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

April 23-24, 2015

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

MEETING SUMMARY

Meeting Objectives/Desired Outcomes:

- *Seek conceptual agreement on recommendations.*
- *Plan next steps.*

A. Welcome, Introduction, Meeting Objective and Agenda

Ms. Gail Bingham, the meeting facilitator from RESOLVE, welcomed everyone to the sixth 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, Ms. Becki Clark, and Lisa Christ from EPA's Office of Ground Water and Drinking Water (OGWDW) to provide opening remarks.

Mr. Eric Burneson welcomed everyone. The April 2015 draft "Report of the Lead and Copper Rule Working Group to the National Drinking Water Advisory Council" (hereafter referred to as the "draft report" or "report") was very gratifying. The report shows a commitment to improving public health, protecting children and preserving the environment. He acknowledged the tremendous efforts of the Group and expressed his appreciation for their new and innovative ideas. He recognized that the Group has more difficult discussions ahead of them. He introduced Becki Clark, the Deputy Director for OGWDW.

Ms. Clark was appreciative of the opportunity to attend this meeting and to watch and listen to the Group's discussions. She noted how impressed she was with the second draft report that dealt with difficult and complex issues. She thanked the Group for their work and encouraged them to work together and to try to reach consensus. She added that she looks forward to next draft and to the final report. Ms. Lisa Christ acknowledged the contributions of the sub-groups who met prior to the April

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

meeting. She also expressed her appreciation for the Group's efforts and looks forward to the next draft.

Ms. Bingham provided a meeting overview.[2] She explained that the agenda assumes that the LCRWG would cover the entire draft report during the two-day meeting, so it would be important to keep to the timing for each topic. There is time at the end of the meeting to come back to issues needing more discussion. The topic of corrosion control treatment (CCT) and monitoring needed the most work and would be the first topic on Day 2. She explained that on Day 2, Jeff Kempic (OGWDW) and Joyce Donahue (Office of Science and Technology) would be available for the CCT/monitoring and copper discussions, respectively, if needed. She explained that the goals of this meeting were to obtain agreement in principle on the recommendations and to have all of the pieces fit together, so that the Group could focus on refining the wording during the final meeting.

Ms. Bingham explained that four sub-groups met via conference calls between the February and April meeting. These sub-groups were: copper, CCT/monitoring, lead public education (PE), and lead service line replacement (LSLR). Three of them met twice and the CCT/monitoring sub-group met three times. Prior to the first call, she sent each sub-group their relevant section from the February 2015 draft report. She rewrote the sections between calls and sent the revised version to the sub-groups for review. The drafts that resulted from those calls are in the April 2015 draft report. She thanked the sub-groups for their time and creativity. She explained that the April draft remains open for discussion and is intended to provide a starting point for the meeting.

B. Reflections from Past Meetings/Thoughts for Today's Meeting

Ms. Bingham asked the Group for their reflections from past meetings and thoughts for today's meeting. In response members provided comments in the following areas:

1. Conceptualizing possible changes to the LCR.
2. General comments on the draft report and meeting process.
3. Periodic assessment of the LCR.

Specific discussions are provided under each subtopic.

1. <u>Conceptualizing Possible Changes to the LCR</u>

One member provided handouts that conceptualize possible changes to the LCR as follows:

- The first handout, *The Big Picture*, is meant to take a big picture view of a possible revised rule to test if it works and to help visualize how the LCR might look after the revisions. The handout depicts the relationship between the community water system (CWS) and individual homes as follows:

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

- CWSs would base CCT on the latest science from the most current CCT guidance manual, provide broad public education (PE) using a national clearinghouse, educate people on risk reduction methods (flush, filters, lead-free materials), maintain baseline CCT and use historical lead data (90^{th} percentile) to transition to the new approach.

- Individual homes would be protected by more robust water quality parameter (WQP) monitoring to better ensure each home is getting the same level of treatment, identifying lead service lines (LSLs) and educating homeowners to take action and to partner with systems to remove them, providing customer-requested testing for those with LSLs and working with health experts in education on how to reduce risk and provide tailored education for the most at risk (pregnant women and parents of infants).

- The measures the Group is considering for individual homes can also be used as feedback to CWSs to be sure they are on track. These checks are to see if: outreach/PE is sufficient, risks are being reduced by reductions in the LSL inventory, sample results from individual homes reflect the need for reevaluation and WQP monitoring results are reflective of set water quality goals.

After developing this handout, he believes that the Group is close to addressing the issues that have created controversy over the last 10 years.

- The second handout, *Community Plumbing*, reflects a new way of thinking about the LCR. The current LCR has a strong focus on CCT, which is insufficient to control for non-soluble lead. So, he suggests thinking more broadly about a lead control and a copper control program. This handout provides a flowchart for his logic for these two programs.

  - For the Lead Control Program, the first question is, "Does your community plumbing contain lead or brass?" If "no", no additional action is required. If "yes", the system goes down two parallel paths of: 1) "Corrosion control treatment needed?" and 2) "Do LSLs exist?". For CCT, the systems uses WQP monitoring to ensure the CCT is being properly operated. A system with LSLs must have a LSLR program. Both tracks come together to three actions: 1) transition to lead-free materials, 2) customer education and outreach and 3) customer requested sampling. A change in treatment or source water necessitates going back to the question of whether and what CCT is needed.

  - For the Copper Control Program, the first question is, "Does your community plumbing contain copper?" If "no", no additional action is needed. If "yes", the next question is, "Is water corrosive?" If not, the system must periodically check corrosively using WQPs and ensure nothing has changed to make it corrosive. If "yes", the system must provide customer outreach or change its water chemistry such that water is not corrosive. In addition, the community will help decide if they want CCT so that the water is no longer corrosive.

  He thought that the pieces are coming together in a logical way that could result in recommendations to the full NDWAC and a revised regulation.

Members had the following initial comments regarding the "Community Plumbing Handout":

- This handout could become a tool. We get asked, what is the first step? We also need to consider a step to help consumers get needed funding.
- This handout helps us organize our thinking and can be used to guide us during this meeting including discussion regarding compliance.

  [Also see Section C.2 for suggestions to include this handout in the draft report with some edits.]

