Get the Lead Out

Ensuring Safe Drinking Water for Our Children at School

ENVIRONMENT MASSACHUSETTS
RESEARCH & POLICY CENTER

MASSPIRG Education Fund

Get the Lead Out

Ensuring Safe Drinking Water for Our Children at School

MASSPIRG Education Fund

Written by:

John Rumpler and Emma Dietz

Environment America Research & Policy Center

March 2019

Acknowledgements

Environment Massachusetts Research & Policy Center and MASSPIRG Education Fund would like to thank Dr. David Bellinger,PhD, Researcher Boston Children's Hospital, Professor at Harvard Medical School; Dr. Morri Markowitz, MD, Professor, Department of Pediatrics Albert Einstein College of Medicine; Yanna Lambrinidou, PhD, anthropologist at Virginia Tech Department of Science and Technology in Society; Adrienne Katner, D.Env, M.S. Louisiana State University Health Sciences Center; and Gideon Weissman, policy analyst at Frontier Group for their review of this report. Thanks also to Christina Schlegel for her work on our initial 2017 report.

The authors bear responsibility for any factual errors. The recommendations are those of Environment Massachusetts Research & Policy Center. The views expressed in this report are those of the authors and do not necessarily reflect the views of our funders or those who provided review.

© 2019 Environment Massachusetts Research & Policy Center

The Environment Massachusetts Research & Policy Center is a 501(c)(3) organization. We are dedicated to protecting Massachusetts' air, water and open spaces. We investigate problems, craft solutions, educate the public and decision-makers, and help Bay Staters make their voices heard in local, state and national debates over the quality of our environment and our lives. For more information about Environment Massachusetts Research & Policy Center or for additional copies of this report, please visit www.environmentmassachusettscenter.org.

MASSPIRG Education Fund is also a 501(c)(3) organization that offers an independent voice on behalf of the public interest. We advocate to protect consumers and promote good government through investigations, public education, and civic engagement.

Design: Meltzer Design

Cover photo: Phase4Photography/Shutterstock

Table of Contents

Executive Summary 1

Introduction. 3

Lead in Schools' Water: A Threat to Children's Health 4

Lead is Contaminating Water at Our Schools 6

State Policies: Still Not Making the Grade 12

Solutions to Ensure Safe Drinking Water at School 15

Communities Rising to the Head of the Class 17

Methodology 19

Appendix 40

Endnotes 41

Executive Summary

Over the past five years, the tragedy of Flint, Michigan has stunned the nation. We watched the drinking water of an entire city become contaminated with lead. And, we know now that this toxic threat extends well beyond Flint to communities across the country.

In fact, test results now show that lead is even contaminating drinking water in schools and pre-schools — flowing from thousands of fountains and faucets where our kids drink water every day.

In all likelihood, the confirmed cases of lead in schools' water are just the tip of the iceberg. Most schools have at least some lead in their pipes, plumbing, or fixtures. And where there is lead, there is risk of contamination.[1]

The health threat of lead in schools' water deserves immediate attention from state and local policymakers for two reasons. First, lead is highly toxic and especially damaging to children — impairing how they learn, grow, and behave. So, we ought to be particularly vigilant against this health threat at schools and pre-schools, where our children spend their days learning and playing.

Second, current regulations are too weak to protect our children from lead-laden water at school. Federal rules only apply to the roughly ten percent of schools and pre-schools that are considered to be their own Public Water Systems.[2] At schools not considered to be a Public Water System, there is no federal rule protecting kids from exposure to lead in schools' drinking water. While the latest edition of the EPA's *3Ts for Reducing Lead in Drinking Water in Schools and Child Care Centers* recommends that schools reduce lead to the "lowest possible concentration," unless a state's law directs schools to adhere to it, this guidance is not enforceable.[3] Moreover, even when federal rules do apply to a school, they only require remediation when testing confirms lead concentrations in excess of 15 parts per billion at ten percent or more of taps sampled, even though medical and public health experts agree that there is no safe level of lead for our children.[4] The error of this approach is compounded by the fact that testing, even when properly done, often fails to detect maximum lead levels in water coming out of the tap.

Unfortunately, so far, most states are failing to protect children from lead in schools' drinking water. Our review of 32 states' laws and regulations finds:

- Several states have no requirements for schools and pre-schools to address the threat of lead in drinking water; and
- Of the few states with applicable laws, most follow flaws in the federal rules — relying on testing instead of prevention and using standards that allow health-threatening levels of lead to persist in our children's water at school.

More specifically, when assessed in terms of protecting children from lead in water at school, these states' policies earned the following grades:

State	Grade
DC	B+
IL	B-
CA, NY, OR	C+
MD; NH; NJ	C
AZ; MA	D
AL; CO; CT; FL; GA; IN; LA; ME; MI; MN; MT; NC; NM; OH; PA; RI; TN; TX; VA; VT; WA; WI	F

Given the high toxicity of lead to children, the most health-protective policy is simply to "get the lead out" of our schools and pre-schools. This involves pro-actively removing lead-bearing parts from schools' drinking water systems — from service lines to faucets and fixtures. Because this prevention work will take time, schools can start by proactively installing filters certified to remove lead at every tap used for drinking or cooking. Schools should also immediately begin regular and proper testing of all water outlets used for drinking or cooking to ensure that the prevention steps being taken are effective, and promptly remove from service any outlets where lead is detected. And, schools should provide the public with easy access to all testing data and the status of remediation plans.

The promise and viability of this "get the lead out" approach can be seen in municipal and voluntary programs across the country. Madison, Wisconsin[5] and Lansing, Michigan[6] have removed all lead service lines from homes, and New York City has replaced them at schools. Washington, D.C. also now requires school to pro-actively install certified filters at all outlets used for drinking or cooking in schools.[7]

Recommendations

The science now makes clear that there is no safe level of lead exposure for our children. So, to ensure safe drinking water for our children, we need policies that are strong enough to "get the lead out" at schools and pre-schools.

States and communities should:

- Proactively "get the lead out" of schools and child care centers by replacing fountains, faucets, and other parts containing lead;
- Install and maintain filters certified to remove lead on every faucet or fountain used for cooking and drinking;
- Adopt a 1 ppb standard for lead in schools' drinking water, consistent with recommendations of the American Academy of Pediatrics;

> **"When it comes to schools, there often is an ideological divide…but potable water should know no ideological or political constraint."**
>
> **—Bob Casey, Senator from Pennsylvania[8]**

- Require testing at all water outlets used for drinking or cooking at all schools annually, using protocols designed to capture worst-case lead exposure for children;
- Immediately remove from service any faucet or fountain used for drinking or cooking where testing indicates lead in the water;
- Disclose all available information about lead in water infrastructure, test results, and remediation plans/progress both onsite and online; and
- Provide funding to remove lead in schools' water infrastructure

The federal government should:

- Enforce and strengthen federal rules to protect drinking water from lead — e.g. the Lead and Copper Rule;
- Provide major funding to help states and communities remove lead in water infrastructure — including lead service lines and plumbing/fixtures in schools; and
- Marshal the authority of all relevant federal agencies to protect public health from contamination of drinking water

And of course, we should fully protect all sources of drinking water from pollution.

Introduction

As our nation rushed through more than a century of unprecedented economic growth, we allowed several toxic health threats to become embedded into the fabric of our lives. One of the more enduring and pervasive of these threats has been the use of lead. While the toxic nature of lead has been known for centuries, we allowed manufacturers to put it in our paint, plumbing, gasoline, and many other products.

For the past few decades, public health officials have been working to undo the damage. Banning lead in gasoline immediately removed a major source of toxic air pollution.[9] Barring lead in paint stopped a major threat to children's health from becoming even worse, but we are still cleaning up the damage from millions of homes with lead paint, as well as related lead in dust and soil.[10]

Yet until recently, few Americans paid as much attention to another pervasive pathway for this potent toxicant: the delivery system that brings drinking water right to our faucets.

Over the past five years, many Americans have watched in horror and disbelief as a tragedy unfolded in Flint, Michigan. Through a combination of appalling decisions and denials, an entire city had its water contaminated with high levels of lead. Tens of thousands of children were exposed to lead during the crisis in Flint.[11] In addition to acute symptoms and other illnesses, by one estimate, these children will lose 18,000 future healthy years combined.[12]

While Flint is an extreme case, it is hardly alone. For decades, Washington D.C. struggled with lead contamination in schools' drinking water. Initial tests done in 1987 revealed taps dispensing lead over 80 ppb. And in 2006, nearly 20 years later, tests revealed that 75 percent of schools were still experiencing contamination, with taps in 14 schools dispensing lead levels considered to be an acute health risk.[13] Since then, D.C. has adopted some of the strongest policies in the nation. But thousands of communities across the country still have lead in their drinking water. A review of data by USA Today found that nearly 2,000 water systems across the 50 states had levels of lead in their water in excess of U.S. Environmental Protection Agency (EPA) standards between 2012 and 2016.[14] And the contamination is likely even more widespread.

Now we know that lead is even contaminating the water at many of our schools and pre-schools — the places our children go each day to learn and play.

Lead in Schools' Water: A Threat to Children's Health

"Anything above zero is harmful. Just like crack cocaine and heroin, there's no safe amount."[15]

—Ron Saff, MD, who coordinated lead tests at Florida schools, from interview with Natural News

Lead is Harmful to Children — Even at Low Levels

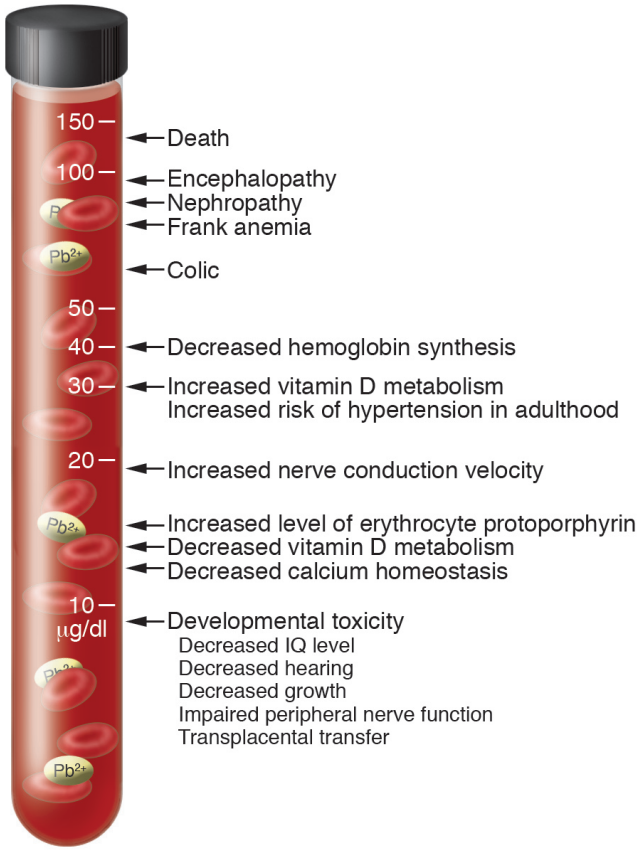
Lead is a potent neurotoxicant. It is particularly damaging to children for several reasons. Children absorb 4-5 times as much ingested lead as adults from any given source.[16] Once absorbed, lead flows from the blood to the brain, kidneys, and bones.[17] Yet children's organs and bones are immature and more vulnerable than adults'; children also have an incomplete blood-brain barrier.[18]

"We see learning difficulties, hyperactivity, developmental delays," said Marcie Billings, a pediatrician with Mayo Clinic in Rochester, Minnesota.[19] Experts say that some of the damage caused by absorbing lead is irreversible.[20,21]

We have known for some time that high levels of lead can cause severe health impacts — including anemia, kidney disease, abnormal brain function and even death. (See Figure 1)

Yet the medical science now confirms that even low blood lead levels can cause permanent damage to our children. According to EPA, "In children, low levels of [lead] exposure have been linked to damage to the central and peripheral nervous system, learning disabilities, shorter stature, impaired hearing, and impaired formation and function of blood cells."[23]

Figure 1: Adverse Effects of Lead at Low Levels[22]



Of particular alarm for schools, the data now links low lead levels with long-term loss of learning in our children. For example, a study done in Wisconsin found that 3,757 fourth-graders with relatively low lead levels in their blood "scored significantly lower on reading and math tests than those without elevated blood-lead levels." These children were exposed to lead before the age of three, yet the adverse effects of lead exposure persisted seven to eight years later.[24]

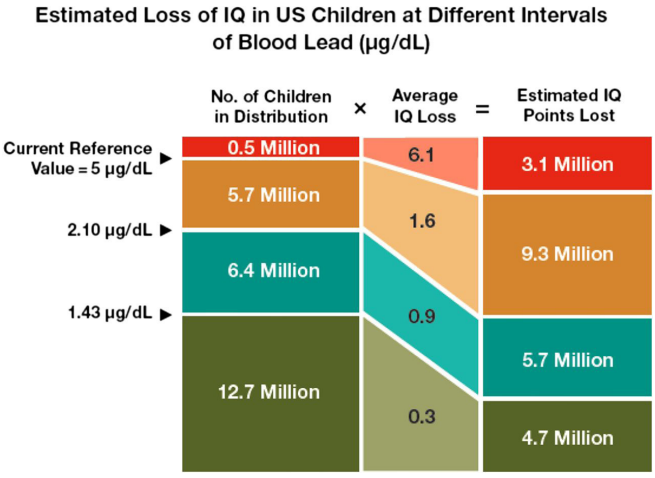
In 2016, the American Academy of Pediatrics concluded that "[e]xtensive and compelling evidence now indicates that lead-associated cognitive deficits and behavioral problems can occur at blood lead concentrations below 5 µg/dL"(micrograms per cubic deciliter), which is the current reference level being used by the Center for Disease Control.[25,26]

One stunning fact underscores the danger at hand: more than 24 million children in America are at risk of losing IQ points due to low levels of lead. See Figure 2.

Moreover, because lead flows from blood into the organs and bones within several weeks, it will not always show up in blood tests. The half-life of lead in blood ranges from 28 to 36 days.[28] However, lead is a persistent toxicant, and once absorbed, it can remain in the body.[29] So, a child who drinks water from a fountain at school that episodically contains a slug of lead might not show elevated blood-lead levels a month or two later. But the damage will persist in her body.

In light of this alarming data, public health experts and agencies now agree: there is no safe level of lead for our children.[30]

Figure 2: More Than 24 Million Children at Risk of Losing IQ Points Due to Low Levels of Lead[27]



Lead is Contaminating Water at Our Schools

Sareanda Hoffman goes to Caroline Elementary School in Ithaca, New York. She used to drink every day from a water fountain in her kindergarten classroom – a fountain that, when tested, measured high for lead. Unfortunately, this fountain was just one of many in Caroline Elementary that was found to be contaminated with lead; tests showed numerous taps that dispensed lead concentrations of 100 parts per billion (ppb).[32] As reported by USA Today, while drinking from these fountains, Sareanda used to come home with a rash around her mouth and so tired she needed a long nap, two symptoms which have been associated with exposure to lead.[33] Concerned about this unusual behavior, Sareanda's mother switched her to bottled water only. Since then, the rash cleared up and Saraenda's energy has returned.

Unfortunately, Sareanda is not alone. As more schools test, they are finding drinking water contaminated with lead at thousands of faucets and fountains across the country, as seen in the map at Figure 3.[34] From Maine to California, lead laced water is being found in schools in communities across the country.

The threat of lead in schools' water affects not only big cites but also suburban and rural communities. Sareanda Hoffman lives in Ithaca, New York. Elsewhere, tests have documented lead tainted water in schools in Cherry Hill, New Jersey[35], Yarmouth, Maine[36], several other school districts in upstate New York[37] and suburban communities in Illinois.[38]

Moreover, some tests are showing exceedingly high levels of lead. For example, one drinking water fountain at a Montessori school in Cleveland dispensed 1,560 parts per billion at the time of testing.[39] A school in the Chicago suburbs dispensed lead at 212 times the federal standard at the time of testing.[40] Leicester Memorial Elementary in Massachusetts had a tap that tested at 22,400 ppb.[41]

Yet given the toxicity of lead at low levels, it is critical to look beyond the most extreme test results. What emerges is a pattern of widespread contamination of drinking water at school.

