THE ROANOKE TIMES
AUG. 30, 2022

'Forever chemical' detected in reservoir

By Laurence Hammack

Tests have detected a so-called "forever chemical," a class of hazardous substances that can remain in the environment for generations, in the water of Spring Hollow reservoir in Roanoke County.

Although the results were not unexpected — PFAS, or per- and polyfluoroalkyl chemicals, are believed to the present worldwide in air, water, soil and living organisms — it was the first and so far only confirmation for the Western Virginia Water Authority, which operates Spring Hollow.

"This stuff is pretty much ubiquitous in the environment right now," said Michael McEvoy, executive director of the authority.

Last year, as part of a statewide study by the Virginia Department of Health, tests at Spring Hollow found HFPO-DA, or hexafluoropropylene oxide dimmer acid, at levels of 51 and 57 parts per trillion.

In June, well after the water authority learned of the tests, the Environmental Protection Agency issued a new health advisory for levels of HFPO-DA, also known as GenX, above 10 parts per trillion.

The amount of GenX in Spring Hollow was the highest concentration of a forever chemical found in 45 public water sources that were part of the statewide tests, according to a 2021 Department of Health report to the General Assembly, which required the study in 2020.

"We are hopeful that WVWA is in the process of notifying its customers regarding this GenX contaminant in our drinking supply," the Blue Ridge Environmental Defense League said Monday.

"We urge WVWA and local leaders to locate the GenX source so impacts on our drinking water can be mitigated and health risks reduced," read a statement released by Mark Barker, executive assistant with the league.

The water authority said it had been planning to send an advisory letter to about 14,000 customers served by Spring Hollow, mostly in Roanoke County but also in Franklin County and Salem. Plans were expedited to post a notice to the water authority's website late Monday afternoon, after inquiries from The Roanoke Times.

Out of what it called an abundance of caution, the water authority said it has reduced the amount of water distribution from Spring Hollow until more is known.

Customers served by the reservoir, which takes water from the Roanoke River in western Roanoke County, will receive more of their supply from Carvins Cove reservoir, which did not test positive for any forever chemicals.

More than 6,000 man-made compounds are considered to be forever chemicals. Able to repel both oils and water, they are widely used in industry and in common consumer products that need to resist heat, oil, stains, grease and water — including nonstick cook wear, waterproof clothing, fast food containers, upholstery and carpets.

But some of the same properties that make them so popular also mean that forever chemicals can last almost as long as their name suggests.

For years, the water authority's testing for the chemicals at Spring Hollow and other facilities it operates found "what chemists would call non-detectable or below the lower limits of the tests," the letter stated.

Then, in 2020, GenX was found at 62 parts per trillion, which at the time was below the EPA's health advisory. The levels were intermittent, McEvoy said, and seemed to be declining.

However, the matter became more urgent after the statewide testing conducted last year by the Health Department, which was followed in June by the EPA's revision to its health advisory to amounts over 10 parts per trillion.

Forever chemicals are not regulated at the federal level, although the EPA and other agencies have taken actions in recent years as more has been learned about their health risks.

Maximum contaminant levels are set at very stringent levels, with health advisories assuming that the average adult drinks two liters of water every day throughout a 70-year life span.

Recent advancements in testing allow for the substances to be measured in the part-per-trillion range. If expressed as a unit in time, one part per trillion would be approximately one second in 32,000 years, according to the water authority's letter.

"We're talking about something very tiny," said Sarah Baumgardner, a spokeswoman for the system, which serves customers in the city of Roanoke and the counties of Roanoke, Franklin and Botetourt. Salem purchases some of its water from the authority.

No source for the GenX has been determined. There are few industries upstream of Spring Hollow.

"That's what's got us scratching our heads and asking 'why is it in the Spring Hollow reservoir?' " McEvoy said. "So far, we haven't figured it out."

GenX is an intermediate product used in the manufacture of non-stick plastic, he said. It can cause kidney and liver complications.

The water authority is working with the Health Department and the Virginia Department of Environmental Quality to identify the source, explore treatment technologies and implement a comprehensive sampling program.

Anyone with questions can contact the water authority at 540-283-2934.

THE ROANOKE TIMES
SEPT. 11, 2022

Tests find chemical in Roanoke River upstream of Spring Hollow reservoir

By Laurence Hammack

What's known as a "forever chemical," first found last year at concerning levels in the Spring Hollow reservoir west of Salem, has more recently been detected in the nearby Roanoke River.