2. General Comments on the Draft Report and Meeting Process

One member recognized the tremendous improvement and work in the draft report but stated some concerns as follows:

- Her guiding principles are that recommendations most importantly be science based, be consumer-centered and reflect the latest thinking (e.g., what is known about lead release and factors that influence CCT).
- She is not sure the recommendations reflect the reality of what the Group has learned regarding the financial resources and expertise of state agencies.
- She supports the national clearinghouse but the report does not include recommendations for delivering regular messages. She is looking for recommendations that will not only inform the public but empower them by giving them access to financial and other resources to protect themselves, which is necessary for environmental and social justice.
- The report contains some information that is not scientifically accurate and needs to be more consumer-centered and focused on environmental justice.
- She requested that that the Group goes through the document page-by-page.

Ms. Bingham explained that the agenda is structured to go section by section and that the questions on the agenda reflect her understanding of key concepts or leverage points from the sub-group discussions. She suggested that the Group operates at a mid-level or conceptual level of detail, focusing on the key questions in the agenda. As they go through each section, the Group can indicate recommendations, questions or concern. She reminded the Group that Peter Grevatt, EPA OGDDW Director, stated at the February meeting that the goal is for the Group to get consensus. That is the reason for a seventh meeting. However, the Group is not required to reach consensus. If the Group does not reach consensus, sections of the report could provide the majority opinion and then list the points of disagreements.

Another member stated that he was encouraged to see partnering with other agencies in the draft report, but recognized that EPA does not have the authority to compel these other agencies to action. He suggested that the report also include a recommendation that PE be provided to these other agencies. Ms. Bingham reminded the Group that the report has an addendum for including ideas that

are outside the Safe Drinking Water Act (SDWA). She noted that some members had suggested putting those that complement or enable the rule to work better (e.g., national clearinghouse) in the body of the report instead of the addendum.

One member, who also serves on the NDWAC, offered to indicate where in the report the NDWAC may need additional background and explanation of terms. Another suggested that the agenda include a discussion of compliance that includes checks for NextGen. Another member added that the *Community Plumbing* flowchart may be helpful when they consider compliance.

3. Periodic Assessment of the Rule

One member asked if a periodic assessment could be built into the LCR to recognize that the science is shifting and to avoid reacting to a crisis. In response:

> Mr. Burneson explained that SDWA mandates EPA review National Primary Drinking Water Regulations (NPDWRs) ever 6 years and make revisions needed to improve or maintain public health protection (i.e., the Six-Year Review Process). He explained that EPA has conducted two to date and that the Agency is in the midst of a third review. The first two focused on maximum contaminant level (MCL) rules because EPA was revising the LCR. He added that EPA has not tailored the Six-Year Review process to the LCR and suggested that the Group provides input on how this would be done for subsequent Six-Year reviews. *[Also see Section H.3 for additional discussion about the Six-Year Review Process.]*

- Another member suggested identifying data gaps and areas where the Group expects the science to change. An example is the Total Coliform Rule (TCR) and possible distribution system requirements for which EPA established a partnership with the Water Research Foundation to conduct research and gather information. This effort included a steering committee to identify gaps, develop a plan and information collection. Another suggested including a recommendation for EPA in the report to regularly update the CCT guidance to reflect the evolving science.

C. Draft Report: Considerations

1. Considerations– Day 1 Discussion

Comments are provided below in three subsections: a. General Comments, b. Historical Trends and c. Considerations in Preparing this Report. On Day 2 of the meeting, the Group discussed a revised April 23 version of these sections, a summary of which is provided in Section C.2.

a. General Comments

Members provided the following general comments:

- One member suggested framing the recommendations for a person who is reading this for the first time and possibly adding a link to additional relevant documents to avoid losing the reader.

- If this report is distributed beyond NDWAC, it is too long for the general public or advocacy groups. Some members did not think the report would be distributed beyond NDWAC and EPA. Another member thought that the Centers for Disease Control (CDC) and people in the Healthy Homes program may also read the report.

- One member stated that the critical factors in the addendum to get the lead out get lost and need to be tied to the upfront discussion regarding the national effort. For example, although the Group focused on SDWA, we recognized importance of lead in paint, gasoline, etc. We have recommendations to tie these together.

b. Historical Trends

Ms. Bingham asked if it adequately conveyed the intent of the Group. In response, members provided the following input:

- A member thought the *Considerations* section was incomplete, inaccurate and unclear as to why a statement was relevant. She suggested either providing a bulleted list of the major developments in recent years, such as revisions to the lead-free requirements, and what has been learned about galvanic corrosion and particulate lead. Alternatively, she suggested deleting the *Historical Trends* Section.

- A member suggested adding a paragraph on the progression to lead-free plumbing components and the history of copper. No members objected to adding these paragraphs, which EPA agreed to draft.

- One member thought the section should state that as a society, we have made progress toward reducing risk from lead while at the same time increasing awareness of the risks. Blood lead levels (BLLs) are lower but CDC's level of concern for BLLs also has gone down to 5 µg/dL. This information should be followed by language that despite this progress, there are reasons to still pay attention to lead, which is why we need to do more. He disagreed with including information about lessons learned (e.g., what we know today about galvanic corrosion). He suggested adding a chart that depicts how CDC's BLL of concern has declined over the last three decades.

- Another member agreed that the third paragraph of the report under *Historical Trends* could be expanded or revised to include a graphic on BLL trends. She also agreed that the report should not provide a long historical background of LCR but instead provide context for the Group's recommendations. Another member agreed that it is important to discuss the national effort to reduce lead and place the SDWA into context.

- One member noted the importance of qualifying the progress that had been made to date. For example, mention that BLL testing is of children 1-5 and not of infants of 0-6 months. Also, reductions in 90th percentile levels are associated with soluble lead only and may reflect improper sample collection (e.g., pre-flushing). Another member responded that this section

needs to discuss the rule in terms of its proper implementation and not discuss non-compliance issues.

- One member commented that the *Historical Trends* section does not flow. Another member suggested having a sub-group write this section. This member suggested revising the section as follows: 1) BLL have gone down in children, but so has CDC's level of concern and both are approaching zero, 2) drinking water and other programs have been working on reducing lead but there is more to do and 3) explain how the LCR has reduced lead in water but include other efforts, such as the new Reduction of Lead in Drinking Water (RLDWA) lead-free requirement). Another member indicated the need to add language that puts lead occurrence in drinking water in context.

