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LOCAL

For years, FM played with fire in Glocester. Now, drinking wells have record levels of PFAS.



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Key Points

- A Glocester, Rhode Island farm discovered their well water is contaminated with PFAS, or "forever chemicals," at levels ten times the state limit.
- The contamination source is believed to be a nearby research campus owned by insurance giant FM, which used PFAS-containing firefighting foam for years.
- While FM is providing filtration systems, residents worry about long-term health effects and the potential for contamination to spread further.
- The incident highlights a nationwide issue, as new regulations lead to the discovery of PFAS in more public and private water supplies.

GLOCESTER – The farm where Brandy Bates lives has been a haven for her family since the days of George Washington. Generation after generation, going back to 1792, have called it home.

But her rural idyll was shattered when Bates found out that the water her family has relied on for 233 years had been contaminated by "forever chemicals" linked to cancers, immune system harm and other serious health problems.

In September, the wells at all three houses on the farm were found to have concentrations of per- and polyfluoroalkyl substances, or PFAS, at levels that were 10 times higher than the state-mandated limit for drinking water.

Now, Bates can't help but worry if she'll fall sick after years of drinking the water. She fears for the health of her two teenage children, and the younger sister she's raising. And she wonders whether the water has done something to one of her rescue horses that keeps circling aimlessly in place.

"I just worry about everything now, because I don't know what could happen," Bates said.

The source of the pollution is FM, the insurance giant formerly known as FM Global that owns a sprawling research campus nearby where, among other tests, it simulates fires and explosions to figure out the best ways to protect commercial properties from damage.

Regularly from the early 1970s through 1981, and sometimes in later years, the Fortune 500 company used firefighting foam made with PFAS to extinguish flames in its test burn building. It then disposed of the chemical-laced remnants in a now-closed landfill on the site. During these tests, it also burned consumer products made with PFAS, including carpets, paints, cleaning products and cookware, and that waste also ended up in the landfill.

The Department of Environmental Management says the landfill, which is capped but unlined, has been leaking PFAS into the same groundwater aquifer used by Bates and other houses in the area.

FM has not disputed the agency's findings.

"We are going well beyond what they've asked us to do," Louis Gritzo, the company's chief science officer, said at a recent public meeting.

Although FM's consultants initially wanted to wait to test Bates' wells, DEM staff say the company has acted quickly to address the problem. Within weeks of getting the test results, the company installed water filtration systems inside two of the houses, with a third planned, at a likely cost of more than $10,000 each. FM has

also agreed to pay for annual testing and maintenance of the filters, which could amount to several thousand dollars a year.

FM is also paying to test the wells at up to four more houses that the DEM believes are also at risk.

But there are still unanswered questions about the contamination, which was only discovered after a change in state law three years ago required the owners of landfills to start testing for PFAS in groundwater.

How long has the water aquifer been contaminated? Could the ongoing DEM investigation find other sources of PFAS on the FM property? FM is seeking permission to build a series of energy projects on its property – could that construction release more contaminants?

And now that news of the contamination has spread by word of mouth through this quiet corner of Glocester, other residents are worried that their wells may also be threatened. Some of them spoke at a pair of town Planning Board meetings in October that were supposed to be focused on FM's plans to install a wind turbine, solar panels and a battery storage facility on the campus to explore new energy technologies.

After hearing the complaints of neighbors about the water contamination and other issues, the Board withheld its support for a zone change requested by the company.

“We worry about what could be in our water, too,” Trisha Wagner, whose home borders the FM campus, told the Board before the vote.

The still-unfolding situation in Glocester illustrates how PFAS have infiltrated every corner of the country. As public health regulations have been tightened and authorities expand their search for contamination, they're finding it in more and more places.

Why is PFAS so dangerous in drinking water?

Drinking water safety in America was, until recently, focused almost exclusively on lead contamination in urban areas like Flint, Michigan, where misguided efforts in 2014 to save money resulted in the poisoning of city children.

But over the past decade, concern has shifted to more rural places where well water can be tainted by PFAS, chemicals that leach through the soil into groundwater aquifers and accumulate over time. Scientists describe them as forever chemicals because they don't break down in the environment.

Blood tests have found that an estimated 97% of Americans have detectable levels of PFAS in their bodies. Studies have associated exposure to the substances with low birth weights, developmental delays in children and kidney, testicular and prostate cancers, according to the U.S. Environmental Protection Agency.

The chemicals can be breathed in through dust and absorbed by the skin, but one of the prime pathways for exposure is through drinking water, and even infinitesimal amounts can be dangerous. Health regulators measure concentrations in parts per trillion, where one unit is equivalent to a single drop in an Olympic-size swimming pool.

