November 20, 2023

Radhika Fox
Assistant Administrator for Water
US Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Dear Assistant Administrator Fox,

We, the undersigned community and environmental justice organizations, are reaching out to you with urgency about EPA's public messaging on steps consumers can take to protect themselves from lead in water. EPA has been delivering this messaging for over 30 years – and continues to deliver this messaging today – in official informational meetings, trainings, webinars, and through the agency's website. As we outline in the attached letter, and have discussed in prior public comments to EPA, rather than mitigate risk of exposure, much of this messaging can prolong and even exacerbate exposures.

We believe that the upcoming release of a new Lead and Copper Rule (LCR) and other public initiatives to reduce consumer exposures to lead in water are important opportunities for EPA to work with affected communities in order to improve effectiveness and accuracy in communications on this topic.

We now know that a Filter First approach to lead in water is the best available protective measure in terms of its effectiveness, accessibility, environmental sustainability, and cost. When implemented correctly, it also offers immediate protection from exposures. With this letter, we ask EPA to adopt Filter First as the agency's primary and urgent recommendation to all consumers, whether they live in a home with a lead service line or not.

The ramifications of relying on outdated, incomplete, or misleading talking points regarding lead-in-water safety are grave, not only for public health and environmental justice, but also for the scientific, regulatory, and programmatic integrity of EPA's lead-in-water regulations, guidance documents, and infrastructure funding programs. EPA is one – if not the most important – source of information on the subject, and it is critical for this administration, as the President continues to prioritize this issue, to update its messaging.

To give a brief example, EPA's claim that standard water testing will reveal if there is lead in one's water, a) contradicts the science of lead in water; b) generates vast underestimations of the prevalence of lead-contaminated water and inaccurate understandings about the contribution of lead-contaminated water to elevated blood lead levels;[1-2] c) misleads consumers into thinking that a 'non-detect' lead reading, for example, signifies their water is 'safe;' d) gives implicit permission to water utilities to issue false assurances of safety to consumers whose one-time test happened to capture no lead; and e) cultivates in consumers the erroneous impression that the adoption of precautionary measures – including lead

[1] See, for example, Stanek et al. 2020; Triantafyllidou et al. 2014; Triantafyllidou & Edwards 2012.
[2] Engel 1986 (Appendix 2) and Renner 2006 illustrate how erroneous governmental assumptions about the contribution of lead-contaminated water to blood lead levels in children has delayed the protection of children with elevated blood lead levels from ongoing ingestion of contaminated water, even when this water is the children's sole source of exposure to lead.

service line replacement – is both a nuisance and a financial waste. The letter below provides more details as well as citations on this and other similar points.

In light of EPA's commendable efforts to improve the Lead and Copper Rule Revisions (LCRR) and to accelerate the full replacement of lead service lines across the nation within ten years, we believe it is imperative that the agency move quicky to align its approach to lead in water with:

- the science of lead corrosion,
- basic environmental justice principles, and
- the public health goals of the Safe Drinking Water Act (SDWA).

Toward this end, we would like to have a meeting with you at your earliest convenience to discuss this matter further and explore how we can support EPA to make necessary corrections in a timely manner. At this meeting, we propose inviting Professional Engineer Elin Betanzo (cc-ed herein) for her expert input on the science of lead in water and the LCR. We also hope that EPA will support our conversation with agency staff who bring analogous expertise.

Should you have any questions, please contact Yanna Lambrinidou, PhD at pnalternatives@yahoo.com.

Thank you and kind regards,

Campaign for Lead Free Water

Childhood Lead Action Project

DC EJ Coalition

DC Environmental Network

DC Statehood Green Party

Earthjustice

Environmental Transformation Movement of Flint (ETM Flint)

Freshwater For Life Action Coalition – MKE

Get The Lead Out Coalition – MKE

Green New Deal for DC

Lead-Free Delaware

Little Village Environmental Justice Organization (JVEJO)

Natural Resources Defense Council (NRDC)

Newark Water Coalition

Parents for Nontoxic Alternatives

Portland Advocates for Lead-free Drinking Water

Sierra Club

Women for a Healthy Environment

cc. Zaineb Alattar, US EPA
KC Becker, US EPA Region 8
Navis Bermudez, US EPA
Eric Burneson, US EPA
David Cash, US EPA Region 1
Leslie Darman, US EPA
Marianne Engelman-Lado, US EPA
Lisa Garcia, US EPA Region 2
Jeaneanne Gettle, US EPA Region 4
Yu-Ting Guilaran, US EPA
Gem Guzman, US EPA Region 9
Hannah Holsinger, US EPA
Jeffrey Kempic, US EPA
Meg McCollister, US EPA Region 7
Jennifer McLain, US EPA
Earthea Nance, US EPA Region 6
Jonathan Nelson, US EPA
Adam Ortiz, US EPA Region 3
Michael S. Regan, US EPA
Zach Schafer, US EPA
Debra Shore, US EPA Region 5
Casey Sixkiller, US EPA Region 10
Carrie Wehling, US EPA
Wendy Wilkes, US EPA
Mae Wu, US EPA
Elin Betanzo, Safe Water Engineering, LLC
Ronnie Levin, Harvard TH Chan School of Public Health
Michael R. Schock, formerly with US EPA's National Risk Management Research Laboratory
Wisconsin State Senator Lena C. Taylor

Re: The scientific basis and public health protective capacity of EPA's recommendations to consumers for preventing exposures to lead in water

On behalf of the community and environmental justice signatories above, we want to express gratitude to the Environmental Protection Agency (EPA) for the October 17, 2023 webinar, "Engaging in EPA's Upcoming Proposed LCRI Drinking Water Regulatory Process." This event was especially informative with regards to the timeline for the upcoming LCRI and steps communities can take to participate in the rulemaking process. Spelling out all the ways in which consumers can provide input on the proposed LCRI aligns with environmental justice principles and helps overcome the common challenge of knowing what the opportunities are for weighing in on proposed environmental rules and how to take advantage of these opportunities.

EPA's webinar, however, alarmed us as well. In a segment about measures we can take "right now" to "protect" ourselves from lead in our tap water, an EPA scientist with the Standards and Risk Management Division of EPA's Office of Ground Water and Drinking Water (OGWDW) delivered a medley of seven recommendations (Appendix 1). We are familiar with these recommendations, as EPA has promoted most of them for over 30 years (Appendix 2).[3] But we also know that they are marred with such serious deficiencies that they risk prolonging – rather than eliminating – consumer exposures to lead in tap water.

Specifically, the recommendations:

- Overlook or contradict the best available, peer-reviewed science, as required by the Safe Drinking Water Act (SDWA) §1412(b)(3)(A), 42 U.S.C. §300g-1(b)(3)(A)[4] (Recommendations 1-5); and/or
- Ask of our communities to take measures that – although potentially challenging, demanding, time-intensive, and/or costly – are only partly or unreliably health protective, if health protective at all (Recommendations 1-6); or
- Lack basic information that is necessary for educated decision-making concerning the specific measure promoted (Recommendation 7).

Additionally, EPA leaves consumers on their own to decide which measure (or combination of measures) to adopt, in the absence of any guidance about each of the seven measures' advantages and disadvantages. And, lastly, none of the seven recommendations:

- disclose that lead in water is ubiquitous in buildings *with* and *without* a lead service line and, therefore, should concern everyone, or
- discuss *who* must bear the cost of measures that involve (or may involve) the purchasing of materials and/or the hiring of professional services.

All these deficiencies violate foundational consumer right-to-know principles codified in the Safe Drinking Water Act (SDWA) 1996 Amendments and the 2016 Water Infrastructure Improvements for the Nation

[3] See EPA's 1992 "Lead in Drinking Water Regulation: Public Education Guidance" for Recommendations 1-3 and 5-7.
[4] Safe Drinking Water Act §1412(b)(3)(A), 42 U.S.C. §300g-1(b)(3)(A) provides, "(3)(A) Use of science in decisionmaking.—In carrying out this section, and, to the degree that an Agency action is based on science, the Administrator shall use—(i) the best available, peer-reviewed science and supporting studies conducted in accordance with sound and objective scientific practices; and (ii) data collected by accepted methods or best available methods (if the reliability of the method and the nature of the decision justifies use of the data)."

Act provisions on lead public education adopted during the Flint lead crisis[5] and raise serious environmental justice and equity concerns (see the Campaign for Lead Free Water 2023 comment on EPA's proposed "National Primary Drinking Water Regulations: Consumer Confidence Report Rule Revisions" [EPA–HQ–OW–2022–0260]).

As we await the announcement of EPA's proposed LCRI, we bring these deficiencies to your attention with urgency and with the hope that EPA has fixed them. If it has not, we urge the agency to fix them as soon as possible (preferably before the release of the proposed improvements) or to make clear which peer-reviewed science it has used to maintain them.

