give you an example of some of the ways we have tried to work with the industry and the government to fix the problem. In 2014 a number of groups, including Kewaunee CARES, petitioned the EPA to simply *investigate* groundwater contamination in Kewaunee County, the maximum EPA was able to do under the Safe Drinking Water Act, but EPA took no meaningful action. EPA pushed the Wisconsin DNR to respond, and WDNR started workgroups to look at some of our issues. The workgroups were very inclusive; they were made up of dairy operation owners, manure haulers, agronomists, state officials, federal EPA officials, environmental advocates, local community member representatives, and town government officials. We worked together for 2 years and presented two proposals to change state regulations to try and fix the problem, all the while knowing that the water in our wells could hurt our families. Those proposals were consensus items, including industry agreement. But when the proposals got to the Governor, he refused to enact the full proposal. The parts of the proposal that did come through have never been implemented by the state. So the problem—that is our poisoned water-- was, and remains, unresolved. To date, not a drop of clean water has been provided despite all that work.

Now, we work with our county and township governments to try to make things better. Just last week, a local tax assessor recognized some devaluation for the homes located next to operations. Earlier this month, a town passed a one-year moratorium on new operations. But

those efforts have small impacts and may be short-lived. We are still fighting every day to get the necessary information to participate in public process on permits, and to get public health and environmental information. Sometimes information is provided at the very last minute, compromising our ability to use it effectively and to fully participate in public proceedings. While you can't make people test their water – and some people don't want to know what's in their drinking water because bad results can affect their property values – the cause for alarm here is very real. It is going to take action from the EPA to keep manure spreading, and the WDNR, in check. But we cannot get EPA or WDNR to do what needs to be done to put the health of people first. If we as a nation are leaving it up to the individual citizen to figure out if their wells are contaminated, and to bear the cost of obtaining clean water, then it is a shameful public policy to simultaneously take away our rights as citizens to bring legal action to get our clean water back.

Photos 1 and 2

Photos 3 and 4

Attachment 5

Fecal microbes found in 60 percent of sampled Kewaunee County wells

LATEST RESULTS SHOW A HIGHER PERCENTAGE OF WELL CONTAMINATION THAN EARLIER ROUNDS OF TESTING.

Coburn Dukehart, W isconsin Center for Investigative Journalism

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LUXEMBURG — Up to 60 percent of sampled wells in a Kewaunee County study contained fecal microbes, many of which are capable of making people and calves sick, two scientists told hundreds of local residents gathered at a public meeting Wednesday night.

The microorganisms included Cryptosporidium, a parasite that comes from both people and animals. Researchers estimated Crypto in drinking water is likely infecting 140 of the county's 20,000 residents each year.

More than 200 people gathered at the Expo Hall at the Kewaunee County Fairgrounds to hear the latest results of a study into the source of viruses, bacteria and parasites in their private well water, and what, if anything, they can do to protect their health. The crowd was quiet during the 90-minute session, with many taking photos and notes.

Kewaunee County, where cattle outnumber people nearly 5 to 1, has become a focal point in Wisconsin over whether local, state and federal governments adequately protect drinking water from manure from dairy farms, especially in areas of fractured bedrock, which is common in northeastern Wisconsin. The latest results show an even higher percentage of well contamination than earlier rounds of testing, which had found that about one-third of tested wells were polluted (http://wisconsinwatch.org/2016/05/bacteria-in-states-drinking-water-is-public-health-crisis/).

Mark Borchardt, a microbiologist with the U.S. Department of AgricultureÕs Agricultural Research Service, presented data on water contamination in Kewaunee County during a meeting at the Expo Hall at the Kewaunee County Fairgrounds, June 7, 2017. Scientists found both bovine and human waste are to blame.

(Photo: Coburn Dukehart/Wisconsin Center for Investigative Journalism)

According to the study, financed in part by the state Department of Natural Resources, the source of the contamination is both bovine and human waste that enters groundwater through cracks in so-called karst or fractured bedrock in Kewaunee County. The DNR began supplying

bottled water (https://www.wpr.org/dnr-offers-bottled-drinking-water-residents-contaminated-wells) this spring to local residents whose wells were found to be tainted by manure.

The researchers cautioned that the percentage of wells with microbial contamination may be even higher than their data show, since the 131 targeted wells were sampled only once during the study period, from April 2016 to March 2017.

“It’s my professional opinion, based on 25 years of experience, that if we sampled more than once, (the contamination rate) would creep up to 90 percent,” Mark Borchardt, a microbiologist with the U.S. Department of Agriculture’s Agricultural Research Service, told the crowd.

According to Borchardt’s research, 40 of the 79 tainted wells contained bovine microbes; 29 contained human microbes, and seven had both. The remainder of the contaminated wells had microbes that could have come from either source.

About 20 written questions were submitted after the talk, many focused on how the scientists knew for sure that human waste was not being added to manure lagoons, possibly masking the true source of the human contamination. Borchardt said that even if that was happening, the amounts would have little effect on the results.

One participant asked whether dispensing less liquid manure would reduce well contamination. “You don’t need a scientist for that one,” Borchardt answered. “If you remove the fecal source, you remove the contamination.”

While the presentation was met with applause, some were left confused by the results.

“I'm having a hard time wrapping my head around it,” Kewaunee County resident Sandy Winnemueller said. “Obviously we shouldn't have septic systems if they aren't working. We haven't solved a darn thing. This study has just muddied the waters.”

Nancy Utesch, a local beef farmer and member of advocacy group Kewaunee Cares, said she believes the picture is even worse than the data suggest.

“What people really suspect here is that it's much worse than the last few years of research implicate,” she said. “It's become an acceptable way of life here. People just know at certain times of the year not to drink the water.”

In an interview before the presentation, researcher Maureen Muldoon said that due to the fast movement of groundwater through the aquifer, water quality can change in a matter of hours. She affirmed that one sample does not adequately reflect well quality.

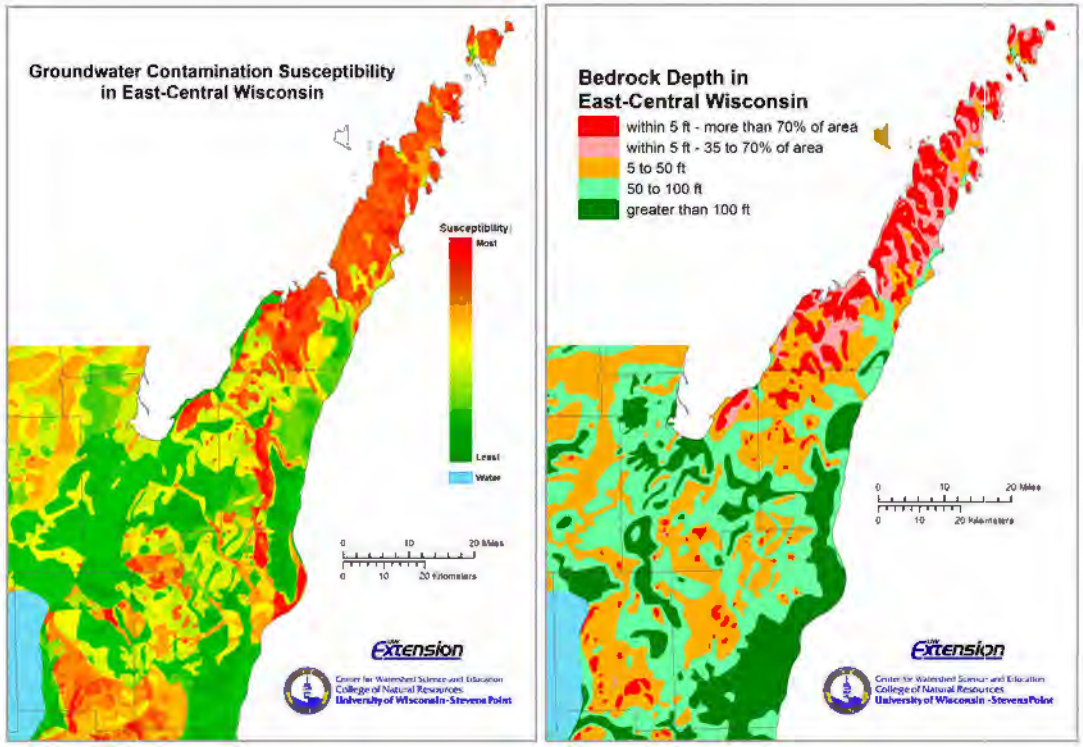
“Your well can be fine one day, then contaminated, then fine again,” said Muldoon, a geology professor at the University of Wisconsin-Oshkosh. “It's like, if you wanted to measure the (annual) temperature and you only went out for one day.”

Wells selected for sampling

Kewaunee County has 4,896 private wells. The study tested water from 621 of them representing wells with various depths of soil to bedrock. Of those wells, 208 tested high for total coliform or nitrate. From that subset, 131 wells were randomly selected for further testing.

“We purposely chose wells that had indicators of water quality problems in order to determine the source (of contamination),” Muldoon said.

Seventy-nine of those wells were contaminated by a fecal microorganism — either a virus, parasite or bacteria — 62 of which were linked directly to either bovine or human sources. The other microbes could have come from either source, the researchers found.



The parasite Crypto was found in 12 percent of the sampled wells, with rotavirus A turning up in 14 percent. Borchardt noted that the concentration of bovine-specific rotavirus A was extremely high, in the thousands of “bugs per quart” compared to the concentration of human-specific ones. Other pathogens found included E. coli, Salmonellaand rotavirus C, the last of which Borchardt said is rarely detected in groundwater.

The sampling found both Cryptosporidium hominis, which is human specific, and also Cryptosporidium parvum, which can transfer back and forth between people and cattle. According to the CDC (https://www.cdc.gov/parasites/crypto/general.html), symptoms of Cryptosporidiosis can be serious, and can lead to severe or life-threatening illness for people with weakened immune systems.

A cryptosporidium outbreak in the Milwaukee area in 1993 was responsible for sickening more than 400,000 people and killing 69 (http://archive.jsonline.com/news/milwaukee/milwaukee-marks-20-years-since-cryptosporidium-outbreak-099dio5-201783191.html), (http://archive.jsonline.com/news/milwaukee/milwaukee-marks-20-years-since-cryptosporidium-outbreak-099dio5-201783191.html) after the parasite got into Lake Michigan water distributed by one of the city's two treatment plants. According to the Milwaukee Journal Sentinel, (http://archive.jsonline.com/news/milwaukee/milwaukee-marks-20-years-since-cryptosporidium-outbreak-099dio5-201783191.html) it was the largest waterborne disease outbreak in U.S. history.