- Another member, who is also on the NDWAC, indicated that she wants some of the background in the report because some NDWAC members may not be familiar with the LCR.

- Other members provided the following editorial comments:

    - On page 6, the following sentence is confusing, "Further, LCR compliance data does not show a correlation between lead action level exceedances and water quality parameter violations." This sentence indicates that the LCR is a treatment technique rule that does not work but will still be required. Also, we are recommending developing more robust WQP requirements on page 7. The text should be revised to acknowledge CCT is important because of aggressive water but is not a surrogate for the safety of a system because it does not indicate the level of lead.

    - The last paragraph, which starts, "However, efforts to reduce lead exposure further . . ." gets lost and should include information about particulates. Another member suggested the following text to add to the end of the last sentence: "and spikes to lead in drinking water are often related to particulates".

c. Considerations in Preparing This Report

Ms. Bingham asked if the section, *Considerations in Preparing This Report*, adequately captured the context for the Group's recommendations, acknowledging NDWAC as the audience. Members provided the following individual comments:

- We should strengthen this section to communicate that success would not happen if it is limited to SDWA.

- We should not include solutions in this section.

- We should move this section before *Historical Trends*.

- We should put the ideas in the paragraph that precedes the bullets into a bullet format because readers may skip the paragraph and go directly to the bullets.

- In the bulleted list, we need to include drivers for the rest of what is written. We talk about shared responsibility that weaves itself throughout. Lead and copper reduction in tap water is a shared responsibility that goes beyond the public water system's (PWS's) compliance with the LCR.

- The bulleted list includes points on which we have not reached agreement. In response, Ms. Bingham explained that the list is a cumulative set of factors important to members of the Group from diverse perspectives.

Members also provided the following specific editorial comments:

- For the first bullet on page 7,

  - For the first sentence, "As is emphasized above, there is no safe level of lead", members provided suggested text:

    - Following it was a statement that we have made progress on, but we have more to do. We don't want the message to be that the rule is not doing us any good.

    - Add the need to drive lead to the lowest possible level.

  - A member suggested deleting the second sentence, "Lead-bearing plumbing materials pose a risk at all times (not just when there is a lead action level (LAL) exceedance)." Another member disagreed with this suggestion because she thought this statement was a critical concept.

- A member suggesting removing the recommendations portion from the following bullets on page 7, so they read:

  - 5th bullet: "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."

  - 6th bullet: "The characteristics of the issues associated with lead and copper are very different."

  - 7th bullet: "The LCR should remain a treatment technique rule. Another suggested adding the word, dynamic." Ms. Bingham asked whether to delete this bullet.

  - 8th bullet: "In-home sampling remains an important part of the LCR." Another indicated that this statement is not a recommendation and should be expanded to indicate that the Group raised the consideration that we need to understand why we do sampling before we decide how to do it. Other suggestions including expanding this bullet to:

    - Indicate factors that impact sampling and that results are variable.

- State that the Group discussed the purpose of sampling and how it can be better used to help with risk assessment and public health.

- 9th Bullet: Split the second sentence into two by putting a period after, "Providing assistance to PWSs is important." Add "continually" to the remainder of the sentence so it reads, "Providing technical assistance to PWSs is important, including updating the guidance manual continually . . ."

2. <u>Considerations and Background Information Section – Day 2 Discussion</u>

On Day 2 of the meeting, Ms. Bingham handed out a revision of the consolidated Section 2, *Considerations and Background Information*. Ms. Bingham explained that she retained the two sub-sections in Section 2, *Considerations in Preparing the Report* and *Historical Trends* but edited and reordered some of the text. She made *Regulatory Background and Formation of the NDWAC Lead and Copper Work Group*, which was formerly Section 3, the last sub-section in Section 2. She noted that the *Historical Trends* section still needs: 1) the CDC chart of the change in the BLL of concern over time and 2) language to convey the concepts that there has been progress in reducing lead levels and BLL but that we have a growing understanding about lead so we need to do more.

Members provided the following feedback on this revised version:

- Regarding the bullet, which indicates the need for additional action beyond the scope of SDWA:
  - Revise it to indicate that these actions are provided in the addendum to the report.
  - Make the wording stronger to say, "critical actions for success for the national effort is to remove lead from drinking water."
  - Consider presenting it as one of the earlier bullets.
- Add a bullet that the success of the Lead and Copper Rule Long-Term Revisions (LCR-LTR) is dependent on shared responsibility.
- Add the *Community Plumbing* diagram with the following changes:
  - Use a more appropriate title.
  - Add a box for "new source or treatment" to the Copper Control Program side that will point back to the question, "Is water corrosive"?
  - Add a box to the Lead Control Program and Copper Control Program that requires a CWS to prepare and distribute the consumer confidence report regardless of whether the system has lead or copper.

D. Draft Report: Section 4.1 Replace Lead Service Lines

Members that served on the LSLR sub-group provided the following overview of the LSLR program that is provided on pages 9 through 14 of the draft report:

- A LSLR program would no longer be triggered by a lead action level exceedance (ALE) following treatment but systems with LSLs would be required to replace them proactively.
- There is a presumption that service lines are lead if they are installed in a certain time frame. Utilities would get credit for proving otherwise.
- A state-approved plan for LSLR would not be required, which would allow a system to focus resources on action.
- An invitation for full LSLR would go to customers annually. If a customer refuses to have their portion of the LSL replaced, the system would not be penalized or receive credit. However, the system would have to contact that customer in three years to determine if he/she has re-considered full LSLR.
- The clearinghouse should have case studies and other information related to an effective LSLR program.
- Milestones would be set for systems to remove LSLs from the inventory either by physical replacement or proving that they are not lead. If they fall behind their schedule, they must increase their efforts by choosing from a menu of options that include but are not limited to additional outreach activities. One LSLR sub-group member explained the handout he prepared with two tables that summarize these concepts:
    - The first table provided elements of a utility report that would be due every 3 years, which should be designed to be straightforward and easy to fill out:
        - The program begins at 2020 (his assumed date for rule implementation). It can be revised to state it as 3 years from promulgation. In about 20-25 years, we have a goal of no LSLs remaining.
        - The first element of the utility report is to confirm PE was done. This could be a copy of the PE materials.
        - The second element is the status of consumer sampling, which could include how many samples were collected and the number of consumers to which this testing was offered. This reporting element would not be applicable in the first three-year cycle but is reported in every 3-year cycle thereafter.
        - The fourth element is the results of consumer sampling that includes the 90th percentile, maximum, median and minimum lead levels.

