

**U.S. Environmental Protection Agency
NDWAC LEAD AND COPPER WORKING GROUP**

June 24-25, 2015

Location:

Cadmus Corporate Office
1555 Wilson Blvd. Suite 300
Arlington, VA 22209

MEETING SUMMARY

Meeting Objectives/Desired Outcomes:

- *Consider NDWAC questions;*
- *Review Compliance Small Group additions and member input; resolve remaining issues;*
- *Agree on report; and*
- *Plan next steps.*

A. Welcome, Introduction, Meeting Objective and Agenda

Ms. Gail Bingham, the meeting facilitator from RESOLVE, welcomed everyone to the seventh and last meeting of the National Drinking Water Advisory Council (NDWAC) Lead and Copper Rule Working Group (hereafter referred to as the “LCRWG” or “Group”).¹ She asked Mr. Eric Burneson, from EPA’s Office of Ground Water and Drinking Water (OGWDW) to provide opening remarks.

Mr. Burneson explained that Dr. Peter Grevatt would be at the meeting in the afternoon and thanked the Group for their efforts on his behalf. He reminded people that EPA asked NDWAC to convene a Working Group to identify provisions that can improve public health for the Lead and Copper Rule (LCR). The LCR is the most complicated of the National Primary Drinking Water Regulations (NPDWR) and the Group’s task is a monumental one. He was very impressed with the work and progress thus far but recognized there is more work to be done. However, he is very optimistic. Consensus makes recommendations stronger so it is desirable but not necessary. He also thanked the LCRWG members who presented key areas of the draft report during the June 22, 2015 webinar to the full NDWAC. He thought that the presentations were very effective and will be extremely helpful to the NDWAC; their questions to the LCRWG also will be helpful in addressing the NDWAC’s concerns in the final report.

Dr. Peter Grevatt, the EPA OGWDW Director, provided remarks in the afternoon, reiterating that he is greatly impressed with the Group’s continued willingness to roll up their sleeves and be collaborative. He appreciated their forward thinking. He emphasized how important this is to EPA and the nation. He

¹ See Attachment A for a list of the LCRWG members and meeting presenters. See Attachment B for a list of the meeting attendees.

urged the Group to stay together as they cross the finish line. The Group has had great success already and he appreciates all of their efforts.

Ms. Bingham, provided a meeting overview and discussed the meeting materials, which included the draft agenda, a summary of questions and comments from the NDWAC that were asked during and after the webinar and the June 2015 draft, “Report of the Lead and Copper Rule Working Group To the National Drinking Water Advisory Council – Fourth Draft” (hereafter referred to as “draft report” or “report”).²

Ms. Bingham summarized the LCRWG’s progress to date, which included presentations by EPA to inform the Group in the early stages and six prior meetings to work through and capture ideas in earlier iterations of the draft report. The Group also participated in sub-group meetings to discuss suggested report revisions including two compliance sub-group meetings to develop compliance sections for topics that did not have outstanding issues. The agenda includes an annotated list of remaining questions.

The goal of this meeting is to decide on the Group’s recommendations to NDWAC, who will then deliberate on these recommendations and provide advice to EPA. Ms. Bingham reminded the Group that it has the flexibility to make specific recommendations or provide general, conceptual suggestions. The Group’s charge is to give advice on selected issues, so it can also choose to remain silent on a topic.

B. General Discussion of Questions and Considerations from NDWAC

The Group discussed the NDWAC’s feedback from the June 22, 2015 webinar. The objectives of webinar were to: 1) brief NDWAC members on the recommendations and remaining issues under consideration by the LCRWG and 2) identify any major policy questions or considerations that the NDWAC members wanted the LCRWG to address during this final June meeting. NDWAC members appreciated the clear and concise presentation and provided some encouragement for and asked question about the revised LCR approach. One LCRWG member noted that it took NDWAC no time to hone in on the most complex issues facing the Group. LCRWG members also discussed more specific comments from NDWAC members as follows:

- Several NDWAC members were concerned about the cost of the Group’s recommendations, especially related to lead service line replacement (LSLR), and some underscored the importance of funding for the proactive LSLR program to succeed.
- Some asked about implementation issues, including what actions can be taken by a private versus a public utility and whether all or just the affected customers would pay for the replacements. Some also questioned how customers with lead service lines (LSLs) would be protected until their LSL were replaced, the ultimate goal of the program and what happens if a utility does not meet its replacement targets. NDWAC members also discussed environmental justice issues related to LSLR and noted that LSLs often are located in low income areas.
- A NDWAC member also asked how much lead exposure is from drinking water. A member explained that a recent report in Environmental Health Perspectives in Montreal evaluated

² See Attachment C for a copy of the meeting agenda. See Attachment D for the June 2015 draft report.

drinking water means of blood lead level (BLL). *[Refer to Section J.2.a for a more detailed discussion of this report.]*

- NDWAC members supported separating copper from lead but one asked if the approach for copper was too extensive based on its health effects.
- A NDWAC member discussed potential tradeoffs between the Safe Drinking Water Act (SDWA) and the Clean Water Act (CWA) with respect to corrosion control treatment.
- Some NDWAC members also expressed concerns about changes to tap sampling requirements, including the role of and cost to the public water system (PWS) for customer initiated sampling.
- One questioned the statement in the report that there is no safe level of lead and thought that the report needed additional context.

A LCRWG member asked how EPA is required to consider costs for a treatment technique rule. In response, Mr. Burneson explained that SDWA requires the rule to reduce contaminants to the extent feasible and using best available technology (BAT) taking costs into consideration. The Act also requires EPA to evaluate quantified and unquantified costs and benefits and look at sensitive populations and risk/risk tradeoffs in order for the Administrator to make the determination if benefits justify the costs. EPA has some discretionary authority to raise the maximum contaminant level (MCL) when benefits do not justify the cost, which is less clear for a treatment technique rule. For example, for arsenic EPA raised the MCL to 10 micrograms per liter ($\mu\text{g/L}$) because it was not able to justify the costs at an MCL of 3 $\mu\text{g/L}$. He also explained that EPA will develop a full cost-benefit analysis after it receives the NDWAC's recommendations. Mr. Burneson added that while EPA did not expect the Group to develop cost estimates, EPA does expect the Group to consider burden that would come from implementing different parts of the rule as it makes its recommendations. *[Refer to Section H. for additional discussion on cost-benefit analysis.]*

The Group also discussed environmental justice and incentives. A LCRWG member noted that if external funding does not come through, there could be serious environmental justice implications for the proactive LSLR proposal. Another member raised the issue of reaching people in multifamily residences. He recommended that these difficult environmental justice issues be explained in the report.

Another member agreed with the importance of addressing environmental justice, but thought that the current paradigm suggested by the Group creates incentives for PWSs and the community to get to full LSLR for the entire service area. Another added that another incentive for LSLR is the reduced costs and environmental benefits of possibly being able to decrease the use of phosphates for corrosion control treatment (CCT) with removal of lead in contact with drinking water. Members noted other factors to consider:

- Limitations in direct contact with renters when they are not the customer, particularly with absentee landlords.
- Facilitating LSLR involves actions outside SDWA, such as changes to local building codes. There is no guarantee these changes will happen.

C. Considerations and Background Information – Section 2

The Group discussed the history section of the report that provides the regulatory background for controlling lead in drinking water. Ms. Bingham suggested that this section be deleted from the report because the Group had different perspectives on what should be included and how the history should be characterized. The Group agreed.

The Group also discussed Figure 1 (Overview of Recommend LCR Framework) and whether it provided sufficient detail for the reader to be informative without being misleading. The Group provided the following feedback:

- Several members thought the flowchart was useful and has value as a starting point that is supported by additional detail in the report.
- Another thought the flowchart was misleading in its simplicity. For example, public education (PE) includes more than the consumer confidence report (CCR) and individuals who are not familiar with water quality parameter (WQP) monitoring may think WQPs are disconnected from tap and CCT. She also thought it did not reflect the tremendous amount of work that the Group had put into the process or expose the rule's complexities and weaknesses.
- Another suggested not to use acronyms and abbreviations in the flowchart.
- A member suggested inserting "tap" before "sampling" in the box, "customer-requested sampling".

The Group decided to keep the flowchart with minor changes as described above.

D. Replace Lead Service Lines – Section 3.1

The Group discussed the following topics that are discussed in Section 3.1 (Replace Lead Service Lines) of the report:

1. LSL Inventory including Pigtails and Partial LSLR.
2. LSLR Recommendations.
3. Compliance.
4. LSLR Tables 1 and 2.

Discussions of each of these topics are summarized in separate subsections below.

1. LSL Inventory including Pigtails and Partial LSLR

On Day 1 of the meeting, the Group discussed whether it intended to combine the conservative assumption that a service line is lead with providing credit to a PWS for documenting that the line is not lead, as currently written in Section 3.1.1 on page 15. In response, a member indicated that he supported this concept but that the report needed to be expanded to include a paragraph to address pigtails (he proposed new text on Day 2).

The Group also discussed whether there should be a prohibition on partial lead service line replacement (PLSLR) except for emergency repairs and provided the following feedback:

- A member indicated that the recommendation needs to be less prescriptive and to allow systems to replace LSLs discovered during main repairs and street work. The aim is to have systems replace the LSLs for which they have responsibility, while encouraging homeowner to replace their LSL. For example, if a system can get 49 of 50 homeowners to replace their LSLs, the PWS should be allowed to do a PLSLR, so the street would not have to be dug up again in the future. Two members agreed but wanted some precautionary actions for consumers that did not want their LSLs replaced, such as sampling and filters.
- Another stated that LSLR should not start in a neighborhood until there was 100% agreement on full LSLR.
- A member asked about additional cost for a utility to conduct a full replacement if it were already doing water main work, and whether that is small enough for the utility to absorb the cost. A member responded that his city is trying to answer that very question as part of its water main replacement program.
- One member asked Mr. Marc Edwards from Virginia Tech for his opinion on whether PLSLR should be allowed during main replacement. Mr. Edwards agreed that a system should not dig up a street without replacing LSLs but suggested that they be replaced with plastic pipes. Another member indicated that a soil analysis may be needed to determine if plastic pipe can be used because some contaminants can permeate the plastic.
- Another member voiced a concern about a prohibition against PLSLR because full LSLR requires entry into a building which could become a legal entry issue. Encouraging is more constructive than mandating.

On Day 2 of the meeting, the Group reviewed a handout that contained revisions to Section 3.1 (Replace Lead Service Lines). The revisions included language to incorporate pigtails and suggested edits for PLSLR that were discussed on Day 1.

In general members agreed with the revised text for Section 3.1 but suggested wording changes for the last bullet and recommended including main replacement as an example.

For the risk minimization program, one member suggested including “aggressive premise flushing”. Another member asked about the science related to flushing and thought including it may confuse people. Dave Cornwell of EE&T explained that several studies have demonstrated whole-home flushing after PLSLR (unlike flushing the hose bibs) to be a very effective measure that can return lead levels back to prior replacement levels within a day. Mr. Burneson added that literature indicates that proper flushing can help but improper flushing can exacerbate the problem. Another member suggested that if the rule language includes flushing as a risk mitigation option to include the proper flushing procedures in the clearinghouse.

2. LSLR Recommendations

The Group discussed the eight recommended areas for inclusion in the revised LCR that are described on pages 16 – 20 of the report in Section 3.1.2 (Establish active LSL replacement programs). Discussions pertaining to each of the recommended areas with the exception of replacement credit are provided below.

a. Goals and Interim Milestones

On Day 1, the Group discussed the stated goal of the LSLR program and provided the following comments:

A member indicated that the report should more clearly state that the goal is that all LSLs will be fully replaced. She suggested that it be expanded to reference Table 2. However, the Group should leave it to EPA to determine how to maximize the likelihood that utilities will meet that goal. On Day 2, Members discussed a handout that included revised language for the goal and interim milestones. The revised goal language incorporated the suggested edits from Day 1 of the meeting.

[Also refer Section D.4. for a discussion of related changes to Tables 1 and 2.]

Also on Day 2, the Group discussed a member's suggestion that a system be required to conduct the sampling requirements of the current rule when the LSLR targets are not met. Ms. Bingham invited elaboration on what the trigger would be and how it relates to customers that refused to participate and the timeframe. In response the member wanted the trigger to be tied to physical replacement of a LSL, but would leave the decision to EPA. Other members did not agree with this proposal for the following reasons:

- A member explained that the framework in the draft report uses long-term incentives to compel PWSs and customers to remove LSLs. The current rule created bad incentives. He does not think creating an alternative path would promote removal of LSLs.
- Another questioned why a sample that is representative of water residing in the LSL (i.e., an LSL sample) would tell us anything we do not already know. We know that LSLs need to be replaced. He indicated that instead a state would follow its escalation policy for enforcement if a system is not making progress.
- Another indicated that EPA can use the Six-Year review process to determine if these goals are being met under the revised LCR.
- The proposal has affordability and complexity issues. Complexity always adds to a cost and it does not make sense to add complexity for some bad actors. The state can handle these through enforcement mechanisms.
- Another member made four points. First, it is valuable to have synchronized goals because options provide complexity. Second, our proactive LSLR program would require the system to ramp up other efforts if they do not reach their replacement goal. They do not get to stop if they do not meet the goal. Third, the Agency has mechanisms to review the rule through its Six-Year review process. Fourth, our proactive LSLR program has transparency in the process that will help hold a system responsible.

b. Targeted Outreach

The Group discussed whether the revised rule should specify the percentage of individuals that should receive the invitation to replace LSLs and the frequency of this invitation. Specific comments included:

- Utilities need to be strategic about their replacements and upfront try to identify the highest risk locations. This can vary by locale.
- The system's strategy could address how to handle a situation where people have the greatest need. It could be based on the criteria for providing Drinking Water State Revolving Funds (DWSRF) that was discussed by one member (*see Section D.2.d for these criteria*), prior tap sampling results or age of the home.
- Another cautioned that the rule should not require systems to offer something they cannot do and so the specifics should be part of the strategy and not the rule.
- Another clarified that the purpose of the invitation is to explain the risk and if applicable, available funding. The invitation does not indicate that the system is replacing the LSLs immediately but explains the various available options, that the system will notify the customer when it is in their neighborhood replacing LSLs and precautions in the meantime.
- A member suggested that the strategic planning criteria be developed and communicated as part of the replacement program.
- A member suggested that the report include some introductory language in Section 3.1.2 to clarify that some of the options in Table 2 may not be viable for all systems.

[Also refer Sections D.4. and F.2 for a discussion on related changes to the two LSLR tables and to monitoring, respectively.]

c. Control and Responsibility

On Day 1, the Group and EPA discussed the definition of control in the 1991 Rule that included a rebuttable presumption that the system owned the LSL unless it demonstrated otherwise. In response to a question, Mr. Burneson reminded the Group that the court did not rule on the merits of this definition and he could not say what the Courts would decide. Also the original definition did not indicate who would pay for the LSLR.

- A member indicated that the Group uses the term "control" and other times "ownership", but questioned if the problem they were trying to solve was the cost of replacement or an uncooperative homeowner.
- A member asked if EPA could require a PWS's at least to use its existing legal authority to do full LSLR.
- EPA also could present model ordinances in the clearinghouse and local agencies can determine if they can use these models.
- A member thought the Group's position was to create a construct where utilities had the flexibility to use local authorities. He did not want the proactive LSLR program to become stalled

to resolve legal issues. He suggested that systems use their authorities to the maximum extent possible, but not to include a rebuttable presumption. He noted that the invitations to consumers to replace their LSLs will indicate what the PWS is authorized to do and the responsibility of the consumer. Other members added:

- The Group needs to be careful of how prescriptive we are due to nuances in using various authorities. He also questioned how states can tell if systems are using their authorities appropriately.
- A member stated that even if a PWS has the authority to take action on private property, he did not want to put a PWS in the position of having to deal with uncooperative homeowners. Instead, he wants to create a situation where people want the PWS on their property to do the replacement.
- A member proposed that utilities be required to use their authorities unless they can demonstrate that in specific cases they cannot.

On Day 2, the Group discussed three options related to the definition of control as follows:

- Option 1: Replace the current definition of control as “ownership” with a requirement that PWSs must replace the entire LSL, where they have the authority to “replace, repair, or maintain” the line or where they have other forms of authority over the LSL. This is listed as a suggestion by some LCRWG members in the last paragraph on page 19 of the report.
- Option 2: Require in the rule that PWS use the authorities they have.
- Option 3: Require systems to exercise all their authorities and to publically disclose these authorities.

Members provided the following feedback:

- Mandating that systems use their authority could have unintended negative consequences. Discretion is an important part of many kinds of public action.
- We should find a middle ground. The member was hoping to find an encouragement mechanism and noted that she did not fully understand the possible domino effects of the requirement. Systems may have civil and criminal authority, but it may not be appropriate to use it in all situations. Another agreed that systems should fully disclose what they can and cannot do.
- Systems may do less early on and may work their way up to the limits of their authority. The advantage of the first option that is currently in the report is that the system can escalate its actions over time.

The Group decided that the Option 1 as described in the report is accurate as currently written. It reflects that the LCRWG discussed but did not agree that the definition of control as ownership should be changed in the revised LCR. The Group also concluded that the report would include recommendations for PWSs to disclose their authorities and for EPA to provide case studies of successful use of PWS authorities in the clearinghouse.

d. Planning and Financing Options

On Day 1, the Group and EPA discussed financing options for LSLR. One member suggested encouraging states to add LSLR criteria for DWSRF funding. Criteria could include: high incidences of elevated BLL for children, percentage of homes with lead, percentage of low income families and utility's prior efforts to abate LSL. He explained that the bank defers payment of the loan until the sale or financing of property. Subsequent discussion included the following:

- Mr. Burneson explained that EPA grants SRF to states. States have a wide degree of discretion to use these funds.
- A member suggested putting a case study in the clearinghouse. Another pointed out that people are hesitant to accept loans because it places a lien on their house. The clearinghouse should include examples of systems that have overcome this obstacle.
- Another noted that although the Group may think LSLR is a high priority, states may determine that other projects should receive this funding.
- Another asked if they can recommend that EPA modify the SRF so it can be used for private utilities. In response, Mr. Burneson explained that the Group could recommend to states that the LCRWG consider LSLR a priority and EPA can write guidance that SRF be used for LSLR. Ms. Lisa Christ with OGWDW, indicated that after the arsenic rule was promulgated, EPA recommended that states with arsenic use their SRF for this issue.
- A member asked how states decide how these funds are used. In response Mr. Burneson explained that the funds must be used for infrastructure and capacity development. Office of General Counsel (OGC) indicated that the use of these funds could be expanded to LSLR. Loans would have to go through the utility to the home.

The Group also discussed whether some of the existing recommendation language in the report regarding funding is better addressed at the local level (e.g., the issue of affordability). In response to these comments, the member who drafted this language suggested moving sections to the Section 4 (Complementary Actions Critical to the Success of the National Effort to Reduce Lead in Drinking Water). No member disagreed with this suggestion.

e. Operations and Customer Engagement

On Day 1, the Group discussed the specific recommendation that pertains to required activities of other utilities when they affect water service lines or water mains. Members provided the following feedback:

- A member suggested that PWSs should develop standard operating procedures (SOPs) that they would send by certified mail to operations and maintenance departments of utilities, such as the cable, phone company and other utilities that potentially could do work that affects water service lines or water mains. The member added that the procedures should be reviewed at the start of the other utilities project (during the mark out process). The SOPs would outline requirements for other utilities to notify affected residences of the risks and appropriate protective actions and to manage work to minimize disruptions.

- A member questioned if the PWS (in particular a private PWS) could require another utility to take action. One suggestion was that any requirements have a caveat limiting it to the extent of the utility's legal authority.

f. Water Systems that Own Their Own Pipes

On Day 1, the Group discussed the recommendation for systems that own all of their pipes. Mr. Burneson suggested that the Group needs to be clear if its intention is to define infrastructure as including the pipes up to the tap. The discussion included the following points:

- One member questioned if there are obstacles the Group has not considered if the definition of infrastructure includes pipes up to the tap. Mr. Burneson indicated that this definition would require a system to replace any pipe fittings or fixtures that do not meet the lead-free definition under the 2011 Reduction of Lead in Drinking Water Act.
- Another member thought this recommendation should only include lead pipe in the ground or building.
- A member suggested that the replacements be as soon as practicable.

The Group and EPA also discussed if this requirement should be limited to non-transient non-community water systems (NTNCWSs). In response to a question, Mr. Burneson explained that a community water system (CWS), such as a mobile home park could control the entire system and asked if it were the intent of the Group to exclude CWSs. In response:

- A member suggested focusing on ownership of plumbing and not on system type.
- Another indicated that the report be clear that the recommendation means "ownership" and not "control".

On Day 2, a member proposed that the requirement would apply to CWSs and NTNCWSs such as schools, hospitals, churches and jails that own the system and control the entire distribution system. It would not apply to CWSs where the majority of connections are individual residential connections such as mobile home parks and those with subdivisions that have a homeowners association because of possible property ownership complications. The replacement should be done as soon as practicable. A member asked that, in determining this timeframe, EPA consider some larger NTNCWSs such as a university where the replacement may have a bigger impact than a church or school. Mr. Burneson thought the suggested language gives utilities and states' the ability to work together to determine what is practicable.

3. Compliance – Section 3.1.3

On Day 1, the Group discussed whether systems should be required to keep records when customers refuse to have their LSLs replaced. These records could include a form in the outreach materials that customers would send back to the PWS. A member suggested clarifying whether this requirement would cover customers that refused or did not respond. The Group decided that requiring systems to maintain records of customers' refusals should be added as a recommendation.

The Group also discussed editorial changes to the compliance section to clarify that Table 2 includes other efforts beyond outreach.

Members also discussed what constitutes a violation:

- A member suggested that not meeting a milestone in Table 1 not be a violation, but rather should be a trigger for action. Failure to do the required activities in Table 2 would be the violation.
- Another member thought there should be a plan B in instances when a PWS is not completing the required actions, which would require systems to go back to a modified version of the original LCR. A member responded that the state can negotiate with the utility, backed up by the possibility of an order or consent decree and suggested this rather than moving back to a system that does not work.
- A member questioned if there should be a deadline, after which the state would take an enforcement action if the utility has not meet its replacement targets. He questioned if the enforcement action could include a mandate to replace LSLs. Ms. Bingham asked if this needs to be linked to definition of control. Another suggested adding something to Table 1.
- LSLR Tables and Targeted Outreach

On Day 1, the Group discussed the updates to the two LSLR tables. Table 1 lists specific elements of the utility reports and milestones that must be completed every three years. Table 2 provides options for systems that do not meet their 3-year replacement target in Table 1. A member reminded the Group of their purpose and how they had changed from the previous version of the report.