In Kewaunee County, the scientists estimated that 3.1 percent of private wells providing drinking water for both humans and calves are contaminated with Cryptosporidium parvum. Of the 12,200 people using private wells in the county, a projected 140 people per year are infected, as well as 1,700 calves.

Borchardt said rotavirus C is one of the few gastrointestinal viruses that can go back and forth between humans and bovine. It can cause diarrhea, vomiting, dehydration and possible death.

“Rotavirus C is more widely understood to be found in India and China, but new studies are showing that it's starting to appear in the U.S.,” Borchardt said in an interview. “We've never seen these results in groundwater before.”

“If I was a rotavirus C and I wanted to retire,” he added, “ I would move to Kewaunee County.”

Question of ‘environmental justice’

Borchardt said he considers the contamination in Kewaunee County to be a matter of “environmental justice” for those who cannot afford treatment systems such as reverse osmosis, which can cost up to $17,000 per home.

“Some people have the money to fix it, but there are many people who can’t even find $500 dollars to put in a treatment system at one faucet,” he said.

Borchardt said when dangerous pathogens were found in private wells during the course of the study, homeowners got phone calls right away to alert them to the results.

“That was really tough,” he said at the meeting. “Some of you I had to call and say ‘There’s Salmonella in your water.’ Those were some of the hardest professional days I had.”

Borchardt got emotional as he recalled those conversations. “I know I’m getting a little mushy, but I care a lot about this county and the people who participated in this study,” he said.

Soil depth little protection

The researchers' original hypothesis was that the greater the depth of the soil, the greater the protection from pollution. And while readings at shallow depths under 5 feet exceeded statewide averages for contamination by nitrate, total coliform and E. coli, they also found more contamination than expected in deeper layers, even where soil depths exceeded 20 feet.

"(Contamination) is worst where the soil is shallowest, because that's where things get in. If you have 80 feet of clay, it will be diluted. If you are in the center of the county with shallow depth to bedrock, you are very vulnerable," Muldoon said.

"I cannot think of a hydrogeologically worse place than northeast Wisconsin to put a lot of cows," she added.

The study was done in conjunction with Randy Hunt from the U.S. Geological Survey's Wisconsin Water Science Center. The presentation was organized by the Kewaunee County Land and Water Conservation Department.

At the end of the meeting, Davina Bonness, the head of the land and water conservation department who helped with the study, said, "This research has never been done in any county before. We have a lot of really great data, and I urge the County Board to really soak this in."

DNR policy adviser Russ Rasmussen said the findings will help his agency develop policy, including proposed changes to administrative rules

Maureen Muldoon, a geology professor from the University of Wisconsin-Oshkosh, presented data on the source and method of water contamination in Kewaunee County during a meeting at the Expo Hall at the Kewaunee County Fairgrounds, June 7, 2017. "Y SHARE ur

(http://dnr.wi.gov/topic/nonpoint/nr151strategy.html) aimed at preventing manure runoff.

well can be fine one day , then contaminated, then fine again," Muldoon said.

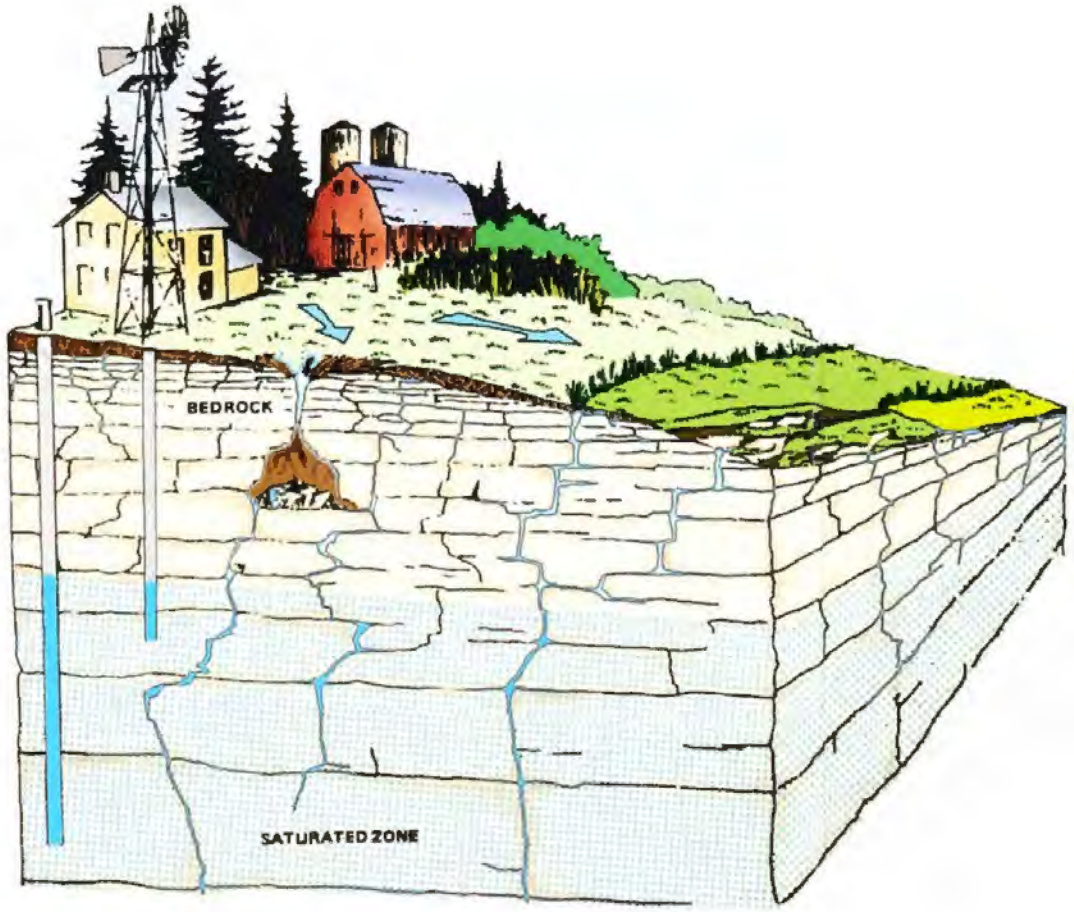
(Photo: Coburn Dukehart/Wisconsin Center for Investigative Journalism)

“The DNR wants to find out what's going on to make good policy decisions,” he said after the meeting. “We are working on implementing all the recommendations that apply to us. We are taking this issue very seriously.”

Cattle outnumber people in Kewaunee

Concentrated Animal Feeding Operations, large farms with more than 1,000 animal units, are allowed to spread manure on land with only 2 feet to bedrock. (https://docs.legis.wisconsin.gov/code/admin_code/nr/200/243/II/14/2/b/7) Kewaunee County has 97,000 cows, heifers and calves, of which 45,500 are dairy cows, according to the (http://quickstats.nass.usda.gov/results/2BBE7318-2442-3676-A755-76C7DFBE00EB)U.S. Department of Agriculture. (http://quickstats.nass.usda.gov/results/2BBE7318-2442-3676-A755-76C7DFBE00EB) There are 15 dairy and one beef CAFO in the county, producing approximately 700 million gallons of manure per year.

In comparison, the county has about 20,000 people (https://www.wiscontext.org/why-kewaunee-county-flashpoint-cafos-and-water-quality) served by 4,822 septic systems. According to Borchardt, about 200 million gallons of septic effluent are released below ground per year, including human waste and water from showers, dishwashers and laundry machines. Septic systems leach into the subsurface by design, but “if it hits a crack, away it goes” into the groundwater, he said.



The fractured nature of the bedrock in Kewaunee County allows for water to easily infiltrate to the subsurface, especially after rain or or snowmelt. The researchers placed autosamplers in three homes to continuously test water quality during periods of recharge.

Using the autosamplers, they detected coliform numbers going from 10 parts per million to 1,000s of ppm within the span of 12 hours as the aquifer recharged, showing that a home's water chemistry can change dramatically within a short period of time.

"It's like sampling a river. It's highly variable," Borchardt said.

During the study, one day after a heavy rain, one home turned up with brown water that the researchers tied to manure spread on a nearby field. The soil from the field and water from the home shared the same signatures for fecal contaminants.

Five days after the rain, at one of the test homes, the same microbes turned up in clear-looking private well water about half a mile away. “Even if the water’s not brown,” Borchardt said, “it doesn’t mean you aren’t drinking contaminated water."

Asked how to solve Kewaunee County’s water problems, Borchardt suggested an expensive fix.

“Both groups, the dairy industry, the suburban people, the exurban people, need to take care of their waste,” he said. “The solution is to centralize treatment for all pooping mammals out there.”

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DOOR COUNTY NEWS KEWAUNEE

Human and Cow Manure Plague Sixty Percent of Kewaunee Wells

By Jim Lundstrom, Peninsula Pulse – June 9th, 2017

These jars contain brown water taken from a tap in Kewaunee County that researchers tied to the recent spreading of manure on a nearby field. The soil from the field and water from the home shared the same signatures for fecal contaminants.

Scientists confirmed on June 7 what everyone with any brain capacity already knew: There is way too much manure on the fractured karst landscape of this peninsula.

Too much cow manure and too much human manure for the fragile landscape we live on. Yet, we continue to pile poop on it and wonder why we can't drink the water.

Perhaps the most significant statement made during a night of significant statements about contaminated water in Kewaunee County came when one of the presenters said by now even the layman should understand why so many private wells in the county are contaminated with fecal matter and various viruses and pathogens.

In fact, several times during the presentation at the Kewaunee County Fairgrounds in Luxemburg, Mark Borchardt said you don't have to be a scientist to know where the pollution is coming from.

We should first point out that we are referring to Mark Borchardt the respected Wisconsin-based U.S. Dept. of Agriculture research microbiologist, not Mark Borchardt the Wisconsin-based director of *Coven* and star of the acclaimed 1999 documentary *American Movie*.

The meeting in the fairgrounds hall was called so Borchardt and his research associate Maureen Muldoon, professor of hydrogeology and environmental geology at the University of Wisconsin-Oshkosh, could present their findings from a randomized testing of wells in Kewaunee County.