The test results are an important development for the Western Virginia Water Authority, which is trying to figure out how a hazardous compound called GenX wound up in one of its key supplies of public water.

"I'm not glad we have it, but I am glad to see that we may be close to confirming where we are getting it," Roger Blankenship, the authority's deputy chief operating officer for water quality, wrote in an Aug. 25 email to colleagues.

The discovery of GenX in the river also raises concerns for Salem, which draws its drinking water about 10.5 miles downstream from where the chemical was detected. To date, no contamination has been found at the city's intake, a spokesman said.

Last year, as part of a statewide study by the Virginia Department of Health, tests of Spring Hollow water found GenX, the trade name for hexafluoropropylene oxide dimer acid, at levels of 51 and 57 parts per trillion.

Later sampling by the water authority found almost three times that amount — 139 parts per trillion — in the river at a location just upstream from where Roanoke River water is pumped into the Spring Hollow reservoir.

The Environmental Protection Agency warns that exposure to more than 10 parts per trillion of GenX in drinking water, over an extended time period, could cause health problems.

A health advisory was issued by the EPA in June, well after GenX was first detected in Spring Hollow. The advisory is not enforceable, and there are currently no federal regulations that govern forever chemicals.

More than 6,000 man-made compounds — officially called PFAS, or per- and polyfluoroalkyl chemicals, but better known as forever chemicals because they can last for generations — are believed to the present worldwide in air, water, soil and living organisms.

It is only in recent years that concerns about them have grown. Tests at Spring Hollow marked the first time they have been found in the authority's water bodies, which serve about 69,000 customers in the Roanoke Valley.

Details of the authority's investigation are contained in emails that the agency provided to The Roanoke Times last week in response to a Freedom of Information Act request.

"We've finally found a significant source of the GenX," read a 6:39 a.m. email dated Aug. 25, shortly after authority officials first received the lab results of samples taken from the river the previous month.

The water authority quickly notified Salem. "This would be particularly bad news for them," Scott Shirley, chief operating officer for water quality, wrote in a email later that morning.

"We are very concerned when something like this is detected in any water source, especially one that is just upstream," city spokesman Mike Stevens said last week in response to questions from the newspaper.

"Thankfully, we have not identified any sort of problem at our intake in Salem," he wrote in an email, saying the city had just received word from the Department of Health that no forever chemicals were found in water samples taken in July.

Additional monitoring is planned. At Spring Hollow, the authority has limited the amount of water distributed to its customers as a precautionary measure until more details are known. Other water bodies that tested negative for GenX, such as Carvins Cove, are being used.

GenX was first detected at Spring Hollow in 2020, at levels below EPA's health advisory guidelines at the time.

The chemical seemed to be appearing intermittently, and in declining levels, until the Heath Department tests in 2021 found it in concentrations in the 50 part per trillion range.

The GenX in Spring Hollow was the highest concentration of a forever chemical found in 45 public water sources that were part of the statewide tests, according to a 2021 Department of Health report to the General Assembly, which required the study in 2020.

Authorities believe the substance was diluted after being pumped into the 3.2-billion gallon reservoir, which would explain the higher numbers in samples taken from the Roanoke River.

Previous tests of river water had not revealed GenX. But now that the authority knows it is there, the search for a source has been narrowed.

"The results seems to indicate that intermittent discharges of this compound are being introduced to the Roanoke River; therefore, additional water sampling investigations can be focused on possible sources along the North and South Forks of the Roanoke River and their tributary creeks," Sarah Baumgardner, a spokeswoman for the authority, wrote in an email.

The authority is confident that the source of GenX will eventually be found, she said, because it has limited uses in manufacturing. The compound is an intermediate product used most frequently in the manufacture of non-stick plastic.

According to the EPA, exposure to the chemical can cause complications to the liver, kidney and immune system, and may be linked to cancer.

However, the administration's health advisory is based on lifetime exposure to a chemical that is measured in tiny amounts. If expressed as a unit in time, one part per trillion would be approximately one second in 32,000 years, states a letter the authority sent to its customers last month.

The water authority is working with the Health Department and the Virginia Department of Environmental Quality in its search for the origin of GenX.

"There just are not that many facilities using this process in the upper reaches of the Roanoke River watershed that provide water to our pumping station," Baumgardner said.

A more remote possibility — but one that has not been ruled out — is that the chemical became airborne and was carried by the wind to the Spring Hollow area.

