February 12, 2019

Mr. David Ross, Assistant Administrator for Water
U.S. Environmental Protection Agency
1200 Pennsylvania Ave. NW
Washington, DC 20460–0001

RE: Comments: Revisions to Lead & Copper National Primary Drinking Water Regulations, Docket No. EPA–HQ–OW-2017-0300

Dear Assistant Administrator Ross:

On behalf of our more than 3 million members and supporters, the Natural Resources Defense Council (NRDC) submits these comments on the Environmental Protection Agency's (EPA) proposed revisions to the Lead and Copper National Primary Drinking Water Regulations, 84 Fed. Reg. 61,684 (November 13, 2019).

Summary of Comments

In 2005, after the Washington, DC Lead Crisis, EPA committed to writing "long-term revisions" to the Lead and Copper Rule (LCR) because major structural changes to the LCR were needed to improve public health protection provided by the rule, and to address weaknesses revealed by the DC crisis and subsequent revelations about other water systems' problems revealed in its wake. EPA finally published proposed revisions to the LCR, on November 13, 2019. The proposed revisions would create some modest improvements in public health protection while decreasing some of the protections provided by the current rule.

It is important to note that independent studies indicate that the public health benefits of reducing lead in drinking water completely dwarf the costs of doing so. For example, a study by the State of Minnesota Department of Health found that the quantifiable benefits of removing lead service lines is about 10 times the costs.[1] Overall benefits of all measures to reduce lead in water yield over twice the benefits compared to costs, and the state says those benefits are likely underestimated.

While we appreciate the agency's modest proposed improvements in the rule, we are concerned that the weakening changes will swallow them, resulting in an overall undermining of public health protections. For example, the proposal actually slows the mandated schedule of lead service line replacement after a lead action level exceedance, allowing more than 33 years for completion of the task. The current rule requires the job to be done within about 14 years. Additionally, the agency proposes to weaken the current definition of a "lead service line" in 40 C.F.R. 141.2 by eliminating the current rule's inclusion of lead pigtails and lead goosenecks. The proposed definition of a lead service line represents a decrease in public health protection and will result in many lead pigtails and goosenecks remaining in service, continuing to expose consumers to lead-contaminated water, with no clear requirements for removal. These are just two examples of the proposal's failure to "maintain, or provide for greater, protection of the health of persons" embodied in the current rule, which violates the Safe Drinking Water Act's (SDWA) anti-backsliding provision. 42 U.S.C. §300g-1(b)(9).

These comments summarize changes that EPA should make to the proposed LCR revisions to address the weaknesses of the 1991 LCR, to both prevent and reduce the risk of exposure to lead in drinking water for millions of Americans.

The Maximum Contaminant Level Goal for lead is 0 ppb. Lead is a potent irreversible neurotoxin. EPA and public health experts ranging from the Centers for Disease Control and Prevention[2] to the World Health Organization[3] (WHO) and the American Academy of Pediatrics[4] have found that there is no safe level of lead. Low levels of exposure in children are linked to damage to the brain and nervous system, learning disabilities, shorter stature, impaired hearing, and harm to blood cells.[5] Exposed adults can suffer from cardiovascular disease and adverse impacts on reproduction and the kidneys, among other harmful health effects.[6] There are 6.5 to 10 million lead service lines serving tens of millions of Americans. Even in homes without lead service lines, most of our plumbing contains lead, in fittings and fixtures, lead solder, and galvanized steel. Even using the flawed current monitoring that understates the problem, between January 2015 and March 2018, about 5.5 million people got their water from systems that exceeded EPA's Lead Action Level,[7] a level that the agency itself admits is not a health-based safety level. The problem is serious, widespread, and poses an ongoing threat to health, especially to children.

This creates a continuous risk of lead in water, an exposure pathway intended for human consumption and necessary for survival. As such, EPA should take this opportunity to shift the focus of the LCR from corrosion control and lead management to lead removal and primary prevention. We must remove lead service lines proactively. If we wait until sampling confirms there is a problem, we have waited too long. Lead is a potent irreversible neurotoxin; the best time to remove a lead service line is before a water treatment failure that causes it to release high lead into the water.

We recommend that EPA take an approach that reflects the ongoing public health crisis from lead exposure and includes fundamental changes to the LCR that both improve public health protection and reduce complexity of rule implementation. We urge EPA to redirect the focus of the LCR and to:

1. Set an at-the-tap MCL for Lead as Required by the SDWA.

EPA should establish an enforceable Maximum Contaminant Level (MCL) for lead at the tap of 5 ppb of lead. This would substantially simplify implementation and enforcement, and would track the Safe Drinking Water Act which requires EPA to set an MCL unless it is "not economically or technologically feasible to ascertain the level of the contaminant." DSDWA §1412(b)(7)(A), Data collected over the past 29 years shows it is feasible to ascertain the level of lead in tap water; EPA should set an MCL for lead. As discussed further in these comments, the statute was amended in 1996 and again in 2011 in ways that negate the rationale EPA put forward in 1991 for issuing a treatment technique for lead rather than an MCL. The former chief author of the 1991 LCR has submitted comments to EPA recommending that the agency dispense with the LCR treatment technique and return to reestablish an at the tap MCL. Extensive data support doing so, and Congress' ban on lead-containing fittings and fixtures since 1991 and revisions to the standard setting provisions of the Act also reinforce that an MCL should be established. We recommend that the level be set as an at the tap standard of 5 ppb, or at the highest at 10 ppb.

2. *In the Alternative, Overhaul the LCR to Require All LSLs to be Fully Replaced at Utility Expense in10 Years, to Reduce the Lead Action Level, and to Strengthen the Corrosion Control Requirements.*

Assuming arguendo that EPA will not establish an MCL for lead and can make the legal and substantive case for doing so, the LCR should be overhauled to require that all lead service lines must be fully replaced, with no partial service line replacements, at the expense of the public water system within 10 years. The rule also should require public water systems covered by the rule to install optimized corrosion control after a detailed study and approval by their primacy agency. EPA should drop the Action Level to 5 parts per billion (ppb), or certainly no higher than 10 ppb. Data presented in these comments, a detailed memo from EPA Region 5's Regional Administrator to the EPA Water Office, and other data in the rulemaking record strongly support a reduced action level rather than a separate and confusing "trigger level." Water utilities and the American Water Works Association have agreed that all lead service lines should be replaced and that partial replacements are not advised. Charging individual homeowners for replacement has led to delays, inefficiencies, and environmental injustices since renters and low-income people and communities of color often are unable to pay for replacement, leaving them to continue drinking lead-tainted water. Multiple studies have concluded that the benefits of lead service line replacement and corrosion control far outweigh the costs. Lead service line replacement is a simple and necessary step that must be taken to eliminate lead in drinking water. Until service lines are replaced, certified point of use filters and replacement filter cartridges should be provided, along with training for how to install and maintain them.

We also urge that the agency to update its monitoring rules for lead to reflect data and studies showing how the current rules encourage under-detection and under-reporting of lead contamination. EPA should require testing not only of the "first draw" water but also of a subsequent draw that comes from the lead service line. Data in these comments and the EPA Region 5 memo make it clear that a sample from the 5^{th} liter and possibly from the 10^{th} liter should be required, with the highest level used as the measurement for establishing compliance. It is critical that the monitoring protocol prohibit outdated methods and sampling tricks that result in under-representation of contamination, some of which the agency has identified. It also is crucial that sampling data captures the highest risk water from lead service lines. Several sampling strategies have been suggested and evaluated, any one of which would better detect the lead release from lead service lines , which would be best determined by delaying the rule and engaging in an extensive sequential sampling study from many different types of systems with lead service lines.

But if the agency decides to proceed without additional data on how to ensure that samples from lead service lines will be captured, EPA should at least set an MCL of 5 ppb and establish a sampling protocol that, based on available data, will generally capture samples from the lead service lines. The agency also should no longer permit monitoring to be reduced to just annual, triennial, or even every 9 years as currently allowed. Testing should be of a statistically valid number of the highest risk homes. Testing of water systems with lead service lines should be done most frequently (some homes with copper pipes and lead solder also should be tested, as in the current rule). And monitoring should be done no less frequently than every 6 months until all lead service lines are removed and optimized corrosion control has been confirmed for at least 2 years. Any change in water source or treatment should trigger mandatory renewed testing and pre-change evaluation of corrosion control.

Finally, we urge EPA to substantially rewrite its rules for public education about lead in drinking water. The current rules have often been ineffective at ensuring that the public understands the health risks posed by lead in drinking water and what they and water utilities can do to minimize those risks.

EPA's cost-benefit analysis is flawed and substantially understates the benefits of a strong rule. The rule fails to quantify the benefits of reduced cardiovascular disease, numerous benefits of reduced behavioral, learning disability, and other adverse effects of in utero and early childhood exposures, and several other benefits such as those established in contingent valuation studies. The Minnesota and other analyses have found far greater benefits than EPA assumes. Additionally, no discount rate should be used for future intergenerational and long-term health benefits.

Re-Establishing an MCL at the Tap for Lead

To both simplify and improve health protection provided by the LCR, EPA should reestablish an at the tap Maximum Contaminant Level (MCL) for lead at the tap. The agency had an MCL for lead, which was originally established under the 1974 SDWA and remained on the books until EPA's 1991 Lead and Copper Rule eliminated it in favor of the infamously complex treatment technique. EPA could and we believe should reestablish an enforceable MCL for lead at the tap of 5 parts per billion (ppb) of lead. Establishing an at the tap MCL for lead would substantially simplify implementation and enforcement and would track the Safe Drinking Water Act's requirements, which provide that EPA must set an MCL unless it is "not economically or technologically feasible to ascertain the level of the contaminant." SDWA §1412(b)(7)(A).

Since the LCR requires water systems to ascertain the level of lead at the tap, a treatment technique should not be used under the statutory framework. An MCL is necessary for lead to be treated with the same urgency as other drinking water contaminants, and it is feasible to ascertain the level of lead in tap water. However, from EPA's proposed LCR Federal Register notice, it is apparent that the agency has given no consideration to reestablishing an MCL for lead nor has the agency justified this failure to comply with the mandates of the Act.

EPA has appropriately established a Maximum Contaminant Level Goal (MCLG) for lead of zero. The SDWA provides that for each contaminant for which it has set an MCLG, EPA shall "specify a maximum contaminant level for such contaminant which is as close to the maximum contaminant level goal as is feasible." SDWA §1412(b)(4)(B).[*] The legislative history of the SDWA, and the EPA administrative history

[*] As discussed below, in 1996 Congress added two provisions to the Act that authorizes an MCL less stringent than is feasible. Under SDWA §1412(b)(5), EPA "may establish a maximum contaminant level for a contaminant at a level other than the feasible level, if the technology, treatment techniques, and other means used to determine the feasible level would result in an increase in the health risk from drinking water by (i) increasing the concentration of other contaminants in drinking water; or (ii) interfering with the efficacy of drinking water treatment techniques or processes that are used to comply with other national primary drinking water regulations." If the agency selects this approach, it "shall minimize the overall risk of adverse health effects…." Id. §1412(b)(5)(B). Additionally, under SDWA §1412(b)(6), if "the benefits of a maximum contaminant level promulgated in accordance with paragraph (4) would not justify the costs of complying with the level, the Administrator may, after notice and opportunity for public comment, promulgate a maximum contaminant level for the contaminant that maximizes health risk reduction benefits at a cost that is justified by the benefits."

and case law are clear than the MCL feasibility is to be determined for large water systems;[†] smaller systems that are unable to achieve the standard are eligible under the statutory scheme to obtain variances or exemptions under SDWA §§1415-1416. By setting an at-the-tap MCL, the agency would be establishing a simple performance standard for water systems that would eliminate the complexities and the implementation and enforcement challenges created by the extremely long and complicated LCR treatment technique.

It is important to note that the EPA's lead author of the 1991 LCR, Jeff Cohen, has recently weighed in arguing that the agency should dispense with the complex LCR treatment technique and instead should reestablish an MCL for lead. (Comments of Jeff Cohen to EPA Docket, January 22, 2020). As Cohen points out, 29 years after the 1991 LCR was established, we now have far more data and a better understanding of how to control lead and what water systems' experience has been with lead in drinking water. As Cohen points out (footnote omitted):

> The 1991 rule was designed to identify and control high-risk scenarios, e.g., sampling was restricted to first draw samples from homes with lead solder installed after 1982 and homes with lead service lines. The proposed revision recognizes that today, sources of lead within household plumbing have largely been eliminated, viz., sampling priorities are for homes with lead service lines.
>
> For this same reason, the Agency should again consider establishing an MCL for lead instead of the current treatment technique approach. Given the restrictions on lead in new plumbing, the Agency's rationale in 1991 for rejecting the option to set an MCL at the tap no longer hold today. As of 2020, it is possible that water systems can be held responsible for the sources of *lead contamination in drinking water, specifically, corrosive water interacting with lead service lines.*
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> Under an MCL approach, implementation and oversight would be significantly streamlined compared to the current rule and the proposed revisions, while continuing to provide comprehensive public health protection:
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> …
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> The complexity in both the current rule - however necessary at the time - and the recent proposal creates potential for confusion and delays in implementation. Many of us scientists, engineers, and policymakers who worked hard on protecting the public from lead recognize and applaud the Agency staff and state programs in the significant reductions in lead levels in drinking water over the past several decades since the current rule was issued. However, the gaps in oversight demonstrated in Newark, NJ and Flint also must be recognized. EPA should fully review the option presented here as a way to fill these gaps.

We agree that the time has come for the agency to reconsider its allegiance to a treatment technique for lead. Certainly, the agency must admit that it is feasible to ascertain the level of lead in drinking water since its LCR and the proposal both require every covered water system to ascertain the level of lead in its tap water. The agency must explain in detail its conclusions in this respect, given the past 29

[†] See H. Report No. 93-1185 part 2, 93rd Cong. 2d Sess. (Aug. 15, 1974) at 18, "the Committee intends that the Administrator's determination of what methods are generally available (taking cost into account) is to be based on what may reasonably be afforded by large metropolitan or regional public water systems."

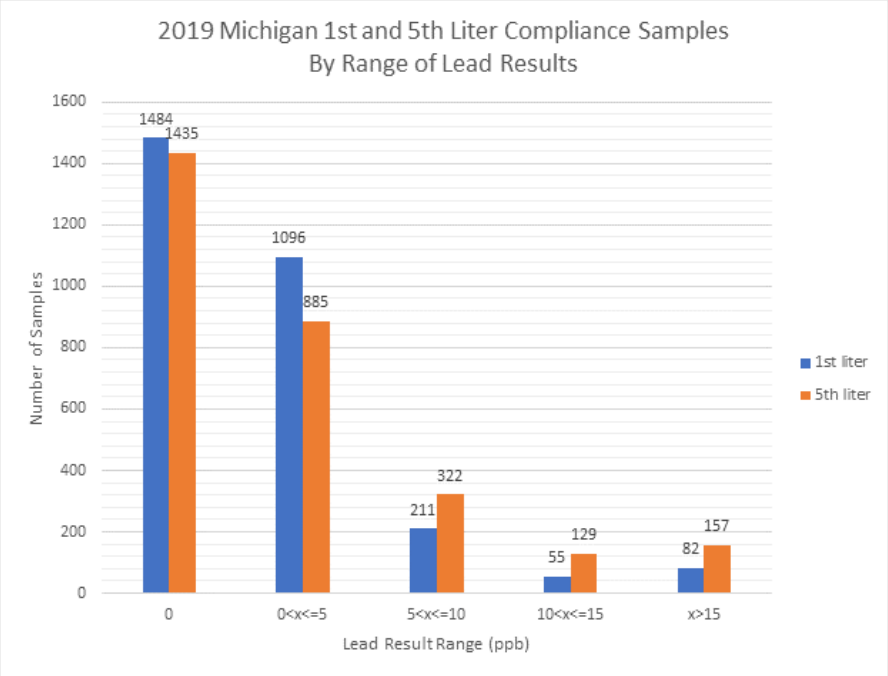
years of experience and data that have become available. EPA arbitrarily did not even consider reestablishing an MCL or analyze the data to do so.

We therefore urge that the agency establish a MCL at the tap of 5 ppb, which is as close to the MCLG as is feasible. Canada recently established a 5 ppb standard, and the WHO recommends a 10 ppb standard, while urging that a lower level be adopted as feasible.

The feasibility of meeting an MCL at the tap of 5 ppb (or certainly no higher than 10 ppb) is demonstrated by available data. For example, as discussed later in these comments, many community water systems currently have at the tap sampling showing that their water meets a first draw and even a 5th liter standard of 10 ppb, and they can meet a 5 ppb at the tap MCL if they truly optimize their corrosion control and remove their lead service lines. Two charts below demonstrate this.

Figure 1 shows that the vast majority of 1st draw and 5th liter samples taken in 2019 in Michigan would meet a 10 ppb and even a 5 ppb standard:

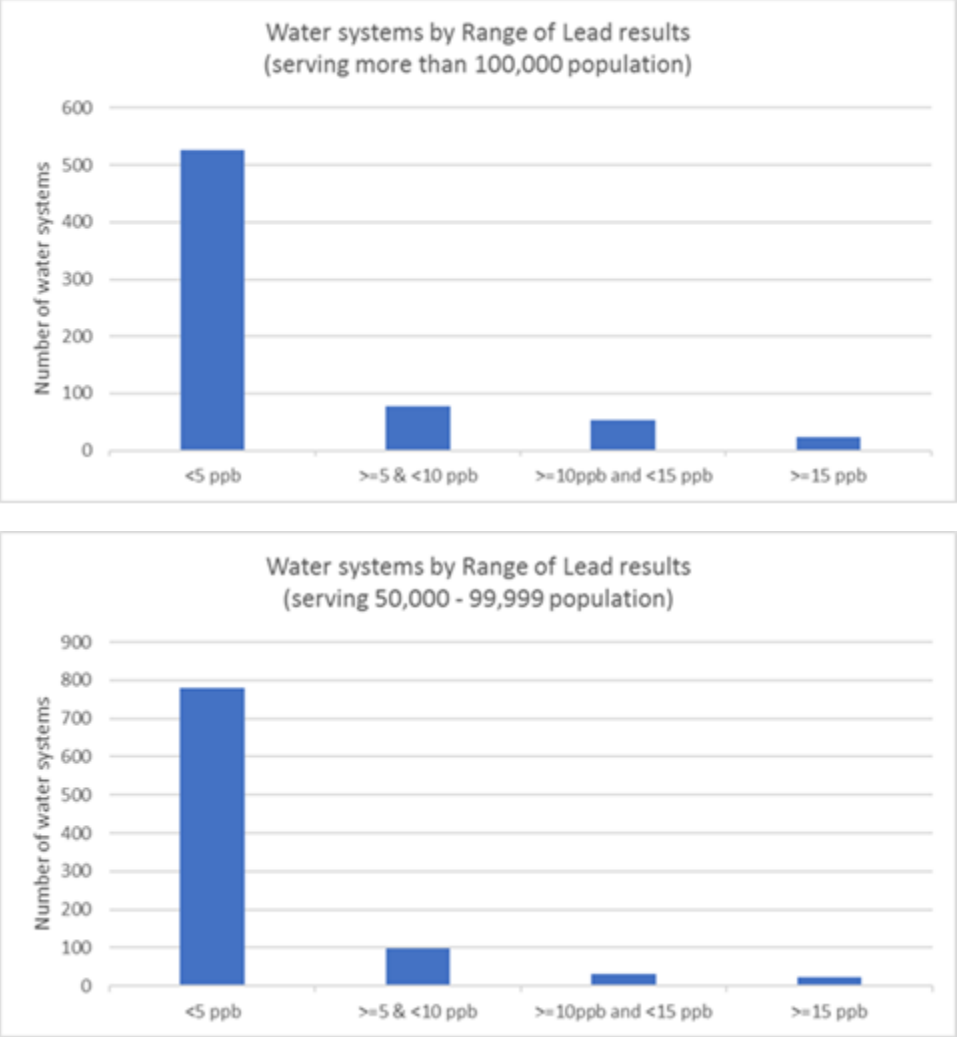
FIGURE 1



Source: Comments of Safe Water Engineering on Proposed LCR, February 2020

Furthermore, as shown in Figure 2, national data in the EPA Safe Drinking Water Information System (SDWIS) shows that the vast majority of public water systems covered by the LCR have 90th percentile lead levels of 0 to 5 ppb. Among water systems that serve more than 100k population, 77% of the water systems have 90th percentile of lead levels <5 ppb; 11% have lead levels in 5-10 ppb range; 8% have lead levels in 10-15 ppb range; and 4% have lead levels >=15 ppb. For water systems serving a population size of 50k-100k, 83% have lead levels <5 ppb; 11% have lead levels 5-10 ppb; 3% have lead levels in the 10-15ppb range; and 2% have lead level higher than 15ppb.

