



THE MAIN PROBLEM

FROM LEAD PIPES TO STORMWATER OVERFLOWS, PROVIDING SAFE, CLEAN WATER TO THE PITTSBURGH REGION HAS BEEN A CHALLENGE FOR YEARS, AND CLIMATE CHANGE HAS MADE CONDITIONS MORE DIFFICULT. HOWEVER, GOVERNMENT OFFICIALS AND ADVOCACY GROUPS ARE PUSHING FOR CHANGES THEY HOPE WILL MAKE A DIFFERENCE.

BY ADAM SMELTZ



“

UNTIL YOU HAVE A KID, YOU DON'T FOCUS ON CERTAIN THINGS...YOU'RE A NEW PARENT; YOU'RE TERRIFIED. ALL YOU KNOW IS, THERE'S LEAD IN YOUR WATER AND IT'S GOING TO AFFECT YOUR CHILD'S DEVELOPMENT."

Claire Pro, Pittsburgh resident

Joshua Franzos

Clair Pro helps her 3-year-old daughter, Mary, drink a glass of water as they sit on the front stoop of their home on Pittsburgh's South Side.

There was a period when Claire Pro didn't think twice about whether lead might seep into her drinking water.

Even as a longtime Pittsburgher — first as a college student and more recently as an entrepreneur — she hadn't fretted over the contaminant that can leach from the city's long-buried service lines.

Then her daughter arrived.

In the three years since, just confirming whether a lead pipe feeds her family's more than a century-old house has turned into an unanswered struggle, Ms. Pro said.

"I'm sure the warnings had been fed across my face. But until you have a kid, you don't focus on certain things," she said, lamenting her failures since 2018 to have her water line replaced. "You're a new parent; you're terrified. All you know is, there's lead in your water and it's going to affect your child's development."

Lead exposure is tied to a range of neurological effects and intellectual disabilities, especially in children, as well as high blood pressure, heart and kidney ailments, and fertility concerns.

While her home water-test results didn't reach a federal threshold for lead mitigation, that's little comfort when researchers consider no level of the toxic metal to be safe, Ms. Pro said. By the fall, she still wasn't sure when contract workers for the Pittsburgh Water and Sewer Authority might dig up her line as they have for neighbors close by.

If lead turns up in Ms. Pro's water line and PWSA hasn't already scheduled her street for a water-main replacement, an authority reimbursement program would compensate her — at least in part — for swapping out the connection herself, according to the authority.

"I am sympathetic to PWSA to a point," Ms. Pro said. "They have to deal with these heavier rains and stormwater flooding, too. At the same time, I'm imagining my 3-year-old could be in the third grade by the time I get a new service line."

Acknowledging the problem

Pittsburgh's lead crisis began drawing national headlines in 2016, when the public water authority faced regulatory scrutiny over unreported changes to its additive for preventing pipe corrosion. While officials eyed those changes as a potential contributor to high lead readings, the levels had been climbing for more than a decade before they eclipsed a key federal threshold that year, then-interim PWSA Executive Director David Donahoe said in the Pittsburgh Post-Gazette story "PWSA ordered to replace lead service lines after elevated levels found in drinking water." Mr. Donahoe cited old infrastructure that can let the metal seep into tap water.

Now, five years since lead counts in the PWSA service area reached the trigger point for corrective action, the authority's push to remove service lines containing lead has become instructive for regional groups targeting long-term

improvements in water quality and safety, according to advocates and policymakers.

In part, they said, that's because PWSA line replacements mirror a common challenge in the area: overhauling the water supply, runoff and sewage infrastructure from another era, built before planners knew or thought as much about health and environmental factors — especially climate change.

But lessons from the lead crisis go beyond mechanics. While imperfect, particularly at the start, the line-replacement campaign has benefited from bringing customers into the planning process, encouraging collaboration and prioritizing people most at risk of harm, observers have noted.

“When we have a public authority that is responsible, that is democratically responsible to the community and to the ratepayers themselves, we have an opportunity to create a system that works for people and provides water as a human right,” said Jennifer Rafanan Kennedy, acting executive director of Pittsburgh United.