Members provided the following comments on Table 1:

- A member suggested adding footnote 6 in Section 3.1.2 (Establish active LSL replacement program). The footnote explains the two-fold concept of providing flexibility for PWSs to select appropriate outreach materials for their community and increasing the number of required outreach activities if replacement targets continue not to be met.
- This member also suggested that Table 1 not specify LSLR targets. In response, another member explained that if a system completely misses these targets, it can make them up in the next three years. The purpose of the targets is to trigger increased actions intended to increase the likelihood of success of the LSLR program. The targets also help prevent the schedule from slipping.

Members provided the following comments on Table 2:

- The new outreach text in Table 2 should be revised to be consistent with the text in Section 3.1.2, such that the invitation for LSLR would not go to all customers every 3 years but to those that do not respond or choose to participate (i.e., a re-solicitation). In response:
 - A member wanted the invitation to be offered to all customers served by LSLs every 3 years and to new owners. Another indicated that the offer should not be made every 3 years to all so the utility can more strategically target its replacement program.

- Another member indicated that the education and replacement are two different things, and that Lansing Board of Water & Light took that approach when they conducted their LSLR program. Education would be sent to all customers with known or suspected LSLs but the actual replacement would be more strategically managed. He explained that a system would start with a conservative inventory, in which all locations of a certain age are assumed to have LSLs. After that, the system would start its education program in order to build a customer support base. The PWS would then proactively work with customers in targeted areas to get them to agree to the replacement.
- Another member questioned whether targeting would cause environmental justice issues if the most vulnerable groups were not targeted. She questioned how the inventory would factor into the targeting decision. Another suggested that the rule could specify or provide incentives so that the most vulnerable populations would get the greatest consideration.
- A member suggested that the list in Table 2 be more robust or limit the number of required activities to avoid situations in which the remaining choices aren't feasible, in particular for small systems.
- Another member suggested that EPA work with water utilities over the next two years to add options to Table 2 and allow some flexibility to incorporate additional activities once the rule is promulgated.

Based on feedback received during Day 1, a member provided suggested edits to Table 2 (handout - Table 2 edits) on Day 2, in which he updated the first bullet of the basic outreach requirements to be consistent with the wording on page 17. The Group also discussed the topic of who should pay for customer-initiated tap sampling:

- Some members thought the system should pay for the sampling. One added that PWSs need to be strategic in their offer to avoid being overwhelmed. Another thought that the current rule requires PWSs to pay for compliance samples. One member indicated that it would be difficult for the PWS not to pick up the cost because the revisions will raise the level of concern about lead. He added that lead may be the next radon and every transaction will require a lead sample and an assessment if the levels are high.
- Some indicated that a system would either have to pay for all or none of the samples because customers would learn if only a subset received free samples.
- A member indicated that customers who sell their home should pay for any lead sample that is required under the terms of that sale.
- A member stated that sampling should not be for free. From a practical standpoint, the system can either charge the customer or pass it on in its rates.
- A member suggested that the report be silent on this issue, explaining that the rule language should specify the minimum number of samples and allow the system to decide how to meet the requirements (e.g., free sampling, subsidized). Communities may find different ways to do outreach and get people to participate. He suggested keeping the language more general and allow systems to determine over time, the best ways to get samples. Otherwise, it could narrow

the creativity of the utility to get the needed number of samples and increase their costs unnecessarily.

- A member noted that being silent allows the marketplace to get involved. He is not concerned with too few samples but a legitimate concern for water utilities may be too many, which was a NDWAC concern. He added that being silent lets utilities figure it out as long as they meet the minimum number of samples.
- In response to a question, Mr. Burneson added that the current rule does not specify who pays for the compliance tap samples.

E. Public Education – Section 3.2

The Group discussed the following topics in Section 3.2 of the report (Develop Stronger Public Education Requirements and Programs for Lead and LSLs):

1. Outreach to New Customers.
2. Consumer Confidence Report.
3. Routine Outreach to Caregivers/Health Care Providers.
4. Public Education Compliance.

Discussions of each of these topics are summarized in separate subsections below.

1. Outreach to New Customers

The Group discussed the new Section 3.2.2 in the draft report regarding outreach to new customers that was based on compliance sub-group discussions. This section identifies suggested topics to include in this outreach but recommends that EPA consult with a diverse group of experts to develop specific language.

Members discussed that, as written, the outreach would go to all new customers including new homes without LSLs. One member questioned if there could be a new home on a property that has a LSL. A member responded that water utilities distinguish between a new customer on an existing line and a new connection. One member suggested modifying the language that outreach is not needed for new homes (new connections) built after 2014 since they have no LSL or leaded brass.

Some members questioned if a water system without LSLs or detectable lead levels should conduct this outreach. Another suggested that EPA determine if there are situations where a system could be granted a waiver. The Group agreed that the report should suggest that EPA may wish to consider situations under which exceptions may be applicable.

2. Consumer Confidence Report – 3.2.3

The Group discussed if any changes were needed to the bulleted list of recommendations in Section 3.2.3 for strengthening the CCR language and the sentence in the report that recommends that EPA convene experts to look at revisions to the language to accomplish those bullets. With one dissent,

members agreed with the CCR language in the report and to consolidate the recommendations in various sections of the report.

3. Routine Outreach to Caregivers/Health Care Providers

The Group discussed the newly added Section 3.2.5 regarding ongoing outreach to caregivers and health providers of populations that are most vulnerable to lead in drinking water. The intent of the outreach is to raise awareness among caregivers and health providers about the health risks of lead in drinking water, steps to prevent exposure and the availability of EPA's online national clearinghouse for further information. A member who drafted this section explained the importance of reaching out to the medical community to make sure individuals receive consistent information. The other member who co-authored this section explained that the intent is that communications be delivered by various city or state health experts in collaboration with PWSs to a targeted and diverse group of caretakers.

Members provided the following feedback:

- A member had specific suggestions on how to shorten the new section and make it easier to find the message.
- A member commented that systems with non-detectable lead levels should not be subject to this requirement.
- A member explained that for small and medium systems, other sources such as pediatricians and Women, Infant, and Children (WIC) have ways of communicating this information.
- A member was concerned that the PWS would be depending on other entities to deliver the outreach. Another member was comfortable having the PWS work through federal, state and local authorities. He stated that this is done in the medical community and pediatricians will get most of their information from the Centers for Disease Control (CDC).
- Another indicated that systems may not be the most credible ones to provide this information but should be aware of the message that is going to health care providers. Another member questioned why PWSs would not be a credible source because they know when a home is built and if a home may have lead. She thought the CDC should not provide the outreach because they are not up to date on lead in drinking water. Two other members added that CDC would not be a good source of this information because they do not consider lead in drinking water to be an issue.
- A member suggested the Group should ask not only who the most credible source to deliver the information might be but how to connect with them.
- Another member thought a PWS would have difficulty knowing which pediatrician their customers use and, thus, would have to target all pediatricians.
- A member noted that he no longer thinks that PWSs should be the ones educating the health community. He provided an example in which a pediatrician serves six different towns, and getting information from six utilities is not effective. Instead, he suggested using the normal

avenues through which doctors and other health care professionals receive their information. Ideally, this would be done at a national level, e.g., through accreditation boards.

- A member suggested requiring outreach to be delivered directly to vulnerable groups, but to provide flexibility that utilities conduct this outreach as it makes sense. Another agreed with outreach to vulnerable populations but thought other organizations, such as WIC program, might be a more credible resource than a PWS. He provided an example in which a note from a pediatrician via the PWS is not as credible as coming directly from the pediatrician.

4. Public Education Compliance

The Group discussed Section 3.2.6 (Public Education Compliance), which describes compliance and violations for the CCR and public access to information. Members provided the following comments:

- A member questioned if failure on the part of the system to provide outreach to caregivers and health care providers would be a violation or if it belongs in guidance. Ms. Bingham pointed out that Section 3.2.5 currently is drafted as guidance.
- The compliance section needs to be expanded to include the new customer outreach requirements.

The Group also discussed what happens if a PWS does not do their part. Another member pointed out that the state can put pressure on PWSs. The Group decided to address this issue in guidance.

F. Corrosion Control and Monitoring – Sections 3.3 and 3.4

1. Improve Corrosion Control – Section 3.3

The Group discussed the questions raised by NDWAC regarding measures that should be taken to ensure existing CCT is protective until LSLs are replaced, how the PWS will know it is minimizing lead at the tap and what type of sampling should be required. As a starting point, Ms. Bingham asked the Group if they agreed with the five bulleted recommendations on pages 31 and 32 in Section 3.3.1 (Corrosion Control Recommendations). Members provided the following comments on the last bullet that large systems review their CCT in light of newly revised guidance:

- This recommendation says every 6 years after guidance is revised, but one member questioned what happens if EPA does not revise its guidance. The recommendation could be revised to indicate if and when EPA updates its guidance, the review should occur within x amount of time. He also questioned what is meant by a review of CCT and how intensive it should be. Another member responded that guidance cannot trigger the review but the rule could be stated such that it requires the system every 6 years to look at the most current optimal corrosion control treatment (OCCT) guidance. If the guidance has not changed, the system would not be required to take action.
- Jeff Kempic, OGWDW, clarified that EPA's guidance could highlight what has changed and which systems would be impacted by the change. For example, new information on blended phosphate would apply to systems using blended phosphate. Systems not using it would not be

affected. This would give purpose to the guidance as opposed to a reference book that someone may or may not read.

- One member recommended that the guidance not just update CCT science but also provide information about what has been learned about unintended consequences.

Ms. Bingham asked if the requirement to review new CCT guidance should vary by system size. A member noted that in Section 3.3.2 (Corrosion Control Compliance), small and medium systems would incur a violation if the state notifies them that they must assess CCT based on state review of the guidance manual and they fail to do so. The member thought that the review should be based on the type of treatment rather than system size, but that the state could inform small and medium systems about updates to guidance. Another member suggested that the recommendation in Section 3.3.1 on page 31 be consistent with the recommended violations in Section 3.3.2 on page 33.

A member shared a proposal to recommend additional requirements in Section 3.3.1 (Corrosion Control Treatment). She provided the following overview and rationale:

- We have heard from CCT experts that tap sampling is needed not only to know what is happening at homes but also to know if additional CCT measures are necessary. Continued tap monitoring is needed to catch unexpected contamination events. WQPs alone cannot detect or predict these events, which can occur even when WQPs are stable and within acceptable ranges.
- The existing sampling protocol that requires a first-draw sample is inadequate for systems with LSLs. Samples from LSLs would yield higher lead levels and result in lead action level exceedances (ALEs) in some instances. These systems should be required to collect a sample to better capture lead in water residing in the LSL. Because action levels (ALs) are based on first-draw samples only, current CCT is not adequate for systems with LSLs. She asked Marc Edwards to elaborate, and he added that he expects 40% of systems to be above the lead AL if they based their 90th percentile levels on LSL samples instead of first-draw samples. In addition, there are reasons to think lead release will get worse over time.
- A LSL system could switch to first-draw sampling when it replaces a certain percentage of LSLs, but must also deliver PE and water filters to remaining homes with LSLs until 100% LSLR is achieved. A major concern she has with the current proposal is that systems may not replace LSLs. If this is true, the package the Group is suggesting will fall apart. Thus, her recommendation ties back to the current rule when a system does not make progress in its LSLR program.
- Systems that exceed the lead AL must conduct a “find and fix” assessment to identify all factors contributing to lead release (e.g., high iron or manganese). The resulting actions could include CCT assessment, reassessment or adjustment. A system would incur a violation for failure to conduct the required “find and fix” assessments or implement the corrective actions determined to be appropriate by the state.
- The report currently does not include a trigger to take CCT actions. Large systems should not only be held to the current requirements to meet the AL but also to re-optimize CCT based on

more rigorous tap sampling. The current rule does not require CCT for large water systems that meet the criteria in §141.81(b)(3). Once CCT is deemed optimized, based on worst-case in-home samples, the state should set system-specific WQPs that include all parameters that contribute to (or control) lead release and must be monitored on a regular basis. Corrosion control experts she has consulted say that no large systems with LSLs have optimized their treatment for lead.

- The proposal in the draft report to use all samples to calculate the 90th percentile level could dilute this level because they would include any customer-requested sample not just high-risk homes. She questioned which sampling scheme is being used for non-LSL and LSL systems and that it could miss contaminant events.
- A member asked if the proposal is in addition to customer-requested sampling. In response, the member who drafted the proposal explained that there can be an overlap as long as the PWS gets enough samples from high-risk homes. Another member commented that the in-home testing may not be able to satisfy the requirements in the proposal because samples need to meet the tiering requirements to be established by EPA.
- A member asked if the proposal is saying that CCT should be the primary response to high lead. The member who drafted the proposal explained that WQPs indicate what is happening in the distribution system and do not directly correlate with how much is coming out of the tap. She noted that utilities can meet their optimal water quality parameters (OWQPs) and have lead issues and vice versa. OWQPs can include more parameters than currently required in the LCR, such as treatment chemicals and those that contribute to lead release like iron, manganese, and chloride to sulfate ratio.
- A member asked if the tap and WQP monitoring do not correlate, what is the find and fix for a system that does not meet its OWQPs other than LSLR. The author of the proposal indicated that the system could evaluate its treatment, assess if it has factors that contribute to lead release and resample at the home. The other member indicated that CCT already is the detailed assessment of all of those factors.

Several members disagreed with the proposal for the following reasons:

- It appears to take the new proposal of proactive LSLR for all systems and adds to it the entirety of the old rule with additional requirements.
- The proposal puts concepts back into play that presented problems, such as the significant challenges faced by PWS in collecting tap samples; obtaining only a limited number of samples from the same locations, which misses some of the homes with high lead levels; an ineffective LSLR program and too few WQP samples. In addition, the member's proposal on top of the recommendations in the report will increase costs significantly, which will be passed onto the consumer.
- Another member thought it was a step backwards. In response, the member who drafted the proposal explained that even if all LSLs were replaced, there are other serious sources of lead and thus, tap monitoring is still needed at high-risk homes. In addition, it will take time to remove LSLs. She does not want to use the proactive LSLR program as a springboard for

weakening current tap and CCT requirements. She thought that CCT that is only based on WQPs and is not focused on tap samples from high risk homes constitutes backsliding.

- Using only worst-case samples or first- and second-draw samples does not address challenges water utilities face with getting enough customers to sample and educating them on how to sample.
- A member thought that the Group had decided that eliminating LSLs was the main goal. He does not agree with retaining monitoring requirements in the current rule and thinks that the proactive LSLR program outlined in the draft report will achieve better health protection.
- A member agreed that systems should continue CCT and noted that the draft report does require large systems to review their existing CCT plan, considering the latest science and with their states to determine if the CCT reflects the best available current science. He indicated that this approach keeps systems moving to improve water quality while replacing LSLs.
- A member noted that Section 3.3.1 of the report already acknowledges the importance of receiving continued information about lead levels in people's homes. This would be done through customer-initiated samples, which will serve as an important source of information in evaluating CCT. Specifically, the report prior to the member's proposal lays out the following elements of the draft recommendations under consideration by the Group:
 - Ongoing consumer sampling, which would be more frequent than monitoring currently required only during a 4-month period every 3 years.
 - Customer sampling, with specific outreach to those with LSLs, in which the type of sample will focus on what the consumer wants to know. This could include a first-draw sample, random daytime sample (RDS) or a LSL sample. This sampling will also provide systems with more information from a broader range of sampling locations because it will no longer be tied to a tiering structure that requires monitoring at single-family homes of a certain age.
 - The utility can regularly review data against CCT so they can review it for trends. The state would review the information with the system on request and/or during sanitary surveys every 3-years to assess any needed actions based on the system's current treatment or when they change their source or treatment. The state also can require the system to collect additional data. Frequent samples above the "household action level" (HAL), could cause the system or state to assess why they are seeing high lead levels and any needed actions. *[See Section G for more detail regarding the HAL.]*
 - Tap samples will be used to: 1) inform and empower individual households to take action to reduce risk; 2) report to health officials when monitoring results exceed a HAL and 3) provide ongoing information to the utility and the state to assess effectiveness of CCT.
- Another member indicated that he thought that the public is being protected from water in contact with lead until LSLs are replaced through ongoing PE. This education should result in customers getting their water tested and LSLs being replaced. Another member agreed that PE, getting people to take samples, and bringing in public health agencies if there is an exceedance of the HAL is sufficient protection.

- The combination of the guidance, requiring utilities to do periodic review of the guidance and state oversight seems like enough accountability.
- Another was concerned about the workload for small systems and reiterated that the requirements need to be implementable by systems of all sizes.

The member that developed the proposal questioned what expertise exists within a water system to do an assessment and determine the necessity of CCT. She was concerned by the statement that Marc Edwards made that CCT is not optimized for any LSL system because 90th percentile levels are based on first-draw samples and not on samples that are representative of water residing in the LSL (i.e., a LSL sample). She also did not want to leave these decisions to each system. Instead, she wanted EPA in its manuals to provide “find and fix” guidance so systems are required to go through a set of corrective actions. In response:

- Members asked for clarification on what optimization means in the rule. In response, Mr. Burneson explained that a large system is optimized if it meets the: 1) requirements in §141.81(b)(2) in which it has conducted activities equivalent to the corrosion control steps that are specified in the rule; 2) requirements in §141.83(b)(3) that demonstrate based on tap and source water monitoring that the system has naturally non-corrosive water and the water is not picking up lead as it goes to the tap; or 3) corrosion control requirements in §141.82 that include meeting its OWQPs, which is the primary way large systems become optimized.
- Ms. Bingham asked if there is a requirement under the current rule to re-optimize. Mr. Burneson clarified that although the rule does not include requirements to re-optimize, systems have incentives under the rule to do so. A member stated that many if not most systems have not re-optimized. Mr. Burneson added that CCT is an iterative process. The system sends a CCT plan to the state that includes lead and copper data. Systems work with states to identify OWQPs. The states set these ranges or minimums, which are enforceable. Mr. Kempic explained that OWQPs are based on a CCT study that evaluates treatment options and the results of lead and copper tap samples, and distribution system and entry point WQP monitoring that is conducted before and after CCT installation. Each set of OWQPs is system-specific.
- A member explained that a system is never alone in making its CCT determination. Primacy agencies are responsible for overseeing and implementing the LCR. Mr. Burneson added that EPA writes guidance and EPA regions are involved in reviewing primacy packages. EPA has oversight and enforcement should states fail to take action or work in concert with them.
- Another member explained that currently a system will hire an engineer to conduct the CCT evaluation and the system will make a recommendation for CCT through an engineer. The state will review the recommendation and tell the system to install the CCT.

A member agreed that the *Information for Assessing the Effectiveness of CCT* that starts on page 35 is vague and should be strengthened. He recommended that if the utility exceeds 15 ppb lead in more than 10% of samples, it should be required to report to the state. Also, if a system exceeds the HAL, it must report to local health departments and they will take action. Systems also need to assess if they have a problem, and CCT installation or re-optimization could be the solution. Other comments included:

- A member offered to provide revised wording for the section, *Information for Assessing the Effectiveness of CCT*, that would more clearly specify the triggers and resulting system requirements for discussion during Day 2. [See Section F.2.b. for a discussion of this revised language.]
- A member indicated that the 90th percentile has not been a useful statistic and customers have trouble understanding this term. However, most customers can get below 15 ppb. His water system did a paper about 8 years ago in which they looked at how many lead samples were between 0 -15, 15-50 and > 50 ppb. Based on frequency distributions, lead levels were declining, which indicated CCT was working. Levels above 15 ppb indicate something is different at that house. He suggested using 15 ppb or the HAL (contingent on the specific concentration for the HAL developed by EPA) as a trigger for a find and fix. The member recommended using a checklist of what would cause lead, e.g., faucet, sample is over 15 ppb, assess patterns in lead levels, as a first step before requiring a system to install or re-evaluate its CCT. Another member suggested that the system could review this checklist to assess the reasons for high lead levels before reporting to local health departments.

The Group concluded that the report should not be revised to include the member's proposal to revert to the requirements in the current rule if a system did not meet its LSLR requirements.

2. Modify Monitoring Requirements – Section 3.4

a. Day 1 Discussion

The Group discussed a handout with revised language for assessing CCT effectiveness in Section 3.4.2 (Tap Sampling for Lead). The revised language includes recommendations for reporting customer sampling data to the state and customer, analyses to be conducted on that data, recordkeeping requirements, public access to the information, requirements if the data exceed the HAL or system action level (SAL) and a review of the data if the system changes its source or treatment. It also includes recommendations for EPA to provide guidance and forms to better use the data for decision making.

Some members supported the concepts in general but had specific comments as follows:

- One member noted that these requirements were similar to those under the Disinfectant and Disinfection Byproduct Rule.
- Some members questioned if a PWS needed to report customer sampling data to the state as frequently as monthly. Currently systems report to the state within 10 days of the end of the monitoring period. Any reporting is a cost to the system, and he suggested giving EPA the discretion to specify this time frame. One member added that he did not think states would do anything with the monthly data. Another thought the requirement should be tiered and balanced.
- A member indicated that the second bullet of the handout should be “household action level” and not a “health action level”.
- A member asked what would be the timeframe for reporting data to the customer and levels over the HAL to the health department and making the data available for public review. The Group decided to change the language to specify “within 30 days”, which is a common timeframe used in the current rule.

- Two members agreed that on-site sanitary surveys, which are typically every three years, should be used as an opportunity for states to review the data with the systems.
- Several members commented on the language that would require systems to provide the state with a data summary report annually of the three most recent years of data, detailing the location and types of all samples, and providing trend analysis, and summary statistics including the data range, median and 90th percentile as follows:
 - A member observed that small systems will have difficulty fulfilling these requirements. His state retains the data for these systems, calculates the 90th percentile levels, and would know if sampling locations or a household lead level changed over time. These systems should not be required to do a trend analysis. Also, large systems already do these analyses. He also questioned what is meant by “summary statistics” and “trend analysis”. He suggested having broader language.
 - Another indicated that the analysis should be conducted every three years and not on a rolling basis in case a system did not receive many sample results in one or more years (e.g., receives many in Year 1 but few in Years 2 and 3). He also did not support the trend analysis because the state already receives the lead results.
 - Two members supported the rolling 3-year period. One also agreed that the data set needs to be robust.
 - Another asked for clarification on the number of samples that would be collected during the 3-year period. A member explained that a system would have to meet the minimum requirement in the current rule for standard or reduced monitoring, whichever is applicable.
 - A member suggested revising the language to give the state the option of doing these data analyses.
 - The member who drafted the language in the handout explained why he suggested the rolling three years. The Group expressed some concern that a system may receive too few or too many requests for samples. If a system does not meet the minimum number of samples in a 3-year cycle, it would receive a violation. If a system waits until the end of the 3-year cycle to analyze its data, it may be too late to get enough samples to meet the minimum requirements.
- Members also discussed whether all customer samples should be used in the 90th percentile calculation to determine if the system exceeds a SAL regardless of the type of sample and location (i.e., LSL or non-LSL home). Comments included:
 - One asked which actions would be triggered by an exceedance of the SAL. In response, the member who drafted the proposal explained that it would trigger the same CCT requirements as the current rule. The system would be required to evaluate the data to try to understand why there is an exceedance and then meet with the state to understand if it needs to change its treatment.