- The fifth element is to confirm that the system's operational policies are in place and ensure that emergency, maintenance and renovation operations consider the risks of disruption to a service line.

- Table 2 provided some ideas for a checklist of options if the system cannot meet its replacement goals in Table 1. The checklist includes resident engagement activities (e.g., in-person call or visit), system policies (funding options) and other (e.g., local health departments contact residents). The member noted that list is not complete and needs to be expanded. He explained that the LSLR sub-group moved to a checklist because it is easier to implement and enforce rather than having the state make a determination if a system made a good attempt at full LSLR. Most likely, a system will have increasing difficulty replacing the last remaining LSLs or to demonstrate that the lines are not lead. In this instance, a system would be required to conduct more of the outreach activities in Table 2. A system that did not meet the milestones in Table 1 would be in violation if it did not do enough of the checklist options in Table 2.

- A sub-group member added that many of these aspects, including the checklist of options for Table 2, are designed to make the LSLR program easier to enforce and implement.

Members provided the following individual comments:

- This approach suggests that we are telling systems and consumers that lead is the most important contaminant. What about systems that have issues other than lead?

  - Another member agreed with this point. She noted that if we require extraordinary measures for lead, what happens when the next contaminant comes along. She added that PE needs to be in correct context and in some instances, lead is not an issue.

  - Another member emphasized that the proposed LSLR approach is a big change from the current rule and a very significant action on the part of the water utilities to suggest this. A very small number of systems are currently required to do LSLR and many are not on a replacement schedule at all. Many systems that are not doing any LSLR now will be required to undertake an extensive program.

- One member expressed difficulty with the presumption that systems have LSLs unless proven otherwise. He explained that some areas of the country do not have LSLs and proving that a system has no LSLs will take resources. He did not think that small and medium systems would still have records of the materials surveys they did over 20 years ago.[3] Other members responded to his points as follows:

[3] Prior to conducting initial monitoring all systems had to conduct a materials survey that was based on information on lead, copper, and galvanized steel collect under §141.42(d) (special monitoring for corrosivity characteristics).

- When states are adopting the LCR LTR, they can explain how the presumption works in their state that could include why there are no LSLs in a particular state.

- One member asked how this works with other contaminants that are not present in many systems. Ms. Christ replied that systems can apply for a use waiver for synthetic organic chemicals (SOCs) and asbestos and it must be renewed every 3, 6, or 9 years based on monitoring.

- There is flexibility in this suggested approach but the timeline may not be long enough.

- Another member suggested discussing the goal of replacing all LSLs in 20 to 25 years in the preamble to the LCR-LTR and in the rule requiring 3-year milestones but not specifying the actual dates. The member referenced the flexibility that exists in the stormwater rule.

- We need to clearly explain what constitutes compliance.

- One member asked what steps will be taken to protect public health during the time when LSLs are identified and they are removed. Should we require filters? Also, the member recommended that Table 1 include a reassessment and strengthening of CCT. In response other members provided the following:

  - Page 13, number 7a of the draft report includes a suggestion that our outreach materials include LSL-associated risk and actions to take if there is work that disturbs a service line. Our PE materials should identify practical risk reduction measures for people who have identified LSLs that include the use of filters. However, we should not require systems to provide filters because not all populations are equally at risk, it sends a mixed message that the water being delivered by the utility is not safe and we want to avoid having systems spend money on filters that may not be needed.

  - If a system has to provide filtration even in the absence of a lead ALE, then the AL has no meaning.

  - The clearinghouse would have information on filters. We are suggesting that Information about the clearinghouse would be in the PE materials that we provide to customers served by systems with LSLs and in the Consumer Confidence Report (CCR) materials.

  - Ms. Bingham noted that the sub-group on LSLR recommended targeted outreach to customers that have LSLs, which is on page 12, item #4 of the draft report.

Members provided the following editorial comments to Section 4.1:

- The title of Section 4.1 “Replace Lead Service Lines” should be changed. Another member suggested using the title from 4.1.2 title as the title for Section 4.1, to read, “Establish Active LSL Replacement Program”.

- Page 12, line 14 should not read, “PWSs that identify LSLs in their inventory should be required to replace the inventory of LSLs.” Instead, the approach is to do targeted outreach aimed at getting replacement. We cannot force the consumer to do anything.

Members provided the following individual comments and questions regarding Table 2:

- Table 2 contains activities that some systems cannot do, such as pass a local code. Another member noted that systems would not have to select that option.

- Whether CCT would be linked to the LSLR program.

- If a system does not meet its replacement goal, states will be required to determine if the system is doing the minimum number of actions from the checklist. Small/medium systems will ask the state for help. It would be very helpful if EPA could develop guidance. Another member agreed that the more templates EPA (with advice from co-regulators) can develop, the lower the burden on the states to oversee the new LSLR program.

- How will the state know if the system has done enough or properly completed a requirement? One of the sub-group members responded that PWSs would have to certify that they have met requirements. This could be a sample letter and certification that is due within a certain timeframe. Also, states can check the status during sanitary surveys.

- If PWSs are making slow replacement progress, is there a point at which they must undertake other measures (e.g., provide filters)? In response, one sub-group member explained that systems would be required to do progressively harder options if the goals in Table 1 are not met.

- A member suggested adding in the “Other” category, local ordinances for real estate and possibly including federally insured mortgage agencies as partners to promote checking and removing LSLs during real estate transactions.

A member asked if the sub-group discussed transparency in terms of the LSLR plan. In response:

- A sub-group member noted that the sub-group had reconsidered whether to require a LSL plan, noting that some systems will develop one, but deciding not to require one. Members also talked about the utility report being made public.