The coalition of community advocacy groups organized the Our Water Campaign, which has encouraged better protections for low-income PWSA customers. The authority's practices now match a number of Our Water requests, including a moratorium on wintertime service shut-offs and the provision of complete lead-line replacements when customers alone can't afford to remove privately owned sections of the lead connections. City and state legislation in 2017 enabled the latter accommodation.

Getting the lead out

In fact, community input pushed the authority “to make sure we were making the right policies” early in the replacement work, said Will Pickering, the authority's CEO.

Lead monitoring gave rise to the state Department of Environmental Protection's pipe-replacement mandate, which was limited to service lines — the thin pipes that carry fresh water from a main beneath the street into houses and other buildings. When lead turns up in tap water, a lead service line is often the culprit.

Regulations required PWSA to replace 7 percent of its lead service lines every year until compliance checks showed lead levels below the federal action limit for two testing cycles. The authority reached that bar in mid-2020, when it notched its lowest lead readings in more than 20 years. Authority leaders attributed much of the progress to orthophosphate, an additive now introduced at the treatment plant to prevent contamination.

PWSA remains committed to swapping out all known service lines containing lead by 2026, Mr. Pickering said, and new federal rules are likely to toughen overall standards for addressing lead pipes.

“We recognize that the lead is still a risk. I still see it as a high priority,” he said. “Keeping our foot on the gas makes sense so we can remove this risk, fulfill regulatory requirements and move on to other needs.”

Some \$17 million from the federal American Rescue Plan Act is expected to accelerate PWSA's line replacements next year. By late August, the authority had replaced some 8,700 publicly owned lines and 5,700 privately owned lines since mid-2016. It estimated that roughly 8,000 more publicly owned lead lines and nearly 11,000 private lead lines remain among the authority's roughly 80,000 tap-water customers.

Another 30,000 or so PWSA customers receive only sewage conveyance from the authority. Most of them rely on an investor-owned utility — Pennsylvania American Water — for tap water. Pennsylvania American spokesman Gary Lobaugh said the company “soft-launched” in fall 2021 a lead-line replacement program in several Pittsburgh neighborhoods and expects an “entire rollout” in 2022.

“Due to the in-home and face-to-face coordination this program requires between our employees, contractors and customers, we have delayed this program's full public communications rollout for the health and safety of all involved because of the COVID-19 pandemic,” Mr. Lobaugh said in a statement.

Lead in tap water can emerge also from household plumbing, such as fixtures and fittings, said Michelle Naccarati-Chapki, executive director at Women for a Healthy Environment. Because water test results can vary day to day, the health advocacy nonprofit urges people to explore whether lead lingers anywhere in their plumbing.

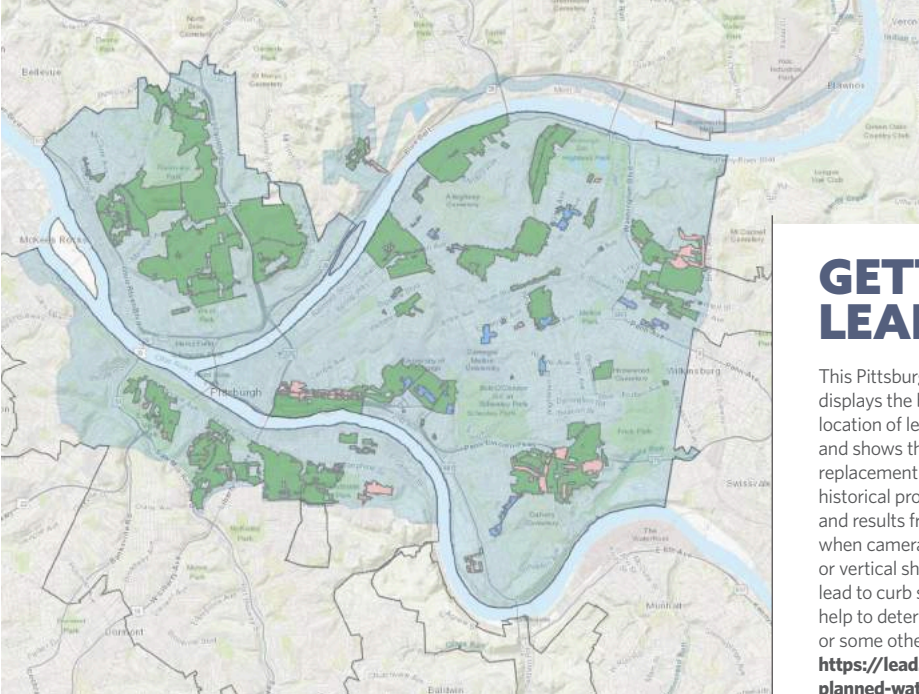
“We try to emphasize filtering as much as possible,” Ms. Naccarati-Chapki said. Her organization has helped provide thousands of drinking-water filters to households affected by lead.