- Another member thought more detail is needed to explain how the PWS would evaluate data following a SAL in order to understand any change or trends in the data. He recommended that the data be used to gauge the CCT changes. The report should specify that the data would be used to prepare an evaluation report.
- A member suggested looking at the representativeness of the samples. He was not sure about random use of samples in calculating the 90th percentile levels. In response the member who drafted the proposal explained that the current sampling protocol is not representative. It includes single family residences (SFRs) of a certain age and excludes other locations. He thought that customer-initiated monitoring would be more representative of the entire population served by the system (e.g., multifamily residences, older SFRs). It could also include first flush and RDS.
- Another member questioned how the system should document if a sample is coming from a LSL if the system has not verified that information. Another member suggested, documenting it as “presumed to be lead”.
- A member recommended that the 90th percentile calculation should be based solely on high-risk homes and when samples are collected during warmer months when lead levels are expected to be higher.
- A member suggested separating the data analysis by type of samples and when they were taken but indicated that a system may not have enough data points. He did not want the analysis to only be based on a subset of the samples. Another member noted that we run the risk of not getting a robust enough data set if we specify in the regulation that a system can only use a subset of the samples.
- A member added that we do not have a database for small systems to look at trends. If there is a high level of lead, the system needs to assess the reason. If levels are high at one location, the reason is probably not tied to treatment.
- A member indicated that if there is a SAL, the system should do more than look at data and trends. There needs to be a toolbox of corrective actions to figure out what might be causing the problem including CCT assessment, reassessment, adjustment, as well as other non-CCT options. In response, a member indicated that the report includes recommendations for more robust WQPs, to improve CCT assessment. Also, the use of customer-initiated sampling should allow a system to obtain samples from locations that are not currently monitored.
- A member questioned the implications for doing a trend analysis, determining the 90th percentile level and preparing an evaluation report if a system gets too few customer-initiated samples. What are we asking from systems and states?
 - A member suggested using the term “system assessment level” rather than a “system action level” because “action” could mean anything. The system would work with state to determine next steps. [The Group decided not to change this term on Day 2.]
 - A member pointed out that the report already contains language that would require a “find and fix” approach to identify and respond to potential problems if there are unexpected or

unexplained changes in the tap sampling data. Another member suggested clarifying the “other actions” required by the state is a fix, which would include re-optimization. The member who drafted the proposal indicated that “other action” was not limited to treatment. Another expressed concern that the language leaves the decision making up to the state and utility, and wondered if the state will require anything if there isn’t a clear action level.

b. Day 2 Discussion

The Group discussed a handout that addressed some of the issues raised during the first day that would be inserted in Section 3.4.2 (Tap Sampling for Lead). Specifically, the revised language:

- No longer specifies a frequency for reporting customer sampling data to the state (the report previously specified monthly reporting).
- More clearly explains what a PWS must do if it exceeds the SAL. PWS activities would not only include an evaluation of the data in order to understand any changes or trends in the data, but also determine what additional analysis and action is needed including if evaluation of CCT is appropriate. The revised text in the handout also specifies that if action is needed, the report should contain a plan of action.
- Includes a footnote that the LCRWG assumes there will be precautions against intentional biasing of sample results.

Specific comments on the handout included:

- A member noted that more in-depth analysis could be useful to assess CCT but should only apply to those with ALE or with CCT.
- Some members were concerned about the extent of these reporting requirements especially for small systems. Specific comments included:
 - Many small and medium systems report triennially and now would be required to report annually and to calculate average, median, range and 90th percentile. His state gets the information from the lab and automatically calculates 90th percentile levels.
 - The member who drafted this revised language suggested small and medium systems could be on a different reporting frequency than large systems. This makes sense since they collect fewer sample (e.g., smallest systems would have a minimum of 5 samples).
 - A member suggested that the data could be made available to the state during sanitary surveys and the state could help the system evaluate the data. Another noted that this is done in practice.
 - Small systems will have difficulty interpreting the data and determining trends. Systems do not have expertise to evaluate these trends and we rely on experts in engineering firms.
- Another member indicated that systems are gathering these data to understand if they are operating properly. All systems regardless of size should have an obligation to sample, review

the data that can include sitting down with the state, determining the issues and deciding if something needs to change.

- The state will have to develop a template on how to conduct the statistical analysis unless EPA develops this template. A member suggested that an Excel spreadsheet could be included in the national clearinghouse.
- Another questioned why systems would report the median, range and trend analysis if actions are still based on the 90th percentile level and questioned how states are going to use the data. He added that there is a transactional cost for every report. The author of the proposal indicated that systems should look at data more thoroughly and part of the way to do this is to include more robust analysis.
- Another member indicated that this is similar to the Revised Total Coliform Rule (RTCR), in which a system must do different levels of assessment. For the LCR, a Level 1 assessment could be required if 5 or 10% of the samples exceed the lead AL or the 90th percentile level exceeds the lead AL. This would be a self-assessment in which the system would diagnose the problem (e.g., high iron or manganese levels, whether a sample was collected properly). The assessment would be due to the state in 30 days for its review. If the problem persists, the system could go to a Level 2 assessment in which they could bring in experts. Another member thought the report should reference the RTCR as a possible model for conducting these assessments.
- A member suggested adding a provision for expert assistance in this process that could include the Rural Community Assistance Partnership (RCAP) to assist water systems in small rural communities. Ms. Bingham asked if this should be in the complementary actions section that EPA fund organizations like RCAP. Ms. Christ explained that EPA gets funding from Congress for RCAP. A member suggested piggybacking RCAP assistance for RTCR, such that they would also provide for the LCR.
- A member suggested an editorial change related to in the wording, “. . . to determine what additional analysis and action, including if evaluation of CCT is appropriate”, such that it would read, “. . . to determine what additional analysis and action, including if a revision to CCT is appropriate”.

The Group decided to recommend that EPA consider concepts in RTCR including Level 1 and 2 assessments, to use technical assistance and to provide guidance to identify trends.

3. Transition Language

A member explained his suggestion for transitioning from the current rule to the new rule framework, which appears in a comment bubble in the draft report. For the CCT and WQP requirements, a PWS must comply with the requirements of the current LCR until the PWS has achieved three rounds of monitoring results under the lead AL using the current LCR requirements. The proposed 3-year transition period is intended to give the system time to work with the state to fix any lead problems and to allow them to reach a stable place. He also noted that the text needs to be expanded to explain that other requirements under the new rule, such as the proactive LSLR program, expanded PE program and assessment of water aggressiveness to copper would start immediately.

In response:

- A member questioned why the monitoring for LSL systems would be based on first-draw sample because it does not capture the highest lead sample. The member who drafted the proposal indicated that this approach tried not to add a lot of complexity for a small group of systems.
- A member stated that systems should have an opportunity to review the new science before they would be required to install CCT.
- A member suggested having an ALE trigger the system into the new rule.

The Group decided to modify the language that instead of three rounds of monitoring, an exceedance under old rule constitutes one under new rule.

G. Household Action Level (HAL) – Section 3.5

The member, who proposed the use of a HAL responded to the four questions on the agenda (shown in italics) as follows:

1. *What are the implications if the HAL is different than the current lead action level (LAL)?* The purpose of the two levels is different. HAL exceedances would require notice to local health departments, who in turn would take some action.
2. *What actions should the HAL trigger?* The system is required to provide notice to the local health department and because the level is specific to a home, most local health departments would take some action to assess the reason for the exceedance and make recommendations for correcting the problem. In some instances, however, a lack of resources may impact the ability of the local health department to act.
3. *What terms does the Group want to use in the report?* The point raised by members is that the acronym HAL also is used for “health advisory level”. He suggested retaining the use of HAL as “household action level” for the LCR. The Group agreed to retain the term household action level.

Comments on the compliance section? He suggested two changes. First on page 39, replace, “Failure to timely report data” to “Failure to report data within 30 days”. Second, clarify that “PH” in “Failure to maintain records of correspondence between CWS and PH” is public health agencies, but to be consistent in whether we call them local health department or local health agencies. Members and EPA questions and discussion:

- Mr. Burneson asked if the Group’s intent was that sources other than drinking water be taken into account in setting the HAL. In response, a member explained that it intentionally did not because 0 – 6 months old are not crawling and are unlikely to have exposure to other lead sources, such as dust.
- A member suggested revising the introductory paragraph so that it would not be misinterpreted to mean an exceedance of the HAL would result in an imminent and substantial endangerment to the health of persons and could result in an action under SDWA Section 1431.

- A member questioned if the HAL would be similar to an MCL and if there would be a liability for a PWS if it does not take more definitive action when the HAL is exceeded. In response, a member indicated that the number could have political implications but it would not have legal ones.
- A member questioned if there should be a trigger that ties back to the HAL that would result in a “find and fix” approach to identify and respond to potential problems. A member explained that an exceedance of a HAL requires more than notification to the local health department, it also triggers a review.
- Members asked about EPA’s progress on developing the HAL. Mr. Burneson indicated that EPA is working on establishing the HAL, but that it will take some time because the HAL must undergo a peer review and quality assurance. It may or may not be available for the full NDWAC meeting in late 2015. In the absence of having this number in time for their report:
 - Some members suggested adding wording to the report, that the LCRWG supports the approach outlined in the report with the assumption that the HAL is above 30 ppb. Other members did not think the report should specify an assumed level on which the Group is basing its recommendations, since the calculations haven’t been done.
 - Others pointed out that if the number is lower than the current AL, it could affect the recommendations the Group would make to EPA in this section and other sections of the report. Another did not think the Group could make recommendations on the HAL until the level is known.
 - Marc Edwards provided a ballpark estimate for the HAL, assuming water is the sole source of lead. A member questioned if this accounted for calcium and asked about his other assumptions.

The Group agreed to add a footnote that says the HAL could affect other recommendations in the report.

H. Copper – Section 3.6

The Group discussed whether the health effects of copper support their recommended approach in the report. Specific comments included:

- The Group cannot necessarily say that the recommendation reflects new information about copper since the rule was promulgated. We were not convened to address a health risk assessment.
- A member indicated that the report should recommend that EPA determine if the benefits justify the costs for copper and to include what we know:
 - The Group received presentations on the health risk of copper. There are acute health risks from copper and new information about genetic predispositions to Wilson Disease.

- Lead and copper should not be regulated in the same way. High copper is not found in places where there is high lead.
- Aggressive water leaches copper and the Group has developed a separate approach for systems with and without water aggressive to copper.
- A member did not think that cost-benefit analysis necessarily equated to protecting public health. He suggested the wording should indicate “meaningful way to protect health”. In response, Mr. Burneson indicated that a meaningful opportunity to protect public health is used to initiate a rule. On the other hand, a cost-benefit analysis is more rigorous and a statutory requirement. He suggested that the Group could indicate in the report that it has worked on a revised framework for copper, but is cautious about this framework because it does not know if the benefits justify costs. A member supported this wording. Another indicated that the approach addresses the acute risk for copper and that this point needs to be made in the report.
- A member explained that this version of the report is missing one of the two tables for identifying a system with water that is non-aggressive water. This table was included in the January 2015 report and included criteria based on orthophosphate dosages and alkalinity.

Members discussed specific wording in Section 3.6.1 (Copper Recommendations). A member suggested revising the wording to indicate that the criteria for binning are examples that still need to be further verified.

Members also provided comments and questions on whether EPA should consider and under what circumstances CCT should be required for a PWS classified as having water that is aggressive to copper:

- A member questioned if there would be a situation where a system would need to treat or whether the education piece that explains copper passivation is sufficient.
- A member indicated that the Group’s recommendations do not require copper samples and questioned if CCT would be triggered based on water aggressiveness. Systems have an option to sample to demonstrate their water is not aggressive to copper. Another indicated that tap sampling can determine if a system needs to treat but he questioned at what level does the system need to treat? A member pointed out that the Group is asking EPA to address that question.
- Another asked about the AL for copper. A member noted language in the draft report that a system that chooses to sample would compare its sample results against the copper AL.
- Another pointed out that the degree of treatment might go beyond a system’s technical expertise. For example, would a small ground water system have to use complex treatment that is typical of large systems?

Mr. Burneson indicated that the cost-benefit analysis evaluates whether EPA is maintaining health protection for the rule as a whole, and thus, lead benefits could compensate for copper. He asked if the Group thinks benefits and costs of copper should be considered separately from lead. In response:

- A member indicated that the two are not different rules and thought it may not make sense to separate them but that OGC should weigh in.

- The Group decided that the report should indicate that the question was raised and that EPA should consider conducting two separate analyses.

A member suggested modifying the last line that currently indicates that the LCRWG did not contemplate that a large percentage of systems with water aggressive to copper will need to install CCT. Instead, to add that the copper recommendations may need to be reconsidered if this assumption is incorrect. Another member indicated this concept is already implicit in the Group's request for a cost-benefit analysis. The Group decided to delete the last sentence and add information that explains a cost-benefit analysis based on the information provided by Mr. Burneson.

Ms. Bingham asked if the Group's recommendations had implications for systems that have CCT. A member indicated that they should have finished water that is non-aggressive and that they must maintain the WQP levels that made them non-aggressive. Therefore, these systems are already covered in the report.

I. Complementary Actions – Section 4.0

The Group discussed the complementary actions language in the report that is referenced in the executive summary and detailed in Section 4.0. Ms. Bingham asked if the Group had any comments on the bulleted list of recommendations on pages 42 and 43 including the need to add any bullets. No member provided any comments or suggested changes.

J. Public Comment

Two individuals provided public comment on both days of the meeting and a third provided comments on Day 1 of the meeting. These comments are summarized below:

1. Paul Schwartz, Water Alliance

a. Day 1 Comments

Mr. Paul Schwartz acknowledged the Group's efforts to resolve some of the difficult public health issues that have not been successfully addressed. He expressed his appreciation for expanding the LCRWG membership to include Yanna Lambrindou, who represents more of the public's perspective, but thought this perspective was underrepresented. He thought that the discussion of costs and benefits of the proposed recommendations heavily considered the utility's perspective instead of the individuals whose health and quality of life is most affected. The Group needs to include some backstops to prevent backsliding and to consider what steps should be taken to protect people if PWSs are not successful at implementing some of the proactive LSLR program or other recommendations. He also recommended that the Group consider the program used by the State of Ohio to distribute CWA SRF. The state gave money to private banks that handled the transactional costs to merchants, farmers, utilities and private customers. He suggested expanding the Group's membership to include someone from an environmental finance center.

b. Day 2 Comments

Mr. Schwartz stated that at the beginning, he questioned the legitimacy of this workgroup and process. A bedrock of this was the knowledge of people at the table, their knowledge of LCR and ties to the utility community. As he has followed the process he has kept a keen eye on what consensus means from his experience and as defined in Wikipedia. It is an aspirational word, and he feels that process has fallen short for several reasons:

- A consensus approach is supposed to ensure that all at the table are heard, and questions are discussed, resolved and incorporated into the Group's recommendations, which he did not feel happened.
- The Group has many utility representatives and has given tremendous power to them. Thus, some people's perspectives have had greater impact than others.
- Use of science and use of facts is important. In his many decades of going to stakeholder meetings, he has heard science invoked again and again. But there has not been enough time to understand the issues and their uncertainty.
- He thinks the Group has decided to go with a package and attached facts to it.
- He would ask that EPA and NDWAC reflect on whether these revisions are serving utilities or are in the interest of the people being hurt by lead in water and their communities.
- He is disturbed by the cost/benefit analysis requirement. He agrees with making the rule less costly and taking the lead out for the utility, but he sees easy outs for non-LSL systems and small PWSs.

Mr. Schwartz also stated that his community in DC had 59% increase in fetal death during a time the PWS refused to tell people about lead in water. Children affected by high lead levels are now 7th and 8th graders who are attending schools in his neighborhood and are the ones that are going to drop out and go to jail. These individuals are affecting the quality of life all around them. While there may have been good intent around table, at this point, the game is over and the Group has accepted the package with small changes. People in America will be hurt if EPA agrees with the suggestions. When we talk about science-based adaptive management on the CWA side, we want to allow for aspiration and hope to move past the rigidity and expense of those rules. We need to demand that EPA write into this rule that after a certain number of years EPA must go back and fix the rule if expectations have not been met regarding LSLR.

2. Marc Edwards, Virginia Tech

a. Day 1 Comments

Mr. Edwards described a health study conducted in Montreal that estimated the relation between a cumulative water lead exposure index and BLLs of children from 1-5 years.³ This study found that an

³ Gerard Ngueta, Belkacem Abdous, Robert Tardif, Julie St-Laurent, and Patrick Levallois. *Use of a Cumulative Exposure Index to Estimate the Impact of Tap-Water Lead Concentration on Blood Lead Levels in 1- to 5-Year-Old Children (Montreal, Canada)* Environmental Health Perspectives. June 2015.

increase of 1 ppb in water lead resulted in a 35% increase in BLL, which is consistent with findings in studies conducted by Virginia Tech and in France. What this shows is that we do not want a rule that is going back on public health protection (no backsliding). Although the existing rule is not perfect, overall it has successfully lowered lead in drinking water. Problems arise when people do not follow the requirements of the rule. In addition, CCT is not a substitute for LSLR. What the Group is proposing is visionary but if you accept no backsliding, the question is what do you do for those utilities that cannot make good progress on LSLR? It is unacceptable to say they did their best and leave people with weakened LCR. If LSLR is not realized, he suggested defaulting to the current rule with a modification to require third- and fifth-draw samples if a home has LSLs and to target worst-case homes that include longer LSLs and lower water use patterns, such that lead is not missed. Every study that has been done to try to identify a safe level of lead in water has come up with something below 15 ppb.

b. Day 2 Comments

Mr. Edwards acknowledged that the Group is faced with a difficult task. He encouraged them to read, *The Great Lead Water Pipe Disaster* by Werner Troesken. The author outlines 150 years of death and denial. He noted that everyone acknowledges that the current rule is broken. He noted three points that could fix the existing rule. First, one reason it is broken is that CCT has never been optimized for systems with LSLs. Second, the new rule construct looks attractive, lot of good intention and hope, but none of this will happen unless the government pays for it. Third, we will be better off fixing the existing rule if we cannot replace lead pipe.

3. Dave Lipsky, New York City Department of Environmental Protection (NYC DEP)

Mr. Lipsky provided comments on Day 1 of the meeting and expressed his appreciation to the Group for its work. He supports the concept of having PWSs develop long-term strategies for LSLR as opposed to the current requirement that ties LSLR to a lead ALE. He indicated that if there is no safe level of lead that maintaining a sampling pool is inappropriate. Instead, he support the Group's current suggestion to provide tap sampling at any home to understand the risk at an individual home versus using tap monitoring results to assess CCT effectiveness. He explained NYDEP has had this broader tap sampling program for two decades. An advantage of this program is that it allows the city to monitor non-Tier 1 sites (e.g., multi-family residences, which comprise 50% of the housing stock) and homes that are not direct customers. He asked the Group to also consider older large cities that may have a harder time to develop accurate LSLs inventory. He cited page 15, lines 3 – 5 of the draft report, *Focus efforts on action to replace LSLs rather than on the time and expense of upfront plan approval and on using simplified reporting to the states so they would only need to intervene when problems arise.*

K. Wrap Up and Next Steps

Ms. Bingham discussed the major concepts that the Group discussed and on which they had agreed will be incorporated into the next iteration of the report. She will draft the next version of the report to reflect these concepts. The next draft will be submitted to EPA for technical accuracy and to the LCRWG for review. Once the Group agrees on the revisions, members' names will be included on the report if they choose. She will try to write the report such that NDWAC members can see how it addresses their questions on topics discussed during the June 22 webinar. In addition, she suggested that the upcoming

PowerPoint presentation to the NDWAC in late 2015 also highlight how their comments were addressed.

A member indicated that she was disappointed that the meetings were concluding without further discussing or including recommendations for providing PE regularly to homes with LSLs and vulnerable populations and ramping up the CCR language. She disagreed on other areas of the report and asked EPA if she could submit a written report with her complete thinking. In response, Dr. Grevatt explained that EPA would provide her with a way to present her views and asked her to distinguish those areas on which she agreed from those she did not.

Ms. Bingham thanked the Group for having the opportunity to work with them and for listening to each other's perspectives.

Dr. Grevatt closed the meeting by thanking the Group for their efforts during meetings, conference calls and many hours outside of the meetings. He noted that the LCRWG comprised a diverse group with different perspective and all provided their views openly. He explained that the LCRWG's report will go to the full NDWAC. NDWAC will offer recommendations to the EPA Administrator. EPA will consider the NDWAC's recommendations and the LCRWG meeting discussions. EPA will have the task to develop the proposed rule. He thanked Ms. Bingham, his staff and Cadmus for their support.

Row	Action Items from June 24 and 25, 2015 LCRWG Meeting	Responsibility¹
1	Revise draft report to reflect LCRWG June meeting discussions.	RESOLVE
2	Review report for accuracy.	EPA/LCRWG members
3	Prepare final report and submit it to the full NDWAC.	RESOLVE/EPA

Acronyms: LCRWG = LCR Working Group; LSLR = lead service line replacement; NDWAC = National Drinking Water Advisory Council.

Notes: EPA refers to the Standards and Risk Management Division (SRMD).

List of Attachments

- Attachment A – List of Lead and Copper Rule Working Group Members and Meeting Presenters
- Attachment B – List of Attendees
- Attachment C – Final Meeting Agenda
- Attachment D – Fourth draft Report of the “Lead and Copper Rule Working Group to the Full National Drinking Water Advisory Council”. June 2015.