FIGURE 2



Source: NRDC, based on SDWIS data for 90th percentile lead levels for sampling periods ending in 2017-2019

While meeting an MCL of 5 ppb at the tap (not a 90th percentile standard but a strict at-the-tap maximum level) would mean that some systems would need to optimize or reoptimize their corrosion control treatment and remove lead service lines at homes exceeding the standard, there is no reason to avoid establishing a strict MCL that is as close to the MCLG of zero as is feasible.

The goal and mandate of the SDWA is not to establish a standard that most systems already meet—it is to establish a standard as close to the health goal as feasible, which Congress understood would require many or most water systems covered by a standard will have to take actions to reduce their level of contamination. In this case, clearly many water systems will have to improve their water treatment by optimizing their corrosion control, and will have to remove their lead service lines, to meet an MCL of 5 ppb. That is a good thing and would achieve Congress' goal.

EPA has essentially admitted that a 5 ppb standard is feasible in its proposal, by noting that many public water systems will be "deemed" to have optimized corrosion control treatment when their 90th percentile lead level is 5 ppb or less. Proposed 40 C.F.R, 141.81(b)(3). Moreover, in proposing a Trigger Level of 10 ppb for all water systems, again the agency is admitting that a standard of 10 ppb at the 90th percentile is feasible. The agency's Health Risk Reduction and Cost Analysis indicates that many water systems already are meeting these levels.

Additionally, we note that since the 1991 LCR was established, the SDWA was overhauled in 1996 and again later to ban lead-containing plumbing and fixtures.

In 1996 Congress amended the SDWA to require plumbing fittings and fixtures to be in compliance with voluntary lead leaching standards. SDWA §1417 (as enacted in 1996). In 2011, Congress enacted the Reduction of Lead in Drinking Water Act that revised the definition of lead-free plumbing by lowering the maximum lead content of wetted surfaces of plumbing products from 8% to a weighted average of 0.25%. See SDWA §1417(e) and EPA, "Use of Lead Free Pipes, Fittings, Fixtures, Solder and Flux for Drinking Water," and EPA, Summary of the Reduction of Lead in drinking Water Act and FAQs, 2013, Available online at https://www.epa.gov/sdwa/use-lead-free-pipes-fittings-fixtures-solder-and-flux-drinking-water. As new lead-free fixtures have been required, and older lead-containing fixtures, fittings and solder have gradually reduced their lead leaching and been internally coated with a passivation layer due to corrosion control treatment, the contribution of indoor "premise" plumbing to lead levels at the tap has diminished, as the charts above and later in these comments document (first draw water lead levels are virtually always lower than lead levels from lead service lines, as pointed out by the Region 5 Memo).

Finally, in 1996 Congress included a new measure in the Act that authorizes EPA to establish an MCL that is different than feasible level for large systems if necessary to minimize adverse health effects from multiple contaminants. Under SDWA §1412(b)(5), EPA "may establish a maximum contaminant level for a contaminant at a level other than the feasible level, if the technology, treatment techniques, and other means used to determine the feasible level would result in an increase in the health risk from drinking water by (i) increasing the concentration of other contaminants in drinking water; or (ii)interfering with the efficacy of drinking water treatment techniques or processes that are used to comply with other national primary drinking water regulations." If the agency selects this approach, it "shall minimize the overall risk of adverse health effects…." Id. §1412(b)(5)(B).

This new provision was intended to directly address the issue that EPA said in 1991 necessitated the establishment of the LCR treatment technique rather than an MCL. Under EPA's 1991 rationale, the agency said it was not feasible to ascertain the level of lead in tap water because doing so would cause an increased risk from other contaminants.

As summarized in the court's decision in *American Water Works Association et al. v. EPA*, 40 F. 3d 1266, at 1270 (D.C. Cir. 1994)(hereinafter "AWWA"),

> the agency interprets "feasible" to mean "capable of being accomplished in a manner consistent with the Act." The agency argues that if public water systems were required to comply with an MCL for lead, they would have to undertake aggressive corrosion control techniques that might reduce the amount of lead leached from customers' plumbing but would also increase the levels of other contaminants. The EPA argues that because the Congress apparently did not anticipate

> a situation in which monitoring for one contaminant, although possible, is not conducive to overall water quality, it impliedly delegated to the agency the discretion to specify a treatment technique instead of an MCL.

However, this potential eventuality has now been directly addressed by Congress with the addition to the Act in 1996 of new SDWA §1412(b)(5). Under that provision, EPA can establish an MCL at a level that "shall minimize the overall risk of adverse health effects" from the treatment that would be necessitated by the MCL. Id §1412(b)(5)(B)(i). EPA has made no finding that it is necessary to adopt an MCL that is less stringent than is feasible in order to address other contaminants, so it cannot here do so based on this provision. Moreover, the data discussed in these comments and in the EPA record show that most large municipal public water systems could meet an at the tap MCL of 5 (or at most 10) ppb without causing simultaneous compliance issues. EPA repeatedly asserts[‡] that the vast majority of public water systems are in compliance with both the LCR and other national primary drinking water regulations, and has presented no data in the proposal to show that a lead at the tap MCL must be weaker than that which is feasible in order to avoid other compliance problems.

In sum, EPA can no longer avoid setting and MCL by hiding behind a supposed unanticipated situation in which monitoring for lead would not be conducive to overall water quality. Congress has directly spoken to this situation and given EPA the tools to set an MCL that minimizes the overall risk of adverse health effects.

Additionally, after EPA had adopted the LCR in 1991 and after the *AWWA* court's 1994 decision, Congress adopted the ban on lead from all premise plumbing. This also vitiates EPA's other 1991 supposed rationale for establishing a treatment technique for lead. As the *AWWA* decision states, 40 F.3d at 1271,

> The Congress clearly contemplated that an MCL would be a standard by which both the quality of the drinking water and the public water system's efforts to reduce the contaminant could be measured. See 42 U.S.C. Sec. 300g-1(b)(5). Because lead generally enters drinking water from corrosion in pipes owned by customers of the water system, an MCL for lead would be neither; ascertaining the level of lead in water at the meter (i.e. where it enters the customer's premises) would measure the public water system's success in controlling the contaminant but not the quality of the public's drinking water (because lead may still leach into the water from the customer's plumbing), while ascertaining the level of lead in water at the tap would accurately reflect water quality but effectively hold the public water system responsible for lead leached from plumbing owned by its customers.

However, as we note above, as a result of the enactment of the ban on lead in premise plumbing in 1996 which was further strengthened in 2011, new lead-free fixtures have been required. Moreover, older lead-containing fixtures, fittings and solder have gradually reduced their lead leaching and been internally coated with a passivation layer due to corrosion control treatment. As the data in Figures 1 &2, data presented in following sections of these comments, and data in EPA's HRRCA and docket show, the contribution of indoor "premise" plumbing to lead levels at the tap has diminished in recent years. The vast majority of public water systems are finding 90th percentile levels of lead well below 5 ppb, and

[‡] See for example EPA's Government Performance and Results Act reports at https://www.epa.gov/ground-water-and-drinking-water/drinking-water-performance-and-results-report.

first draw water lead levels are virtually always lower than lead levels from lead service lines, showing diminishing contribution from premise plumbing.

Moreover, the SDWA §1401(4)(A)[§] explicitly provides EPA authority to regulate all parts of the public water system's distribution system that is under its control—which includes the lead service lines. As discussed further herein, water systems clearly control their service lines; they have authority to shut off water provided to them, routinely make emergency repairs to them, often required that they be made of lead (as in Chicago and many other cities), required that homeowners receive explicit approval for installing a service line and connecting to the system, and often the water system itself installed the lead service line (as in Newark and many other cities). The 1991 LCR originally explicitly covered lead service lines under the control of the water system in the provisions requiring replacement of such lines in certain circumstances. While EPA later stepped back from that requirement after the *AWWA* court remanded that measure because the court found that the agency hadn't provided sufficient opportunity for public comment on that provision, the agency clearly recognizes that it has authority to regulate all lead service lines under the control of the public water system.

Thus, this 1991 rationale for avoiding setting an MCL also cannot withstand scrutiny in light of the progress made in the past 3 decades.

As Cohen noted, our experience over the past 29 years has shown that the simplicity of following the statutory design by establishing a strict at the tap MCL would result in a more efficient, enforceable, and clear regulatory regime than the highly complex and problematic LCR treatment technique.

Assuming Arguendo that EPA Insists on Establishing a Treatment Technique, the Proposal Must be Overhauled and Strengthened

We maintain, as noted in the section above, that EPA must establish an MCL for lead at the tap. However, assuming arguendo that the agency will decide against this and can justify such as position in light of the new statutory construct and data that has become available over the past three decades, at a minimum the agency must revise the proposal to include the following provisions in its final LCR revision:

1. **Require complete, verified service line inventories**. EPA must define the rigor of service line verification required. The inventory must identify service line material from the water main to the first shutoff valve, or 18" inside the house, whichever is shorter. The initial inventory can continue with the schedule proposed, but the final inventory identifying all unknown service lines must be complete 2 years after the initial inventory.
2. **Establish a requirement for public water systems to remove all full lead service lines, regardless of lead levels measured in drinking water, at the utility's expense. This requirement should be**

[§] SDWA §1401(4)(A) provides in relevant part "The term 'public water system' means a system for the provision to the public of water for human consumption through pipes or other constructed conveyances…. Such term includes … any collection, treatment, storage, and distribution facilities under control of the operator of such system and used primarily in connection with such system…" (emphasis added)

completed within 10 years of the rule becoming final.[**] This requirement will be most effective if coupled with an appropriation for lead service line replacement. Funding for lead service line replacement should be prioritized for water systems with a high ratio of lead service lines to population served living under the poverty level. Water utilities including the American Water Works Association have agreed that all lead service lines should be replaced[8] and that partial replacements are not advised.[9] Water systems should pay the full cost of full service line replacement. Charging individual homeowners for replacement has led to delays, inefficiencies, and environmental injustices since renters and low-income people and communities of color often are unable to pay for replacement, leaving them to continue drinking lead-tainted water.[10] Studies have concluded that the benefits of lead service line replacement far outweigh the costs—according the Minnesota Health Department, by a factor of 10 to 1.[11] Lead service line replacement is a simple and necessary step that must be taken to eliminate lead in drinking water. EPA clearly has the authority to require complete service line replacement, as the SDWA §1401(4) gives the agency authority to regulate all of a public water system including any part of the distribution system under its control, including lead service lines. A Harvard Law School-EDF study shows that water systems are authorized under state law to pay for full lead service line replacements out of ratepayer funds.[12]

3. **Reduce the action level for lead from 15 ppb to 5 ppb**, rather than using the proposed lead "trigger" level of 10 ppb that will likely generate substantial implementation and enforcement problems.
4. **Until service lines are replaced (and for a time after replacement while lead levels can remain high), certified point of use** (POU) **filters should be provided, along with training for how to install and maintain them.** NSF has recently revised standards 53 and 58 for lead reduction to require reduction to 5 ppb, resulting in improved protection from certified filters.[††] The reduced action level, plus the new certification standard provides the opportunity for consumers to be protected from exposure to lead in drinking water at measurements over the new action level. The use of filter distribution programs to provide immediate protection from lead exposure will allow consumers to continue using water from the PWS rather than switching to bottled water.
5. **Prohibit all partial lead service line replacements and provide a clear definition of emergency replacements during which temporary partial replacements are allowed.** All temporary emergency partial replacements must be completed as full replacements within 30 days of the partial replacement.
6. **Revise public education to provide more timely and informative information regarding the risk of lead in drinking water.** This includes annual notification to all consumers of lead and unknown service lines as proposed, improved language regarding the risk of lead service lines and the need to use lead reducing filters, and more complete information on the health risk of exposure to lead in water. More detail regarding each of these recommendations is provided in the details of these comments.

[**] As discussed below, we recognize that a handful of water systems such as Chicago and Detroit have over 100,000 LSLs and will find complete replacement of all their LSLs within 10 years to be challenging. We believe that rather than writing the national rule to address a couple of exceptions, EPA to should instead establish a clear deadline for all water systems to replace all LSLs within 10 years. Any possible extensions could be provided by primacy states in a few truly exceptional circumstances pursuant to the Variance or Exemption authorities in sections 1415 and 1416 of the SDWA, or pursuant to a Consent Decree with regulators.

[††] https://www.wwdmag.com/lead/maximum-allowable-lead-level-lowered-5-ppb-nsf-certification

7. **Reduce the action level for lead from 15 ppb to 5 ppb, rather than creating potential confusion and implementation and enforcement problems by establishing a "trigger level" of 10 ppb while retaining a 15 ppb action level.**
8. **Use compliance sampling procedures that ensure more comprehensive testing and collect water from lead service lines**. Analyses presented later in these comments demonstrate that first liter samples do not represent the elevated lead levels that are detected when sequential samples are collected from lead service lines, and the first liter sample results are consistently lower than samples from lead service lines. These first liter samples are inadequate for identifying at risk systems, communicating the risk of lead service lines, triggering public education and lead service line replacement programs, and measuring the effectiveness of corrosion control treatment. In addition, experience in Washington, D.C., Flint, Newark, and many other public water systems in the wake of the Flint crisis has demonstrated that the current LCR's provisions allowing less frequent monitoring and fewer samples to be taken has resulted in serious failures to detect lead contamination problems. The rule should no longer permit monitoring to be reduced to just annual, triennial, or even every 9 years as currently allowed. Testing should be of a statistically valid number of the highest risk homes. Testing of water systems with lead service lines should be done most frequently (some homes with copper pipes and lead solder also should be tested, as in the current rule). And monitoring should be done no less frequently than every 6 months until all lead service lines are removed and optimized corrosion control has been confirmed for at least 2 years. The LCR must therefore require more samples to be taken, should not allow routine reductions in monitoring frequency and numbers of homes selected, and should require samples from the LSL as well as first draw samples.
9. **Require a study for all source water and treatment changes to identify simultaneous compliance and corrosion control issues prior to any such changes**. We have learned from our experiences with Washington, D.C., Flint, Newark and other water systems that a change in source water (as in Flint) or in water treatment (as in Washington and Newark) can result in widespread unanticipated lead contamination. They also in some cases have triggered other serious problems with simultaneous compliance with other rules such as violations of the Total Coliform Rule, the disinfection byproduct rules, and a Legionella outbreak. Such changes must be tested before they are adopted, and corrosion control options carefully evaluated, to ensure water safety and full compliance is protected.
10. **Mandate notification to all customers served by the PWS that the system is considering a source water or treatment change, and public notice of the results of the mandatory study.** Such notice should include plain language explanations of the implications of the change for water quality and for consumers.
11. **Build on the improved corrosion control treatment section to ensure that all corrosion control studies are designed to identify optimal corrosion control treatment.** Make the corrosion control study available to the public and hold at least one public meeting during the study process.

These foundational elements are necessary for achieving the primary goal of preventing lead exposure through the revised LCR. You will see these elements reflected throughout the detailed comments that follow. The next section provides a summary of my overarching comments on the major provisions of the LCR revision proposal.

Additionally, as discussed below, EPA's cost-benefit analysis fails to consider the full array of benefits that will accrue from compliance with a strong lead and copper rule. For example, the analysis fails to consider the massive health and thus economic benefits of reduced cardiovascular disease from lowering lead levels, underestimates the lifetime economic and non-quantifiable benefits of improvements in cognitive development (including not just IQ improvements but also reduced impulsivity and behavioral problems in children, adolescents and adults who consume less lead), and fails entirely to consider "approaches to identify consumer willingness to pay for reductions in health risks from drinking water contaminants," as required by the SDWA, 42 U.S.C. §300g-1(b)(3)(C)(iii). Full consideration of these and other benefits would drive a more stringent rule. Moreover, the agency fails to justify its use of 3% and 7% discount rates for future benefits. As discussed further herein and more extensively in the comments of the New York University Institute for Policy Integrity in the EPA docket, these discount rates are wholly inappropriate and result in a substantial understatement of the benefits. EPA should use a zero discount rate for the intergenerational and long-term future health benefits over the next several decades of the rule. OMB's 2003 Circular A-4 calling for the 3% and 7% discount rates is badly outdated (for example OMB's 2020 Circular A-94 long-term 30-year interest rate is 0.4%).[‡‡] EPA must fully justify its use of a discount rate more than zero, and as the NYU comments note, even a 3% discount rate is probably too high, so EPA must fully justify whatever rate it uses.

Requirements to retain in the final LCR revision

- State MAY require corrosion control study for those NOT deemed to have optimized corrosion control even if they do not exceed the trigger. This provision gives a state oversight program the ability to require a corrosion control study at any time.
- Annual service line notification for lead and unknown service lines. According to this provision, consumers must be notified within 30 days of completion of the initial LSL inventory required by proposed § 141.84(a). This annual notification serves as a frequent reminder of the risk of lead exposure at the individual home. It also ensures that the occupant of the home will get notified when the residents change regardless of whose name is on the water bill.
- New requirement to review corrosion control treatment and water quality parameter data at sanitary surveys.

Requirements to keep but to improve in the final rule:

- Updated requirements for **corrosion control studies**. New elements in the proposal are important improvements, but there are additional opportunities to strengthen the clarity and specificity of corrosion control study requirements. As detailed later in these comments, there are several improvements in the corrosion control study section, such as specific treatment options that must be investigated and removing the use of coupons as a study method. There are some requirements that continue to undermine the intent of the rule to ensure effective corrosion control treatment, such as small and medium systems can "re-optimize" treatment just by getting under the trigger level for 2 monitoring periods without adding treatment. This does nothing to provide lead reduction for at risk consumers. There are many improvements

[‡‡] See https://www.whitehouse.gov/wp-content/uploads/2019/12/M-20-07.pdf. While this interest rate is not established for regulatory cost-benefit analysis, EPA has not explained why a higher discount rate that this level is warranted.

that can be made to make the corrosion control requirements more effective. These will be detailed later in these comments.