Two days after this field was spread with manure on Oct. 26, 2016, water from a nearby a home turned brown, with contamination directly tied to the manure.

They went into great detail about the testing and results, but before they got to any of that, they explained why the karst landscape presents such a problem for maintaining a contaminant-free aquifer.

Muldoon, who has been studying the geology and aquifer of this region for decades, explained that the Silurian dolomite aquifer we live on is fraught with cracks, both vertical and horizontal. If there are contaminants on the surface or subsurface, in the case of septic systems, gravity will impel them to find the cracks and eventually, inevitably, work their way down to the water we rely on to live.

"Water can move very quickly through these fractures," Muldoon said.

Borchardt said the aquifer here moves more like a river than a typical sluggish aquifer.

Muldoon, who did tracer studies on the area's aquifer for her PhD, described the peninsula's aquifer as a superhighway, moving the same amount of water in one day that a more normal sand aquifer would move in a year.

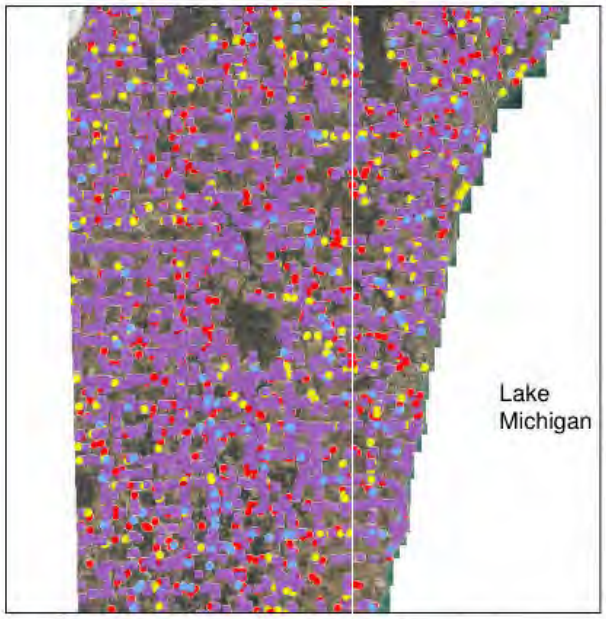
Borchardt then took the floor to explain the randomized well testing they devised, and why it was important to do it that way. He said previous well testing reports had been criticized as biased. He said they had access to a list of all 4,896 private wells in Kewaunee County, and using a random number generator, they chose 621 wells to sample. A third of those wells (208) tested high for bacteria or nitrate.

Kewaunee County Septic Systems

- 4822 septic systems in the county
- 540 holding tanks, 155 abandoned

Personal comm. Lee Luft, Kewaunee County Supervisor, March 7, 2017

Legend
Purple = replaced or inspected
Red = not inspected
Yellow = holding tank
Blue = abandoned system



Kewaunee County septic systems

Approximately 200 million gallons septic effluent per year released to the subsurface

Muldoon explained that 131 of the wells that tested bad were randomly selected for further testing in order to try to determine the source of contamination. Of those, 79 wells were contaminated. Forty wells tested positive for bovine manure, 29 for human manure and seven had both.

Testing revealed the expected results that wells in areas with deeper soil had less contamination. They tested wells in soil depths of 0 to 5 feet and found 46 percent of them were contaminated, while 28 percent of the wells in soil depths of 5 to 20 feet were infected.

“Pay attention to depth of bedrock. That’s a very important parameter,” Muldoon said.

Borchardt said it's pretty obvious what the problem is, with 97,000 cattle producing 700 million tons of waste annually, and 4,822 septic systems in the county dealing with 200 million gallons of human wastewater annually.

"That's one large fecal source on the landscape," Borchardt said.

The one-time sampling showed a 60 percent well contamination rate in Kewaunee County.

"It's my professional opinion based on my 25 years' experience, that if we sampled more than once, this would creep up to 90 percent," Borchardt said.

In addition to fecal matter, Borchardt said the testing also found cryptosporidium in 12 percent of the wells and high concentrations of rotavirus A in 14 percent of the wells, along with E. coli, salmonella and rotavirus C, which Borchardt said he's never seen in groundwater in the U.S. before.

He added that making the phone call to the owners of wells with salmonella "were some of the hardest professional days I had. I know I'm getting a little mushy, but I care a lot about this county and the people who participated in this study."

Borchardt said the No. 1 question from the study participants was "What can I do about my water?"

He suggested a reverse osmosis system, which is what is used in his lab to create water so pure it has no taste. He also said ultraviolet light is effective for killing pathogens, but suspected it wouldn't work so well with the hard water of the area.

He also said he is working with Kevin Erb of the University of Wisconsin-Green Bay Extension to create an early warning system to predict groundwater contamination.

He added that if you have brown tap water, that is bovine contamination.

“Brown water events are not human, they are bovine. You don’t need my fancy methods. Just use your nose,” he said.

During a Q&A session, Borchardt was asked if less manure on the landscape would result in less well contamination.

“You don’t need a scientist for that,” he said. “Remove the fecal source and you remove the contamination.”

After the meeting, Rep. Joel Kitchens, whose district includes Kewaunee County, said he had received the well contamination data about a month ago and was surprised at the amount of human fecal contamination, which prompted him to call the Kewaunee County Sanitarian to ask about the septic system situation in the county.

“Kewaunee County has a really big backlog of problematic septic systems that they have not forced people to fix,” he said, adding that the county is aware of 70 to 80 failed septic systems. “They have to do something about that. More than 40 percent of the contaminated wells were from human waste. That should be fixable, for the most part.”

Kitchens said he hopes the Clean Water Access Bill he and Sen. Rob Cowles wrote and that passed the Senate Committee on Natural Resources and Energy last week will help county residents who need to replace septic systems. The bill would allow municipalities to make low-interest or no-

interest loans providing up to 75 percent of costs, up to $16,000, to replace a contaminated well or private wastewater treatment system.

And while Kitchens said it may seem to be a hopeless situation for clean water in those shallow soil areas, he has faith in the rewrite of state statute 151 regarding runoff management in sensitive karst areas.

“What I’m hopeful for, when the new rules come out, which will be pretty soon, I don’t think we’ll ever be able to put a cap on and say you can’t have cows in this area, but I think we can severely limit them spreading anything on those shallow soils,” he said. “For the CAFOs, they’re not allowed to spread on anything less than two feet of soil, which still is not that great. But smaller farms can spread on them. So we’re going to have to have severe restrictions on those areas.”

Maybe solid manure is applied to those shallow farm fields rather than liquid manure, which so easily finds the cracks in the topography, Kitchens suggested.

“I think there are a lot of things that can help, but it’s never going to be 100 percent,” he said. “We are making progress there. Rewriting 151 is a huge deal. My path ahead is to make sure it has teeth and is adequate to protect the groundwater.”

Kitchens said the bill should be out in about a month, followed by public hearings.

“I hope people get involved in that,” he said.

Kewaunee County announced on June 9 that it is proposing to amend its sanitary ordinance for private wastewater treatment systems. The proposal

would require that every septic system that was installed before Jan. 1, 985 il l i f O 202

The Kewaunee County Zoning Office will also accept written comments on the proposal until June 12. Those who would like to submit a comment, may do so in person or by mail, Kewaunee County Zoning Office, 810 Lincoln St., Kewaunee, WI 54216.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Environmentalists: Manure Spills Endangering Wisconsin Water

Manure

Environmentalists warn that manure spills are putting Wisconsin's water supply at risk and that the proliferation of so-called "megafarms" will lead to more pollution accidents.

Livestock operations have spilled at least 4.8 million gallons of manure since 2009, according to Wisconsin Department of Natural Resources data and published reports across **Gannett Wisconsin Media**.

By **Associated Press**

More than 3 million gallons of manure spilled in 2013 and 2014. The numbers could be even higher because the DNR's records don't include cases that are still under investigation by the agency.

DNR records show most of the incidents resulted from equipment malfunctions, such as ruptured hoses, or accidents, including manure trucks that tipped over.

Most spills are cleaned up without any measurable harm to people or animals, DNR spokesman Ed Culhane said. But at least some have caused fish kills, polluted wetlands and contaminated drinking water, according to reports published by Gannett Wisconsin Media.

Environmental advocacy groups say pollution from liquified manure is one of the biggest hazards for Wisconsin's drinking wells and waterways.

"As a farmer, I've watched some of these issues. Manure is literally running into ditches and getting washed into rivers," said Lynn Utesch, co-founder of Kewaunee C.A.R.E.S., a group promoting environmentally friendly farming practices.

Manure is liquified by using water to flush animal waste from barns into storage lagoons. The manure is then sprayed on fields as fertilizer using trucks or irrigation systems.

Leaders in the dairy industry say liquid manure is safe when managed properly. The DNR has strict regulations for large farms that produce

the most manure, including limits on when and how much can be sprayed.

"We're way ahead of the game (with manure management) compared to the rest of the nation," said Laurie Fischer, director of dairy policy for the Dairy Business Association.

But critics argue accidents are becoming larger and more frequent.

Manure contains many pathogens, including E. coli and coliform bacteria, that can harm people and animals. When liquified, the manure more easily flows into waterways or seeps into groundwater, said Jason Lowery, spills response team leader for the DNR.

Areas in central and northeastern Wisconsin are particularly vulnerable to contamination because of sandy and rocky soils that allow liquids to seep through more easily and quickly, DNR officials and local conservationists said.

A growing number of conservationists, landowners and lawmakers are blaming the spills and well pollution on the proliferation of large farms.

Wisconsin is home to more than 260 of such farms, also called concentrated animal feeding operations. That's up from less than 50 just 10 years ago, according to DNR permitting records.

These farms are home to about 400,000 dairy and beef cows that produce 47 million gallons of manure every day, based on estimates by the U.S. Environmental Protection Agency. That's more waste than the amount produced by all the residents of Wisconsin combined.

"When you have one farm producing millions of gallons of manure in one year and there's a need to spread that over massive areas — I just have to think the danger is greater," said Shahla Werner, director of the Sierra Club's Wisconsin John Muir chapter.

Fischer, of the Dairy Business Association, said it's unfair to blame the large operations, which are becoming increasingly necessary

for farmers to make a living and meet people's demand for food.