- Another added that the PE materials for homes with LSLs would talk about risk of LSLs, who is responsible for what part of the LSL, how the homeowner would work with the utility to remove the LSLs and financial options. In addition, the LSLR invitation will include the same types of information that would have been in the plan. Also, the PE materials and invitation could be available as part of the clearinghouse.

Ms. Bingham asked the Group if the suggestion on page 23 from the CCT/monitoring sub-group to offer customer-requested lead drinking water sampling for residences with LSLs should be a tool for the LSLR

program. If so, she would better link this recommendation to the LSLR section. Members did not agree on this point and provided the following comments:

- One member disagreed with this testing and added that some people have opted out of full LSLR because they had a low lead level. The message should be that full LSLR is necessary even when a sample result is low. She also questioned the benefit of one-time testing.

- Two members expressed support for this testing. One thought that people would want information about the lead level in their drinking water. Another thought that it would be step backwards not to have this testing. He added that system would need to explain that the result is specific to that sample and that lead results are variable. A high lead result indicates a lead issue, but a sample with a low result could be higher if it were collected on a different day.

E. Draft Report: Section 4.5 Health Based Standard

The Group discussed the concept from the February 2015 LCRWG meeting of establishing a lead health based standard separate from the AL, which would trigger additional and immediate action. Specific discussions are provided below under three subtopics: 1) Overview of the health based standard, 2) modeling and implications if the health based standard is lower than the AL and 3) decisions regarding Section 4.5.

1. Overview of the Health Based Standard

The member, who drafted this section of the April report, led the discussion. He explained that during the February meeting, he did not realize that the term "imminent and substantial endangerment" has a legal meaning under EPA's SDWA Section 1431 authority. Thus, he suggested removing this language when referencing the health based standard and from the title of Section 4.5.

The principle behind this standard is to deal with high lead levels in drinking water at the local level to eliminate the need for a Section 1431 action. If any sample (either one collected by the system or homeowner) exceeded this level, the system would notify the local health department (LHD) and state. He noted that LHDs know how to communicate with people on health topics and there are precedents for similar actions, such as the US Department of Housing and Urban Development (HUD) doing an environmental intervention for a high BLL. He suggested that the suggested health-based level would be based on an infant drinking formula that would translate to a BLL of 5 µg/dL. EPA has models to provide this estimate.

Members provided the following feedback:

- Another member suggested calling this level, the "household action level (HAL)" because it corresponds to the lead level in an in-home sample that would result in a 5 µg/dL BLL. *(No one expressed disagreement with this name and hereafter this level is referred to as HAL in this summary.)*

- A member asked about the procedure when a sample above the HAL is from a home where the occupants are senior. In response, another member indicated that the LHD would ask if children visit or live in the home.

- Another noted that some of these notifications to the LHDs may end up in no needed action. Another member offered that the suggested approach is a preventive one.

- One member noted that some people are fearful of government. He could see a situation where the health department gets the notice before the individual. Two members thought he raised a good point.

- Another expressed the need for a statute or regulation that provides legal authority and recourse if an action is not taken, e.g., a landlord refuses to replace the LSL. He added that this legal authority exists for leaded paint. In response:

    - A member explained that most states or counties do not have other than general authority to deal with lead dust. Other tools can be used such as better communication for doctors. Also tenants can argue a breach of their lease. In addition, LHDs have many tools and the clearinghouse or CDC could provide recommendations to LHDs.

    - Another explained that we cannot force people to make the right choices, for example, there is no jurisdiction over smoking. However, ideally we will be dealing with responsible adults that will take appropriate steps.

One member suggested that the letter to homeowners regarding in-home drinking water testing could explain that any level above the HAL would be referred to the LHD, but questioned if that would discourage some people from getting their water tested. Two members indicated that they did not think this would be a disincentive. One noted that people do not think of health departments the same way they think about social services and that concern should not shape the Group's thinking. Another stated that people with children from 1 to 6 years of age would want their doctor to test their children's BLL.

2. Modeling and Implications If the HAL Is Lower than the AL

Mr. Burneson explained that EPA has an Integrated Exposure Uptake Biokinetic Model (IEUBK) for lead. Joyce Donahue (OST) explained that the current AL was based on 10 µg/dL using a short-term exposure model. She explained for bottle-fed infants, all lead would come from drinking water as opposed to using a relative source contribution of 20% that is sometime assumed for drinking water. She added that the model would need to consider high levels of calcium in formula because it affects the absorption rate. She also noted that there could be a range or distribution because not all infants will drink the same amount and that the length of exposure will impact the HAL. Mr. Burneson noted that OGWDW will work with EPA's Office of Children's Health Protection on estimating the HAL. He added that EPA will need to make a number of assumptions and the HAL determination process would need to be vetted. Therefore, EPA could not provide the LCRWG with a suggested HAL for the June 2015 LCRWG meeting.

Members and EPA also discussed the possibility and ramifications of having an HAL that is lower than the current AL of 15 ppb:

- Two members explained that this situation would impact how the information would be communicated to the LHDs and the public.

- Members questioned the role of the current AL versus the HAL. One member indicated that the current AL is a system AL. *[See Section H.4 for additional discussion regarding the role of the current AL.]*

- Another stated that if the derived HAL is low and implies that half the samples are a problem, he would question the model. He does not think that half of the children are being endangered by lead in drinking water.

- Another member thought the intent of the HAL is to notify the LHDs of immediate risks, such as spikes in lead levels and not to notify the LHD every time there is a sample of 8 ppb or higher, for example. Another member added that his idea for the HAL was tied to short-term exposure.

- Another did not think that EPA's models would have the sensitivity to produce an exact number but a relative estimate of twice or three times the AL.

3. <u>Decisions Regarding Section 4.5</u>

The Group decided that Section 4.5 of the report will be revised to reflect the HAL approach without a specific level. Specifically revisions will:

- Fit into the context of a shared responsibility approach.

- Require systems to notify the LHD if the HAL is exceeded.

- Rely on LHDs to use best public health practices to communicate with homeowners and other health professionals and will indicate the need to understand how LHDs will communicate this information.

- Leave it to EPA to define the actual HAL.