- **Service line inventory** and notification requirements. An accurate service line inventory is fundamental to effective water utility asset management. The proposal presents a move in the right direction, but substantial additional details are necessary. The proposal offers many incentives to categorize service lines as unknowns and has no time requirement for identifying the content of unknown service lines. We are concerned that this will create incentives for water systems to designate as many service lines as possible as unknowns, to avoid the requirements applicable to LSLs.
- **Lead service line replacement.** The proposal includes new encouragement for lead service line replacement and disincentives for partial lead service line replacement. However, there is no specific requirement to replace the full lead service lines on a mandated schedule and no explicit ban on partial lead service line replacements. The proposal actually slows the mandated schedule of lead service line replacement after a lead action level exceedance to 3% per year, allowing more than 33 years for completion of LSL replacement (the current rule requires the task to be done within about 14 years). This is a substantial weakening of the current rule which we believe is unlawful under the SDWA's anti-backsliding provision. 42 U.S.C. §300g-1(b)(9). The LCR revision proposal offered the following minor improvements regarding full lead service line replacement (FLSLR):
    - Only FLSLR counts toward the mandatory replacement rate after a lead action level exceedance
    - A PWS must provide filters after FLSLR is complete.
    - Replace public side when a property owner replaces the private side of the line.
- **New clarifications around sampling**. The new service line inventory plus the mandate to sample at lead service line homes represents an improvement in sampling at high risk homes. Likewise, the new sampling procedure requirements for that sampling should not occur at sites with a service line of unknown material, no aerator removal, no pre-flushing, and specification of wide mouth bottles should be retained. Another improvement is that the proposal ends the practice of testing out of lead service line replacement, a change we support. On the other hand, the proposal does not address the most impactful sampling change of all – a sampling protocol that collects water from lead service lines. Data provided in these comments demonstrates the extent to which the first liter samples underestimate the contribution of the lead service line to water lead concentrations. Further concerns regarding the proposed sampling requirements are the provisions that continue to allow some systems to sample every three years (and in some cases every nine years) at a reduced number of sites. These reduced monitoring provisions should be revoked, at least until all LSLs are fully replaced, unknowns have been confirmed as non-lead, and corrosion control has been fully reevaluated and confirmed as optimized.
- Requirement to make compliance sampling **data publicly available**. The final rule should also make all sampling data publicly available in a format that is understandable to the general public (including mapped results), including investigation sampling, and there must be a requirement to notify the public how to access the publicly available data.
- **Small System Flexibility**. This new section is novel and forward looking. To the extent consistent with the other recommendations of these comments, EPA should consider how similar options may be available to improve public health protection and be available to all size water systems if

the full package of all three provisions are required. We urge, however, that the timeline for LSL removal be reduced to 10 years.

Requirements that should be removed from the final LCR revision:

- **The trigger level**. The proposed lead trigger level adds complexity to an already very complicated rule. The addition of a trigger level of 10 ppb is at bottom an admission that the action level of 15 ppb is too high for systems to begin taking action. It would be far more simple, more implementable, and more enforceable to reduce the action level, we would urge to 5 ppb. Additional discussion is provided later.
- The LSLR requirement for **replacing only 3% of lead service lines per year**, only while a PWS has an action level exceedance. As stated earlier, a proactive mandatory LSLR program with a 10-year deadline is needed for all water systems. All the loopholes for avoiding LSLR must be removed from the final rule.
- **Find and Fix**. This section takes a corrosion control treatment approach to an immediate high lead risk concern and does nothing to provide immediate risk reduction where high lead levels are measured. The focus in the final rule should be lead service line removal and filter provision for immediately lead risk reduction. Among other things, Find and Fix:
    - Does not specify allowable follow up sampling protocols
    - Does not address how to treat follow-up samples with significantly different information from initial compliance samples
    - Does not define what is “Fixed”
    - Does not require lead service line removal
    - Does not require installation and maintenance of a POU filter certified for lead removal
    - Does not provide clear response or follow up remediation at homes with samples over 15 ppb

All of these steps should be included in the find-and-fix provision in the final rule addressed.

- **School and childcare sampling requirements**. We are concerned that the school and child care sampling requirements would require such minimal monitoring that they will result in widespread false negatives (i.e. they will cause instead modify the small system flexibility requirements of 141.93 option (3) for POU devices to apply to schools and childcare centers to believe incorrectly that they don’t have a lead problem because the testing failed to detect it, even when they do have a problem). We know from school monitoring completed in multiple states such as New York that unless there is regular monitoring of each site at which water can be consumed, lead contamination will be missed at some of the locations where children drink water. The provision should be modified to require public water systems to choose between either:
    a. Conducting robust ongoing monitoring (for example, monitoring of every outlet that may be used for drinking water to be tested routinely, at least every 6 months, with specific recommendations for replacement or removal of outlets from service if they test over a specific threshold (we recommend the American Academy of Pediatrics’ 1 ppb level); or

b. Installing certified point-of-use filtration stations at schools and childcare centers that will ensure lead removal.

The school and childcare water sampling requirements presented in the LCR revision proposal are inadequate, misleading, and would waste money which could result in little or no public health benefit since many lead contamination problems would be missed, and no remediation is required. On the other hand, given that lead is a specific problem that can often occur at unpredicted locations, a POU strategy for schools and childcares, which includes regular maintenance, will result in an immediate source of drinking water with improved protection from lead in drinking water. The revised NSF certification standard of 5 ppb for filters certified under NSF 53 and NSF 58 for remediation even recommended lead removal[§§] allows for schools and childcares to continue to use water from public water systems rather than switching to bottled water to protect our most vulnerable children from lead exposure.

Reducing the Action Level to 5 ppb Lead

Rather than establishing a Trigger Level of 10 ppb and maintaining the Action Level of 10 ppb for lead, the agency should simply reduce the lead Action Level to 5 ppb. This will simplify implementation and enforcement. As noted above, EPA has essentially admitted that a 5 ppb action level is feasible in its proposal, by noting that many public water systems already will be "deemed" to have optimized corrosion control treatment when their 90th percentile lead level is 5 ppb or less. Proposed 40 C.F.R, 141.81(b)(3). Moreover, in proposing a Trigger Level of 10 ppb for all water systems, again the agency is admitting that a standard of 10 ppb at the 90th percentile is feasible. The agency's Health Risk Reduction and Cost Analysis indicates that many water systems already are meeting these levels, as do the data presented in the previously in these comments.

The data presented in the previous section in Figures 1 and 2 both reinforce that an action level of 5 ppb, or at the very highest 10 ppb using samples from the LSL (such as 5th liter samples) is entirely feasible. The data from Michigan and Chicago, and the Region 5 Memo, show that samples from the lead service line should be the basis for a determination as to whether the Action Level is met. This is the basis of the Region 5 recommendation that monitoring be done of samples from the lead service line rather than solely first draw samples.

The Economic Analysis is Flawed, Undercounts Benefits, Overestimates Costs, and Fails to Include Critical Information and Analysis

The economic analysis of the EPA Proposal is deeply flawed, and in order to meet the statutory requirements of the Safe Drinking Water Act, EPA must make many adjustments and include significant additional data as well as additional analysis. The principal problems with the analysis, which we discuss below, flow from (1) overrepresenting the costs of the proposal and undercounting the benefits of reducing lead exposure, as well as, (2) failure to take consumer willingness to pay into account, (3) failure to conduct any meaningful analysis of alternatives to the Proposal, and (4) failure to adequately analyze the impacts of this proposal (or alternatives) on sensitive populations.

[§§] https://www.wwdmag.com/lead/maximum-allowable-lead-level-lowered-5-ppb-nsf-certification

The SDWA directs EPA to prepare a Health risk reduction and cost analysis of any consider the costs and benefits associated with setting any national primary drinking water survey.[13] The statute also authorizes EPA to identify approaches to measure and value benefits, which include consumer willingness to pay.[14]

i. EPA overestimates costs of the rule and underestimates benefits of reducing lead exposure

In contrast with other studies, which have found a net-benefit to spending to reduce exposure to lead, EPA's model does not. For example, the Minnesota Department of Health conducted an extensive study, attached, which concluded that the costs of replacing lead service lines in the state would range from $228 million to $365 million, with benefits exceeding those costs by about 10-fold, estimated at $2.1 billion to $4.25 billion.[15] The state also found that overall benefits of a package of lead in drinking water reduction reforms would yield benefits of about double the costs. The state noted that these benefits were likely understated.

Similarly, a 2017 report by the Pew Trusts and the Robert Wood Johnson Foundation, which investigated what it would take to eliminate the threats of lead (from all sources) for the cohort of children born in 2018, found that:

> If federal investment of $80 billion was sufficient to prevent the 2018 cohort's blood lead from exceeding zero, estimated societal benefits would be $1.05 per $1 invested; if the necessary investment proved smaller, the cost-benefit ratio would be greater. Additionally, permanent removal of lead hazards would affect future cohorts, and those benefits would be in addition to the estimates provided in this analysis.[16]

The following analysis suggests some reasons why EPA's findings undercount benefits and overestimate costs.

a. Underlying assumptions make EPA's calculations of costs and benefits unreliable

EPA relies on SHEDS model to estimate lead exposure, which is the foundation of the benefits calculation. However, is inappropriate to use for modeling blood lead levels, especially water lead exposures. For water exposures, the SHEDS model uses a single coefficient, despite the fact that lead levels in first-flush versus fully flushed samples can vary by an order of magnitude, as the data in the previous Figures demonstrate. For example, it is well-established by the data that first draw samples from homes with lead service lines always or virtually always are lower than subsequent samples taken from the lead service line. See analysis of lead levels in first draw water vs. samples taken from lead service lines below, and in the attached memorandum from EPA Region 5 to EPA Office of Water. Without a dynamic model, there are likely to be inaccuracies in actual exposure to lead, and these will have a greater (depressive) impact on benefits estimations than on (inflationary) impacts on costs. For example, given the sampling methodologies that EPA proposes, the model may accurately capture the instances when a water system would trigger additional requirements of the rule (because apparently the model's flaws are similar to the sample collection methodology's flaws and thus may similarly underrepresent exposure), but it will not accurately reflect actual exposure, which will be considerably higher than estimated by the current model, as illustrated in our analysis and the Region 5 memo noted above. If there is an underrepresentation of actual exposure underlying benefits calculations, this will

lead to a serious undercounting of benefits associated with both CCT and lead service line removal (which EPA needs to calculate, see below) and LSL replacements because it underestimates the exposure avoided.

Similarly, EPA's failure to account for prenatal exposure to lead also is arbitrary and capricious. Prenatal exposure has many of the same impacts as postnatal exposure (in addition to novel effects, such as preterm birth).[17] This is a flaw in the model that must be corrected.

Finally, EPA's reliance on a 7% discount rate is inappropriate. No discounting is appropriate for benefits to future generations and for benefits to be felt decades from now. On the question of whether to rely on a 3% or 7% discount rate, NRDC incorporates by reference the comments of the Center for Policy Integrity.

b. In contrast to how it handles costs, EPA only monetizes some of the benefits of the proposal, despite literature that enables EPA to create a more exacting benefit estimate

Throughout the Proposal, EPA meticulously counts costs, often overestimating them, but fails to accurately account for benefits either by neglecting to include them at all or by failing to monetize them. One potent example of this flawed approach is the way that EPA handles monetizing educational outcomes associated with this rule. Learning disabilities, reduced IQ, and ADHD are all known consequences of lead exposure,[18] and each can lead to specific and straightforward-monetizable outcomes such as special education services, higher lifetime likelihood of interaction with the criminal justice system including incarceration, among others. Yet, EPA does not monetize any of these outcomes.[19] In contrast, when considering the benefits of reduced exposure to lead, EPA includes increased costs of higher educational achievement when considering benefits. This theme: partially monetizing the benefits but fully or overcounting the costs creates a dangerous asymmetry which is a disservice to the public and runs afoul of the health mandates of SDWA.

Another area where this Proposal would provide considerable, monetizable benefits that are not sufficiently reflected in the Economic Analysis is the benefit of CCT to people who live in homes *without* an LSL. CCT is important because of the millions of LSLs serving homes, but even pipes deemed "lead free" can still have .25% lead content, solder, fixtures, and internal plumbing are all important sources of lead exposure.[20] The Proposal states:

> The EPA does track the number of ''no LSL'' homes potentially affected by water systems increasing their corrosion control during the 35-year period of analysis. The number of no LSL homes that experience increase in CCT over the 35 years ranges from 14 million in the low cost scenario and 26 million in the high cost scenario. The EPA considered one possible approach to estimating the potential benefits to children of reducing lead water concentrations in these homes (see Appendix F of the EA) but has determined that the data are too limited and the uncertainties too significant to include in the quantified and monetized benefit estimates of this regulation.[21]

CCT benefits anyone drinking water coming from those sources. As early as 1984, the Department of Energy was able to estimate the nationwide benefits of CCT, and found them to be more than $700 million.[22] In 1989 the American Water Works Association Research Foundation wrote:

> [A]lthough internal corrosion cannot be eliminated, it can normally be controlled in a cost effective manner. Reference literature ... indicated that beneficial B:C [benefit to cost] ratios normally result from controlling internal corrosion.[23]

EPA must include these important benefits for any Economic Analysis to be complete and in line with the mandate of the SDWA.

There are several health endpoints well-established to be consequences of lead exposure which can be monetized. In general, EPA neglected to monetize the benefits of reduced lead exposure on adults and sensitive populations (below). We recommend that EPA include these benefits.

In one 2016 paper, researchers monetized the impacts on adults of 16 health endpoints.[24] The context for the paper was occupational exposure, but there is no reason this cannot or should not be applied in a drinking water context, as even with a different source of exposure the effects of lead are the same. The impacts are:

- Cardiovascular:
  - Hypertension
  - Myocardial infarct
- Neurologic:
  - Muscular pain
  - Ocular disorder
  - Depression—mild
  - Depression—severe
  - Nervous system disorder
  - Panic disorder
  - Dementia
- Reproductive:
  - Fertility—male
  - Fertility—female
  - Preterm birth
- Kidney disease:
  - ESRD
  - Chronic kidney disease
- Carcinogenicity
  - Lung cancer
- Mortality
  - All cause mortality
- Anemia (comorbid condition)

In addition, there are other impacts that EPA can and should monetize, such as the impacts of ADHD and learning disabilities (e.g. the cost of special education).[25]

EPA's failure to address cardiovascular impacts is particularly troubling. EPA states that "evidence relevant to quantifying the incremental contribution of blood lead concentrations (especially at BLL <5 mg/ dL) to cardiovascular disease (and associated mortality) relative to strong predictors such as diet, exercise, and genetics."[26] But it is not necessary to rule out other factors contributing to the cause of these diseases (and resulting mortality) to establish a link sufficient to count benefits. Indeed, there is significant literature on this endpoint. NRDC incorporates by reference the comments of the Environmental Defense Fund on this point.

c. EPA wrongly assumed 100% compliance, even with the non-legally binding provisions in the rule, which leads to an overestimation of costs

Without justification, it appears that EPA assumes that there will be 100% compliance with the Proposal, including provisions that are not clearly legally binding with time-bound enforceable requirements, and as a result overestimates costs associated with its implementation. In general, utilities have a poor track record of complying with drinking water requirements, much less with non-legally binding suggestions. Despite a requirement from the 1991 that utilities conduct inventories of their lead pipes, very few utilities have such an inventory nearly 30 years later. GAO found that "[o]f the approximately 43 states that responded that they would fulfill EPA's request for information about the location of LSLs, almost all (39) reported to EPA that, although they had encouraged water systems to publicize inventories, few systems had completed their lead pipe inventories."[27] GAO found that of the 100 largest water systems, only 12 had publicized the location of lead service lines.[28] NRDC's most recent analysis of EPA data finds that nearly 30 million people in the United States drank water from community water systems that violated the Lead and Copper Rule between January 2015 and March 2018.[29] EPA's assumption that 100% of water systems will comply with this Proposal unfounded and arbitrary, and by making this assumption EPA has overestimated the costs associated with this Proposal. EPA should develop a realistic model of compliance and then adjust projected costs accordingly.

ii. EPA fails to take valid approaches for the measurement and valuation of benefits, such as willingness to pay, into account

The SDWA provides that EPA is to consider "valid approaches for the measurement and valuation of benefits under this subparagraph, including approaches to identify consumer willingness to pay for reductions in health risks from drinking water contaminants."[30] Neither the EPA Economic Analysis nor the EPA Federal Register notice makes a mention or an attempt to conduct a willingness to pay study or even to survey the literature on willingness to pay for safer drinking water.

There is some limited discussion of willingness to pay in the EPA Economic Analysis, but it is insufficient and does not provide meaningful information about how consumers may be willing to pay for safer drinking water. For example, EPA does make mention of the potential effects of disclosure requirements for lead pipes on home sale prices or rental value but does not conduct a full study of the impacts. EPA mentioned one study that suggested homes with LSLs in Pittsburgh PA "sold for about 5% less, indicating a lower price of $9,700 on average."[31] But EPA goes on to asserts that the study did not effectively control for other factors. Other studies, the agency asserts, were similarly inconclusive,

however EPA must consider information about consumer willingness to pay more for a home where lead paint had been remediated.[32]

It is important to look at lead-in-water specific information, and a meaningful study should be conducted and included in this analysis. In addition, EPA must consider other indicia that consumers are willing to pay for safer drinking water. There is an abundance of evidence that consumers are willing to pay for cleaner drinking water.

Consumers have been voting with their wallets for bottled water and point of use filters due to concerns about the safety of tap water. Bottled water sales in the United States in 2017 topped $18.5 billion dollars,[33] showing consumer willingness to pay for water perceived as safer than tap water. And safety of tap water is indeed a leading reason that consumers have been turning to bottled water, according to published, peer-reviewed science. For example, an in-depth study published in 2011 found that "U.S. consumers are more likely to report bottled water as their primary drinking water source when they perceive that drinking water is not safe. Furthermore, those who give lower ratings to the quality of their ground water are more likely to regularly purchase bottle water for drinking and use bottle water as their primary drinking water source."[34]

It is also worth noting that the Jacksonville Florida study's findings are confirmed by other published, peer-reviewed studies making similar findings in other locales. This is so even in lower income communities, such as Parral, Mexico where researchers determined "households are willing to pay from 1.8% to 7.55% of reported household income above their current water bill for safe and reliable drinking water services."[35] Similarly, in Bangladesh, consumers were willing to pay for water that contained safe levels of arsenic, despite the endemic poverty in the region. The authors of this peer-reviewed, published paper found that "Regardless of economic class, most of the households (75%) were willing to pay" the equivalent of "2–6% of their respective monthly income to access safe drinking water."[36]

Published willingness to pay studies have demonstrated consumer willingness to pay for safer tap water. For example, a recent consumer willingness to pay for safer drinking water study in Jacksonville, Florida was published in a peer-reviewed journal by Florida researchers.[37] After an environmental group had published a study suggesting contamination of the local water supply with certain contaminants (at levels below EPA standards), researchers surveyed local residents as to how much they would be willing to pay to "improve the quality of your water?" The researchers found that the average consumer was willing to pay $6.22 per month for improved quality of their water, or about $75 per year, with no violations of standards alleged or any official indication that the water was unsafe. Indeed, the local water utility vehemently publicly denied that there was any significant health risk from the contamination. Thus, if there were a violation of a federal standard, and associated authoritative statements about the health risks posed by the contamination, it would be reasonable to assume the willingness to pay would have been substantially higher.

When there are known dangers in tap water, consumers repeatedly demonstrate a willingness to pay. For example, multiple "boil water advisories" in recent years in the greater Washington DC area have resulted in shortages of bottled water in stores.[38] People are willing to pay significant amounts for safe water.

Even when the dangers present in water are poorly communicated to the public, as is often the case with LSLs, there are examples of how people are wiling to pay for service line replacement. For example, Washington DC has had various voluntary LSL replacement program for many years. Many residents have opted to pay for replacing their own LSL or applied to a new program to receive public funds to replace lead pipe.

iii. EPA failed to conduct any meaningful analysis of alternative proposals

While SDWA plainly recognizes that economic analysis is a decision-making tool and is best applied to multiple scenarios, EPA failed to do so in this Proposal. The obvious scenarios to include are the possibility of lowering the action level, implementing an MCL for lead, and requiring comprehensive replacement of all lead service lines. Without this, this economic analysis clearly is incomplete.

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iv. EPA failed to adequately analyze the impacts of the proposal on sensitive populations

Similarly, the SDWA contemplates an economic analysis that pays special attention to sensitive populations, something that this Proposal fails to accomplish. For some of the health endpoints that EPA includes, there are researchers who believe that these impacts are more likely to occur when there are very high levels of lead exposure,[39] something that is less common than it was previously, but is still more common where there is more than one source of exposure from lead. This is more likely to occur in sensitive populations, such as children in low income brackets who are more likely to be exposed to lead from paint as well as drinking water. EPA must analyze the impacts of this rule on sensitive subpopulations for the economic analysis to be complete.