"Regardless of if you're a small, medium or large farm, accidents can occur. It's how we manage those farms on a day-to-day basis that matters," she said.

Back to news

Comments

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Pat
Merrill, WI
2/10/2015 09:35 PM

There are a few omissions in the claims made by the EPA. According to the story, each cow is consuming about 117 gallons of water each day. That is a lot of water! Water that is consumed by the cow, and water used to clean milking facilities and other equipment. But to say that each of the 5.76 million residents of Wisconsin uses only about 8 gallons a day? The difference is that much of the water people use, especially in urban areas, is that the waste water is treated and then returned to nature. For a farm to treat waste water the same way would be possible, but incredibly expensive. Would such water treatment one day be mandatory? Let's just face it, studies such as this, and environmental groups which hold a lot of power to the fears of the majority of people. The farmer, regardless of however the size of their respective operation, is easily outnumbered, and outvoted. We have only one ace up our slaves and that is that we provide food. But, we are more and more on the wrong end of an argument and forever on the defence. And all of these manure spills does nothing in our favor.

10901 W. 84th Terrace Suite 300 Lenexa, KS 66214

FAILURE AT THE FAUCET

Nitrate in water widespread, current rules no match for it

While nitrate contamination increases, experts say state's main approach unlikely to protect drinking water

By **Kate Golden** November 15, 2015

Erik Daily/La Crosse Tribune

Land use is a factor boosting the level of nitrate in the water in Wisconsin. In the Upper Midwest, millions of acres of grassland — which leaches little nitrogen into aquifers — have been converted into fields of corn, soy and other crops since 2008, according to University of Wisconsin-Madison researchers. Here, a farmer harvests corn near Blair in Trempealeau County.

Born a month early in the spring of 1999, Case 8 had been thriving on formula. But at three weeks old, when her family ran out of bottled water and started using boiled water from the household well at the dairy farm where they lived, she got sick.

She was just 4 pounds, 10 ounces, when her parents brought her to a Grant County emergency room. Cold, pale and "extremely blue," she was rushed by helicopter to a regional intensive care unit.

Nearly all of her red blood cells had lost the ability to carry oxygen, according to medical records Wisconsin public health officials summarized in the Wisconsin Medical Journal.

Two days after she fell ill with methaemoglobinaemia, or "blue baby syndrome," water tests turned up the most likely culprit — high levels of nitrate.

According to state estimates (http://www.researchgate.net/publication/235911045_Private_Drinking_Water_Quality_in_Rural_Wisconsin), nitrate is at unsafe levels in an estimated 94,000 Wisconsin households. One in five wells in heavily agricultural areas is now too polluted with nitrate for safe drinking, according to data from the state Department of Agriculture, Trade and Consumer Protection.

And public water systems recorded 57 violations of health-based standards for nitrate in 2014. Those systems were required to post notices, provide bottled water, replace wells, install treatment or take other corrective actions to reduce nitrate. More than 120 of the 11,420 systems failed either to monitor or report nitrate levels.

"Nitrate that approaches and exceeds unsafe levels in drinking water is one of the top drinking water contaminants in Wisconsin, posing an acute risk to infants and women who are pregnant, a possible risk to the developing fetus during very early stages of pregnancy, and a chronic risk of serious disease in adults," according to the 2015 Wisconsin Groundwater Coordinating Council report (http://dnr.wi.gov/topic/groundwater/documents/GCC/GwQuality/Nitrate.pdf) to the Legislature.

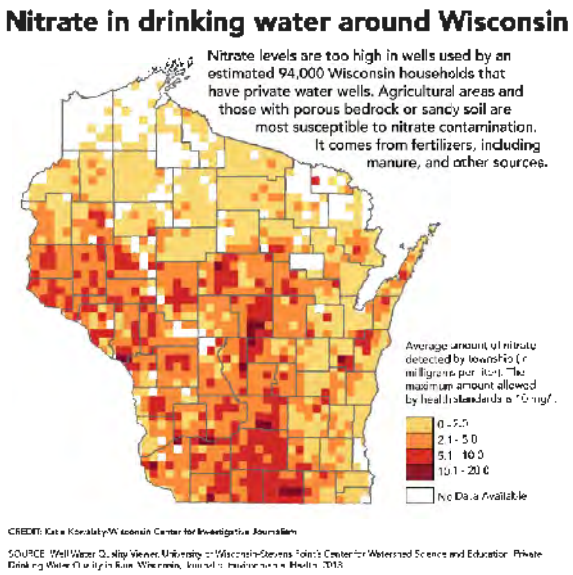
The multi-agency council also reported that nitrate — one of the most pervasive groundwater contaminants in Wisconsin — is "increasing in extent and severity."

Despite the signs of trouble, Wisconsin's most recent in-depth look at blue baby syndrome is more than a decade old.

State health officials identified eight cases (http://www.researchgate.net/profile/Lynda_Knobeloch/publication/10814458_Eight_blue_babies/links/02bfe510736ecce3b800000 in the 1990s. All recovered — including Case 8, who was released from the hospital after 17 days. Generally, a baby can recover in one or two days once given clean water.

New studies have suggested even the current health standard for nitrate may be too high.

Yet blue baby syndrome is rare. That is probably because private well owners have been warned for decades to test their water, especially if they have a baby. But over the past four decades, the contamination has been worsening in extent and severity.



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Katie Kowalsky / Wisconsin Center for Investigative Journalism

Among those with water contaminated by nitrate are Sherryl and Doug Jones of rural Spring Green.

About eight years ago, water from their private well tested at 20 milligrams of nitrate per liter of water — twice the health limit. Sherryl Jones said the couple initially switched to bottled water and, since 2012, they have been using a reverse osmosis system to remove nitrate at a cost of about $25 a month. Reverse osmosis removes nitrate and other contaminants by using high pressure to push water through a semipermeable membrane.

“We had children, we had babies in our house, we had a pregnant daughter, we had pregnant daughters-in-law. What was this (water) doing? There was no way we could let them drink this water,” Sherryl Jones recalled.

Jones said she urged neighbors to get their water tested, too. The result: Some of them had been drinking water with four times the health limit of nitrate. In fact, testing by the University of Wisconsin-Stevens Point’s Center for Watershed Science and Education found 31 percent of the private well samples collected in the Spring Green area had nitrate levels above the health standard.

Sherryl Jones said the DNR never warned them about high nitrate levels in the beautiful area along the Wisconsin River where they built their dream home. State officials have been studying dangerous nitrate levels private water wells in the Lower Wisconsin River Valley at least since the early 1990s (http://dnr.wi.gov/topic/groundwater/documents/GCC/MonitoringResearch/AllProjects.pdf) .

(http://u6efc47qb7f1g5v06kf9kfdcn.wpengine.netdna-cdn.com/wp-content/uploads/2015/11/Copy-of-nitrate-and-phosphate-testing.jpg)

Debra Sisk / University of Wisconsin-Stevens Point

Ian Torkelson runs a test for the presence of nitrate and phosphorous in water at the University of Wisconsin-Stevens Point's Center for Watershed Science and Education. Nitrate from fertilizers, including animal manure, and human waste has polluted numerous wells in Wisconsin.

"They've known about it. Now, what have they done?" she said. "They haven't even educated the residents of this area."

Rules no match for nitrate

At least 90 percent of nitrate inputs into groundwater come from artificial fertilizers and manure from farming operations, according to the 2015 report of the Groundwater Coordinating Council. Nitrate in drinking water systems is increasing, the council found, and "current management activities to limit nitrate pollution have questionable effectiveness."

In addition to blue baby syndrome, researchers are studying other possible health effects from nitrate in drinking water, including several cancers, thyroid problems, birth defects and diabetes. Nitrate can convert to compounds that are "some of the strongest known carcinogens," according to the state groundwater council.

Nutrient management plans are the state's main tool for addressing the problem. They help farmers apply nitrogen and phosphorus at the right rate to keep nutrients out of surface and groundwater.

"(But) nutrient management plans clearly don't protect groundwater if we mean anything close to maintaining the drinking water standard," said George Kraft, a professor of water resources at UW-Stevens Point who is the governor's representative to the council.

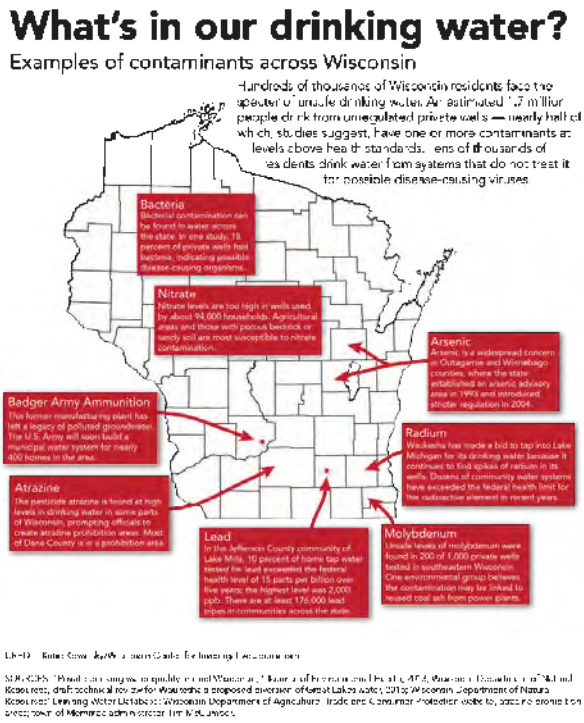
Last year, the groundwater council made protecting groundwater from nitrate and other agricultural contaminants one of three top-priority recommendations for the state.

The state DNR, which is responsible for protecting groundwater, declined to provide anyone for an interview with the Wisconsin Center for Investigative Journalism about nitrate in Wisconsin's drinking water. Former agency

spokesman Bill Cosh also refused to answer questions about what strategy DNR was pursuing to reduce nitrate, directing a reporter instead to previously published reports.

But DNR drinking water chief Jill Jonas acknowledged at a 2014 scientific conference on nitrogen's environmental impacts held in Madison that Wisconsin has "a worsening problem that we need to tackle."

In October, 16 Wisconsin residents, including the Joneses of rural Spring Green, filed a petition (http://midwestadvocates.org/assets/resources/Petition%20for%20Corrective%20Action/2015-10-19_PCA_-_Signatures.pdf) with the U.S. Environmental Protection Agency seeking to force the DNR to correct deficiencies in its enforcement of the federal Clean Water Act.