The first types of fluorinated chemicals were invented in the 1930s and were heralded for their ability to repel oil, water and grease. Within two decades, DuPont had started using one of them, known as PFOA, to make Teflon, while 3M was using another, PFOS, in Scotchgard.

Soon, the compounds were also shown to be effective in smothering petroleum fires, enabling foams to spread more easily and form tighter caps over flammable liquids. Today, there are thousands of substances in the family that are used in everything from rain jackets to makeup and even dental floss.

The highest-profile cases surrounding PFAS have arisen in Minnesota and West Virginia, around factories that manufactured the chemicals and contaminated water

supplies in neighboring communities. Military bases, such as Joint Base Cape Cod, where large quantities of firefighting foam were used, have also polluted groundwater aquifers.

But contamination isn't confined to these individual sites. The total number of people at risk of drinking PFAS-tainted tap water is 172 million, according to an analysis of federal data by the Environmental Working Group, a Washington, D.C.-based nonprofit.

For years, the chemicals went unregulated by the federal government, despite repeated calls from environmental and public-health groups. The EPA only offered recommendations for safe concentrations in drinking water, setting the advisory level in 2016 at 70 ppt for PFOS and PFOA, the two compounds that have been the main subjects of the growing body of research into the dangers of the family of chemicals.

It wasn't until 2024 under President Joe Biden that the federal agency adopted a legally-enforceable national standard for drinking water and it only came after a host of states had adopted their own PFAS laws. The current federal law limits the concentrations of PFOA and PFOS to 4 ppt each and calculates a "hazard index" to weigh cumulative risks from four other substances. The administration of President Donald Trump is seeking to weaken the law by retaining only the caps on PFOA and PFOS.

Chemicals found 'everywhere' in Rhode Island water supplies

In Rhode Island, the worst incident of PFAS contamination to date occurred in 2017 in Burrillville, where it's believed a container of foam concentrate stored inside the Oakland-Mapleville Fire District's station house leaked into the water supply used by about 175 people. The residents of Oakland village had to use bottled water for nearly two years until a new water line was completed at a cost of $3 million.

The first tests for PFAS in drinking water in Rhode Island began in 2013, but only the largest systems and a sampling of smaller ones were targeted. The state started

a more comprehensive effort in 2017. The contamination in Burrillville was discovered that summer.

While it was the only place where concentrations were found to be above the federal advisory level at the time, other water systems then and in subsequent rounds of sampling tested positive for PFAS, though at lower levels that state authorities determined did not require action.

The regulatory landscape shifted in 2022 when, after years of trying, supporters pushed through legislation in the General Assembly that set a mandatory cap of 20 ppt for combined levels of PFOA, PFOS and four other PFAS chemicals.

By then, authorities had tested every major drinking water system, every school and smaller system in the state. PFAS was found in nearly half of the 87 systems tested, and 12, besides Oakland village, had levels above 20 ppt. The systems with exceedances were required to sign consent agreements with the state Department of Health to clean up their water.

The list includes two larger suppliers – the Universtiy of Rhode Island and the Quonset Development Corporation – but most are smaller and include schools in North Smithfield, Scituate and Foster, as well as West Glocester Elementary School. URI became the first of them to take care of the problem, using a $20 million state appropriation to build a system last year that filters PFAS from three wells that supply the campus of 20,000 people.

Passage of the new federal standard meant that other systems in the state that detected lower levels would also have to take action. Because of uncertainty in the regulatory landscape, that number could range from 13 to 18 additional systems, according to the health department. Little Compton's school is set to be the first among that group to install a filtration system, aided by $550,000 in federal funding.

Over nearly a decade of testing water systems across the state, authorities had sampled the drinking water of 87% of Rhode Island residents. But still to be tested

was the water for the 13% of Rhode Islanders whose homes are supplied by private wells.

The DEM began testing individual wells this year, and, while the effort is continuing, the agency has so far identified 30 homes in 11 different areas of the state with PFAS levels above the state standard. The agency has notified the owners and is working to select a contractor to install filtration systems.

"The numbers could change because we're actively sampling," said Nick Noons, a DEM environmental engineer helping to oversee the effort. "We're finding PFAS everywhere."

The first round of testing has focused on wells in areas close to common sources of contamination, including fire stations and landfills.

Rainer Lohmann, an expert on PFAS at the University of Rhode Island, said that because the substances have been so commonly used in consumer products, landfills that accepted waste from the mid-1960s onward are likely to leach some of them into the ground.

He reviewed documents on the FM landfill sent to him by The Journal and said in an email that the levels there appear "particularly" high.

“Leachate from lined landfills always contains PFAS, often elevated, but typically not as bad as this one,” said Lohmann, director of the Sources, Transport, Exposure and Effects of PFAS (STEEP) Center.

