



Pittsburgh struggles to maintain a network of reservoirs, pumps and pipes — at least a quarter of which contain toxic lead — that dates to the 19th century. Barry Reeger, For PennLive

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sticker" so lawmakers cut indiscriminately.

As the DEP contracted, losing some 750 positions — more than a fifth of its total workforce — between 2007 and 2017, drinking water inspectors saw their workloads increase. The job, with a current starting salary of about \$40,000, already saw significant turnover due to retirements and new recruits moving up to better paying posts within state government. The cuts meant that departing inspectors weren't replaced.

"Any time the budget gets cut, we have to go back and say, 'We have X number fewer staff,'" Daniels said. "What does that mean for how many [water systems] we can get to this year?"

By the time of the EPA's 2016 warning, each inspector was responsible for an average of 149 water systems. A 2012 survey by the Association of State Drinking Water Administrators showed a national average of 67.

To understand how short staffing impacts public health, it's helpful to define the scope of the DEP's drinking water program.

First, the DEP does not oversee private wells. If a home has its own well, the owner is responsible for maintenance and water testing.

A test for total coliform bacteria, which can cause flu-like symptoms and gastrointestinal upset, costs \$15 to \$30.

Roughly 20,000 private wells are drilled each year but, aside from some local and county ordinances, there are no construction standards.

An estimated 3.5 million Pennsylvanians rely on private wells. The rest of the state, some 10 million people, get their water primarily from public systems.

Each of the state's roughly 8,500 public systems are subject to a sanitary survey, a comprehensive inspection in which an inspector checks equipment, treatment and water sources. The inspector's bible, chapter 109, is some 600 pages long.

The science of drinking water is still in its infancy — Pennsylvania began regulating drinking water in 1905 and Congress passed the Safe Drinking Water Act in 1974 — so

best practices are constantly updated as new contaminants are identified. One example: Lead, which can lower IQ and cause a host of behavioral and physical symptoms, wasn't banned from pipes until 1986.

Community water systems receive a sanitary survey once every three years. These types of utilities provide water to the same population year round and include municipal authorities, such as Pittsburgh and Steelton; mobile home parks; and residential developments. Non-community water systems, which include businesses, campgrounds and schools, must be inspected once every five years.

The number of full inspections completed each year fell in tandem with the DEP's budget. According to EPA data, inspectors completed 3,177 surveys in fiscal 2009. By 2015, that number dropped to 1,847. Meanwhile, the number of violations that inspectors identified but were never resolved spiked from 4,298 to 7,922, even with fewer inspectors on the ground. In fiscal 2017, state inspectors visited about 19 percent of the state's water systems, well below the national average of 37 percent.

### LIMITS ON REGULATORS

Like most regulatory programs, Pennsylvania's drinking water enforcement relies heavily on self-reporting.

Water systems are required to submit routine testing data and, once a year, they send a document called a Consumer Confidence Report to their customers. (It's generally sent out in early summer.)

"We get about 150,000 sample results every month," Daniels said, "which is why we need an electronic data system, such as we have."

That system automatically screens the data for "big-ticket items," she said, meaning high levels of contaminants and obvious discrepancies that an inspector should follow up on.

Even in the best of times, however, regulators can only do so much.

Daniels said an astute laboratory worker recently flagged samples that showed the exact same results for test columns, such as fluoride and nitrates, submitted by a number of small systems.

The results strained believability. As it

happened, a circuit rider who goes around collecting samples from multiple water systems had simply replicated the results from one system to the next. That case is still under investigation so the details of which particular systems were affected have not been released.

As with the 2013 incident in Steelton, there are also cases of mishandling or outright fraud involving the water systems that collect the samples or the labs that process them. And not every lab technician or system operator is so eagle-eyed.

"We need to be able to do routine inspections," Daniels said. "We need to have those eyes on the ground."

Inspectors say budget cuts over the last decade created a lot of room for error. And, when they do find problems, for years the DEP failed to follow up to ensure they were corrected. The DEP pursued formal enforcement action against just 15 of the 86 systems currently deemed serious violators under EPA guidelines due to the length or severity of their deficiencies.

"Say you get an E.coli sample and you write up a paper violation," one inspector said, referring to the common bacteria that can cause diarrhea and other ailments. "You tell them, 'Don't do it again or we may fine you.' Five years later, they do it again and nobody remembers they did it before."

Those examples may not show up in EPA data, inspectors said, because of how infrequent the follow-up inspections were.

More frustratingly, several inspectors said they referred violations up the chain of command for formal enforcement only to see nothing happen.

Ideally, inspectors issue notices of violations and then work with the systems to see that they are corrected. If problems can't be corrected at that stage, they are sent up to compliance specialists and, eventually, may end up in court.

"Once it becomes a formal enforcement, we have to work with our attorneys to make sure that we're writing something that would hold up in court if it's appealed," Daniels explained, "and we have a prioritization schedule for that, as well."

The same budget cuts that hit the inspection side also impacted enforcement. Currently, the DEP employs 68 attorneys who

represent its regulatory programs.

"If we had all the resources we had, everything would be elevated for formal enforcement," Daniels said, "but we just can't do that."

During his 22 years with the agency, attorney Martin R. Siegel helped out in most of the regulatory areas the DEP oversees.

"We had openings of attorneys who had left," he said. "It always took a while to fill those openings, if they were filled at all."

Siegel said that ultimately meant a bigger workload, at least temporarily. It's difficult to judge whether the reduced enforcement was due specifically to vacancies on the legal side since the agency had vacancies everywhere.

According to EPA data, formal enforcement actions represented 1 percent of all drinking water enforcement in Pennsylvania in fiscal 2017. The national average was 7 percent. That's not to say every other state is doing it better than Pennsylvania. The EPA's Office of Inspector General has found deficient enforcement, oversight and reporting nationwide, from Michigan to Texas and Puerto Rico.

Another key factor in enforcement is the system operators' ability to pay.

Roughly 85 percent of the state's water systems serve fewer than 3,300 people and 71 percent serve fewer than 200. In the real world, that often means the operators don't have the resources and expertise to fix problems on their own.

"There's no easy way to gain compliance," one inspector said. "If you issue them penalties, they won't have the money."

There are programs, such as Capability Enhancement Facilitators and PennVEST, that provide engineering assistance, infrastructure grants and low-interest loans to struggling utilities but the available funding is far below what is needed.

The most recent EPA needs assessment, which was completed in 2015 and made public this March, showed that Pennsylvania's drinking water systems would need \$16.8 billion in infrastructure upgrades over the next 20 years — a figure that does not include billions more that would need to be spent to remove lead water mains. Over the last decade, PennVEST awarded \$887 million for 238 drinking water projects

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