F. Draft Report: Section 4.2 Public Education for Lead

Ms. Bingham explained that a sub-group met to discuss PE for lead, which is intended to have a broader distribution than the targeted PE that the Group discussed for homes with LSLs (Section 4.1) and for the HAL approach (Section 4.5). The lead PE section of the draft included the following four areas, which appeared as a bulleted list on the bottom of page 15 and top of page 16 of the draft report:

1. A national clearinghouse of information about lead in drinking water for the public and PWSs.

2. Revised CCR language to address LSLS and update health statements.

3. Requirements for targeted outreach to customers with LSLs.

4. Other ways to strengthen requirements for public access to information.

Discussions pertaining to each of these areas are provided in separate subsections below.

1. National Clearinghouse – Section 4.2.1

The Group indicated general support for a national clearinghouse. This is not part of the rule revisions but is a tool that the Group believes is important to support the revisions and for which EPA should take a leadership role. Other points included:

- The terms clearinghouse and national website are being used interchangeably; use a consistent term.
- Information should be available via the internet, the EPA drinking water hotline and through a link in the CCR. Information would be available in different formats and languages.
- The content of the clearinghouse has not been fully developed, but it is intended to be a tool for states as well as the public, PWSs, health professionals/agencies and states.
- Having a clearinghouse allows utilities to include links to it in all of their communication.
- The clearinghouse needs to be coupled with well-crafted PE to make people want to use this resource. There needs to be regular output from the water utility to the public about lead in drinking water to make the clearinghouse an effective tool. Right now the public is not interested. In response, to a comment that the draft report includes a recommendation for branding, the member responded asking if branding includes educating and raising awareness. The member still expressed concern that there's a difference between getting a link to it when you are pregnant, you just had a baby, and understanding when you really want to go to the website. She recommended regular (monthly, yearly) communication from the water utility about the clearinghouse. Another member stated that customers can get notice fatigue, and that this type of communication is covered by the CCR. Another member agreed that the goal is to get people to know the clearinghouse exists. EPA can consult communication experts to ensure that as many people as possible are aware of the website.
- We should use the storm water program as an example of a successful communication program. We need to understand the level of effort to adequately get the message out. We have a lot of information to convey and we have enough air time in our public service announcements for people to hear and understand the message.
- Another member asked if EPA's website explains the contaminants in the CCR. In response, Mr. Burneson explained that the Agency has multiple webpages for lead because it is a multimedia contaminant, and webpages and fact sheets for individual or groups of contaminants. All of this information can be accessed through EPA's drinking water home page. A member noted that he wanted contaminant-specific information in the CCR as opposed to contaminant-specific clearinghouses.

Members also provided the following editorial comments:

- We need to clarify the concept that EPA should consult with experts on how to increase public awareness and interest in the clearinghouse. Currently it is buried on page 16.

- The information from the paragraphs that proceed the bullets on page 16 need to be part of the bullets, such as including in the clearinghouse, case studies on successful LSLR program and other needed information for utilities.

2. <u>Revise the CCR Language – Section 4.2.2</u>

The Group discussed possible revisions to the CCR language in Section 4.2.2 of the draft report on Day 1 and a revised version of this section on Day 2. These discussions are summarized in separate subsections below.

a. Day 1 Discussion

Ms. Bingham explained that page 18 of the April draft report provides two options for revising the current mandatory CCR language (as shown in strikeout and underline). The first is based on input from the second lead PE sub-group call; the second suggestion is from one of the Lead PE sub-group members. The sub-group did not reach agreement but provided some general concepts as a good starting point for today's meeting. For some members, the length of the language was a consideration. The current CCR language is 12 lines and options 1 and 2 are 15 and 29 lines, respectively.

Members provided the following general and editorial comments:

- One member thought that the CCR is a useful tool because it provides information in a broad context that includes other drinking water contaminants.

- A member who served on the sub-group explained that page 18 line 11 provides a suggestion from the sub-group to have experts review the suggested mandatory CCR language.

- One member questioned whether to revise the wording for conditional waivers on page 17, lines 41-44 that would allow CWSs to forego making a statement about lead in their CCR if they can demonstrate they have no lead-bearing materials. She noted that the example is very specific to systems that only serve subdivisions built entirely after 2014.[4] Another member indicated that there are many new subdivisions built after 2014 and that the example represented a situation that may be more common in the future.

Members provided the following comments regarding the two options.

[4] On January 4, 2014, the Reduction of Lead in Drinking Water Act (RLDWA) became effective that lowers the allowable lead content for a product be "lead free" and prohibits the use and introduction into commerce of pipes, pipe fittings, plumbing fittings, and fixtures that do not meet this new lead free requirement.

- One member supported Option 1 because it is more general. He noted that some people do not have LSLs or high lead levels. He added that targeted information will be provided to people with LSLs or when they have their samples taken and to health professionals,

- The member who drafted Option 2 stated that the mandatory language should make the following points: 1) lead in drinking water can cause serious health problems such as fetal death, 2) the LCR is a shared responsibility rule and 3) as long as it has lead-bearing plumbing, a home can have problems regardless of whether a system has CCT. She thought this information needs to be provided to the general public and asked if it is not included in the CCR what other vehicle would be used.

- Another member thought the language in the first option was incomplete and the second one provides language regarding situations that may not necessarily occur. He suggested using the same language as the paint program to have consistency across programs as follows: "Lead can affect children's brains and developing nervous systems, causing reduced IQ, learning disabilities and behavioral problems. Lead is also harmful to adults." Members provided the following feedback regarding using the language from the paint program:

    - Some members did not agree for the following reasons:

        - Fetuses are different. For lead in drinking water, there are specific effects that are not here. Pregnant women are instructed to drink tap water because it has fluoride. If it has particulate lead that could cause miscarriages.

        - Lead in paint and lead in drinking water may not be analogous.

        - People have been conditioned for decades that lead comes from paint, soil and dust. Water is dismissed as a lead source. There needs to be a link to drinking water.

    - Others agreed with the suggested language for the following reasons:

        - The health effects language should be the same regardless of the source. We should not get caught up with two different modes of exposure.

        - This language would get the attention of people and prompt them to learn more about lead.