In a report this year, the group found that 80 percent of 28 water systems in Allegheny County identified lead in their drinking water. Another eight water providers did not respond in full to the nonprofit's request for information.

“People in this region say things have gotten much better than they used to be. But we're still one of the most heavily impaired regions in the country when it comes to pollution, especially air and water,” said Philip Johnson, the Endowments' senior program director for Environment & Health.

The Endowments supports a number of organizations, including Pittsburgh United and Women for a Healthy Environment, that build greater context and information into dominant local narratives around environmental issues. These groups “give people the facts and data to address the challenges we face,” Dr. Johnson said.

Such public education and awareness played vital roles in equipping the public to hold policymakers accountable



to goals during the PWSA lead crisis, said Matthew Barron, senior program officer for Sustainability at the Endowments. But effectively addressing other shortfalls of water infrastructure, especially stormwater management, demands an extra component: collaboration across municipalities and utilities' service territories, he explained.

"There just really aren't strong convening bodies that are multi-county or regional around issues like this here," Mr. Barron said. "Because water doesn't respect municipal or county boundaries, it's very hard to come up with holistic solutions."

Fostering cooperation

One effort to help the region overcome the disjointed nature of local government is the nascent Southwestern Pennsylvania Water Network. The Water Center at the University of Pennsylvania is leading the project, which seeks to build a network of water experts, leaders and communities across 10 adjacent counties.

Politics of the past "should no longer be allowed to impede our region's social, economic or environmental futures," said Howard Neukrug, the center's executive director, adding that collaboration is needed "to tell the story of our water-rich heritage and how we plan to continue to be stewards of our three great river sheds."

"When considering the region's water quality and resource priorities during this period of increasingly life- and property-threatening floods and storms, we must jointly prioritize our region's many water challenges," he said.

Whatever form the water network takes, members will confront the regional fallout of climate change. Especially in flood-prone spots, the inundation of stormwater is likely to become more intense and perhaps more frequent, said Carnegie Mellon University Professor David A. Dzombak, the school's department head in civil and environmental engineering.

GETTING THE LEAD OUT

This Pittsburgh Water and Sewer Authority map displays the best available information on the location of lead service lines in the PWSA system and shows the status of the authority's line replacement process. The information is based on historical property data; construction records; and results from curb box inspections, which is when cameras are sent down into the curb boxes, or vertical shafts in front yards or sidewalks that lead to curb stops. The cameras take pictures that help to determine whether pipes are made of lead or some other material.

<https://lead.pgh2o.com/your-water-service-line/planned-water-service-line-replacement-map/>

36

There are 36 water systems in Allegheny County, each of which can have a different operational procedure and can be privately or publicly owned.

Source: Women for a Healthy Environment: Something's in the Water — A System Analysis on Quality and Transparency in Allegheny County Community Water Systems, April 2021 — Revised June 2021.

80%

Lead was detected in 80 percent of 28 water systems in Allegheny County, Pennsylvania, which encompasses Pittsburgh, in 2019. Eight other water providers did not fully respond to requests for information.

Source: Women for a Healthy Environment: Something's in the Water — A System Analysis on Quality and Transparency in Allegheny County Community Water Systems, April 2021 — Revised June 2021.