In addition, there are a number of other vulnerability factors that EPA did not analyze. For example:

- Populations more likely to be formula-fed rather than breastfed as infants, such as rural populations, some racial minorities, and infants in families receiving WIC assistance (food stamps) [40].
- Health endpoints likely when blood lead levels are comparatively high (such as higher incidences of learning disabilities, ADHD, or severe intellectual disabilities) and children demographically more likely to be exposed to multiple sources of lead, such as from paint in poor quality housing.[41]
- Health outcomes of lead exposure that, independent of lead exposure, are more likely in certain demographic groups, such as demographics in which adults are more likely to suffer from increased incidences of cardiovascular disease,[42] historically marginalized racial minorities and other groups.[43]
- In its 2016 White Paper, EPA acknowledges that "Potential costs may be disproportionately borne by specific low-income localities, such as Detroit, which has an estimated 100,000 LSLs and where 40 percent of the population is below the poverty line."[44]
- In its 2016 White Paper, EPA rightly acknowledges the special burden on low income renters, noting that it is important to figure out "[h]ow to address LSLR in rental properties, particularly where low income residents do not control the property or have the ability to contribute to the cost of LSLR."[45]

Without this analysis, including where possible monetizing these effects, the economic analysis is simply incomplete.

DETAILED COMMENTS ON PROPOSED LCR LANGUAGE[***]

Definitions

- *Lead service line* means a service line made of lead, or any portion made of lead, from the discharge of the corporation fitting to the building plumbing at the first shut-off valve inside the building, or 18 inches inside the building, whichever is shorter. ~~which connects the water main to the building inlet~~. A lead service line may be owned by the water system, owned by the property owner, or both. For the purposes of this subpart, a galvanized service line is considered a lead service line if it ever was or is currently downstream of any lead service line or service line of unknown material. ~~If the only lead piping serving the home or building is~~ A lead gooseneck, lead pigtail, or lead connector ~~, and it is not a galvanized service line that~~ is considered ~~an LSL the service line is not~~ a lead service line.
    - The definition of a lead service line in the LCRR represents a weakening of requirements issued under the Safe Drinking Water Act. The 1991 LCR defined a Lead Service Line as "a service line made of lead which connects the water main to the building inlet and any lead pigtail, gooseneck or other fitting which is connected to such lead line." If a CWS is allowed to use an inspection inside the house to identify the material of a service line, then the section of pipe inside the house must also count as part of the service line. A lead service line removal would still be a partial lead service line removal causing a risk of increased lead exposure in the home if the portion of the lead service line inside the house is not also removed at the same time.
- Pitcher filter definition "means the pitcher and filtration cartridge ~~insert~~ ~~for water pitchers~~ that removes lead in drinking water, and that is certified to remove lead in accordance with NSF/ANSI standard 53 and remove particulates in accordance with NSF/ANSI standard 42.
    - The definition must be specific about the standard that must be met.
- Wide mouth bottles – "At least 55 mm wide, required to be used for lead and copper tap sampling collection ~~to optimize capturing accurate lead measurements~~."
    - Implies this is the only important thing for "capturing accurate lead measurements." This statement is not necessary for a clear enforceable definition of "wide mouth bottles." Collecting lead service line samples is far more important for "capturing accurate lead measurements" and should be included in the final LCR revision.
- The definition for "Trigger Level" should be removed from the final LCRR.
    - The introduction of a trigger level increases the implementation complexity of the LCRR above and beyond what is already acknowledged as the most complex of all EPA drinking water regulations. The cost and confusion of adding and implementing this new definition will outweigh any benefit it might provide. It will be far simpler to lower the Action Level to 5 ppb, resulting in improved public health protection.

[***] These detailed comments are largely based on comments by Elin Betanzo of Safe Water Engineering. We incorporate those by reference to the extent they are consistent with these comments.

Trigger level vs action level

The lead action level is a pivotal number in the LCR. It is not a measure of public health protection, because the safe level of lead in water is 0 ppb. Rather, the lead action level is related to corrosion control efficacy. Although corrosion control might not be optimal even when lead levels are below 15 ppb, lead levels exceeding the lead action level are indicative of such significant lack of efficacy that additional safeguards should be taken, as a matter of course, to protect public health. Thus, when a water system exceeds the lead action level they are triggered into additional steps – corrosion control studies, more frequent sampling, public education, and lead service line replacement. The LCRR proposal acknowledges that the current level of 15 ppb is not triggering enough water systems into additional action by creating a trigger level of 10 ppb that performs a lot like the action level. The final LCRR should use 5 ppb as the new action level so that the protective requirements apply to a larger universe of regulated water systems. Simply lowering the action level will create a more protective requirement and reduce the complexity that the trigger level would have introduced.

Corrosion Control Requirements

As stated previously, the LCRR includes some important improvements to the corrosion control requirements of the LCR, but there are additional opportunities to improve the clarity and specificity of these requirements. First, the new lead trigger level adds an unnecessary level of complexity that will undermine the public health protection intended in the final rule. The applicability of the corrosion control requirements should be based solely on the action level, and reducing the action level to 5 ppb. As a policy and technical expert solely focused on reviewing and submitting comments on the LCRR, I spent hours trying to decipher the requirements based on the lead trigger and lead action levels. Due to complexity and errors throughout the proposal language I was unable to understand how the action level and trigger level will work in practice. Every water system that must comply with these requirements is also complying with the full set of National Primary Drinking Water Regulations and day to day operations. Every state that has primacy for the Public Water System Supervision program is also enforcing every other regulation, and enforcing them at hundreds of public water systems. If an expert working full time on the LCRR alone cannot make sense of the requirements, these cannot be enforced in a meaningful way in the context of other responsibilities. The LCRR will be far more efficient and more protective health outcomes will be realized by merely reducing the lead action level to 10 ppb and eliminating the complexity that was added to section 141.81.

141.81(c) allows a small or medium water system to stop treatment steps when the water system meets both action levels during two consecutive 6-month monitoring periods. Starting and stopping corrosion control treatment steps results in delayed corrosion control treatment and leaves consumers unknowingly at risk of lead exposure. Small and medium systems have had reduced corrosion control treatment protection compared to large systems since 1991. If a small or medium water system is triggered into the corrosion control treatment steps due to lead sampling results, the water system must be required to follow through on the corrosion control study. The only alternatives offered should be the Small Water System Compliance Flexibility options proposed in section 141.93. Ceasing corrosion control studies and allowing small and medium systems to “re-optimize” treatment by getting under the trigger level for 2 monitoring periods without adding treatment does nothing to reduce the risk of lead

exposure for at risk consumers when 10% of samples collected can have any level of lead while a water system maintains compliance with these criteria.

The LCRR includes several improvements in 141.82, the description of corrosion control treatment requirements, that will improve the quality of corrosion control studies. Improvements that should be maintained in the final rule include:

- Eliminating the use of coupons in corrosion control studies,
- Designating more specific treatment options that must be investigated, the revised rule specifies that orthophosphate must be studied, eliminating polyphosphate as a corrosion control option. However blended polyphosphates are still an option if they meet the required orthophosphate dose. Further revision is necessary, as discussed below.
- The concept of re-optimization is important as water quality characteristics and needs change over time. It might be helpful to add a definition of "re-optimization" in the list of definitions.
- Giving EPA the clear authority to review state treatment decisions and revise as appropriate.

Please consider the following suggestions to continue improving this section of the rule (the applicable requirements appear in several places in the rule so the specific sections are not noted):

- The rule proposal, like the original LCR, instructs small and medium sized water systems without corrosion control treatment to recommend one or more of the corrosion control treatments listed in paragraph (c)(1). The state may require a study or may require additional water quality parameter sampling. Given the lack of technical, managerial, and financial capacity at many small and medium systems, I recommend flipping the language here to place this responsibility of recommending corrosion control treatment on the state, which is more likely to have corrosion control experience and expertise. This change may result in more efficient recommendation and review processes.
- The best water quality decisions will be made when a corrosion control study is conducted by each individual water system. As currently written, the proposal would only require a corrosion control study in limited circumstances for small and medium systems and when the state requires it, and even large systems that come in under the Trigger Level would not be required to complete a study. Corrosion control is very specific to source water quality, treatment in place, treatment history, and the materials present in the distribution system. EPA should require all water systems to complete a corrosion control study to identify optimal corrosion control treatment. Another option to provide better information for small and medium systems would be for EPA to conduct systematic corrosion control studies in typical representative source waters across the country that states could use to extrapolate to treatment requirements for individual small and medium size systems.
- Evaluate a scenario that drops the polyphosphate dose to 10% or less (i.e., 90% orthophosphate).
- For chlorinating systems, add evaluation of PbO_2 scale and pH adjustment as a corrosion control option (see DeSantis et al.). In other words, evaluate effectiveness of chlorination to maintain scale before switching to orthophosphate.
- Consider adding DBP pre-cursor removal as corrosion control treatment because it allows high chlorine and high pH while maintaining compliance with DBP MCLs

- Small and medium systems can "re-optimize" just by getting under the trigger level for 2 monitoring periods without adding treatment. This does nothing to provide lead reduction for at risk consumers. EPA must remove this option unless all LSLs are removed after the LALE.If a small or medium water system exceeds the lead action level, they should be taking real action to reduce risk of lead exposure through improved corrosion control treatment or filters that must be maintained as long as sources of lead continue to be present in service lines and household plumbing.
- As noted previously, the schedules in the proposal for CCT studies, installation of treatment, and monitoring for WQPs are based on both the trigger and action level. This structure is complicated and will result confusion during implementation. It will be more effective to just lower the action level and simplify the process.

Changes needed to corrosion control study requirements (the applicable requirements appear in several places in the rule so the specific sections are not noted):

- The final rule must be clear that water systems must analyze straight orthophosphate at doses of 1 and 3 mg/L and not polyphosphate blends. This appears to be in the intention of the rule, but as written a water system that relies on a previous study could test these doses using a polyphosphate blend. Polyphosphate blends can be evaluated in addition to the straight orthophosphate if the water system chooses, but it should not be mandatory.
- For systems that use chlorine for secondary disinfection, the final rule should add evaluation of existing PbO_2 scale as a corrosion control option since PbO_2 can be highly effective for binding lead. If modifications to existing treatment can be effective, they should be evaluated alongside orthophosphate.
- Similarly, consider adding DBP pre-cursor removal as corrosion control treatment because it allows higher chlorine and high pH that may maintain PbO_2 scale while maintaining compliance with DBP MCLs.
- Under the re-optimization study options, add a requirement for systems that currently use a polyphosphate or a polyphosphate blend to conduct a re-optimization study.
- The provisions in 141.82(c)(1)(ii) and 141.82(c)(2)(ii) allow a water system to rely on analyses based on documented analogous treatments with other systems of similar size, water chemistry, and distribution system configurations. The final rule must clarify that if a water system relies on such a study, it must meet the requirements of this section. For example, if relying upon a previous analysis, it must include evaluation of the currently mandated study options and cannot rely solely on coupon studies. The LCRR should prevent water systems from making new decisions based on old studies that do not meet the revised requirements.
- All corrosion control optimization and re-optimization studies in systems with lead service lines must evaluate corrosion control effectiveness using sequential samples that measure water collected from lead service lines, not just first liter samples as compliance samples are collected in the LCRR proposal. Effective corrosion control treatment for reducing lead release from lead service lines cannot be evaluated via first liter samples that do not represent corrosion of the lead service line. As demonstrated later in these comments, first liter samples are inadequate for assessing corrosion control effectiveness in lead service lines. Any partial-system test must include sampling of the 1-10th liters out of the tap at lead service line locations. This

requirement should be added to the final rule in all sections describing corrosion control study requirements.

- In the proposal, the schedules for CCT studies, installation of treatment, and monitoring for WQPs are all based on trigger and action level – this is too confusing and impossible to follow. Just lower the action level and simplify the process.
- The role of water quality parameters (WQPs), both in the context of corrosion control studies and as part of ongoing monitoring, are to help ensure the efficacy of corrosion control treatment. As such, mandatory WQPs that are measured as part of a study in 141.82 must include the water quality factors that affect release of lead and copper as listed in the EPA Optimal Corrosion Control Guidance Manual. To make this fundamental construct of the LCR effective, these WQPs must be part of mandatory sampling in a corrosion control study:
    - Dissolved inorganic carbon (DIC)
    - Hardness (calcium and magnesium)
    - Dissolved oxygen
    - pH
    - Silica
    - Oxidation-reduction potential
    - Ammonia, chloride, and sulfate
    - Natural organic matter (NOM)
    - Iron, aluminum, and manganese.
- The WQPs monitored under 141.87 are not by themselves sufficient indicators or predictors of lead release – this is evidenced by a lack of correlation between WQP violations and lead action level exceedances. This list of WQPs should also be updated to include the most relevant water quality parameters and add to the requirements. Factors that affect release of lead and copper from EPA's guidance manual should be included. Data-driven decision making will be possible when the relevant data are collected. Once the additional WQPs are added to the monitoring requirements of 141.87 it will be important to remove the provisions that allow a water system to go on reduced monitoring for WQPs. The LCR intends to use WQPs as an early warning of potential lead issues; reducing sampling frequency to every three years completely defeats this purpose. If both lead and copper compliance sampling AND WQP sampling are reduced to every 3 years, the water system has no information available to identify if a water quality change is resulting in unknown lead release in certain sections or throughout the distribution system. This means a child could be exposed to unidentified high lead concentrations for 3 entire years of the most important formative years of their life without any information to allow an intervention.
    - If the final rule switches to meaningful WQPs, water systems should not be able to reduce monitoring to every three years. This completely defeats the purpose of using WQPs as an early warning tool if you are not sampling for them on a regular basis.
    - The proposal could be read to provide that small systems apparently don't have to install CCT until second lead action level exceedence. Is that correct? If so, this should not be the case. Certainly any exceedance of the Action Level should trigger CCT.
- We need a better body of corrosion control research to support PWS decision making. So PWS have data to work with. We suggest at a minimum funding of $10 million of corrosion control research.

- The final rule should include a requirement to hold a public meeting to discuss treatment changes and make corrosion control studies and recommendations available for public review. All the materials of the LCR assert that management of lead is a shared responsibility due to lead containing materials inside customer homes. Consumers should have the ability to review such studies because they have impact on water quality within consumer homes. Consumers should at a minimum be able to verify that the water system completed their requirements per the LCR.

Find and Fix

This entire section as drafted would add little to public health protection. Essentially, the proposed Find and Fix provisions of the proposed LCRR in 141.82(j) creates a localized corrosion control study based on flawed WQPs to investigate individual samples over the action level.

Better to do comprehensive CCT study for any exceedance of the lowered lead action level. The study described will not identify the needed interventions in individual homes with high lead levels. This new requirement creates busy work for a water system that would be better invested in a system-wide thorough corrosion control study. As an alternative to this proposal, please consider implementing a corrosion control study according to the requirements of 141.87 any time an individual sample is over the lead action level.

The Find-and-fix provisions do not provide any immediate risk reduction to consumers in the home with an individual sample over the lead action level. 141.87(j)(2) requires follow up sampling at any tap-sample site that exceeds the action level within 30 days of receiving the sample results, but it does not specify the sampling protocol to be used. Different sampling protocols provide different information, and these nuances are typically not shared with consumers in the home. Inappropriate sampling protocols are frequently used to make the appearance that the elevated lead level was a one-time limited occurrence. Unclear sampling requirements and varying sampling protocols can create scenarios in which consumers think they are not at risk of lead exposure and continue to drink water from a high-risk location. EPA should specify in the final LCRR that any investigatory sampling should be at least as representative of water as compliance sampling. Ideally investigatory follow-up sampling would collect additional data, including sequential one-liter samples representing water from the tap to the water main, and analysis for additional metals that can help identify the source of lead in the original sample.

The appropriate response to a compliance sample over the lead action level, which is not a level protective of public health, is immediate intervention including provision of filters and lead service line replacement. As such, the “find-and-fix” provisions of the final LCRR should be:

> Step 1: Provide a filter that is certified to NSF/ANSI standard 53 for lead reduction.
>
> Step 2: Identify whether the property is served by a lead service line. If so, remove the lead service line.
>
> Step 3: If a lead service line is not present, take additional sequential samples to identify the source of the lead and investigate lead levels in similar properties. Make all sampling data available to consumers and print in their bill and consumer confidence report how they can access the data.

Step 4: Complete a corrosion control study to identify optimized corrosion control treatment for the water system.

Requirements regarding source water and treatment changes

The one provision that could have prevented lead crises in Washington, DC; Flint, Michigan; Pittsburgh, PA; University Park, IL and countless other cities would have been a requirement to study any source water or treatment changes prior to implementation. This mandatory study would evaluate the impact of the changes on simultaneous compliance and corrosion control. This is the only way to prevent lead in water crises before they happen. Such studies can also identify whether different overall treatment approaches might be more effective at controlling contaminants of concern rather than adding treatment to address one contaminant at a time.

Depending on how EPA chooses to address this issue, requirements in 141.81(b)(3)(iii), 141.86(d),[†††] and 141.90(a)(3) must be consistent with each other to solve this longstanding issue in the LCR. As it currently reads, the requirement of 141.90(a)(3) only applies to water systems on reduced monitoring because it refers to 141.86(d)(4), wherein the only reference to notifying the state is in the context of systems on reduced monitoring. 141.81(b)(3)(iii) also includes this limitation and lack of clarity. For clarity and simplicity, the LCRR should make one requirement to evaluate source water and treatment changes that applies to all water systems subject to the LCRR without exceptions. A new section in 141.86(d)(4) should be added, 141.81(b)(3)(iii) and 141.86(d)(4)(…)(iii) should be deleted, and 141.90(a)(3) revised as follows:

141.86(d)(new)

Any water system subject to sampling under Subpart I shall notify the State in writing in accordance with § 141.90(a)(3) of any upcoming long-term change in treatment or addition of a new source as described in that section. The water system must evaluate the source water and or treatment change in consultation with the State and submit the evaluation study to the state. The State must review and approve the addition of a new source or long-term change in water treatment before it is implemented by the water system. This evaluation must include a new corrosion control study per 141.82(c) to evaluate the impact of the potential changes on corrosion control effectiveness and the water system must maintain optimal corrosion control treatment during the source water and/or treatment change. The study must also evaluate the impact on simultaneous compliance with all national primary drinking water regulations. The State may require the system to resume sampling in accordance with paragraph (d)(3) of this section and collect the number of samples specified for standard monitoring under paragraph (c) of this section.

141.90(a)(3): At a time specified by the State, or if no specific time is designated by the State, then as early as possible prior to the addition of a new source or any long-term change in water treatment, a water system shall submit written documentation to the State describing the change or addition referred to in § 141.86(d)(4)(new). The State must consult with the water system in the preparation of a

[†††] Please note that the numbering in section 141.86(d) appears to be incorrect. The language on p. 61763 second column paragraph (iii) appears to be numbered either 141.86(d)(3)(iii) or 141.86(d)(4)(vi)(B)(3)(iii),

study evaluating the source water and/or treatment change, and review and approve the addition of a new source or long-term change in treatment before it is implemented by the water system. Examples of long-term treatment changes include the addition of a new treatment process or modification of an existing treatment process. Examples of modifications include adding ozone, switching secondary disinfectants, switching coagulants (e.g., alum to ferric chloride), and switching corrosion inhibitor products (e.g., orthophosphate to blended phosphate). Long-term changes can include dose changes to existing chemicals if the water system is planning long-term changes to its finished water pH or residual inhibitor concentration. Long-term treatment changes would not include chemical dose fluctuations associated with daily raw water quality changes.

Service Line Inventory Requirements

According to the preamble, there are between 6.1 and 9.3 million lead service lines serving homes and businesses across the country. It is critical for our water systems to finally have an accurate number of lead pipes so they can develop effective replacement plans, so the inventory requirements of the LCRR are a strong step in the right direction. The final LCRR should require a comprehensive, verified distribution system materials inventory where all service line materials are identified and there is a mandatory deadline for identifying all service lines of unknown material. EPA needs to set the floor for defining what constitutes a verified service line.