Some of the highest PFAS levels on record

Not so long ago, FM used the sales slogan "Don't play with fire. Let us do it for you."

And that's precisely what the Johnston-based company, one of the largest insurers of commercial property in the world, has done on its 1,600-acre research campus that straddles the Rhode Island/Connecticut border. Starting in 1967 when it opened the site off Reynolds Road in Glocester, it's been burning building materials,

furniture and other items to help determine how to minimize damage during an actual fire.

Fire tests were conducted in a special burn building constructed near a manmade pond on the west side of the campus that's fed by and, for several years at least, emptied back into Shady Oak Brook, which flows north along the Connecticut state line. In the early years, the company pumped water from the pond to extinguish its test fires. The used water was routed through a settling basin and solids were dumped in the landfill on the north end of the campus while the water was emptied back into the pond.

The company started using firefighting foam for “select” tests in the early 1970s and continued this practice until 1981, according to information the company filed with the DEM. After 1981, foam “was used very infrequently,” the filing said.

One longtime Glocester resident, who declined to be named because of the controversy surrounding the contamination issue, said that when he was a child, he always knew when the burn facility was being used because he would hear explosions one day and the next see clumps of soot-covered foam floating downstream on Shady Oak Brook, where he and other neighbors used to fish.

In the early 1990s, the company built a new plant to treat pond water used in the tests, but it continued to channel effluent back into the pond. A decade later, it built a new test burn building with a “closed loop” water system and stopped using water from the pond.

The company continued to dump items soaked in firefighting foam and other pieces of solid waste from the burn tests into the landfill until the 1990s, when the DEM ordered it to be closed. The site was capped, and from 1997 to 2009 a system operated to filter groundwater for toluene and other volatile organic compounds, which may have also helped with PFAS. The company also started monitoring groundwater around the landfill, but only for VOCs, not for PFAS.

In 2022, as concerns rose about the dangers of PFAS, the General Assembly added them to the list of chemicals that landfill owners were required to test for. In October 2023, the DEM notified FM that it had 180 days to conduct at least two rounds of tests for PFAS in groundwater. The following April, the company provided the results of the first sets of tests from four monitoring wells. Most levels in those and subsequent tests were in the hundreds and thousands of parts per trillion, with a low of 78 ppt and a high of 19,560 ppt.

The latter concentration is among the highest on record in Rhode Island, said Noons. The only place where higher levels have been found is Naval Station Newport, but the impact there has been minimal because Aquidneck Island does not rely on groundwater for its drinking water supply.

Contamination levels 10 times higher than the state limit

The highest levels on the FM site were found in wells just north and downhill of the landfill, about a quarter mile from Bates' house.

Last December, the DEM requested that FM test the water in her wells. Consultants to the company responded in February, saying that more investigation of groundwater flows was needed before doing so. In March, the DEM reiterated its request.

FM representatives approached Bates afterwards and asked if they could install sample wells on the farm. She said they made no mention of contamination.

"They never said anything about PFAS at all," said Bates.

When other family members asked the company when they would see the results of any tests, they were told it would take two years, according to Bates.

Curious why FM would want to test the groundwater, Bates called the DEM. Noons and Trevor Moulton, another DEM environmental scientist working on the case, visited the farm and explained the situation.

In a subsequent letter to FM, they pushed back against delaying action and ordered FM to test the drinking water.

“Our immediate concern is to establish whether there are impacts to human health and the environment resulting from the groundwater plume associated with the landfill,” Moulton wrote in July.

FM did the tests in September. Every well on Bates’s property – five in total, including two shallow dug wells – had PFAS levels exceeding the state standard by a wide margin. Two had levels above 200 ppt for the six substances covered by the law, but the totals for all PFAS tested for those wells were approximately 400 ppt and 500 ppt, respectively.

Concentrations for PFOA and PFOS – chemicals that the EPA considers unsafe at any level – exceeded the federal standard at four wells each. PFOS levels were among the highest, according to the test results, 25 times higher than the federal cap at two of the wells. Both PFOA and PFOS are found in firefighting foam.

At the same time the wells were tested, water samples were also taken from Shady Oak Brook, which flows near Bates's property and past several other houses. Levels were above 1,000 ppt, which Noons said is unusually high for moving water.

It would have taken time for the chemicals to have percolated through the ground into the aquifer and then reach Bates' wells, but as to how long the water's been contaminated, it's impossible to know.

"The only safe prediction is that it will take a long time for the wells to become clean," Lohmann said. "As is, the water will need to be filtered for a long time."