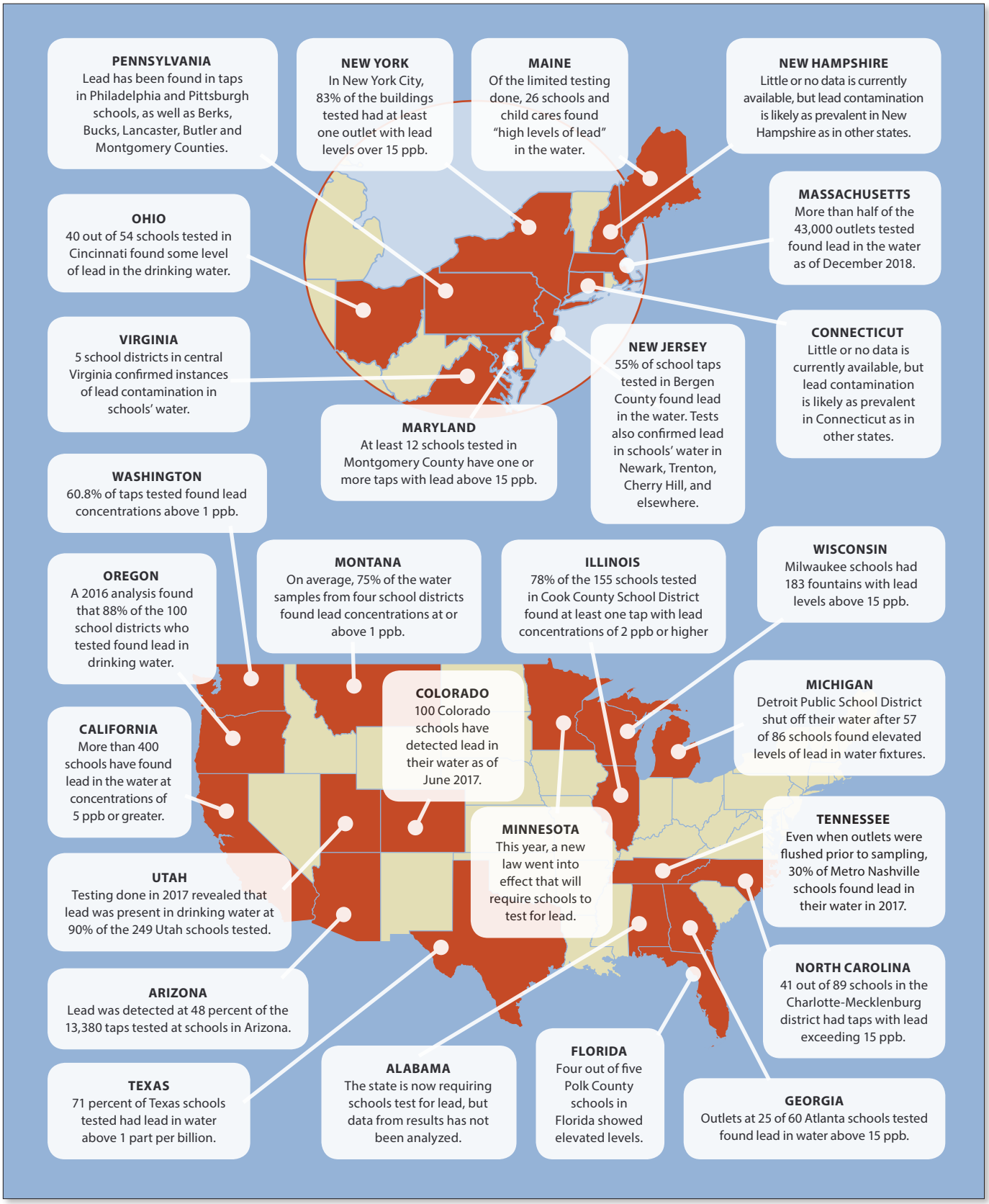
Massachusetts is one of the few states to publish statewide test results showing lead in concentrations below the 15 ppb level. Of the 43,000 taps tested in schools across the Commonwealth as of 2018, 59 percent found lead in the water.[42]

A More Pervasive Threat Than Confirmed by Testing

In all likelihood, these confirmed cases of lead in schools' water are just the tip of the iceberg. Most schools are still not testing for lead at all.

Moreover, tests — even when properly done — can fail to capture the lead hazard present. Part of this conundrum is that corrosion and breaking off of lead particles from pipes is highly variable. Multiple water tests from one tap can result in highly variable lead levels between samples.[43] In a lead sampling study conducted in 2013, researchers concluded that a

Figure 3: A Deeper Dive: State-Specific Information About Lead in Schools' Water



single sample from a water tap could not accurately reflect the levels of lead flowing through the tap. In their test of 32 homes with lead service lines, samples from the same tap varied from below the lead action level to well above it. This degree of variation was true for most samples in the study.[44]

> "This is like Russian roulette."
>
> —Marc Edwards on testing for lead in drinking water.[45]

In addition to the inherent variability in testing, some testing techniques mask lead risks even further. Chief among these is a practice known as pre-stagnation flushing, where taps are run for a certain number of minutes or even hours the night before test samples are drawn. This practice can artificially lower lead levels in test samples because it removes the water which was sitting stagnant in lead service lines or other lead-laden plumbing, and this extended period of time is when lead typically leaches into the water. With these considerations in mind, EPA is now recommending against the use of pre-stagnation flushing in testing water for lead.[46]

The experience of New York City provides a dramatic example of how pre-stagnation flushing can cause failures in lead testing in schools' drinking water. In the summer of 2016, the city flushed the water in every school for two hours the night before sampling the water for lead. According to Dr. Yanna Lambrinidou from Virginia Tech, who has done extensive research on leaded drinking water, "Unless N.Y.C. schools flush every drinking water tap every evening for 2 hours routinely, their sampling technique is both unreliable and scientifically and morally indefensible." Dr. Marc Edwards, another nationally recognized lead expert at Virginia Tech, agreed. "The results should be thrown into the garbage, and the city should start over."[47] The city has now retested taps at all its schools without the two-hour pre-stagnation flushing step.[48] With retesting complete as of late April, 2017, the results show that 83% of the buildings tested had at least one outlet with lead levels over 15 ppb.[49]

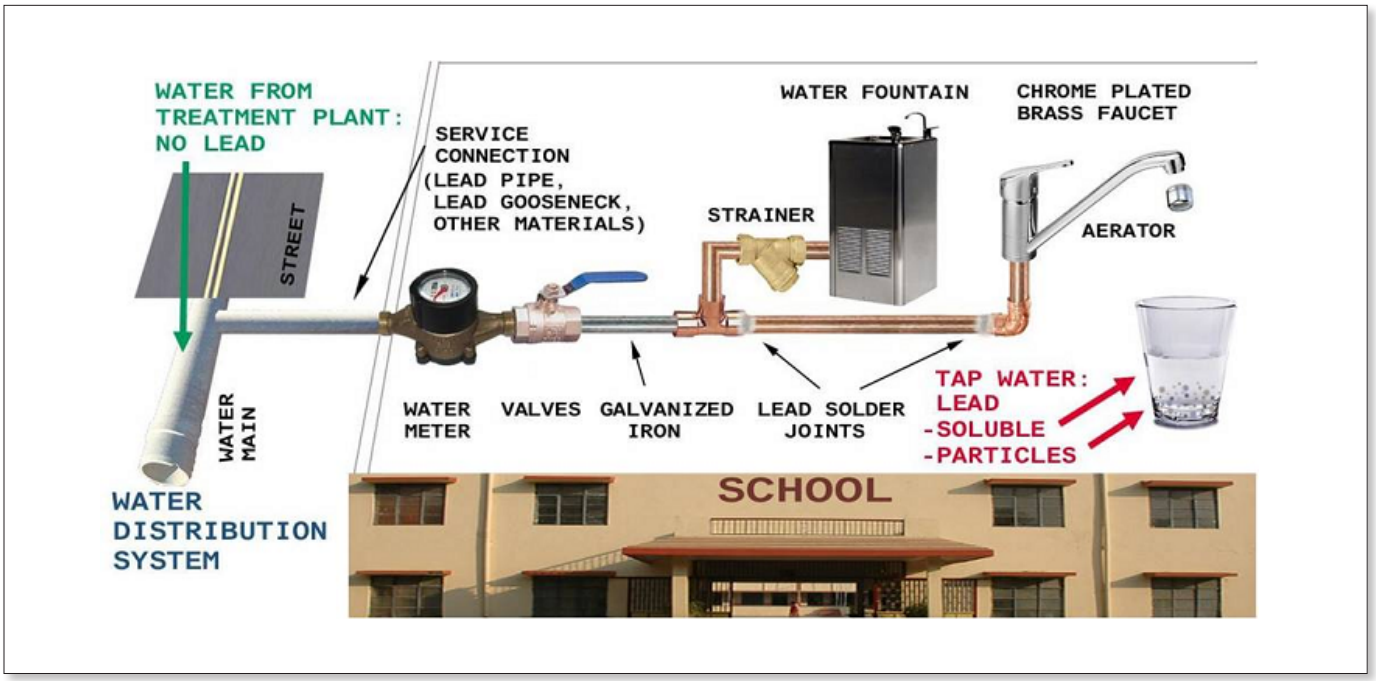
To be sure, the limited available test results from schools across the country are alarming enough, as they confirm the presence of a potent neurotoxicant in thousands of faucets and fountains in schools across the country. But in truth, the scope of this lead-laden threat to our children's health is even wider.

How Lead Gets into Schools' Drinking Water

Most schools have at least some lead in their pipes, plumbing, or fixtures. And where there is lead, there is risk of contamination.

For smaller schools and child care facilities, the problem can start with the pipe that brings water into the building, called the service line (or service connection). When service lines are made of lead, they are a major source of water contamination.[50] In part, this is a function of the unparalleled surface area inside the service line where water is in direct contact with 100 percent pure lead. In addition, the service lines are in closer proximity to disturbances from construction — especially repair work on water mains — which can dislodge lead particles into the water.[51] The role of lead service lines in water contamination is so strong that the Center for Disease Control was actually able to correlate them with elevated blood lead levels in Washington, D.C.[52]

While installing new lead service lines was halted decades ago with the passage of the Safe Drinking Water Acts Amendments of 1986, their toxic legacy is pervasive.[53] According to an estimate by the American Water Works Association, over 6 million lead service lines remain in use across the nation. Though the study had sampling limitations, and therefore may not accurately reflect the number of service lines remaining nationwide, it made a conservative estimate that the drinking water of 15 to 22 million people still passes through lead service lines.[54]



Reproduced from Lead in School Water Delivery Systems. W.K. Kellogg Foundation, Managing Lead in Drinking Water at Schools and Early Childhood Education Facilities (February 2016), reproduced from Edwards, Marc and Simoni Triantafyllidou, Lead (Pb) in U.S. Drinking Water: School Case Studies (2009).

While larger schools are unlikely to have lead service lines, they do have extensive interior pipes, plumbing, and many more faucets and fountains – all of which are potential sources of lead. Until 1988, many drinking water fountains or bubblers were manufactured with lead liners.[55] And until 2014, significant amounts of lead were allowed in new pipes, pipe fittings, plumbing fittings, and fixtures (except in California, which adopted stricter codes in 2010).[56] Some experts fear that even the new, stricter regulations for allowable levels of lead per wetted surface area in pipes and plumbing could still leave enough lead in contact with water for contamination to occur.[57]

The bottom line: most schools and early childhood education programs are likely to have had lead in their water delivery systems. And where there is lead, there is risk that the water kids are drinking can be contaminated.

Data from several school districts underscores the danger from the lead contained in outlets and

A Lead Service Line[58] Credit: EPA

plumbing inside of schools. For example, after brass fixtures were installed at 131 schools in Los Angeles, the school district found elevated lead levels.[59] And in Milwaukee, *even after the school district stated that all lead service lines had been removed,* tests showed 183 samples with lead in drinking water at levels greater than 15 parts per billion.[60]

Current Policies Do Not Ensure Lead-Free Drinking Water

Common sense suggests that the best way to keep drinking water free of lead is to stop using it in water delivery systems. Over time, national policies have embraced this preventative approach, at least with respect to new products. In 1986, new lead service lines were banned.[61] In 1988, Congress passed the Lead Contamination and Control Act, which dramatically reduced the lead content of new pipes and plumbing to 8 percent.[62] And then, as recently as 2014, the definition of "lead free" plumbing was ratcheted down to "not more than a weighted average of 0.25 percent lead when used with respect to the wetted surfaces of pipes, pipe fittings, plumbing fittings, and fixtures."[63] Still, some experts are concerned that even this relatively small amount of lead can still cause some contamination.[64]

Unfortunately, because these critical prevention policies were only adopted recently, we are still left with an extensive legacy of lead in the pipes and fixtures that bring water to the faucets in our homes and the fountains our children use at school. And with thousands of test samples now confirming the presence

of lead in water, it is self-evident that our existing laws and rules are doing a poor job of protecting our children from this dangerous legacy.

The problem is not a failure to acknowledge the serious threat lead poses to children. Every relevant federal agency — including EPA — agrees that there is no safe level of lead for children, and that the goal should be to have zero lead in drinking water.[65] So why is national policy falling so far short of this critical health goal?

Since 1974, the Safe Drinking Water Act (SDWA) has provided an important framework for ensuring that the water public utilities send to their customers and communities is clean and safe. As such, the primary focus of regulations promulgated by EPA pursuant to the Act — such as the Lead and Copper Rule — is on establishing and enforcing system-wide responsibilities of water utilities.

However, this narrow regulatory focus leaves our drinking water vulnerable to contamination both before and after it is in possession of public water utilities. On the front end, it does little to prevent pollution of the rivers, lakes and streams that serve as sources of our drinking water; recently, we have seen cases where toxic threats — including nitrates, cyanotoxins, and chemical spills — have entered the drinking water supply.[66] And on the back end, it leaves water susceptible to contamination as it travels through plumbing in the streets, in our homes and schools, all the way to the faucet where we actually drink it.

It is on this "back end" where most lead contamination of drinking water occurs. This is particularly true with large buildings like schools, which have extensive networks of pipes and plumbing before water

Corroded water main with lead fittings. Photo by Mike Thomas via Flickr, CC BY NC ND 2.0

reaches the tap. In this context, it becomes clear how federal policy has been formulated in ways which fail to ensure the water coming out of the faucet is safe to drink.

In 1991, EPA promulgated the Lead and Copper Rule, pursuant to SDWA. The rule is primarily designed to get utilities to identify problems that require systemwide action, such as adjusting corrosion control at the treatment plant.[67] At least to some degree, the Lead and Copper Rule (LCR) has reduced lead concentrations in drinking water for large water systems that it requires to use corrosion control.

Yet the rule has four key shortcomings. First, the rule relies heavily on testing (rather than proactively removing lead bearing parts and installing certified filters). As discussed above, testing for lead can often result in false negatives due to the "Russian Roulette" factor in corrosion and water sampling.

Second, the rule only mandates remediation when tests show lead concentrations in water greater than 15 parts per billion in 10 percent or more of taps sampled, even though there is no safe level of lead in drinking water. This leads to the third shortcoming, which is that, as the LCR only applies to water utilities, roughly 90 percent of schools and daycares across the country are exempt from even its limited requirements.[68]

Fourth and finally, the schools the LCR does apply to are often home-based early child care centers, which house our youngest and most vulnerable population — but the rule only requires utilities to take action when more than 10 percent of test samples exceed this 15 ppb "action level."[69]

A different federal guidance, the EPA's 3Ts Manual for Reducing Lead in Drinking Water in Schools and Child Care Facilities, has recommendations that would address some of the shortcomings of the LCR. For example, it provides explicit testing instructions that prohibit sampling protocols known to hide lead (such as pre-stagnation flushing). And significantly, rather than using a 15 ppb standard, the 3Ts guidance now urges schools to take action to "reduce their lead levels to the lowest possible concentrations."[70] However, except in states with policies explicitly directing schools to adhere to this document, the 3Ts manual is not enforceable.[71]

In summary, federal requirements to protect our children from lead-laced water at schools and early childhood programs are weak to non-existent. Much stronger action by state and local officials will be critical for our children's health.

State Policies: Still Not Making the Grade

For this report, we evaluated laws and policies in 31 states and an ordinance in the District of Columbia on how well they protect children from lead in drinking water at school. The states were graded on five main criteria:

- **Getting the lead out:** Are schools required to proactively remove lead from water delivery systems, or only required to take action in response to testing if at all? Are required steps sufficient to eliminate the threat of lead contamination?
- **The "lead standard":** What level of lead triggers mandatory remedial action?
- **Testing:** Is testing required, and if so, how are tests conducted, and how often?
- **Public disclosure and transparency:** How much information is being shared with parents and the public?
- **Applicability:** Do the state laws apply to both schools and early childhood programs? Does the law apply to all schools and child care centers, or just those built before a certain year?

Figure 6 shows the grade earned by each state this year – and how it compares to their grade from 2017.[72] Some states like California and Oregon have seen progress, while others are continuing to receive a failing grade.