ATTACHMENT A

Seventh NDWAC Lead and Copper Working Group Meeting

List of Lead and Copper Rule Working Group Members and Public Commenters

June 24 and 25, 2015

NDWAC LCR Working Group
Christina Baker: Deputy Public Counsel, Office of the Public Counsel, State of Missouri
Leon Bethune: Director, Director of Office of Environmental Health, Boston Public Health Commission
Gary Burlingame: Laboratory Director, Philadelphia Water Department
Marilyn Christian: Manager, Environmental Health Programs, Harris County Public Health
Matthew Corson: Manager, Environmental Compliance, American Water
Derrick Dennis: Water Quality Unit Supervision, Office of Drinking Water, State of Washington
Stephen Estes-Smargiassi: Director of Planning, Massachusetts Water Resources Authority
Hector Gonzalez: Director Health Department, Laredo, Texas ¹
Yanna Lambrinidou: Parents for Non-toxic Alternatives
Thomas G. Neltner: National Center for Healthy Housing ²
John Sasur Jr.: Three Rivers Fire District, Massachusetts
Robert C. Steidel: Director Department of Public Utilities, City of Richmond Virginia
June Swallow: Chief, Division of Water Quality, Rhode Island Department of Health
Lynn Thorp: National Campaigns Director, Clean Water Action
Chris Wiant: President, Caring for Colorado
Nse Obot Witherspoon: Executive Director, Children's Environmental Health Network
EPA Office of Ground Water and Drinking Water
Eric Burneson: Division Director, Standards and Risk Management Division
Lisa Christ: Branch Chief, Targeting and Analysis Branch
Peter Grevatt: Director
Public Commenters
Marc Edwards: Virginia Tech
Carrie Lewis: Milwaukee Water Works/NDWAC
Dave Lipsky: New York City Department of Environmental Protection
Paul Schwartz: Water Alliance
Meeting Facilitator: Gail Bingham, RESOLVE

¹ This member was unable to attend the meeting.

² Formerly with National Resources Defense Council.

ATTACHMENT B

Seventh NDWAC Lead and Copper Working Group Meeting

List of Attendees

June 24 and 25, 2015

First Name	Last Name	Affiliation
John	Arnett	Copper & Brass Fabricators Council
Christina	Baker	MO Office of Public Council/National Association of State Utility Consumer Advocates
Victoria	Banks	EPA
Leon	Bethune	Boston Public Health Commission
Scott	Biernat	Association of Metropolitan Water Agencies
Gail	Bingham	RESOLVE
Miranda	Brannon ¹	Air Force
Gary	Burlingame	Philadelphia Water Dept
Eric	Burneson	EPA
David	Carrillo	Air Force
Lisa	Christ	EPA
Marilyn	Christian	HCPHES/NACCHO
David	Cornwell	Environmental Engineering & Technology, Inc.
Matt	Corson	NAWC/American Water
Leslie	Darman	EPA
Miguel	Del Toral	EPA
Derrick	Dennis	Association of State Drinking Water Administrators
Joyce	Donahue ¹	EPA
Laura	Dufresne ¹	Cadmus
Stephen	Estes-Smargiassi	AWWA/MWRA
Chris	Fulk	EPA
Erik	Helm	EPA
Anne	Jaffe Murray	Cadmus
Jeff	Kempic ²	EPA
Andy	Kireta Jr. ¹	Copper Development Association
Yanna	Lambrinidou	Parents for Nontoxic Alternatives
Vanessa	Leiby ²	Water and Wastewater Equipment Manufacturers Association, Inc.
France	Lemieux	Health Canada
Frank	Letkiewicz	Cadmus
Carrie	Lewis	Milwaukee Water Works/NDWAC
Dave	Lipsky	NYC DEP/Bureau of Water Supply
Suril	Mehta	EPA

First Name	Last Name	Affiliation
Tom	Neltner	National Center for Healthy Housing
Amanda	Palleschi ¹	Inside EPA
Sarah	Rains ²	Cadmus
John	Sasur	Three River Water Dept/NRWA
Mike	Schock	EPA
Michelle	Schutz ¹	EPA
Paul	Schwartz	Water Alliance
Lameka	Smith ²	EPA
Francine	St. Denis	EPA
Bob	Steidel	City of Richmond, VA / AMWA
June	Swallow	RI Department of Health
Jim	Taft ¹	Association of State Drinking Water Administrators
Lynn	Thorp	Clean Water Action
Steve	Via	American Water Works Association
Chris	Wiant	Caring for Colorado Foundation
Nse	Witherspoon	Children's Environmental Health Network

¹Attended the June 24, 2015 session only.

²Attended the June 25, 2015 session only.

ATTACHMENT C

U.S. Environmental Protection Agency NDWAC LEAD AND COPPER WORKING GROUP

The Cadmus Group, Inc.
1555 Wilson Blvd., Suite 300 | Arlington, VA 22209 | 703.247.6161

June 24-25, 2015

Agenda

Meeting Objectives/Desired Outcomes:

- Consider NDWAC questions;
- Review Compliance Small Group additions and member input; resolve remaining issues;
- Agree on report; and
- Plan next steps.

Advance materials: NDWAC LCR Work Group Report FOURTH DRAFT 06 15 2015

Wednesday June 24, 2015

- 8:45-9:00 Informal gathering
- 9:00-9:30 Welcome, Introductions, Meeting Objectives/Agenda, Materials and Logistics
Welcome: Peter Grevatt, Director, Office of Groundwater and Drinking Water
Introductions: Gail Bingham, *facilitator*
- 9:30-10:00 Open Discussion: General Discussion of Questions/Considerations from NDWAC Objectives: Share initial perspectives on questions heard. (Questions also will be addressed when the applicable section is being discussed.)
- 10:00-12:00 Discuss Draft Report and Recommendations: Section 3.1 Replace Lead Service Lines
w/break
Objectives: Discuss and seek agreement on recommendations to include in report.
Suggested Discussion Questions:
 - Confirm whether it is the group's intent to prohibit partial LSLR, except during emergency repairs. [p.15]
 - Confirm whether it is the group's intent to combine the conservative assumption that a service line is lead with giving credit for documentation that it is not. [p.15] Does the group have a recommendation on how this determination is made, or leave that to EPA?
 - How can EPA better address EJ concerns? Does the group want to recommend prioritizing certain LSLRs (vulnerable populations? EJ communities? [p.15]
 - Comments on planning and financing section? Use of the word "affordability?" [p.17-18]
 - What should be required of a PWS with respect to other utilities? [p.19]
 - What category of system is item 8 applicable to? [p.19]

- What does the group want to recommend with respect to the definition of control? [p.19]
- What records should be kept on customer refusals? [p.20]
- Will the requirement for escalation of actions be sufficient (i.e. result in meeting replacement milestones)? Should it be a violation not to meet milestones? What if customers refuse? [p.20]
- Other compliance comments?

12:00-12:15 Public Comment

12:15-1:15 LUNCH *[on your own]*

1:15-2:15 Discuss Draft Report and Recommendations: Section 3.2 Public Education for Lead
Objectives: Discuss and seek agreement on recommendations to include in report.

Suggested Discussion Questions:

- Comments on outreach to new customers section? [p.24]
- Are there changes needed to the bullets describing updates to the CCR? To the suggested starting point language? [p.24-25]
- Comments on outreach to caregivers/health care providers section? [p.26-30]
- Should there be any variation for small systems?
- How might PE/outreach help address EJ concerns?
- Comments on compliance section?

2:15-5:15 Discuss Draft Report and Recommendations: Section 3.3 Corrosion Control and Section
w/break 3.4 Monitoring Requirements

Objectives: Discuss and seek agreement on recommendations to include in report.

Suggested Discussion Questions:

- Are there issues with including the recommendations in the five bullets from the previous draft? [p.31-32?] – *not whether to add any, but with them specifically*
- What should be the requirement for reviewing updated CCT guidance manuals from EPA? For action to revise CCT? Should the requirements differ by size of system? What happens if EPA doesn't update the guidance? [p.32]
- Comments to the additions suggested by Yanna Lambrinidou? [p.32-33]
- How does the discussion affect the monitoring questions and options? Any differences for systems with and without LSLs? For small systems? [p.35]
 - What should be the role of the lead action level (and tap sampling) if the proposed recommendations are adopted to make PE and LSL replacement a requirement for all PWSs?
 - WQPs are a process control to assess whether the CCT plan is being implemented correctly. However, is tap sampling still needed:
 - Until LSLs are removed?
 - To confirm that a system's CCT is minimizing lead at the tap?
 - How could customer-initiated tap sampling be used?
- Comments on the transition recommendation suggested by Steve Estes-Smargiasi and Gary Burlingame? [p.34]
- What does the group want to recommend about process control (WQP) monitoring? More frequent? More locations? Additions to the standard list

and/or tailoring to system conditions (or does the current rule provide for that already)? Whether some need tightening? What is feasible for small/med systems? [p.34]

- Confirm recommendations related to customer-initiated tap sampling for lead
 - Available to all customers, with targeted outreach to those with LSLs and vulnerable populations? How might EPA address EJ concerns? [p.35]
 - What should be the purposes of customer initiated tap sampling? [p.35]
 - Sampling protocols vary based on customer request? [p.35]
 - Should the utility be required to take addl. samples to reach a floor? [p.36]
- What is the role of sample invalidation criteria? Recommendations re. flushing, aerators, etc? [p.36-37]
- Comments on CCT and monitoring compliance sections? e.g confirm monitoring results outside the WQP range would remain a violation.

5:15-5:30 Wrap Up and Adjourn for the Day

Thursday, June 25, 2014

8:30-8:45 Informal gathering

8:45-9:00 Review Day Two Agenda
Objective: Reflections from Day One and confirm agenda for today.

9:00-9:30 Discuss Draft Report and Recommendations: Carry-Over Topics from Day One
Objectives: Discuss and seek agreement on recommendations to include in report.

9:30-10:30 Discuss Draft Report and Recommendations: Section 3.5 Household Action Level
Objectives: Discuss and seek agreement on recommendations to include in report.

Suggested Discussion Questions: [p.38-39]

- What are the implications if the household action level is different than the current lead action level?
- What actions should the household action level trigger?
- What terms does the group want to use in the report?
- Comments on the compliance section?

10:30-10:45 BREAK

10:45-12:15 Discuss Draft Report and Recommendations: Section 3.6 Copper
Objectives: Discuss and seek agreement on recommendations to include in report.

Suggested Discussion Questions: [p.39-41]

- Is the recommendation of the work group with respect to CCT for copper that EPA establish the criteria for when it should be required? Or also whether?
- What are the implications of the recommendations for systems that have set CCT for copper?
- Did the work group form a conclusion about what the health effects suggest regarding whether the benefits warrant these recommendations? Leave that to EPA?

- Comments on the compliance section?

12:15-1:30 LUNCH *[on your own]*

1:30-1:45 Public Comment

1:45-2:00 Discuss Draft Report and Recommendations: Section 4.0 Complementary Actions
Objectives: Discuss and seek agreement on recommendations to include in report.

Suggested Discussion Questions: [p.42-43]

- Comments on the added recommendations?
- Any more to add? Any modifications to those listed previously?

2:00-3:45 Open Session: Resolution of Remaining Issues / Intro Sections / Consensus
w/break Objectives: Discuss introductory sections, overview diagram, remaining issues and other topics as needed. Seek agreement on recommendations. Discuss process for completing the report.

3:45-4:00 Wrap up and Next Steps

4:00 ADJOURN MEETING

ATTACHMENT D

Report of the Lead and Copper Rule Working Group To the National Drinking Water Advisory Council

FOURTH DRAFT

[NOTE: THIS DRAFT WAS PREPARED FOR DISCUSSION BY THE LCRWG AT ITS MEETING ON JUNE 24-25, 2015. THIS DRAFT IS BASED ON THE LCRWG'S APRIL 23-24 MEETING, INPUT FROM SMALL GROUP CALLS HELD IN MAY AND FROM INDIVIDUAL COMMENTS ON DRAFT THREE.. IT DOES NOT REFLECT A CONSENSUS OF THE WORKING GROUP. ADDITIONAL EDITS ARE ANTICIPATED.]

JUNE 2015

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Appendices

Appendix A – Lead and Copper Working Group Members

Appendix B – Table 2

Figures

Figure 1 – Overview of Recommended LT-LCR Framework

DRAFT

Abbreviations

AL – Action Level
ALE – Action Level Exceedance
CCR – Consumer Confidence Report
CCT – Corrosion Control Treatment
DWLRP – Drinking Water Lead Reduction Plan
EPA – Environmental Protection Agency
LAL – Lead Action Level
LCR – Lead and Copper Rule
LCRWG – Lead and Copper Rule Working Group
LSL – Lead Service Line
LSLR – Lead Service Line Replacement
LTR LCR – Long Term Revisions to the Lead and Copper Rule
MCLG – Maximum Contaminant Level Goal
µg/L – Microgram per Liter
µg/dL – Microgram per deciliter
NDWAC – National Drinking Water Advisory Committee
OGWDW – Office of Ground Water and Drinking Water
OCCT – Optimum Corrosion Control Treatment
OWQP – Optimal Water Quality Parameter
PE – Public Education
pH – Negative log of hydrogen ion molar concentration
PLSLR – Partial Lead Service Line Replacement
POTW – Publicly owned treatment works
POU – Point-of-use treatment device
PWS – Public Water System
SAB – Science Advisory Board
SDWA – Safe Drinking Water Act
DWSRF – Drinking Water State Revolving Fund
TT – Treatment Technique
WQP – Water Quality Parameter

Report of the Lead and Copper Rule Working Group to the National Drinking Water Advisory Council

1. Executive Summary

The Lead and Copper Rule Working Group (LCRWG) of the National Drinking Water Advisory Council (NDWAC) has completed its deliberations on issues associated with long term revisions to the Lead and Copper Rule (LCR). This report includes the group's findings and recommendations.

This executive summary provides a brief overview of the report. Details of the findings and recommendations are provided in the body of the report. A list of the members of the working group can be found in Appendix A.

1.1. Charge

The charge to the LCRWG was to provide advice to the NDWAC as it develops recommendations for the U.S. Environmental Protection Agency (EPA) on targeted issues related to long term revisions to the Lead and Copper Rule under the Safe Drinking Water Act (SDWA).

1.2. Findings and Recommendations

The anticipated Long Term Revisions to the Lead and Copper Rule (LTR LCR) is a very important opportunity for removing sources of lead in contact with drinking water and for reducing exposure to lead from drinking water in the meantime. Creative financing and robust public education also are essential.

The LCRWG took the following considerations, among others, into account in making recommendations for revisions to the LCR. First, there is no safe level of lead. Lead can pose health risks to anyone, but there are heightened risks for pregnant women, infants and young children and other vulnerable populations with both acute and chronic exposures. Effective elimination of lead materials in contact with water and minimization of exposure to lead in drinking water is a shared responsibility; public water systems (PWSs), consumers, building owners, public health officials and others each have important roles to play. The lack of resources to reduce the sources of exposure in some communities, however, also raises important questions of disparate impact and environmental justice. Thus, creative financing mechanisms will be needed. The LCR should remain a treatment technique rule, but it can be improved. Corrosion control treatment is complicated, and will vary based on specific circumstances in each public water system. Thus, regular updates by EPA to guidance based on the latest science and the creation of a national clearinghouse of information both for the public and for PWSs is needed.

The LCRWG specifically recommends that EPA revise the LCR to:

- Require proactive lead service line (LSL) replacement programs, which set replacement goals, effectively engage customers in implementing those goals, and provide improved access to information about LSLs, in place of current requirements in which LSLs must be replaced only after a lead action level (AL) exceedance and corrosion control treatment (CCT);
- Establishes more robust public education requirements for lead and LSLs, by updating the Consumer Confidence Report (CCR), adding targeted outreach to consumers with lead service lines and other vulnerable populations (pregnant women and families with infants and young children), and increasing the information available to the public;

- Strengthen CCT, retaining the current rule requirements to re-assess CCT if changes to source water or treatment are planned, adding a requirement to review updates to EPA guidance to determine if new scientific information warrants changes ;
- Modify monitoring requirements to provide for consumer requested tap samples for lead, utilizes results of tap samples for lead to inform consumer action to reduce the risks in their homes and to [comment from Gail Bingham: This is a placeholder for issues associated with the role of the current lead AL, how tap samples should be used, and related monitoring questions, which will be discussed at the June LCRWG meeting]; tailors water quality parameters (WQPs) to the specific CCT plan for each system, and increases the frequency of WQP monitoring for process control;
- Establish a health-based, household action level that triggers a report to the consumer and to the applicable health agency for follow up;
- Separate the requirements for copper from those for lead and focus new requirements where water is corrosive to copper; and
- Establish appropriate compliance and enforcement mechanisms.

Although leadership by EPA is essential, reduction of exposure to lead in drinking water cannot be achieved by EPA regulation alone. Thus, this report also includes recommendations for renewed commitment, cooperation and effort by government at all levels and by the general public. We urge EPA to play a leadership role not only in the revisions to the LCR but also in educating, motivating, and supporting the work of other EPA offices; federal state and local agencies and other stakeholders. (See Section 4: Complementary Actions Critical to the Success of the National Effort to Reduce Lead in Drinking Water.)

2. Considerations and Background Information

2.1. Considerations in Preparing this Report

The members of the LCRWG brought different perspectives and expertise to the preparation of this report. Although not all members agreed with each and every consideration listed below, the LCRWG took one another's perspectives into account and, thus, the following concepts collectively underlie the recommendations in this report. Additional detail is provided in the recommendations section below.

- There is no safe level of lead. Lead can pose health risks to anyone, but there are heightened risks for pregnant women, infants and children with both acute and chronic exposures.
- Lead-bearing plumbing materials in contact with drinking water pose a risk at all times (not just when there is a lead action level (LAL) exceedance).
- Effective elimination of lead materials in contact with water and minimization of exposure to lead in drinking water is a shared responsibility. PWSs, consumers, building owners, public health officials and others each have important roles to play.
- The LTR LCR is an important opportunity for removing sources of lead in contact with drinking water and for reducing exposure to lead from drinking water in the meantime. However, additional action beyond the scope of the Safe Drinking Water Act is needed. Removing lead from drinking water systems also will require renewed commitment, cooperation and effort by government at all levels and by the general public. (See Section 5: Complementary Actions Critical to the Success of the National Effort to Reduce Lead in Drinking Water.)

- Proactive action is needed to remove the sources of lead, with appropriate incentives both for PWSs and their customers needed to encourage such action.
- Successful implementation of the revised LCR can only take place in the context of a more holistic effort on lead in water issues involving stakeholders other than just EPA and water systems, and resources beyond those able to be brought to bear by water systems. Partnerships at all levels are essential. Recognizing that public agency budgets are tighter than ever, greater engagement by local health agencies, those funding housing programs, and those involved in permitting and construction is particularly important.
- Creative financing mechanisms also will be needed to achieve this goal for all individuals potentially exposed to lead, regardless of race, ethnicity or income. Leaving a lead service line in place because a low-income resident does not have the means to pay raises serious questions of disparate impact and environmental justice.
- The public plays a critical role in protecting their families' health by reducing exposure to lead and copper, and informing the public enables them to be effective participants in implementing their share of the responsibility.
- The issues associated with lead and copper are very different and warrant more separate attention than has been the case in the past.
- The LCR should remain a treatment technique rule, but it can be improved.
- Corrosion control treatment (CCT) is complex, dynamic, and varies based on the circumstances in each PWS. The understanding of the challenges with CCT has improved in recent years, but questions still remain.
- Attention to unintended consequences is important generally and, in particular, with respect to CCT.
- The presence of lead-bearing materials in premise plumbing raises issues about what systems can implement that requires attention.
- Attention to what States are able to oversee and enforce also is important.
- PWS and state resources should be focused on actions that achieve the greatest health outcomes.

2.2. Regulatory Background and Formation of the NDWAC Lead and Copper Work Group

Under the Safe Drinking Water Act EPA sets public health goals and enforceable standards for drinking water quality.¹ The Lead and Copper Rule is a treatment technique rule. Instead of setting a maximum contaminant level (MCL) for lead or copper, the rule requires (PWSs) to take certain actions to minimize lead and copper in drinking water, to reduce water corrosivity and prevent the leaching of these metals from the premise plumbing and drinking water distribution system components and when that isn't enough, to replace lead service lines under their control. The current rule sets an action level (AL), or concentration, of 0.015 mg/L for lead and 1.3 mg/L for copper. An AL is not the same as an MCL. An MCL is based on health effects and feasibility; whereas an action level is a screening tool for determining when certain treatment technique actions are needed.

The LCR action level is based on the practical feasibility of reducing lead through controlling corrosion. In the LCR, if the AL is exceeded in more than ten percent of tap water samples collected during any

¹ EPA establishes national primary drinking water regulations (NPDWRs) under SDWA. NPDWRs either establish a feasible maximum contaminant level (MCL) or a treatment technique "to prevent known or anticipated adverse effects on the health of persons to the extent feasible."

monitoring period (i.e., if the 90th percentile level is greater than the AL), it is not a violation, but triggers other requirements that include water quality parameter monitoring, corrosion control treatment (CCT), source water monitoring/treatment, public education, and lead service line replacement (LSLR). The rule also requires States to report the 90th percentile for lead concentrations to EPA's Safe Drinking Water Information System (SDWIS) database for all water systems serving 3,300 or more persons, and for those systems serving fewer than 3,300 persons only when the lead action level (LAL) is exceeded. States only report the 90th percentile for copper concentrations in SDWIS when the copper action level is exceeded in water systems regardless of the size of the service population. Public education requirements ensure that drinking water consumers receive meaningful, timely, and useful information that is needed to help them limit their exposure to lead in drinking water.

In early 2004, EPA began a wide-ranging review of the implementation of the LCR to determine if there was a national problem related to elevated levels of lead in drinking water. As part of its national review, EPA collected and analyzed lead concentration data and other information, carried out a review of implementation in States, held four expert workshops to discuss elements of the regulations, and worked to understand local and State efforts to monitor for lead in school drinking water, including a national meeting to discuss challenges and needs. EPA released a Drinking Water Lead Reduction Plan (DWLRP) in March 2005. This plan outlined short-term and long-term goals for improving implementation of the LCR. The plan can be found at the following web address:

http://water.epa.gov/lawsregs/rulesregs/sdwa/lcr/lead_review.cfm

In 2007, EPA promulgated regulations, which addressed the short-term revisions to the LCR that were identified in the 2005 DWLRP. These requirements enhanced the implementation of the LCR in the areas of monitoring, treatment, LSLR, public education, and customer awareness. These revisions were intended to better ensure drinking water consumers receive meaningful, timely, and useful information needed to help them limit their exposure to lead in drinking water.

A number of Safe Drinking Water Act (SDWA) amendments aim to reduce lead in drinking water by limiting the amount of allowable lead in plumbing materials that come into contact with drinking water. In 1986, the SDWA was amended to prohibit the “use of any pipe, any pipe or plumbing fitting or fixture, any solder, or any flux, in the installation or repair of (i) any public water system; or (ii) any plumbing in a residential or non-residential facility providing water for human consumption, that is not lead free”. Lead Free was defined as solder and flux with no more than 0.2% lead and pipes with no more than 8% lead.