The definition of a lead service line is critical to the accuracy of the service line inventory requirement by the final LCRR. As noted above, the proposed definition of a lead service lines represents a decrease in public health protection and will result in many lead pigtails and goosenecks remaining in service with no clear requirements for removal. This is contrary to the requirement of the SDWA in section 1412(b)(9) that any revision of a national primary drinking water regulation "shall maintain, or provide for greater, protection of the health of persons." Our current sampling data do not represent the lead contribution from these shorter pipe segments. It is critical for public health protection to categorize these lead components as lead service lines so they will be removed through lead service line replacement programs. The only way we are going to eliminate lead in drinking water is to eliminate the lead from contact with drinking water. The least expensive time to eliminate the lead is when any and all lead components of a service line are exposed and work is being completed on the line. It is a waste of resources to not define these components as lead service lines and require the removal of lead goosenecks, lead pigtails, and lead connectors during service line work.

The preamble correctly describes the long-lasting impacts of having no requirements for service line inventories. It is essential that the resulting inventory is a comprehensive inventory that identifies all service line materials, even non-lead materials. In addition to description in the preamble, inventories are an essential step to creating an effective and efficient lead service line replacement program.

"EPA recommends but does not require that water systems update the inventory as new information becomes available." Section 141.84(4) requires water systems to update their inventories annually as lead service lines are replaced and unknown service lines are verified. Water system resources, regardless of service line material, will be used most efficiently if they update and maintain their infrastructure inventories as they go, rather than going back and filling in missing or old data at a later

date. EPA should make the maintenance of an up-to-date service line inventory, including materials of all non-lead service lines, a mandatory requirement for all water systems. Incomplete service line inventories will result in increased expense to the water system at a later date and will reduce the efficiency of all asset management programs.

EPA determined LSL inventory is feasible and requests comment.

The preamble is not clear that the Michigan Distribution System Materials Inventory requires water systems to identify the materials of all service lines. The Michigan LCR requires all water supplies to have an inventory of all distribution system materials. The inventory must identify the material of every service line from the water main to 18" inside the house, whether made of lead, galvanized steel, copper, or plastic pipe. It is not sufficient to merely identify lead, non-lead, and unknown service lines. Otherwise we will be stuck doing this inventory all over again in the future when we realize there are issues with other material types. Given the easy access to electronic reporting in the field these days, there is no reason to not require ongoing maintenance of asset inventories.

The Preamble states that the rule will treat all unknown service lines as lead. This creates an incentive to accurately identify these service lines to reduce other implementation burdens. It is proper to treat unknown service lines as lead service lines for the purpose of customer protection and water system planning. However, there are places in the proposed rule language where this intention was not carried through as reflected in detailed comments below. The LCRR should not create incentives for categorizing lead service lines as unknown service lines. There are several instances in the proposed rule where the language must be clarified to place ongoing inventory and public notification requirements on both water systems with lead service lines and water systems with unknown service lines. These include:

- 141.84(a)(5) Service lines categorized as unknown count as lead for LSLR.
- 141.84(a)(5)(iii) states that a lead categorized pipe later determined to be non-lead does not count toward replacements. This creates an incentive to categorize suspected lead pipes as unknown pipes because an unknown will could count towards LSLR, but an incorrectly identified LSL will not count for LSLR.
- 141.84 (a)(3)(ii) – as this requirement is written, the broad definition for unknown service lines creates an incentive for water systems to categorize non-lead services as unknown because this will allow them to get to 3% LSLR rate faster by just properly categorizing service lines in their inventory without actually replacing a single pipe.
- 141.85(e) (1) does not require annual notification of homes in systems with only service lines of unknown material.
- 141.85(e)(3) requires notice to consumers with lead service lines, but only customers with service lines of unknown materials.

The following changes are highly recommended for the inventory requirements:

- 141.84 (a)(2)(iii), add GIS and asset inventory to the list
- 141.84(a)(2)(iv) Any resource required by the state to assess service line materials for structures built prior to 1989

    - This requirement is unclear as written. If this means that the state can require a water system to use any specific information resource to populate their service line inventory, then this is a good requirement. However, this intent must be made clear in the rule language.
- 141.84 (a)(3) states that only the initial inventory must include all service lines regardless of ownership status.
    - Revise to: "The initial inventory and all inventory updates must include all service lines connected to the public water distribution system regardless of ownership status. Each service line ~~Service lines~~ shall be categorized in the following manner:
    - (i) each service line must have at least one record, and each service line may require up to 4 records identifying the material at the water main connection (gooseneck), public side of the curb box, private side of the curb box, and inside the building.
- 141.84 (a)(3)(ii) "Record all non-lead materials for the water system portion and customer portion ~~Non-lead~~ where both the water system portion and customer portion are non-lead"
    - For all asset management purposes it is critical for all water systems to maintain a current, complete inventory of all service line materials. We don't want to create any scenario where they will have to go through this effort again to identify non-lead portions.
- 141.84 (a)(4) specifies that inventories must be updated on an annual basis.
    - The LCRR must specify a date by which all unknown service lines must be identified by their actual material. A suggestion would be 5 years after the initial inventory is submitted. In addition, water systems with unknown service lines should submit a plan for identifying material of all service lines.
- 141.84(a)(5)(i)
    - If an unknown service line can be demonstrated to be non-lead via records and not physical examination, then it should never have been unknown in the first place. It looks like this provision belongs in number (3) above, defining how the initial inventory should be developed.
- 141.84(a)(5)(iii) a lead categorized pipe later determined to be non-lead does not count toward replacements.
    - This incentives categorization of lead pipes as unknown and would exclude them from the compliance sampling pool.
- 141.84(a)(6) The USEPA shall designate acceptable methods to determine the service line material of unknown lines.
    - The USEPA must set a national floor for the acceptable rigor of a service line inventory.
    - Likewise, in 141.84(b) the water system shall report basis of inventory. EPA should consider the approach Michigan is using for its preliminary and complete Distribution System Materials Inventory. In other words, as noted above, EPA should consider the components of the Michigan rule including requiring all water supplies to have an inventory of all distribution system materials. The inventory should have to identify the material of every service line from the water main to 18" inside the house, whether made of lead, galvanized steel, copper, or plastic pipe. It is not sufficient to merely identify lead, non-lead, and unknown service lines. Otherwise we will be stuck doing this inventory all over again in the future when we realize there are issues with other

material types. Given the easy access to electronic reporting in the field these days, there is no reason to not require ongoing maintenance of asset inventories.

- 141.84(a)(7) All water systems ~~with lead service lines~~ must make its inventory publicly accessible. A notification that the inventory is available for review must be included in the annual Consumer Confidence Report and in customer billing statements.
    - The service line inventories required as part of the LCRR must be comprehensive service line inventories for all PWSs. Customers of PWSs with no LSLs must also have access to their PWS service line inventory so they can know the material of their own service line and see the documentation the PWS used to confirm that there are no LSLs in the entire system and actual risk mitigation in the home, so they can make informed decisions about possible LSLR and use of filters. Some important specific recommendations:
        - Doesn't specify sampling protocols. Based on Michigan experience this is a problem.
        - Doesn't require any corrective action at the site (filters, LSLR, etc.) The only "fix" required is corrosion control treatment which does nothing as an immediate intervention like filters and/or LSLR would.
        - Should require installation and maintenance by the PWS of certified POU device.
        - Doesn't require publication of this investigative data (any data collected not used for 90th percentile calculation does not need to be made public)
- Inventory

- 141.84(a) (7) (i) The inventory must include a location identifier, such as a street, intersection, or landmark, served by each ~~lead~~ service line.
    - The inventory must be a comprehensive inventory – identify ALL service line materials not just lead.

- 141.85(e) (1) All water systems with lead service lines or service lines of unknown material must provide notification to all consumers with a lead service line or a service line of unknown material informing them they have a lead service line or a service line of unknown material.
    - As written, this requirement would not apply to any water system that categorized all potential lead service lines as unknown service lines and must be revised to achieve the public health protection goal that all unknown service lines are treated as lead service lines until confirmed otherwise.
- 141.85(e)(3) (2) Consumers ~~Customers~~ with a service line of unknown material.
    - Section 141.85(e)(1) says that consumers get the notice for both LSLs and unknown lines. But (e)(3) states that only customers receive notice of a service line of unknown material. If unknown service lines are to be treated as lead service lines, all consumers in a building with an unknown service line should receive the mandatory notice of service line material.
- 141.85(e)(2)
    - The requirement that water systems notify residents of lead or unknown service lines within 30 days of submitting their initial inventory is appropriate and protective of public health.
    - EPA can also require written same day notification of a lead service line any time maintenance work is completed on a service line and lead material is confirmed.
- 141.85(e)(3) Content. (i) Consumers with a confirmed lead service line. The notice must include a statement that the consumer's service line is lead, an explanation of the health effects of lead,

steps consumers can take to reduce exposure to lead in drinking water, information about opportunities to replace lead service lines and information about programs that provide innovative financing solutions to assist consumers with replacement of their portion of a lead service line, and a statement that the water system is required to replace its portion of a lead service line when the consumer notifies them they are replacing their owned portion of the lead service line.

  - If the final LCRR requires all lead service lines to be replaced as recommended elsewhere in these comments, this language should be revised to reflect those new requirements. If the LSLR requirements are not strengthened in the final LCRR, this provision should add the following: "The notice must also explain that the water system is required to replace its portion of a lead service line when the consumer notifies them they are replacing their owned portion of the lead service line, and describe opportunities for replacing the lead service line at the time of verification if a lead service line is confirmed."
  - The consumer notice should facilitate the LSLR process for the customer so they do not have to come back again for lead service lines replacement if a lead line is confirmed.

- 141.85(e)(4) The notice must be provided to the property owner and all persons served by a lead service line or service line of unknown material, either by mail or by another method approved by the primacy agency.

  - Unknowns are NOT treated same as LSLs. Need a mandatory schedule for identifying all unknowns.
  - Need a national floor for defining an adequate inventory.
  - Need to identify and replace to 18" inside the house (the definition of LSL is critical!!!!)

Service Line Replacement Requirements

Full (or complete) lead service line replacement reduces the risk of lead exposure by removing the largest source of lead affecting drinking water in homes and buildings. The LCRR needs to create a proactive mandate to replace all lead service lines that is not dependent on trigger level or lead action level exceedances. As such, 141.84(b) should establish requirements for all water systems with lead or unknown service lines. The core contents of the lead service line replacement programs must define the minimum requirements for a lead service line replacement program. These requirements, established at the federal level, will minimize implementation burden on both state primacy agencies and water systems. Rather than developing custom procedures, strategies, and goals for each water system, universal requirements for these programs, that could be based on the AWWA lead service line replacement standard, would ensure a basic level of public health protection afforded to all customers, consistency across water systems, and the flexibility of individual water systems to add additional components to their programs.

The LSLR requirements of the final LCRR should be rewritten to accommodate the following provisions:

1. There must be a requirement to remove all lead service lines by a date certain regardless of lead levels measured in water. All systems should be required to replace all LSLs within 10 years. Systems with more than 30,000 LSLs can be granted an alternative schedule approved by the state. If we had started FLSLR with the 1991 LCR, we would be done by now.

- Customer initiated LSLR should have public side replacement at the same time not staggered (e.g., PLSLR) as allowed by proposed rule. If that's inconvenient for water systems, then PWS needs to establish the LSLR schedule, not private citizens.
  - Need a default replacement requirement – all systems must replace all LSLs within 10 years. Systems with more than 100,000 LSLs can have an alternative schedule under exemption provisions (or under a Consent Decree). We shouldn't write the rule for the whole country to address a handful of exceptions.
- State should be able to accelerate replacement rate for trigger or ALE as much as they want to.
- 3% replacement rate is not sufficient. Need 10 year maximum.
  - Water system should have to pay for the full replacement. Address the environmental injustices of requiring low-income property owner and landlords to pay, which will result in millions of people continuing to get water through LSLs. Also leads to inefficiencies if PWS must negotiate with every property owner regarding LSLR. Simply require it. Under Supremacy Clause of the US Constitution, if EPA requires it, this will override any state or local law impediment to water systems fully funding LSLR. In any event, the Harvard-EDF study says there actually aren't legal impediments under state law to water systems paying for LSLR out of ratepayer funds.[‡‡‡]

2. Water systems should not be able to stop LSLR once they start and regardless of whether future lead results are below the lead action level.
   - The LCRR proposal inappropriately allows water systems to do no LSLR if they can convince residents to refuse replacement. EPA needs to remove this loophole.

If this section of the rule is not completely overhauled in the final LCRR, the following corrections, clarifications, and recommendations are offered:

- 141.84(b) (i) All water systems with lead service lines in their distribution system shall, by [date], submit a lead service line replacement plan and lead service line inventory to the primacy agency described in paragraph (a) of this section. The lead service line replacement plan must include the following elements: (1) System wide schedule for replacing all LSLRs. (2) Communications plan to inform consumers of the FLSLR program and encourage cooperation. (3) Communication plan to inform consumers and other utilities of potential increases to lead levels in drinking water due to lead service line disturbances. (4) Procedures for coordinating the full lead service line replacement and delivering required consumer notices. (5) A funding strategy for conducting lead service line replacements. (6) A faucet or pitcher filter tracking and maintenance plan.
  - (ii) The state must approve the lead service line replacement plan within 6 months following submission of the lead service line replacement plan.
  - EPA and the state must define the core contents of the minimum lead service line replacement program and these requirements must be provided in the rule language. This will greatly reduce the implementation burden because water systems will not need to

[‡‡‡] See Harvard Law School and EDF, "Rates could fund lead pipe replacement in critical states: Laws in states with the most lead service lines support the practice." 2019, available online at http://clinics.law.harvard.edu/environment/files/2019/04/Rates-Fund-LSL-Replacement-States_Harvard_EDF_2019.pdf

invent this on their own and states will receive consistent inventories that facilitate review. This requirement as written will result in inconsistent public health protection, wide variation across lead service line replacement programs, and significant oversight burden for primacy agencies as they develop custom plans with every water system.
    - 141.84(f)(8) refers to State approval of the lead service line replacement goal rate in 141.84(b) that is not specified in that section. These edits provide for EPA and the state setting a national lead service line replacement rate and mandatory state review and approval of all lead service line replacement plans. This will substantially reduce implementation burden on states and improve clarity and expectations for water systems. It will allow water systems to implement their lead service line replacement plans with the confidence of primacy agency approval.
- 141.84(c) provides a separate list of requirements for replacing lead goosenecks, pigtails, or connectors.
    - This complexity is unnecessary and adds to implementation burden for state primacy agencies and water systems. To simplify the rule, all lead goosenecks, pigtails, and connectors should be defined as lead service lines and be subject to service line inventory and replacement requirements throughout the LCRR.
- 141.84(d)(3) A water system must replace the lead service line it owns when it is notified that the customer will replace the portion of the lead service line under private property.
    - Item 4 below appears to apply when a customer has already replaced the lead service line, whereas (3) appears to describe the situation when the replacement is planned.
- 141.84(d)(4) When a water system is notified by the customer that he or she has replaced the ~~customer-owned~~ the portion of the service line under private property ~~and that replacement has occurred within the previous 3 months~~, the water system must replace its portion within 45 days from the day of their notification. The water system must provide notification and risk mitigation measures in accordance with (d)(1)(i)–(iv) of this section. ~~(5) When a water system is notified by the customer that he or she has replaced the customer-owned portion and the replacement has occurred more than three months in the past, the water system is not required to complete the lead service line replacement of the system-owned portion.~~
    - As written, customer-initiated lead service line replacement is the primary mechanism of lead service line replacement encouraged in the LCRR. If customer funded proactive lead service line replacement is the only default lead service line replacement in the revised rule, this should apply to all customer-initiated replacements and not just those completed within the last 3 months. Ideally, water systems will design this program so that the entire LSL can be replaced at the same time.
- 141.84(e) Requirements for conducting full lead service line replacement. (1) Any water system that conducts a full lead service line replacement (e.g., replace all portions of the lead service line ~~both the portion of a lead service line owned by the customer and by the water system~~) must provide notice to the owner of the lead service line, or the owner's authorized agent, as well as ~~non-owned~~ non-owner resident(s) served by the lead service line prior to turning the water back on in the house and within 24 hours of the replacement.
    - Not all water systems have divided ownership of service lines. It is not necessary to carry this assumption throughout the document. Also, a correction. It should refer to service lines under private property rather than assuming they are customer-owned.

- 141.84(e)(i)….In instances where multi-family dwellings are served by the lead service line to be replaced, the water system shall contact each dwelling individually to notify them of the replacement. This information can be delivered at the same time as the faucet filter or pitcher filter as described in 141.84(e)(iii). In addition, the water system may elect to post the information at a conspicuous location. ~~may elect to post the information at a conspicuous location instead of providing individual notification to all residents.~~
    - The requirement as written in the proposal does not provide equal protection to residents of multiple family dwellings.
- ~~141.84(e)(iv) The water system must take a follow up tap sample between three months and six months after completion of any partial lead service line replacement.~~
    - It appears this requirement does not belong in the section "Requirements for conducting full lead service line replacement." It is already provided in the previous section on partial lead service line replacement.
- 141.84(f)(1) ~~Within six months following completion~~ At the same time a water system submits their ~~of the~~ initial inventory ~~invention~~, pursuant to paragraph (a) of this section…
    - 141.84(b) requires the goal to be set in the water system's LSLR plan, which is due the same date as the initial inventory. This requirement applies to all water systems with lead service lines, not just those serving over 10,000 persons. It is possible that this should read that the state must approve the goal rate within 6 months of the LSLR plan submission.
- 141.84(f)(5) The water system must provide notification regarding the lead service line replacement requirement to customers with lead service lines as required in 141.85(f).
    - Edited for clarification. Otherwise this appears to reference the LSL notification requirements of 141.84(e).
- ~~141.84(f)(6) Any water system that fails to meet its lead service line replacement goal must: (i) conduct public outreach activities pursuant to 141.85(g) until either the water system meets its replacement goal, or tap sampling shows the 90th percentile of lead is below the trigger level for two consecutive monitoring periods.~~
    - This provision declares that not meeting a lead service line replacement goal is approved compliance and it is a suitable compliance strategy for a water system to make no effort toward replacing lead service lines. The voluntary "mandatory" LSLR goal does not represent public health protection. It is all talk with no action.
- 141.84(f)(6)(ii) Recommence its goal-based lead service line replacement program pursuant to this paragraph if the 90th percentile lead value anytime thereafter exceeds the lead trigger level.
    - This provision should become item (f)(7). It should apply regardless of whether the water system previously failed to meet its lead service line replacement goal.
- 141.84(f)(7) The first year of lead service line replacement shall begin on the first day following the end of the monitoring period in which the lead trigger ~~action~~ level was exceeded.
    - This section is about exceeding the trigger level, not the action level. However, as recommended earlier, the trigger level should be removed from the final rule. The final rule must be reviewed for consistency and correctness depending on what the final requirements are determined to be.
- 141.84(f)(8) Pursuant to the procedures in § 142.19, the EPA Regional Administrator may review the lead service line replacement plan ~~goal rate determination made~~ approved by a State under paragraph § 141.84(b) of this section and issue a Federal goal-based lead service line replacement

rate determination where the Regional Administrator finds that a higher goal-based lead service line replacement rate is feasible for a water system.

  - Refers to a replacement goal rate determination made by a state under paragraph 141.84(b) of this section. However, no such provision is presented there. These comments suggest that EPA set a national goal rate, and that the state must approve a water system's lead service line replacement plan that includes the EPA established replacement goal rate. The state or the Regional Administrator should have the ability to require a faster replacement rate than established in the federal rule.