Tests are currently underway to further explore that theory.

Able to repel both oils and water, forever chemicals are widely used in industry and in common consumer products that need to resist heat, oil, stains, grease and water — including nonstick cook wear, waterproof clothing, fast food containers, upholstery and carpets.

But some of the same properties that make them so popular also mean that the chemicals can remain in the environment for almost as long as their name suggests.

THE ROANOKE TIMES
SEPT. 16, 2022

Water authority to spend $13.5 million to remove toxin in Spring Hollow reservoir

By Laurence Hammack

The Roanoke Valley’s primary supplier of public water took steps Thursday to curtail a contaminant found in the Spring Hollow reservoir and the nearby Roanoke River.

In a unanimous vote, the board of the Western Virginia Water Authority approved a $13.5 million package of improvements at Spring Hollow, including an upgrade to a carbon filtering system designed to lower levels of a so-called “forever chemical.”

Tests of the reservoir and river water have detected hexafluoropropylene oxide dimer acid, better known by its trade name of GenX, at concentrations that exceed what is recommended for long-term consumption by the Environmental Protection Agency.

An EPA health advisory calls for no more than 10 parts per trillion. The level at Spring Hollow has been as high as 62 parts per trillion, and more recent tests in the Roanoke River just upstream of the reservoir's intake have shown more than twice that.

"There is an urgent need to implement improvements for GenX removal," a memorandum presented to the authority's board of directors stated.

Although the EPA's health advisory is not enforceable, "obviously we want to be providing water that is safe and healthy to drink," Michael McEvoy, executive director of the authority, told the board.

The improvements will be financed through tax-exempt bonds over an extending period of time and are not expected to result in higher rates for the authority's 69,000-some customers.

The first phase of the project will be to upgrade an existing granular activated carbon filer system, first installed when Spring Hollow was built in the 1990s.

Although the system has been successful in reducing the levels of GenX to some degree, a $2.5 million upgrade of its infrastructure is needed to deal with the amount of the chemical believed to be in the reservoir.

The water authority stopped pumping water from the river into Spring Hollow earlier this summer. Even so, McEvoy estimated that it will take about two years to remove the GenX that has accumulated there.

Meanwhile, efforts are underway to determine the origin of the chemical — believed to be an industry or business upstream of the 3.2-billion gallon reservoir, which is close to the Roanoke-Montgomery county line.

"I feel confident that we're going to find the source," McEvoy said.

GenX is not widely used by industries in the area. Not an end product in itself, the compound is used in the making of fluoropolymers, which in turn are ingredients in the manufacture of non-stick plastics, semiconductor chips, automotive parts and other products.

Also known as HFPO-DA, GenX is one of more than 6,000 compounds that are commonly referred to as forever chemicals because they are slow to break down and can last for generations in the environment.

Concerns about their toxicity have grown in recent years, although there are currently no federal or Virginia regulations to limit the release of the chemicals. The EPA is considering action, as is the state Health Department.

Water with more than 10 parts per trillion of GenX, when consumed in large amounts over a lifetime, can cause liver and kidney complications for some people, according to the EPA.

At Thursday's meeting, the water authority's board also approved two other improvements at Spring Hollow — construction of a 2-million gallon storage tank estimated to cost $4.8 million and an upgrade

to a water pump station that will cost another $5.2 million — that were seen as complementing the carbon filtering system.

“The trend is positive; we’re moving in the right direction,” McEvoy said. “But to make it work we’re going to have to spend some money.”

“We know it’s there,” he said, “and we need to remove as much of it as possible.”

THE ROANOKE TIMES
OCT. 9, 2022

Search continues for source of ‘forever chemical’ detected in Roanoke River

By Laurence Hammack

The source of a contaminant in the Roanoke River and Spring Hollow reservoir, which if left unchecked could remain there in perpetuity, remains a mystery.

Officials with the Western Virginia Water Authority, which operates the public water supply, and the state Department of Environmental Quality said last week that they are continuing to search for the source of GenX, a so-called “forever chemical” that has been detected in river and reservoir water.

Emails between the two agencies show that one potential trail led them from the Roanoke County reservoir upstream, all the way to the Blacksburg Industrial Park.

In an Aug. 31 email to DEQ, water authority executive director Michael McEvoy asked for a list of industries that have state permits to discharge treated waste into Cedar Run, a tributary of the North Fork of the Roanoke River.