Congress again amended the SDWA in 1996, to prohibit the introduction into commerce of any pipe, pipe or plumbing fitting or fixture that is not lead free and to also require pipes, pipe or plumbing fittings or fixtures be in compliance with 3rd party lead leaching standards. These provisions ensure that only products meeting the lead free definition are sold in the U.S. and that pipes, pipe or plumbing fittings or fixtures are certified to be lead free.

The Reduction of Lead in Drinking Water Act of 2011 revised the maximum allowable lead content from not more than 8% to not more than a weighted average of 0.25% lead and included a calculation procedure for determining the weighted average; further reducing the amount of lead in contact with drinking water. It also eliminates the federal requirement to comply with the lead leaching standard and included exemptions from the lead free definition for plumbing devices that are used exclusively for non-potable services and also for specific plumbing devices such as toilets, bidets and urinals. The Community Fire Safety Act of 2013 further amended SDWA to add fire hydrants to the list of exempted plumbing devices.

EPA has continued to work on the long-term issues that required additional data collection, research, analysis, and full stakeholder involvement, which were identified in the 2005 DWLRP and the 2007 rule

revisions. This action is referred to as the LCR Long-term Revisions (LTR). The LCR LTR would apply to all community water systems (CWSs) and non-transient non-community water systems (NTNCWSs). In this report, the term public water system (PWSs) is meant to refer to both of these categories but not to transient non-community water systems.

Seeing the need for additional input on potential revisions to the Lead and Copper Rule, EPA requested that the National Drinking Water Advisory Committee (NDWAC) form the Lead and Copper Rule Working Group (LCRWG) to consider several key questions for the LCR LTR, taking into consideration previous input. The LCRWG met seven times in 2014 and 2015 to produce this report, and sought input from the NDWAC in advance of the last meeting to understand and address questions the NDWAC might have about the working group's recommendations.

A list of members of the working group is provided in Appendix A. *[add following approval...]* This report was approved by consensus of the LCRWG.]

3. Recommendations for Revisions to the Lead and Copper Rule

The long term revisions to the LCR is an important opportunity for removing sources of lead in contact with drinking water and for reducing exposure to lead from drinking water in the meantime. Creative financing and robust public education also are essential.

The LCRWG offers the following recommendations, based on information provided to the work group and on the work group's own deliberations. The LCRWG considers these recommendations to be an integrated package, not a menu of choices from which some recommendations can be selected and combined with others. This package reflects a concerted attempt to strengthen public health protection, which includes targeting the resources available to PWSs for the greatest public health value. While individual members might differ on specific recommendations, it is the consensus of the work group that this package of recommendations constitutes an improvement over the current LCR. *[Comment from Gail Bingham: This question will be asked again at the June meeting.]*

The LCRWG carefully considered the information and questions posed by EPA in a white paper prepared for the working group. In its deliberations, the LCRWG came to the conclusion that the lessons learned from the implementation of the current LCR warranted a fresh look at the premises of the regulation. To truly solve the problem of exposure to lead in drinking water, the LCRWG concluded that lead-bearing materials should be removed from contact with drinking water to the greatest degree possible, while minimizing the risk of exposure in the meantime. That premise has led to a different paradigm for a revised LCR and, thus, to a somewhat different set of assumptions than underlay questions posed to the working group.

The diagram on page 13 illustrates the conceptual framework of the recommendations that follow. *[Comment from Gail Bingham: What are the pros and cons of the diagram – does it help the reader put the details in context? Does it risk being misleading by leaving important pieces out? What could/should be added?]*

The LCRWG specifically recommends that EPA revise the LCR to:

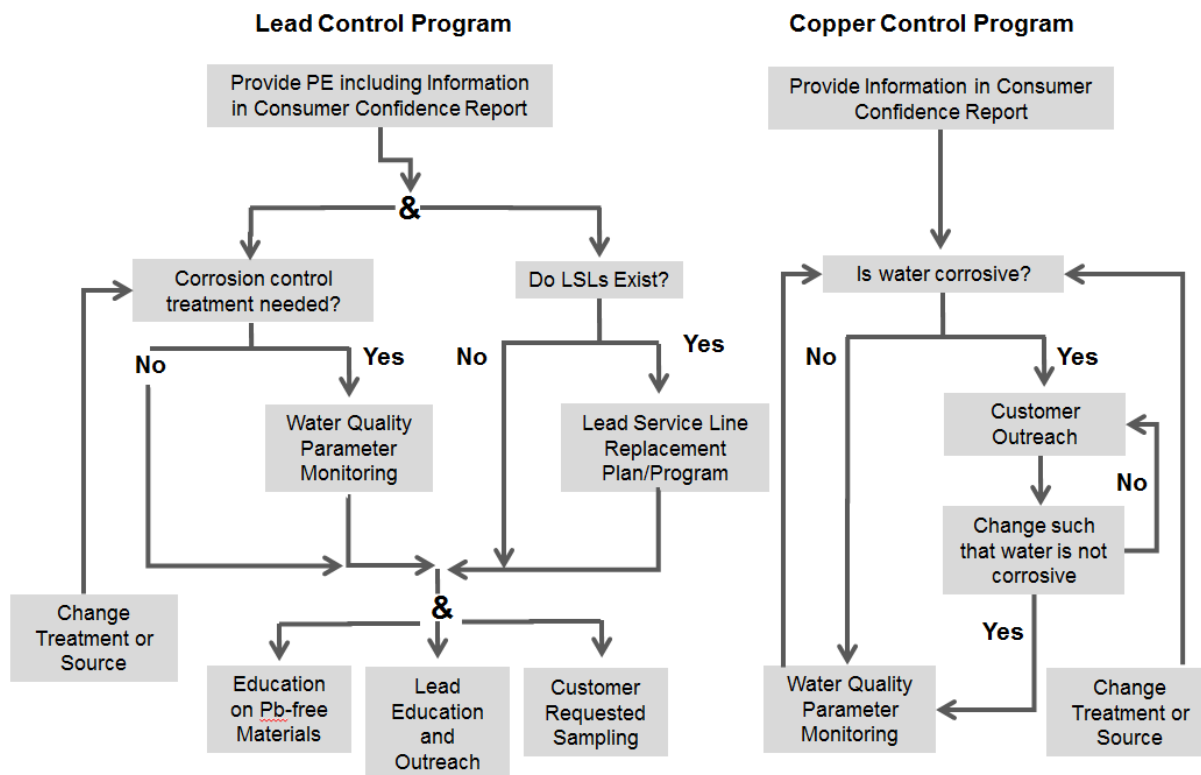
- Require proactive LSL replacement programs, which set replacement goals, effectively engage customers in implementing those goals, and provide improved access to information about LSLs, in place of current requirements in which lead service lines (LSLs) must be replaced only after a lead action level (AL) exceedance and CCT;

- Establishes more robust public education, by creating a national clearinghouse of information for the public and templates for PWSs, by updating the Consumer Confidence Report, adding targeted outreach to consumers with lead service lines and other vulnerable populations (pregnant women and families with infants and young children), and increasing the information available to health care providers and the public;
- Strengthen corrosion control treatment (CCT), retaining the current rule requirements to re-assess CCT if changes to source water or treatment are planned, adding a requirement to review updates to EPA guidance to determine if new scientific information warrants changes;
- Modify monitoring requirements to provide for consumer requested tap samples for lead, utilizes results of tap samples for lead to inform consumer action to reduce the risks in their homes and to [Comment from Gail Bingham: This is a reminder to add points agreed to at the June LCRWG meeting on issues associated with the role of the current lead AL, how tap samples should be used, and related monitoring questions]; tailors water quality parameters to the specific CCT plan for each system, and increases the frequency of WQP monitoring for process control;
- Establish a health-based, household action level that triggers a report to the consumer and to the applicable health agency for follow up;
- Separate the requirements for copper from those for lead and focus new requirements where water is corrosive to copper; and
- Establish appropriate compliance and enforcement mechanisms.

Although leadership by EPA is essential, reduction of exposure to lead in drinking water cannot be achieved by EPA regulation alone. Thus, this report also includes recommendations for renewed commitment, cooperation and effort by government at all levels and by the general public. We urge EPA to play a leadership role not only in the revisions to the LCR but also in educating, motivating, and supporting the work of other EPA offices; federal, state and local agencies and other stakeholders. (See Section 4: Complementary Actions Critical to the Success of the National Effort to Reduce Lead in Drinking Water.)

Overview of Recommended LT-LCR Framework

Note: Compliance steps are embedded throughout the framework



3.1. Replace Lead Service Lines²

Removing the sources of lead in drinking water should be a national goal. More proactive action than has taken place to date is needed to achieve it.

Although success in achieving this goal will require a concerted effort by many and can not be accomplished solely through the authorities provided under the Safe Drinking Water Act, revisions to the Lead and Copper Rule are an important component to achieving this goal and should be structured accordingly. [See Section 4 for recommendations that complement revisions to the LCR.]

The existing LCR has not created sufficient incentives to fully replace LSLs and other sources of lead, because LSL replacement is only required when the lead AL has been exceeded and optimizing CCT is insufficient to bring a system back under the action level. Systems that do not exceed the lead AL will never have to implement a LSL replacement program. Further, the link to action level exceedance does not allow adequate time for a well-planned LSLR program, and a significant unintended consequence where systems have had to implement a LSL replacement program quickly has been an increase in partial LSL replacement.

² 141.2 definition: “Lead service line means a service 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.” For the purpose of this report, the LCRWG includes both full and partial LSLs in this term.

EPA asked the Science Advisory Board (SAB) to evaluate the current scientific data regarding the effectiveness of PLSLR and the review centered around five issues: (1) associations between PLSLR and blood lead levels in children; (2) lead tap water sampling data before and after PLSLR; (3) comparisons between partial and full LSLR; (4) PLSLR techniques; and (5) the impact of galvanic corrosion. The SAB found that the quantity and quality of the available data are inadequate to fully determine the effectiveness of PLSLR in reducing drinking water lead concentrations. The small number of studies available had major limitations (small number of samples, limited follow-up sampling, lack of information about the sampling data, limited comparability between studies, etc.) for fully evaluating PLSLR efficacy.

While recognizing the limits to current data, the SAB concluded that PLSLRs have not been shown to reliably reduce drinking water lead levels in the short-term, ranging from days to months, and potentially even longer. Additionally, PLSLR is frequently associated with short-term elevated drinking water lead levels for some period of time after replacement, suggesting the potential for harm, rather than benefit during that time period. The available data suggest that the elevated tap water lead levels tend to increase then gradually stabilize over time following PLSLR, sometimes at levels below and sometimes at levels similar to those observed prior to PLSLR. The SAB also concluded that in studies comparing full LSLR versus PLSLR, the evaluation periods were too short to fully assess differential reductions in drinking water lead levels. However, the SAB explained that full LSLR appears generally effective in reliably achieving long-term reductions in drinking water lead levels, unlike PLSLR. Both full LSLR and PLSLR generally result in elevated lead levels for a variable period of time after replacement. The limited evidence available suggests that the duration and magnitude of the elevations may be greater with PLSLR than full LSLR.

Taking all of these considerations into account, the LCRWG has concluded that an effective framework for replacement of LSLs would include the following and the LCR should be revised accordingly:

- Requiring all PWSs to establish a LSL replacement program that effectively informs and engages customers to share appropriately in fully removing LSLs, unless they can demonstrate that LSLs are not present in their system;
- Clear guidance, case studies, and templates for LSL replacement programs, including a toolkit of ideas for creative financing strategies;
- Targeted outreach to customers with LSLs, with information about the risks of lead exposure, an offer to test a tap sample, and information about and encouragement to participate in the LSL replacement program;
- Dates by which systems should have met interim goals and completed replacement of all LSLs and PLSLs, without penalty to PWSs for those homeowners who refuse to participate in the replacement program as long as the PWS has made a meaningful effort to work with such a homeowner;
- Creating incentives for understanding where LSLs and PLSLs exist, while making action on full replacement rather than investigation of the location of LSLs and PLSLs the priority;
- Maintaining ongoing-outreach to homeowners where LSLs or PLSLs still exist;
- Implementation of standard operating procedures (SOPs), either from EPA guidance or tailored to the system, that helps define operations that disturb LSLs and practices to minimize disturbance and consumer exposure to lead.
- Stronger programs to educate consumers, and to provide test results of tap samples at the request of consumers; and

- Focus efforts on action to replace LSLs rather than on the time and expense of upfront plan approval and on using simplified reporting to the states so they would only need to intervene when problems arise.
- Prohibition of partial LSL replacements except during emergency repairs. [Comment from Gail Bingham: Added to be explicit about intent of the group – check at meeting.]

3.1.1. Update inventories and improve access to information about lead service lines

Updating and improving access to information about the location of both full and partial lead service lines is both essential to ensuring LSLs are replaced and important for successful, proactive outreach to customers who are most likely to have a LSL.

The LCRWG recommends combining:

- 1) The presumption that a service line put in place prior to the date when lead service lines were prohibited has lead materials unless the PWS has information to confirm that it not, with
- 2) Providing credit to a PWS toward its replacement goals for demonstrating that a service line does not have lead materials.

This approach is intended to create incentives for prompt action to develop an accurate inventory of LSLs and PLSLs in part by being overly conservative initially on the potential existence of LSLs, time to organize an effective replacement program, and an opportunity to take action to replace LSLs rather than devoting time and resources on planning documents that must be approved by the primacy agency.

The LCRWG recognizes that PWSs vary in the amount of information they have about the location of full and partial LSLs.

In addition, the LCRWG recommends that all PWSs should establish a clear mechanism for customers to access information on LSL locations (at a minimum). Detailed public education recommendations for both lead and copper follow in separate sections. With respect to information about LSLs, PWSs should:

- Have outreach materials that indicate that property specific information is available.
- Inform customers who may have LSLs about the risks of partial line replacement, who is responsible for paying for replacing the service line, and the legal basis of that determination.
- Provide information it has about LSLs to existing home owners and residents on request.
- Provide information to realtors, home inspectors, and potential home buyers on request
- Communicate that this information is subject to disclaimer for accuracy based on information available to utility.
- Develop a system to track LSL replacement.

Where a service line serves multiple dwellings or places such as schools or child care centers that have many children, EPA should establish a formula for giving an extra weight or numerical count to these lines in the initial inventory to recognize the additional children that would be affected. [Comment from Gail Bingham: Lynn Thorp asks whether the WG also wants to recommend prioritizing the replacement.]

3.1.2. Establish active LSL replacement programs

Proactive LSL replacement programs by PWSs and their customers are key to moving to a future in which lead is not in contact with drinking water. To accomplish this, the LCRWG recommends replacing the current regulations, in which LSL replacement is required only if a PWS has a lead AL exceedance and after the PWS takes action to operate CCT, because this has not resulted in the complete replacement of many LSLs across the country.³

Instead, a revised LCR should include a requirement that all PWSs with lead service lines prepare and implement a LSL replacement program, along with a combination of changes to the regulatory approach described in this report and supportive actions by other public and private agencies, customers and other stakeholders. Taking this approach has the advantages of making replacement of LSLs something all systems do and of establishing programs that are put in place in an organized and measured way.

Supportive actions include increased funding of federal lead risk reduction programs under the Department of Housing and Urban Development (HUD) to help fund customer-owned portions of LSLs and to consider federal tax deductions for this purpose. Additionally, states should pass legislation requiring inspection, disclosure and/or replacement of LSLs on sale of property, and when lines have been disturbed as part of a renovation. Details on these and other ideas are included in Section 4 of this report.

The LCRWG recommends that EPA include the following revisions to the LCR:

1. Goal: PWSs will work with their customers to implement full replacement of all lead service lines in their service areas according to the milestones outlined in Table 1. The LCRWG urges PWSs work with their customers to replace LSLs in their service areas more quickly, but recognizes that the recommended approach of replacing LSLs in all PWSs with LSLs adds a new and potentially costly requirement for utilities and their customers with LSLs who currently are not and may not ever be triggered into a LSLR program under the current rule.
2. Interim Milestones: PWSs that identify LSLs in their inventory should be required to perform targeted outreach to customers on the inventory of LSLs and to work with them to replace LSLs according to a sequence of three-year milestones,⁴ beginning 36 months after the effective date of a revised LCR. Milestones would be set at a faster pace in earlier years and would recognize progress may be more difficult to achieve in later years with those LSLs that remain at that time. Tables 1 and 2 provide an illustration of this concept. PWSs are encouraged to contact a larger number of homeowners than needed for compliance, since some homeowners may fail to reply or may refuse to participate.
3. Replacement Credit: The following actions can be counted toward the cumulative replacement requirement:
 - Full LSL removal
 - Confirmation that an LSL included in the initial inventory is not lead.

PLSLR will not be counted toward this requirement. Lack of response or refusal to participate by the customer also will not count toward replacement milestones.

³ EPA estimates that there were approximately 10.5 million LSLs in 1988 before the promulgation of the LCR and approximately 7.3 million LSLs now.

⁴ Three years is a standard reporting timetable for drinking water regulations.

4. *Targeted Outreach*: EPA should create a checklist in the rule of approved outreach methods for contacting customers with LSLs and inviting them to participate in the utility’s LSLR program. Table 2 provides examples. EPA also should provide guidance and/or templates for these methods to encourage best practices in customer communication. For compliance purposes, the revised LCR should require that a PWS individually notify customers with known or possible LSLs describing the risks of lead in drinking water, specifically inviting them to participate in the LSLR program, and clearly describing the terms of the program, and how to follow up. If the customer does not respond or chooses not to participate, the PWS must follow up with another invitation at least every three years and always when there is a new customer at that address.
5. *Control and Responsibility*: The revised LCR should require PWSs to clearly state how the PWS defines ownership of LSLs, who has what financial responsibility for the replacement, what the legal basis is for that determination and any financial assistance programs that may be available.
6. *Planning and Financing Options*: [Comment from Gail Bingham: Draft language provided by Bob Steidel per assignment at April LCRWG meeting. A few members weren’t sure how this new section fits here and/or whether it goes into detail more appropriate to the local level.] EPA should provide a template and guidance for planning LSL replacement programs, including reference to options to assist customers replace their portion of lead service lines. Small systems may wish to refer to a national information source, such as one provided by EPA; large systems may wish to tailor such information to their circumstances. Financial assistance and affordability [comment from Gail Bingham: Note: this term has specific meaning under SDWA – is it applicable here or does it cause confusion?] options EPA may want to describe in guidance and PWSs could consider include but are not limited to:
 - a. Rate design considerations:
 - i. Low rates for low volumes
 - ii. Household size-based rates
 - b. Non-rate policies
 - i. Budget billing
 - ii. Fixture retrofits and plumbing assistance by the PWS
 - iii. Service line replacement and insurance programs not provided by PWS
 - iv. Direct assistance, emergency bill payment relationships
 - v. Fixture retrofits and plumbing assistance by NGO organizations providing affordable housing
 - vi. Subsidies including LSL / connection replacement costs associated with street, sidewalk, and other repairs not related to drinking water infrastructure
 - vii. On-bill financing provided by the PWS
 - c. Funding guidance
 - i. EPA’s Financing for Environmental Compliance – Water
 - ii. Tools for Financing Water Infrastructure
 - d. Funding sources beyond rate revenue:
 - i. EPA’s Drinking Water State Revolving Fund (DWSLF)
 - ii. USDA’s Water and Environmental Programs, U.S. Department of Agriculture, Rural Development
 - iii. HUD’s Community Development Block Grant Program – U.S. Department of Housing and Urban Development
 - iv. EPA Targeted Grants to Reduce Childhood Lead Poisoning
 - v. HUD Healthy Homes Technical Studies
 - vi. HUD Office Healthy Homes and Lead Hazard Control Lead Hazard Reduction Demonstration Program
 - vii. HUD Health Homes Initiative Lead Elimination Action Program

viii. HUD Office of Healthy Homes and Lead Hazard Control Lead Hazard Control Lead Technical Studies Grant Program

The LCRWG recommends that: [comment from Gail Bingham: Bob S. will have a handout at the meeting to clarify these suggested recommendations.]

- EPA clearly state the prioritization of LSL replacement within the planning priorities of the EPA drinking water infrastructure needs assessment as a subcategory of transmission and distribution, so that the national estimates of necessary water infrastructure needs include this new mandate..
 - EPA seek an increase of approximately \$10 million to the base Drinking Water SRLF appropriation (approximately 0.5% of the current allotment received by the top 15 states) each year of the first three years after adoption of the revised LCR, reserving those funds for PWSs to use for LSL replacement pilot programs to place into operation the funding alternative methods also being recommended to EPA. Those pilot programs would further refine current recommendations and develop new methods of service delivery for LSL / connection replacement.
 - Regardless [comment from Gail Bingham: Steve E.S. asks whether this is appropriate for individual PWS to be doing in the context of a regulation.] of the programs the PWS is required to create to work with customers to replace LSL / connections, a recommendation to EPA is prior to implementation of a new mandate from a changed LCR to replace LSL / connections, the PWS determine the affordability for the customers within their service area. PWSs may use methodology from Manual M1 (Principles of Water Rates, Fees, and Charges Rate Manual) or Raftelis (Water and Wastewater Finance and Pricing, 4th Edition 2015) or a combination of both, and that the method used determines household relative affordability (EPA (National Drinking Water Advisory Council 2003). The governing board of the PWS will adopt household relative affordability as policy and if the PWS rates applied to the customers exceed that adopted policy, the prioritization of needs and expense will be funded as determined by that governing board.
7. *Operations and Customer Engagement:* EPA also should provide guidance on PWS policies and procedures for how to engage customers in full lead service line replacement and to inform them on appropriate risk reduction measures. PWSs should adopt templates provided in guidance by EPA or, for larger systems, their own standard operating procedures (SOPs) and make them available to their customers and the primacy agency for:
- a) planned capital projects by the PWS that would require:
 - Prior notification (e.g., 45 days prior to planned main replacement or repair) - Contact letter to affected households likely to have lead service lines, providing information about lead service lines, associated risk, risk reduction options, and full-lead service line replacement options.
 - Reminder of flushing post LSLR (e.g., 48 hours prior to actual field work affecting structure) -- Door hanger (or alternative direct contact) with information on flushing and POU devices immediately after lead service line replacement.
 - b) emergency main and service line repairs by the PWS that would define how to manage potential disturbance to LSLs safely:
 - Direction to information on lead service lines, associated risk, risk reduction options, and full-lead service line replacement options.