Our sense of urgency is rooted in two concerns:

1. **The grave environmental injustice embedded in the LCR's 'shared responsibility' regime, as this regime has been conceptualized and implemented up to today**

   For the past 30+ years, the LCR's treatment technique approach (i.e., corrosion control, source water treatment, lead service line replacement, and public education) has left our communities largely unaware that they are at risk of exposures to both low-level, chronic and high-level, acute lead-in-water concentrations, *even when their water utilities are in full regulatory compliance*.[6] Worse, it has communicated consistently that, unless a community receives mandated public education about a lead action level (LAL) exceedance, lead in water at this community's taps does not pose a health risk.[7]

   Yet LCR compliance sampling results from water utilities across the US, as well as highly visible lead-in-water contamination events in cities like Benton Harbor, MI; Flint, MI; Jackson, MS; Newark, NJ; Portland, OR; and Washington, DC, have shown that lead-in-water levels at a community's taps can be present – as well as high and even exceedingly high – long before the LAL is exceeded, if it is exceeded at all.

   In other words, the LCR does not, and cannot, achieve the public health goals of the Safe Drinking Water Act (SDWA)[8] without regular delivery of scientifically sound, complete, and accurate public education about the nature and prevalence of lead in water, the unpredictability of its release, health risks from ingestion, the LCR's 'shared responsibility' regime, and effective

[5] See Public Notice and public education requirements for lead action level exceedances, SDWA §1412(c)(1)(D), (c)(2)(D), & (c)(5), 42 U.S.C. §300g-3(c)(1)(D), (c)(2)(D), & (c)(5), and Consumer Confidence Report requirements in SDWA §1414(c)(4), 42 U.S.C. §300g-3(c)(4).

[6] See, for example, the Campaign for Lead Free Water 2021 blog post "The EPA Lead and Copper Rule is an Optical Illusion."

[7] EPA's webpage "Basic Information about Lead in Drinking Water" states unequivocally that "EPA's ***Public Notification Rule*** requires public water systems to alert you if there is a problem with your drinking water" (emphasis in original).

[8] According to the SDWA, "A required treatment technique for a contaminant which is listed under paragraph (1) (B) shall require treatment necessary in the Administrator's judgment to prevent known or anticipated adverse effects on the health of persons to the extent feasible. For purposes of this paragraph, the term 'feasible' means feasible with the use of the best technology, treatment techniques, and other means, which the Administrator finds are generally available (taking cost into consideration)" (pp. 1663-1664).

and reliable steps that consumers can take to prevent exposures at all times and in all buildings.[9] In the absence of such disclosures that empower consumers to understand how the LCR works and protect themselves effectively and immediately,[10] the LCR turns into an instrument of public deception, which disables consumers' ability to take the best available health-protective measures and prolongs the risk of exposure, while falsely assuring our communities that their tap water is, with rare exceptions, safe.

2. **The worrisome connection between deficient public education and the LCR's integrity more broadly**

The LCR's treatment technique approach consists of four components: corrosion control, source water treatment, lead service line replacement, and public education.[11] To achieve the public health goals of the Safe Drinking Water Act (SDWA), each of these components separately must introduce an effective layer of consumer protection, and all these components together must produce a system of consumer protections that maximizes the LCR's public health protective capacity as a whole. For this to happen, the four components must be based on:

- the best available, peer-reviewed science, as well as
- robust understanding about how water utilities implement (or don't) the LCR, how oversight agencies enforce (or don't) the LCR, and how consumers are empowered (or not) to make health-protective decisions in relation to lead in water and the LCR.[12]

If the deficiencies in EPA's seven recommendations, which we discuss in the analysis that follows and summarize in Table 1, carry over to the LCRI's four (interrelated and interdependent) components, then there is reason to be concerned about the LCRI's overall ability to protect our communities from lead in tap water and achieve the public health goals of the Safe Drinking Water Act (SDWA) for generations to come.

To be specific – if, for example, EPA overlooks the inherent variability in lead release from plumbing (as is the case in EPA's recommendations to consumers, see point 1 below), proper implementation of lead-in-water monitoring and corrosion control treatment is likely to be compromised.[13] Similarly, if EPA fails to make explicit that reliable identification of lead-bearing plumbing on the private side and along the entire length of a service line can require several types of interventions[14] (as is the case in EPA's recommendations to consumers, see point 2 below),

---

[9] See Section II, "Public Education for Lead and LSLs," in Parents for Nontoxic Alternatives 2015 and Section 8, "Public Education," in Coalition Letter 2020.

[10] Such empowerment was envisioned by EPA over 30 years ago. The preamble to the 1991 LCR states that a) the agency chose solely a treatment technique approach over a dual MCL/treatment technique approach because it believed that the former would be "simpler" for the public – among others – to understand (1991 Lead and Copper Rule, 56 Fed. Reg. at 26472) and b) the "public education program included in the final rule can prevent adverse health effects by supplying people with information on ways to reduce the amount of lead in the water consumed (1991 Lead and Copper Rule, 56 Fed. Reg. at 26500).

[11] These components are triggered, in large part, after a LAL exceedance.

[12] See, for example, the 2016 NRDC report "What's in Your Water? Flint and Beyond" and the 2017 NRDC report "Threats on Tap: Widespread Violations Highlight Need for Investment in Water Infrastructure and Protections."

[13] See, for example, Schock, M. R. and F. G. Lemieux 2010. Challenges in Addressing Variability of Lead in Domestic Plumbing. *Water Science & Technology—Water Supply* 10(5):793-799.

[14] These interventions can include visual examination, water sampling, and excavation (Hensley et al. 2021).

successful implementation of full lead service line replacement programs is likely to be undermined. Worse, many lead service lines are likely to be left in operation long after water utilities declare that the lead service lines in their system have been fully replaced.

We have high hopes that EPA's proposed LCRI is going to be the long-overdue, public health protective, equitable, and just regulation communities across the nation deserve. Toward this goal, we trust that EPA will give serious consideration to our request. Thank you.

EPA's Recommendations

1. "Have your water tested. Contact your water utility to have your water tested and to learn more about the lead levels in your drinking water."

This EPA "Concerned About Lead in Your Drinking Water?" infographic was not included in the agency's October 17, 2023 webinar, but it echoes the webinar's messaging. We insert it here to provide a visual example of the EPA's erroneous claim that water testing can establish with *certainty* if one's water is contaminated with lead.

This recommendation defies decades of scientific research on a) the inherent variability in lead release, and b) the inability of standard water sampling methods to capture reliably worst-case lead-in-water levels at any single tap. It is a recommendation that can, in fact, prolong – rather than mitigate – exposures to lead in water, by giving water users the impression that their water is "safe" when, in reality, it exposes them to low-level, chronic and/or high-level, acute lead-in-water concentrations.

EPA has known since at least the 1980s that the release of lead from individual taps tends to be highly variable, both before and after corrosion control treatment installation (e.g., Pocock 1980, cited in 1991 Lead and Copper Rule). This variability was mentioned repeatedly in the preamble to the 1991 Lead and Copper Rule (LCR) and was even used as an argument against the adoption of a Maximum Contaminant Level (MCL) for lead in water.[15]

More recently, EPA scientists established that, because of the inherent variability in lead release, "most sampling protocols cannot accurately represent Pb exposure" (Triantafyllidou

[15] The preamble to the LCR of 1991 states that, "Numerous commenters supported the establishment of a treatment technique, stating that the primary source of lead is from home plumbing materials, which are beyond the water system's direct control. These commenters argued that water systems can only control the water quality parameters that affect the corrosivity of the water and should not be held responsible for lead and copper levels at individual taps. They contended that *it is infeasible to measure MCLs accurately at taps because corrosion control technology does not guarantee specific or predictable tap water lead levels, as is evident by monitoring programs that have shown significant variability in tap lead levels within a system and even within a tap over time after installation of treatment*" (1991 Lead and Copper Rule, 56 Fed. Reg. at 26472, emphasis added).

et al. 2021:12). Indeed, according to Masters et al. 2017,[16] in cases of extreme lead-in-water variability, one would need to collect over 1,200 samples from a single tap to assess average lead-in-water concentrations at this tap to within 20% of the true mean. In practice, this means that one, two, or even three water samples at any given tap – which is what most standard sampling protocols involve – are likely to miss worst-case lead-in-water levels to which people using this tap are exposed. In other words, standard water testing – whether for LCR compliance sampling or other purposes – is associated with routine and potentially significant underestimations of real-world lead-in-water exposures and is unreliable for capturing the true extent of contamination problems at any single tap (Masters et al. 2016, Del Toral et al. 2013).

Moreover, consumer inquiries to water utilities about the safety of their water are often addressed with information about:

- 90th-percentile values (which usually meet the LCR's 15 parts per billion LAL), and
- the water "meeting or exceeding" LCR safety standards.

These responses echo standard language on the EPA website, as well as in annual Consumer Confidence Reports (CCRs).[17] This language erroneously links LCR compliance to water safety and suggests that if lead-in-water contamination problems were detected, consumers would be notified. Such assurances do not disclose, however, that lead levels at individual taps can reach hundreds and even thousands of parts per billion, even when 90th-percentile values are well below the LAL and LCR requirements are met. Conflating the LCR's LAL with the Rule's Maximum Contaminant Level Goal (MCLG) of zero, EPA and water utilities also often insinuate, and sometimes claim, that a single water sample from a single tap showing non-detect levels of lead, or measuring below 15 parts per billion, confirms the water's safety at this tap.[18] Such suggestions are incorrect.