He received a spreadsheet, which was included in a series of emails obtained through an open records request from The Roanoke Times, that shows four tenants of the industrial park, which is located in the headwaters of Cedar Run.

Armed with the list, Scott Shirley, the water authority’s chief operating officer for water quality, visited the park “to gain a better perspective of the manufacturers present,” he wrote in a Sept. 2 email.

The email states that Shirley saw several chemical tanks at Wolverine Advanced Materials, an automotive parts manufacturer, that indicated the use of Fluoroelastomer rubber coating and lining materials.

Shirley also viewed a groundwater extraction system at Federal-Mogul Powertrain, which makes engine and replacement bearings for commercial and light vehicles. Research indicated that the process at the plant includes the use of elastomer materials, he wrote.

While noting that additional investigation was needed, Shirley wrote at the time that “manufacturing of a fluoroelastomer should be a high priority site for further follow-up.”

The email stated that the water authority had identified a point on Cedar Run downstream from the industrial park for testing. Since then, a Sept. 12 test of the water showed no detectable traces of GenX. But the compound’s presence is believed to be intermittent, and additional testing is planned.

The water authority’s interest in Federal-Mogul and Wolverine was intended to narrow potential areas for investigation, according to Sarah Baumgardner, a spokesperson for the water authority.

“Subsequent research has indicated that these operations are not likely to generate HFPO-DA [hexafluoropropylene oxide dimer acid, which is commonly referred to by the trade name of GenX], but ongoing sampling will assist in confirming these findings,” Baumgardner wrote in an email Friday.

Later in the day, she wrote in a follow-up email that the companies in the industrial park “have been eliminated from the Water Authority's businesses of interest in our investigation.”

GenX is used in the manufacture of fluoropolymers, a non-stick coating that is resistant to weather, temperatures and other chemicals. It is common in the automotive industry and in the manufacture of semiconductor chips.

A spokesman for Tennaco, the corporate owner of Federal-Mogul, said the company has not been contacted by DEQ or any other state or local agency concerning GenX. Efforts to reach Wolverine were unsuccessful.

DEQ currently has no information that implicates any of the tenants of the industrial park that have state-issued permits to discharge into Cedar Run, spokesman Aaron Proctor said.

The environmental agency has not contacted or visited any of the companies, “though we are still actively working to find the source of the pollutant within the watershed” of Spring Hollow, he wrote in an email last week.

Mark Barker, an executive assistant with the Blue Ridge Environmental Defense League who has closely followed the GenX issue, questioned why DEQ is not using its authority to inspect permitted facilities.

”If they are not going on site at suspected facilities — and there can't be that many that can feed into the Roanoke River before Spring Hollow — then why aren't they?” Barker asked.

“This should be treated as a health emergency. The source needs to be found ASAP and stopped ASAP.”

Forever chemicals 'are everywhere'

At first glance, the numbers may not seem alarming.

Forever chemicals like GenX — which have an ab ility to repel both oil and water, making them attractive for a wide variety of uses in industry and the manufacture of consumer products — are measured in tiny amounts, usually parts per trillion.

In June, the Environmental Protection Agency issued a health advisory for GenX in drinking water, warning that long-term consumption of water with more than 10 parts per trillion could cause health problems for some people that include complications in the liver, kidney and immune system.

Tests of the water at Spring Hollow have shown levels as high as 62 parts per trillion in January 2020, although concentrations have been going down since then. At times, no GenX has been detected at all.

A more recent test of the Roanoke River, just upstream of where water is pumped into Spring Hollow, found 139 parts per trillion.

One part per trillion, if expressed as a unit in time, would be approximately one second in 32,000 years, according to the water authority. The EPA's health advisory was based on a 70-year lifetime of drinking two liters of water per day.

While that may appear to pose only a minimal risk, it's important to remember that forever chemicals are likely to be in far more products than the water we drink, according to Kang Xia, an environmental chemistry professor at Virginia Tech's School of Plant and Environmental Sciences.

There are more than 6,000 different types of forever chemicals, which is the more commonly used name for per- and polyfluoroalkyl substances, or PFAS. They are named "forever" because their chemical composition does not easily break down, meaning they can remain in the soil, water and air for generations.

The man-made compounds are used to manufacture consumer products that need to resist heat, oils, stains, grease and water. That includes nonstick cook wear, waterproof clothing, fast food containers, upholstery, carpets, cosmetics and dental floss.

"We're using so much PFAS in every aspect of our lives," Xia said.