FM started delivering bottled water to Bates immediately after the test results came back, and she said the company has continued to do everything she's asked. Not only is the company installing whole-house filters in the homes on the property, which include a farmhouse used regularly for stays by extended family and a

smaller house that had been rented to the same couple for a decade, it's also putting in a system inside her barn.

But her family's whole life has been disrupted. Bates was told to stop eating the eggs her ducks and chickens lay because they drink the groundwater. So do her eight goats and eight horses, including the sick one, which is suffering from a persistent viral condition that Bates thinks may not be clearing up because PFAS interfere with vaccines and immune response.

She led a reporter and photographer around the farm on a recent morning, starting at the house her late father, a carpenter, built himself, stopping by the family cemetery that sits on a promontory looking west toward Connecticut, and crossing a hayfield to get to Shady Oak Brook, where she used to bring her horses to drink. She would sometimes water the field by hooking a pump up to the brook, and now she's worried that its soils are contaminated.

She turned south and walked through a pine forest to the boundary with FM's land. Looming above the trees was the grassy dome of the landfill.

Though Bates says her family has no plans to sell any part of their property, she's sure the contamination has harmed its value.

"What's it even worth now?" Bates said. "This isn't something that can get fixed."

Considering the long use and disposal of products made with PFAS on the research campus, The Journal asked FM if it had ever thought of preemptively testing for the chemicals. It also asked the company if it's planning to take any steps to remediate the landfill.

In response to these and other questions, FM issued a brief statement, saying in part, "We take this matter seriously, and we're working closely with the [DEM] and environmental experts to determine the source of the PFAS and evaluate whether additional testing or any other steps are needed. We are in close contact with DEM and are committed to keeping the community updated as we learn more."

Residents speak out

It didn't take long before other Glocester residents heard about what Bates was facing. Wagner, who also lives on Reynolds Road about a mile-and-a-half south, was one of them.

Her property abuts the FM campus and she'd recently gotten a notice in the mail about the company's rezoning application and its renewable energy plans. She called the DEM and was told that her well wasn't of immediate concern because it sits uphill of the landfill. Hers is not one of the four additional properties whose water is being tested.

While Noons said that those four houses are of highest concern, he said the DEM is still investigating and can't rule out another source of contamination besides the landfill. Although Noons said that the topography suggests that the chemicals most likely only spread northwest, one of the test wells on the FM campus that showed the presence of PFAS is south of, and upgradient from, the landfill. The consultants to FM said the chemicals "should be undetectable" in that well because of its location.

Because the extent of contamination is not yet known, Noons said it's uncertain if the company's proposed construction projects could exacerbate the problem.

Wagner paid $400 to have her well tested. None of the specific PFAS covered by state law were found in her water, but the tests did find other PFAS at low levels.

"When I talked to the lab, they said there's still the question of why you have any PFAS at all," Wagner said.

At the Oct. 7 Planning Board meeting on FM's energy plans, Gritzo, the FM executive, said he couldn't "speak to what happened in the past."

"Yes, there is a societal issue with PFAS," he said. "We are not using anything that would contribute to that, nor would we ever."

At the following Board meeting on Oct. 21, residents urged the company to hold off on the energy plan at least until the state had completed the PFAS investigation.

"These proposed projects have the potential to affect groundwater flow, so even areas that are not currently impacted by this could possibly be affected in the future," said Crystal Baris, a Reynolds Road resident whose property is near Bates'.

The Board voted 4-1 against recommending the plan. It was set to be taken up by the Town Council at its Nov. 6 meeting, but the item was removed from the agenda on Oct. 31 at the request of FM. The company said it made the decision in light of the feedback from community members. It would not say if it planned to come back at a later date for Council approval.

In an earlier interview, Council President William Worthy said that he wanted to postpone consideration so that FM could clear the air on the contamination issue. He said that to his knowledge, FM hasn't done anything against the law, and he believes the state investigation is being done properly and methodically.

He also said that Glocester officials have to balance the welfare of its residents and the needs of the company, which is the town's largest taxpayer.

"I'm hoping that there is a solution to this whole thing," Worthy said. "I'm hoping that nobody gets sick."

Baris brought a gallon jug filled with water from her well to the Oct. 21 Planning Board meeting. She told everyone that she and her husband were still awaiting the results from a test of their groundwater that they'd paid for.

In a scene reminiscent of "Erin Brockovich," the movie about a notorious water contamination case, she brought out cups and offered the water around to the representatives of FM. Nobody took any.

"This is the well water I've been giving to my children for the last eight years," Baris said. "This is the water I drank while pregnant with two of them. This is the water

my dad drank his entire childhood, because he grew up in that home. This is the water my grandparents drank for years and years while they lived there until they passed. And I don't know what's in it right now. That's scary."