More than half of the states reviewed have failed to establish any meaningful law or policy for schools to reduce risks of lead in drinking water. Of the states with laws on the books, some only require testing and no remediation. What's more, even when states do require remediation, their policies often replicate some of the key limitations of the federal Lead & Copper Rule, such as only requiring action when lead levels exceed 15 ppb.

While mandatory rules to protect children's health received higher scores in our assessment, states did receive partial credit for well-funded voluntary measures with demonstrated results. However, we did not

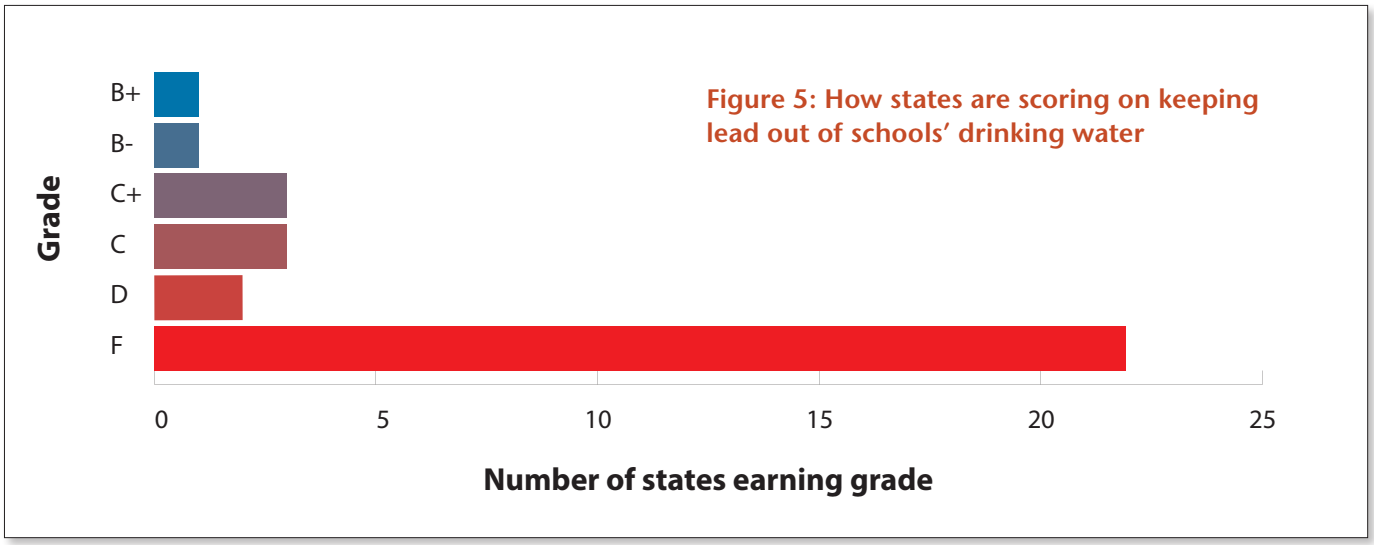


Figure 5: How states are scoring on keeping lead out of schools' drinking water

include funding in our grading criteria; since funding comes from so many different sources — including the federal drinking water state revolving fund —we could not establish a reliable way to assess sufficient funding for any given state's efforts.

Exploring Some State Policies:

Heralding a more preventative approach, in 2016 California became the first state in the nation to pass a law to eliminate lead service lines — not just for schools but across the entire state. Signed into law by Governor Jerry Brown in September of 2016, SB 1398 required public water systems to compile an inventory of known lead service lines by July 2018; now, they are required to provide the state with a timeline for the replacement of these lines. Erring on the side of public health, public water systems must either affirmatively determine whether service lines are made of lead and report that information to the State Water Resources Control Board or have a plan for replacing service lines where the lead content cannot be determined by 2020.[73] One key caveat is that the state has yet to establish an enforceable timeline for this ambitious and preventative measure.

Wisconsin is also working to tackle lead service line removal. While the Badger State's program is not mandatory or comprehensive, it has awarded $26 million through a voluntary program that is beginning to remove lead service lines in 42 communities across the state.[74] As noted earlier, however, service lines are only one source of lead in schools' water. Wisconsin, like many other states, does not require schools to take specific measures to "get the lead out" of their fixtures or plumbing, or to shut off taps with elevated lead levels.

Far and away the most protective policy for addressing lead in schools' drinking water is the ordinance adopted by Washington, D.C. The U.S. Capitol is now the first jurisdiction in the country with the following protections: 1) requiring filters at every tap in school used for drinking; 2) establishing a standard for lead in drinking water stricter than the Federal "action level";

Figure 6: State Grades: Then and Now

State	2017	2019	State	2017	2019
AL	**	F	MT	**	F
AZ	**	D	NC	**	F
CA	F	C+	NH	**	C
CO	**	F	NJ	C-	C
CT	F	F	NM	**	F
DC	B	B+	NY	C	C+
FL	F	F	OH	F	F
GA	F	F	OR	F	C+
IL	D	B-	PA	F	F
IN	**	F	RI	**	F
LA	**	F	TN	**	F
MA	D	D	TX	F	F
MD	F	C	VA	**	F
ME	F	F	VT	**	F
MI	**	F	WA	F	F
MN	**	F	WI	F	F

*** Not graded in 2017*

3) requiring annual tests of all outlets; 4) publishing all testing and remediation data online; 5) placing bar codes with access to filter maintenance data on fountains at school; and 6) the law applies to schools, early childhood programs, and even public parks.[75]

It is perhaps no accident that such a far-reaching measure should emerge in Washington, D.C., as the District has experienced a major crisis with lead in its drinking water. Many of the policy ideas in the ordinance came from parents and long-time lead-in-water activists, who have been spearheading the push for this precedent-setting measure. While the standard for lead in schools' water being used is Washington, D.C. is still not the most health-protective at 5 ppb, the policy as a whole earned the top grade in our report due to its pro-active approach to addressing this toxic threat.

Finally, while our analysis focused on laws applicable to schools, we did give additional credit where those same policies also applied to early childhood programs. As per a previous study by the Environmental Law Institute, some states have requirements that apply solely to child care facilities.[76] We did not include such policies in our analysis.

For a breakdown of how each state earned their grade, see our methodology section.

Extra credit projects

While many states are not making the grade on protecting children from exposure to lead in school drinking water, there are a handful of states across the country with *proposed* laws or rules that, if adopted, would increase their grade. Some of these states include Massachusetts[77], Vermont[78], Washington[79], Pennsylvania[80] and Montana[81]. This year, we graded those proposed policies; Figure 7 shows how each of these states' grades would improve if they were to adopt the policy that is currently proposed:

Figure 7: Adopting proposed policies could improve states' grades

State	Proposed Policy Grade
MA	A
WA	B+
PA	B-
VT	C

If adopted, the proposed policy from Massachusetts, H 774/S 500, would be the strongest policy nationwide based on our grading structure, earning the Bay State an "A". The bill would establish a 1 ppb standard for lead in schools' water and require outlets that exceed this level to be shut off until remediated; require proactive installation of filters and removal of lead service lines and other lead-bearing parts; require annual testing of all potable water outlets using protocols that capture worst-case lead exposure; and require transparent and accessible reporting of all results and of remediation plans.[82] The bill was introduced by Representative Ehrlich (D-Marblehead) and Senator Lovely (D- Salem), and as of February 20, 2019 has 79 co-sponsors.[83]

A strong bill is also being considered by the legislature in Washington State. Introduced by Rep. Pollet (D- 46th legislative district). HB 1860 would require schools to proactively install certified filters on potable water outlets; inventory and replace lead bearing parts in schools; design a consistent plan for testing and ensure transparent reporting of results; and shut off taps where lead in drinking water exceeds 5 ppb.[84]

A bill introduced in Pennsylvania by Representative Boback (R-District 117) will require annual testing at schools using protocols designed to capture worst-case lead exposure. If lead concentrations exceed 5 ppb, remediation must include either installing filters certified to remove lead or removing the lead parts causing the contamination. And, all specific results of the testing are to be shared online and sent home to parents, in order to ensure transparency.[85]

In Vermont S.40, An act relating to testing and remediation of lead in the drinking water of schools and child care facilities, would require schools to test all outlets used for drinking or cooking using best-practice protocols; prohibit the use of outlets where lead exceeds the established action level of 3 ppb; remediate all affected taps; and ensure fully transparent and accessible data is available for the public.[86]

In each case, the proposed policy would be a good step forward in protecting our children from exposure to lead in schools drinking water – and would earn the state a higher grade!

Solutions to Ensure Safe Drinking Water at School

All of our children deserve safe drinking water — especially at the places they go each day to learn and play. Yet we have constructed water distribution systems that deliver water to their fountains and faucets laced with lead. And wherever there is lead, there is an ever-present risk of corrosion and contamination. Given this reality, it is imperative to adopt *all* of the following solutions to ensure safe water at our schools and early childhood programs:

1) Get the Lead Out. The most effective way to ensure lead-free water for our children is, quite simply, to get the lead out. As documented above, lead service lines are a major source of water contamination. In 2015, the National Drinking Water Advisory Council — comprised of experts, advocates, and affected communities advising EPA - made the clear case for lead service line removal:

"The Council considers that the driving proactive principle to improve public health protection is removing full lead service lines from contact with drinking water to the greatest degree possible and minimizing the risks of exposure to the remaining sources of lead in the meantime."[87]

Marc Edwards, the Virginia Tech engineer who helped Flint residents confirm their water contamination, has called for the "complete removal of all lead service lines" across the country.[88]

Yet prevention cannot stop at the service line. As the data from Milwaukee to Los Angeles shows, schools and early childhood programs must take action to ensure that every part of their water delivery systems — from plumbing to fixtures to faucets — is lead-free.

2) Install and maintain certified filters. Getting the lead out will take time. In the interim, every outlet used for drinking or cooking should be fitted with filters certified by the Occupational Safety and Health Administration (OSHA), which includes accreditations such as the National Sanitation Foundation (NSF) or the American National Standards Institute (ANSI) to remove lead from water. Even with high levels of contamination in Flint, an EPA analysis documented that NSF filters proved effective at removing lead.[89]

3) Proactively prevent lead contamination. Rather than waiting for tests to confirm that the water our children drink is laced with lead, schools should be removing lead-bearing parts and installing filters certified to remove lead proactively. This preventative approach is critical because tests — even when properly done — can fail to capture lead exposure.

Moreover, a proactive prevention approach is consistent with other national policies aimed at protecting children's health from lead. To address lead from auto emissions, our nation has banned leaded gasoline. Belatedly, we also banned lead in paint.[90] For a home to be certified as lead-safe, policies require rigorous remediation to "get the lead out."

4) Require action at 1 part per billion. Medical experts agree that there is no safe level of lead, and standards that trigger mandatory remediation — often called an "action level" — should reflect this

health assessment. For this reason, the American Academy of Pediatrics is calling on officials "to ensure that water fountains in schools do not exceed water lead concentrations of 1 ppb."[91] At a minimum, outlets with water exceeding this concentration should immediately be removed from service until permanent remediation — not mere flushing — ensures safe drinking water on an ongoing basis.

5) Proper Testing. While schools must "get the lead out" proactively over time, testing in the interim can at least confirm some immediate threats to children's health and ensure that remediation steps are working properly. Schools and early childhood programs should test at all water outlets used for drinking and cooking annually, and use protocols designed to capture worst-case lead exposure for children. For example, U.S. EPA put out a clarification on sampling procedures in 2016 that recommends against pre-stagnation flushing.[92] And given the inherent variability in lead concentrations, officials must be careful to avoid suggesting that a failure to detect lead is the same as a permanent assurance of safe water.

6) Provide full disclosure and accountability. Parents have a right to know whether their children's water at school is safe. Moreover, as securing lead-free water at school will require several steps over time, transparency and accountability are critical to ensure that those steps are implemented and effective. Schools and early childhood programs should provide the public with information about lead-bearing materials in their water infrastructure, test results, and remediation plans and progress. Such information should be available both onsite and online, with community-appropriate language access. In Washington DC, resident activists have urged local officials to require a bar code on each tap at school, so that parents can verify that filters are being maintained properly at all sources used for drinking and cooking. Further, all such information should be made accessible online on a statewide basis as Massachusetts has done. This provides the public with a clear picture of the scope of the lead-in-water problem, which facilitates informed statewide policy responses.

Finally, it is critical that all of these lead prevention measures apply to outlets used for cooking as well as drinking. As Edwards explains, "If you're cooking pasta in the tap water, you're using a huge volume of water and a high flow rate. Then you pour the water away and the lead sticks to the food. The net result is almost the same as drinking that entire volume of water."[93]

Photo by Jeff Turner via Flickr, CC BY 2.0

Communities Rising to the Head of the Class

"Parents send their kids to school to be in a safe environment. You have to make sure the water the students are drinking in schools is safe."

—Mike Thomas, Superintendent of Operations, Brockton MA, after replacing all old fountains with filtered bottle filling stations[94]

A small number of cities and school communities are beginning to embrace the precautionary principle and have already been working either on getting the lead out of their water systems completely or providing a safe alternative. While we only assigned grades to states as a whole (and the District of Columbia) there are cities and school districts across the nation that are upholding more protective standards than their state. Some trailblazing cities include San Diego, Austin, Cleveland, Brockton (MA) and Madison.

San Diego's school district has committed to testing all drinking water outlets for lead and doing physical repairs anytime a water tap tests positive for lead at 5 parts per billion or higher.[95] While pediatricians stress that there is no safe level of lead for children, this 5 ppb standard is still one third of the level of lead currently allowed in school drinking water by the state of California.

The Metropolitan School District in Cleveland, Ohio has also begun taking steps to address lead contamination of schools' drinking water. After voluntarily testing more than 1,700 drinking water outlets across 69 school buildings, the district has either replaced, capped, or (in a few cases) installed a certified filter at every outlet that showed an elevated level of lead.[96] Though this approach is not pro-active and the district is still using a 15 ppb standard, the remediation steps are strong in that they "get the lead out" by removing the source of the problem.

Austin, Texas has adopted one of the most health protective standards and is working to ensure that lead in schools' water does not exceed 1 ppb, as recommended by the American Academy of Pediatrics. In order to achieve this, they will be installing (or replacing) filters certified to remove lead on any outlet that tests above this level.[97] Installing point of use filters or filtered water bottle filling stations as a source of potable water is a relatively inexpensive and easy first step to "get the lead out" of kids' water at school.

In Brockton, Massachusetts the public school district replaced all of their old water fountains with filtered

water bottle filling stations and replaced all faucets with new models that are certified lead-free. Brockton is hardly the wealthiest of school districts; 77 percent of its students receive free or reduced lunch.[98] Yet when testing showed lead in the water, Superintendent of Operations Mike Thomas decided to draw on the district's emergency contingency budget to fix the problem. When asked what compelled him to do so, Thomas said, "Parents send their kids to school to be in a safe environment. That includes the physical part of the building they're going to be in. You have to make sure the water the students are drinking in schools is safe."[99]

In Massachusetts, this message has been heard: in his FY20 budget, Governor Baker has proposed up to $30 million to help schools take first key "get the lead out" steps, such as buying filters and replacing lead bearing parts.[100]

More broadly, a trio of Midwestern cities is at the forefront of efforts to fully replace lead service lines— not just at schools and pre-schools but across their communities.

Madison, Wisconsin, is already ahead of the pack. Faced with test results confirming lead in its water, the city dug out approximately 8,000 lead pipes between 2001 and 2011. This step led to a drastic reduction in lead contamination; between 2011 and 2016, the highest lead level in the city's water was 3.5 ppb.[101] Moreover, in opting to "get the lead out" instead of adding phosphates to its water for corrosion control, Madison helped protect its beloved lakes. Phosphates contribute to algal blooms, which can harm wildlife and human health as well.[102] And in the wake of Flint, Susan Bauman, who was Mayor of Madison during the pipe replacements, can see the impact it has had on the city. "People walk up to me in the streets now and say, 'Thanks.'"[103]

Just 60 miles from Flint is Lansing, another city that has successfully removed lead from its water infrastructure. Last year, Lansing completed the removal of 14,500 lead pipes underneath the city.[104] And lastly, after identifying about 70,000 properties with lead pipes or lead service lines, Milwaukee is now planning to borrow $2.6 million from the federal-state loan fund for lead pipe replacement. The city is prioritizing lead pipe replacement at 385 daycare centers.[105]

Other cities moving forward with lead service line replacement include Galesburg, Illinois, which is using a $4 million federal loan to remove half of the estimated 10,000 lead service lines there.[106] Denver is also working to replace lead service lines as it finds them during construction projects.[107]

Methodology

For assessing state policies:

In scoring states' laws and policies related to lead in schools' drinking water, we assigned the following values for specific measures based on our assessment of their relative importance in ensuring lead-free water at school:

Point Range	Grade
0 - 39	F
40 - 64	D
65 - 79	C-
80 - 94	C
95 - 109	C+
110 - 125	B-
126 - 140	B
141 - 155	B+
156 - 170	A-
171 - 185	A
186 - 200	A+

We graded states in five main categories: Lead Standard in Water; Testing Protocols; "Get The Lead Out" Steps; Public Disclosure and Transparency; and Applicability. In some categories, the criteria were tiered so that states not taking the full recommended measure could still earn points for the steps they are taking. Where appropriate, we gave states partial credit for credible voluntary measures that, as best we could verify, were actually being implemented.

