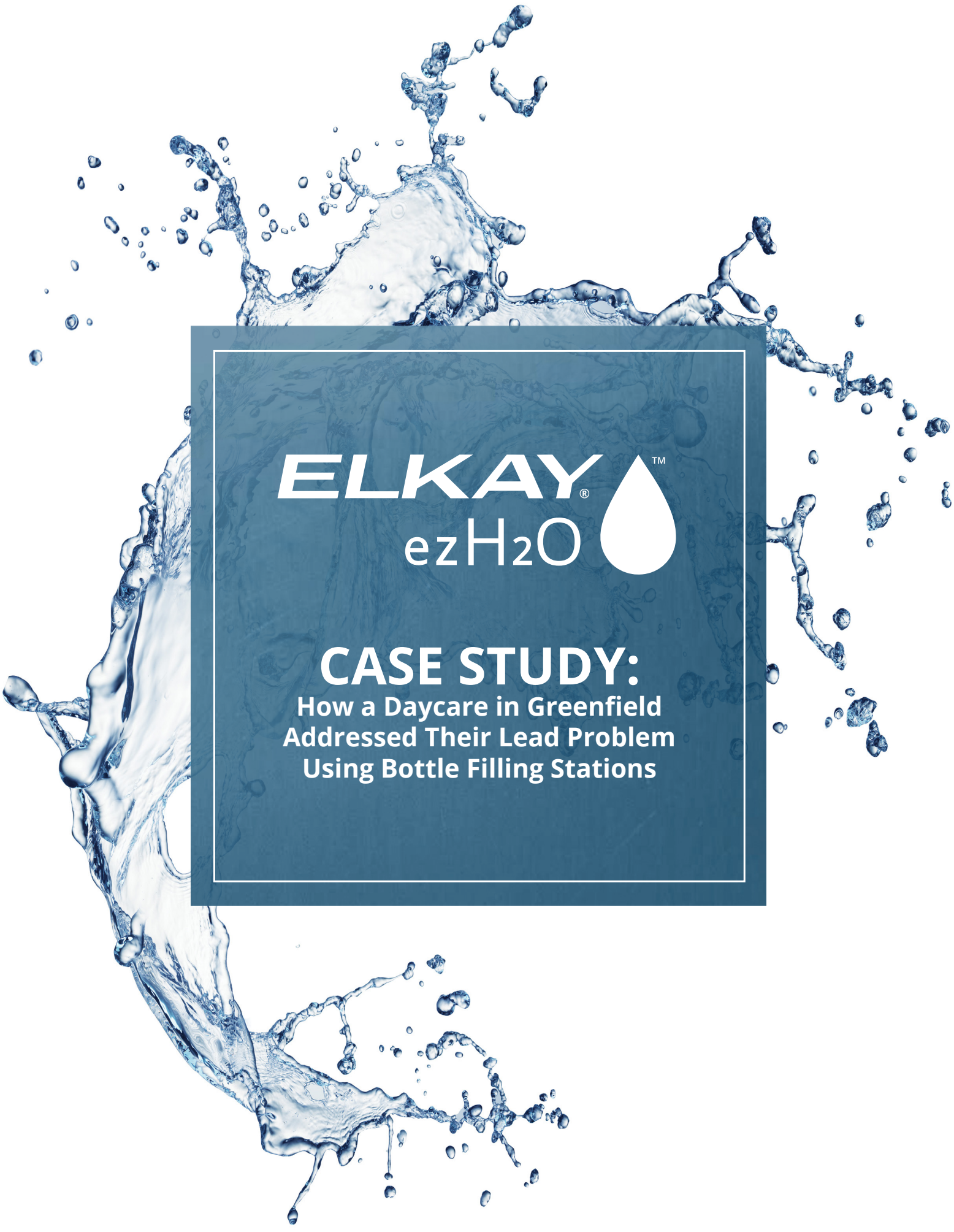

ELKAY®
ezH2O™

CASE STUDY:

How a Daycare in Greenfield Addressed Their Lead Problem Using Bottle Filling Stations

Since Flint, Michigan, shocked the country with the severity of its lead contamination in drinking water, states and towns across the country have begun testing and remediation programs in their schools to make sure the water is safe for consumption.

What they have found is cause for concern. Lead contamination has been found in school water across the country, from New York to Arizona to California, since 2015. Though there is no national data showing how many schools or daycare centers are affected, some experts have estimated that up to 20% could contain harmful levels of lead in their water.

Schools are at high risk for lead in water due to their old infrastructure and young demographics.

Lead is most likely to enter water from aging pipe infrastructure that contains lead. To make things worse, lead can cause its most severe health effects in young children, harming the way they learn, develop and behave.