4x

Among children tested for elevated blood lead levels before the age of 6, nearly four times as many Black and Hispanic children tested positive for lead poisoning compared to white children (4.5 percent vs. 1.2 percent).

Source: Pennsylvania Department of Health's 2018 Childhood Lead Surveillance Annual Report

“We’re getting more water and some more intense storms,” Dr. Dzombak explained. “We’ve long had, and will have in the future, flooding challenges because of the amount of rain and our topography that concentrates water rapidly — because of the hills and the valleys.”

The Pittsburgh area’s nearly 40 inches of annual precipitation should keep ticking upward, underscoring needs for runoff management to handle the flow, he said. Annual precipitation in the city averaged some 45.36 inches from 2016 to 2020, up from an average of 35.5 inches from 1916 to 1920, according to data he compiled with Yuchuan Lai, a Carnegie Mellon postdoctoral researcher.

Some of that water can engulf southern neighborhoods, overwhelming thoroughfares as streams channel urban runoff. The group Watersheds of South Pittsburgh is pursuing a plan to ease floods, improve waterway quality and reintroduce more green space.

“If you improve land use, you’re going to improve water quality. It’s as simple as that,” said Executive Director Lisa Werder Brown. “What happens on the land could improve not only the water quality but also the water quantity running off. Reduced flooding would save an enormous amount of money.”

Findings from Three Rivers Waterkeeper, which tracks the region’s river-water quality across 125 miles of frontage, show improvement but continued pollution surges when bad weather hits or significant snowmelt runs off, Executive Director Heather Hulton VanTassel said.

That’s due to combined sewers, which allow household sewage to mix with precipitation runoff and dump the blend into local waterways. It tends to happen amid heavy rain.

“For that moment, the water isn’t very safe,” said Dr. Hulton VanTassel, whose organization helps identify and hold businesses accountable for runoff violations. “Some parts of our watersheds have slightly more updated sewer systems that can handle the strong events or might not overflow. Other areas aren’t so updated.

“As we increase development uphill and runoff flows downstream, the river-water quality will depend on the infrastructure in place to handle that water.”

Reinforcing nature’s infrastructure — trees — is likewise critical in promoting water quality, said Matt Erb, the director of urban forestry at Tree Pittsburgh. As of 2015, trees in Allegheny County removed more than 4.5 billion gallons of stormwater a year, he said, and about 54 percent of the county was covered by trees in 2015.

But that tree canopy has been shrinking, having lost some 11,000 acres countywide from 2010 to 2015, according to Tree Pittsburgh. As part of its work, the nonprofit is quantifying the stormwater benefits of trees, educating the public about their impact, and collaborating with municipal governments on tree preservation and growth.



Kristina Serafini, Tribune-Review

FLOOD DAMAGE

Remnants of Hurricane Ida that first hit the U.S. in Louisiana traveled northeast, resulting in heavy rains that caused extensive damage in other states, exemplified by this car that sat in flood water in Pittsburgh’s Brookline neighborhood on Sept. 1.



GRAY AND GREEN INFRASTRUCTURE

The Allegheny County Sanitary Authority, or Alcosan, and its 59-acre wastewater treatment plant, left, are located on Pittsburgh’s North Side and serve 83 municipalities, which include nearly 900,000 county residents. Alcosan is collaborating with the Pittsburgh Water and Sewer Authority and city officials on a comprehensive stormwater management plan that includes green infrastructure installations such as the one pictured below at the intersection of Herron and Centre avenues in the city’s Hill District neighborhood. This project includes a linear bioswale — a shallow, vegetated depression that captures and treats stormwater runoff — with two underground storage tanks, underdrain piping, concrete paver stones, a new manhole and a catch basin.



RAIN CHECK



WE'RE GETTING MORE WATER AND SOME MORE INTENSE STORMS."

David A. Dzombak, Carnegie Mellon University professor and head of the department of civil and environmental engineering

"We're clearing a lot of land for really the same amount of residents," he said. "Looking at land-use policies is really important to try to preserve some of the tree canopy that we have."