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Katie Kowalsky / Wisconsin Center for Investigative Journalism

The petitioners allege DNR has failed to adequately protect ground and surface waters that provide drinking water to the state. The agency has responded by saying it takes its responsibilities under the law seriously.

As bad as it is now, Wisconsin's groundwater nitrate contamination overall is likely to increase long before it stabilizes, Kraft and other groundwater experts said, due to the lag time between when nitrogen is applied to the surface and when it reaches the water.

A team of researchers led by the EPA estimated (http://iopscience.iop.org/1748-9326/10/2/025006/pdf/1748-9326_10_2_025006.pdf) in 2008 that agricultural nitrate may cost the nation $157 billion per year. Nitrate's direct damage to drinking water supplies was estimated at $19 billion, with some of the greatest costs borne by

Upper Midwest states including Wisconsin, Minnesota, Iowa, Illinois, Ohio, Michigan and Indiana. Much of the cost was attributed to a projected increase in colon cancer among those drinking contaminated water.

Jonas told the scientific conference last year that the costs of testing and treatment to remove nitrate pollution are growing statewide, "and it certainly is unsustainable."

Dairy's role scrutinized

In a handful of recent court cases, nitrate pollution has come front and center as rural residents have challenged large livestock operations. A Wisconsin judge in 2014 cited Kewaunee County's widespread pollution of drinking water by nitrate and bacteria as evidence of "massive regulatory failure" by both federal and state agencies — a view that the DNR refutes.

Some residents there have pointed to the large dairy farms, known as concentrated animal feeding operations, as the most likely culprits for their polluted water. They have filed a separate petition (http://www.cleanwisconsin.org/wp-content/uploads/2015/01/2014-10-22-Kewaunee-SDWA-Petition-to-EPA_final.pdf) asking the EPA to provide them with emergency safe drinking water and to investigate the sources of the nitrate pollution. Many also want tighter regulation of the dairies to protect the area's vulnerable karst topography, where aquifers lie underneath shallow bedrock filled with cracks and holes.

In a case that all sides agree could set a national model, a federal judge in Washington state in May sided with environmental groups in ruling that several large Yakima dairies' manure had polluted drinking water supplies with nitrate (http://www.yakimaherald.com/news/lower_valley/lower-valley-dairies-settle-final-issues-in-federal-case/article_c76923ed-c79f-5e48-843b-741aa8857701.html) and posed an imminent threat to human health. The dairies were ordered to provide clean drinking water to hundreds of neighbors with contaminated wells.

(http://u6efc47qb7f1g5v06kf9kfdcn.wpengine.netdna-cdn.com/wp-content/uploads/2015/11/Copy-of-Wisconsin-dairy-farm.jpg)

Kate Golden / Wisconsin Center for Investigative Journalism

Manure from dairy operations is blamed in part for nitrate that pollutes the drinking water in some parts of Wisconsin.

Giant dairy farms have mushroomed (http://wisconsinwatch.org/2014/02/mega-dairys-growth-plans-hotly-debated/) as Wisconsin's industry has consolidated. The Wisconsin Dairy Business Association, an industry group, has fought the notion that the large farms have tainted drinking water by citing the looser regulation of small farms and the presence of human, as well as animal, waste in wells.

The group acknowledges agriculture's role in the overall problem — and potential solutions.

"If anything, these dairies will be a big part of any improvements going forward," said the association's representative John Holevoet, adding that such farms "have embraced regular soil testing and detailed nutrient management planning in a way that others have not," and pointing to research and technologies to improve the efficiency of nitrogen use.

"The reality is, manure management has never been better or more sophisticated than it currently is. It will only get better," Holevoet said.

However, even farmers who are following best farming practices set out by federal or state agencies may pollute the groundwater, particularly in areas with geologically vulnerable aquifers such as northeastern Wisconsin's karst areas or the Central Sands region.

Kevin Masarik, a groundwater education specialist at UW-Stevens Point's Center for Watershed Science and Education, said some of the factors are beyond farmers' control.

"We don't have a lot of tools in the toolbox to address nitrate in groundwater," he said.

Blue babies and birth defects

Nitrate in drinking water poses a "serious health risk to infants and pregnant women," said Roy Irving, a state Department of Health Services toxicologist. Those who are most at risk are babies who drink formula made with nitrate-contaminated well water; breastfed infants appear to be fine even if their mothers drink polluted water.

Wisconsin's public health officer, Henry Anderson, said his department typically finds one or two cases of blue baby syndrome per year through scanning hospital discharge and emergency-room databases.

But the department does not follow up to find out if the cases were water-related, he said, as the illness can also be triggered by medications or a rare congenital disorder. Anderson and other experts said they believed outreach by pediatricians and public health officials has been effective.

(http://u6efc47qb7f1g5vo6kf9kfdcn.wpengine.netdna-cdn.com/wp-content/uploads/2015/11/Capitol-protest.jpg)

Abigail Becker / Wisconsin Center for Investigative Journalism

Dick Swanson of Algoma carries dolls painted blue to highlight "blue baby syndrome," a condition caused when infants drink water polluted by nitrate. Swanson, a member of the advocacy group Kewaunee Cares, attended a "stink-in" with about 50 others on the steps of the Wisconsin State Capitol on Nov. 7 to protest pollution from concentrated animal feeding operations. Activists blame large-scale farming operations for contaminating drinking water in Kewaunee County and elsewhere.

"Every visit, we ask, 'What kind of water do you use? Do you have a well?' " said Dr. Beth Neary, an environmental health advocate whose longtime Madison pediatric practice included many mothers from rural areas. "But there's got to be people who don't go to the doctor."

Last year, the Department of Health Services updated its health advice to warn women who may become pregnant to stay away from water with high nitrate levels, based on emerging research linking the chemical to birth defects.

In one 2013 study of 3,300 Iowa and Texas case mothers and 1,121 control mothers, those whose babies had spina bifida, cleft palate or lip, or a limb deficiency were all more likely to have drunk (http://ehp.niehs.nih.gov/wp-content/uploads/121/9/ehp.1206249.pdf) at least 5.4 milligrams of nitrate a day, which is under the health standard.

Some of those health effects, researchers have written, may be caused not by the nitrate itself but by contaminants, including pesticides, that often occur with it.

Dismaying statewide trend

In 2014, Masarik and a group of UW-Madison and state of Wisconsin collaborators analyzed (http://ua.dnr.wi.gov/topic/Groundwater/documents/GCC/Minutes/posterMasarik201402.pdf) a decade's worth of data for more than 8,500 churches, bars and other "transient non-community water systems" that are required to test at least annually for nitrate.

They projected that given the rising or falling nitrate levels among those wells, about 687 non-community systems, or 8 percent of the total, would eventually need to invest in a new well or a treatment system.

Because nitrate can take time to make its way down to aquifers, some recent trends may be the result of land use practices from decades ago. Improvements made now may take years to bear fruit.

(http://u6efc47qb7f1g5v06kf9kfdcn.wpengine.netdna-cdn.com/wp-content/uploads/2015/11/Copy-of-Masarik-water-sample.jpg)

Ron Seely / Wisconsin Center for Investigative Journalism

Kevin Masarik, a groundwater education specialist at the University of Wisconsin-Stevens Point's Center for Watershed Science and Education, is seen here at Wisconsin Farm Technology Days near Sun Prairie in August. "I don't think we have fully realized what the extent of nitrate (in groundwater) is throughout Wisconsin yet," he said.

"I don't think we have fully realized what the extent of nitrate is throughout Wisconsin yet," Masarik said. "I think there's areas where we're going to continue to see wells exceeding the standard that maybe in the past have not been."

Masarik described how the Joneses saw their well water creep up over 20 milligrams per liter of nitrate — twice the safe limit. Doug Jones wondered if a 15-acre field he was renting out, on which corn and soy was growing, could be to blame. Would taking land out of production improve his well water?

"I don't know," Masarik told Jones, offering to monitor the water.

Two years later, the nitrate levels had decreased. But, Masarik acknowledged, it is not a strategy that most well owners have the "luxury" to employ.

People always ask him: What about septic systems?

In some areas they are to blame. Human waste is rich with nitrogen, just like animal waste. Septic systems that are improperly constructed or placed in areas with vulnerable geology can lead to polluted wells.

Statewide, septics account for about 9 percent of the nitrate inputs to groundwater. Lawn care contributes another 1 percent. Artificial fertilizer and manure contribute the remaining 90 percent.

Masarik estimates that to match the water quality impact of a 20-acre field of corn, those 20 acres would have to have 36 normally functioning septic systems on them.

"Nobody really wants to think that it's because of them," Masarik said, but added, "If you want to have an intelligent debate about where it's coming from and how you can fix it, it's important to really understand the source."

Nutrient management no fix

Fertilizer usage has about quadrupled since 1960 nationwide, according to U.S. Department of Agriculture figures. The state Department of Agriculture, Trade and Consumer Protection estimates (http://dnr.wi.gov/topic/groundwater/documents/GCC/AgencyActivities/DATCPactivities.pdf) that farmers applied over 200 million pounds of nitrogen in excess of UW-Extension crop recommendations in 2007.

Masarik said the nitrate problem is not mainly about farmers heedlessly polluting the landscape by over-applying nitrogen. The trouble is that no plant is perfect at soaking up nutrients.

The state agriculture department says nutrient management planning (http://datcp.wi.gov/Farms/Nutrient_Management/) is one of the best ways to prevent excess nutrients from tainting the water. Wisconsin's current standards are among the most stringent in the nation, agency spokeswoman Donna Gilson said, and revisions currently underway (http://socwisconsin.org/current-work/nutrient-management/) will require "substantially stronger restrictions" on spreading nutrients for certain soil types, in winter and near conduits to surface or groundwater.

(http://u6efc47qb7f1g5v06kf9kfdcn.wpengine.netdna-cdn.com/wp-content/uploads/2015/11/Copy-of-central-sands-dirt.jpg)

Kate Golden / Wisconsin Center for Investigative Journalism

The porous soil of Wisconsin's Central Sands region allows manure and other fertilizers from farming operations to make their way into the aquifer, sometimes polluting the groundwater and drinking water with nitrate.