Greenfield, Massachusetts, is a small, tree-lined town in western Massachusetts. The Greenfield Public School system contains a preschool and daycare center. Each day, 105 children between the ages of three and five years old attend the Academy of Early Learning.

In 2016, Greenfield officials found elevated lead levels throughout the town's school system. Unlike many schools that have been in the news, Greenfield quickly and transparently responded to the problem. This is the story of how they tested, strategized, and remediated the lead contamination to make water safer for all of their students, from the youngest to the oldest.

Discovering Lead:

Greenfield had voluntarily tested most taps in its schools for years by measuring lead levels at two taps per school building per year. When a $2 million grant program sponsored by the Massachusetts Clean Water Trust announced that it would test public schools for free in 2016, the school system accepted the funding to conduct a more rigorous testing protocol.

With the grant, in January 2017 school and state employees tested every fixture throughout the six school buildings for lead and copper, even rarely used taps in locations such as janitors' rooms. In total, more than 1,000 taps were tested. Employees used a standard testing protocol by drawing samples after letting water sit in pipes for 24 hours, then drawing once more after flushing the taps.

Lab results revealed high lead levels in 25 fixtures throughout the schools. Five of these were in the Academy of Early Learning, and two were drinking fountains, endangering students as young as 3 years old.

Lead levels in faucets were found to be as high as 310 parts per billion, twenty times the EPA's action level of 15 ppb. Drinking water sources all showed lower levels, ranging from 16 ppb to 46 ppb. In the Academy of Early Learning, the highest drinking water level found was 24 ppb.

Remediation:

The immediate steps to take were clear, according to Alan Schmidt, Facilities Manager at Greenfield Public Schools: "If you run into lead, the first thing you do is shut that thing down, doesn't matter where it is." Acting quickly, officials disconnected all of the affected fixtures within 24 hours.

Then, Greenfield methodically determined a longer-term solution. First, administrators sent a letter to parents, students, and staff notifying them of the issue and assuring them that the administration was working in a thorough and timely manner. This would be the first of three public letters to update the community, which would provide information along with social media posts, local news articles, and mentions at town meetings. Then, for the experienced Department of Public Works and facilities teams, there was a choice: which of the three main remediation options to use.

They quickly ruled out the first option, pipe replacement. This is a method (used by Newton Public Schools, for example) to remove sources of lead from pipe infrastructure. Because so few fixtures tested high for lead in Greenfield, the administration concluded that elevated levels were most likely coming from the fixtures themselves, rather than the underlying pipes. Plus, for many schools, pipe replacement is an extremely expensive and time-consuming remediation method.

The second option, which would be the least expensive up front, but also the most arguably labor-intensive and least safe, would be to flush each tap for at least 30 seconds and up to several minutes at the start of each day. This is intended to remove overnight lead buildup in pipes. Flushing is not considered a safe remediation method, however: in one 2016 study, lead concentrations at a university's faucets returned to dangerous levels within 15-20 minutes of flushing. Greenfield did decide to implement a flushing regimen for drinking water sources testing high for copper, while waiting for hydrated lime to coat the interiors of the pipes as an anti-corrosion mechanism.

For fixtures with elevated lead levels, Greenfield officials instead chose point-of-use filtration. Greenfield used Elkay-brand drinking fountains and filtered bottle filling stations. Bottle filling stations were installed in three schools, including the Academy of Early Learning. According to Ouellette, the choice was clear based on efficacy and cost.

These units contain filters that are NSF certified to remove over 99% of lead. They require a simple filter replacement one year after installation or possibly more depending on water usage.

The new bottle filling stations were also a solution within the means of the town budget. According to Ouellette, in total the remediation cost approximately $12,000 between testing, replacement of about 20 fountains, and removal of about six drinking fountains that were old and infrequently used. Town engineers and plumbers donated their time to install the replacement fixtures free of charge.

At sinks and other sources of non-potable water, officials posted signage to warn students and staff away from drinking from them.

By September 2017, with new filtered bottle filling stations installed, a new round of testing confirmed that Greenfield's water was within the level of consumption considered safe to drink,

every fixture testing at a lead concentration of 6ppb or below. The town breathed a sigh of relief. According to Jordana Harper, Superintendent of Greenfield Public Schools, the community and school administrators were pleased with the swiftness and comprehensiveness of the response. "Knowledge is power," she says, "and ensuring the safety of our schools is a top priority."

The Long-Term Plan:

The newly installed fixtures have passed two rounds of testing since September 2017. Using their new knowledge and protocols, the school district will continue to make sure water remains cleaner and safer.
Testing it is the only way to find out if there are harmful amounts of lead in your water.