    - Another member agreed that most people do not know about lead in drinking water and suggested adding a phrase about lead in drinking water to the health effects language from the paint program.

b. Day 2 Discussion

On the second meeting day, the Group discussed an April 23 revision to the Section 4.2 - *Develop Stronger Public Education Requirements and Programs for Lead and LSLs*". The Group discussed the following:

- The lead language CCR waiver in the introductory paragraphs.
- The revised list of bullets that provide recommendations for revising the CCR.
- The two options revising the current mandatory CCR lead language.

CCR Waiver

The Group discussed the April 23 revised language in Section 4.2.2 (second paragraph) that clarified under what circumstances a PWS could forego including lead information in their CCR as follows:

> *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 that there are no lead bearing materials in contact with drinking water that EPA may want to consider allowing the primacy agency to waiver this CCR language requirement if an entire CWS can meet this criterion. However, this determination should not be based on monitoring results.*

Members did not provide any suggested edits to the revised language.

Members discussed whether the first paragraph in Section 2.2.2 provided useful information. This paragraph reads:

> *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. Thus, the CCR should provide basic information and a link to the national clearinghouse described above for additional information.*

One member suggesting deleting the last sentence or the entire paragraph. Another member suggested retaining this paragraph because the recommendations are going to NDWAC and some may think the CCR is adequate. The Group decided to retain this paragraph.

Bulleted List of Recommendations

Members had the following suggested additions to the bullets:

- Add the phrase "and summarize the health effects" to the end of the bullet, "Public health statements updated to reflect current understandings that there is no safe level of lead, and that some individuals are particularly vulnerable".
- Add that concept that the mandatory CCR language should encourage people to go to the national clearinghouse for additional information.

CCR Mandatory Language

Ms. Bingham explained the April 23rd updates to the CCR mandatory language options:

- The first option was revised to include the lead health effect language from the paint program and to clarify that the language pertains to lead in drinking water. It does not include fetal death or miscarriages as lead health effects because there was not agreement from the Group to include this language.

- The second option provides a comment regarding the phrase, "running the water until it is fresh" because some members questioned that language.

One member indicated support for Option 2. She questioned if the language in Option 1 would motivate an individual to go to the clearinghouse for additional information because people may not realize from the language that they may have lead problems at their tap. In response, one member explained that the first paragraph indicates, "lead can be very serious in your household" and this option also includes statements about variation from home to home.

Other members preferred Option 1 but suggested additional revisions to:

- Start with the notion of developing nervous systems, then children's brains.

- Start the second paragraph with the concept that protecting against exposure from lead is a shared responsibility.

- Indicate that shared responsibility is between you and your utility rather than EPA.

- Replace the term "corrosivity" or include it in a comment that another word is preferable.

- Replace "You can take responsibility" with "You should identify and remove lead sources . . .".

- Remove "running the water until it is fresh or", and retain, "using a filter". Another member questioned if using a filter is enough and to note that flushing information is available at the clearinghouse.

Ms. Bingham noted that based on the discussion she would delete the second option, make the suggested changes for Option 1, and note other things the Group wanted to address. She also asked whether the Group wished to delete the phrase, "such as running the water until it is fresh or using a filter" from the suggested language and include a recommendation for EPA to work with experts to come up with appropriate steps that consumers can take to reduce their family's risk.

3. Strengthen Requirements for Public Access to Information – Section 4.2.3

On Day 1 of the meeting the Group discussed suggested language in the draft report for strengthening the requirements for public access to information. On the second day, the Group discussed a member's proposals regarding specific information that should be made publically available and consultation with communication experts. Both days' discussions are provided below in separate subsections.

a. Day 1 Discussion

The Group discussed the suggested language in the draft report starting on page 19. The language contained four suggestions from different members:

1. Systems that have their own websites would be required to post information about LSLs, such as how to identify one, associated risk, information about in-home sampling, risk reduction options and full LSLR options.

2. Systems with a LSLR program would provide targeted outreach to customers with LSLs, which would inform the customer that they have a LSL and/or how to determine if they have one, the health risks associated with exposure to lead, risk reduction options and their options for full LSL replacement.

3. Systems would provide information about the risks of lead from lead-bearing plumbing in a "new account" welcome letter to all customers, and EPA should develop guidance that specifies other options for effectively communicating this information.

4. Systems regardless of whether they have a lead ALE would regularly deliver robust PE about the risks of lead-bearing plumbing and the benefits of removing the plumbing and/or taking regular precautions to reduce their risks. *[This fourth recommendation is identified as Option 3, which is how it was identified in the February draft.]*

Members provided the following feedback:

- One member indicated that the public currently does not have access to utility data on lead. Another member indicated that they post their monitoring data with the address redacted to not deter people from volunteering to be part of the sampling pool. Another noted that his systems do not post monitoring information on their website, but provide specific results back to customer. *[See Section F.3.b for additional discussion on this topic.]*

- A member indicated that a system should provide: the dates of sample collection, protocol for sampling, results of resident-collected samples, invalidated samples and reasons, optimal water quality parameters (OWQPs) and their meaning, disinfectant chemicals used, CCT being used, service line inventory and all legal documents that establish ownership in each jurisdiction. In response, one member observed that some of this information is sensitive, such as available chemicals and their locations. There are legal ramifications and terrorism issues. She volunteered to highlight suggestions that could cause these issues. *[See Section F.3.b for additional discussion on the types of information that could be made publically available.]*

- A member questioned if publically available means that the information is available on a website or that it is subject to the Freedom of Information Act (FOIA).

- One member suggested rewording and reordering the last bullet in Section 4.2.3. The bullet as written would require that information be provided in a welcome letter and some systems do not use these letters. Instead, start the bullet with the last half of the sentence to read, "EPA

should include other options for effective communication of this information in guidance" and at the end of the sentence add, "such as a utility's new account welcome letter".

- Another member indicated that small water systems have limited capabilities for providing information, potentially creating a compliance problem. For example, her state hires a contractor to write CCRs for small systems.

Ms. Bingham reminded the Group of its recommendation that EPA consult with risk communication experts about methods that would increase public awareness about lead in drinking water that would encourage the public to learn about it. *[Note that this language was revised and discussed on Day 2 of the meeting. See Section F.3.b for additional information.]*

b. Day 2 Discussion

The Group's comments on information availability and expert consultation are provided below.