But state agriculture officials' view of these plans' effectiveness in addressing nitrate is rosier than that of groundwater experts Kraft and Masarik. Masarik, who was involved in research examining the effectiveness of such nutrient management planning, said the strategy may still result in contaminated wells unless farmers rotate their crops.

Even revisions to the nutrient management standards are unlikely to dramatically improve water quality, Masarik said. The benefits of such plans "may have been oversold in some cases — or misunderstood in terms of what's actually realistic," he said.

For one thing, such plans sometimes increase the use of nutrients. A survey (http://www.jswconline.org/content/67/1/51.full.pdf) of 259 Wisconsin farmers, most of whom grow corn and soybeans with livestock, found that 51 percent increased their nitrogen applications after implementing nutrient management planning.

Well testing is rare

Private well owners in Wisconsin are not required (http://dnr.wi.gov/topic/wells/retransfer.html) to test their wells, and very few have done so, let alone on the annual schedule that public officials recommend. In some areas, even annual tests may not be often enough to guarantee safe water because pollution can spike one month and disappear the next.

Petitioners Sherryl and Doug Jones feel the state Department of Natural Resources has left residents to fend for themselves when it comes to ensuring the quality of their water.

What do the Joneses want?

“We all are entitled to clean water, drinking water,” Doug Jones said. “There’s no reason why with this day and age and all the science and technology that something can’t be done to improve the situation because it just seems to be getting worse.”

Others favor a change in state law, including mandatory testing of private wells.

“Leaving it up to the individual citizen is just not good public health policy,” pediatrician Neary said.

Masarik, who spends much of his time encouraging people to test their wells, cautions that such a requirement could add a layer of bureaucracy without making the public any safer. What would well owners whose tests found nitrate be required to do?

(http://u6efc47qb7f1g5v06kf9kfdcn.wpengine.netdna-cdn.com/wp-content/uploads/2015/11/jones-well.jpg)

Bridgit Bowden / Wisconsin Center for Investigative Journalism

Doug and Sherryl Jones show a monitoring well on their property in rural Spring Green. The couple’s drinking water was found in 2007 to contain twice the health limit for nitrate. They initially switched to bottled water but now have a reverse osmosis system to remove nitrate. The Joneses are among 16 petitioners seeking to force the state Department of Natural Resources to better enforce part of the Clean Water Act.

In some situations, “you kind of have to weigh your options,” he said. “The government is not going to be able to make those decisions for them.”

Masarik believes the government’s most helpful role is educating health care providers, local health departments and rural well owners about their responsibility to test their water, especially when buying a piece of property or when a baby is on the way.

Short-term fixes costly

The cost of solving a nitrate problem for a household can run from hundreds of dollars a year for bottled water or water treatment systems to thousands of dollars to drill a new well. Treatment systems, in particular, require maintenance — and are no guarantees of safety, as another case from the Wisconsin Medical Journal illustrates.

Case 4 was a baby girl from Eau Claire County weighing 6 pounds and 10 ounces. She had been healthy for the first month of life. But she started to throw up after feedings and had loose stools. She was treated for dehydration and went home the next day.

Six days later she was readmitted and was described as “wasted and dusky,” or in other words, blue.

She had drunk formula made with well water. The family knew the water was contaminated and was filtering it with a reverse osmosis system.

A water sample taken while Case 4 was hospitalized showed nitrate at 9.9 milligrams, right near the health standard, with later samples at 12.5 and 23.5 milligrams per liter.

It turned out the family’s solution — a filter — was no solution at all.

Reporter Bridgit Bowden contributed to this report. Portions of the series were produced in collaboration with journalism classes participating in The Confluence, a project involving the Wisconsin Center for Investigative Journalism and the University of Wisconsin-Madison School of Journalism and Mass Communication. The nonprofit Wisconsin Center for Investigative Journalism (www.WisconsinWatch.org) collaborates with Wisconsin Public Radio, Wisconsin Public Television, other news media and the UW-Madison School of

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Farming activity contaminates water despite best practices

AN EXCLUSIVE INVESTIGATION SHOWS MILLIONS OF AMERICANS LIVING CLOSE TO FARMS ARE DRINKING WATER FROM CONTAMINATED SOURCES.

Jackie W ang, Nicole T yau and Chelsea Rae Ybanez, News21

Chapter 1

FARMING CONTAMINATES WATER

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farms are making contaminated-water

CASCO, Wis. – Lynda Cochart did not realize her water was contaminated with coliform bacteria until she contracted MRSA, an antibiotic-resistant skin infection. She believed it came from the water in her well in Casco, Wisconsin. “There’s no other way I could have

gotten it," she said.

A year later, U.S. Department of Agriculture microbiologist Mark Borchardt tested her well while testing others in Kewaunee County. He found total coliform bacteria at levels too dangerous to drink. Cochart lives between two dairy farms with over 1,000 cows each. None of the bacteria Borchardt found came from human feces, she said, so the methicillin-resistant Staphylococcus aureus most likely came from cow manure. Borchardt told her to immediately stop drinking the water.

More: Central Coast conservationists sue water boards (http://www.thecalifornian.com/story/news/2017/08/15/water-and-ag-polluiton/561427001/)

"He said, 'What I found in your well is what I expect to find in a Third World country,'" Cochart recalled. When she told him she still needed to shower with that water, Borchardt advised, "Then keep your eyes closed and your mouth shut."

In California's San Joaquin Valley, which grows nearly one-quarter of the nation's food, fertilizer and manure spread on fields and orchards have contributed to unsafe nitrate levels in drinking water sources. The News21 analysis of Environmental Protection Agency records of community water systems shows 491 instances of unsafe nitrate amounts in many of the region's 663 community water systems over the past 10 years.

Nicolas Castañon(left), trims young jujube trees and Juan Salas fixes a leak in the drip irrigation line at L. E. Cooke Co. tree nursery in Visalia, Calif. Castañon said he has safe drinking water because his home has a filtration system. (Jackie W ang/News21)

(Photo: Jackie Wang)

Many farm workers who live in these communities still
have to pay for the contaminated water coming from the faucet, as well as buying bottled water to drink. But the farmers who employ them don't agree with their concerns.

"They say, 'Why are you complaining? You have jobs? We are giving you jobs. You eat because of us,' " said Irma Medellin, who works with Latino farmworkers in Tulare County to clean up the drinking water. "They contaminate our water, and we, the poor, are paying for water as if we were rich. And we are not rich. But we are paying the price of contaminated water."

The News21 analysis shows that the drinking water of millions of Americans living in or near farming communities across the country is contaminated by dangerous amounts of nitrates and coliform bacteria from fertilizer and manure widely used in agriculture. Community water systems serving over 2 million people across the country were cited for excessive nitrate levels.

While the 5,050 nitrate violations can largely be traced back to agricultural activity, the 22,971 total coliform violations could be from either human or animal feces. However, in heavily farmed areas, much of the coliform bacteria can be attributed to manure.

Those records don't cover the millions (https://water.usgs.gov/edu/gw-well-contamination.html) of private wells that many Americans use, which are left vulnerable to pollution of shallow groundwater in agricultural areas.

A 2012 University of California, Davis, study (http://groundwaternitrate.ucdavis.edu/files/139110.pdf)attributed high nitrate levels in the San Joaquin Valley groundwater to crop and animal agriculture activities based on an analysis of land use and the amount of nitrogen entering the water. Heavy use of fertilizers and manure on crops account for most of the nitrate found in the studied area.

An Iowa Geological Survey researcher found (http://www.sciencedirect.com/science/article/pii/S0167880904001227)in 2004 that row crops, such as corn, cotton and soybeans, contributed the most to high nitrate levels in Iowa's rivers. In 2007, U.S. Geological Survey researchers found (http://pubs.acs.org/doi/pdfplus/10.1021/es0716103)that Iowa was one of nine Midwestern farming states that contributed over 75 percent of the nitrates that flow from the Mississippi River into the Gulf of Mexico. And a 2010 study by researchers from the University of Illinois and Cornell University found (https://dl.sciencesocieties.org/publications/jeq/abstracts/39/5/1657) that the biggest contributors of excessive nitrate to the Mississippi River were in the Midwestern corn belt.

People living farther away from agricultural areas also are vulnerable to farming pollution because contaminants can flow downstream in rivers and groundwater.

In Wisconsin, the USDA's Borchardt tracked manure runoff from a field to the tap water of a nearby home after the water ran brown. Three days later, genetic testing showed the same bacteria traveled 1,500 feet through groundwater to another home's well.

In 2016

Tony Brey is a dairy farmer in Door County , Wisc., and a member of Peninsula Pride Farms, a watershed initiative to protect groundwater from contamination. (Chelsea Rae Ybanez/News21)

(Photo: Chelsea Rae Ybanez)

(http://www.dispatch.com/content/stories/local/2016/06/30/nitrate-warning.html), the Columbus Division of Water issued a nitrate contamination warning not to drink the city's water after heavy rain pushed fertilizer into a watershed 60 miles north of the Ohio city, the second nitrate advisory in two years.

"They're increasing," said Kristy Meyer, who oversees the Ohio Environmental Council's water programs as the managing director of natural resources. "Now you're starting to see drinking water utilities spend a lot more money to be able to treat the water and keep their customers safe."

For example, Des Moines, Iowa, is surrounded by farms that grow the most corn, soybeans, eggs and hogs in the nation. Fertilizer and stored manure drain into the groundwater and flow into streams and rivers, leaving people to pay to treat their drinking water.

The Des Moines Water Works, which serves half a million people in Iowa's capital, draws most of its water from the Raccoon River and Des Moines River. The utility shelled out over $2 million from 2013 to 2015 to reduce nitrates to safe drinking standards, and will soon have to spend up to $183.5 million to build a new treatment facility.

Des Moines Water Works sued three northern Iowa counties in 2015, accusing the 10 drainage districts in those counties of dumping nitrates into the Raccoon River without a federal permit. The river runs (http://www.iowacourts.gov/About_the_Courts/Supreme_Court/Supreme_Court_Opinions/Recent_Opinions/20170127/160076.pdf)for 186 miles from Buena Vista County to the Des Moines River, south of

downtown Des Moines. The drainage districts use “tile drainage,” which moves groundwater directly under the soil through underground pipes and into the river, turning saturated land into farmable land.