What We Learned:

Greenfield Public Schools' lead remediation strategy is just one way to respond to a systemic problem, but studying their methods provides valuable lessons on how to handle the problem of lead in drinking water in schools.

1. **Test thoroughly and beyond what is legally required**
   Federal regulations do not require any specific lead testing for 90% of schools in the U.S. Even though the town DPW had regularly tested taps throughout Greenfield Public Schools, some fixtures emitting lead-contaminated water were not identified until the Massachusetts Clean Water Trust grant in 2016. Sometimes the most rarely used fixtures are the least obvious choices for lead testing, but can discharge the most dangerous lead levels, since lead may be allowed to collect in pipes for long periods of time. Luckily, this testing program provided enough funding to collect samples from every fixture, including rarely used fixtures, so that the schools could address the issue.

2. **Know the options**
   Greenfield schools were able to quickly analyze their priorities – cost-effectiveness, efficacy and ADA-compliance. They chose a solution that best addressed these, Elkay fountains and filtered bottle fillings stations, because school officials were familiar with the three main options for lead remediation.

   For more information about the options for remediating lead contamination of school drinking water, please read "How to Solve Your School's Lead in Water Problem."

3. **Build systems for long-term safety**
   The process of responding to lead contamination made it clear that Greenfield's previous testing system had been valuable, but incomplete, as it had missed some lead contamination by only testing two fixtures in each building per year and prioritizing the most commonly used fixtures. Now, with the baseline provided by the Massachusetts statewide testing program, officials will continue to use this system moving forward but will be prepared to expand testing if it becomes necessary. It will be important to maintain clear records of the testing so that the information may be easily referenced.

   With its swift and decisive response, Greenfield Public School officials succeeded in making water safer for all students, from the youngest to the oldest.

   In addition to Greenfield Public Schools, BeCause Water has learned from schools across the country and assisted with testing, fundraising, remediation and awareness. For additional resources and information, please contact us at support@becausewater.org

Sources

NPR, April 2016. "Lead-Laced Water In Flint: A Step-By-Step Look At The Makings Of A Crisis."

US EPA, National Service Center for Environmental Publications, 1989. "Lead Ban: Preventing the Use of Lead in Public Water Systems and Plumbing Used for Drinking Water."

US EPA. "Basic Information About Lead in Drinking Water."

USA TODAY, March 2016. "Got lead in your water? It's not easy to find out."

Water Research Center. "Special Report #3: Lead In Drinking Water – Is There Lead In My Drinking Water?"

Mayo Clinic. "Lead Poisoning Symptoms and Causes."

Pediatrics Journal, October 2005. "Lead Exposure in Children: Prevention, Detection, and Management."

Agency for Toxic Substances and Disease Registry, August 2007. "PUBLIC HEALTH STATEMENT: Lead."

US EPA. "Drinking Water Requirements for States and Public Water Systems: Lead and Copper Rule."

US EPA. "Consumer Confidence Reports (CCR)."

US Government Publishing Office, June 1991. "Title 40: Protection of Environment; Part 141: National Primary Drinking Water Regulations; Subpart 1: Control of Lead and Copper."

USA TODAY, March 2016. "Beyond Flint: Excessive lead levels found in almost 2,000 water systems across all 50 states."

Massachusetts Water Resources Authority. "What You Need to Know About Lead In Tap Water."

CNN, June 2016. "5,300 U.S. water systems are iUS authorities distorting tests to downplay lead content of watern violation of lead rules."

Natural Resources Defense Council, June 2016. "Report: What's in Your Water? Flint and Beyond Analysis of EPA Data Reveals Widespread Lead Crisis Potentially Affecting Millions of Americans."

The Guardian, January 2016. "US authorities distorting tests to downplay lead content of water."

US EPA Office of Enforcement and Compliance Assurance, December 2009. "Memorandum: Drinking Water Enforcement Response Policy."

CNN, March 2016. "Flint water crisis lawsuits: 5 things to know."

BeCause Water Knowledge Base

Written by BeCause Water for Elkay Manufacturing

ABOUT ELKAY

For more than 100 years, Elkay® Manufacturing has been making innovative products and providing exceptional customer care. Family owned since 1920, Elkay began by making residential butler and pantry sinks. Today, the company has grown to include faucets, foodservice fixtures, water delivery products and architectural millwork in addition to world-class sinks. We are proud to be America's No. 1 selling kitchen sink company, as well as a leading manufacturer of award-winning water delivery products, including the ezH2O® bottle filling station.

Like your family, Elkay has values and traditions that endure. We take pride in offering reliable products that inspire change and leave the world a better place for generations to come. Headquartered in Downers Grove, Illinois, Elkay is American owned and operated providing thousands of jobs that support our families and communities.

ELKAY® ezH2O™