We are concerned that EPA's testing recommendation – which is amplified by water utilities, health departments, government agencies, and media outlets and which does not address the potential cost that might be involved[19] – perpetuates a grossly simplistic and misleading

[16] Masters, S. V. et al. 2017. "Inherent variability in lead and copper collected during standardized sampling" [Power Point presentation] (slides available upon request).

[17] See, for example, the Campaign for Lead Free Water 2023 comment on EPA's proposed "National Primary Drinking Water Regulations: Consumer Confidence Report Rule Revisions" [EPA–HQ–OW–2022–0260] and the Campaign for Lead Free Water 2021 blog post, "The EPA Lead and Copper Rule is an Optical Illusion."

[18] In some documents EPA actually acknowledges the problem with this conflation – see, for example, the agency's 2016 "Lead and Copper Rule Revisions White Paper," which states that, "Although public discussion often mistakes the action level as having significance in terms of health impacts, EPA has consistently emphasized that the health-based maximum contaminant level goal (MCLG) for lead in the current LCR is zero and that there is no safe level of lead exposure. While the future LCR will maintain treatment technique requirements (e.g., CCT, public education and LSLR) to reduce lead exposures, a health-based benchmark for lead in drinking water could help to guide appropriate actions to communicate and mitigate risk, particularly at the household level" (p. 11).

[19] Some water utilities offer free annual lead-in-water testing to their customers, but others do not. Additionally, customers who want to have their water tested independently are on their own to cover the cost. A survey of three independent certified labs in the Washington, DC area revealed that this cost can range from $25-$125 for a 1st-draw sample and go up to $200 for a 1st- and 2nd-draw sample. Customers interested in more than two samples would be charged over $200.

characterization of the nature of lead in water. Even worse, it risks steering consumers away from health-protective action and leaving them unnecessarily in harm's way. Indeed, qualitative research about property owner decision-making vis-à-vis lead service line replacement has revealed that some property owners refuse to consent to private-side replacement precisely because a one-time test at one of their home taps showed lead-in-water levels below 15 parts per billion – a reading which assured them that the water at their home did not pose a health risk and, therefore, did not justify a costly remedy (Lambrinidou 2015).[20]

2. "Learn if you have a lead service line. Contact your water utility or a licensed plumber to determine if the pipe that connects your home to the water main (called a service line) is made from lead."

Determining one's service line material is a sound recommendation since lead service lines are made of 100% pure lead and "represent the greatest source of lead in drinking water" (Hensley et al. 2021). This, however, is an exercise consumers should be encouraged to carry out *after* taking immediate measures to protect themselves from lead-in-water exposures. Waiting to confirm the presence of a lead service line *before* taking such measures – or forgoing proper precautions all together when one's service line is confirmed to *not* be lead – places consumers at risk of prolonged lead-in-water exposures and associated health harm.

Additionally, this recommendation must disclose a) common challenges in obtaining complete and reliable information from one's water utility about one's service line material(s), b) steps one can take to verify one's water utility claims, and c) the costs associated with hiring a licensed plumber to determine the presence or absence of lead-bearing plumbing materials along the entire length of one's service line. Specifically, the recommendation must spell out that:

- Although there are different definitions of a "lead service line," lead-bearing plumbing materials along the length of a service line can include:
    - lead pipe,
    - galvanized iron or galvanized steel pipe,
    - brass pipe,
    - water meters,
    - compression fittings,
    - goosenecks, pigtails, and connectors (these plumbing components, for example, are not included in EPA's definition of a "lead service line" under the Lead and Copper Rule Revisions (LCRR)).

  In other words, even when the pipe that connects a building to a water main is not lead, one or more of the above plumbing components may still be present along the length of the building's service line and may still cause significant elevations of lead in water.

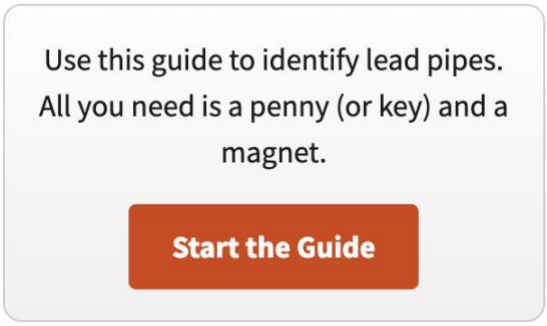
[20] Lambrinidou, Y. "Empirical and Legal Evaluation of Public Health Protection Under the Federal LCR" (2015, unpublished research, Appendix 3).

- One's water utility may – and, in many cases, is likely to – have incomplete or incorrect information about one or more service line materials along the length of one's service line (Kite 2022, DC Water 2023 disclaimer). This is especially the case at the present moment, when lead service line inventories are still in the process of completion.[21] Therefore, consumers must be given information on how to verify their water utility claims.

- Reliable identification of lead-bearing plumbing materials along the length of one's service line may necessitate several types of interventions. Specifically, lead that is visible inside the home means that there is a lead service line. But the absence of lead inside the home does *not* rule out the possibility of buried lead between the water main and the building. Further investigation is necessary to rule out the possibility of a lead service line (and/or other lead-bearing plumbing materials). In those cases where a simple visual examination of the service line is inconclusive or shows no lead, additional investigation may involve extensive water sampling (Schock et al. 2021). When such sampling shows no lead, excavation may be required to rule out with certainty the presence of a lead service line (and/or other lead-bearing plumbing materials) in private space and along the service line's entire length (Hensley et al. 2021, Betanzo & Attal 2022, Michigan Department of Environment).

  This is an important point, as the majority of public facing instructions for identifying a lead service line assume that the material seen inside the home is the same for the entire length of the service line. Water system inventories demonstrate that this is frequently not the case. EPA and water utility instructions inaccurately imply that homes do not have a lead service line if lead is not visible inside the home. Indeed, some water utilities seem to rely on customer-conducted visual examinations to confirm or rule out the presence of a lead service line in private space or throughout the entire length of the line (e.g., Baltimore, MD; Chatham Borough, NJ; Lake County, IL; the state of Louisiana; Milwaukee, WI. These few examples likely scratch the surface of a much larger set of water utilities and other authoritative bodies – such as municipal and state agencies, technical assistance providers, and the media – that issue misleading information about how to identify a lead service line). In fact, EPA's website can also give the false impression that customer-conducted visual examinations suffice for identifying lead service lines:

[21] It is worth noting that even DC Water – the water utility which has conducted among the highest, if not the highest, number of (full and partial) lead service line replacements in the nation to meet LCR requirements – *still* does not know with certainty where all the city's lead service lines are. In July 2023, DC resident, attorney, and longtime Advisory Neighborhood Commissioner Mr. Randy Speck testified in front of DC City Council that: "Shockingly, after knowing about the lead-in-water problem for 20 years, DC Water still has only the vaguest notion of how many LSLs require replacement or where they are located. Its estimates seem to be little more than guesses, and they have increased even in the absence of any more reliable data. DC Water's June 2021 'Lead Free DC' plan estimated about 28,000 replacements, but by May 2023 that number increased to 41,000. Still, however, DC Water's latest guess is based on arbitrary assumptions that half of the 14,000 service lines with unknown materials are lead and one fifth of the 66,000 previously identified non-lead lines will be discovered to have lead and must be replaced. There's no empirical basis for those numbers. These malleable inventory assumptions are a primary driver of DC's ever escalating cost estimate [for the full replacement of all of the city's LSLs] …" (Council of the District of Columbia, Committee on Transportation & the Environment, Public Hearing, July 6, 2023).



EPA's "Protect Your Tap: A Quick Check for Lead" Guide

- Hiring a licensed plumber to conduct a thorough investigation of one's service line might be costly. Therefore, the approximate cost range for such work must be provided and customer inability to pay for such a service must be addressed.

- The presence of a lead service line (and/or other lead-bearing plumbing materials across the length of a service line) necessitates its replacement. Because however:
    - in many jurisdictions, lead service lines were forced on property owners by law (Troesken 2006, Rabin 2008, McCormick & Uteuova 2022);
    - under the LCR, and with active water utility participation, consumers across the US have received misleading information about the health risks associated with both intact and partially replaced lead service lines (see point 1 above about EPA linking LCR compliance to water safety and suggesting that if lead-in-water contamination problems were detected, consumers would be notified; see also Brown et al. 2011); and
    - under the LCR, and with active water utility participation, consumers have been left unprotected from both low-level, chronic and high-level, acute exposures to lead in water (see point 1 above and Brown et al. 2011);

  consumers must be protected against having to pay for remediation of a contaminant that was inflicted on them and from which they may have suffered irreparable health harm. This includes both out-of-pocket costs and water rate increases for lead service line replacement. Thus, water utilities must be required to aggressively pursue all possible means of paying for system-wide lead service line replacement, including:
    - existing ratepayer funds (i.e., by allocating or reallocating portions of these funds to lead service line replacement),
    - federal, state and local funding, and
    - innovative funding and financing programs (e.g., Newark, NJ's use of port fees or Madison, WI's use of revenue from allowing cell phone antennae on its water towers).