- 141.84(g) Water systems must annually replace three percent of the initial number of lead service lines ~~in the inventory, including~~ plus the number service lines of unknown material in the inventory of 141.84(a) at time of the action level exceedance.
  - As written, the requirement did not clearly include the requirement to treat unknown service lines as lead service lines as described in the preamble. This edit clarifies the rule language.
- 141.84(g)(4) Water systems must conduct notification to customers with lead service lines as required in § 141.85~~(f)~~ (e)and (i).
  - Paragraph f refers to goal-based replacement after a lead trigger level exceedance and does not include language regarding mandatory lead service line replacement that is required after a lead action level exceedance. A new section, suggested here as (i) must be added to describe the notification requirements for mandatory lead service line replacement following a lead action level exceedance.
- 141.84(g)(6) A water system may cease mandatory lead service line replacement when its lead 90th percentile level, calculated under § 141.80(c)(4), is at or below the lead action level during each of four consecutive monitoring periods. If first draw tap samples collected in any such system hereafter exceed the lead action level, the system shall recommence mandatory lead service line replacement.
  - I support this provision that requires water systems with any individual first draw tap sample that exceeds the lead action level to recommence mandatory lead service line replacement, rather than waiting for the 90th percentile of first draw tap samples to exceed the lead action level.
- ~~141.84(g)(7) The water system may cease mandatory lead service line replacement if it obtains refusal to conduct full lead service line replacement from every customer in its distribution area served by a lead service line on the customer's portion. If the water system exceeds the action level again, it must reach out to any customers served by a lead service line where there has been a change in residents with an offer to replace the customer-owned portion. The water system is not required to bear the cost of replacement of the not all wat lead service line.~~ A water system is still subject to all full lead service line replacement requirements, even if customers are unable to bear the cost of replacement of the customer owned lead service line. The water system must apply for grants, issue a bond, raise water rates, or find other third-party funding to pay for the cost of replacement of the customer owned lead service line.
  - This provision gives a water system the option to inflate the cost of lead service line replacement, convince all customers with lead service lines that the cost of lead service line replacement is unaffordable, get their agreement that they are not willing or are unable to pay for lead service line replacement, and avoid all lead service line replacement

requirements. This option should not be provided in the Lead and Copper Rule. It does not protect public health, and it makes access to safe drinking water dependent on individual's ability to pay for lead service line replacement.
    - In order to achieve primary prevention of exposure to lead in drinking water via removal of lead service lines, water systems must be required to secure funding to replace lead service lines for all customers.
- 141.84(g)(9) should reference monitoring described in paragraph g, not paragraph f.

Public Education 141.85

Beyond the health effects language, the LCRR proposal makes no modifications to the contents of public education, but many improvements are needed. The health effects of lead in 141.85(a)(1)(ii) should be revised as follows:

> Exposure to lead, even at low levels, can cause serious health effects in all age groups. Infants and children who drink water containing lead could have decreases in IQ and attention span and increases in learning and behavior problems. Adults have increased risk of cardiovascular disease and high blood pressure as well as kidney and nervous system problems. Pregnant women have increased prenatal risk, and women who later become pregnant have similar risks if lead stored in the mother's bones is released during pregnancy.

It is important to be clear that even low levels of lead have serious health effects. This detail is important when consumers see their public education and lead sampling results presented in the context of the 15 ppb action level that is not protective of public health. Further, evidence of adult health effects from lead exposure is not limited to recent findings. The health effects information should not indicate that this is new.

Regarding the contents of Public Education (PE), please take a look at Michigan's revised public education requirements. The public education requirements leave many opportunities to be vague about the sources and risk of lead exposure. Below is a list of specific issues associated with the current public education requirements that were addressed in the Michigan rule:

- The LCR allows public education materials to be combined with other municipal communications. Frequently this means that the important information on a consumer's responsibility to protect themselves is buried in a standard publication and the average consumer would not know to seek out that information. The Michigan LCR requires PE materials to be printed in a standalone publication. Alternatively, if it is included in a community publication, the first page of the publication must include in highly visible print "[PWS] has exceeded the action level for lead in drinking water. See page [insert page] for important information about your drinking water."
- The current PE language is not clear at all that a water system has exceeded the action level. The average consumer is not presented with clear information. Michigan requires PE to now include "[PWS] has exceeded the action level for lead"
- 141.85(a)(1)(iii)(C) encourages the water system to discuss other important sources of lead exposure. This is confusing when the entire purpose of the PE is to explain to the consumer how to reduce their exposure to lead in water. Michigan has revised this to the following: "Although

other sources of lead exposure exist, such as lead paint, and lead contaminated dust, [PWS] is contacting you to reduce your risk of exposure to lead in drinking water. If you have questions about other sources of lead exposure, please contact [health department].

- The PE must include a requirement to report the PWS's 90th percentile, the range of sample results, and the number of samples included in the 90th percentile calculation.
- 141.85(a)(1)(iii)(B) should clarify that lead service lines are the largest source of lead in drinking water when present, but lead solder, home/building plumbing, and fittings and fixtures may also contain lead.
- Most consumers do not realize that lead release in drinking water is highly variable and that a single low or non-detect sample does not mean there is no risk of lead exposure within a home. As in Michigan, the PE should "explain the unpredictability of lead release, the limits of 1-time tests, and the high lead content of some lead particulates."
- PE should be very clear about how to identify a filter that is certified to reduce lead.
- Due to many PWSs downplaying the significance of lead compliance sampling results, Michigan added a requirement that the PE "cannot state or imply that the identified risk is limited to a single property." Given the small number of compliance samples required under the LCR, this representative sampling is intended to represent potential lead exposure at all homes with similar risk factors.
- PE must be clear about how to identify "lead-free" plumbing fixtures. Most consumers do not understand the current definition of "lead-free" plumbing that allows up to 0.25% lead by weight in materials intended for drinking water use and any lead content for materials not intended for drinking water use.
- 141.86(i) requires a PWS to make all the results of tap water monitoring used to make the 90th percentile calculation available to the public. Public Education materials must instruct consumers on how to access that information.

As noted previously, the requirements for annual notification of homes with lead service lines or service lines of unknown material should be retained in the final rule. It is important to make the correction that all water systems must issue notification of unknown service lines, not just those that also have lead service lines.

The notification of exceedance of a lead trigger level and the related outreach activities for failure to meet the LSLR goal will generate additional work while giving a PWS a regulatory pathway to not comply with the voluntary "mandatory" goal established after a lead trigger level exceedance. As stated previously, the entire construct of the trigger level should be removed from the final rule and the action level lowered instead.

- 141.85(g) Outreach activities for failure to meet the lead service line replacement goal. (1) In the first year that a water system that does not meet its annual lead service line replacement goal as required under § 141.84(f),
    - The activities listed under 141.85(g) are good ideas for outreach, but they are no equivalent of public health protection provided by actual lead service line replacement. Unfortunately, as written, the rule allows these activities as a substitute for meeting the lead service line replacement goals established in 141. 84(b). These outreach activities should be

implemented as part of the proactive mandatory lead service line replacement program recommended in these comments.

- 141.85(h) Public education to local and State health agencies. (1) All water systems shall provide public education materials that meet the content requirements of paragraph (a)(1) of this section along with an informational notice that encourages distribution to all the organization's potentially affected customers or community water system's users.
    - This new section creates mandatory annual public education requirements for local and State health agencies. As such, this information must include context for what the local and State health agencies are expected to do with the information.

Sampling 141.86

The final LCRR will provide much more reliable sampling at high risk sites if EPA establishes minimum requirements for service line inventory quality as requested earlier in these comments. If 141.86(a)(2) allows a PWS to identify service line material based on inspection inside the building as proposed, this means that the section of pipe is in fact part of the service line. It must be included in the definition of a service line and it must be removed during a full lead service line replacement. The LCRR clarifies that a service line of unknown material cannot be used as a tier 1 sampling site. Likewise, the LCRR should include a requirement that the PWS must identify the material of enough unknown service lines to identify the minimum number of tier 1 sample sites by the date the new compliance monitoring requirements become effective, even if this means they must identify the material of all unknown service lines. 141.86(a)(10) should be clarified such that a PWS cannot sample at tier 3 or tier 4 sites if they have unknown service lines that might be made of lead.

The complications presented by the lead action level and lead trigger level make the sampling provisions extremely hard to follow. The final LCRR should include only the action level, which will simplify this section of the rule. However, the final LCRR should not allow monitoring less frequently than annually. The ability to reduce sampling to every third year means that unidentified lead issues could continue for 3 years before being recognized, allowing a 3-year cohort of babies to be exposed to lead during their most critical development. Only water systems with no lead service lines and optimal corrosion control should be eligible for reduced sampling.

141.86(h) instructs a PWS to collect follow-up samples at any site that exceeds the action level within 30 days of receiving sample results. They can use any sample volume or collection procedure. This instruction will generate confusing and misleading data, and it includes no requirements for explaining the significance of sample collection procedures to the consumer when they receive their sample results. This provision should be removed from the final LCRR.

141.86(i) Requires public availability of all data in 90th percentile calculation. This provision should be retained in the final rule, but should require all sampling results to be public, and the PWS must notify the public that the data are available. This should be accomplished through customer bills, consumer notice of lead results, and annual consumer confidence reports.

Lead Service Line Samples

EPA requests comments on whether water systems with lead service lines should be required to collect tap samples that are representative of water that was in contact with lead service lines during the 6-hour stagnation period.

The EPA LCR and the proposed LCRR requires water systems to collect the first liter of water from the tap; this first liter typically does not include water from the lead service line, which is the largest source of lead in contact with drinking water. The first liter sample can potentially show the risk of lead release from internal plumbing, but it does not capture the highest risk water in a building with a lead service line. As the attached memorandum from Region 5 Acting Regional Administrator to the EPA Office of Water ("Region 5 Memo") makes clear, the first draw water always or virtually always contains lower levels of lead than the 5th liter or other draw from the lead service line. In the words of that memo (p. 7), "[u]sing the LCR first-draw sampling protocol missed the peak lead values 100% of the time at LSL sites." This is illustrated by Figure 3 below from the Region 5 Memo:

Figure 3. First-Draw and Sequential Sampling at All LSL Sites in 2011 Chicago Study

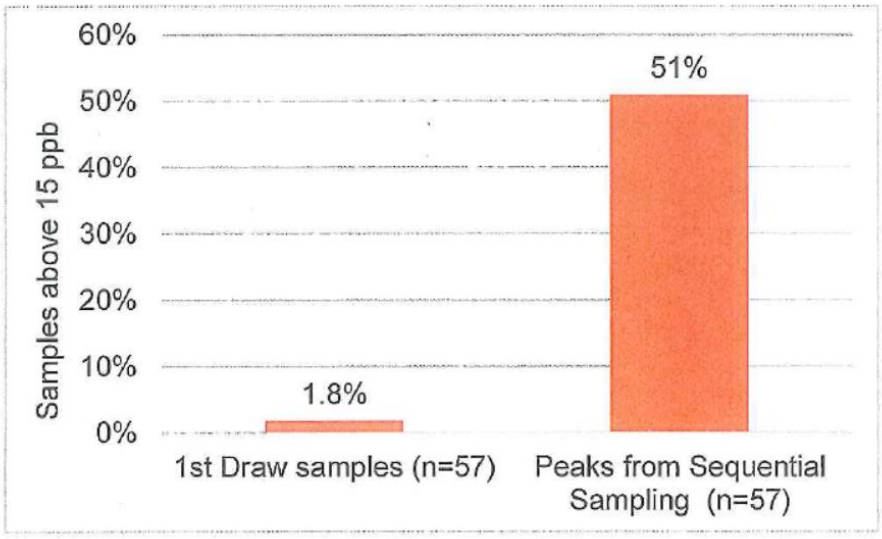


Figure 3: All sequential sampling profiles (28 LSL sites, most of which were sampled twice) from the Chicago study confirm the finding that lead levels in first draw samples underestimate the high lead levels that can come from a LSL. The one profile (1/57) with a first-liter sample above 15 ppb had an even higher peak lead level further from the tap.

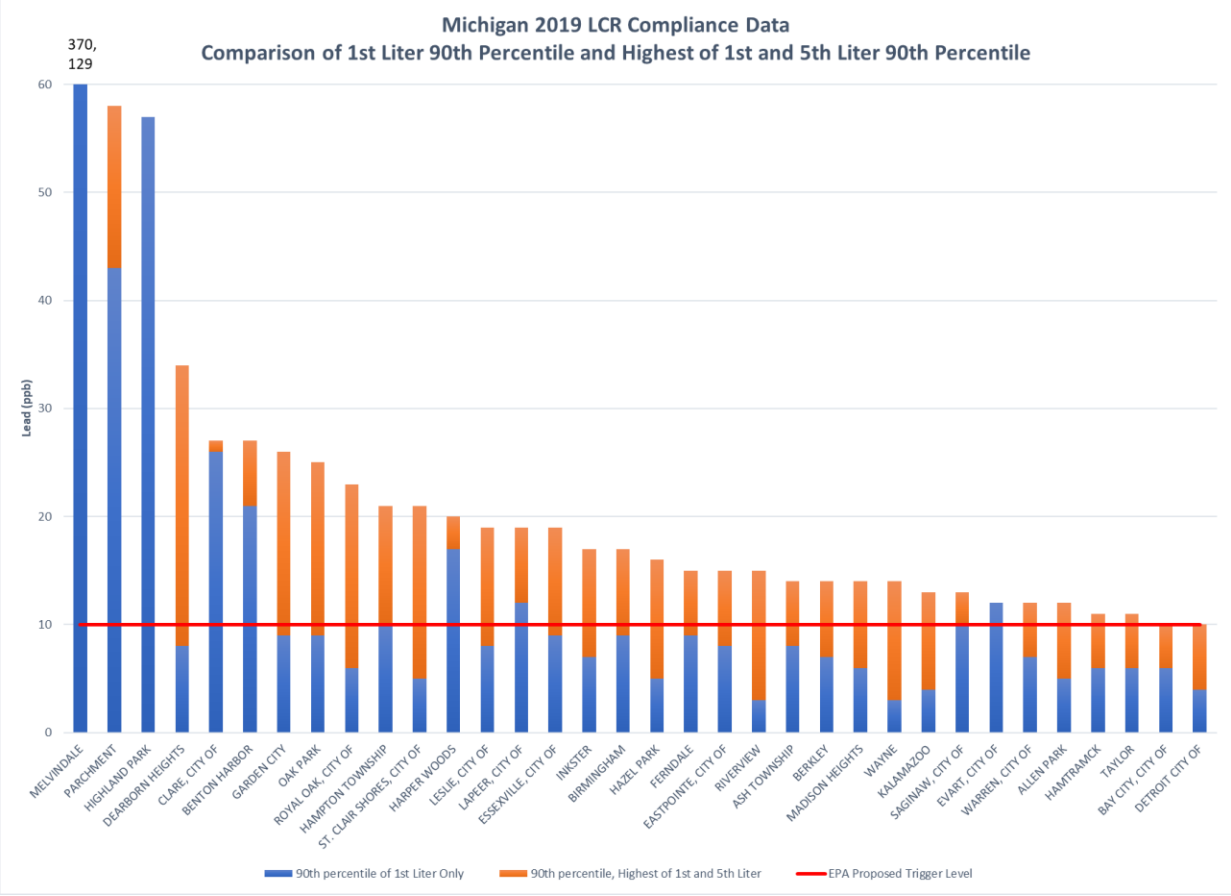
Source: EPA Region 5 Memo, p. 6

The Michigan LCR now requires water systems with lead service lines to also collect the fifth liter out of the tap. This sample is more likely to capture a portion of the water from the lead service line leading up to the home. The fifth liter better measures the potential range of exposure to lead in water in lead service line homes and better represents the effectiveness of corrosion control treatment for addressing multiple lead sources in plumbing. Only water systems that exceed the lead action level are triggered into a corrosion control study that will reduce the risk of lead exposure as customers wait for their lead service lines to be replaced. When the sampling protocol does not measure the highest risk water, the systems that need improved corrosion control to better protect their consumers are not triggered into taking protective actions. Experience in Michigan has demonstrated that collecting the first- and fifth-

liter samples is practical and implementable. The final LCRR must include a requirement for water systems with lead service lines to collect samples from the higher risk water in lead service lines.

Below is an analysis of sequential sampling data that shows that the first liter sample is consistently not representative of the high lead levels measured from lead service lines. The sampling protocol in the LCRR proposal does not measure the water that is most likely to exceed the action level of 15 ppb due to inadequate corrosion control treatment, and therefore the LCRR proposal is ineffective for triggering additional action at water systems with the greatest risk of lead exposure. Consequently, the proposed LCRR will not reduce lead exposure in the water systems and homes that need it most.

FIGURE 4

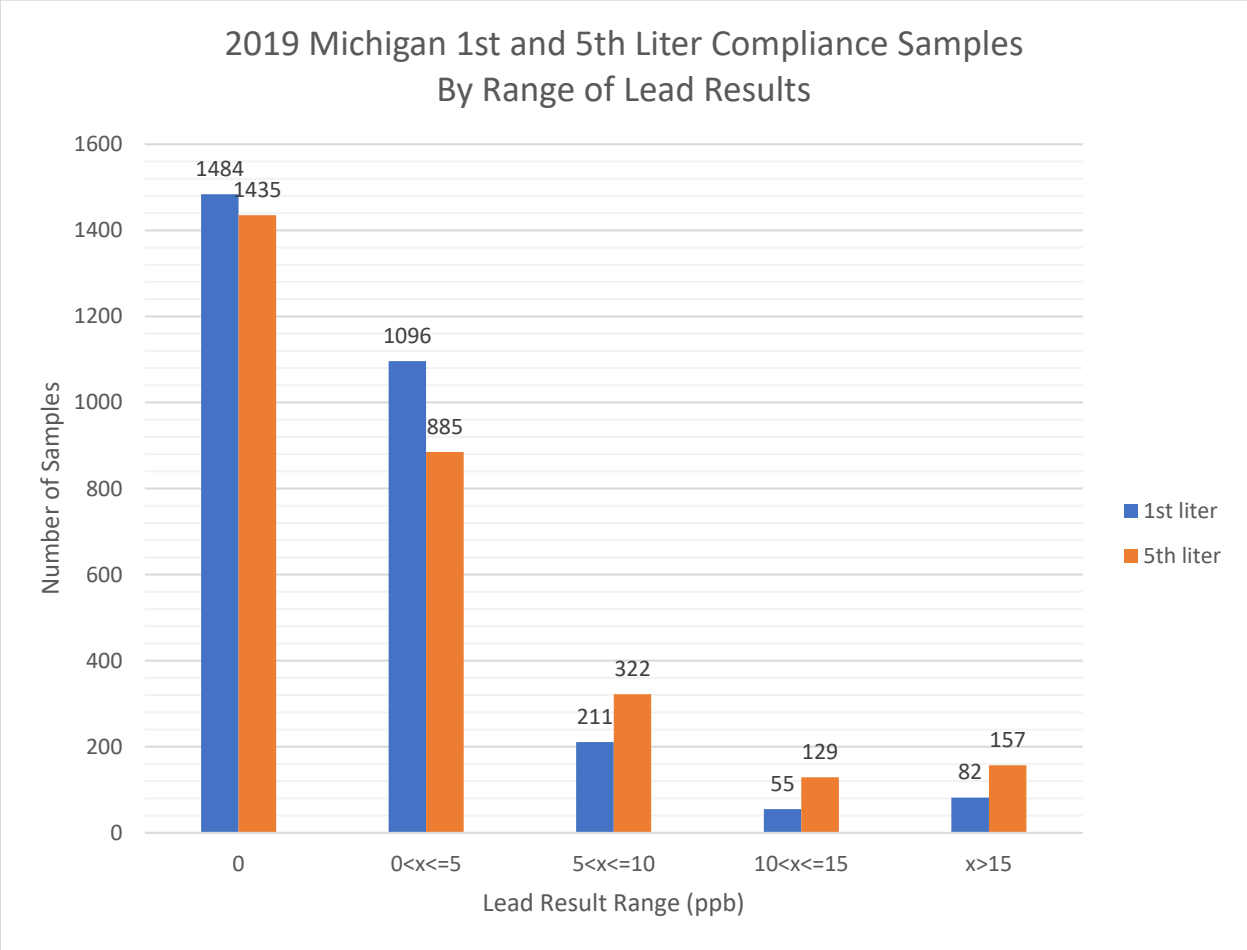


It is notable that sampling pools at 10 of the 34 water systems were diluted by sites where only first liter samples were collected. The fifth liter sample results were still sufficient to drive the 90th percentile to 10 ppb or greater. It is also important to consider the sampling pool from which these samples were collected. Michigan PWSs were required to complete a preliminary distribution system inventory by January 1, 2020, a few months after the compliance samples were due. It is possible that the systems that submitted compliance data by September 30 did not verify lead service lines in their sampling pool, and therefore may have collected samples at non-lead service line sites. Also, even if all samples were collected at lead service line homes, the composition of the lead service lines was not reported. We do not know if samples were collected at homes with full lead service lines, partial lead service lines, or at

sites with lead goosenecks or pigtails. See my comments on how lead service lines should be prioritized for lead compliance sampling in the previous section.