To a large degree, the successful implementation of lead prevention policies will depend on funding and enforcement. Yet funding comes from so many different sources — including the federal drinking water state revolving fund — that we could not establish a reliable way to assess sufficient funding for any given state's efforts. Similarly, absent uniform data, we had no meaningful way to compare the effectiveness of state enforcement or compliance efforts.

The following chart provides a breakdown of where each state earned (or did not earn) points on our grading structure. The policies assessed were confirmed by our directors in each state organization to ensure that 1) it was the most up-to-date policy promulgated by the state and 2) points were awarded or withheld accurately based on the requirements of the policy.

	Score	AL	AZ	CA	CO	CT	DC	FL	GA
Lead Standard in Water	**Max Score: 30 points**	**5**	**5**	**5**	**5**	**0**	**10**	**0**	**0**
Uses 1 ppb or zero	30 points					0		0	0
Uses above 1 ppb but under 15 ppb	10 points						10		
Uses 15 ppb (1 liter sample) or 20 ppb (250 mL sample)	5 points	5	5	5	5				
No standard specified	0 points								
Testing Protocols	**Max Score: 35 points**	**10**	**15**	**16**	**0**	**0**	**35**	**0**	**0**
Testing for worst-case results—several samples per tap, prohibit sampling protocols known to hide lead	15 points				0	0	15	0	0
Only prohibits protocols known to hide lead	10 points	10	10	10					
Tests all faucets and fountains used for drinking or cooking at every school	15 points	0	0		0	0	15	0	0
Tests at least some outlets at every school	5 points		5	5					
Tests every year at schools	5 points	0	0		0	0	5	0	0
Tests every 2-5 years at schools	2 points								
Only requires schools to test once	1 point			1					
No testing required	0 points								
"Get The Lead Out" Steps	**Max Score: 95 points**	**0**	**15**	**40**	**0**	**0**	**55**	**0**	**0**
Requires pro-active replacement of fountains, faucets and/or other lead-bearing parts	30 points	0	0	0	0	0	0	0	0
Requires pro-active installation of filters certified to remove lead at every outlet used for drinking or cooking	25 points	0	0	0	0	0	25	0	0
Requires immediate shut off of potable water outlets that exceed testing standard for lead	20 points	0	5	20	0	0	20	0	0
Remediation requires removing lead bearing parts or installing filters certified to remove lead	20 points	0	0	20	0	0		0	0
Requires some remediation, but there is broad discretion (could allow flushing only, etc.)	10 points		10				10		
No remedation required	0 points								
Public Disclosure and Transparency	**Max Score: 20 points**	**10**	**10**	**13**	**10**	**0**	**18**	**0**	**0**
Disclosure of lead infrastructure: service lines, fixtures	5 points	0	0	3	0	0	3	0	0
Disclosure of all specific test results	5 points	5	5	5	5	0	5	0	0
Disclosure information available online	5 points	5	5	5	5	0	5	0	0
Disclosure of remediation plan and implementation	5 points	0	0	0	0	0	5	0	0
Applicability	**Max Score: 20 points**	**0**	**0**	**10**	**0**	**0**	**20**	**0**	**0**
Laws cover all schools and all child care centers	20 points	0	0	10	0	0	20	0	0
Total Points	**200**	**25**	**45**	**84**	**15**	**0**	**138**	**0**	**0**
BONUS POINTS - Proactive removal of LSLs system wide	Max Bonus: 30 points	0	0	20	0	0	10	0	0
Final Score		25	45	104	15	0	148	0	0
GRADE		**F**	**D**	**C+**	**F**	**F**	**B+**	**F**	**F**

	Score	IL	IN	LA	MD	MA	ME	MI	MN
Lead Standard in Water	**Max Score: 30 points**	**30**	**5**	**0**	**5**	**5**	**0**	**0**	**0**
Uses 1 ppb or zero	30 points	30		0			0	0	
Uses above 1 ppb but under 15 ppb	10 points								
Uses 15 ppb (1 liter sample) or 20 ppb (250 mL sample)	5 points		5		5	5			
No standard specified	0 points								
Testing Protocols	**Max Score: 35 points**	**31**	**10**	**0**	**35**	**15**	**0**	**0**	**27**
Testing for worst-case results—several samples per tap, prohibit sampling protocols known to hide lead	15 points	15		0	15	15	0	0	
Only prohibits protocols known to hide lead	10 points		10						10
Tests all faucets and fountains used for drinking or cooking at every school	15 points	15	0	0	15	0	0	0	15
Tests at least some outlets at every school	5 points								
Tests every year at schools	5 points		0	0	5	0	0	0	
Tests every 2-5 years at schools	2 points								2
Only requires schools to test once	1 point	1							
No testing required	0 points								
"Get The Lead Out" Steps	**Max Score: 95 points**	**30**	**0**	**0**	**30**	**0**	**0**	**0**	**0**
Requires pro-active replacement of fountains, faucets and/or other lead-bearing parts	30 points	0	0	0	0	0	0	0	0
Requires pro-active installation of filters certified to remove lead at every outlet used for drinking or cooking	25 points	0	0	0	0	0	0	0	0
Requires immediate shut off of potable water outlets that exceed testing standard for lead	20 points	20	0	0	20	0	0	0	0
Remediation requires removing lead bearing parts or installing filters certified to remove lead	20 points		0	0		0	0	0	0
Requires some remediation, but there is broad discretion (could allow flushing only, etc.)	10 points	10			10				
No remedation required	0 points								
Public Disclosure and Transparency	**Max Score: 20 points**	**6**	**5**	**10**	**5**	**10**	**0**	**0**	**5**
Disclosure of lead infrastructure: service lines, fixtures	5 points	0	0	0	0	0	0	0	0
Disclosure of all specific test results	5 points	3	0	5	0	5	0	0	5
Disclosure information available online	5 points	3	5	5	5	5	0	0	0
Disclosure of remediation plan and implementation	5 points	0	0	0	0	0	0	0	0
Applicability	**Max Score: 20 points**	**10**	**0**	**0**	**5**	**0**	**0**	**0**	**5**
Laws cover all schools and all child care centers	20 points	10	0	0	5	0	0	0	5
Total Points	**200**	**107**	**20**	**10**	**80**	**30**	**0**	**0**	**37**
BONUS POINTS - Proactive removal of LSLs system wide	Max Bonus: 30 points	10	10	0	0	10	0	30	0
Final Score		117	30	10	80	40	0	30	37
GRADE		**B-**	**F**	**F**	**C**	**D**	**F**	**F**	**F**

	Score	MT	NC	NH	NJ	NM	NY	OH	OR
Lead Standard in Water	**Max Score: 30 points**	**0**	**0**	**5**	**5**	**0**	**5**	**5**	**5**
Uses 1 ppb or zero	30 points	0	0			0			
Uses above 1 ppb but under 15 ppb	10 points								
Uses 15 ppb (1 liter sample) or 20 ppb (250 mL sample)	5 points			5	5		5	5	5
No standard specified	0 points								
Testing Protocols	**Max Score: 35 points**	**0**	**0**	**32**	**26**	**0**	**27**	**15**	**28**
Testing for worst-case results—several samples per tap, prohibit sampling protocols known to hide lead	15 points	0	0	15		0		15	12
Only prohibits protocols known to hide lead	10 points				10		10		
Tests all faucets and fountains used for drinking or cooking at every school	15 points	0	0	15	15	0	15	0	15
Tests at least some outlets at every school	5 points								
Tests every year at schools	5 points	0	0			0		0	
Tests every 2-5 years at schools	2 points			2	1		2		1
Only requires schools to test once	1 point								
No testing required	0 points								
"Get The Lead Out" Steps	**Max Score: 95 points**	**0**	**0**	**20**	**20**	**0**	**30**	**5**	**40**
Requires pro-active replacement of fountains, faucets and/or other lead-bearing parts	30 points	0	0	0	0	0	0	0	0
Requires pro-active installation of filters certified to remove lead at every outlet used for drinking or cooking	25 points	0	0	0	0	0	0	0	0
Requires immediate shut off of potable water outlets that exceed testing standard for lead	20 points	0	0	10	20	0	20	0	20
Remediation requires removing lead bearing parts or installing filters certified to remove lead	20 points	0	0	0	0	0		5	20
Requires some remediation, but there is broad discretion (could allow flushing only, etc.)	10 points			10			10		
No remedation required	0 points								
Public Disclosure and Transparency	**Max Score: 20 points**	**0**	**0**	**5**	**10**	**0**	**15**	**0**	**15**
Disclosure of lead infrastructure: service lines, fixtures	5 points	0	0	5	0	0	0	0	0
Disclosure of all specific test results	5 points	0	0	0	5	0	5	0	5
Disclosure information available online	5 points	0	0	0	5	0	5	0	5
Disclosure of remediation plan and implementation	5 points	0	0	0	0	0	5	0	5
Applicability	**Max Score: 20 points**	**0**	**0**	**20**	**20**	**0**	**20**	**0**	**20**
Laws cover all schools and all child care centers	20 points	0	0	20	20	0	20	0	20
Total Points	**200**	**0**	**0**	**82**	**81**	**0**	**97**	**25**	**108**
BONUS POINTS - Proactive removal of LSLs system wide	Max Bonus: 30 points	0	0	0	0	0	10	0	0
Final Score		0	0	0	0	0	107	25	108
GRADE		**F**	**F**	**C**	**C**	**F**	**C+**	**F**	**C+**

	Score	PA	RI	TN	TX	VA	VT	WA*	WI
Lead Standard in Water	**Max Score: 30 points**	**5**	**0**	**5**	**0**	**0**	**0**	**5**	**0**
Uses 1 ppb or zero	30 points		0		0		0		0
Uses above 1 ppb but under 15 ppb	10 points								
Uses 15 ppb (1 liter sample) or 20 ppb (250 mL sample)	5 points	5		5				5	
No standard specified	0 points								
Testing Protocols	**Max Score: 35 points**	**3**	**10**		**0**	**15**	**0**	**0**	**0**
Testing for worst-case results—several samples per tap, prohibit sampling protocols known to hide lead	15 points	0			0	0	0	0	0
Only prohibits protocols known to hide lead	10 points		10	10					
Tests all faucets and fountains used for drinking or cooking at every school	15 points	0	0	0	0	15	0	0	0
Tests at least some outlets at every school	5 points								
Tests every year at schools	5 points	3	0		0	0	0	0	0
Tests every 2-5 years at schools	2 points								
Only requires schools to test once	1 point			1					
No testing required	0 points								
"Get The Lead Out" Steps	**Max Score: 95 points**	**10**	**0**	**20**	**0**	**0**	**0**	**0**	**0**
Requires pro-active replacement of fountains, faucets and/or other lead-bearing parts	30 points	0	0	0	0	0	0	0	0
Requires pro-active installation of filters certified to remove lead at every outlet used for drinking or cooking	25 points	0	0	0	0	0	0	0	0
Requires immediate shut off of potable water outlets that exceed testing standard for lead	20 points	0	0	20	0	0	0	0	0
Remediation requires removing lead bearing parts or installing filters certified to remove lead	20 points		0	0	0	0	0	0	0
Requires some remediation, but there is broad discretion (could allow flushing only, etc.)	10 points	10							
No remedation required	0 points								
Public Disclosure and Transparency	**Max Score: 20 points**	**5**	**5**	**3**	**0**	**0**	**0**	**0**	**0**
Disclosure of lead infrastructure: service lines, fixtures	5 points	0	0	0	0	0	0	0	0
Disclosure of all specific test results	5 points	0	0	3	0	0	0	0	0
Disclosure information available online	5 points	5	5	0	0	0	0	0	0
Disclosure of remediation plan and implementation	5 points	0	0	0	0	0	0	0	0
Applicability	**Max Score: 20 points**	**0**	**20**	**0**	**0**	**0**	**0**	**0**	**0**
Laws cover all schools and all child care centers	20 points	0	20	0	0	0	0	0	0
Total Points	**200**	**23**	**35**	**39**	**0**	**15**	**0**	**5**	**0**
BONUS POINTS - Proactive removal of LSLs system wide	Max Bonus: 30 points	10	0	0	0	5	0	20	10
Final Score		33	35	39	0	20	0	25	10
GRADE		**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**

**Washington state score only reflects policies related to schools.*

How the States Earned Their Grades: *Explanations of partial credit and sources*

Alabama

Points:

Lead Standard
- Uses a 20 ppb standard.[1] - **5 points**
- Testing Protocols
- Prohibits protocols known to hide lead.[1] - **10 points**
- Tests all taps used for drinking or cooking.[3] - **0 points**
  - At a minimum, each participating school shall have at least one water cooler and one kitchen sink tested.

"Get The Lead Out" steps
- None required - **0 points**

Public Disclosure and Transparency
- Disclosure of all specific results.[3] - **5 points**
- Disclosure of results available online.[3] - **5 points**

Applicability
- Not applicable to all schools or all preschools - **0 points**
  - Voluntary school testing program.[1]

Sources

1 Alabama Department of Environmental Management, "Lead Testing in Public Schools Sampling Plan." Accessed March 6th 2019 at http://www.adem.state.al.us/programs/water/waterforms/LeadTestingatSchoolsSamplingPlan.pdf

2 State of Alabama Department of Education, "Alabama state department of education and alabama department of environmental management to assist in determining lead levels in drinking water in pre-k through grade 12 public schools," November 15th, 2016. Available at https://www.alsde.edu/sec/comm/News%20Releases/11-15-2016%20ADEM%20Water%20Testing.docx.pdf

3 Alabama Department of Environmental Management, "Determining Lead Levels in Drinking Water Alabama's PK thru 12 Public Schools Master Plan." Accessed March 6th 2019 at http://www.adem.state.al.us/programs/water/waterforms/LeadTestingatSchoolsMasterPlan.pdf

Arizona

Points:

Lead Standard
- Uses a 15 ppb standard [1] - **5 points**

Testing Protocols
- Only prohibits protocols known to hide lead [2] - **10 points**
- Tests at least some outlets at every school [2] - **5 points**
  - Select two sampling locations from each building built before January 1, 1988 and one sample location for buildings built after this date
- Frequency: 1 time program - **0 points**

"Get The Lead Out" steps
- No proactive measures **- 0 points**
- Requires immediate shut off of potable water outlets exceeding testing standard for lead [1] - **5 out of 20 points**
  - If two taps tested exceed 50 ppb, the school is required to shut off ALL their water
- Requires some remediation, but there is broad discretion (could allow flushing only, etc.) [1] - **10 points**

Public Disclosure and Transparency
- Disclosure of all specific test results [3] - **5 points**
- Disclosure information available online (in google drive) [3] - **5 points**

Applicability
- Only applies to schools, not child care centers **- 0 points**

Sources

1 Arizona Department of Environmental Quality, "Public School Drinking Water Lead Screening Program Corrective Action Guidance." Accessed March 6th 2019 at http://static.azdeq.gov/wqd/pb_schools/corrective_action_guide.pdf

2 Arizona Department of Environmental Quality, "Arizona Department of Environmental Quality Public School Lead Drinking Water Screening Program Sampling Plan & Collection Log for Experienced Sample Collectors." Accessed March 6th 2019 at http://static.azdeq.gov/wqd/pb_schools/sample_collection_short.pdf

3 ADEQ Lead in Drinking Water Results. Available on Google Drive at https://drive.google.com/drive/folders/1_WEyjhNH-Ga208HrplV9Bafja6Z4mWxD

California

Points:

Lead Standard

- Uses action level of 15 ppb[2]- **5 points**

Testing Protocols

- Prohibits sampling protocols known to hide lead.[3] - **10 points**
- Tests at least some outlets at every school.[3] - **5 points**
  - Must test at least 5 outlets at every school
- Every school must test, but only once.[2] - **1 point**
  - partial credit because mandatory testing, but just once, not continued

"Get The Lead Out" steps

- Requires immediate shut off of taps exceeding action level.[2] - **20 points**
- Remediation requires removing lead bearing parts or installing filters certified to remove lead.[2] - **20 points**