As an example, she pointed to research that shows that someone who applies lipstick containing a PFAS three times a day could potentially be facing a higher exposure than what is found in drinking water.

Many forever chemicals have been in use for decades, going as far back as the 1940s. But concerns about them have grown in recent years, as analytical instruments for testing and laboratories to process results have advanced to the point of being able to measure more minuscule amounts.

"If you don't see it, you don't know that it's there," Xia said. "And if you don't know it's there, you don't know if there is a problem."

Even the metal parts of the analytical instruments used to test for PFAS may be coated with substances that contain PFAS compounds, which could complicate the tests due to cross-contamination.

"Testing for PFAS is very, very tricky, because PFAS are everywhere," Xia said. "It's very easy to have false positive tests because of that kind of cross-contamination from other sources."

Searching for the source

Although the water authority has known since 2020 that GenX was in Spring Hollow, the EPA's health advisory issued in June marked the first time that levels were above what is recommended for human consumption.

Since then, the authority has increased sampling of both the reservoir and the river, and stepped up its efforts to find the source.

"As the compound comes from a very specific manufacturing process, the authority has been collecting samples and doing research to refine our search and narrow the universe of potential sources," Baumgardner wrote in an email.

Early on, the Mountain Valley Pipeline was considered and later ruled out. The unfinished pipeline, which will cross the Roanoke River upstream of Spring Hollow, is covered with an epoxy coating meant to safeguard the metal pipe from corrosion. Pipeline opponents have expressed concerns that the coating could degenerate and leach into groundwater, raising health concerns.

But no connection was found between the coating and GenX, Baumgardner said.

Another possible source that was checked out and crossed off the list was the Radford Army Ammunition Plant, and in particular an open burning ground where hazardous waste from the making of propellants is incinerated.

One theory was that toxins from that process could have been carried by wind to Spring Hollow before settling in the water. That was considered a remote possibility, and became even more so after air testing found low levels of GenX.

"We will continue to monitor atmospheric deposition; however, this pathway does not appear to be a significant contributing source," an Oct. 4 update posted to the authority's website stated.

A spokesperson for the arsenal said GenX is not in the waste that goes to the open burning ground.

Although some forever chemicals can be spread by other means — such as runoff from treated sludge used on farmlands as fertilizer, or from groundwater contaminated by a fire-fighting foam used in airplane crashes — an industry is still considered the most likely source for a chemical like GenX.

In July, the water authority began taking more samples, testing the river and reservoir weekly. Tests of treated water show a steady decline, from 34.4 parts per trillion in early July to more

recent detections of 3.8 and 1 part per trillion, well below the EPA's heath advisory for more than 10 parts per trillion.

The authority has stopped drawing water from the Roanoke River to fill Spring Hollow, which previously served about a third of its 69,000-some customers in the Roanoke Valley.

More water from Carvins Cove, which tested negative for forever chemicals, is being used. Water treated by a carbon filtering system at Spring Hollow, which has been largely successful in reducing GenX levels, currently makes up about 15% of the water distribution, Baumgardner said.

But the treatment is considered rudimentary, and the authority is planning a $2.5 million upgrade to the system.

Assuming a source for the contamination is found, an enforcement action from DEQ may not be possible. Currently, forever chemicals are not regulated in Virginia or at the federal level.

But as the authority stated on its website, “knowing the source of this compound and removing its discharge into the river will protect our customers and everyone in the Roanoke River watershed.”

Extent of contamination unknown

In 2020, the General Assembly passed a law requiring the state Health Department to convene a work group to study forever chemicals and the possible development of guidelines to limit their use.

As part of a statewide review, testing of water was carried out at 43 public waterworks last year. Of a total of 63 samples taken, forever chemicals were found at 15 locations.

The highest concentration of about 10 compounds that were the focus of the testing was 57 parts per trillion of GenX at Spring Hollow.

No forever chemicals were found in the water of the New River Valley Regional Water Authority, which draws an average of 7.4 million gallons a day from the New River to serve customers in Montgomery County, the towns of Blacksburg and Christiansburg, and Virginia Tech.

Water systems in the cities of Radford and Salem and Pulaski County also tested negative.

Another round of testing is being done this year. The work group will then consider new rules that would draw a line in terms of how much forever chemicals are allowed.

A report from the workgroup last year noted that nearly 1,000 public water systems, many of them serving less than 3,000 customers, remain untested. Also unknown is the level of pollution in private wells, which the Health Department does not test.