Figure 5 shows counts of first and fifth liter samples from all sites with paired samples in the Michigan dataset by range of lead results. These results show that lead results at 5 ppb and less were more frequently measured in first liter samples. Fifth liter sample results were greater than 15 ppb and 10 ppb at twice as many sites as first liter samples. Again, the data indicate that if corrosion control is not working to reduce lead levels, it is more likely to be identified in the 5th liter sample than the 1st liter sample of the LCRR proposal.

FIGURE 5



  - First liter sample is typically the lowest lead level among sequential samples in LSL homes. As a result, the protections in this rule only apply to a tiny number of systems
- Source water sampling
  - The state gets to define the maximum permissible lead level in treated water (unchanged from 1991 rule). For me this calls into question all the statements about there being no lead in source water. If water utilities are being accurate, it should always be 0 ppb.

    - I have never seen a PWS publish their source water sampling data. From all the places I have read in the rule, I don't see any place where the PWS must make their source water sampling data publicly available so we can actually truth check their statements.

Other Monitoring and Public Disclosure Requirements for Lead and Copper

The Final rule should require PWSs to publish their most recent source water monitoring data for lead with the rest of the lead data they must provide to the public. Water systems frequently state that lead is not found in their source water but they do not make this data available to the public. It should be noted that the "source water samples" required in the LCR are post-treatment entry point samples. In a related note, the ability of state to determine a "maximum permissible source water level" is difficult to reconcile with the rest of the LCR that claims that lead in water comes only from pipe, solder, fittings, and fixtures. Lead should be non-detectable at the entry point to the distribution system.

    - The "source water sampling" is all at the entry point to the distribution system, post treatment. This is common for a lot of "source water sampling,"
    - If they are taking their single "source water sample" in a source of fluctuating water quality, and they catch it on a good day, the treatment could be adequate for removing the contaminant from that source. However, if that contaminant fluctuates up in that source water, it is entirely possible that existing treatment might no longer be adequate for removing that contaminant. A single entry point sample that is called a "source water sample" is a sham when it comes to providing information about whether lead might be present in source water. The final rule should require sampling for lead both at the raw water intake and at the entry point to the distribution system.
  - Waiver for source water sampling is inappropriate when the data is not available to the public. Remove this new requirement.
- 141.90(1)(a)(ix) A copy of tap sampling protocol provided to residents or those sampling, to verify that pre-stagnation flushing, aerator cleaning or removal and the use of narrow-necked collection bottles were not included as recommendations.
    - This is a good and needed addition, allowing water systems to demonstrate compliance and states to verify water system sampling practices.
- 141.90 (e) Lead service line inventory and replacement reporting requirements. Water systems shall report the following information to the State to demonstrate compliance with the requirements of § 141.84: (1) No later than 12 months after the end of a monitoring period in which a water system exceeds the lead action level in sampling referred to in § 141.84(~~f~~g), the water system must submit written documentation to the State of the service line inventory ~~material evaluation~~ conducted as required in § 141.84(a), identify the initial number of lead service lines and service lines of unknown material in its distribution system at the time the water system exceeds the lead action level, and provide the water system's schedule for annually replacing at least 3 percent of the initial number of lead service lines in its distribution system.
    - 141.90(e) should begin with the basic inventory and lead service line replacement reporting requirements that currently appear as 141.90(e)(5) and later. The order of the requirements as written are confusing.
    - This section should refer to 141.84(g) regarding lead action level exceedances. It should be noted that the water system was already required to submit the inventory on the

compliance date of the rule and update it annually, so the state would already have that required information. The water system should already have a violation if it has not complied with the annual reporting requirement. The only new piece of information a water system would need to submit in case of a lead action level exceedance would be the schedule for replacing at least 3 percent of the initial number of lead and unknown service lines in its distribution system.

- 141.90(e)(2) No later than 12 months after the end of a monitoring period in which a water system exceeds the lead action level in sampling referred to in § 141.84(~~f~~ g), and every 12 months thereafter, the water system shall certify to the State in writing that the water system has: (i) Replaced in the previous 12 months at least 3 percent of the initial lead service lines (or a greater number of lines specified by the State under § 141.84~~(f)(10)~~ (g)(9)) in its distribution system,

- 141.90(e)(5) No later than the compliance date of the rule, the water system must submit to the State an inventory of ~~lead~~ service lines as required in § 141.84(a), and every 12 months thereafter, any water system that has lead or unknown service lines must submit to the State an updated inventory that includes the number of lead service lines remaining in the distribution system as required in § 141.84(a).
    - As stated in the preamble and elsewhere, unknown service lines are to be treated as lead service lines. As such, any water system with unknown service lines must continue providing annual updates of its inventory until the material of all service lines are identified.
    - The rule language is not clear about what should be submitted that constitutes an "inventory." Add new (i) as follows "The inventory submission shall include the composition (full, partial public, partial private, etc.) and number of service lines of each material type, and a description of the records and validation techniques used to populate the inventory. A comprehensive inventory with at least one record for every service connection shall be maintained at the water system for review during the next sanitary survey."
- 141.90(e)(5)(i) Any water system that contains a lead service line in their distribution system must submit to the State, as specified in section § 141.84(b) a lead service line replacement plan at the same time the ~~lead~~ service line inventory is submitted. Any water system that contains an unknown service line in their distribution system must submit to the State a plan for identifying the material of all unknown service lines at the same time the service line inventory is submitted.
- 141.90(6) No later than 12 months after the end of a monitoring period in which a water system exceeds the lead trigger level but not the lead action level in sampling referred to in § 141.84(~~e~~ (f) the water system must submit written documentation to the state that the system has replaced lead service lines at the annual goal rate. In addition, every 12 months thereafter, the water system shall certify to the State in writing that the water system has:
    - The requirement is not a complete sentence and references the wrong section of the rule.
- 141.90(6)(iii) (iii) Additionally, the water system must certify to the State that it delivered the notification of lead service line materials as specified in § 141.85~~(b)~~ (e)
    - (b) refers to delivery of public education requirements.

Monitoring for lead in schools and child care facilities

The school and child care water sampling requirements presented in the LCRR proposal are inadequate, misleading, and will waste money with no public health benefit and no remediation is required. It doesn't even inform schools about problem fixtures in their schools because it does not include a

comprehensive "Test and Tell" program. The requirements to collect 5 samples in schools and 2 samples in child cares every 5 years are not enough to detect actual lead exposure and availability of safe drinking water in schools and childcares. Eliminate the school and child care sampling requirements and address through other regulatory vehicles. The LCR cannot create requirements for schools that receive their water from a PWS.

EPA requests comment on an alternative to the proposed requirements for public education and sampling at schools and child care facilities described in this section. My suggestions for more active lead risk reduction in schools are the following:

- 141.92(a)(1) requires identifying a list of all schools and child care facilities served by the system by the compliance date of the rule, at the same time that the PWS must complete the service line inventory of 141.84(a). When the inventory is made available to the public, it should clearly identify any school or child care with a lead service line or service line of unknown materials. Lead service line notification and education activities should begin immediately at schools and childcares. The final LCRR should include a requirement to replace school and child care lead service lines first.
- In lieu of Address school water safety through a different statute where the responsible party can actually follow through to provide safe drinking water for students. These LCRR requirements add burden for PWS, schools, and primacy agencies without any of the teeth necessary to identify or actually provide safe drinking water to students. This is all cost and no benefit..
- EPA has included school sampling requirements in the LCRR because "Water systems have developed the technical capacity to do this work in operating their system and complying with current drinking water standards"
    - No they haven't. CWS have no requirements for building water quality. They have insisted forever that they have no responsibility past the meter. Only a few water systems have developed this expertise, and it is the exception not the rule. Most PWSs are not plumbing experts and do not have capacity to add this expertise to their staff. Most small and medium PWS will struggle greatly to comply with this portion of the rule.
- School and child care facility sampling contributes to increased public awareness of the potential for elevated levels of lead in premise plumbing independent of a water system's 90th percentile value
    - The rule provides no context for school tap sampling data, and there are no public data sharing requirements
    - The rule requirements do nothing to advance this cause, which could be advanced through better communication about compliance sampling and its relevance to household exposure (see http://graham.umich.edu/project/revised-lead-and-copper-rule/faq?faq=30)
- The CWS would not be required under this proposed rule for taking any remedial action at the school or childcare facility following the sampling and notification requirements of this proposal. Would use the 3T's guidance to respond.

    - The 3T's guidance is not mandatory and, in many ways, can result in misleading information being presented to schools and child care facilities. School sampling programs across the country produce results on a daily basis that do not follow the guidance, or conveniently skip pieces of the guidance. Relying on guidance, rather than requirements, for the actual protection of children's health is not a winning strategy.
- Alternative school sampling programs
    - The LCRR allows more stringent state or local school sampling programs to continue, but does not allow an explicit option for maintaining a filter first program as an alternative to this sampling requirement. However, the sampling requirements and assumptions for the Michigan filter first bill are more stringent than the school/childcare sampling requirements presented in this rule.
- The LCRR has no requirement for schools to share lead PE with staff, students, and families (not in current rule either), because SDWA does not regulate schools.
    - My school district has told me that they just dump their PE in the trash every time they receive it). They have refused to share the current PE for a current lead action level exceedance with the school community despite me asking them directly by email at least 3 times.
    - New 141.92(a)(2)(i) to share information about health risks from lead in drinking water on an annual basis will do nothing to actually push information out to the school community because there is no requirement to share that information with students, staff, and families. SDWA can't regulate schools that are not public water systems.
- In 141.92(f), the school sampling data must be shared with the primacy agency no later than 30 days after the results are received. Why does the CWS also have to certify that they have completed the requirement? Shouldn't the data be sufficient to prove this? States and CWS do not need the added busy work.
    - I do not think these school sampling requirements provide any benefit to anyone so I would delete them all from the final rule. However, if EPA must keep theseseprovisions,I would suggest a requirement that states must compile, publish, and share all school data for students, families, and staff to see. If state primacy agencies had enough resources, they could use the compiled data to detect trends in the safety of drinking water in schools and push for zero lead plumbing to replace school pipes, fittings, and fixtures so that actual lead free water can be provided.
- Depending on specific circumstances, these LCRR school sampling requirements may be more stringent than NTNCWS requirements under the LCR. Many NTNCWS schools must sample 1-5 taps and sampling can be reduced to every 9 years, but they do have more PE requirements. The LCRR school sampling program requires each school to collect at least 5 samples every 5 years. This rule allows schools that are NTNCWS to skip the provision of 141.92.
    - The Michigan filter first requirements would be more stringent than NTNCWS requirements for a school, so we'll have to address that in Michigan.
- 141.92(b)(1) does not require sampling at enough taps per school to determine whether water is safe for children to drink (5 samples per school, 2 per childcare in schools with well over 200 taps).
    - Lead in water is highly variable. There is no such thing as a representative tap in a school. If they are going to require school sampling, they should samplee all taps used for drinking water in the school.

- School sampling data sets show that even when the same faucet is used in multiple rooms, individual sample results vary. A room that tests low today may test high in a repeat sample (see data from Beverly Elementary).
- Single samples can flag a lead problem, but cannot be used to declare a tap safe.
- Single 250 mL samples cannot identify if the lead source is the faucet or upstream.

These sampling requirements are not even effective as a test and tell strategy. They will not identify the range of lead in water nor the extent to which taps throughout the school buildings have lead in the water.

FIGURE 6

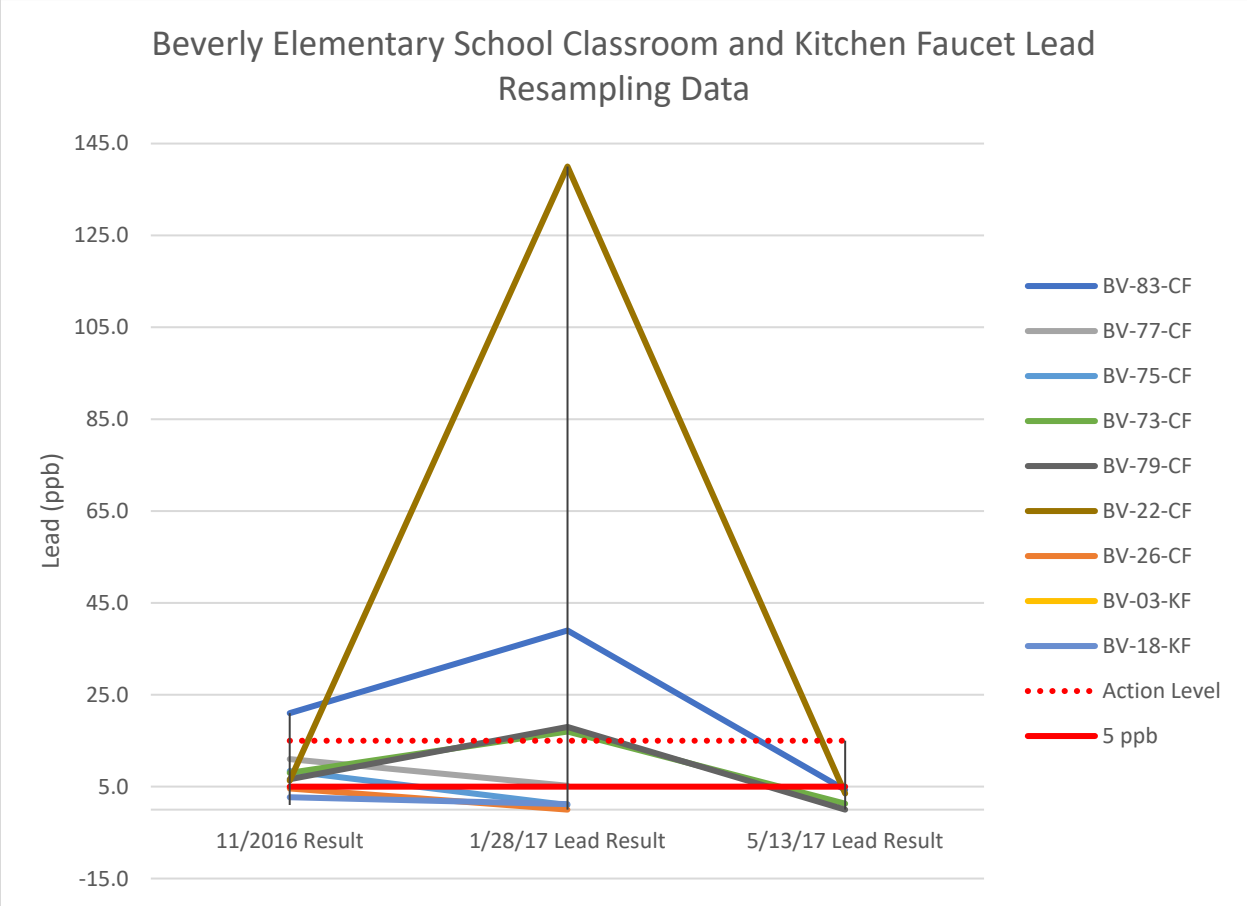


Figure 6 shows data for all the classroom and kitchen faucets at Beverly Elementary in Beverly Hills, MI that were retested due to exceeding the lead or copper action level. The majority of sites were resampled for exceeding the copper action level. This graph shows that taps that "passed" during the first round of sampling (i.e., a result under 15 ppb) were as likely to have a result over the action level during a following sampling period as to have a result under the action level during a following sampling period. This is one example of how lead release is sporadic, and no single sample represents the risk of lead exposure at a given tap. After remediation and initial confirmation that the sample meets the action level, additional samples must be collected to confirm the ongoing safety of the remediation strategy.

- 141.92(b)(1)(v) The sampling protocol for the limited number of samples does not represent the worst-case water that students actually drink. Allows for a maximum stagnation of 18 hours and

does not prohibit pre-flushing which has been identified in some school districts as a way to mask the actual lead levels in water, e.g., NYC, others.
    - An example of worst-case water that students may actually be drinking would be water the first day back after winter or summer break. (even if they flushed the plumbing the week before school started, it is unlikely that someone flushed all the fountains the morning of the first day of school)
- There are no requirements to share the actual sampling data with students, families, and staff. The "Tell" part of this "Test and Tell" strategy is missing. Students, families, and staff will not even be able to use this limited information to take steps to ensure they can find their own safe drinking water in schools.
- We already know through current voluntary and state/locally required school sampling programs that many schools will not be forthcoming with information about the water quality, and often they do not understand what it means themselves.
- There are no requirements to actually provide safe drinking water in schools, no requirements to take any action based on lead sampling results nor what lead results might merit action, and no requirements for remediation or filtration. These requirements present additional burden, provide little to no actionable information, and no response requirements.
- There are no requirements on how to interpret or explain the significance of the sampling results. This is particularly critical because these school requirements are presented in the context of the Lead and Copper Rule, with an action level of 15 ppb that measures treatment effectiveness. Even the preamble to the proposed rule confuses this issue. When evaluating lead in water in schools, we are not evaluating treatment effectiveness. We are evaluating the safety of water that children are actually drinking. It is irresponsible to present these sampling requirements for schools without associated requirements for interpreting or explaining the sampling results, particularly when the LCR rule construct encourages schools to interpret 15 ppb as a safe level of lead in drinking water and when the LCR itself states that 0 ppb is the safe level of lead in water.
- These requirements present a challenging implementation burden for both primacy agencies and regulated PWSs because they create a significant amount of new work with no public health benefit. They also have no jurisdiction over schools. This may be particularly challenging for private and charter schools.
- 141.92(f) Notification of Results. A water system shall provide analytical results as soon as practicable but no later than 30 days after receipt of the results.
    - Preamble actually states the opposite – provide sampling results no less than 30 days after receipt.

Small System Flexibility 141.93

This new section is novel and forward looking, but it is entirely optional. It would be most protective to require all three options at the same time: lead service line replacement, corrosion control treatment, and POU devices. These options to make bold commitments to public health protection should be available to all size water systems, and states should have the authority in the final LCRR to require any of these flexibilities at any time. However, the final rule should require LSLR in 10 years

Taken as a package, the small water system compliance flexibility provisions provide an effective framework around which the entire revised rule should be designed. EPA should consider rewriting the

entire LCRR to require the package of "Flexibility" options for all water systems, establishing deadlines for each. This would result in a simpler, more protective LCR.

The LCRR will be far more effective for long-term public health protection if EPA includes a similar requirement in the lead service line replacement section where large systems must maintain mandatory lead service line replacement programs after a single lead action level exceedance regardless of whether the 90th percentile lead results are below the lead action level in the future, and also requires the water system to replace all lead service lines by a certain date.