Public Disclosure and Transparency

- Disclosure of lead infrastructure.[5] - **3 out of 5 points**
  - Disclosure of lead infrastructure (just service lines) required by CWS, partial credit because LSLs are the only infrastructure that must be disclosed
- Disclosure of all specific test results.[4] - **5 points**
- Disclosure of results available online.[4] - **5 points**

Applicability

- Applies to schools and child care facilities.[2] - **10 out of 20 points**
  - Required to test the lead levels of drinking water at ALL California public, K-12 schools and preschools and child day care facilities located on public school property, *partial credit* because only for schools built before 2010

Bonus points

- Required pro-active removal of LSLs statement[1] - **20 points out of 30**
  - No enforceable timeline

Sources

1 An act to add Section 116885 to the Health and Safety Code, relating to drinking water, SB 1398. September 27th 2016. Available at http://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201520160SB1398

2 Health and Safety Code: Pure and Safe Drinking Water, Article 1 added by Stats. 1995, Ch. 415, Sec. 6. Effective January 1st 2019. Available at https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=HSC&sectionNum=116277

3 California Water Boards, "SAMPLING GUIDANCE: Collecting Drinking Water Samples for Lead Testing At K-12 Schools," December, 8th 2017. Available at https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/leadsamplinginschools/sampling_guidance_final.pdf

4 California Water Board, "Lead Sampling of Drinking Water," February 15th, 2019. Available at https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/leadsamplinginschools.html

5 California Water Board, "Lead Service Line Inventory Requirement for Public Water Systems," February 14th, 2019. Available at https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/lead_service_line_inventory_pws.html

Colorado

Points:

Lead Standard
- Uses a 15 ppb standard.[1] **- 5 points**

Testing Protocols
- None required **- 0 points**
  - There are training videos on the CO website, but there is nothing that mandates schools to adhere to these protocols

"Get The Lead Out" steps
- None required **- 0 points**
  - HB 17-1306 requires the Department of Public Health & Environment to create a grant program for public schools to test, but does not include any enforceable "get the lead out" steps.[2]

Public Disclosure and Transparency
- Disclosure of all specific results.[1] **- 5 points**
- Disclosure of results available online.[1] **- 5 points**

Applicability
- A grant program that allows schools to apply for reimbursements for testing their water, which does not apply to child care centers **- 0 points**

Sources

1 Colorado Department of Public Health and Environment, "School Lead Testing Results." Available at https://www.colorado.gov/pacific/cdphe/school-lead-testing-results

2 "Test Lead in Public Schools' Drinking Water", HB17-1306. 2017. Available at https://leg.colorado.gov/bills/hb17-1306

Connecticut - No Policy

Washington, D.C.

Points:

Lead Standard
- Uses action level of 5 ppb.[1] - **10 points**

Testing Protocols
- Testing for worst-case scenarios.[3] - **15 points**
- Tests all drinking water sources.[1] - **15 points**
- Tests all sources annually.[1] - **5 points**

"Get The Lead Out" steps
- Required proactive installation of filters at every tap/fountain used for drinking or cooking.[1] - **25 points**
- Requires immediate shut off of potable water outlets exceeding 5 ppb.[1] - **20 points**
- Requires some remediation, but there is broad discretion.[1] - **10 points**

Public Disclosure and Transparency
- Disclosure of lead infrastructure.[4] - **3 out of 5 points**
  - Disclosure of lead service lines - partial credit because not mandating disclosure of fixtures
- Disclosure of all specific test results.[1] -**5 points**
- Disclosure of all results available online.[1] - **5 points**
- Disclosure of remediation plan.[1] - **5 points**
  - Disclosure of remediation plan implementation to COO, and notification of parents for any exceedance

Applicability
- Applies to all schools and child care facilities.[1,5] - **20 points**
  - DCPS includes child care facilities, and this law covers every DCPS; therefore including pre-schools and child care facilities

Bonus Points:
- Proactive removal of LSLs.[2] **- 10 points out of 30**
  - Partial credit for a planned District wide program that requires proactive removal of LSLs

Sources

1 § 38–825.01a. Prevention of lead in drinking water in schools. Available at https://code.dccouncil.us/dc/council/code/sections/38-825.01a.html

2 DC Water, "New District Lead Service Line Replacement Program Offers Historic Opportunity To Replace Old Plumbing," December 6th 2018. Available at https://www.dcwater.com/whats-going-on/news/new-district-lead-service-line-replacement-program-offers-historic-opportunity

3 Department of General Services, "Water Filtration and Testing Protocol," September 28th 2017. Available at https://dgs.dc.gov/sites/default/files/dc/sites/dgs/publication/attachments/Water-Filtration-and-Testing-Protocol-9-28-17.pdf

4 DC Water, "DC Water Service Information" Available at https://geo.dcwater.com/Lead/

5 District of Columbia Public Schools, "Early Learning" Available at https://dcps.dc.gov/ece

Florida- No Policy

Georgia - No Policy

Illinois

Points:

Lead Standard

- Uses a 1 ppb standard for lead.[1] - **30 points**
  - Requires schools to remediate ANY level of lead found, de facto 1 ppb standard

Testing Protocols

- Tests for worst case results.[3] - **15 points**
- Tests all potable water outlets.[3] - **15 points**
- Test schools one time.[3] - **1 point**
  - One time testing program that applies to every school built pre-2010

"Get The Lead Out" steps

- Requires immediate shut off of water outlets used for drinking or cooking that exceed testing standard for lead. [1] - **20 points**
  - Per step 5 of DPH document
- Requires some remediation, but can include just flushing.[1] - **10 points**

Public Disclosure and Transparency

- Disclosure of test results online.[3] - **3 out of 5 points**
  - For samples exceeding 5 ppb, results may be posted online or may be sent directly to parents via email
- Disclosure of the specific sampling result.[3] - **3 out of 5**
  - Partial credit because only mandated if a test exceeds 5 ppb

Applicability

- Applies to schools and child care centers.[1]- **10 out of 20 points**
  - Partial credit because applies to those built before 2000

Bonus Points:

- Requires replacement of lead service lines.[1] **10 out of 30 points**
  - Requires replacement if the lead standard is triggered so partial credit

Sources

1 Illinois Department of Public Health, "Mitigation Strategies for Lead Found in School Drinking Water." Available at http://www.dph.illinois.gov/sites/default/files/publications/school-lead-mitigation-strategies-050917.pdf

2 Illinois Lead Service Line Replacement Appendix A. Available at https://www2.illinois.gov/epa/Documents/iepa/compliance-enforcement/drinking-water/sample-collectors-handbook/ch-4-pbcu-appendix-i-lead-service-line-replacement.pdf

3 Illinois General Assembly, "225 ILCS 320: Illinois Plumbing License Law" Available at http://www.ilga.gov/legislation/ilcs/ilcs3.asp?ActID=1343&ChapterID=24

Indiana

Points:

Lead Standard
- Uses a 15 ppb standard.[1] - **5 points**

Testing Protocols
- Prohibits sampling protocols known to hide lead.[3]- **10 points**

"Get The Lead Out" steps
- Nothing required - **0 points**

Public Disclosure and Transparency
- Results posted online.[2] - **5 points**

Applicability
- Does not apply to all schools or child care centers.[2] - **0 out of 15 points**
  - Voluntary but well-funded program, so not mandatory
  - Only K-12 schools can opt-in

Bonus Points:
- Indiana Subsidiary of American Water Company filed a plan with Indiana Utility Regulatory Commission to fully replace LSLs in communities it serves in the next 10 to 24 years - **10 out of 30 points**

Sources

1 Indiana Finance Authority, "Lead Sampling Program," 2018. Available at https://www.in.gov/ifa/2958.htm

2 Indiana Finance Authority, "Indiana Lead Sampling Program for Public Schools: Enrollment and Results." Available at https://www.in.gov/ifa/files/12.17.18%20Lead%20Sampling%20Program%20Enrollment%20and%20Results.pdf

3 IFA's Lead Sampling Program for Public Schools, "Guidance For Schools." Available at https://www.in.gov/ifa/files/IFA%20Lead%20Sampling%20Program%20Guidance%20for%20Schools.pdf

4 IFA Lead Sampling Program, "Frequently Asked Questions," 2017. Available at https://www.in.gov/ifa/files/IFA%20Lead%20Sampling%20Program%20for%20Schools%20FAQ.pdf

5 IURC Online Services Portal, "Docketed Case 45043" available at https://iurc.portal.in.gov/legal-case-details/?id=cf202ede-c405-e811-811c-1458d04eaba0

Louisiana

Points:

Lead Standard
- Does not have an action level.[1,2] **- 0 points**

Testing Protocols
- Only tests in 12 schools.[2] **- 0 points**

"Get The Lead Out" steps
- None required

Public Disclosure and Transparency
- All specific results of testing are disclosed.[1] **- 5 points**
- All results published online.[1] **- 5 points**

Applicability
- Only applies to 12 schools - **0 points**

Sources

1 Louisiana Department of Health, "School Water testing Pilot Program." Accessed March 6 2019 at http://ldh.la.gov/index.cfm/page/3275

2 "An Act to enact R.S. 40:5.6.1, relative to safe drinking water; to authorize a pilot program for 3 drinking water testing at schools; and to provide for related matters." HB. 632. 2018 Available at http://www.legis.la.gov/legis/ViewDocument.aspx?d=1103405

Maryland

Points:

Lead Standard
- Uses a 15 ppb standard.[2] - **5 points**

Testing Protocols
- Testing for worst-case results.[1] - **15 points**
  - several samples per tap, prohibit sampling protocols known to hide lead per section 6-1502 (C)(3)
- Tests all faucets or fountains used for drinking or cooking.[1] **- 15 points**
- Testing required every year.[1] - **5 points**

"Get The Lead Out" steps
- Requires shut off of outlets exceeding testing standard.[1]- **20 points**
  - If there is an elevated level of lead in a drinking water outlet, access to the drinking water outlet be closed per section (C)(7)(II)

Requires some remediation.[1]- **10 points**
  - Broad range of possible remediation actions that includes flushing as an option, (C)(7)(IV)

Public Disclosure and Transparency
- Sampling results posted online.[1] - **5 points**

Applicability
- Does not apply to daycare centers
- Applies to all schools (not limited by year) - **5 points**

Sources

1 "AN ACT concerning Environment – Testing for Lead in Drinking Water – Public and Nonpublic Schools" HB 270. Available at http://mgaleg.maryland.gov/2017RS/chapters_noln/Ch_386_hb0270T.pdf

2 Maryland Department of the Environment, "Testing for Lead in Drinking Water - Public and Nonpublic Schools" Available at https://mde.maryland.gov/programs/Water/water_supply/Pages/Testing-For-Lead-In-Drinking-Water-Public-and-Nonpublic-Schools.aspx

Massachusetts

Points:

Lead Standard
- Uses a 15 ppb standard.[1] **- 5 points**

Testing Protocols
- Test for worst-case lead exposure.[2] **- 15 points**
- Voluntary program; does not test multiple times, does not test all faucets and fountains **- 0 points**

"Get The Lead Out" steps
- No requirements **- 0 points**

Public Disclosure and Transparency
- Disclosure of all specific test results.[3] **- 5 points**
- Disclosure information available online.[3] **- 5 points**

Applicability
- Voluntary program. **- 0 points**

Bonus Points
- Voluntary but very well-funded LSL replacement program. **- 10 points**

Sources

1 Massachusetts Department of Environmental Protection, "Lead and Copper in School Drinking Water Sampling Results." Available at https://www.mass.gov/service-details/lead-and-copper-in-school-drinking-water-sampling-results

2 Massachusetts Department of Environmental Protection, "Sampling for Lead and Copper at Schools and Childcare Facilities." Available at https://www.mass.gov/guides/sampling-for-lead-and-copper-at-schools-and-childcare-facilities#collecting-samples-from-faucets-and-fountains

3 Massachusetts Department of Energy and Environmental Affairs Data Portal, available at https://eeaonline.eea.state.ma.us/portal#!/search/leadandcopper

4 Massachusetts Department of Environmental Protection, "Incentivized Lead Service Line Replacement Program." Available at https://www.mass.gov/service-details/incentivized-lead-service-line-replacement-program

Maine- No Policy

Michigan

Points:

Lead Standard
- No policy **- 0 points**

Testing Protocols
- No policy **- 0 points**

"Get The Lead Out" steps
- No policy **- 0 points**

Public Disclosure and Transparency
- No policy **- 0 points**

Applicability
- No policy **- 0 points**

Bonus Points
- Mandatory replacement of all LSLs **- 30 points**
  - Paid for entirely by Public Water Systems in the next 20 years

Sources

1 Michigan DEQ, "drinking water and municipal assistance division R 325.10101 to R 325.12820" available at http://src.bna.com/zCj

Minnesota

Points:

Lead Standard
- No standard in the law - **0 points**

Testing Protocols
- Only prohibits protocols known to hide lead.[1]- **10 points**
- Tests all faucets and fountains used for drinking or cooking.[1] - **15 points**
- Tests every five years.[1] - **2 points**

"Get The Lead Out" steps
- No remediation or pro-active steps required - **0 points**

Public Disclosure and Transparency
- Disclosure of all test results.[1] - **5 points**

Applicability
- Applies to *all* schools (not limited by year) **- 5 points out of 20**
  - Partial credit because it's happening in every school (not limited by year) but not happening in pre-school

Sources

1 2018 Minnesota Statutes, "121A.335 LEAD IN SCHOOL DRINKING WATER" available at https://www.revisor.mn.gov/statutes/cite/121A.335

Montana - No Policy

North Carolina - No Policy

New Hampshire

Points:

Lead Standard
- Uses a 15 ppb standard.[2] - **5 points**

Testing Protocols
- Testing for worst-case results -- several samples per tap, prohibit sampling protocols known to hide lead.[1] - **15 points**
  - Schools are required to test in accordance to the technical guidance provided by the DEP, in this case the 3Ts guidance on testing, which is inclusive of all testing best practices
- Tests every outlet used for drinking and cooking.[1] - **15 points**
- Testing once every five years.[1] - **2 points**

"Get The Lead Out" steps
- Requires immediate shut off of potable water outlets that exceed testing standard for lead.[1] - **10 out of 20 points**
  - If a tap exceeds the level, schools must ensure that the children are provided only drinking water that meets the standard; partial credit because it doesn't require the outlet is *shut off*, but it does say that kids must be provided alternate water
- Requires some remediation, but a broad discretion.[1] - **10 points**

Public Disclosure and Transparency
- Disclosure of lead infrastructure.[1]- **5 points**

Applicability
- Applies to public and private schools and licensed and license-exempt child care centers.[1] - **20 points**

Sources

1 "Preventing childhood lead poisoning from paint and water," New Hampshire SB 247. Available at https://legiscan.com/NH/text/SB247/id/1662028

2 New Hampshire Department of Environmental Services, "Lead in Drinking Water" available at https://www.des.nh.gov/organization/divisions/water/dwgb/lead-drinking-water.htm

New Jersey

Points:

Lead Standard
- Uses a 15 ppb standard. [1] - **5 points**

Testing Protocols
- Prohibits sampling protocols known to hide lead.[1] - **10 points**
  - Per section (d)1.(iii)(1)
- Test all faucets and fountains used for drinking or cooking.[1] **- 15 points**
- Requires testing once every six years.[1] - **1 out of 2 points**
  - Partial credit because longer than every 5 years, but more than just once

"Get The Lead Out" steps
- Requires immediate shut off of potable water outlets that exceed testing standard for lead.[1]- **20 points**

Public Disclosure and Transparency
- Disclosure of all specific results.[1] **- 5 points**
  - Per section (e)(1)
- Disclosure of all results online.[1] **- 5 points**
  - Per section (e)(1).