As the report stated, “the extent and level of PFAS contamination in drinking water … is still largely unknown.”

THE ROANOKE TIMES
NOV. 11, 2022

Source of ‘forever chemical’ in Roanoke River traced to Elliston plant

By Laurence Hammack

A so-called “forever chemical” detected in the Roanoke River has been traced to a plant in Elliston that services industrial water treatment equipment.

ProChem Inc. has been releasing GenX into wastewater that is treated and discharged into the South Fork of the Roanoke River, according to the Western Virginia Water Authority. From Elliston, the contaminated water has flowed into the Roanoke River, which a short distance downstream supplies water for the Spring Hollow reservoir, a key source of drinking water for the region.

The company said Thursday that it was unaware until recently of the GenX releases, which it says came from the equipment of one of its customers.

Long-term exposure to GenX can cause health problems that include complications to the liver, kidneys and immune system, the U.S. Environmental Protection Agency warns.

Recent tests of wastewater that ProChem released into a sewer system that leads to the Elliston water treatment plant detected levels of GenX at 1.3 million parts per trillion — far more than the 10 parts per trillion threshold recommended by the EPA in a June health advisory.

After the water had been treated and released into the South Fork of the Roanoke River, the level had decreased to 23,900 parts per trillion.

Even at the lower number, "we have never seen a level that high in the Roanoke River," said Sarah Baumgardner, a spokeswoman for the water authority.

Forever chemicals are currently not regulated by the EPA, and studies on their risk to humans are evolving.

ProChem has been instructed not to service equipment believed to be linked to GenX, the water authority said on its website. Follow-up testing is planned by the authority and the Virginia Department of Environmental Quality.

According to the water authority, ProChem provides a chemical washing process on equipment from a Chemours facility in West Virginia. Chemours is a company that works with industries that include automotive manufacturing, paints, laminates, advanced electronics, construction and telecommunications.

Chemours has been linked to the spread of GenX near Wilmington, North Carolina, among other places.

ProChem vice president Brian Kidd said late Thursday that any discharge was accidental.

“We are dismayed that ProChem may have unknowingly contributed to the presence of GenX found in the local water supply," Kidd said in a written statement.

"We believe this is the result of contaminated units (of which we were unaware) provided by a customer with whom we have discontinued service. We are actively working with the DEQ and the local water authorities to aggressively treat the issue."

Because GenX is not regulated by the federal or state government, there are currently no requirements for testing. “As a result, routine regulatory testing conducted by ProChem would not indicate the existence of GenX compounds in treated wastewater,” Kidd said.

As soon as it was notified by DEQ of tests that showed high concentrations, ProChem discontinued service to the customer suspected of being the source, which it did not identify. Since then, the company believes that no other forever chemicals have entered its system.

“We also believe current tests will show substantially reduced levels of GenX,” the company said. “We will continue to aggressively treat the issue until levels are below the EPA’s current lifetime health advisory of 10 parts per trillion. This process may take several weeks.”

ProChem is located about 5 miles upstream of where the water authority draws water from the Roanoke River to fill Spring Hollow. Since tests first detected GenX in the river in late August, the authority has stopped pumping water from the river into the reservoir.

Most customers of the authority, which serves about 69,000 homes and businesses in the Roanoke Valley, have been receiving water from other sources that tested negative for forever chemicals, such as Carvins Cove.

A water sample was taken Oct. 5 in the area of ProChem. Laboratory testing generally takes about a month before results are known.

Since it learned that it was the source of GenX, ProChem has been conducting frequent monitoring of the water it pumps into the Montgomery County Public Service Authority’s treatment plant in Elliston. It has also starting using a carbon filtering system similar to one currently in use at Spring Hollow.

Forever chemicals do not break down naturally over time. They can repel both oil and water and are widely used in industry and the manufacture of consumer products, including nonstick cookwear, waterproof clothing, fast food containers, upholstery and carpets.

GenX is the trade name for hexafluoropropylene oxide dimer acid. Chemours uses the substance in the manufacture of fluoropolymers, which can resist heat, water, salt and chemicals and are used in demanding industrial environments.

“It’s great that the source has been found and even better that it appears to have been stopped,” said Mark Barker with the Blue Ridge Environmental Defense League. “These are ‘forever poisons’ with health impacts.”

“We have a right to know what’s in our drinking water,” Barker wrote in an email. “The state and the companies must do better. Companies must know who they are dealing with and what chemicals are involved. They can’t be allowed to get away with this.”