- 141.93(a) A small community water system ~~that exceeds the lead trigger level but meets the lead and copper action levels~~ must evaluate compliance options in paragraphs (a)(1) through (3) of this section and make a compliance option recommendation to the State when the water system submits its service line inventory as specified in 141.84(a) on the date the rule becomes effective. ~~within six months of the end of the monitoring period in which the exceedance occurred~~
    - Rather than waiting for a lead trigger level or lead action level exceedance to prepare for a small system compliance alternative, small water systems should be required to submit their compliance recommendation at the same time as their service line inventory on the date the rule becomes effective. Alternatively, this schedule could be phased to facilitate primacy agency review of inventories and compliance plans like the LT2ESWTR and Stage 2 DBPR implementation schedules were.
    - This way the water system will be ready to take action within 6 months if they have a trigger level or action level exceedance, and the water system will not have to wait for an additional lead action level exceedance to respond appropriately. If this recommendation is adopted, sections (c) and (d) can be deleted.
    - The way items (c) and (d) are written, it appears that the small water system compliance flexibility is not intended to apply if a water system exceeds both the lead and copper action levels. I would support allowing the options in 141.93 to apply in the case of both a lead and copper action level exceedance if the water system is also required to evaluate corrosion control for the maintenance of copper levels in the drinking water.
- 141.93(a)(3)(ii) The POU device must be certified by a third party to meet ~~the~~ NSF/American National Standards Institute standard 53 for the reduction of ~~to reduce~~ lead in drinking water.
    - It is my understanding that third party organizations certify filters to NSF/ANSI standard 53 for lead reduction. I think my suggested language better reflects the way the certification programs work. This edit should be made in all the locations of 141.93 where this language appears.
- 141.93(a)(3)(iv) The community water system must monitor one-third of the POU devices each year and all POU devices must be monitored within a three-year cycle. First-draw tap samples collected under this section must be taken after water passes through the POU device to assess its performance. Samples should be one-liter in volume and have had a minimum 6-hour stagnation time. All samples must be at or below the current filter effluent requirement of NSF/ANSI standard 53 for lead reduction ~~lead trigger level~~. The system must document the problem and take corrective action at any site where the sample result exceeds the lead trigger level.
    - The new NSF/ANSI standard 53 allows a filter to be certified for lead reduction if the filtered samples are at 5 ppb or lower. The LCRR sets the lead trigger level at 10 ppb. It is inappropriate to tie POU compliance to the trigger levels. To use the POU compliance

option, filtered samples must meet the current certification requirements of NSF/ANSI 53 for lead reduction. This edit should be made in all places in 141.93 where this language appears.

Consumer Confidence Reports

- 141.153(vi) For lead and copper: The 90th percentile concentration of the most recent round of sampling, the number of samples required, the number of samples collected, the number of sampling sites exceeding the action level, and the range of tap sampling results;
- Add new 141.153(vii): "The report shall include the number of lead service lines, the number of service lines of unknown material, and the total number of service lines in the water system. The report shall include a statement that a service line inventory has been prepared and is available for review either on the water system website or at the water system offices. The report shall notify consumers that complete lead sampling data are available for review and shall notify how to access the data.

Required additional health information

- 141.154(1) A short informational statement about lead in drinking water and its effects on children. The statement must include the following information: ~~If present, I~~ [If monitoring indicates detectable lead levels at the tap in some homes supplied by the water system start with this language: "Some homes served by [NAME OF UTILITY] have been tested and contain lead in their water."] Even at relatively low levels, lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water comes ~~is~~ primarily from lead service lines and materials ~~and components~~ associated with service lines and home plumbing. [NAME OF UTILITY] is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components in your home. You share the responsibility for protecting yourself and your family from the lead in your home plumbing. ~~You can take responsibility by identifying and removing lead materials within your home plumbing and taking steps to reduce your family's risk. Before drinking, flush your pipes for several minutes by running your tap, taking a shower, doing laundry or a load of dishes. You can also use a filter certified to remove lead from drinking water.~~ If you are concerned about lead in your water you may wish to have your water tested, contact [NAME OF UTILITY and CONTACT INFORMATION]. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available at http://www.epa.gov/safewater/lead.
    - This section is incomplete and can cause consumers to take actions that may increase their exposure to lead in water. If a PWS is not providing appropriate corrosion control or removing lead service lines, consumers are limited in their ability to adequately protect themselves from lead in water. Under the inventory provisions of the LCRR, it is the PWS' responsibility to identify lead service lines. This should clarified separately from identifying leaded components within household plumbing. Flushing instructions should include flushing the tap that will be used for consumption prior to drinking or cooking in addition to using the water for other household purposes. Filter instructions must include an explanation of how to identify a certified filter, especially when so many filters are offered for sale on the internet from a variety of sources. Infographics, pictures, and videos may be more effective ways to communicate critical information to consumers.
    - As currently written, this language is highly misleading for consumers that have lead in their tap water, which will be a high percentage of people receiving these notices. It makes it

seem like a remote possibility that there is lead present in their tap water, when the water knows that many of its customers do have lead in their tap water. It should be revised to reflect this, as suggested above.

- Appendix A to subpart O of Part 141, Major sources of lead in drinking water: Lead service lines, corrosion of household plumbing including fittings and fixtures ~~systems~~, Erosion of natural deposits.
    - The mandatory must acknowledge the largest source of lead in drinking water as specified in the preamble to the LCRR.
- Appendix A to subpart O of Part 141, and Appendix B to Subpart Q of Part 141Health effects language
    - Exposure to lead, even at low levels, can cause serious health effects in all age groups. Infants and children who drink water containing lead could have decreases in IQ and attention span and increases in learning and behavior problems. Adults have increased risk of cardiovascular disease and high blood pressure as well as kidney and nervous system problems. Pregnant women have increased prenatal risk, and women who later become pregnant have similar risks if lead stored in the mother's bones is released during pregnancy.

Public Notice

141.202(10) I support Tier 1 public notice for a lead action level exceedance.

Primary Enforcement Responsibility

- 142.14(d)(8)(viii) Section 141.84(e) determinations of lead service line replacement goal rate as well as mandatory full lead service line replacement rates below 3 percent.
    - The previous language here was "determinations establishing shorter lead service line replacement schedules under 141.84"
    - This changes a reporting requirement for documenting a decision that is more protective of public health to documenting a decision that reduces protection of public health. This revision reiterates that reducing the lead service line replacement rate after a lead action level exceedance to 3% results in a reduction in public health protection.
    - These portions of 141.84(e) and this associated provision should be deleted from the final LCRR.
- 142.14(d)(8)(xviii) Section 141.88 – evaluation of water system source water or treatment changes
    - This is an important requirement that should be retained in the final LCRR.
- 142.14(d)(8)(xx) Section 141.84(a) completed lead service line inventories and annual updates to inventories.
    - This is an important provision to maintain in the final LCRR since it is critical for the primacy program to maintain these records to support future decision making. States also need to maintain records for LSLR plans and compliance sampling pools.
- Add new: Section 141.84(b) Lead Service Line Replacement Plans and updates and Section 141.86(a) Compliance sampling pools and updates.
- 142.15 (b)(4)(i)(B)(ii) States shall report the PWS identification number of each public water system identified in paragraphs (c)(4)(iii)(A) through (F) of this section.

    - There is no F in this section. It is not clear if this was meant to replace (i) or (iii), but it seems like (ii) is not correct.
- 142.15 (b)(4)(i)(B)(ii)(E) For each public water system required to begin replacing lead service lines after a lead trigger level or action level exceedance, the replacement rate that the water system must meet as specified in § 141.84 of this chapter and the date each system must begin replacement; and
    - This is not a complete sentence. Not clear what was intended, but I made a guess.

Special Primacy Conditions

The following comments apply to new provisions described in section 142.16 (d):

- (5) Section 141.84—Establishing lead service line replacement goal rates.
    - As stated previously within these comments, the implementation burden on states for custom replacement goal rates does not make sense. There should be one national standard. There is no need for a special primacy condition
- (6) Section 141.84—Designating acceptable methods for determining service line material for the lead service line inventory.
    - Again the definitions for an acceptable service line inventory should be established at the national level, not at the state level.
- (7) Section 141.92—Defining a school or childcare facility and determining any existing State testing program is at least as stringent as the Federal requirements.
    - The school and childcare sampling requirements described in the LCRR proposal are not scientifically defensible and provide no public health protection. These requirements should be modified and the final rule should require either robust regular monitoring of all outlets in the school or day care center, or installation of POU filtration stations maintained by the PWS.
- (8) Section 141.82—Verifying compliance with ‘‘find-and-fix’’ requirements.
    - Find-and-fix should be removed from the final LCRR
- (9) Section 141.88—Reviewing any change in source water or treatment and how this change may impact other National Primary Drinking Water Regulations.
- Add (o)(2)(i)(B)(I) lead and copper rule service line inventory, verification methodology, and compliance sampling pool
    - The state should have the ability to review detailed records regarding service line inventories and lead and copper rule compliance sampling pools during their onsite sanitary survey.
- 142.19(b) Pursuant to the procedures in this section, the Regional Administrator may review state determinations establishing a goal lead service line replacement rate or the lead service line replacement rate established under 141.84(g) and may issue an order establishing federal ~~goal~~ replacement rate requirements for a public water system pursuant to § 141.84(b) where the Regional Administrator finds that an alternative ~~goal~~ lead service line replacement rate is feasible.
    - The Regional Administrator should be able to order a faster lead service line replacement rate any time it is determined feasible, even under a mandatory program after a lead action level exceedance.

Improved, accurate information coupled with proactive practices raises visibility and willingness to finally address lead in drinking water to protect our current residents and generations to come.

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[1] Minnesota Department of Health, Lead in Minnesota Water, Assessment of Eliminating Lead in Minnesota Drinking Water, 2019, available online at https://www.health.state.mn.us/communities/environment/water/docs/leadreport.pdf

[2] CDC, Lead in Drinking Water, https://www.cdc.gov/nceh/lead/prevention/sources/water.htm, accessed December 16, 2019.

[3] WHO, Lead Poisoning and Health, https://www.who.int/news-room/fact-sheets/detail/lead-poisoning-and-health, accessed December 16, 2019.

[4] American Academy of Pediatrics, With No Amount of Lead Exposure Safe for Children, American Academy of Pediatrics Calls For Stricter Regulations, https://www.aap.org/en-us/about-the-aap/aap-press-room/Pages/With-No-Amount-of-Lead-Exposure-Safe-for-Children,-American-Academy-of-Pediatrics-Calls-For-Stricter-Regulations.aspx , accessed December 16, 2019.

[5] EPA, Basic Information About Lead in Drinking Water, https://www.epa.gov/ground-water-and-drinking-water/basic-information-about-lead-drinking-water, accessed December 16, 2019.

[6] Ibid; see also Bruce Lanphear, Stephen Rauch, Peggy Auinger, Ryan Allen, and Richard Hornung, Low-level lead exposure and mortality in US adults: a population-based cohort study, The Lancet Public Health, v. 3:4, PE177-E184, April 01, 2018, available online at https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667(18)30025-2/fulltext, accessed December 16, 2019.

[7] Dr. Kristi Pullen Fedinick, NRDC, What's in Your Water: An Updated Analysis, available online at https://www.nrdc.org/experts/kristi-pullen-fedinick/whats-your-water-updated-analysis, accessed December 16, 2019.

[8] AWWA Policy Statement on Lead Service Line Management, https://www.awwa.org/Policy-Advocacy/AWWA-Policy-Statements/Lead-Service-Line-Management, accessed December 16, 2019.

[9] AWWA, Peter Chawaga, A New Standard for Lead Service Line Replacement, January 9, 2018, available online at https://www.wateronline.com/doc/a-new-standard-for-lead-service-line-replacement-0001, accessed December 16, 2019.

[10] In the words of the founding principles of the water industry-NGO coalition called the Lead Service Line Collaborative, "LSL replacement initiatives should address barriers to participation so that consumers served by LSLs can benefit equitably, regardless of income, race or ethnicity." https://www.lslr-collaborative.org/about-us.html, accessed December 16, 2019. While the Collaborative has not embraced a requirement for water system responsibility for all LSL replacements, it has noted this basic environmental justice issue.

[11] See e.g., Minnesota Health Department, supra note 1, and The Pew Charitable Trusts & Robert Wood Johnson Foundation, 10 Policies to Prevent and Respond to Childhood Lead Exposure, 2017, available online at https://www.pewtrusts.org/-/media/assets/2017/08/hip_childhood_lead_poisoning_report.pdf, accessed December 16, 2019.

[12] See Harvard Law School and EDF, "Rates could fund lead pipe replacement in critical states: Laws in states with the most lead service lines support the practice." 2019, available online at http://clinics.law.harvard.edu/environment/files/2019/04/Rates-Fund-LSL-Replacement-States_Harvard_EDF_2019.pdf

[13] 42 U.S.C. § 300g-1 (A)(3)(C)(i) EPA must publish, seek public comment on, and use . . . . an analysis of each of the following:

1. Quantifiable and non quantifiable health risk reduction benefits
2. Quantifiable and non quantifiable health risk reduction benefits in cooccurring contaminants
3. Quantifiable and non quantifiable health risk reduction benefits that are likely to occur solely as a result of compliance
4. Incremental costs and benefits of rule options
5. Effects of the contaminant on the general population and sensitive subpopulations including infants, children, pregnant women, the elderly, and individuals with a history of serious illness,
6. Any increased health risks that may occur as a result of compliance including risks associated with cooccurring contaminants
7. Other relevant factors such as uncertainties in the analysis and factors with respect to the degree and nature of the risk

[14] *Id.* at (C)(iii).

[15] Minnesota Health Department, supra endnote 1, at 25.

[16] Pew Report, supra note 11, at 16. This study found variable benefits for LSL replacement, ranging from $0.42-$1.33 for every dollar spent. The study did not take adults into account. It did not take corrosion control treatment into account.

[17] *See Zainal H, Dahlui M, Soelar SA, Su TT (2019) Cost of preterm birth during initial hospitalization: A care provider's perspective. PLoS ONE 14(6): e0211997. https://doi.org/10.1371/ journal.pone.0211997; Zhu, Motao & Fitzgerald, Edward & Gelberg, Kitty & Lin, Shao & Druschel, Charlotte. (2010). Maternal Low-Level Lead Exposure and Fetal Growth. Environmental health perspectives. 118. 1471-5. 10.1289/ehp.0901561;*

[18] *See, e.g. Lanphear BP, Dietrich K, Auinger P, Cox C. Cognitive deficits associated with blood lead concentrations <10 microg/dL in US children and adolescents. Public Health Rep. 2000;115(6):521–529. doi:10.1093/phr/115.6.521.*

[19] See, Pew Study(citing J. Schwartz, *Societal Benefits of Reducing Lead Exposure, Environmental Research* 66 (1994): 105–24, https://dx.doi.org/10.1006/ enrs.1994.1048); Scott Grosse, *How Much Does IQ Raise Earnings? Implications for Regulatory Impact Analyses*, Research Letter, Association of Environmental and Resource Economics, 27, no. 2 (2007). http://www.umsl.edu/~kosnikl/AERE%20Essay.pdf; *see also* Gould, Elise. "Childhood lead poisoning: conservative estimates of the social and economic benefits of lead hazard control." *Environmental health perspectives* vol. 117,7 (2009): 1162-7. doi:10.1289/ehp.0800408.

[20] See Minnesota study, supra note 1.

[21] Proposal at 61725.

[22] Singley, J.E., Beaudet, B.A., and Markey, P.H. Sun . "Corrosion manual for internal corrosion of water distribution systems". United States.

[23] American Water Works Association Research Foundation Economic and Engineering Services, *Economics of Internal Corrosion Control*, 22 (1989).

[24] Ronnie Levin (2016) The attributable annual health costs of U.S. occupational lead poisoning, International Journal of Occupational and Environmental Health, 22:2, 107-120, DOI: 10.1080/10773525.2016.1173945.

[25] *See, e.g.* Geier, David & Kern, Janet & Geier, Mark. (2018). *A cross-sectional study of the relationship between blood lead levels and reported attention deficit disorder: an assessment of the economic impact on the United States.* Metabolic Brain Disease. 33. 201-208. 10.1007/s11011-017-0146-6 (finding more than $100 billion in lifetime costs associated with lead exposure); Matza, L.S., Paramore, C. & Prasad, M. A review of the economic burden of ADHD. *Cost Eff Resour Alloc* **3,** 5 (2005). https://doi.org/10.1186/1478-7547-3-5.

[26] Proposal at 61737.

[27] GAO, *Drinking Water: Approaches for Identifying Lead Service Lines Should Be Shared with All States*, GAO-18-620 (September 2018).

[28] *Id.* at 14.

[29] Fedinick, Kristi Pullen. "What's in Your Water? An Updated Analysis" *NRDC Expert Blog* September 14, 2018. Available at https://www.nrdc.org/experts/kristi-pullen-fedinick/whats-your-water-updated-analysis last accessed February 6, 2020; *see also* Fedinick, Kristi Pullen, Mae Wu, Mekela Pandithratne, and Erik Olson. *Threats on Tap: Widespread Violations Highlight Need For Investment In Water Infrastructure And Protections*. NRDC. (May 2017) available at https://www.nrdc.org/sites/default/files/threats-on-tap-water-infrastructure-protections-appendices.pdf <last accessed February 6, 2020>.

[30] 42 U.S.C. § 300g-1 (A)(3)(C)(iii).

[31] Economic Analysis at 9-16.

[32] *Id*. at 9-17.

[33] Statista, Revenue of bottled water production in the United States from 2014 to 2017 (in billion U.S. dollars), available online at https://www.statista.com/statistics/290547/revenue-of-bottled-water-production-in-the-us/.

[34] Z. Hu et al., Bottled Water: United States Consumers and Their Perceptions of Water Quality, Int. J. Environ. Res. Public Health 2011, 8, 565-578; doi:10.3390/ijerph8020565.

[35] W. Vasquez et al, Willingness to pay for safe drinking water: Evidence from Parral, Mexico, J. Envtl. Management, v. 90:11 (August 2009); pp. 3391-3400.

[36] Dey, N.C., Parvez, M., Saha, R. et al., Water Quality and Willingness to Pay for Safe Drinking Water in Tala Upazila in a Coastal District of Bangladesh. Expo Health (2018). https://doi.org/10.1007/s12403-018-0272-3.

[37] C. Chatterjee et al., Willingness to pay for safe drinking water: A contingent valuation study in Jacksonville, FL, J. Envtl. Management, 203 (2017); 413-421.

[38] Rachel Chason, Arlington residents hunt for coffee and bottled water after water main break, Washington Post (Nov 9 2020), available at https://www.washingtonpost.com/local/virginia-politics/arlington-residents-hunt-for-coffee-and-bottled-water-after-water-main-break/2019/11/09/5e29b738-0317-11ea-8bab-0fc209e065a8_story.html (last accessed Feb 11 2020); Neal Augenstein, rlington, DC stores hustle to restock bottled water amid boil advisory, WTOP (Nov 9 2019), available at https://wtop.com/arlington/2019/11/arlington-dc-stores-hustle-to-restock-bottled-water-amid-boil-advisory/ (last accessed Feb 11 2020); Kate Kyros, During water advisory, local restaurants spent thousands in the name of safety, WJLA (Nov 19 2019), available at https://wjla.com/news/local/water-advisory-restaurants-spent-thousands (last accessed Feb 11, 2020).

[39] For example, the Pew literature review indicated that there is stronger research about certain impacts of lead exposure when it is present in very high levels in children's blood, more than 5 µg/dL. While we believe there is ample evidence to monetize the impacts of low level effects, at a minimum EPA must analyze the impacts of this high-level exposure, which falls disproportionately on sensitive populations. *See* Pew Study at 16, **check citation https://www.pewtrusts.org/-/media/assets/2017/08/hip_childhood_lead_poisoning_report.pdf

[40] *See* CDC, Breastfeeding: Facts, cdc.gov/breastfeeding/data/facts.html (last visited Feb. 11, 2020).

[41] Pew Study.

[42] *See, e.g.* HHS, Office of Minority Health, Heart Disease and African Americans, https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlid=19 (last visited Feb. 11, 2020).

[43] Freedman, David & Woods, George. (2013). Neighborhood Effects, Mental Illness and Criminal Behavior: A Review. Journal of politics and law. 6. 1-16. 10.5539/jpl.v6n3p1.

[44] https://www.epa.gov/sites/production/files/2016-10/documents/508_lcr_revisions_white_paper_final_10.26.16.pdf

[45] 2016 White Paper, at 10.