- Door hanger (or alternative direct contact) with information on flushing and POU devices immediately after lead service line replacement.
 - c) flushing of service lines after lead service line replacement:
 - flush outside hose bib
 - Initial flush followed by house flush by homeowner or plumber using multiple taps to maximize water velocity
 - Information on proper use of filters when lead levels might be high
 - d) Requiring that when the activities of other utilities (e.g. power, cable) affects water service lines or water mains to: [comment from Gail Bingham: Is the recommendation that the PWS provides information both to the other utility and to the customer? How is the PWS expected to know about the activity? Needs further discussion. Also, what should be required and what should be in guidance?]
 - Provide information to the other utility about how to manage potential disturbances safely
 - Alert affected residents to information on flushing and the proper use of filters when lead levels might be high
8. A revised LCR also should require that *[insert intended category]* water systems [comment from Gail Bingham: Community? NTNCWS? Transient non-community systems?] that own their own pipes (e.g. hospitals, churches, schools, jails, etc.) should replace lead piping within XX [this is a placeholder] years of the effective date of the revised LCR.

The LCRWG discussed and agreed that EPA guidance should encourage PWSs to make every effort to ensure that LSL replacement provides equal protection to low income customers (or rental units with low income residents), people of color and others protected by civil rights law and policy. Environmental justice and civil rights considerations are particularly important in those jurisdictions where the PWS requires the property owner to pay a share of the costs of removing the LSL. Making environmental justice a priority can be achieved through creative financing programs for low-income customers and setting priorities for which neighborhoods are targeting first for LSLR to ensure equal treatment of low income neighborhoods.

The LCRWG also discussed but did not agree that the definition of control as ownership should be changed in the revised LCR. [Comment from Gail Bingham: Yanna Lambrinidou asks that the issue of control be reconsidered.] In the current lead and copper rule, when a system exceeds the LAL, EPA requires water systems to replace only that portion of the LSL that it owns. This is based on EPA’s current interpretation of the term “control” in the definition of public water system as limited to ownership. Some members of the LCRWG urged that the current definition of control as “ownership” should be replaced with a requirement that PWSs must replace the entire LSL, where they have the authority to “replace, repair, or maintain” the line or where they have other forms of authority over the LSL. However, the LCRWG also recognized that some utilities are prevented by law from spending public funds on private property and that gaining physical access to private property poses significant legal issues when a property owner objects.

The LCRWG does agree that the revised LCR should require PWSs to inform customers about the scope of their responsibility with regard to LSL replacement and the legal basis for that decision.

3.1.3.LSL Compliance

3.1.3.a LSL Replacement Compliance

Recordkeeping:

- Inventory of LSLs [comment from Gail Bingham: Yanna Lambrinidou suggests that PWSs keep records of customer refusals – e.g., add a form to the outreach materials for customers to send back. (Can't force people to return them, but keep the forms of those who do.)]

Reporting: At the end of each three year period, each PWS must provide to the primacy agency:

- Certification of the outreach conducted (see above for outreach requirements);
- Report on the change in the number of LSL removed from the inventory with better information;
- Report on the number of full LSL removed; and
- Report on locations where the utility side LSL was removed, but the homeowner refused to replace private portion

Violations: [comment from Gail Bingham: Yanna Lambrinidou suggests adding a violation if the PWS has not met the LSL replacement target.]

- Failure to conduct required outreach;
- Failure to step up intensity of outreach if 3-year LSL replacement target has not been met;
- Failure to provide on-going outreach (at least every 3 years) to locations with full or partial LSL
- Outreach materials do not meet the content requirements of the rule

3.1.3.b Operations and Customer Engagement Compliance

CWS must maintain records of who was notified, when notice was given, and content of notice for each capital project. (for 7a and 7b)

Violations:

- Lack of timely notice to customer that LSL removal is scheduled
- Notice materials do not meet rule content requirements

CWS also must develop SOP, and maintain records that it was provided to all utilities conducting activities which may impact LSL (for 7d)

Violation:

- CWS has not developed an SOP (or adopted an SOP template available on the National Clearinghouse) or not provided it to other utilities

3.2. Develop Stronger Public Education Requirements and Programs for Lead and LSLs

Given the public's role in the shared responsibility nature of the LCR, notifying and educating the public about lead in drinking water is important for risk reduction. Public education about the risks of lead in drinking water also is important regardless of whether LSLs are present, since lead can be present in other premise plumbing materials. Moreover, targeted outreach is a key to the success of LSL removal programs. The current LCR does not adequately focus on creating on-going opportunities to educate customers on the risks of LSLs or on opportunities to replace them, especially when action is most likely, e.g. at the sale of a home.

The objectives of public education programs should include consumer understanding of: 1) the risks of lead in drinking water; 2) the likelihood that the water in one's home may contain lead; 3) the LCR as a "shared responsibility" rule; and 4) the availability of additional resources that consumers can use to better minimize their exposure to lead.

Although the LCRWG was briefed on and has experience with public education requirements and practices, it does not include members whose specific area of expertise is consumer-centered risk communication. Thus, the LCRWG generally recommends that public education programs for lead should move away from past practices of one-way communication from "experts" to the "public" toward newer concepts of risk communication that involve sustained, multiple, two-way channels of ongoing communication and partnership with the public.⁵ EPA should consult with those with such expertise and encourage and apply best practices in effective ways to communicate with the public.

Communication in languages appropriate to the demographics of the community, in clear terms understandable by the public, and with engaging, reader-friendly graphics, photos, and video all help achieve greater understanding. Outreach programs and materials can be improved by involving people with diverse, and consumer-oriented expertise and perspectives, including consumer-centered risk communication experts, community members with extensive experience with lead in water including individuals not necessarily affiliated with an organization, lead/copper corrosion experts, grassroots public-health workers, and staff of PWSs, state and federal regulatory agencies and public health agencies. This information can and should be conveyed in different ways and through different communication channels, tailored to the specific circumstances.

Thus, with these and other considerations in mind, the LCRWG recommends that EPA, in consultation with the aforementioned stakeholders and drawing on principles of consumer-centered risk communication:

- Establish an easily accessible, national clearinghouse of information about lead in drinking water to serve the needs of the public and of public water systems (section 3.2.1).
- Require information be sent to all new customers on the potential risks of lead in drinking water (section 3.2.2)
- Revise the current CCR language to address lead service lines and update the health statements (section 3.2.3). Add requirements for targeted outreach to customers with lead service lines (section 3.1.1).
- Strengthen requirements for public access to information about lead service lines, tap monitoring results, and other relevant information (section 3.2.4).
- Expand the current requirements for outreach to caregivers/health care providers of vulnerable populations (section 3.2.5)

In addition, the LCRWG recommends that EPA consult with the aforementioned experts and stakeholders about methods that would increase public awareness of and motivation to learn about the effects of lead in drinking water and the benefits of removing these materials and/or taking regular precautions when

⁵ Resources include: 1) EPA's "Risk Communication in Action" (<http://nepis.epa.gov/Adobe/PDF/60000I2U.pdf>) ; 2) EPA's "7 Cardinal Rules of Risk Communication" (http://www.wvdhhr.org/bphtraining/courses/cdcynergy/content/activeinformation/resources/epa_seven_cardinal_rules.pdf); and 3) Education & Communication WG Report 2010; National Conversation on Public Health and Chemical Exposures (http://www.resolv.org/site-nationalconversation/files/2011/02/Education_and_Communication_Final_Report.pdf)

cooking or drinking, regardless of whether LSLs are present or there has been a lead AL exceedance. Based on this advice, EPA should take small systems into account and also consider whether such methods should be included in guidance or in revisions to the LCR.

3.2.1. National Lead in Drinking Water Clearinghouse

The LCRWG recommends that EPA take the lead, working with other partners to establish a national, accessible information clearinghouse. The LCRWG suggests that this information clearinghouse include a website, that the materials on the web site be accessible for distribution through the Safe Drinking Water Hotline for those who may not have internet access, and that EPA investigate and apply newer communication technologies and ideas for interactive or other innovative means of communication with the public about lead in drinking water (e.g. social media methods and outreach programs). The clearinghouse should include information in multiple languages, in clear terms understandable by the public, and should include engaging, reader-friendly graphics, photos, and video. In developing this clearinghouse, EPA is encouraged to consult people with diverse, and consumer-oriented expertise and perspectives, including consumer-centered risk communication experts, community members with extensive experience with lead in water including individuals not necessarily affiliated with an organization, lead/copper corrosion experts, grassroots public-health workers, and staff of PWSs, state and federal regulatory agencies and public health agencies.

Such a clearinghouse would be intended for use by the general public, PWS's, public health agencies, and health professionals.

- It should include information and educational materials for the public that the public could access directly and that PWSs could use to meet many of the public education requirements of the LCR.
- It also would include guidance and templates, particularly for small systems, on SOPs for compliance with the LCR (e.g. templates for communicating lead monitoring results to individual customers, template for explaining to customers how to obtain information on whether their service line could be lead, etc).
- Principles and guidelines for best practices in public education would be important for developing the content of the materials.
- Case examples of how communities have been successful in lead inventory updates and removal programs, information about funding sources, and contacts to other relevant agencies also should be included.
- Further, EPA should consider best practices in methods for achieving greater public awareness of the clearinghouse so that it reaches as many people as possible.

The web site should include the following information:

Health risks

- Clear and prominent statement that no level of lead in drinking water is safe for human consumption and that a short-term exposure to a young child can result in permanent harm to the brain if the levels are high enough.
- Clear and distinct language on the health risks of consuming lead in drinking water
- Identification of the most vulnerable populations
- Importance of drinking water plumbing as a lead source
- How to have BLLs checked and limitations of testing
- How to have water tested and limitations of testing
- List of labs for testing water other than the utility and what to ask for in terms of number and size of bottles, diameter of mouth of bottles, analysis that measures lead particles, etc.

Forms of lead in water and health risk implications

- Soluble
- Particulate
- Unpredictability of lead release

Sources of lead in drinking water

- LSLs
- Other lead-bearing plumbing
- Scale on internal plumbing that can be a source of lead from present or past LSLs

Identification of service line material

- How to recognize a pipe that is made of lead (and when not to check due to age of home)
- What to do about galvanized pipe and why it is a potential source of lead

For homes with LSL

- LSL ownership
- Difference between full and partial lead service line replacement (physically and in terms of health risks)
- Benefits to full LSL replacement
- Actions to take if you have a partially replaced LSL
- Available methods for LSL removal
- Opportunities for removal, approximate cost, and financing options
- Overall benefits to the community of removing LSLs fully (lower treatment costs, better community health, environmental, etc.)
- Where applicable, requirements for notification during real estate transfer or new rental

Health-protective actions

- Precautionary water-use practices
- Role of filters and proper maintenance of them if they are used
- Replacement of leaded plumbing with lead-free plumbing

Additional information

- How to contact your utility and request a LSL inspection and/or water test
- Where applicable, reference to utility-specific website with local lead-related documents and data (e.g. Consumer Confidence Reports (CCRs), sampling protocol used for LCR compliance, lead-in-water test results, etc.)
- What you need to know about lead in water in schools and day care centers (it is not regulated, and link to national website that provides more information)
- Reference to a national website that provides a video version of basic educational information, including information on how the LCR works (with minority language versions)
- Where to get more information on drinking water, on lead in water, and on lead in general

3.2.2. Outreach to New Customers

[Comment from Gail Bingham: Yanna Lambrinidou and Steve Estes-Smargiasi suggest this section be added.]

The LCRWG recommends that a revised LCR require CWSs to provide information to all new customers in a letter or via other direct means on the potential risks of lead in drinking water.

The outreach materials should include information about the potential for lead from plumbing materials to contaminate drinking water even when a CWS meets the LCR LAL, to contaminate drinking water in

homes with and without LSLs, and to pose chronic and acute health risks to vulnerable populations. The specific information to be covered in those materials could be determined by a diverse group of experts as described in the introduction to Section 3.2 above and in Section 4 below. Although the LCRWG defers to such a group, it suggests that at a minimum the following topics be covered:

1. Information about lead in drinking water (its sources, variable and erratic release, and wide range of lead concentrations)
2. Information about the health effects of lead in drinking water (including chronic and acute health risks)
3. Information about the LCR's shared responsibility regime
4. Actions the CWS is taking to minimize lead in drinking water
 - CWSs with LSLs would mention their proactive LSL replacement program
5. Steps consumers can take to reduce exposure to lead in drinking water
 - In addition to a list of actions like the ones mentioned in the current Rule, CWSs with LSLs would spell out how consumers in homes with a LSL can participate in their proactive LSL replacement program
6. Phone numbers and online links for additional information (including a link to EPA's online National Clearinghouse)

The outreach to new customers should be delivered within 30 days or with the first bill.

3.2.3. Revise the Current CCR Language

The CCR is a necessary but not sufficient source of information for the public. It can provide general information, but is not designed to be frequent or detailed enough for all public education purposes.

All community water systems (CWSs) should continue to include a statement about lead in their CCR. There may be circumstances (e.g. a subdivision built entirely after January 2014 when "lead-free" requirements came into effect), where a CWS can demonstrate that there are no lead-bearing materials in contact with drinking water. EPA may want to consider allowing the primacy agency to waive this CCR language requirement if an entire CWS can meet this criterion.

The LCRWG recommends that the CCR language should be strengthened to include:

- Public health statements updated to reflect current understandings that there is no safe level of lead and a summary of the health effects, that this risk pertains to everyone, and that some individuals are particularly vulnerable;
- A link to the national clearinghouse should be added to the CCR for all CWSs;
- Recognition that a CWS's compliance with federal regulations does not guarantee what level of lead (lower or higher) might be found at the tap in a particular home; and
- The message that customers play an important role in protecting themselves from exposure to lead.

In addition, the work group recommends that PWSs where full or partial lead service lines exist (or are presumed to exist until an inventory demonstrates otherwise) also add information about what a lead service line is and how to contact the utility for information about how to find out if you have one and why you should replace it.

Further, the LCRWG recommends that the following redraft of the CCR be considered as a starting point for incorporating the elements listed above, to be reviewed by a diverse group of experts involving people with diverse, and consumer-oriented expertise and perspectives, including consumer-centered risk

communication experts, community members with extensive experience with lead in water including individuals not necessarily affiliated with an organization, lead/copper corrosion experts, grassroots public-health workers, and staff of PWSs, state and federal regulatory agencies and public health agencies.

Important Information from EPA about Lead *If lead is present in your drinking water, it ~~elevated levels of~~ can cause serious health problems, especially for pregnant women and young children. Lead can affect children’s brains and developing nervous systems, causing reduced IQ, learning disabilities and behavioral problems. Lead is also harmful to adults. Lead in drinking water is primarily from materials and components associated with ~~service lines and~~ home plumbing and service lines (the pipe connecting your home to the water main). ~~(System name) is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components.~~ Contact us for information about lead service lines, how to find out if you have one and why you should replace it. [Last sentence for systems with LSLs.]*

When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. Protecting you against exposure to lead is a shared responsibility. Your water utility is required to minimize the corrosivity of the water. However, because every home is different, the amount of lead in your tap water may be lower or higher than the monitoring results for your public water system as a whole. You can take responsibility for identifying and removing lead materials within your home plumbing and taking steps to reduce your family’s risk. If you have lead service lines or lead-bearing materials in your home, are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline at 1-800-426-4791 or www.epa.gov/safewater/lead. [Insert new national web site link]

3.2.4. Strengthen Requirements for Public Access to Information

The LCWWG supports the public’s right to know about the quality of their water and considered various options to increase the public’s access to data related to lead and copper.

Under the current rule, the PWS is only required to make publicly available through the Consumer Confidence Reports (CCR) that “90th percentile value of the most recent round of sampling and the number of sampling site exceeding the action level.” 40 CFR 141.153. In many jurisdictions, a concerned consumer may be able to obtain or view a redacted version of the complete sampling data set but this approach is time-consuming and burdensome on the PWS (or the state) and the community. EPA receives only a summary of the sampling results.

As the LCRWG evaluated different approaches, we kept in mind EPA’s Office of Enforcement and Compliance Assurance (OECA) five principles for highly effective regulations and that OECA is working with regulatory programs to evaluate new and revised rules against these principles. Principle 4 calls for rules to “leverage accountability and transparency by providing the government and the public with real-time access to quality information on regulated entities” emissions, discharges and key compliance activities and outcomes.” OECA identified two tools to accomplish this:

- Electronic reporting to the government.
- Public accountability via websites, paper/electronic mailings, and other ways to provide the public and stakeholders (e.g., customers, ratepayers) with compliance information.

The LCRWG encourages EPA to use the SDWIS-Prime [comment from Gail Bingham: Define in a footnote?] data system⁶ that is under development to meet the first provision of the above goal. Electronic reporting from utilities to a centralized data system would allow the public to access data from the State or EPA in a coordinated manner and allow for consistent access to all water quality data, not just data for lead and copper.

Until such time as the new data system is in place, though, the LCRWG believes that water systems should increase the availability of data to the public. This would include:

- The number of samples over the Household Action Level (described in Section 3.5 below) in the last monitoring period, the highest level found during the last monitoring period, and the median levels as well as the current “system action level” (renamed from the current action level [comment from Gail Bingham: Review based on final monitoring recommendations (whether there will be a recommended system action level requirement and, if so, what?)]).
- Requiring water systems to include WQP-related information on their webpage, or in the CCR or some equally accessible manner (e.g., CCT treatment, approved WQP ranges, WQP results from the last monitoring period [comment from Gail Bingham: Review based on final monitoring recommendations.])
- Encouraging [comment from Gail Bingham: Is this in guidance?] water systems to post additional information on their webpages such as:
 - Public education materials (and link to National Clearinghouse)
 - Sampling protocol the water system provides to customers to use when collecting lead sample and any variations from EPA recommendations.
 - Individual sampling results (with appropriate privacy provisions such as address redaction)
 - Inventory (such as a map) of confirmed and presumed lead service lines

Where a community has lead service lines, EPA should require PWSs provide a public statement of lead service line ownership and the legal basis of said determination. (See section 3.1.2, point 5 “*Control and Responsibility.*”)

3.2.5. Routine outreach to caregivers/health care providers of vulnerable populations

[Comment from Gail Bingham: Yanna Lambrinidou and Steve Estes-Smargiasi suggest the following additional section.]

The LCRWG recommends that a revised LCR require CWSs to institute locally appropriate and ongoing public education programs targeted at caregivers and health providers of the populations most vulnerable to lead in drinking water (i.e., fetuses, infants, young children, and children with elevated BLLs). The intent of such outreach is to raise awareness among caregivers and health providers about the health risks of lead in drinking water, easy steps to prevent exposure, and the availability of EPA’s online National Clearinghouse for further information. It is expected that public education messaging in service areas with LSLs will differ from public education messaging in service areas without such lines.

⁶ SDWIS is a database for storage about drinking water systems. The federal version (SDWIS/FED) stores the information EPA needs to monitor approximately 156,000 public water systems. The state version (SDWIS/STATE) is a database designed to help states run their drinking water programs. SDWIS-Prime is an upcoming version of this program. The website for SDWIS is located here:

<http://water.epa.gov/scitech/datait/databases/drink/sdwisfed/index.cfm>

SDWIS Reports:

<http://water.epa.gov/scitech/datait/databases/drink/sdwisfed/howtoaccessdata.cfm>

The LCRWG also recommends that a revised LCR require CWSs to cooperate in locally appropriate public education programs targeted at caregivers and health providers of the populations most vulnerable to lead in drinking water (i.e., fetuses, infants, young children, and children with elevated BLLs). The intent of such outreach is to raise awareness among caregivers and health providers about the health risks of lead in drinking water, easy steps to prevent exposure, and the availability of EPA’s online National Clearinghouse for further information. It is expected that public education messaging in service areas with LSLs will differ from public education messaging in service areas without such lines.

Under the current Rule⁷, there is no required outreach other than the CCR except when a CWS exceeds the LAL; the CWS is then required to implement a public education program that covers the following topics (EPA 2008,

<http://water.epa.gov/lawsregs/rulesregs/sdwa/lcr/upload/Lead-and-Copper-Rule-Public-Education-Other-Public-Information-Requirements-for-Community-Water-Systems-Fact-Sheet.pdf>):

1. Information about the LAL exceedance
2. Information about health effects of lead (general)
3. Sources of lead in the environment (general)
4. Steps to reduce exposure to lead in drinking water (e.g., flush, avoid hot tap water, use alternative sources of drinking water, replace lead-bearing plumbing fixtures, conduct water testing, conduct BLL testing, do not boil drinking water for lead elimination)
5. Actions the CWS is taking to address the contamination
6. Phone numbers and online links for additional information

During the exceedance of the LAL, this information is to be delivered annually to facilities and organizations likely to be visited by pregnant women, infants, and young children (i.e., local public health agencies; public and private pre-schools, schools, or school boards; Women Infants and Children (WIC) and Head Start programs; public and private hospitals and medical clinics; pediatricians, obstetricians-gynecologists, and midwives; family planning clinics; local welfare agencies; licensed childcare centers). The current LCR suggests that the delivery of the information take place through a broad range of communication vehicles, including:

- Public Service Announcements
- Paid advertisements
- Information displays in public areas
- Emails to customers
- Public meetings
- Information delivery to every household as well as multi-family homes
- Other methods approved by the primacy agency (here we would include social media)

In conducting outreach to caregivers and health care providers it is important that the message be provided by an organization or individual that carries credibility with those audiences. The LCRWG suggests the way to best ensure that caregivers and health providers hear and respond appropriately to information about lead and drinking water is for water suppliers to participate in joint communication efforts, lead by state health departments, state lead poisoning prevention agencies, and state drinking water primacy agencies. This outreach should be targeted to individuals, organizations and facilities likely to be visited by the vulnerable populations of pregnant women, infants, and young children:

1. local public health agencies;

⁷ See CFR 141.85(b)(2).

2. public and private pre-schools, schools; Women Infants and Children (WIC) and Head Start programs;
3. public and private hospitals and medical clinics;
4. pediatricians, obstetricians-gynecologists, and midwives;
5. family planning clinics;
6. local welfare agencies; or
7. licensed childcare centers.

The outreach efforts should include the following types of information: [comment from Gail Bingham: Is this in addition to what is in 141.85(b)(2)?]

1. Information about lead in drinking water (its sources, variable and erratic release, and wide range of lead concentrations)
2. Information about exposures routes of lead in drinking water to different vulnerable populations, including bottle-fed infants
3. Information about lead service lines
4. Information about the LCR's shared responsibility regime between water system and customer
5. Actions that CWSs typically take to minimize lead in drinking water, or the actions of the specific system participating in the outreach
6. Mechanisms for linking patients or customers to their specific PWS
7. Steps consumers can take to reduce exposure to lead in drinking water, including removal of LSL
8. Phone numbers and online links for additional information (including a link to EPA's online National Clearinghouse)

Examples of communication vehicles might include: [comment from Gail Bingham: Is this in addition to what is in the current LCR?]