THE ROANOKE TIMES
NOV. 13, 2022

How the source of a ‘forever chemical’ in the Roanoke River was found

By Laurence Hammack

The worst contamination of the Roanoke Valley's public water supply in recent history comes from a company that, ironically, specializes in water quality.

ProChem Inc., which has a sign in front of its Elliston plant that bears the slogan "When Water Matters," was identified last week as the likely source of GenX, a hazardous chemical that has been detected downstream in the Roanoke River and the Spring Hollow reservoir.

The company said Thursday that it was "dismayed" to learn that it was the source of the pollution.

An investigation by the Virginia Department of Environmental Quality and the Western Virginia Water Authority — which operates Spring Hollow reservoir — traced the GenX to industrial equipment that was undergoing a "chemical washing process."

ProChem said it was cleaning equipment for a customer it declined to name, citing confidentiality requirements that are part of its contract.

However, the water authority has identified the customer as Chemours, a global producer of chemicals that can repel oil, heat and water. Known as "forever chemicals," the compounds are used by many industries and in the manufacture of a wide variety of consumer products, ranging from nonstick cookwear to waterproof clothing to carpets.

Since 2014, ProChem has been servicing "vessels" — which are the same configuration as home water softeners and serve essentially the same purpose — that are part of the manufacturing process at a Chemours plant near Parkersburg, West Virginia. After ProChem removed calcium and magnesium compounds from the units, they were returned to Chemours.

"If ProChem had been made aware of the presence of GenX on those vessels, it would not have accepted the order," the company said in a statement released Friday. "As soon as this knowledge was obtained, the service of these vessels ceased."

The ProChem plant is about five miles upstream from where the water authority draws from the Roanoke River to fill Spring Hollow.

GenX, the trade name for hexafluoropropylene oxide dimer acid, is one of the forever chemicals that have received increased scrutiny in recent years from the federal and state governments as more is learned about their health risks.

In June, the U.S. Environmental Protection Agency issued a health advisory that warned against the lifetime consumption of water containing more than 10 parts per trillion of GenX.

Samples of ProChem's wastewater that were discharged into a sewer system that leads to a Montgomery County water treatment plant showed levels of 1.3 million parts per trillion.

After the wastewater was treated, and before it was released into the South Fork of the Roanoke River, the level had decreased to 23,900 parts per trillion, according to the water authority, which recently received tests results from its laboratory.

Although monitoring for GenX is still in its infancy, levels in the Roanoke River are the highest reported so far in Virginia.

The authority stopped taking water from the river shortly after GenX was detected there in late August. Since then, a carbon filtering system at Spring Hollow has reduced levels to below the 10 parts per trillion threshold issued by the EPA.

EPA's health advisory, which is not enforceable, is based on a 70-year-old's lifetime consumption of two liters of water a day. Possible dangers include complications to the liver, kidneys and immune system.

Until the most recent tests were conducted close to ProChem's plant, the highest level of GenX detected in the river was 139 parts per trillion, in the proximity of the reservoir. The concentrations, which have been intermediate, have been declining in recent months.

Although tests show that customers of the water authority are no longer receiving tainted water, more monitoring is planned. Among the unknowns is how much past exposure people may have had, not just to GenX but to different forever chemicals in products other than drinking water.

Water drawn from wells by homes and businesses that are not served by the authority may also need to be tested.

"I think it is something that needs to be followed up on," said Michael McEvoy, executive director of the authority.

Finding the source

The discovery of GenX marks the worst water contamination in the history of the authority, which was formed in 2004 and currently serves about 69,000 customers in the Roanoke Valley.

"I can't think of anything else close to matching this," McEvoy said.

The chemical was first detected in Spring Hollow's water in 2020, at about 60 parts per trillion. Once the EPA recommended no more than 10 parts per trillion in June — and after GenX was detected late this summer in the Roanoke River at higher concentrations — the authority stepped up its efforts to find the problem's origin.

After that, it was just a matter of time.

"There just aren't that many factories in the United States that are using this compound," McEvoy said. "And there aren't that many above us" in the watershed of Spring Hollow.

Working with DEQ, the authority first focused on the North Fork of the Roanoke River. A number of potential sources in Montgomery County, including some in the Blacksburg Industrial Park, were considered and later eliminated.

Attention then shifted to the river's South Fork. After examining state permits for businesses authorized to release wastewater into the treatment plant operated by the Montgomery County Public Service Authority, DEQ identified ProChem as a possible source.