  If, after pursuing all such means, a water utility needs additional funds for lead service line replacement and decides to resort to water rate increases, it must be required under the LCR to submit to state drinking water programs – and make public:
    - the funding sources it has pursued,
    - the funding proposals it has submitted, and

- the responses it has received.

In turn, state drinking water programs should have the obligation to review and report on whether the water utility has truly exhausted all possible funding options. Of course, when funding options are exhausted and rates are raised, rate reforms should insulate low-income consumers from affordability challenges (see Water Affordability Advocacy Toolkit).

Absence of such financial protection – and of public disclosure about the imperative of such protection – will be inherently unfair and will exacerbate environmental injustices, as it:

- will force consumers to pay for the removal of a contaminant they did not choose and, in many cases, did not know about, and
- will compound the longstanding environmental injustice of lead in water, both on low-income consumers and on consumers of middle and high incomes, most of whom have likely been unwittingly exposed to lead in water and suffered associated health harms for many generations (Troesken 2006, Baehler et al. 2021).

3. "Run your water. Before drinking, flush your home's pipes by running the tap, taking a shower, doing laundry, or doing a load of dishes. The amount of time to run the water will depend on whether your home has a lead service line or not, and the length of the lead service line. Residents should contact their water utility for recommendations about flushing times in their community."

This recommendation overlooks the complexities of flushing, as have been established in the scientific literature. Although flushing can, indeed, temporarily reduce – or even eliminate – lead from water, this outcome is not guaranteed. Research has shown that, under certain circumstances, flushing can in fact *increase* lead-in-water levels.

Additionally, the suggestion that water utilities possess scientifically reliable information about appropriate *community-wide* "flushing times" fails to address the challenge of the particularities at the *household level* of plumbing materials, plumbing arrangements, water-use practices, water age, water chemistry, and other factors, which can give rise to markedly different lead release patterns in different buildings within the same community (and even within the same neighborhood or the same street). Such differences would, presumably, necessitate tailoring recommended flushing times to each building's particularities and would make *community-wide* "flushing times" scientifically difficult, if not impossible.

In short, this is not an appropriate recommendation, especially since there are far more reliable measures for eliminating lead in water and preventing exposures (e.g., filtration, bottled water use, water distillation).

Stagnation of water in lead-bearing plumbing has, indeed, been shown to increase lead leaching (Lytle & Schock 2000). Although flushing can temporarily reduce – or even eliminate – lead-in-water contamination, it cannot be relied upon to prevent exposures. Indeed, under certain circumstances, flushing can:

- *Increase* lead release from plumbing (Katner et al. 2018, Del Toral et al. 2013). Del Toral and coauthors state that, "Much of the current published and web-based flushing guidance inadvertently increases the risk of exposure to elevated lead levels by clearing an insufficient amount of water volume. Even fully flushing LSLs may only lower lead levels to a limiting, measurable lead level, that relates to the plumbosolvency of the water, the flow rate, the length and internal diameter of the pipe, and possibly effects of prior disturbances" (Del Toral et al. 2013:9305).
- Be rapidly followed by a return of the lead levels present in the water prior to the flush (Murphy 1993); and
- Reduce the risk of childhood elevated blood lead levels from water to a smaller degree than bottled water consumption (Fertmann et al. 2004, Moralez et al. 2005:452)[22] or fail to reduce this risk all together (Triantafyllidou et al. 2014). Notably, Triantafyllidou and Edwards report that, "Even flushed water samples for lead poisoned children in the 2009 data from Massachusetts contained as high as 146 µg/L lead" (2012:1337).

This recommendation is justified only as a last resort for situations where consumers are unable to remove lead from water through filtration and other processes and also lack access to bottled water.

4. "Learn about construction in your neighborhood. Be aware of any construction or maintenance work that could disturb your lead service line. Construction may cause more lead to be released from a lead service line."

Although science-based, this recommendation is incomplete and inappropriate for health protection. Since there are steps one can take to practically eliminate lead from water (e.g., filtration, bottled water use, water distillation) *at all times* and regardless of activity levels in one's neighborhood, asking consumers to monitor construction/maintenance work is a tall order with insufficient returns.

Research has shown that physical disturbances of lead service lines are associated with higher lead release from these lines (Del Toral et al. 2013). However, the problem of physical disturbances is more complex than what this recommendation suggests – namely:

- Construction and plumbing maintenance work constitute only one category of activity that can disturb lead-bearing plumbing. It is highly likely that lead-bearing plumbing can also be disturbed by other categories of activities, such as nearby movement of heavy-weight vehicles, high-traffic roads, earthquakes, and any other phenomenon that can vibrate the ground (e.g., a large tree falling); and

[22] A study on blood lead levels in Mexican-American children and adolescents in the US concluded that, "… Mexican-American children with tap water as their principal source of drinking water have higher BLLs than Mexican-American children drinking bottled water, suggesting that plumbing may be an important source of lead exposure in Mexican-American children" (Moralez et al. 2005:452). Similar findings from Hamburg, Germany were reported in Fertmann et al. 2004.

- Physical disturbances can result in higher lead release not only from lead service lines, but also from lead-bearing premise plumbing (Edwards 2014). As such, they pose a risk to *all consumers*, whether or not they reside in a home (or attend a school or work in a building) with a lead service line.

In light of this complexity, asking *only* consumers in lead service line homes to:

- monitor *only* construction/maintenance work in their neighborhood (an ask that is practically impossible for many), and
- presumably, take additional precautions when such work is taking place,

constitutes a 'whack-a-mole' approach to lead in water, which is inadequately health protective. This approach overlooks the entirety of phenomena that can cause physical disturbances of lead-bearing plumbing as well as the entirety of buildings that are vulnerable to higher lead release from such disturbances.

There is no justification for this recommendation when there are steps consumers *in all buildings* can take *at all times* to practically eliminate lead from water (e.g., filtration, bottled water use, water distillation) regardless of the state of ground vibrations in their neighborhoods.

5. "**Use cold water.** Use only cold water for drinking, cooking and making baby formula. Remember, boiling water does not remove lead from water."

This recommendation may protect consumers from the higher lead-in-water levels associated with hot water use, but it does not prevent either low-level, chronic or high-level, acute exposures to lead in water. Since there are measures consumers can take to practically eliminate lead from water (e.g., filtration, bottled water use, water distillation), promoting the consumption of unfiltered cold water for anyone, *and especially for infants dependent on reconstituted formula*, steers consumers in a direction that prolongs their risk of exposure and leaves them vulnerable to significant health harm.

LCR compliance sampling data from utilities across the country are based on the collection and analysis of 1st-draw cold-water samples following a period of stagnation in faucets and other plumbing materials close to faucets. These data show that cold water often contains both soluble and particulate lead and places consumers at risk of exposure to both low-level, chronic and high-level, acute exposures. This is the case even when the 90th-percentile value of a water utility's sampling round falls well below the LCR's 15 parts per billion LAL. In other words, lead in cold water is ubiquitous and affects all homes, whether they have a lead service line or not.

Washington, DC is a case in point:

- In 2019, the 90th-percentile value for DC Water's January-June sampling round was 2.2 parts per billion lead and for the July-December sampling round, 2.3 parts per billion lead. Yet in the January-June sampling round 85% of 1st-draw samples contained some amount of lead, and in the July-December sampling round 86% of

1st-draw samples contained some amount of lead. ***The highest lead reading in January-June was 33.3 parts per billion and in July-December, 209 parts per billion.***

- In 2020, the 90th-percentile value for DC Water's January-June sampling round was 1.8 parts per billion lead and for the July-December sampling round, 2.8 parts per billion lead. Yet in the January-June sampling round 77% of 1st-draw samples contained some amount of lead, and in the July-December sampling round 84% of 1st-draw samples contained some amount of lead. ***The highest lead reading in January-June was 17.3 parts per billion and in July-December, 37.3 parts per billion.***

Given the inherent variability in lead release (see discussion about Recommendation 1 above), it is reasonable to assume that cold water contamination in Washington, DC (and other jurisdictions) is even more prevalent and severe than LCR compliance data suggest (Del Toral et al. 2013). Specifically, the taps that measure at zero lead at the time of LCR compliance sampling likely dispense both low and high levels of lead at other times. And the taps that measure below 15 parts per billion at the time of LCR compliance sampling likely dispense high levels of lead at other times. In short, using "only cold water for drinking, cooking and making baby formula" (EPA recommendation above) is far from a health protective practice (Baum & Shannon 1997).[23] Therefore, we believe that EPA's cold-water recommendation is justified only as a last resort for situations where consumers are unable to remove lead from water through filtration and/or other processes and lack access to bottled water.

Lastly, boiling not only "does not remove lead from water" (EPA recommendation above), it tends to concentrate it. According to a peer-reviewed scientific paper on lead poisoning in infancy, excessive boiling "increases the lead concentration of tap water, amplifying the risk of lead intoxication and exposing the infants to substantial quantities of lead with every formula feeding" (Shannon & Graef 1992:89). And yet this information is missing from most recommendations for preventing exposures to lead in water as well as from many – perhaps even most – boil-water advisories that water utilities issue to protect consumers from waterborne pathogens. It is, therefore, imperative that EPA's messaging is clear: when it comes to lead from plumbing, boiling one's water can be dangerous because it can expose consumers to unusually high levels of lead, causing potentially significant health harm.