The Iowa Supreme Court dismissed (https://localtvwhotv.files.wordpress.com/2017/01/16-0076.pdf)the case earlier this year because state law protects drainage districts from lawsuits. Though the drainage districts were not penalized, studies point to agricultural runoff as a major contributor of nitrates in the Raccoon River.

Chapter 2

CONTAMINATED DRINKING WATER POSES SERIOUS HEALTH RISKS

Two of the most prominent farming contaminants in water are nitrates and total coliform bacteria.

Nitrate-related contamination comes from fertilizer for crops and manure. The body digests nitrates and turns it into nitrites, which inhibits red blood cells’ ability to carry oxygen. The EPA limits nitrate levels to prevent infants from contracting blue baby syndrome, a potentially fatal disorder that deprives infants of oxygen. Research indicates that long-term exposure may affect adults as well.

More: 63 million Americans exposed to unsafe drinking water (https://www.usatoday.com/story/news/2017/08/14/63-million-americans-exposed-unsafe-drinking-water/564278001/)

For the past 20 years, National Cancer Institute researcher Mary Ward has been researching drinking water contaminants, focusing on nitrates and cancer risk. She followed a group of people in Iowa to do so. Though studies need to be repeated before drawing conclusions, she said her research suggests drinking water with high levels of nitrates increases the risk for gastrointestinal and urinary tract cancers.

Tom Nolan, a hydrologist with the USGS, said in agriculturally intense areas, it's fair to say the majority of nitrate pollution comes from agricultural sources.

"That's just because that's where the sources are," Nolan said. "In agricultural areas, there are higher applications of fertilizer … You can look at (nitrate) exceedance rates and they're highest in shallow groundwater in agricultural areas."

Fertilizer and manure not only increase nitrates in drinking water sources, but also fuel algae blooms that make water unsafe to drink and harder to treat. Cyanobacteria grows in phosphorous-heavy waters, which is primarily caused (https://www.cdc.gov/safewater/chlorination-byproducts.html) by manure and fertilizer runoff. Also known as blue-green algae, cyanobacteria becomes problematic (https://www.epa.gov/nutrient-policy-data/cyanobacteriacyanotoxins)for drinking water systems in treatment facilities. During the sanitation process, water treatment facilities apply chemicals to kill the cyanobacteria. When the cell dies, it releases cyanotoxins, which can have health effects (https://www.epa.gov/nutrient-policy-data/health-and-ecological-effects) ranging from fever to pneumonia to death, according to the EPA.

A worker hoses down the milking station after a batch of cows finishes one of three daily milking sessions at Lenssen Dairy in Lynden, W ash. (Jackie W ang/News21)

(Photo: Jackie Wang)

“The blue-green algae is not regulated. There’s no EPA requirement to test for it,” said Bill Stowe, the CEO and general manager of Des Moines Water Works. “We test for it because we know from our experience that it is an adverse risk that is unregulated now, but smaller communities don’t have the resources or knowledge to do that.”

Beyond the problems cyanotoxins create, the chemicals (https://www.cdc.gov/safewater/chlorination-byproducts.html)that kill the algae react with organic material in the water and create disinfection byproducts (DBPs), which increase cancer risk. The News21 analysis showed that water systems across the U.S. were cited over 28,000 times in the last decade for exceeding the DBP legal limit, exposing over 25 million people to unsafe levels of DBPs.

Cyanotoxins and cyanobacteria “are significant risks for us because we increase our use of chlorine,” Stowe said. “When you increase one, you increase the likelihood of creating carcinogens.”

The other major source of water contamination from farming is total coliform bacteria from raw, untreated manure. When rain falls on recently fertilized fields, it pushes contaminants from the surface deeper into the soil, and eventually into groundwater. People can see and smell the brown water from their taps. But in the days before or after, water can continue to be contaminated even if the water runs clear.

Drinking water with total coliform bacteria can cause gastrointestinal illnesses, which are linked to diarrhea, stomach cramps, nausea and fever.

The California Division of Drinking Water is supplying 20 communities in the agricultural San Joaquin Valley with bottled water because of nitrate or coliform bacteria pollution. According to the News21 analysis, the most nitrate citations in the United States over the past 10 years were recorded in Tulare County, which is in the valley. Though nitrates and

bacteria are currently below the legal limit, the department still delivers water to them because of historic issues with contamination.

Each resident of unincorporated community Tooleville in Tulare County receives half a gallon of water for drinking and cooking per day, delivered every month and paid for by the state. For many residents, it isn't enough.

One Tooleville resident, Esther Ceballos, buys extra cases of water for herself, her two children and her husband. She still pays $40 a month for tap water she does not use for drinking or cooking.

An irrigation sprinkler sprays a cornfield in Grandview , Wash. Overhead sprinkler systems often spread liquid manure on crops. (Jackie W ang/News21)

(Photo: Jackie Wang)

Rosa Rubio, who lives next to Ceballos, relies on the bottled water delivery for herself, her husband and their four dogs. She said they've known their water was undrinkable since they first moved in, thanks to a neighbor who warned them. Sometimes, their tap water comes out white.

"Even if they say it's OK, we're scared to use that water," she said.

Chapter 3

ENVIRONMENTAL REGULATION OF AGRICULTURAL IS MOSTLY VOLUNTARY

On a still day in the northwest corner of Washington state, a brown, swirling pool burps methane as liquid manure shoots from a pipe propped up by a tractor. But when a breeze comes by, the smell of 1.5 million gallons of liquid cow manure hits the nose and then lingers in the back of the throat for hours.

This is the manure lagoon on Terry Lenssen's 710-cow dairy farm. Lenssen has only fallen into his manure lagoon once, accidentally backing a tractor into the pit. He's steered clear of the lagoon ever since. "I smelled like shit for three days," he laughed. "Must get into your pores or something.

Thousands of dairy farmers around the United States store their cows' manure like Lenssen does, in separate forms: liquid into a large pit, and the solids heaped into soft, dry mountains. Hog and chicken farmers also store vast amounts of manure to use later as fertilizer.

Dairy farmers usually take the liquid manure and apply it to their fields where they grow corn and alfalfa to feed their cattle. But when a farmer applies too much manure for plants to absorb, the rest finds its way out. In addition to that, lagoons can spill over or spring a leak. In a 2013 report about the Lower Yakima Valley in Washington state, the EPA estimated one dairy's lagoon leaked between 482,000 to 5.9 million gallons of liquid manure per year into the surrounding soil.

The EPA started regulating what goes into federal waterways in the 1972 Clean Water Act amendments (https://www.epa.gov/laws-regulations/history-clean-water-act). Many industries must apply for National Pollutant Discharge Elimination System permits, which allow certain discharges into national waterways. But farming is exempt (https://www.epa.gov/cwa-404/exemptions-permit-requirements)from the Clean Water Act, unless the EPA designates a farm as a concentrated animal feeding operation (CAFO).

A manure lagoon at Lenssen Dairy in L ynden, W ash., burps methane as more liquid manure is piped into the pit, which holds 1.5 million gallons. (Nicole T yau/News21)

(Photo: Nicole Tyau)

And many CAFOs have not applied for discharge permits. Although the number of CAFOs increased by 956 between 2011 and 2016 to a total of 19,496 in the United States, the number of discharge permits held by CAFOs has gone down 1,806 in the same five-year period.

Lenssen has not registered as a CAFO yet. Washington state implemented a new CAFO permit in March, but both environmental groups and dairy organizations immediately filed appeals against the new regulations. In the meantime, Lenssen has a 2-inch-thick binder holding his voluntary nutrient management plan as a testament to his environmental responsibility.

Nutrient management plans are intended to hold farmers accountable for what they apply and how much of it. States decide if they require these plans and how detailed they need to be. While some states, such as Maryland (http://mda.maryland.gov/resource_conservation/Documents/NM_Law.pdf), require farmers to work with a certified professional to construct a nutrient management plan,

others don't require consultation with an engineer or nutrient management expert, and farmers can submit their own plans for approval.

"Frankly, if I was to go and open a business today, I would need a business plan but also a permit of some kind," said Meyer, of the Ohio Environmental Council. "Why shouldn't one of the largest industries in the United States be required to have a permit?"

The Natural Resources Conservation Service, an arm of the Department of Agriculture, works with farmers to craft nutrient management plans on a voluntary basis. Each region of the U.S. has different priorities in its plans. Groundwater varies by geographic location. Conditions in one region of a state may drastically differ from a neighboring region of the same state. Aquifers are underground sections of rock (http://imnh.isu.edu/digitalatlas/hydr/concepts/gwater/aquifer.htm) that water moves through, and the type and amount of rock, soil and gravel it contains vary by region. Porous rock, such as karst, allows surface water to move quickly into the aquifer below, making it more vulnerable to contamination.

Nicolas Castañon(left), trims young jujube trees and Juan Salas fixes a leak in the drip irrigation line at L. E. Cooke Co. tree nursery in Visalia, Calif. Castañon said he has safe drinking water because his home has a filtration system. (Jackie W ang/News21)

(Photo: Jackie Wang)

Chapter 4

FARMERS AND THOSE SUPPORTED BY FARMERS' MONEY SHAPE AGRICULTURAL POLICY

If an aquifer is contaminated, the private wells that draw water from it become contaminated too. Yakima County in Washington state, home to around 67 dairy farms (http://wadairy.com/sites/default/files/facts-about-washington-dairy-industry_0.pdf), sits on aquifers the EPA determined to be contaminated by nitrates.

Larry Fendell, a 60-year-old ex-farmer, regularly attends Lower Yakima Valley Groundwater Management Area (GWMA) meetings. Its board first met in 2012 to solve nitrate contamination problems in the Lower Yakima Valley groundwater, but Fendell has been fighting for stricter regulations of large dairy farms for 20 years.

> “And even if there are regulations, so many things are suggestions,” Fendell said. “Nutrient management plans are suggestions. There’s no teeth behind them. Everything is voluntary.”

Dairyman Dan DeGroot represents the Yakima Dairy Foundation at GWMA meetings. He’s part of the advisory committee steering the research and planning to reduce nitrate concentration in groundwater. DeGroot said he defends himself from people who accuse dairy farms of being the biggest polluter of groundwater.

“I said, ‘You know what, I care more about drinking water than any of you people in here,’” DeGroot said. “It’s of critical importance because I’ve got 3,500 animals, plus 35 people, plus seven in my family – all drinking this water. I care. A lot.”