- Development and routine delivery of a joint communication from the CWS (or a group of CWSs) and the City/State to:
 - * Health providers (e.g., OBGYNs, pediatricians, midwives)
 - * Childhood lead poisoning prevention professionals/organizations
 - * Professionals at licensed daycare centers and schools
 - * Listservs/organizations for pregnant women/parents of infants (e.g., local listservs, environmental health groups, La Leche League, etc.)
- Delivery of educational materials during any water-related work at customer homes
- When lead-in-water levels at individual homes test above the HAL, delivery of information to a) the residents at the home and b) City/State health departments. These materials ought to cover information prescribed in the current LCR for public outreach during a LAL exceedance as well as:
 - * The lead level detected at the specific home
 - * What this level means in terms of health risk to vulnerable individuals
 - * If the CWS determines that the home has a LSL, information about how to participate in the CWS's proactive, full LSL replacement program.

The LCRWG also recommends that EPA, working with CDC, HHS and HUD develop guidance (and make it available through the National Clearinghouse) on how to develop and deliver effective communication efforts to caregivers and health care providers focusing on ways those individuals and groups can reach pregnant women, parents of infants and young children and those who care for them. The audience for those materials would be state primacy agencies, state or local health departments, and state or local lead poisoning prevention agencies, as well as CWSs.

To support CWSs in the development of feasible, locally appropriate, and successful public outreach programs targeting vulnerable groups on a routine basis, the LCRWG recommends the following: that the diverse group of experts EPA may convene for the development of consumer-centered public education messaging and materials (see introduction to Section 3.2), also develop guidelines and best practices that CWSs can use to create proactive risk communication programs. Echoing extant principles and understandings of effective risk communication,⁸ we imagine such programs to involve robust collaboration between CWSs, many of the local public health agencies and organizations listed above, as well as local childhood lead poisoning prevention groups (State-funded and grassroots), environmental health organizations, and key community leaders (e.g., advisory neighborhood commissioners).

Education of public health and health care providers on lead and water issues

The LCRWG had extensive discussions about the frustration that members of the group had that many in the public health community minimized the risk of lead exposure from drinking water, placed a lower priority on actions to reduce that risk, and frequently provided incomplete or conflicting information to members of the public or patients. This made and continues to make the work of water professionals in motivating appropriate action by customers more difficult. Those in the health sector are highly regarded, and viewed as knowledgeable about all health related topics. Customers will look to them for advice and to validate what they hear from their water provider. Efforts by water systems to reach out to their customers must be appropriately re-enforced by those in the health sector if those efforts are to be successful.

The LCRWG recommends that EPA, CDC, HHS and HUD conduct training and outreach to local health agencies, medical professionals and local and state lead poisoning prevention agencies on:

1. Information about lead in drinking water (its sources, variable and erratic release, and wide range of lead concentrations)
2. Information about exposures routes of lead in drinking water to different vulnerable populations, including pregnant women, infants and young children
3. Information about lead service lines
4. Information about the LCR's shared responsibility regime between water system and customer
5. Actions that CWSs typically take to minimize lead in drinking water
6. Steps consumers can take to reduce exposure to lead in drinking water, including removal of LSLs
7. Phone numbers and online links for additional information (including a link to EPA's online National Clearinghouse)

The LCRWG also recommends that EPA work with CDC to incorporate in the CDC's website, educational materials, and materials used by CDC-funded childhood lead poisoning prevention programs

⁸ Lundgren, R. E. and A. H. McMakin. 2013. *Risk Communication: A Handbook for Communicating Environmental, Safety, and Health Risks*. Hoboken, NJ: John Wiley & Sons, Inc.

Risk Communication in Action, <http://nepis.epa.gov/Adobe/PDF/60000I2U.pdf>

Communicating about Lead Service Lines,

<http://www.awwa.org/Portals/0/files/resources/publicaffairs/pdfs/FINALLeadServiceLineCommGuide.pdf>

Strategies to Obtain Customer Acceptance of Complete Lead Service Line Replacement,

<http://www.awwa.org/Portals/0/files/legreg/documents/StrategiesforLSLs.pdf>

National Conversation on Public Health and Chemical Exposures: Education and Communication Work Group Report,

http://www.utmb.edu/cet/downloads/Natl_Conv_Edu_Comm_WorkGroup%20Report.pdf

Advancing Collaborations for Water-Related Health Risk Communication,

<http://www.waterrf.org/PublicReportLibrary/91145.pdf>

nationwide, accurate and up-to-date information about lead in drinking water (its sources, variable and erratic release, wide range of lead concentrations, chronic and acute health risks, the LCR's shared responsibility regime, steps to prevent exposure).

3.2.6. Public Education Compliance

[Comment from Gail Bingham: Check against new sections.]

3.2.6.a Compliance for CCR

Recordkeeping, reporting and violations: Same as in the current CCR rule, with updated content.

3.2.6.b PE Compliance for Public Access to Information [comment from Gail Bingham: Is this worded correctly?]

PWS must provide the public access to information about:

- Number of samples over the Household Action Level, median and highest level found in the last monitoring period
- CCT treatment, approved WQP ranges and WQP results from the last monitoring period

Violations:

- Failure to make this information available to the public

3.3. Improve Corrosion Control

Corrosion Control Treatment (CCT) involves the addition of chemicals (e.g. orthophosphates or silicate) to create a barrier between the pipes and the drinking water, or to modify drinking water chemistry (such as pH and hardness) to inhibit the potential for corrosion. The concept is to manage the treatment system to reduce corrosion (and, thus, the release of metals such as lead and copper) from the distribution system and premise plumbing.

Under the current LCR, PWSs serving more than 50,000 people were required to work with their primacy agency (typically the state) from 1994 to 1997 to designate and install optimal corrosion control treatment. Systems serving 50,000 people or less must optimize corrosion control treatment only if the results of lead and copper tap sample exceed the action levels. A PWS exceeds the lead AL if ten percent or more of the tap samples collected are greater than the 15 ppb action level.

In evaluating CCT choices, a PWS must consider list of assessment parameters; and, as part of the approval of a PWS CCT plan, the state also approves a shorter list of process control parameters applicable to that system to demonstrate that the selected treatment is being properly operated over time. For purposes of this report, the term water quality parameters (WQPs) applies to these latter process control measures. Recommendations concerning WQPs are included in Section 3.4.

Based on the experience with current LCR requirements provided to this work group and shared by work group members, the LCRWG has concluded the following:

- CCT remains an important component of the LCR, in that it is intended to achieve a water quality that minimizes dissolution of lead and copper in water.

- Effective CCT varies based on the specific conditions from system to system. Increased knowledge about CCT since promulgation of the current LCR, if applied today, could lead to improvements in CCT in some systems. Thus, PWSs and their primacy agency should apply the most current science, tailored to the unique circumstances of each system, to the choice of treatment plan and its associated water quality parameters. A variety of factors affect the dissolution of lead in water, including but not limited to pH and alkalinity. Factors other than the stability of designated WQPs can include, among others, the formation/dissolution of protective scales; the presence of manganese, iron, chlorides, sulfates, aluminum and other materials; and temperature. Variations in water quality also can occur within the distribution system. These water quality conditions vary among PWSs, which in turn affect the CCT choices a PWS must make in the context of other regulatory requirements.
- Lead also occurs in different forms in plumbing systems, from soluble to insoluble and particulate in nature. PWSs vary in their sources of lead from the very common leaded solder and brass fixtures/valves, to LSLs, and to less common lead-lined iron pipe. CCT is more effective in reducing exposure to soluble lead than it is for particulate lead, although CCT that contributes to the formation of certain scales may also provide benefits in reducing exposure to particulates. Thus, while very important, CCT is not the only lead control mechanism that a PWS must have in place. In other words, CCT should not be relied upon by itself to control lead in water. Rather, it should be one of a tool box of other required mechanisms depending on a PWS's particular conditions and lead sources (e.g. LSLs, lead solder, leaded brass, etc.). These tools are described in other sections of this report and include: LSL replacement (as well as the replacement of other less common sources of lead such as lead-lined iron pipe), current and future use of lead-free materials, stronger public education including targeted public education to vulnerable populations (pregnant women and families with infants and young children), availability of certified POU filters, instructions on how to flush plumbing systems when lead could be disturbed, etc.

3.3.1. Corrosion Control Recommendations

The LCRWG recommends that:

- EPA release a revised CCT guidance manual as soon as possible and update this manual every six years, so that PWSs and primacy agencies can take advantage of improvements in the science;
- EPA provide increased expert assistance on CCT to PWSs and primacy agencies;
- The LCR continue to require re-evaluation of CCT when a PWS makes a change in treatment or source water;
- The LCR continue to require WQP monitoring to ensure that the CCT is achieving the treatment objectives and that EPA consider requiring such monitoring on a more frequent basis with additional guidance on process control methods; and
- Large systems review their existing CCT plan in light of current science in a newly revised guidance manual with their primacy agency to determine whether the WQPs reflect the best available current science. [Comment from Gail Bingham: Is there a way to differentiate the guidance manual review for medium and small systems? E.g., require something similar to what small and medium systems already do for wastewater discharge monitoring reports?] The LCRWG suggests that this review be done every six years following EPA's six year rule review cycle, and subject to there being sufficient science change that EPA updated the guidance manual. EPA should plan to review and refresh Agency guidance every 6 years, subject to significant improvement in the state of knowledge, to allow research to inform rule implementation. In addition, regularly revised guidance would help states and systems stay

current with corrosion control science as they respond to problem situations, but more importantly help them anticipate challenges as new water sources and treatments are brought on line, or they contemplate further refinement to corrosion control.

Yanna Lambrinidou suggests the following additional requirements:

- To catch unexpected contamination events that cannot be detected with or predicted from WQPs, no matter how system-tailored and “stable” these WQPs might be, continuation of the tap sampling requirements in the current LCR with appropriate tiering (as defined by EPA, based on current science) and a lead AL (as defined by EPA).
- At systems with no LSLs, using the current sampling protocol (1st draw only) and conducting monitoring annually, unless a system has a documented history (as defined by EPA) of lead levels below the lead AL, switching to reduced monitoring (e.g. every 3 years)
- At systems with LSLs, using a sampling protocol that includes a 1st draw sample as well as a 2nd sample to most likely capture LSL water (to be defined by EPA) and conducting monitoring annually, unless: 1) it is a small/medium system and develops a documented history (as defined by EPA) of lead levels below the lead AL, switching to reduced monitoring (e.g. every 3 years) or 2) it is a large system and develops a documented history (as defined by EPA) of meeting a 90th percentile “minimal” threshold value that is considered to be achievable and represents the best feasible health protection as specified by the revised LCR), switching to reduced monitoring.
- When a LSL system achieves a certain percentage of full LSL replacements or has only a certain number of LSLs left, having the ability to switch to 1st draw sampling while also delivering PE and water filters to all remaining homes with LSLs until 100% LSL replacement is achieved.
- When there is a LAL exceedance in any system, require a “find and fix” assessment by the PWS that identifies all the factors contributing to lead release. The revised LCR would require corrective action from a tool box of options that include but not necessarily mandate re-optimization of CCT, depending on the results of the assessment and on EPA guidance manuals spelling out proper chains of corrective actions.
- For large systems only, EPA should keep the current LCR definition of optimization as minimization of lead at the tap (90th percentile threshold value below 15ppb considered to be achievable and represents the best feasible health protection). LCR compliance monitoring that indicates 90th percentile lead levels above this threshold to trigger the same “find and fix” requirement as above and the same requirement for corrective actions. Once CCT is deemed optimized, based on worst-case in-home samples, WQPs to be set for each system and to include all parameters that contribute to (or control) lead release and must be monitored on a regular basis.
- When a PWS or primacy agency sees significant changes in WQP data, initiate a “find and fix” process that, when appropriate, includes tap sampling in worst-case homes, looking for LAL exceedances or, for large systems only, exceedances of a threshold value below 15 ppb, and requiring the PWS to make any needed adjustments or corrections.
- Violations would include not conducting the “find and fix” assessments following a LAL exceedance (and for large systems only, a threshold level exceedance) and not implementing the corrective actions determined to be appropriate by the primacy agency.

3.3.2. Corrosion Control Compliance

PWS must maintain records that it reviewed new EPA guidance manuals and assessed whether and, if so, what changes to CCT are applicable, based on the current state of the science.

Violations: [comment from Gail Bingham: See suggested additional violations in the comment field above.]

- Failure to notify and consult with primacy agency on re-evaluating CCT if the PWS makes a change in treatment or source water
- Failure to review CCT when EPA updates the guidance manual (for large systems)
- Failure to act if state notifies them that they should assess CCT or make adjustments, based on state review of guidance manual (for medium and small systems)
-

3.4. Modify Monitoring Requirements

Under the current LCR, a PWS is required to conduct monitoring to assess the effectiveness of its corrosion control treatment (CCT) and trigger additional actions to reduce exposure when necessary. Water systems must compare sampling results to an Action Level (AL). The AL for lead is 15 µg/L and the AL for copper is 1.3 mg/L. In the Lead and Copper Rule (LCR), water systems must prioritize sample site locations (often residences) within the distribution system which are at a high-risk of elevated lead and/or copper in the water. Selection and use of these elevated lead and copper sites enables a smaller number of sample sites than random or geographic site selection procedures.

Implementation of this approach over time has revealed numerous challenges. Recruitment of customers to take in-home samples can be difficult and costly. Customers are not professional samplers and, thus, may implement the sampling protocols inconsistently. Research on sampling protocols also has shown that sampling results may vary, and not necessarily consistently, based on the configuration and length of lines from the water main to the sampling tap and whether the sample is a first draw or a subsequent sample intended to reflect water that had been in a LSL for some time.

The LCRWG recommends two types of on-going monitoring: 1) a more robust WQP monitoring program to improve process controls for CCT, and 2) voluntary customer initiated tap water sampling coupled with a more robust and targeted public education program to encourage sampling, in part to provide direct information to consumers that they can use to reduce potential exposures to lead from drinking water in their home and to provide ongoing information to the PWS to identify and correct unanticipated problems.

Insert a transition recommendation.

[Comment from Gail Bingham: The following is the facilitator's attempt to combine ideas from Gary Burlingame and Steve Estes-Smargiasi, so may need to be edited for clarity.]

The LCRWG also recommends that EPA establish criteria for a PWS to transition from the current rule framework into the new rule framework. A PWS must comply with the requirements of the current LCR until the PWS has achieved three rounds of monitoring results under the lead AL using the current LCR requirements. Results from past rounds of monitoring can be used or new data will be required if prior year data is above the AL. At that point, the PWS can define their CCT or WQPs for the new rule as that which was used to achieve this record. The existing lead AL will be redefined as a System Action Level in the new rule wherein it will be used when determining re-optimization, e.g. for used during a review of a new source or treatment, if the state determines that a round of tap sampling is warranted. In other

words, it will provide a baseline target for confirming CCT if lead sampling is chosen as one means by which to determine CCT.]

3.4.1. Water Quality Parameter Monitoring

As noted above, WQP monitoring is distinguished from the more extensive list of parameters that a water system would consider as it evaluates corrosion control technology choices. WQPs for the purpose of this section involve the on-going process control monitoring that demonstrates that the selected treatment is being properly operated over time.

The WQP program recommended below builds on what is in the current rule by recommending:

- 1) more frequent monitoring than present and monitoring that is better distributed [comment from Gail Bingham: Check what the current rule requires about sampling locations, i.e. is this the same or broader geographic distribution?] through out the distribution system (e.g. at points currently used for DBP monitoring or at a subset of points used for TCR monitoring) to capture currently undetected variability;
- 2) continuing to tailor WQPs to the individual PWS CCT plan and asking EPA to review and consider adding to the list of WQPs referenced in the LCR, based on EPA’s anticipated revision to the CCT guidance manual;
- 3) that WQP monitoring be periodically revisited based on the advancing science as documented in research reports and disseminated through periodically revised EPA guidance manuals; and
- 4) that a more rigorous data review process such as control charting and similar process control techniques be used to take advantage of the collected data to improve the consistency of operation, encourage fine-tuning of processes, reduce variability of water quality within the distribution system and detect and manage excursions.

In addition, this data should be reviewed whenever there is a change in source or treatment (see 4.3 above); and, when a system or state primacy agency sees significant changes in WQP data, it should initiate a “find and fix” process, looking for what changed and why, and requiring the PWS make any needed adjustments or corrections. This provides one type of reality check and correction not explicitly in the current LCR.

In addition, the LCRWG recommends that systems which are not currently practicing CCT under the LCR but have been under the lead action level by virtue of either naturally non-aggressive source water or by virtue of other aspects of treatment in use, be required to conduct a WQP monitoring program to continue to demonstrate that the characteristics which caused them to be non-corrosive are continuing to be in place.

3.4.2. Tap Sampling for Lead

The LCRWG also recommends that a voluntary customer-initiated sampling program based on the more robust and targeted public education efforts being recommended elsewhere in this report be substituted for the current LCR tap sampling requirements. Revisions to the LCR should require that outreach to the general public, households with lead services, and vulnerable populations such as pregnant women and households with young children offer free lead sampling of tap water. [Comment from Gail Bingham: Gary Burlingame suggests being clear that tiering would no longer apply.]

[Comment from Gail Bingham: The idea of replacing the existing LCR tap sampling requirements remains an unresolved issue. Questions raised at past meetings that have not been finally agreed upon include:

- What is the LCRWG’s recommendation about what happens to the lead AL in a new LCR? What should the relationship be to CCT? (*The current rule triggers CCT in small in medium systems, but does not trigger re-optimization for large systems. If the draft recommendations were adopted, a lead AL exceedance would no longer trigger LSLR or PE, because these would be required of all PWSs.*)
- How does PWS confirm that CCT is actually minimizing lead at the tap unless it does tap sampling? (What should be in guidance and what should be in the rule?)
- How can customer-initiated tap sampling be used to calculate a lead AL?

The option written here from the last meeting is to substitute consumer-initiated tap sampling targeted to homes with LSLs but available to anyone, for the current rule requirements.

Yanna Lambrinidou proposed another option to keep tap sampling, using current tiering (or revised tiering based on the latest science) and the lead AL, change sampling protocols, and trigger a “find and fix” approach (see comment field in CCT section above). In addition:

- an LCR compliance sampling protocol that bans a) pre-flushing, aerator removal, and anything that is known to miss lead and b) all changes to the “proper” sampling protocol as defined by EPA and presented in the revised LCR
- Customers to be notified about all invalidations of their samples and the reasons for such invalidations (and utilities to keep records of the notifications).

(Specific recommendations probably go in the CCT section on the next page)

The results of the voluntary tap sampling program will be used for three separate purposes:

- informing and empowering individual households to take action to reduce risk,
- reporting to health officials when monitoring results exceed a “household action level” (see section 3.5) and
- ongoing information to the utility to assess effectiveness of CCT.

Information for Households

Data from customer-initiated sampling will be valuable in informing and empowering individual households and thus provide greater customer service. All data provided to customers would need to include appropriate information about the variability of lead levels, that a single sample does not represent all water quality, and that levels at a particular tap at a particular time might be higher or lower. The transmittal should also provide appropriate information about the risks of lead exposure, sensitive populations, and actions the consumer can take to minimize risk.

This type of sampling is currently discouraged by the current rule because water systems are often concerned that “complaint” or “customer “ samples would be included into the required 90th percentile calculation with potential mandatory response actions if it exceeded the action level. This resulted in system not offering sampling or having the samples be analyzed through a private lab (and therefore the data would not be available for any utility management or regulatory purpose). Currently, PWSs are mandated to return to the same locations which, while it may have value for other reasons, means that many other households do not get the opportunity to understand their lead exposure. Voluntary customer-initiated sampling can also capture data from multi-family residences, which is not included in the

mandatory LCR sampling in most cases. A new approach could achieve greater customer service and more data to understand and manage lead corrosion. [Comment from Gail Bingham: Steve Estes-Smargiasi suggests adding the following:

Outreach to encourage customers to sample will likely involve many different opportunities of customer contact including the CCR, outreach related to having a LSL, outreach related to CWs construction contracts, community meetings, other educational outreach efforts, and whenever a customer contacts the CWS for a water quality question or complaint.

Customers should be given the opportunity to determine the type of information they are interested in, thus should be offered a menu of samples types, e.g. a random daytime sample to determine typical exposure levels, first draw to determine the effects of a brass faucet, or a timed or temperature determined sample from within a service line. The National Clearinghouse should include templates with instructions for each type of sample.]

[Comment from Gail Bingham: Chris Wiant also suggested discussing the value of tap sampling for risk assessment (not at the system scale). E.g., should there be follow up in a home that gets a result above the AL, or the HAL? Should a high level in one home trigger consideration of additional areal sampling? More directed consumer education?]

Information for Public Health Officials

Data from customer samples which exceeded the “household action level” recommended in section 3.5, would be required to be forwarded to health officials. While LCR tap water results are currently provided to the collecting household, the LCR does not require any action for individual high samples, and there is no mandate to refer to health authorities. While the LCR cannot guarantee actions by health departments, this recommendation provides direct health intervention in those cases where sampling indicates high lead levels.

Information for Assessing the Effectiveness of CCT

The third use of the customer tap sampling data is to provide on-going information to the utility of potential changes in the effectiveness of CCT. Under the current rule, most systems are sampling for one four-month period every three years. Any changes or variability in lead levels at the tap during the other 32 months of that period are missed. Under this proposal, it is anticipated that there would be a more regular stream of data from more locations, providing information which can be used to understand system performance. The data would be provided to the state primacy agency and presented as time series data to facilitate identifying any changes in the data over time. Small systems might report the data on something as simple as a spreadsheet chart, while larger systems might use more sophisticated analytical methods to understand and use the data.

Unexpected or unexplained changes in the tap sampling data can be used in a “find and fix” approach to identify and respond to potential problems. This could be system initiated or in response to periodic review of the system data by the primacy agency, such as during a sanitary survey. This provides a reality check on whether something unexpected is happening within the distribution system, even though consistent treatment was maintained. The more robust (in both temporal and geographic distribution) of the customer sample data set provides a more powerful check on treatment than the current episodic sampling does.

It seems appropriate to include some sort of floor to the number of customer samples. Some members of the group suggested that systems should be required to collect no fewer samples in a three year period than they would under the current three-year reduced monitoring requirement.