6. "**Clean your aerator.** Regularly clean your faucet's screen (also known as an aerator). Sediment, debris, and lead particles can collect in your aerator. If lead particles are caught in the aerator, lead can get into your water."

This recommendation is scientifically sound and we encourage it, albeit only as a second line of defense following filtration. To be implementable, however, it must address the practical challenges and potential costs it involves under some (if not many) circumstances. Additionally, it must include crucial information about the nature of lead particles and the

[23] In their study, Baum and Shannon (1997) analyzed the lead content in 40 samples of reconstituted infant formula and found that two measured above 15 parts per billion (i.e., at 17 and 70 parts per billion). According to the authors, both of these samples were prepared with cold tap water.

gravity of the health risk they pose. This information is necessary for consumers' appreciation of the importance of clean aerators and/or other measures one can take to prevent lead particle exposures.

We certainly support the idea of clean aerators. However, this recommendation omits crucially important information that consumers need to a) understand the purpose of the measure, b) assess its practicality for their specific circumstances, and c) resort to alternatives if and when they conclude that this measure is out of their reach. Indeed, cleaning faucet aerators can seem like a nuisance in the absence of basic information about what lead particles are and what risk they pose to human health. After many years of public education delivery under the LCR – through annual CCRs and other public outreach requirements – most consumers do not know that:

- lead in water can appear in the form of lead particles (i.e., tiny pieces of pure lead, lead solder, leaded brass, and other lead-bearing components) (Triantafyllidou et al. 2007);
- the release of such particles is common (McNeill and Edwards 2004); and
- the ingestion of such particles can expose one to hundreds and thousands of parts per billion lead – concentrations which sometimes meet or far exceed "hazardous waste" criteria (i.e., >5000 µg/L) (Triantafyllidou et al. 2007, Lambrinidou et al. 2010).[24]

Research has shown that food cooked with lead particles can contain lead levels higher than the levels in a lead paint chip approximately the size of a penny (Triantafyllidou et al. 2007) and that consuming "even a small amount of water containing >5000 µg/L lead would greatly exceed the dose from 1900s lead abortion pills" (Edwards 2014:739).

Food cooked with tap water containing lead particles collected from the home of a lead-poisoned child contained more lead than a lead paint chip approximately the size of a penny.

Triantafyllidou et al. 2007:114

Exposures to such high concentrations of lead have been associated with miscarriage, fetal death, infant mortality, and elevated blood lead levels in young children (Triantafyllidou et al. 2007, Edwards 2014, Troesken 2006).

[24] For a detailed critique of the annual CCR requirement, see, for example, the Campaign for Lead Free Water 2023 comment on EPA's proposed "National Primary Drinking Water Regulations: Consumer Confidence Report Rule Revisions" [EPA–HQ–OW–2022–0260].

At the same time, depending on one's faucet age, condition, and/or design, aerator removal can be entirely impossible[25] or can cost money for pliers, masking tape, and other necessary materials. Moreover, both the removal and the reassembling can be challenging for many consumers without the help of a plumber (which can be financially burdensome or even prohibitive). For this reason, any mention of this recommendation must be coupled with precise instructions on *how* to remove an aerator, an acknowledgement of the challenges this might involve, and alternative measures for consumers who are unable to carry out the measure (e.g., filtration, distillation, use of bottled water).

7. "**Use your filter properly.** If you use a filter, make sure you use a filter certified to remove lead. Read the directions to learn how to properly install and use your cartridge and when to replace it. Using the cartridge after it has expired can make it less effective at removing lead. Do not run hot water through the filter."

Given that proper filtration in common water chemistries and common lead service line scale formations can remove lead effectively and protect consumers from lead-in-water exposures immediately, this recommendation must be highlighted and prioritized *over all other* recommendations and must include all the information a consumer needs to make informed decisions about health-protective filter use.

Lead in water is ubiquitous, no matter what one-time testing shows (due to the challenge of the inherent variability in lead release, see discussion about Recommendation 1 above). This is the case even when:

a. one's water utility meets LCR requirements,[26]
b. one's home (or business, workplace, public building/space) has no lead service line (Triantafyllidou et al. 2007, Stanek et al. 2020, Triantafyllidou et al. 2021),
c. one runs the water before using it (Katner et al. 2018),
d. one draws only cold water for drinking and cooking,[27]
e. one's neighborhood is free of construction,[28] and
f. one cleans faucet aerators routinely.[29]

In other words, unless and until EPA revises its definition of "lead free" plumbing to mean *plumbing that contains no lead*, and unless and until all existing lead-bearing plumbing is replaced with true *lead free* plumbing, consumers will continue to be at risk of exposures to both low-level, chronic and high-level, acute lead-in-water concentrations.

[25] Some faucets, like this pulldown kitchen faucet for example, come with built-in aerators that are not removable.
[26] See, for example, the Campaign for Lead Free Water 2021 blog post, "The EPA Lead and Copper Rule is an Optical Illusion."
[27] LCR compliance sampling, which routinely captures lead-in-water contamination in jurisdictions across the US, includes only cold-water samples.
[28] It is safe to assume that LCR compliance sampling, which routinely captures lead-in-water contamination in jurisdictions across the US, includes homes with no neighborhood construction at the time of sampling.
[29] Soluble lead and many lead particles are small enough to fit through faucet aerators (Triantafyllidou et al. 2007).

Given that it will take many decades to rid all of the nation's water distribution systems of lead, EPA must highlight and encourage *above all else* actions consumers can take *immediately* to protect themselves from exposures.

To our knowledge, filtration is the best available such action in terms of its effectiveness, accessibility, environmental sustainability, and cost. It is, in fact, precisely for this reason that Washington, DC in 2017 and the state of Michigan in 2023 enacted legislation mandating a "Filter First" approach to lead in school water. "Filter First" involves the proactive installation of filters at all taps used for drinking and cooking, regardless of how those taps tested in the past or would test in the present (due to the challenge of the inherent variability in lead release).

Against this backdrop, EPA's filter recommendation must a) be revised to read as an *urgent call* to all consumers (as well as businesses, workplaces, and public buildings/spaces) for the end to unnecessary exposures to lead in water through filtration, and b) highlight information that is necessary for informed decision-making about filters, proper filter use, and health-protective alternatives to such filters. Specifically, this call must include:

- guidance on how to identify a lead-certified filter;
- a description of all types of point-of-use filters certified to remove lead (i.e., faucet-mount, refrigerator, pitcher-style, and bottle-fitted activated carbon filters);
- the most health-protective combination of certifications currently available for activated carbon filters (i.e., NSF/ANSI 42 standard for particulate Class I reduction *and* NSF/ANSI 53 standard for soluble and particulate lead reduction, coupled with the statement that the filter is certified to reduce lead) (see EPA's "Consumer Tool for Identifying POU Drinking Water Filters Certified to Reduce Lead" and filter certifications for Newark, New Jersey in Lytle et al. 2020);
- general information about the approximate cost (while also addressing customer inability to pay), installation procedures, maintenance, and replacement schedule for each type of filter;
- limitations and/or challenges posed by these filters (e.g., the potential difficulty of installing faucet-mount filters, the potential for bacterial growth in the filters under certain conditions (Wu et al. 2017, Williams 2017), the potential suboptimal effectiveness of the filters in waters with uncommon water chemistries and/or uncommon lead service line scale formations (Lytle et al. 2020));
- solutions to those limitations and/or challenges (e.g., using a pitcher-style filter when faucet-mount filters cannot be easily installed, flushing stagnant water out of filters every morning (Williams 2017), verifying the effectiveness of filters following installation (Lytle et al. 2020), notifying and working with one's water utility if filters fail to remove lead);
- performance characteristics of faucet-mount versus pitcher-style filters per EPA's Benton Harbor, MI water filter study (Tully et al. 2023; in this study, pitcher-style filters that met the NSF/ANSI 53 lead reduction standard (<5 ppb) were more likely to have detectable lead in the filter effluent compared to faucet-mount filters);
- information about devices that can offer additional layers of protection as a complement to activated carbon filters (e.g., reverse osmosis filters) or that can be used instead of activated carbon filters (e.g., water distillers), and

- strong warnings about the limitations of point-of-entry filters, under-sink filters, and all other filters certified to remove lead that are not designed for point-of-use installation. This is especially important as in many cities – including Flint, MI and Washington, DC – residents install such filters thinking that they offer them full protection from lead in water, when they do not.

We believe that EPA, as the agency tasked with implementing the Safe Drinking Water Act (SDWA) and ensuring tap water is safe for human consumption, has a moral obligation to arm consumers with complete and accurate information about the ins and outs of water filtration for lead removal. Not doing so condemns even more generations to the health harms of this entirely preventable scourge.