Blending green with gray

Preventing combined-sewer overflows will depend partly on "green infrastructure," or mechanisms such as rain gardens and urban tree canopies, that hold rainwater in place by letting it absorb into the ground or flow more gradually toward "gray infrastructure." The concrete and metal stormwater channels then whisk runoff farther away, toward treatment plants or into waterways.

In addition to its regional work, the University of Pennsylvania's Water Center is collaborating with PWSA, city officials and the Allegheny County Sanitary Authority, or Alcosan, on a comprehensive stormwater management plan. Alcosan provides wastewater treatment for 83 communities.

Alcosan's federally mandated Clean Water Plan is on track to reduce combined-sewer overflows by some 7 billion gallons a year, largely by introducing massive underground tunnels near the region's Allegheny, Monongahela and Ohio rivers to store and transport excess runoff for treatment over longer periods.

A treatment plant expansion along the Ohio River, already in progress, should be finished by 2027, Alcosan spokesman Joey Vallarian said. Related tunnel construction, beginning alongside the Ohio, should start in 2025. The entire \$2 billion project should be finished by 2036, Mr. Vallarian said.

At Pittsburgh United, Ms. Rafanan Kennedy hopes municipalities and water utilities that depend on Alcosan will push "for more of the solutions they want as customers" — namely "greener plans" than the Alcosan endeavor, she said. Capacity in the Alcosan plan hinges on dry-weather data that don't reflect the latest climate and rainfall projections, she contended.

"If you build a tunnel but then you have more rainfall than the tunnel can capture, it's not going to be a working solution by the time it's built," Ms. Rafanan Kennedy said. "We've been fighting for climate-resilient solutions distributed in neighborhoods that grow and work better over time than

fixed, gray-engineering solutions. Once those are built, it may be too late — they might already be unable to solve the problem."

And if the Alcosan project fails to fulfill federal expectations for clean waterways, ratepayers will remain "on the hook" for additional work, she added. "We'll have to pay more, and we still won't have the benefits that people have been fighting for for over a decade: good local jobs to maintain green infrastructure, reduce flooding, and enable more community amenities and cleaner air."

Mr. Vallarian countered that the inverse is true, too — that "we [would] still have to spend more" if Alcosan were to rely solely on green infrastructure and that approach were to prove insufficient. The authority "would never be able to afford the cost of designing a system for every eventuality" but believes the Clean Water Plan, which includes "continuous adaptability" to account for new data, will be effective, he said.

Further, Mr. Vallarian said Alcosan's Green Revitalization of Our Waterways program had issued nearly \$44 million in grants for 126 projects — across 48 municipalities and municipal authorities — by late summer. Some \$15.6 million of that money was for green infrastructure, he said.

"Right now we own only 90 miles of pipe. There's 4,000 other miles of sewer pipe out there [under other utility agencies] that we don't own," Mr. Vallarian said. "Alcosan, as a regional sewage conveyance and treatment authority, does not have the authority to go to one of our partner municipalities and say, 'You have to put green infrastructure in.' Instead, we offer to partner with them to find the most cost-effective solutions that remove water from the system."

At PWSA, Mr. Pickering said that planners are balancing new green infrastructure with more conventional means to ease combined-sewer overflows. Some 70 percent of the authority's sewer lines are classified as combined systems, according to Alex Sciulli, the PWSA board chairman.

He expects that PWSA's stormwater-related capital spending "will jump dramatically in the next decade."

More rate increases will be necessary to sustain infrastructure and overall water quality, he said, calling for the business community to support a separate stormwater fee that will help to fairly distribute the stormwater infrastructure burden. PWSA included a stormwater fee in its budget for 2022.

Pittsburgh Mayor Bill Peduto and Mr. Neukrug, a former CEO of the Philadelphia Water Department, also endorsed the idea, with Mr. Peduto, who leaves office at the beginning of January, noting the need for local government cooperation too.

"We can't build our way out of [stormwater issues] only by building bigger pipes," Mr. Peduto said. "There needs to be a reconciliation among local governments to minimize the amount that goes into the system." **h**