Applicability
- Applies to all schools and child care centers.[1] **- 20 points**

Sources

1 New Jersey Education Code, "N.J.A.C. 6A:26, EDUCATIONAL FACILITIES" available at https://www.state.nj.us/education/code/current/title6a/chap26.pdf

New Mexico - No Policy

New York

Points:

Lead Standard
- Uses a 15 ppb standard.[1] - **5 points**

Testing Protocols
- Prohibits sampling protocols known to hide lead.[1,2] - **10 points**
  - they have re-adjusted their guidance to ensure testing is done according to proper protocol.[2]
- Test all faucets and fountains used for drinking or cooking.[1]- **15 points**
- Test every 2-5 years.[1] **-2 points**

"Get The Lead Out" steps
- Requires immediate shut off of water outlets used for drinking or cooking that exceed testing standard for lead.[1] - **20 points**
- Requires some remediation (broad discretion, could allow flushing only.[1]- **10 points**

Public Disclosure and Transparency
- Disclosure of all specific test results.[1]**- 5 points**
- Disclosure information available online.[1] - **5 points**
- Disclosure of remediation plan and implementation.[1]**- 5 points**

Applicability
- Applies to pre-kindergarten through 12th grade.[1] - **20 points**

Bonus:
- Incentivized lead service line replacement.[3,4] **- 10 points**

Sources

1 New York Department of Health, "Subpart 67-4 Lead Testing in School Drinking Water" available at https://regs.health.ny.gov/book/export/html/56608

2 New York State Department of Health, "Lead in school drinking water status report," January 27 2017 available at https://www.health.ny.gov/press/releases/2017/docs/lead_in_school_drinking_water_report.pdf

3 New York State Assembly Bill A03007B. January 23 2017. Available at https://nyassembly.gov/leg/?default_fld=&leg_video=&bn=A03007&term=2017&Summary=Y&Text=Y

4 NY Assembly, "Assembly Secures $2.5 Billion in Water Quality Improvement Funding in 2017-2018 SFY Budget" available at https://nyassembly.gov/Press/20170407/

Ohio

Points:

Lead Standard
- Uses a 15 ppb standard.[1] **- 5 points**

Testing Protocols
- Testing for worst-case exposure **- 15 points**
  - In order to be eligible for reimbursement, the testing must be done according to EPA protocols.[2]

"Get The Lead Out" steps
- Remediation requires replacing plumbing or installing filters **- 5 out of 20 points**
  - Partial credit because there is a well-funded program that provides money for schools to take these steps but it is not required; had a 45% participation rate.

Public Disclosure and Transparency
- Nothing in the law **- 0 points**

Applicability
- Voluntary but well-funded program **- 0 points**

Sources

1 Ohio Facilities Construction Commission, "Lead plumbing fixture replacement assistance grants program," January 2019. Available at https://ofcc.ohio.gov/Portals/0/PbGP%20Program%20Results%20FINAL%20January%202019.pdf

2 131st General Assembly Regular Session, H.B. No. 390 available at https://dsnews.com/wp-content/uploads/2016/05/hb390_04_PS.pdf

Oregon

Points:

Lead Standard
- Uses a 15 ppb action level.[1] - **5 points**
  - Per section 5 of the bill

Testing Protocols
- Prohibits sampling protocols known to hide lead.[1]- **12 out of 15 points points**
  - Only requires a first draw sample unless the tap exceeds 15 ppb on the first draw. Partial credit because multiple tests are only required where exceedances are found.
- Tests all faucets or fountains used for drinking or cooking.[1]- **15 points**
- School must test once every 6 years .[1] - **1 out of 2 points**
  - Partial credit because it's more than every 5 years, but it does require repeat testing.

"Get The Lead Out" steps
- Requires immediate shut off of potable water outlets that exceed testing standard for lead.[1]**- 20 points**
- Remediation requires removing lead bearing parts or installing filters certified to remove lead.[1] - **20 points**
  - Flushing is not an accepted mitigation strategy, as defined by section (6)(b).

Public Disclosure and Transparency
- Disclosure of all specific test results.[1]- **5 points**
  - Per section (3)(d) of ORS 332.334
- Disclosure information available online.[1]**- 5 points**
  - Per section (4) of ORS 332.334
- Disclosure of remediation plan.[1]- **5 points**
  - per section (3)(e) of ORS 332.334

Applicability
- Applies to schools and child care centers.[1,2] - **20 points**
  - Two different rules -- but there are rules for both that are equally protective

Sources:

1 Oregon Administrative Rules, "Reducing Lead in School Drinking Water," available at https://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/DRINKINGWATER/RULES/Documents/rulerevision/lead-testing-in-schools-FINAL-11-28-formatted.pdf

2 Oregon Early Learning, "Preventing exposure to lead" available at https://oregonearlylearning.com/lead-poisoning-prevention/

Pennsylvania

Points:

Lead Standard
- Uses a 15 ppb standard.[1] - **5 points**

Testing Protocols
- Requires annual testing.[1]- **3 out of 5 points**
  - Partial credit; schools must test every year or hold a public meeting to explain why they're not testing

"Get The Lead Out" steps
- Requires some remediation, but broad discretion.[1] - **10 points**

Public Disclosure and Transparency
- Disclosure of results online.[1] - **5 points**

Applicability
- Does not mandate every school to act and doesn't apply to childcare - **0 points**

Bonus Points:
- Proactive removal of Lead Service lines.[2,3] - **10 points**
  - Has an incentivized LSL removal program and private water systems can replace public side pipes

Sources

1 Pennsylvania Act 39, "An act relating to the public school system" available at https://www.legis.state.pa.us/cfdocs/legis/li/uconsCheck.cfm?yr=2018&sessInd=0&act=39

2 "Governor Wolf Announces Funding to Support PWSA Lead Line Replacement," October 17th 2018 available at https://www.governor.pa.gov/governor-wolf-announces-funding-support-pwsa-lead-line-replacement/

3 Environmental Defense Fund, "Pennsylvania empowers municipalities to replace lead service lines," December 11, 2017. Available at http://blogs.edf.org/health/2017/12/11/pennsylvania-lead-service-lines/

Rhode Island

Points:

Lead Standard
- No standard established **- 0 points**

Testing Protocols
- Prohibits sampling protocols known to hide lead.[1]- **10 points**

"Get The Lead Out" steps
- None **- 0 points**

Public Disclosure and Transparency
- Disclosure of testing results is available online.[1] - **5 points**

Applicability
- Tests all public schools pre-k through grade 12 and daycare facilities.[2] - **20 points**

Sources

1 Rhode Island Department of Health, "Lead in School and Daycare Facility Drinking Water" available at http://health.ri.gov/data/schools/water/

2 "An Act Relating to Water and Navigation - Lead and Copper Drinking Water Protection Act" H 8127. Enacted July 12 2016. Available at http://webserver.rilin.state.ri.us/PublicLaws/law16/law16439.htm

Tennessee

Points:

Lead Standard
- Uses a 20 ppb standard for lead.[1] - **5 points**

Testing Protocols
- Only prohibits protocols known to hide lead.[1] **-10 points**
- Frequency of testing.[1] - **1 point**
  - Requires schools test "periodically" but not to exceed biennially

"Get The Lead Out" steps
- Requires immediate shut off of potable water outlets that exceed testing standard for lead.[1] - **20 points**

Public Disclosure and Transparency
- Disclosure of all specific results.[1] - **3 out of 5**
  - Disclosure of all specific results to parents if there is an exceedance

Applicability
- Does not apply to all schools **- 0 points**

Source

1 "AN ACT to amend Tennessee Code Annotated, Title 49; Title 68 and Title 69, relative to water quality in schools," Tennessee Public Chapter No. 977. Available at https://publications.tnsos-files.com/acts/110/pub/pc0977.pdf

Texas - No policy

Virginia

Points:

Lead Standard
- No standard established.[1] - **0 points**

Testing Protocols
- Test all faucets and fountains used for drinking or cooking.[1] - **15 points**

"Get The Lead Out" steps
- No steps required by the law.[1] - **0 points**

Public Disclosure and Transparency
- No notification required.[1] - **0 points**

Applicability
- Does not apply to all schools - **0 points**
  - Gives priority to schools built before 1986, not for daycare centers

Bonus:
- Small, private side grants available for replacement of LSLs that could apply to in-home daycares.[2] - **5 points**

Source

1 Code of Virginia, § 22.1-135.1. Potable water; lead testing. Available at https://law.lis.virginia.gov/vacode/22.1-135.1

2 Virginia Department of Health, "Drinking water funding program details & application materials" available at http://www.vdh.virginia.gov/drinking-water/financial-construction-assistance-programs/drinking-water-funding-program-details/

Vermont - No policy

Washington

Points:

Lead Standard
- Uses a 15 ppb standard.[1] - **5 points**

Testing Protocols
- There is no requirement for schools to test their water, only a voluntary program - **0 points**

"Get The Lead Out" steps
- The law says that DOH must establish guidance for what to do if the federal action level is exceeded, but there are no mandatory requirements for schools - **0 points**

Public Disclosure and Transparency
- None required **- 0 points**

Applicability
- There are no requirements for schools, which is the primary focus of this report. There is a separate testing requirement for daycares. - **0 points**

Bonus
- Governor Inslee directed that DOH shall work with stakeholder groups to develop policy and budgetary proposals with a goal of removing all lead service lines within 15 years - **20 points**
  - Partial credit because it is a goal, not an enforceable law.

Sources

1 State of Washington, "Engrossed Substitute Senate Bill 6032," March 29, 2018, available at http://lawfilesext.leg.wa.gov/biennium/2017-18/Pdf/Bills/Session%20Laws/Senate/6032-S.SL.pdf

2 Directive of the Governor, "Assisting community and agency responses to lead in water systems," May 2, 2016 available at http://www.governor.wa.gov/sites/default/files/directive/dir_16-06.pdf

Wisconsin

Points:

Lead Standard
- None - 0 points

Testing Protocols
- None - 0 points

"Get The Lead Out" steps
- None - 0 points

Public Disclosure and Transparency
- None - 0 points

Applicability
- None - 0 points

Bonus
- Significant funding has been put towards removing LSLs and many communities in Wisconsin are taking steps to tackle the issue.[1] - **10 points**

Sources

1 "Community and utility efforts to replace lead service lines," Environmental Defense Fund, available at https://www.edf.org/health/recognizing-community-efforts-replace-lsl

Proposed Grades: Justifications

Massachusetts

Points:

Lead Standard
- Uses a 1 ppb standard - **30 points**

Testing Protocols
- Test for worst-case results - several samples per tap, not just a first-draw sample and prohibits sampling protocols known to hide lead - **15 points**
- Test all faucets and fountains used for drinking or cooking - **15 points**
- Test every year at schools: **3 points out of 5**
  - Partial credit because of exemptions that can be made

"Get The Lead Out" steps
- Requires proactive installation of NSF-certified filters at every tap/fountain used for drinking or cooking - **25 points**
- Requires proactive replacement of lead bearing parts - **10 out of 30 points**
  - Public Water Systems must fully replace LSLs at all schools and child care centers
- Requires immediate shut off of water outlets used for drinking or cooking that exceed testing standard for lead - **20 points**
- Requires some remediation but broad discretion - **10 points**

Public Disclosure and Transparency
- Disclosure of lead infrastructure; service lines, fixtures - **5 points**
- Disclosure of all specific test results - **5 points**
- Disclosure information available online - **5 points**
- Disclosure of remediation plan and implementation - **5 points**

Applicability
- Applies to all schools and all child care centers - **20 points**

Bonus
- Incentivised LSL replacement - **10 points**

Source

"An Act ensuring safe drinking water in schools" HD 3765 available at https://malegislature.gov/Bills/191/HD3765

Pennsylvania

Points:

Lead Standard
- Uses a 5 ppb standard - **10 points**

Testing Protocols
- testing for worst-case results -- several samples per tap, prohibit sampling protocols known to hide lead - **15 points**
- Tests all faucets and fountains used for drinking or cooking at every school - **15 points**
- Tests every year at schools - **5 points**

"Get The Lead Out" steps
- Requires immediate shut off of potable water outlets that exceed testing standard for lead - **20 points**
- Remediation requires removing lead bearing parts or installing filters certified to remove lead - **20 points**

Public Disclosure and Transparency
- Disclosure of all specific test results - **5 points**
- Disclosure information available online - **5 points**
- Disclosure of remediation plan and implementation - **5 points**

Applicability
- Not applicable to all - 0 points

Bonus Points:
- Proactive removal of Lead Service lines - **10 points**
  - Has an incentivised LSL removal program and private water systems can replace public side pipes

Source

AN ACT Amending the act of March 10, L949 (P.L.30, No.14), "An act relating to the public school system, including certain provisions applicable as well to private and parochial schools; amending. revising, consolidating and changing the laws relating thereto"

Washington

Points:

Lead Standard
- Uses a 5 ppb standard - **10 points**

Testing Protocols
- Tests once every 3 years - **2 points**
- No specific protocol for lead testing, gives this responsibility to the office of the superintendent of public instruction - **0 points**

"Get The Lead Out" steps
- Requires proactive replacement of fountains, faucets and/or other lead-bearing parts - **25 points**
  - Schools must create an inventory of lead-bearing parts and remove them by 2021 to the extent feasible and cost effective
- Requires proactive installation of filters certified to remove lead at every outlet used for drinking or cooking - **25 points**
- Requires immediate shut off of outlets exceeding action level - **20 points**
- Remediation requires removing lead bearing parts or installing filters certified to remove lead - **20 points**

Public Disclosure and Transparency
- Disclosure of complete results - **5 points**
- Disclosure information available online- **5 points**
- Disclosure of lead infrastructure- **5 points**
- Disclosure of remediation plan- **5 points**

Applicability
- Applies to all schools but does not apply to child care: **5 points out of 20**

Source

"Addressing lead in drinking water in schools," HB 1860. Available at https://app.leg.wa.gov/billsummary?BillNumber=1860&Year=2019&Initiative=false

Vermont

Points:

Lead Standard

- Uses a 3 ppb standard - **15 points**
  - Gets 5 bonus points because it's stronger than the 5 ppb FDA standard, but still not quite at 1 ppb

Testing Protocols

- Testing for worst-case results -- several samples per tap, prohibit sampling protocols known to hide lead - **15 points**

"Get The Lead Out" steps

- Immediate shut off of tap exceeding action level - **20 points**

Public Disclosure and Transparency

- Disclosure of all specific results - **5 points**
- Disclosure of results online - **5 points**

Applicability

- Applies to schools and childcare centers: **20 points**

Source

"An act relating to testing and remediation of lead in the drinking water of schools and child care facilities" S. 40. Available at https://legislature.vermont.gov/Documents/2020/Docs/BILLS/S-0040/S-0040%20As%20Passed%20by%20the%20Senate%20Unofficial.pdf

Appendix

History of Federal Policy on Lead in Drinking Water

National Policy/ Guidance	What it does
Safe Drinking Water Act, 1974	Authorized EPA to establish Maximum Contaminant Levels for all substances known or suspected to be hazardous to humans. These requirements applied to every Public Water System in the U.S.
EPA Interim Drinking Water Regulations, 1975	Kept the standard maximum allowable concentration of lead at 50 parts per billion (ppb) where water enters the distribution system.
Lead Ban, 1986	Among other bans, pipes and pipe fittings with more than 8% lead were banned. Any pipe or fitting under 8% lead was considered "lead free".
Lead Contamination and Control Act, 1988	Banned the manufacture and sale of water fountains that did not meet the "lead free" definition. The LCCA defined "lead-free" as: "not more than 8 percent lead, except that no drinking water cooler which contains any solder, flux, or storage tank interior surface which may come in contact with drinking water shall be considered lead-free if the solder, flux, or storage tank interior surface contains more than 0.2 percent lead." In addition, the EPA was mandated to issue guidance to schools on how to identify and remediate lead-contaminated drinking water. States were required to distribute this guidance and required to help develop testing and remediation programs for schools. However, school testing was not mandatory.
EPA Guidance, 1989	The first federal guidance to schools on assessing and remediating leaded drinking water. EPA also recommended that "action be taken to limit exposure" whenever lead levels exceeded 20 ppb.
Lead and Copper Rule, 1991	Public Water Systems are required to provide corrosion control and routine water monitoring. If over 10% of samples collected from a water system exceeded lead levels of 15 ppb, the system was to intensify water quality monitoring, optimize corrosion control, issue public notification and other education materials, and in some cases, monitor and/ or replace lead service lines.
ACORN v. Edwards, 81 F.3d 1387 (5th Cir. 1996)	The State of Louisiana was sued for failing to implement several provisions of the SDWA that required the establishment of water testing programs. The Court's decision held the Act's provisions were unconstitutional and compelled the state to enact federal programs which the state had no option to decline. The decision does not restrict states from creating their own school drinking water programs.
EPA Guidance, 2006	EPA issued a guideline for monitoring lead in school drinking water, focused on three aspects: training of school officials on the hazards of lead, proper lead testing, and proper telling to school communities about test results. The EPA guidance is stated to be "only suggestions... not requirements".
EPA Guidance, 2018	The EPA issues an updated guidance for monitoring lead in school drinking water. This document provides new guidance for the 3Ts (training, testing, and telling) for protecting children from lead in school water: The suggestions are non-enforceable, and the guidance provides no clear threshold for lead in drinking water above which schools should remediate.
EPA Federal Action Plan, 2018	The EPA issues it's Federal Action Plan for addressing lead in schools' water, a product of the President's Task Force on Environmental Health Risks and Safety Risks to Children. The action plan establishes four goals – reduce children's exposure to lead; identify lead-exposed children and improve their health outcomes; communicate more effectively with stakeholders; and support and conduct critical research. However, the Action Plan fails to establish any clear goals or timelines for taking action to reduce kids exposure to lead.