Table 1. Highlights of deficiencies in EPA's recommendations to consumers for protecting themselves from lead in water

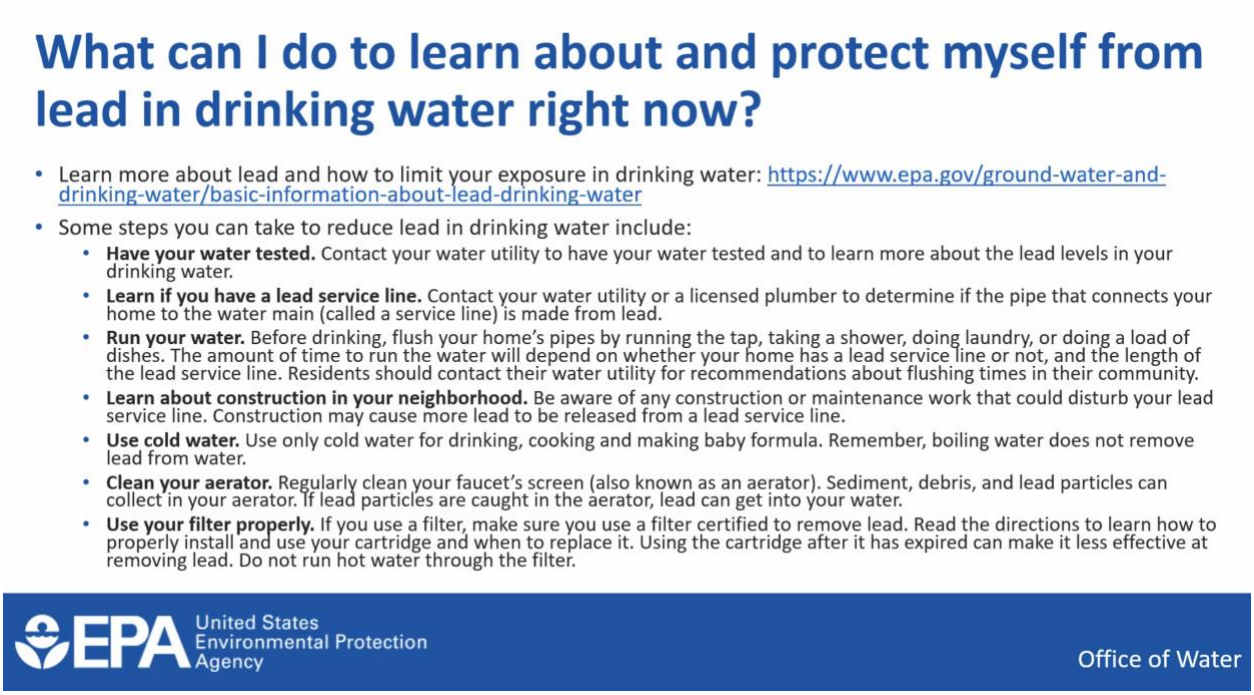
	Overlooks and/or contradicts relevant peer-reviewed science	Contains misleading and/or incomplete information	Places unrealistic, unsustainable, and/or questionable expectations on consumers	Perpetuates false assurances of water safety and/or of consumer ability to achieve such safety	Fails to disclose measures known to be more effective at protecting consumer health
Rec 1: "Have your water tested."	Re the inherent variability in lead release	Misleads re the connection between LCR compliance and water safety Stays silent on the potential cost of lead-in-water testing (whether this testing is done through one's water utility or an independent, certified lab)	Re the cost of testing, if it is not covered by one's water utility and/or if one wants to test one's water using a sampling protocol that is more thorough than the sampling protocol offered by one's water utility	√	√
Rec 2: "Learn if you have a lead service line."	Re the inadequacy of resident-led "scratch" or "magnet" testing for identifying all lead (and galvanized iron/steel) components across the entire length of a service line	Misleads re the multiple – lead-bearing and non-lead-bearing – materials that can make up a service line Misleads re the complexities, challenges, and costs associated with obtaining reliable information about the plumbing materials along the entire length of one's service line Stays silent on steps consumers might want to take to verify their water utility claims re the material of their service line	Re relying on one's water utility for complete and accurate information about the plumbing materials along the entire length of one's service line Re the cost of hiring a licensed plumber	√	√

	Overlooks and/or contradicts relevant peer-reviewed science	Contains misleading and/or incomplete information	Places unrealistic, unsustainable, and/or questionable expectations on consumers	Perpetuates false assurances of water safety and/or of consumer ability to achieve such safety	Fails to disclose measures known to be more effective at protecting consumer health
Rec 3: "Run your water."	Re the unreliability of flushing for health-protective purposes Re the scientific difficulty – if not impossibility – of establishing health-protective community-wide "flushing times."	Misleads re the ability of flushing to reliably reduce/eliminate lead in water	Re flushing taps before drinking/cooking	√	√
Rec 4: "Learn about construction in your neighborhood."	Re premise plumbing's ability to release higher levels of lead due to physical disturbances	Misleads re lead service lines being the only lead-bearing plumbing component that can release higher levels of lead due to physical disturbances [Likely misleads re construction/maintenance work being the only factor that can cause physical disturbances of lead-bearing plumbing]	Re monitoring construction/maintenance work in one's neighborhood	√	√
Rec 5: "Use cold water."	Re lead contamination in cold water Re the health risks of boiling lead-contaminated water	Re the safety of unfiltered cold water Re the safety of unfiltered and boiled water	Re avoiding hot water to mix infant formula and/or make meals/drinks, when one relies on this practice	√	√

	Overlooks and/or contradicts relevant peer-reviewed science	Contains misleading and/or incomplete information	Places unrealistic, unsustainable, and/or questionable expectations on consumers	Perpetuates false assurances of water safety and/or of consumer ability to achieve such safety	Fails to disclose measures known to be more effective at protecting consumer health
Rec 6: "Clean your aerator."		Stays silent on the nature and health risks of lead particles Stays silent on the potential cost involved	Re the ease and potential cost of aerator cleaning	√	√
Rec 7: "Use your filter properly."		Fails to highlight the benefits of lead-removing filters – in buildings *with* and *without* lead service lines – over and above less effective measures Fails to mention important information about lead-removing filter options, effectiveness, cost, limitations/challenges, solutions	Fails to provide information necessary for informed decision-making about lead-removing filters and proper filter installation, operation, and maintenance Fails to provide information about health-protective alternatives to lead-removing filters and their cost	√	

This table highlights limitations in the seven EPA recommendations to consumers who are "concerned about lead in their drinking water." Two recommendations (Rec 1 and Rec 5, marked in red) contradict current scientific understanding about the nature of lead release from plumbing and encourage the adoption of measures likely to prolong consumer exposures to lead in water. One recommendation (Rec 3, marked in red) can, in fact, increase lead-in-water levels, placing consumers at higher risk of exposure. Three recommendations (Rec 2, Rec 4, and Rec 6) promote measures that are neither always easy to execute, nor as health protective as other available measures (e.g., filtration, bottled water use, water distillation). And the one recommendation (Rec 7) that is generally effective at preventing lead-in-water exposures fails to reinforce the advantages – in terms of accessibility, effectiveness, environmental sustainability, and cost – of the measure it promotes. Lastly, none of the recommendations: a) disclose that lead in water is ubiquitous in buildings *with* and *without* a lead service line and, therefore, should concern every consumer, or b) discuss who must bear the cost of measures that involve (or may involve) the purchasing of materials and/or the hiring of professional services. All these deficiencies raise serious environmental justice and equity concerns.

Appendix 1. Recommendations presented at EPA's October 17, 2023 webinar, "Engaging in EPA's Upcoming Proposed LCRI Drinking Water Regulatory Process"



Appendix 2. For over 30 years EPA, as well as water utilities and other authoritative bodies (e.g., municipal and state agencies), have been delivering deficient recommendations to consumers for protecting themselves from lead in water. Below are four illustrations from the *Washington Post*, although similar recommendations appear in newspapers from other cities.[30] Illustration 1 shows how, at times, erroneous governmental assumptions about the contribution of lead-contaminated water to blood lead levels in children have delayed the protection of children with elevated blood lead levels from ongoing ingestion of contaminated water, even when this water is the children's sole source of exposure to lead.

Illustration 1.

Tests on Lead in D.C. Water to Take 3 Months
By Margaret Engel Washington Post Staff Writer
The Washington Post (1974-); Dec 21, 1986; ProQuest Historical Newspapers: The Washington Post
pg. B3

Tests on Lead in D.C. Water to Take 3 Months

By Margaret Engel
Washington Post Staff Writer

The extent of lead contamination of District drinking water will not be determined for another three months, according to the acting city Public Health Commissioner, Dr. Reed Tuckson.

High lead levels caused by aged lead pipes and lead solder is rapidly becoming one of the District's thorniest public health problems. Nearly 1,000 households have swamped the city's water testing program with requests for tests after residents of the Palisades neighborhood, in lower Northwest along the C&O canal, learned that several older houses had lead-contaminated water.

The issue became public last month after a yearlong effort by the parents of twin infants to find the source of their daughters' serious lead poisoning. After repainting their home at the city's suggestion with little improvement in the children's health, the couple hired a private laboratory to test their water.

The laboratory discovered abnormal lead levels and pinpointed the source as the lead service pipes leading to their turn-of-the-century house.

Tuckson said the city must analyze the water samples, which are being tested by a private lab in Rockville, before it can tell what the health risks from city water may be. The analysis will take at least three months, he said.