When a system changes its source or treatment, and is required to consult with the state, the state primacy agency also may choose to require additional one-time monitoring to evaluate those changes if the degree of the change warrants.

Some members suggested that some small systems might want the opportunity to maintain the current home tap water monitoring program. The revised LCR should allow this, while not discouraging customer sampling.

3.4.3. Sample Invalidation Criteria

[Comment from Gail Bingham: What is the role of sample invalidation criteria if these recommendations are adopted?

Steve Estes-Smargiasi suggests:

The invalidation criteria will continue to be needed during the transition period as systems determine if their prior three rounds of samples are below the AL, and may be needed if states require tap water sampling as part of the assessment prior to or after a new source or new treatment process is put into place

Gary Burlingame suggests that once the PWS transitions to the new rule construct, this would no longer need to apply.]

Under the existing regulation (141.86 (f)(1)), “The State may invalidate a lead or copper tap water sample if at least one of the following conditions is met.

- (i) The laboratory establishes that improper sample analysis caused erroneous results.
- (ii) The State determines that the sample was taken from a site that did not meet the site selection criteria of this section.
- (iii) The sample container was damaged in transit.
- (iv) There is substantial reason to believe that the sample was subject to tampering.”

These are all good and necessary reasons for invalidating a sample and should be retained, but because this list is limited, samples must be accepted that are obvious “outliers” and don’t represent the water that is normally consumed and should not be used as a basis for treatment changes or public education. This is especially true for small systems where the limited number of samples required means that a single, unusually high, value can cause the Action Level to be exceeded. This could lead to installation of expensive treatment when treatment is not needed or adequate corrosion control is already being provided. While probably not as frequent, non-representative samples could also cause water systems to be below the action level when treatment changes really are needed. Good invalidation criteria can help states address both problems.

The purpose of the invalidation is to make sure that decisions are based on the most representative set of samples possible and to do so through a process that provides adequate information to make good invalidation decisions and assures documentation of the reasoning behind the invalidation.

The following is a proposal from states that will serve those two functions.

States believe that the essential criteria for invalidation are already well stated in the [Revised LCR Monitoring and Reporting Guidance \(EPA 816-R-10-004, March 2010\)](#) or the October 2006 memorandum on [Management of Aerators During Collection of Tap Samples to Comply with the Lead and Copper Rule](#). The language in these documents is consistent with the sampling requirements in 141.86 (b).

- “Always collect a first-draw sample from a tap where the water has stood in the pipes for at least six hours (e.g., no flushing, showering, etc.). However, make sure it is a tap that is used regularly, and not an abandoned or infrequently used tap.”
- “First-draw samples collected at single-family residences must always be drawn from the cold-water kitchen tap or bathroom tap.”
- “First-draw samples collected from buildings other than single-family homes must always be drawn from an interior tap from which water is typically taken for consumption.”
- “Therefore, public water systems should not recommend that customers remove or clean aerators prior to or during the collection of tap samples for lead.”

3.4.4. Monitoring Compliance

CWS must monitor and report based on water quality parameters and schedule set by state primacy agency, and use the data for on-going treatment process control (3.4.1)

Violations:

- Failure to monitor as per schedule
- Failure to maintain data, and use in process monitoring (to be evaluated by state during sanitary survey inspections or as state primacy agency requests)
- Failure to report data to state
- Monitoring results outside the WQP range established in the PWSs CCT plan along lines similar to current rule requirements

CWS also must include an offer to customers in all LCR related outreach to conduct a sample, including in all LSL outreach efforts. CWS must also:

- collect sufficient number of samples, either by customer request or utility initiated sampling, i.e. no fewer samples in a three year period than under the current three-year reduced monitoring requirement, assuming the CWS qualifies for such reduced monitoring;
- promptly report the data to the customer, the state and local PH (if above health action level); and
- use the data as part of on-going evaluation of CCT performance, monitoring for changes in lead levels at the tap over time, geographic trends in levels, and interaction with distribution system water quality.

Violations:

- Failure to offer to sample
- Failure to collect minimum number of required samples within 3-year window
- Failure to report data to:
 - Household
 - State
 - Local public health agency (if above household action level)
- Failure to provide rule-required information in sampling offer materials, or in household reporting of the data
- Failure to use household tap sampling data in on-going evaluation of CCT and maintain record of having done so, (as determined by state during sanitary survey inspections or as state primacy agency requests)

3.5. Establish a Household Action Level

[Comment from Gail Bingham: Note question above about terminology.]

The current lead action level is based on the 90th percentile of the collected samples. Without a maximum limit, some users may be exposed to levels of lead in the drinking water that presents a potentially significant health threat, especially to children, without exceeding the action level. If the levels are high enough and state and local authorities do not act, EPA could determine that the levels pose “an imminent and substantial endangerment to the health of persons” pursuant to section 1431 of the Safe Drinking Water Act. (40 USC 300i)

3.5.1. Household Action Level Recommendations

To avoid the need to invoke section 1431 of the SDWA, the LCRWG recommends that EPA establish in a revised rule a “household action level” and require the PWS to notify the local health department and state drinking water authority of sample results over that level. The requirement would be triggered by any sample results that the PWS receives from a user or from its own monitoring. However, the PWS would not be required to make the notification until it has investigated the sample in a timely manner to eliminate sampling or assay errors.

The existing rule already requires the PWS to notify residents of the results of water system conducted lead sampling. We would anticipate that the PWS would alert the resident to possibility that the health department may be notified when the sample was taken or the resident provided the PWS with the sample results. While this notice may have the unintended consequence of discouraging some customers from testing, it is important for the customer to make an informed choice.

In response to the notification, the PWS and the health department would consider the situation and take action that they deem appropriate (e.g., testing children’s blood, recommending a filter, discussing lead service line replacement with the resident or landlord, advising grandparents about risk to visiting children, or continuing to monitor the situation). We anticipate that the health department be the lead agency, and that the rule would not prescribe actions other than notice as the situations are too diverse and complicated for prescription actions. The LCRWG encourages EPA to work with the Centers for Disease Control and Prevention on recommended approaches and make this information available through the clearinghouse discussed in section 4.2.

This requirement would be somewhat similar to the regulatory approach taken by the Department of Housing and Urban Development which mandates that public housing authorities notify the local health department within five days when it receives information from any source that a child of less than six years of age living in an assisted dwelling unit may have an environmental intervention blood lead level. (24 CFR 35.1225)

We recommend that EPA set the household action level based on the amount it would take for an infant to have a blood lead level greater than five micrograms per deciliter ($\mu\text{g}/\text{dL}$) based on consumption of infant formula made with water. When a child’s blood lead level exceeds five $\mu\text{g}/\text{dL}$, the Centers for Disease Control and Prevention (CDC) recommends that laboratories and health care providers notify local and state health departments and that action be taken to identify and prevent further exposure.⁹ While unlikely, if the calculation shows that the household action level is lower than the system action level, EPA would need to reassess the approach.

⁹ http://www.cdc.gov/nceh/lead/ACCLPP/blood_lead_levels.htm

3.5.2. Household Action Level Compliance

If household sample exceeds the household action level, PWS must promptly notify the household and the local public health agency; certify that this has been done, and maintain records of having done so.

Violations:

- Failure to timely report data to
 - Household
 - Local public health agency
- Failure to certify to state that this has been done
- Failure to maintain records of correspondence between CWS and PH

3.6. Establish Separate Monitoring Requirements for Copper

The current LCR does not deal effectively with copper. Generally speaking, the current rule focuses on the health benefits associated with lead risk reduction, with the result that the currently required in-home sampling is often done in locations with old copper that has passivated. Thus, the possibility may be missed that a system's water chemistry could result in copper releases. Further, the current rule does not require public education for copper, which can have broad benefits.

The LCRWG has concluded that the regulatory approach should separate lead and copper risk management, refocusing attention to where there may be a problem with copper without increasing the burden on systems where there is not a problem. This can be achieved in a cost effective manner by targeting copper monitoring requirements to those PWSs where there may be exposures.

Elevated exposures to copper generally result from new copper plumbing¹⁰ where water chemistry is aggressive to copper. It is technically possible to identify water chemistries that are aggressive versus not aggressive to copper. Thus, the LCRWG recommends that the requirements for copper monitoring focus first on sampling for basic finished water quality parameters such as pH and alkalinity in a way that is representative of the distribution system to identify waters that are aggressive to copper. Systems that can demonstrate that their finished waters are not aggressive to copper or that their distribution systems contain no copper should have no further copper monitoring requirements. This could be written into the rule, rather than require a monitoring "waiver."

3.6.1. Copper Recommendations

Further, the LCRWG recommends that the LCR be revised based on the following concepts:

1. Instead of basing action on the results of routine, in-home copper sampling, actions should be based on the aggressiveness of the water to copper. Systems can determine if their water is aggressive to copper by doing WQP monitoring in the distribution system. All PWSs should be assumed to have water that is aggressive to copper unless they demonstrate that it isn't.
2. EPA should develop criteria to define water that is not aggressive to copper for the purpose of establishing whether a system falls into that category (or "bin") for the purposes of the LCR. EPA should consider the accuracy and potential variability of pH and alkalinity monitoring as well as corrosivity to copper in establishing pH and alkalinity ranges. The criteria also should include consideration of passivation time. Examples of bins would be:

¹⁰ New copper is generally understood to be up to six months to three years of age.

- a. if alkalinity is < 35 pH must be > 7.0 (no upper pH limit)
 - b. if alkalinity is 36 to 100, pH must be > 7.2
 - c. if alkalinity is 101 to 150 , pH must be > 7.5
 - d. if alkalinity is 151-250 , pH must be > 8
3. PWSs can choose one of several approaches to demonstrate that their water is not aggressive to copper:
- a. Conduct water quality parameter monitoring to assess whether their water meets the definition established by EPA.
 - b. Conduct a one-time evaluation with copper sampling at vulnerable houses (houses < 2 years old with new copper plumbing) to demonstrate that water chemistry is non-aggressive (copper levels fall under the AL/SMCL). EPA may want to consider:
 - i. Limited number of sample sites needed given copper chemistry
 - ii. Provision for sample invalidation based on site-specific conditions such as biologically-induced corrosion.
 - c. Conduct a pipe loop study to demonstrate the water chemistry is non-aggressive
 - d. Change water chemistry to within the range established for non-aggressive water quality
4. PWSs with water **classified as non-aggressive to copper** must continue to demonstrate that the water is non-aggressive. PWS's can choose to:
- a. Maintain those WQPs that demonstrate it maintains non-aggressive water under (2) above, or
 - b. Conduct copper sampling at vulnerable houses (houses < 2 years old with new copper plumbing) to demonstrate that water chemistry is non-aggressive (copper levels fall under the AL/SMCL)

PWSs that are not able to maintain their WQPs must implement a public education program as described in the next section.

5. PWS's with water **classified as aggressive to copper** must initiate and maintain a public education program. The public education program must either provide:
- a. Information to all new homes (new construction or change of service) upon initiation of new service
- AND
- b.
 - i. Information to newly renovated homes at time of renovation
- OR
- ii. Information to all customers on a routine basis

In addition, in guidance, EPA should encourage PWSs to notify contractors, plumbing suppliers, and plumbers of copper corrosivity and to work with relevant officials and organizations to consider building and plumbing code changes that would prohibit copper piping in new construction if the corrosive water conditions cannot be eliminated. EPA also should provide guidance and/or templates, particularly for small systems, for public education messages and modes of delivery.

6. EPA should consider whether or under what circumstances CCT should be required for a PWS **classified as aggressive to copper**. Not all systems with water aggressive to copper necessarily will have homes with new copper, so treatment might not be necessary or perhaps even advisable, particularly for small systems that can control plumbing materials used or for systems in communities that modify their plumbing codes. Passivation time of copper varies considerably, and CCT may not be necessary or advisable when passivation time is short if interim actions to protect public health other than CCT are feasible. In determining when CCT should be required and any associated monitoring requirements, EPA also should take into consideration that a PWS may not have access to information about renovations where new copper has been installed and, even when such information is available, can't control whether the customer will participate in a monitoring program. Setting the correct level and establishing a regulatory approach that triggers CCT only when necessary will require a complex assessment and is beyond the scope of this workgroup, but the LCRWG does not contemplate this leading to a large percentage of systems with water aggressive to copper having to install treatment.
7. In the revised LCR, systems should continue to be required to notify the primacy agency if they are making any long-term treatment change or addition of a new source. This section of the rule should be made clear that for copper, the system may be required to demonstrate that its finished water continues to be non-aggressive to copper (per 4 above).
8. Additional information needs to be gathered on the current distribution of pH, alkalinity, and phosphate residual among systems nationally to fully understand the implications of this approach.

3.6.2. Copper Compliance

Violations:

- Failure to implement public education, for PWSs that have not demonstrated their water chemistry is not aggressive to copper.
- Failure to maintain a monitoring program representative of the distribution system that demonstrates the system has water chemistry not aggressive to copper.
- Failure to provide notice to and, if required, consultation with the primacy agency, when a PWS makes a significant change in source or treatment (as in the current LCR).
- Failure to implement CCT or other risk reduction actions prior to CCT as determined by the primacy agency.

4. Complementary Actions Critical to the Success of the National Effort to Reduce Lead in Drinking Water

The LCRWG urges EPA not only to promulgate a revised LCR, but also to play a leadership role in educating, motivating, and supporting the work of other agencies, where EPA does not have the authority to act. The Long Term Revisions to the Lead and Copper Rule (LTR LCR) are very important. However, removing lead from drinking water systems and reducing exposure to lead from drinking water in the meantime will require renewed commitment, cooperation and effort by government at all levels and by the general public.

Specific recommendations for action in addition to the LTR LCR include:

[Note: These items are taken from a variety of sources, are in no particular order.]

- EPA working across all offices to take an integrated approach to action and education on lead from all sources (paint, air, site clean-up, etc.), with proper emphasis on lead in drinking water, especially in relation to the populations most vulnerable to this source (i.e., fetuses and infants dependent on reconstituted formula). For example, OGWDW should coordinate with EPA's lead-based paint program so lead hazards are communicated consistently.
- Work with other federal agencies including HUD in terms of lead programs, including but not limited to expanding federal funding from those programs to include lead service line replacement; HUD/DOT in terms of efficiency in possible coordination of lead service line replacement with road projects, construction projects; and CDC in terms of childhood lead poisoning prevention, screening, and protection programs
- Enhanced cooperation with state, county, local health departments to promote an integrated approach to childhood lead poisoning screening, prevention, and protection that emphasizes drinking water and its potential as a primary lead source, especially for fetuses and infants dependent on reconstituted formula
- EPA needs to work with agencies at all levels of government to support financial assistance programs for LSL removal. Building costs into a PWS's capital budget planning should also be a consideration.
- EPA should include diverse perspectives in its stakeholder engagement programs, including affected consumers (who should not be required to be members of formal organizations), lead poisoning prevention/clean water advocates, EJ advocates, lead/copper corrosion experts, and representatives from PWSs, States, and federal agencies with Healthy Homes and childhood lead poisoning prevention programs..
- Local or state building and plumbing codes, including possibility of prohibiting copper plumbing where water is aggressive to copper
- A federal tax deduction to support replacement of the customer portion of LSLs
- State Actions to support customer lead service line replacement, e.g.
 - State legislation requiring inspection or replacement on sale of home
 - Disclosure requirements at sale of home
 - Requirements for LSL removal as part of school and day care licensing
 - Building code requirements for LSL removal upon substantial renovation (could be national action as well)

- Priority in SRF funding (especially if increased funding is available)
- PWSs should educate (encourage partnerships with?) healthcare providers and health departments even when levels are below the AL.
- Additional technical review (additional study?) is needed on flushing.

[Comment from Gail Bingham: Three bullets suggested by Gary Burlingame.]

- Published, peer reviewed research explaining that water in plumbing systems with leaded materials and LSLs can have sufficient levels of lead in the water to be a risk to those consuming the water. This paper is important to gaining support from the public health agencies and others and to placing water in context with other sources of lead.
- Considering that lead remains a complex issue and that research and information gaps still exist, the EPA should establish a Research and Information Collection Partnership to encourage the filling of these gaps in knowledge. The RICP should be initiated once the EPA begins working on the revised rule and continue for three years or more into the promulgation of the revised rule.
- The EPA and other agencies, such as the Water Research Foundation, should conduct research (such as bench scale and limited system case studies) to confirm the bins selected to define aggressive waters for copper. The bins are based on theory and need some level of confirmation prior to promulgating an actual regulation. This work can be done within the timeframe of developing a final rule.

[Comment from Gail Bingham: Two bullets suggested by Yanna Lambrinidou and Steve Estes-Smargiasi.]

- EPA should work with CDC and HHS to ensure that the standard protocol for investigation of any child with elevated blood lead levels or of a home with lead levels above the HAL include determination of whether there is a lead service line.
- EPA should work with HHS and HUD to modify funding guidelines for the Healthy Homes and other federal funding programs to explicitly authorize and prioritize the use of those funds for lead service line removal programs targeting the privately owned portion of any lead service line. The current situation of having tens of thousands of dollars spent by a local Healthy Home or lead poisoning prevention program to remove lead paint, and leave behind a lead service line because of arbitrary finding guidelines is unacceptable.

[Comment from Gail Bingham: Bullet suggested by Chris Wiant.]

- States should consider including requirements for lead in drinking water in state child care licensing rules.

5. Conclusion

The LCRWG appreciates the opportunity to provide these recommendations to the NDWAC, offers our thanks to the experts and members of the public who made presentations to the work group, and wishes particularly to acknowledge EPA for the extensive commitment of staff time and expertise to this process.

ATTACHMENT A

NDWAC Lead and Copper Working Group

Members
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Table 1: Elements of utility reports by dates in three-year cycle (*based on EPA adoption of rule in 2017)

Action	2020*	2023	2026	2029	2032	2035	2038	2041	2044	2047	2050
Confirm broad and targeted education programs underway ¹	Yes. If not, then explain.	Yes. If not, then explain.	Yes. If not, then explain.	Yes. If not, then explain.	Yes. If not, then explain.	Yes. If not, then explain.	Yes. If not, then explain.	Yes. If not, then explain.	Yes. If not, then explain.	Yes. If not, then explain.	Yes. If not, then explain.
Status of consumer sampling ²	NA	# done & # offered	# done & # offered	# done & # offered	# done & # offered	# done & # offered	# done & # offered	# done & # offered	# done & # offered	# done & # offered	# done & # offered
Confirm communication of sampling results ³	Yes. If not, then explain.	Yes. If not, then explain.	Yes. If not, then explain.	Yes. If not, then explain.	Yes. If not, then explain.	Yes. If not, then explain.	Yes. If not, then explain.	Yes. If not, then explain.	Yes. If not, then explain.	Yes. If not, then explain.	Yes. If not, then explain.
Confirm operation policies in place ⁴	Yes. If not, then explain	Yes. If not, then explain.	Yes. If not, then explain.	Yes. If not, then explain.	Yes. If not, then explain.	Yes. If not, then explain.	Yes. If not, then explain.	Yes. If not, then explain.	Yes. If not, then explain.	Yes. If not, then explain.	Yes. If not, then explain.
Replacement Progress ⁵	Initial Baseline	85% remaining	70% remaining	55% remaining	40% remaining	25% remaining	17% remaining	10% remaining	6% remaining	3% remaining	0% remaining
If replacement goals not met, number of checklist items confirmed completed (See Table 2) ⁶	Basic requirements [see Section 3.1.2]	Basic requirements	TBD (by EPA)	TBD (by EPA)	TBD (by EPA)	TBD (by EPA)	TBD (by EPA)	TBD (by EPA)	TBD (by EPA)	TBD (by EPA)	TBD (by EPA)

¹ See Section 3.1.2 (item 4 “targeted outreach” EPA to provide a checklist; PWS to contact customers with LSLs individually at least every three years and when there is a new customer at that address.

² Number of customers offered opportunity to conduct at-tap samples and number of samples taken.

Confirmation that results were provided to the customer. Number exceeding the household action level and confirmation that the results were submitted to health department. Maintain records for review by the primacy agency.

⁴ Program to ensure that emergency, maintenance and renovation operations consider risks of disruption to service line increasing lead exposure to residents. See Section .

⁵ A service line is presumed lead unless installed after date installation of lead service line prohibited or records or tests by utility confirm entire service line is not lead. Confirming that a service line is not lead counts toward replacement progress.

⁶ This is a two-fold concept, the details of which the LCRWG suggests be determined by EPA: 1) provide the PWS the flexibility to select outreach methods appropriate to that community and 2) increase the number of required outreach methods to be completed if replacement goals are not met. See Table 2 for checklist of options for additional effort (in addition to the basic outreach requirements).

Table 2: Checklist of options (in addition to the basic outreach requirements) to be accomplished by utility if replacement progress goals in Table 1 not met.¹

Basic outreach requirements:

Contact customers with LSLs individually at least every three years and where there is a new customer at that address, with information about the risks associated with LSLs, an offer to replace the LSL with the financial terms available, and an offer to do tap sampling (see Section 3.1.2 for additional details)

- Provide a written offer to replace the LSL when work is being done on the water main in the street (with the same information above)

Resident engagement	System policies	Other
1. Notice to new customers of need	1. Plumbing code requires full replacement if service line will be disturbed.	1. Local health agency contact with resident.
2. Written offer to replace when main in street rehabbed (customer pays)	2. Grants or low-interest loan funds identified to cover customer costs sufficient to maintain progress for period.	2. Local health agency funding for removal as part of remediation
3. Written offer to volunteer (customer pays)	3. Financing options such as liens on home provided to customers or tax deductions for property owner costs.	3. Media campaign launched
4. Written refusal from customer(s)	4. MOU or other arrangement to implement notification of customers/property owners by other utilities about replacement options if LSL is disturbed	4. Homeowner association(s) send letters to members supporting replacement.
5. Certified letters sent	5. Capital improvement plans target system pipe rehab and replacement to areas with more LSLs	5. Real estate organizations notified of requirement for replacement of LSL on sale or transfer of title
6. In-person call or visit made	6. Service line insurance program revised to include replacement LSLs if damaged or leaking	6. Cooperative outreach efforts with non-profits
7.	7. More aggressive flushing in areas with LSLs to manage iron related lead particles	7. Coordinated outreach with WIC
8.	8.	8. Outreach to plumbers/contractors
9.	9.	9. Outreach to ob/gyns and pediatricians
10.	10.	10. Local ordinance requiring inspection/notification/replacement of LSLs upon sale or transfer of title
11.	11.	11. LSL identification added to home inspector standard operating procedures
12.	12.	12.

¹ EPA will provide guidance on the options and update them periodically as best practices evolve.