Samples were taken in early October at two locations — from a sewer manhole adjacent to the plant, and of water that had been processed at the county's treatment plant in Elliston. When

results came back from a laboratory about a month later, extraordinarily high levels indicated a breakthrough in the investigation.

After being contacted by DEQ, ProChem said it had been cleaning equipment from Chemours, a known source of GenX.

"It all kind of came together in the last 10 days," McEvoy said Friday.

The source responds

At ProChem, an Elliston-based company that provides expertise and products meant to solve industrial water problems, the news was a shock.

"We are dismayed that ProChem may have unknowingly contributed to the presence of GenX found in the local water supply," the company's vice president, Brian Kidd, said in a written statement.

Starting in 2014, ProChem began providing its chemical washing process to two vessels a month that were used in Chemours' manufacturing process. That accounted for less than 0.5% of ProChem's total business, the company said.

In what is called a resin regeneration service, a sand-like material was used to absorb and remove calcium and magnesium, which can contribute to water hardness.

After the process was completed, ProChem again cleaned the wastewater generated before discharging it into the sanitary sewer for treatment by the county. That was done in accordance with a DEQ permit, "which does not list GenX in the list of parameter limitations," the company said.

Both Virginia and the federal government currently do not have regulations that apply to forever chemicals, which have only been gaining attention in recent years as more becomes known about the risks they pose.

Laws recently passed by the General Assembly, included one sponsored by Del. Sam Rasoul, D-Roanoke, have established a system of testing and a process that will be used to draft regulations as soon as next year. "We need to keep a close eye on it," Rasoul said in a text.

U.S. Rep. Morgan Griffith, R-Salem, said he was monitoring work at the federal level. "I appreciate that DEQ is acting to remedy the situation and look forward to answers on how the problem developed," a statement from Griffith read.

At ProChem, efforts are underway to cooperate with DEQ and local water officials, the company said.

“In the absence of state and federal regulations, we are taking multiple precautions to help identify and mitigate risks moving forward including additional testing, implementing a carbon absorption technology system, and working with customers to screen for PFAS compounds,” Kidd said.

Shorthand for forever chemicals, PFAS refers to per- and polyfluoroalkyl chemicals, which are believed to the present worldwide in air, water, soil and living organisms. There are more than 6,000 different kinds of the substances, which do not break down naturally over time.

ProChem said it will it will continue to address the GenX issue until levels are below the EPA’s guidelines, a process that “may take several weeks.”

The company has been at its Elliston location since 2005, when it had about 60 employees. According to its website, its customers include Caterpillar Inc., General Electric, Goodyear, R.J. Reynolds, the U.S. Postal Service and Volvo.

The EPA takes action

If the GenX contamination of the Roanoke River is definitively traced back to Chemours, it will not be the company’s first problem with a forever chemical.

The EPA has taken enforcement action at both the Chemours plant in West Virginia and one in Fayetteville, North Carolina.

In a 2019 letter to the president and CEO of Chemours, an EPA official said the company had violated the Toxic Substances Control Act, in part by failing to notify the government of its plans to manufacture a new chemical substance.

The EPA had previously requested information about “when Chemours first learned about the GenX-related contamination in and around” the West Virginia and North Carolina plants, “including GenX contamination in drinking water,” Diana Saenz, director of the EPA’s waste and chemical enforcement division, wrote in the letter posted to the agency’s website.

Chemours did not respond to an email Friday from The Roanoke Times inquiring about the equipment it sent to ProChem and whether it had been contacted recently by DEQ or the water authority, among other things.

But in a March 18 letter to EPA headquarters, an attorney for Chemours took issue with the agency’s toxicity assessment of GenX.

The assessment “contains substantial scientific flaws, fails to incorporate available peer-reviewed scientific literature highly relevant to the analysis, and significantly overstates the potential human risks associated” with GenX, Brian Israel of the Washington D.C. firm Arnold & Porter wrote.

Fluoropolymers, a type of forever chemical, manufactured by Chemours are essential for “countless industries including the medical, automotive, electronics, aerospace, energy and semiconductor industries,” Israel wrote.

The EPA is expected to propose a plan for regulating some forever chemicals in drinking water later this year, with a final set of rules to become effective by the end of 2023.

On its website, EPA said: “This proposed rulemaking would increase transparency around releases of these harmful chemicals and help to hold polluters accountable for cleaning up their contamination.”