"We're trying to figure out how many parts of the city need to be tested," Tuckson said. "For the last couple of weeks we've been trying to design a study." He said the city will hire an outside contractor to perform the water survey.

Thousands of homes in the District are believed to be serviced by lead pipes leading from concrete water mains. The city's Department of Public Works has not done an inventory of affected homes because records do not exist from some builders, officials said, and because of the enormity of the project.

"We don't know yet whether it's a problem of older neighborhoods or one that's citywide," Tuckson said.

Because of residents' concerns, the city is recommending that pregnant women and children under the age of 6 in homes where the water has not been tested drink bottled water as a safety precaution. In all other homes where lead pipes might exist, the city is suggesting that residents let the water run three to four minutes each morning before using it for drinking.

Also, all children under 4 should have their blood tested twice a year for lead levels, said Dr. Martin Levy, director of the District's Preventative Health Services Administration. Private pediatricians can perform the test or the city will do it for free, he said. If their children's blood lead levels are low, parents should not be concerned about the content of their water, he said.

Levy said that the federal Centers for Disease Control's Center for Environmental Health doubts that the lead problem in the District will require replacing all existing lead pipes.

"No one has found water as the major source of lead in children," he said, conceding that the District's lead poisoning project has never tested water. "The CDC doubts that it will come to replacing pipes."

The city of Boston, which has similar lead pipe problems, reduced much of the high levels by diluting the acidity of the water. The acid ate away the protective calcium carbonate that forms inside pipes to keep lead from leaching into the water.

However, the District's water already is low in acid, which may eliminate a chemical cure, Levy said.

"This is just a situation in flux," he said. "It certainly is becoming a major health problem, but we haven't reached the answers we need yet."

[30] For example, a) Anonymous. 1989. Toxic Hazards Can Make Your Home Dangerous. *Chicago Sun-Times* (July 7), b) Delgado, D. 1988. OUC Running Random Tests on Lead Content in Water. *Orlando Sentinel* (May 12), c) Lore, D. 1988. Water Customers Cautioned About Dangers of Lead Pipes. *Columbus Dispatch* (February 28).

Illustration 2.

Classified Ad 26 -- No Title
The Washington Post (1974-); Apr 29, 1988; ProQuest Historical Newspapers: The Washington Post
pg. D3

PUBLIC NOTICE
LEAD, DRINKING WATER, AND YOU!

It was common practice in the United States through the early 1900s to use lead pipes for interior plumbing. Since the 1930s, copper pipe has been used for residential plumbing. Until 1986, however, lead-based solder was used widely to join copper pipes. Lead-free solder and lead-free materials are now required by federal law for use in new household plumbing and for plumbing repairs. To find out if the plumbing in a residence contains lead, try scratching the pipe with a key or screwdriver. Lead is a soft metal and is dull gray in color. If lead pipes are present they will scratch easily and will be shiny when scratched.

Dissolved lead cannot be seen in water. However, if there is reason to believe that your drinking water has lead contamination because of the presence of soft water, lead pipes, lead solder, and other lead-based plumbing materials, there are ways to minimize exposure.

One way is to "flush" each cold-water faucet in a home when water stands more than a few hours. Flushing a cold-water faucet means allowing the water to run until it gets as cold as it will get before each use. Normally this may take up to two or three minutes. Keep in mind that toilet and shower use or doing laundry with cold water will also move water through the plumbing system, and this will reduce the amount of time needed to flush the cold water faucets to five to 30 seconds.

Another way is to avoid cooking with or consuming water from the hot water faucet. Hot water dissolves lead more quickly than cold water. Especially avoid using hot tap water for making baby formula. If hot water is needed for cooking or oral consumption, draw water from the cold water tap and heat it on the stove or in the microwave.

If plumbing repairs or other plumbing work is done, make certain that only lead-free solder and other lead-free materials are used. This is now a federal law.

Even if there is no obvious lead source in your environment, all children under 6 years of age should have a blood lead test at least once a year. Pregnant women with a concern about lead in their environment should also have a blood lead test. Therefore if there is a concern about elevated lead in your drinking water, the most important thing you can do is to have a blood lead test on young children and pregnant women in your household. This can be arranged through your doctor or local health agency.

For additional information, please contact the local utility, county or state health department, or the U.S. EPA. The U.S. EPA has a toll-free hotline dedicated to this subject — 1-800-426-4791 — and has also prepared a booklet on this issue.

This information meets EPA's lead public notice requirements under Section 1417 of the Safe Drinking Water Act Amendments of 1986.

See below for detailed information provided by participating utilities; this information is provided for customers served only by the specific utility listed. Because water chemistry and plumbing materials vary, the information provided below should NOT be applied to water supplied from other sources.

Illustration 3.

Fair's Safety Message: Let's Get the Lead Out: Workshop Gives Tips for Removing Toxic Sul
Fern Shen Washington Post Staff Writer
The Washington Post (1974-); May 16, 1991; ProQuest Historical Newspapers: The Washington Post
pg. MD1C

Health officials now recommend letting water run for several minutes before using it, treating water with lime or soda ash or switching to lead-free soldered pipes. The state has a list of companies that test lead paint chips, soil and water. Prices range from $15 to $30 a sample.

Illustration 4.

Programs Aim To Get Lead Out: Further Water Testing Planned in Area
Hsu, Spencer
The Washington Post (1974-); May 20, 1993; ProQuest Historical Newspapers: The Washington Post
pg. VA_1

Lead Abatement to Expand

LEAD, From Page 1

The Prince William utility study covered an area served by more than 250 miles of pipe in the county's eastern quadrant, Service Authority Director Ralph Eckley said.

At EPA orders, the utility sampled more than 100 "high-risk" area homes twice in 1992. All were built between 1983 and 1986, after which lead use was banned in indoor plumbing. The metal, while present in older homes, leaches less over time because minerals in tap water coat pipe surfaces, blocking water contact, EPA engineers say.

In both trials, Eckley said, 16 homes exceeded a limit of 15 parts lead per billion parts water. To meet EPA standards, no more than 10 percent of the homes can fail the standard.

In response, the utility has mailed special bulletins to all water users in the area. Safety guidelines recommend that residents flush taps for one minute if they have been left unused for more than six hours and avoid drawing hot tap water for drinking or cooking.

Water is naturally corrosive, hot water more so than cold, and accumulates metal contaminants when left standing in indoor pipes. As part of the abatement plan, the Prince William Service Authority will spend between $70,000 and $100,000 on studies to find if the addition of calcium or phosphorus compounds can speed formation of protective pipe coatings, Eckley said.

Results are expected by fall, he said, but health officials say they have broader concerns about other environmental sources of lead as well.

CDC scientists upgraded their position on lead as a major threat to children and pregnant women in 1991, and EPA scientists said as many as two million people may be at risk of poisoning.

A metallic element, lead accumulates in the body over time and blocks nerve development, causing retardation and behavioral problems in even microscopic amounts. Lead-induced damage is largely irreversible.

Eileen Mannix, head of Virginia's year-old Childhood Lead Poisoning Project, said most ingested lead comes from lead paint, dust or contaminated soil. Leaded gasoline in use before 1977 is also believed to have left traces along major roads.

A 1991 study estimated as many as 34,000 Virginia homes contain lead paint and 284,000 children potentially at risk of showing symptoms. Statewide, mandatory reporting of lead poisoning cases is only now beginning, Mannix said.

The state program, funded by the federal government, has already encouraged universal testing of children in five areas in Virginia where the age of housing and population profiles suggest high risk: Arlington, Richmond, Norfolk, Portsmouth and Petersburg.

But the first nine months of tests have showed only 6 percent, or less than one-third of original estimates, of children with high lead levels in their blood, Mannix said.

Lead poisoning is expected to be a minor problem locally, however.

Most area construction is much newer, said county Health Department Nursing Manager Anne Terrell said. "We have a lot of new housing out here so we haven't got the paint problem. We do have some old housing, and a lot of traffic, but that's it."

Appendix 3. We provide relevant slides from a 2013 Power Point presentation to the Public Health Law Research program of the Robert Wood Johnson Foundation as well as an outline of preliminary results submitted in 2015 to the National Drinking Water Advisory Council (NDWAC) Lead and Copper Rule (LCR) work group. These documents report on the findings of qualitative research in Washington, DC and Providence, RI, which revealed that some property owners refused to consent to private-side lead service line replacement because a one-time test at one of their home taps showed lead-in-water levels below 15 parts per billion – a reading which assured them that the water at their home did not pose a health risk and, therefore, did not justify a costly remedy.