Table adapted from information in Yanna Lambrinidou, Simoni Triantafyllidou and Marc Edwards, "Failing Our Children: Lead in U.S. School Drinking Water," New Solutions Vol, 20(1), 2010, pages 28-33.Additional information sourced from the EPA website.

Endnotes

1 Emma Brown, "A legal loophole might be exposing children to lead in the nation's schools", Washington Post, March 18th 2016 available at https://www.washingtonpost.com/news/education/wp/2016/03/18/a-legal-loophole-might-be-exposing-children-to-lead-in-the-nations-schools/?noredirect=on&utm_term=.a83a918fa14d

2 Emma Brown, "A legal loophole might be exposing children to lead in the nation's schools", Washington Post, March 18th 2016 available at https://www.washingtonpost.com/news/education/wp/2016/03/18/a-legal-loophole-might-be-exposing-children-to-lead-in-the-nations-schools/?noredirect=on&utm_term=.a83a918fa14d

3 United States EPA, "3Ts for Reducing Lead in Drinking Water in Schools and Child Care Centers," October 2018. Available at https://www.epa.gov/sites/production/files/2018-09/documents/final_revised_3ts_manual_508.pdf

4 Lead and Copper Rule: A Quick Reference Guide, U.S. Environmental Protection Agency available at https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=60001N8P.txt

5 Cheryl Corley, "Avoiding A Future Crisis, Madison Removed Lead Water Pipes 15 Years Ago," National Public Radio available at https://www.npr.org/2016/03/31/472567733/avoiding-a-future-crisis-madison-removed-lead-water-pipes-15-years-ago

6 Michael Gerstein, "Lansing Replaces City's Final Lead Service Line", The Detroit News, 14 December 2016 available at https://www.detroitnews.com/story/news/local/michigan/2016/12/14/lansing-lead-service-line/95435604/

7 Code of the District of Colombia § 38–825.01a. Prevention of lead in drinking water in schools. Available at https://code.dccouncil.us/dc/council/code/sections/38-825.01a.html

8 Edwin Lopez, "School lead testing: The race for tighter regulations and more funding," Politico, June 16, 2016, accessible at http://www.politico.com/story/2016/06/ school-lead-testing-the-race-for-tighter-regulations-andmore-funding-224419

9 Basic Information about Lead Air Pollution, U.S. EPA accessed February 20, 2019 at https://www.epa.gov/lead-air-pollution/basic-information-about-lead-air-pollution

10 "Protect your family from exposure to lead", U.S. EPA accessed February 20, 2019 at https://www.epa.gov/lead/protect-your-family-exposures-lead

11 Lori Higgins, "Up to 30,000 Flint kids to get screened for lead impact settlement", Detroit Free Press April 9th, 2018, available at https://www.freep.com/story/news/education/2018/04/09/flint-water-crisis-lead/478577002/

12 Muennig, Peter. "The Social Costs Of Lead Poisonings." *Health Affairs*, vol. 35, no. 8, 2016, pp. 1545–1545., doi:10.1377/hlthaff.2016.0661.

13 Yanna Lambrinidou, Simoni Triantafyllidou and March Edwards. "Failing Our Children: Lead in US School Drinking Water." *New Solutions*, Vol. 20(1) 25-47, 2010

14 Alison Young and Mark Nichols, "Beyond Flint: Excessive lead levels found in almost 2,000 water systems across all 50 states," USA Today, March 11, 2016, accessible at http://www.usatoday.com/story/news/2016/03/11/near- ly-2000-water-systems-fail-lead-tests/81220466/.

15 Allergist Ron Saff, quoted by Isabelle Z., "High lev- els of lead found in Florida schools' drinking water," Natural News, November 12, 2016, accessible at http://www.naturalnews.com/055983_lead_contamination_clean_water_Florida_schools.html#ixzz4V77EJcJX.

16 World Health Organization, *Lead Poisoning and Health*, 23 August 2018. Available at https://www.who.int/news-room/fact-sheets/detail/lead-poisoning-and-health

17 World Health Organization, *Lead Poisoning and Health*, 23 August 2018. Available at https://www.who.int/news-room/fact-sheets/detail/lead-poisoning-and-health

18 Alan Woolf, Professor of Pediatrics at Harvard Medical School, "Blood Lead Thresholds & Health Effects," webinar presentation for Environment America, slide 7, September 20, 2016

19 Marcie Billings, quoted by Laura Ungar, "Lead taints drinking water in hundreds of schools, day cares across USA," USA Today, March 17, 2016, accessible at http://www.usatoday.com/story/news/nation/2016/03/17/ drinking-water-lead-schools-day-cares/81220916/.

20 Marcie Billings, quoted by Laura Ungar, "Lead taints drinking water in hundreds of schools, day cares across USA," USA Today, March 17, 2016, accessible at http://www.usatoday.com/story/news/nation/2016/03/17/ drinking-water-lead-schools-day-cares/81220916/.

21 Ruff, H., Bijur, P., Markowitz, M., MA, Y., & Rosen, J. (1993). Declining blood lead levels and cognitive changes in moderately lead-poisoned children. *JAMA*. Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/8455297.

22 David C. Bellinger and Andrew M. Bellinger, "Childhood lead poisoning: the torturous path from science to policy," The Journal of Clinical Investigation, Volume 116, Number 4, April 2006, accessible at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1421365/pdf/JCI0628232.pdf.

23 U.S. Environmental Protection Agency, "Basic Information about Lead in Drinking Water," EPA.gov, updated December 2016, accessible at https://www.epa. gov/ground-water-and-drinking-water/basic-information- about-lead-drinking-water.

24 Cara Lombardo and Dee Hall, "'Regulatory vacuum' exposes Wisconsin children to lead in drinking water at schools, day care centers," WisconsinWatch.org, December 18, 2016, accessible at http://wisconsinwatch.org/2016/12/regulatory-vacuum-exposes-wisconsin-children-to-lead-in-drinking-water-at-schools-day-care-centers/; summarizing the study conducted by Michael Amato et al, "Lead exposure and educational proficiency: Moderate lead exposure and educational proficiency on end-of-grade examinations," Annals of Epidemiology 22(10), 2012, pages 738-743, accessible at http://www.sciencedirect.com.ezproxy.library.tufts.edu/science/article/pii/S104727971200302X?np=y.

25 American Academy of Pediatrics, Prevention of

Childhood Lead Toxicity, (policy statement), July 2016, page 3, available at http://pediatrics.aappublications.org/content/pediatrics/138/1/e20161493.full.pdf

26 Center for Disease Control, "What Do Parents Need to Know to Protect Their Children?" May 17th 2017 available at https://www.cdc.gov/nceh/lead/acclpp/blood_lead_levels.htm

27 American Academy of Pediatrics, Prevention of Childhood Lead Toxicity, (policy statement), July 2016, page 4, available at http://pediatrics.aappublications.org/content/pediatrics/early/2016/06/16/peds.2016-1493.full.pdf.

28 Agency for Toxic Substances and Disease Registry, "Lead Toxicity: What is the Biological Fate of Lead in the Body", June 12, 2017, available at https://www.atsdr.cdc.gov/csem/csem.asp?csem=34&po=9

29 Agency for Toxic Substances & Disease Registry, "Case Studies in Environmental Medicine: Lead Texicity", June 12, 2017 available at https://www.atsdr.cdc.gov/csem/lead/docs/CSEM-Lead_toxicity_508.pdf

30 This statement has been asserted by multiple health and environmental agencies and organizations. See for instance: Centers for Disease Control and Prevention, "Lead," CDC.gov, September 2016, accessible at https:// www.cdc.gov/nceh/lead/; U.S. Environmental Protection Agency, "Basic Information about Lead in Drinking Water," EPA.gov, December 2016, accessible at https://www.epa. gov/ground-water-and-drinking-water/basic-information- about-lead-drinking-water; and the American Academy of Pediatrics, "Lead Exposure in Children," aap.org, 2016, accessible at https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/lead-exposure/Pages/Lead- Exposure-in-Children.aspx.

31 Laura Ungar, "Lead taints drinking water in hundreds of schools, day cares across USA," USA Today, March 17, 2016, accessible at http://www.usatoday.com/story/news/nation/2016/03/17/drinking-water-lead-schools-day-cares/81220916/.

32 Laura Ungar, "Lead taints drinking water in hundreds of schools, day cares across USA," USA Today, March 17, 2016, accessible at http://www.usatoday.com/story/news/nation/2016/03/17/drinking-water-lead-schools-day-cares/81220916/.

33 Laura Ungar, "Lead taints drinking water in hundreds of schools, day cares across USA," USA Today, March 17, 2016, accessible at http://www.usatoday.com/story/news/nation/2016/03/17/drinking-water-lead-schools-day-cares/81220916/.

34 Information from the following articles: Florida - Ryan Dailey and Jeff Burlew, "Lead found in drinking water at area schools," Tallahasee Democrat, October 25, 2016, accessible at http://www.tallahassee.com/story/ news/2016/10/25/elevated-lead-levels-found-water-16-le- on-schools/92732168/; Georgia – Molly Bloom, "Elevated lead levels found in more Atlanta schools' water," Atlanta Journal-Constitution, July 13, 2016, accessible at http:// www.ajc.com/news/local-education/elevated-lead-levels- found-more-atlanta-schools-water/oPiYaPnyoa5T7inZM-0KG9I/; Illinois - Jake Griffin, "Why schools won't test for lead," Daily Herald, December 6, 2016, accessible at http:// www.dailyherald.com/article/20161206/news/161209344/ and Maudlyne Ihejirika, "Latest CPS lead-testing results show 113 schools with high levels," Chicago Sun-Times, August 19, 2016, accessible at http://chicago.suntimes. com/news/cps-lead-testing-totals-113-cps-schools-with- high-levels/; Maine - Laura Ungar, "Lead taints drinking water in hundreds of schools, day cares across USA," USA Today, March 17, 2016, accessible at http://www.usatoday. com/story/news/nation/2016/03/17/drinking-water-lead- schools-day-cares/81220916/ and Madeline St. Amour, "State investigates high lead levels in central Maine school's water," Portland Press Herald, October 19, 2016, ac- cessible at http://www.pressherald.com/2016/10/19/high- lead-levels-found-in-central-maine-elementary-school/; Massachusetts - Massachusetts Department of Environ- mental Protection. "Lead and Copper in School Drinking Water Sampling Results." Accessed on January 10, 2017. Accessible at http://www.mass.gov/eea/agencies/mass- dep/water/drinking/lead-and-copper-

in-school-drinking- water-sampling-results.html; Maryland – Liz Bowie, "Water from a fountain? Not in Baltimore city schools," Baltimore Sun, April 9, 2016, accessible at http://www.baltimore-sun. com/news/maryland/baltimore-city/bs-md-ci-lead-in-water-20160409-story.html; New Jersey – Dan Ivers, "Officials say contaminated water at Newark schools 'urgent', but no Flint," NJ.com, March 9, 2016, accessible at http://www. nj.com/essex/index.ssf/2016/03/officials_say_contami- nated_water_at_newark_schools.html; New York - Larry Rulison, "Lead report: Most drinking water in upstate schools safe," Albany Times Union, January 27, 2017, ac- cessible at http://www.timesunion.com/local/article/Lead-report-Most-drinking-water-in-upstate-10890137.php; Pennsylvania – Kristen Graham, "City school district to test drinking water for lead," Philly.com, October 7, 2016, accessible at http://www.philly.com/philly/educa- tion/20161008_City_school_district_to_test_drinking_wa- ter_for_lead.html; Ohio - Brie Zeltner, "Cleveland schools find dangerous lead levels in water from 60 buildings; will replace 580 outlets," Cleveland.com, November 18, 2016, accessible at http://www.cleveland.com/healthfit/index.ssf/2016/11/cleveland_schools_find_dangerous_lead_lev- els_in_water_from_60_buildings_will_replace_580_out- lets.html and Greater Cincinnati Water Works, (letter from Greater Cincinnati Water Works to Cincinnati Public Schools), August 6, 2016, accessible at https://www.scribd. com/document/322734381/Letter-from-Greater-Cincinna- ti-Water-Works-to-CPS; Oregon – Kelly House, "Portland schools lead: Superintendent Carole Smith vows to 'take responsibility'," The Oregonian, June 4, 0216, accessible at http://www.oregonlive.com/portland/index.ssf/2016/06/ portland_schools_lead_superint.html; Texas – Scott Noll, "Houston-area schools fail to test for lead despite federal guidelines," KHOU.com, October 5, 2016, acces- sible at http://www.khou.com/news/investigations/high-lead-levels-found-in-houston-area-schools/329239520; Washington D.C. – Sarah Anne Hughes, "D.C. Tested Public Schools' Water for Lead. More Than 60 Had High Levels," Washington City Paper, June 27, 2016, accessible at http:// www.washingtoncitypaper.com/news/article/20782859/dc-tested-public-schools-water-for-lead-more-than-60-had-high-levels; Wisconsin - Cara Lombardo and Dee Hall, "'Regulatory vacuum' exposes Wisconsin children to lead in drinking water at schools, day care centers," Wis- consinWatch.org, December 18, 2016, accessible at http:// wisconsinwatch.org/2016/12/regulatory-vacuum-exposes- wisconsin-children-to-lead-in-drinking-water-at-schools-day-care-centers/.

35 Jim Walsh, "Lead level high in Cherry Hill class- room," Courier-Post, December 7, 2016, accessible at http:// www.courierpostonline.com/story/news/local/south- jersey/2016/12/07/cherry-hill-lead-water/95095118/.

36 Gillian Graham, "Excess lead in Yarmouth schools' water sparks call for testing at all schools," Portland Press Herald, September 2, 2016, accessible at http://www. pressherald.com/2016/09/01/excess-lead-in-water-sparks- call-for-testing-at-all-schools/.

37 See Dan Herbeck, Jane Kwiatkowski Radlich, and T.J. Pignataro, "Tests show high lead levels in water in 11 WNY school districts," The Buffalo News, October 21, 2016, accessible at https://buffalonews.com/2016/10/21/tests- show-high-lead-water-multiple-wny-schools/, Bethany Bump, "Lead is new water worry: High school in village plagued by PFOA coping with high levels of metal," Times Union, November 28, 2016, http://www.timesunion.com/ local/article/Lead-is-new-water-worry-10641099.php and Laura Ungar, "Lead taints drinking water in hundreds of schools, day cares across USA," USA Today, March 17, 2016, accessible at http://www.usatoday.com/story/news/ nation/2016/03/17/drinking-water-lead-schools-day-cares/81220916/.

38 See Juan Perez Jr, "Claypool pledges to spend 'whatever it takes' to fix CPS lead in water problems," Chicago Tribune, June 20, 2016, accessible at http://www. chicagotribune.com/news/ct-chicago-school-lead-water- meetings-met-20160620-story.html, and Emily Coleman, "Water test: High levels of lead found in 10 percent of Waukegan schools," Lake County News-Sun, August 22, 2016, accessible at http://www.chicagotribune.com/ suburbs/lake-county-news-sun/news/ct-lns-waukegan- district-60-lead-water-st-0819-20160822-story.html, and Jake Griffin, "Why schools won't test for lead," Daily Herald, December 6, 2016, accessible at http://www.dailyherald.com/article/20161206/news/161209344/.

39 Brie Zeltner, "Cleveland schools find dangerous lead levels in water from 60 buildings; will replace 580 outlets," Cleveland.com, November 18, 2016, accessible at http://www.cleveland.com/healthfit/index.ssf/2016/11/cleveland_schools_find_dangerous_lead_levels_in_water_from_60_buildings_will_replace_580_outlets.html.

40 Jake Griffin, "Why schools won't test for lead," Daily Herald, December 6, 2016, accessible at http://www.dailyherald.com/article/20161206/news/161209344/.

41 Data from the Massachusetts Executive Office of Energy and Environmental Affairs' Data Portal, "Lead and Copper in School Drinking Water Sampling Results," Mass.gov, updated on February 18, 2019, https://eeaonline.eea.state.ma.us/portal#!/search/leadandcopper/results?FacilityType=School%20(SCH)&SchoolName=Leicester%20Memorial%20Elementary&AnalyteName=LEAD .

42 All data calculated from the Massachusetts Executive Office of Energy and Environmental Affairs' data portal of lead test results, "Lead and Copper in School Drinking Water Sampling Results," Mass.gov, as of December 18th 2018, https://eeaonline.eea.state.ma.us/portal#!/search/leadandcopper. Data analysis done by Damon Guterman of Massachusetts DEP, personal communication via email.