Though Yakima County is 49 percent Hispanic, the 22-person groundwater management board is all white, save for one Latino representing the Washington State Department of Health. It has not had an active Latino community representative since April. This leaves an already vulnerable community out of the discussion to remedy high nitrate levels, which significantly affect lower-income Latino farmworkers who rely on private wells.

For over three decades, the American Farm Bureau Federation has pushed to exempt farming from environmental regulation. For example, fertilizer and manure are not regulated by the Clean Water Act because agricultural activities are considered “nonpoint source pollution,” which means it comes from many sources.

In 2015, a federal judge ruled that over-applied manure could be regulated as waste after examining a case brought against a Washington dairy. The Washington State Dairy Federation, dairy organizations (http://www.idahodairymens.org/wp-content/uploads/2017/04/Idaho-Dairy-Focus-May-2015.pdf) and farm publications (http://agrilife.org/texasaglaw/2015/05/20/washington-court-holds-manure-subject-to-federal-regulation-parties-agree-to-settle/) opposed the ruling, but also cautioned dairy farms to exceed manure management expectations and prove that more environmental regulation was unnecessary.

A central pivot irrigation system waters a corn field in Grandview Wash. These irrigation systems are frequently used in farming to spread water and liquid manure fertilizer on crops. (Nicole Tyau/News21)

(Photo: Nicole Tyau)

U.S. Rep. Dan Newhouse, a well-to-do farmer and Republican congressman who represents farming-focused counties in Washington state, even filed a bill that would exempt fertilizer and animal manure from being regulated as solid waste entirely. Out of the $747,916 Newhouse received from political action committees between 2015 to 2016, 29 percent came from agriculture and food-related PACs.

The American Farm Bureau alone spent almost $3.8 million in lobbying nationally in the 2016 election cycle, according to the Center for Responsive Politics (https://www.opensecrets.org/lobby/clientsum.php?id=D000021832&year=2016). The center also reported (https://www.opensecrets.org/lobby/indus.php?id=A&year=2016) agribusiness organizations – which include farming, food production and stores – spent $127.5 million last year in lobbying the federal government.

Local farming lobbyist Steve George joined a tour of a Washington dairy farm by dairymen Jason Sheehan and DeGroot for News21. George is secretary of the Yakima County Farm Bureau, has been active as a spokesman for the Washington State Dairy Federation and works as a dairy nutrition consultant.

Keeping his arms crossed and his sunglasses on a furrowed brow, George occasionally interjected his thoughts into the conversation while following the dairy tour group closely, always making sure no one was alone with the reporters. Like other dairy operators News21 spoke with, George pointed to leaky septic systems as an underrepresented contributor of nitrate to drinking water sources, compared with farming.

Yet according to the federal conservation service (https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/nra/rca/?cid=nrcs143_014211), manure from a dairy milking 200 cows produces as much nitrogen

as is in the sewage from a community of 5,000 to 10,000 people.

George and DeGroot criticized the terms “corporate” and “factory farming,” arguing the words are only used as fuel for environmental activists to attack farms.

“What is factory farming?” DeGroot asked. “To me, I always considered that to be kind of a good thing, comparing me to a factory that is very organized, very smooth, efficient. That’s what it feels like to me.”

News21 reporter Andrea Jaramillo contributed to this article.

About this project

This report is part of the Troubled Water (http://troubledwater.news21.com/)project produced by the Carnegie-Knight News21 initiative, a national investigative reporting project by top college journalism students and recent graduates from across the country and headquartered at the Walter Cronkite School of Journalism and Mass Communication at Arizona State University.

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5 Investigates: Manure Money

By: NATE STEWART (mailto:nate.stewart@wearegreenbay.com)
Posted: Mar 01, 2017 10:32 PM CST
Updated: Mar 02, 2017 09:01 AM CST

KEWAUNEE - "We turned on the shower to see if it was through all the pipes and it just smelled. It was brown, flush[ed] the toilets and it came out pure manure."

Kewaunee County resident Erika Balza went to brush her teeth back in October when she noticed brown water running through her pipes.

She says a farmer had spread manure on the field just west of her property, and the next day it rained.

"I had run the dishwasher that night, so all the dishes were washed in pure manure - and heated dry," Balza said.

The manure runoff flowed directly into her well, leaving her family without clean water for 16 days. It stained their new toilets, they couldn't shower, and they had to boil water for the dishes. They also had to get a new dishwasher, and it set her back almost $800. However, Erika isn't alone.

There are people living today that should not bathe, should not wash their dishes, certainly should not drink the water that is coming out of their tap," said Lee Luft, a Kewaunee County board supervisor.

Luft says of the roughly 21,000 residents in Kewaunee County, 3,000 of them could have contaminated well water. He says the shallow soils along with the number of cows in the area is a big reason why.

"As the cattle-herd count has grown within the county, which has been the highest amount of cattle-herd growth in any county of our state, some of that growth has occurred in areas of very shallow soils and karst or cracked bedrock," said Luft.

That means there's more room for the manure to runoff from the estimated 95,000 cows in the area that produce some 650 million gallons of manure each year.

The water contamination is so bad that Algoma High School has a clean water kiosk for residents to use, and Luft says about 70 families use it.

So what's being proposed to fix the problem? The state is suggesting an integrated anaerobic manure digester that would help solve the manure runoff, and help treat the water.

"Digesters aren't going to take care 100% of the water quality issues themselves, that's what sets this project apart from previous efforts," said Clint Fondrich with the Public Service Commission.

The digester solution is one getting a lot of attention from the state, but simply building a digester doesn't solve the issue.

Especially after testing last year indicates there may be another contributor to Kewaunee County's groundwater woes.

"[In 2015] Nearly 500,000 gallons of human waste was spread on lands in Kewaunee County," Luft said.

Faulty septic tanks are another possibility. Microbiologists say weather conditions also play a role - with animal waste showing higher levels in wet weather, and human waste in drier conditions.

"The sources of the contamination, whether it be human or cattle, depends upon the level of groundwater, whether recharge is happening, whether the groundwater levels are rising or it's a non-recharging period when groundwater levels are falling," said USDA microbiologist Mark Borchardt.

The findings of such studies can help Kewaunee County plan future courses of action to make immediate corrections.

"We have about 4,800 septic systems in Kewaunee County," said Luft. "Of that number, 80-percent have been inspected and brought into compliance with state standards."

Manure Money: Part 2

The Public Service Commission has authorized using up to $20 million from Focus on Energy - a state utility, rate-funded program, not tax dollars - for renewable energy projects around the state. One of those projects is the installation of an integrated anaerobic digester system, along with systems to treat water.

It's a proposal that Governor Scott Walker has high praise for, especially when he announced the project in Kewaunee County late last year.

"We think it's a win, win, win. It helps clean water, it helps the environment with sustainable energy, and it helps our farmers which is an important part of our state's economy," Walker said.

The Public Service Commission says that the money for the digester project is going to be distributed to farms that are the most qualified and meet the criteria based on their evaluation. So even though Kewaunee County does have a water contamination issue, and it's the place where Governor Walker made his announcement that a digester project was coming to the state to solve the problem, Kewaunee County could essentially be left out to dry - and the project could go to another part of the state.

Communities that want one - will have to compete to get them.

The evaluation team will decide where the money for the project goes based on things like which community has the best plan for biogas production and utilization, water treatment and recovery, energy cost effectiveness, and nutrient management.

Even if Kewaunee County does get the money for a new digester, the celebration could be short-lived.

John Pagel owns Pagel's Ponderosa Dairy in Kewaunee County. He has a digester on his farm that was installed in 2008. It was provided by a combination of state and federal tax dollars.

His digester turns out 1200 kilowatts of electricity a day.

"We could power the City of Kewaunee [with] just the electricity that we make here," said Pagel.

Needless to say, John doesn't need all that power - so he signed a contract with Wisconsin Public Service, and sold excess power to them.

He was making about 7 cents per kilowatt for the electricity. But when that contract expired, things changed. WPS now pays him only 3 cents per kilowatt. John says that barely covers operating the digester.

"I don't believe that it is fair, but right now, as many times in life, you have to play the hand with the cards you have in your hand. These are the cards that we got," said Pagel.

WPS says the rate change is determined by a lot of factors, including demand.

"It's our responsibility as a utility company to purchase power at an approved rate that is most cost-effective and most advantageous for all the customers that we serve throughout our service territory," said Matt Cullen with WPS.

John then offered methane from his digester, and WPS says they're not interested.

"It's just our position right now, that we're not in a position to accept that gas into our natural gas delivery system and distribution system," said Cullen.

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Digesters and biogas plants in other states have had significant issues as well.

The Fremont Community digester project in Michigan opened at the end of 2012 and closed just three years later because the owner couldn't pay the electricity bill. It was a $22 million project.

Other digesters have shut down because of the stench.

Heartland Biogas in Colorado shut down after they broke state and county rules, including air quality regulations. Now dairy farmers there are struggling to find places to dump their manure since the plant was the only sustainable way for them to get rid of it.

"What we are asking the state to do is be very cognizant of what has happened in other areas of our country that have installed systems similar to the one they are proposing here," said Luft.

Lynn Utesch is a Kewaunee County farmer. He owns 150 acres of land and raises grass fed beef . He also has several concerns about the digester system the state is proposing.

"There's a lot of other options out there that are actually better for the soil, better for the air, better for the health of the people - and we're just not looking at those. We're under the assumption that this current system is the only one that we can utilize," said Utesch.

The PSC says the digesters have their advantages if a water treatment system were added.

"By putting a digester in between, and water treatment in between the barn and the field, you're reducing pathogens through the digestion process," said Fondrich. "Then with the water treatment side, you're able to remove some of the solids and liquids - get solids and liquids apart, [and] do some more pathogen screening. Then you've got potentially clean water to irrigate on the fields. You have the ability to pelletize those nutrients, and that could be a marketable product, or it could go right back to the farms for them to put on the fields as well."

The PSC is proposing a hub-and-spoke approach for the digester system to help out with all farms. However, Kewaunee County board members are already working towards clean water without the use of a digester or water treatment system.

They've held workgroups with the DNR, and have made about 50 recommendations to improve the water. Some of those have already begun.

"If those recommendations are truly implemented, we will see an improved quality of water - both surface and groundwater here - there's no question," said Luft.

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347 People Became U.S. Citizens. This Is How We Said Welcome

By DoubleTree by Hilton