Homeowner Decision-Making About LSLR Under the LCR

Yanna Lambrinidou, PhD
Parents for Nontoxic Alternatives
Washington, DC

Ralph Scott, BA
Parents for Nontoxic Alternatives
Washington, DC

Homeowner Interviews

Type of LSLR

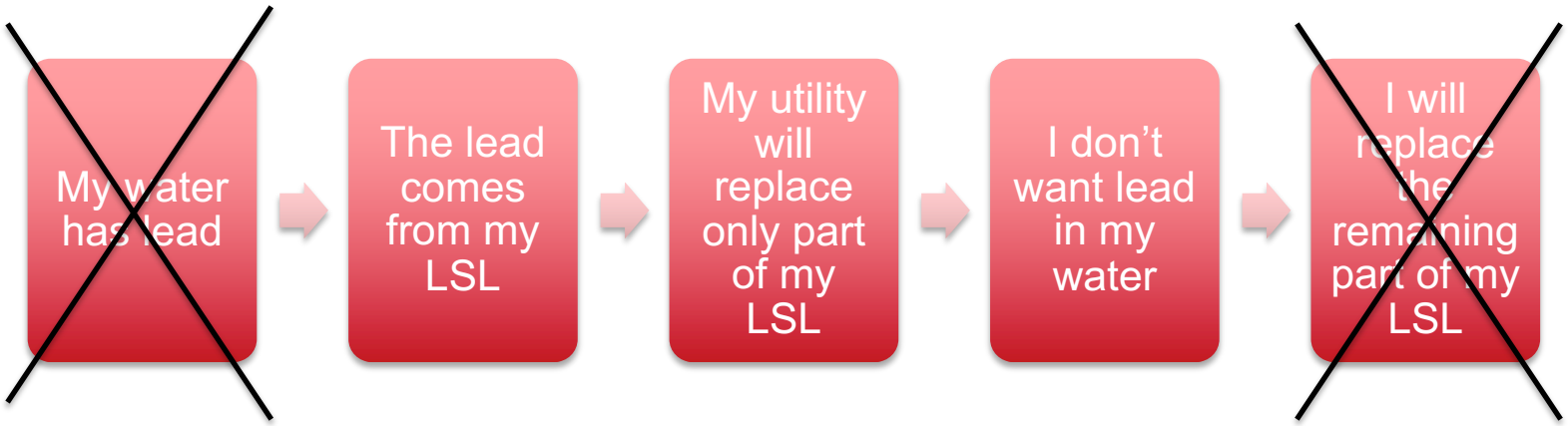
	Washington, DC	Providence, RI	Total
Full LSLR	18	1	**19**
Partial LSLR	13	7	**20**
Total	**31**	**8**	**39**

Demographics

	Washington, DC	Providence, RI	Total
White/Caucasian	17	6	**23**
Black/African American	10		**10**
Hispanic/Latino	2	2	**4**
Other	2		**2**
Total	**31**	**8**	**39**

Preliminary Results

Result 1: Why do most homeowners decline full LSLR despite their water utility's LAL exceedance?



My water has lead → The lead comes from my LSL → My utility will replace only part of my LSL → I don't want lead in my water → I will replace the remaining part of my LSL

- 50% - no pre-test
- 15% - no results
- 15% - results <LAL

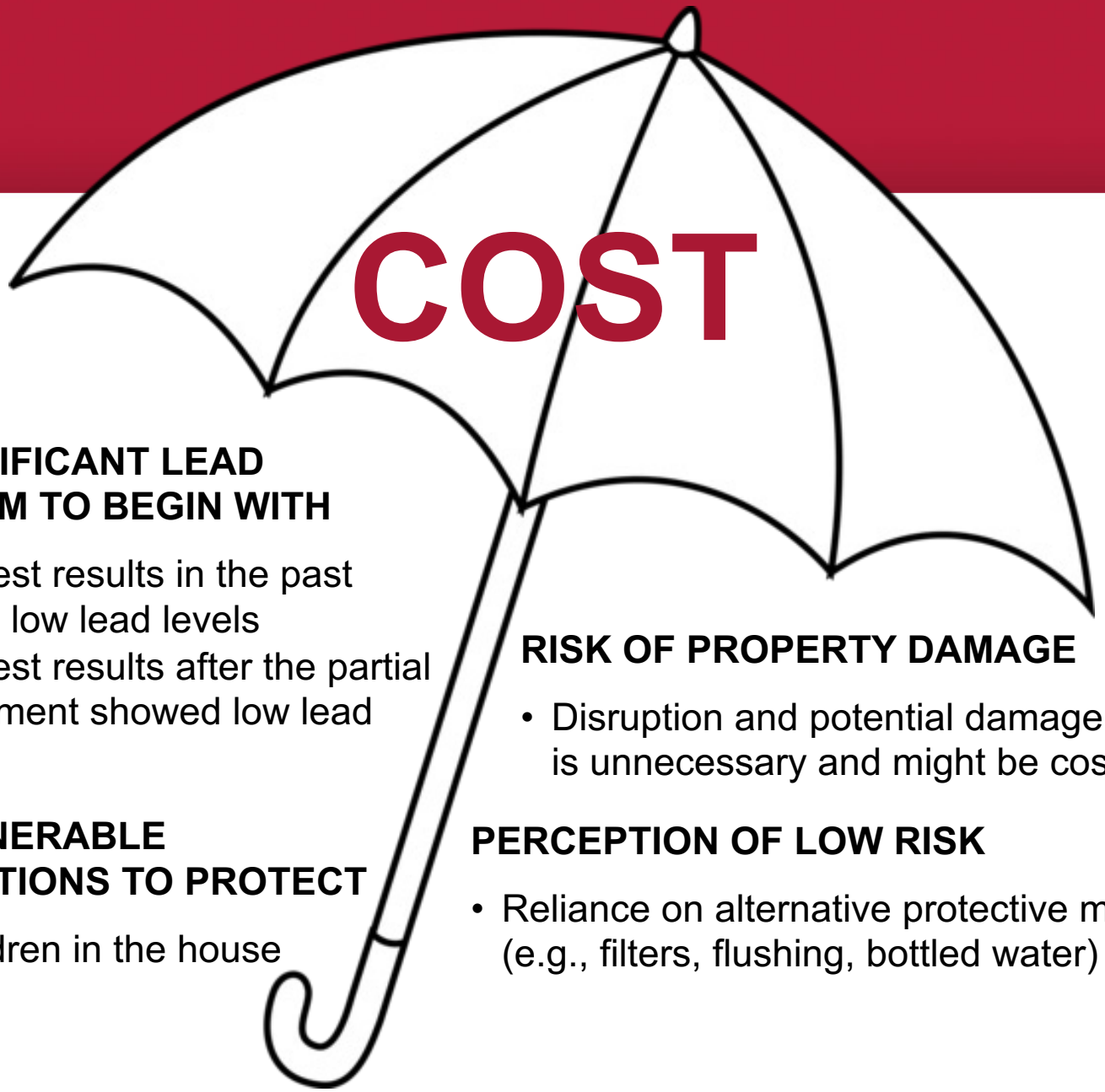
Is there a lead-in-water problem at my particular house?

Recalled estimate range: $1,000-$7,000

If the utility were to cover the cost:

- 80% - would agree to a full replacement
- 20% - would agree to a full replacement if it were advisable for preventing known (rather than speculative) health harm

Cost concern across income levels → Given the cost, I must weigh all relevant factors in my decision.



NO SIGNIFICANT LEAD PROBLEM TO BEGIN WITH

- Water test results in the past showed low lead levels
- Water test results after the partial replacement showed low lead levels

NO VULNERABLE POPULATIONS TO PROTECT

- No children in the house

RISK OF PROPERTY DAMAGE

- Disruption and potential damage to property is unnecessary and might be costly

PERCEPTION OF LOW RISK

- Reliance on alternative protective methods (e.g., filters, flushing, bottled water)

Result 2a: Why do higher-income homeowners choose a partial LSLR?

Partial LSLR with annual income > $100,000 } N = 7

PRELIMINARY EMERGING THEMES

Common motivations for partial LSLR:

- Cost of full LSLR
- Avoidance of potential physical disruption
- No children in the house
- Perception of low risk
  - Water tests <LAL
  - Not drinking unfiltered water
  - Short length (and threat) of remaining LSL
  - Belief that any spikes would be short-lived

2.6.15

Empirical and Legal Evaluation of Public Health Protection Under the Federal LCR
Public Health Law Research Program, Robert Wood Johnson Foundation

Qualitative Research

Yanna Lambrinidou, PhD

Preliminary findings (please do not quote or circulate without permission):

- → Homeowners in all income brackets mentioned cost as the main impediment to replacing the private portion of their LSL:
    - → 80% would opt for full LSLR if the cost were covered
    - → Remaining 20% would opt for full LSLR if the cost were covered *and* a full LSLR was known to be definitively better than a partial LSLR
- → Common factors that reinforced homeowner decision to opt out of full LSLR:
    - → Belief that the water in one's specific home was safe (based on test results <15 ppb)
    - → No children in the house
    - → Fear of costly damage to one's property
    - → Perception of low-risk due to use of other precautionary measures (e.g., filters, bottled water, etc.)
- → Homeowners who had a partial LSL replacement characterized their utility's informational materials about LSL replacement as:
    - → Focusing on the logistics of the construction
    - → Lacking consumer-friendly information and/or helpful facts about the pros and cons of full versus partial replacement (50% said that clear messaging about the short- and long-term health risks of partials would have convinced them to opt for a full replacement or, at least, to take the option more seriously)
- → Homeowners who opted for full LSLR (all in highest income bracket), did so for reasons that were largely independent from utility messaging:
    - → Discounted rate
    - → Health protection due to general awareness about lead's toxicity
    - → Resale value of home
    - → Getting rid of entire lead source once and for all, and replacing aging pipes proactively