43 Miguel A. Del Toral, Andrea Porter and Michael R. Schock, "Detection and Evaluation of Elevated Lead Release from Service Lines: A Field Study," Environmen- tal Science and Technology Vol 47, No 16, July 2013, page 9304, accessible at http://pubs.acs.org/doi/abs/10.1021/es4003636.

44 Miguel A. Del Toral, Andrea Porter and Michael R. Schock, "Detection and Evaluation of Elevated Lead Release from Service Lines: A Field Study," Environmen- tal Science and Technology Vol 47, No 16, July 2013, page 9304, accessible at http://pubs.acs.org/doi/abs/10.1021/es4003636.

45 Michael Wines, Patrick McGeehan and John Schwartz, "Schools Nationwide Still Grapple With Lead in Water," New York Times, March 26, 2016, available at http://www.nytimes.com/2016/03/27/us/schools-nationwide-still-grapple-with-lead-in-water.html.

46 United States Environmental Protection Agency, Clarification of Recommended Tap Sampling Procedures for Purposes of the Lead and Copper Rule, (memorandum), February 29, 2016, available at https://www.epa.gov/sites/ production/files/2016-02/documents/epa_lcr_sampling_ memorandum_dated_february_29_2016_508.pdf.

47 Dr. Marc Edwards, quoted by Kate Taylor, "Lead Tests on New York City Schools' Water May Have Masked Scope of Risk," New York Times, August 31, 2016, accessible at http://www.nytimes.com/2016/09/01/nyregion/lead- tests-on-new-york-city-schools-water-may-have-masked- scope-of-risk.html?_r=0.

48 NYC Department of Education, Water Safety: 2017 NYC DOE Water Test Results, available at https://www.schools.nyc.gov/about-us/reports/water-safety

49 NYC Department of Education, Water Safety: 2017 NYC DOE Water Test Results, available at https://www.schools.nyc.gov/about-us/reports/water-safety

50 Anne Sandvig et al., Jointly sponsored by Awwa Research Foundation and the U.S. Environmental Protection Agency, Contribution of Service Line and Plumbing Fixtures to Lead and Copper Compliance Rules, 2008, page 24, available at http://www.waterrf.org/PublicReportLibrary/91229.pdf.

51 Paul Biedrzycki, head of environmental health for the city of Milwaukee, quoted by Silke Schmidt and Dee J. Hall, "Lead pipes, antiquated law threaten Wisconsin's drinking water quality," WisconsinWatch.org, February 1, 2016, accessible at http://wisconsinwatch.org/2016/02/ lead-pipes-antiquated-law-threaten-wisconsins-drinking- water-quality/.

52 See charts from Mary Jean Brown, Curtis Blanton and Thomas Sinks, "Examining the Effect of Previously Missing Blood Lead Level (BPb) Surveillance Data on Results Reported in the MMWR," CDC.gov, May 2010, ac- cessible at https://www.cdc.gov/nceh/lead/leadinwater/reanalysis.htm.

53 "Lead Ban: Preventing the Use of Lead in Public Water Systems and Plumbing Used for Drinking Water," National Service Center for Environmental Publications accessed March 7, 2019 at https://nepis.epa.gov/Exe/ZyNET.exe/10003GWO.TXT?ZyActionD=ZyDocument&Client=EPA&Index=1986+Thru+1990&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5Czyfiles%5CIndex%20Data%5C86thru90%5CTxt%5C00000003%5C10003GWO.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=hpfr&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1&SeekPage=x&ZyPURL

54 David Cornwell, Richard Brown and Steve Via, "National Survey of Lead Service Line Occurrence," Journal AWWA (Vol. 108 No. 4), page E182, April 2016, accessible at http://www.awwa.org/publications/journal-awwa/abstract/articleid/57880483.aspx

55 "EPA Lists Coolers that Could Contain LEad Parts," Education Week, Volume 08, Issue 30, published April 19, 1989, *print*. Available at https://www.edweek.org/ew/articles/1989/04/19/08260026.h08.html

56 Reduction of Lead in Drinking Water Act, National Service for Environmental Publications U.S. EPA, December 19 2013, https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P100M5DB.txt

57 Environmental Defense Fund, "Lead from a new "lead-free" brass faucet? More common than you'd hoped" November 6th 2018 accesible at http://blogs.edf.org/health/2018/11/06/nsf-61-lead-from-a-new-lead-free-brass-faucet/?utm_source=twitter&utm_campaign=edf-health_none_upd_hlth&utm_medium=social-media&utm_id=1541515990

58 Image from U.S. Environmental Protection Agency, "Advice to Flint Residents," EPA.gov, September 2016, accessible at https://www.epa.gov/flint/advice-flint- residents

59 Michael Wines, Patrick McGeehan and John Schwartz, "Schools Nationwide Still Grapple With Lead in Water," New York Times, March 26, 2016, available at http://www.nytimes.com/2016/03/27/us/schools-nationwide- still-grapple-with-lead-in-water.html.

60 Milwaukee Public Schools, "Milwaukee Public Schools releases results of water quality testing," Decem- ber 16, 2016, accessible at http://mps.milwaukee.k12.wi.us/ News/Milwaukee-Public-Schools-releases-results-of-water- quality-testing.htm.

61 Lead Water Service Lines: Lead in the Water, National Conference of State Legislature available at http://www.ncsl.org/research/environment-and-natural-resources/lead-water-service-lines.aspx

62 Drinking Water Contaminants – Standards and Regulations, U.S. EPA available at https://www.epa.gov/dwstandardsregulations/use-lead-free-pipes-fittings-fixtures-solder-and-flux-drinking-water

63 U.S. Congress, "An Act To amend the Safe Drink- ing Water Act to reduce lead in drinking water," Congress. gov, January 4, 2011, accessible at https://www.congress. gov/111/plaws/publ380/PLAW-111publ380.pdf.

64 Interview with Yanna Lambridinou, PhD, on February 1, 2017.

65 Basic Information for Lead in Drinking Water, U.S. EPA available at https://www.epa.gov/ground-water-and-drinking-water/basic-information-about-lead-drinking-water

66 See Georgina Gustin "Toxic Algal Blooms Occuring More Often", Inside Climate News available at https://insideclimatenews.org/news/15052018/algae-blooms-climate-change-methane-emissions-data-agriculture-nutrient-runoff-fertilizer-sewage-pollution-lake-erie; Amanda Schmidt, "600,000 customers warned of drinking water as North Carolina's flooded hog farms, waste lagoons under scrutiny for contamination", MSN.com September 19 2018 available at https://www.msn.com/en-us/news/us/600000-customers-warned-of-drinking-water-as-north-carolinas-flooded-hog-farms-waste-lagoons-under-scrutiny-for-contamination/ar-BBNyHqr ; and John Rumpler, "Accidents Waiting to Happen," Environment America Research & Policy Center (June 2016) and sources therein, available at https://environmentamerica.org/sites/environment/files/reports/WEB_AME_Accidents-Report-Jan19.pdf

67 "Lead and Copper Rule," U.S. EPA accessed February 20, 2019 at https://www.epa.gov/dwreginfo/lead-and-copper-rule

68 Lead and Copper Rule, 56 FR 26548 §141.80 (1991). Available at https://www.ecfr.gov/cgi-bin/textidx?SID=9c5415b2fe8eb76878a169c14454171f&mc=true&node=sp40.25.141.i&rgn=div6

69 Lead and Copper Rule, 56 FR 26548 §141.80 (1991). Available at https://www.ecfr.gov/cgi-bin/textidx?SID=9c5415b2fe8eb76878a169c14454171f&mc=true&node=sp40.25.141.i&rgn=div6

70 United States Environmental Protection Agency, 3Ts for Reducing Lead in Drinking Water in Schools and Child Care Facilities, updated October 2018. Available at https://www.epa.gov/sites/production/files/2018-09/documents/final_revised_3ts_manual_508.pdf

71 United States Environmental Protection Agency, 3Ts for Reducing Lead in Drinking Water in Schools and Child Care Facilities, updated October 2018. Available at https://www.epa.gov/sites/production/files/2018-09/documents/final_revised_3ts_manual_508.pdf

72 John Rumpler and Christina Schleagal, February 1st 2017 available at https://environmentamerica.org/reports/ame/get-lead-out

73 "SB-1398 Public water systems: lead user service lines," California Legislature, accessed December 10, 2016, available at http://leginfo.legislature.ca.gov/faces/billNav- Client.xhtml?bill_id=201520160SB1398.

74 Governor Scott Walker, Governor Walker Administration Awards More Than $26 Million for Lead Service Line Replacement in 42 Wisconsin Communities (press release), 18 July, 2018, https://urbanmilwaukee.com/pressrelease/governor-walker-administration-awards-more-than-26-million-for-lead-service-line-replacement-in-42-wisconsin-communities/.

75 "Childhood Lead Exposure Prevention Amend- ment Act of 2017," Council of the District of Columbia, (pro- posed ordinance), accessed on January 28, 2017, available at http://lims.dccouncil.us/Download/37185/B22-0029-In- troduction.pdf.

76 Environmental Law Institute, Drinking Water Quality in Child Care Facilities: A Review of State Policy (August 2015)

77 Rep. Lori Ehrlich and Senator Joan Lovely, HD 3765 An Act ensuring safe water in schools. Available at https://malegislature.gov/Bills/191/HD3765

78 Sen. Brian Campion S.40 An act relating to testing and remediation of lead in the drinking water of schools and child care facilities. Available at https://legislature.vermont.gov/bill/status/2020/S.40

79 Rep. Pollet, HB 1860 Addressing Lead in Drinking Water in Schools. Available at https://app.leg.wa.gov/billsummary?BillNumber=1860&Year=2019&Initiative=false

80 Rep. Boback HB 2025. Amending An Act relating to the public school systems. February 5th 2018, available at https://www.legis.state.pa.us/cfdocs/legis/PN/Public/btCheck.cfm?txtType=PDF&sessYr=2017&sessInd=0&billBody=H&billTyp=B&billNbr=2025&pn=2984

81 Nicky Oullet, *Proposed Rule Would Require Lead Testing In All Montana Schools*. October 30th 2018, available at http://www.mtpr.org/post/proposed-rule-would-require-lead-testing-all-montana-schools

82 Bill HD 3765 An Act Ensuring Safe Drinking Water in Schools, 191st Congress of the Commonwealth of Massachusetts, available at https://malegislature.gov/Bills/191/HD3765

83 Bill HD 3765 An Act Ensuring Safe Drinking Water in Schools, 191st Congress of the Commonwealth of Massachusetts, available at https://malegislature.gov/Bills/191/HD3765 ; and SD 1991 An Act Ensuring Safe Drinking Water in Schools, 191st Congress of the Commonwealth of Massachusetts, available at https://malegislature.gov/Bills/191/SD1991

84 "Pollet's HB 1860 addresses lead in school water", Washington House Democrats, February 5th 2019, available at https://housedemocrats.wa.gov/pollet/2019/02/05/pollets-hb-1860-addresses-lead-in-school-water/

85 Rep. Boback, House Co-Sponsorship Memorandum, January 24th 2019. Available at https://www.legis.state.pa.us/cfdocs/Legis/CSM/showMemoPublic.cfm?chamber=H&SPick=20190&cosponId=27926

86 S. 40 CHAPTER 24A. LEAD IN DRINKING WATER OF SCHOOLS AND CHILD CARE FACILITIES, as of January 18th 2019 available at https://legislature.vermont.gov/Documents/2020/Docs/BILLS/S-0040/S-0040%20As%20Passed%20by%20the%20Senate%20Unofficial.pdf

87 U.S. EPA National Drinking Water Advisory Council letter to EPA Administrator Gina McCarthy (December 15, 2015) accessed on 12/31/16 from http://media.jrn.com/documents/lead_advisory01.27.16.pdf

88 Silke Schmidt and Dee J. Hall, "Lead pipes, anti- quated law threaten Wisconsin's drinking water quality," Wisconsin-Watch.org, February 1, 2016, accessible at http://wisconsinwatch.org/2016/02/lead-pipes-antiquated-law- threaten-wisconsins-drinking-water-quality/.

89 U.S. Environmental Protection Agency, Flint, MI Filter Challenge Assessment, June 2016, page 2, accessible at https://www.epa.gov/sites/production/files/2016-06/ documents/filter_challenge_assesment_field_report_-_ epa_v5.pdf

90 Lead Home: Prevention Tips, Center for Disease Control. Available at https://www.cdc.gov/nceh/lead/tips.htm

91 American Academy of Pediatrics, Prevention of Childhood Lead Toxicity, (policy statement), July 2016, page 11, available at http://pediatrics.aappublications.org/content/pediatrics/early/2016/06/16/peds.2016-1493.full.pdf.

92 See United States Environmental Protection Agency, Clarification of Recommended Tap Sampling Procedures for Purposes of the Lead and Copper Rule, (memorandum), February 29, 2016, accessible at https://www.epa.gov/sites/ production/files/2016-02/documents/epa_lcr_sampling_ memorandum_dated_february_29_2016_508.pdf.

93 Marc Edwards, quoted by Megan Cottrell, "Why experts say Chicago parents should worry about the drinking water," Chicago Parent, April 21, 2014, accessible at http://www.chicagoparent.com/magazines/chicago- parent/2014-april/lead.

94 Interview with Michael Thomas, Superintendent of Brockton Public Schools. December 7th 2018.

95 San Diego Unified School District, Drinking Water sampling, accessed February 4th 2019 at https://www.sandiegounified.org/watersampling

96 Sam Allard, "CMSD Has Removed or Replaced 'Virtually All' Water Fountains with Elevated Lead Levels" March 5, 2018 available at https://www.clevescene.com/scene-and-heard/archives/2018/03/05/cmsd-has-removed-or-replaced-virtually-all-water-fountains-with-elevated-lead-levels

97 Rebecca Flores, "Austin school district responds to new report on lead levels in drinking water," KVUE ABC News, May 29th 2018, available at https://www.kvue.com/article/news/local/austin-school-district-responds-to-new-report-on-lead-levels-in-drinking-water/269-559469250; Austin Independent School District, Water Testing Results by Facility, September 22, 2017 available at https://www.austinisd.org/announcements/2017/09/22/more-information-water-testing-results-facility-faqs

98 Alison Bovell and Ana Poblacion, "Ending Hunger in Our Classrooms," Children's Health Watch and EOAs, April 2017, available at http://eosfoundation.org/wp/wp-content/uploads/2014/09/CHW-School-Breakfast-Report_April-2017.pdf

99 Interview with Michael Thomas, Superintendent of Operations, Brockton Public Schools. December 7th 2018.

100 Massachusetts Legislature, Governor's Budget FY 2020, H.1. outside section 58 and 62, available at https://malegislature.gov/Budget/GovernorsBudget

101 Darryl Fears and Brady Dennis, "One city's solution to drinking water contamination? Get rid of every lead pipe," Washington Post, May 10, 2016, available at https://www.washingtonpost.com/national/health-science/one-citys-solution-to-drinking-water-contamination-get-rid-of-every-lead-pipe/2016/05/10/480cd842-0814-11e6- bdcb-0133da18418d_story.html.

102 Nutrient Pollution: The Problem, US EPA accessed February 19th 2019 at https://www.epa.gov/nutrientpollution/problem

103 Darryl Fears and Brady Dennis, "One city's solu- tion to drinking water contamination? Get rid of every lead pipe," Washington Post, May 10, 2016, available at https:// www.washingtonpost.com/national/health-science/one-citys-solution-to-drinking-water-contamination-get- rid-of-every-lead-pipe/2016/05/10/480cd842-0814-11e6- bdcb-0133da18418d_story.html.

104 Darryl Fears and Brady Dennis, "One city's solution to drinking water contamination? Get rid of every lead pipe," Washington Post, May 10, 2016, available at https://www.washingtonpost.com/national/health-science/one-citys-solution-to-drinking-water-contamination-get-rid-of-every-lead-pipe/2016/05/10/480cd842-0814-11e6- bdcb-0133da18418d_story.html.

105 Susan Bence, "Milwaukee Announces Water Filter Plan to Help Address Lead Pipes," Milwaukee Public Radio, November 8, 2016, available at http://wuwm.com/post/ milwaukee-announces-water-filter-plan-help-address- lead-pipes#stream/0.

106 Michael Hawthorne and Peter Matuszak, "As other cities dig up pipes made of toxic lead, Chicago resists," Chicago Tribune, September 21, 2016, accessible at http://www.chicagotribune.com/news/watchdog/ct-lead- water-pipes-funding-20160921-story.html.

107 Brian Maass, "Denver Water Steps Up Lead Pipe Removal," CBS Denver, June 13, 2016, accessible at http:// denver.cbslocal.com/2016/06/13/denver-water-steps-up- lead-pipe-removal/.