Information Availability

The Group discussed a member's proposal regarding the types of information that should be made publically available. Ms. Bingham suggested the Group begin by discussing which of the following should be required to be made publically available for systems serving > 100,000 people:

- Lead sampling results.
- WQP results.
- Type of treatment generally.
- LSL inventory.

Members provided the following feedback:

- Regarding sampling results:
  - Some members thought lead sample data should be made publically available but differed in their opinions on how much and whether locational data should be available (e.g., include the full address, redact the street address, including just the zip code).
  - Some members supported redacting the address for privacy issues or to avoid deterring public participation in the sampling program if people could tie a test result to a specific home.
  - One member questioned if there was value in posting lead data. His system does not receive many lead questions. In response, two members indicated that in the future, his system may get more questions about lead after consumers receive more robust PE.
  - Another member noted the need to be transparent about the monitoring data. In response, one member suggested adding NextGen Principle 4 to Section 4.2.3 of the draft report

because it promotes transparency. This principle states: “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.”

- Another noted that the report should address the following as important questions: 1) how frequently information would need to be updated (what is considered current) and 2) the level of effort to keep this data current.

- One member supported making the lead sampling protocol publically available. Two members did not agree and suggested this information should be on the national clearinghouse. The original commenter indicated that the current LCR has a standard protocol to which not all systems adhere. (The Group did not object to including the sampling protocol in the next draft of the report.)

- Regarding the type of treatment:

  - A member thought that the type of treatment may be important to convey to the public but not when and how it is done.

  - Another thought that knowing the type of treatment was not useful without the entire treatment train but such a requirement was too onerous.

- Regarding the LSL inventory data, some members supported making this information publically available but had similar comments as they did for lead sample results regarding the sensitivity of locational information.

The Group also discussed whether systems, states or EPA should be required to report sample results and the general reporting requirements for systems and states. Mr. Burneson explained that EPA’s drinking water regulations specify reporting requirements (systems to states and state to EPA) as well as recordkeeping requirements. SDWIS Prime is designed to facilitate the transmission of information from system to state and then from state to EPA. Currently, systems report all results to the state (i.e., parametric data) and states report 90th percentile levels and violations to EPA. Mr. Burneson added that SDWIS Prime should be in place in a few years; however, it is being built from the current rule. The public can access data through the Freedom of Information Act (FOIA) but state-specific FOIA laws dictate what information is available. He also noted that CCRs require some reporting of lead levels (90th and detects).

Members provided the following comments:

- One member indicated that to date, systems have not been required to post their data. Unregulated contaminant monitoring data is posted by EPA. Requiring systems to post their information would set a precedent and we need to consider the implications and talk to others in the drinking water community. He also questioned for systems with a large number of samples (e.g., 100 or 200 samples), would we require them to post all of this information or provide a range and 90th percentile?

- On member asked if EPA is requiring systems to post data to EPA's Enforcement and Compliance History On-line (ECHO).

- Another member added that if we want to be able to compare data across cities, they must be reported in a consistent format. This brings into question who should post the data.

- One member suggested that it would make more sense for the state to report this information.

Expert Consultation

The Group discussed the April 23, 2015 revised version of Option 3 (reflects the numbering used in the February draft report). Ms. Bingham explained that Option 3 is on page 20 in the full April draft in Section 4.2.3 – *Strengthen requirements for public access to information* and read as follows:

> *Robust PE about the risks of lead-bearing plumbing and the benefits of a) removing this plumbing, and/or b) taking regular precautions when cooking or drinking, would be delivered regularly, regardless of a PWS's compliance with the LAL and regardless of whether there are LSLs in the service area since lead leaching can occur in buildings without LSLs.*

In the April 23, 2015 version, this paragraph is the last paragraph in Section 4.2, is no longer titled Option 3, includes language that recommends EPA consult with experts and reads as follows:

> *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 cooking or drinking, regardless of whether LSLs are present or there has been a lead AL exceedance. Based on this advice, EPA should consider whether such methods should be included in guidance or in revisions to the LCR.*

Members provided the following feedback regarding this revised paragraph:

- Three members commented that they agreed with the wording. One noted that the goal is to increase public awareness and to motivate them to learn and to take appropriate action to reduce their risk to lead exposure.

- One member questioned whether to include an action item for EPA to help encourage people to go to the clearinghouse and other sources for information.

- A member suggested adding language to promote participation in the voluntary testing program. Others agreed with this suggestion but that the wording needed to be appropriately placed in the report (e.g., clearinghouse section was one suggestion). Another suggested asking experts how to get people motivated to participate in the voluntary sampling program.

G. Draft Report and Recommendations: Section 4.6 Copper

The Group discussed Section 4.6 – Establish Separate Monitoring Requirements for Copper. Specific discussions are provided under the following three sub-sections: 1) Overview and General/Editorial comments, 2) CCT for Copper and Copper Passivation and 3) Small System Waivers and Variances.

1. Overview and General/Editorial Comments

One of the copper sub-group members provided a brief overview of the current proposal in Section 4.6 of the draft report as follows:

- The approach is based on work done by Dave Cornwell (EE&T) and Mike Schock (EPA Office of Research and Development).
- Actions would be based on the aggressiveness of water toward copper.
- The sub-group recommended that EPA develop criteria to define water that is non-aggressive to copper for purposes of binning, using the initial numbers from Cornwall and Schock as a starting point, and also recommends that EPA consider passivation time.
- Systems with water corrosive to copper would be required to conduct customer outreach.
- Systems are assumed to have aggressive water unless they demonstrate it is not. This demonstration can be based on WQP monitoring, copper monitoring at vulnerable homes, pipe loop study or a change in water chemistry such that the water meets the WQP criteria for non-aggressive water.
- Systems that are classified as having non-aggressive to copper must continue to demonstrate that their water is non-aggressive, either by WQP or copper monitoring at vulnerable homes.
- Systems that have a change in source or treatment must re-evaluate if their water is corrosive or non-corrosive to copper.
- EPA should develop:
    - PE guidance and/or templates for small systems.
    - Guidance should also encourage PWSs with water corrosive to copper to notify contractors, plumbing suppliers and plumbers and to work with building codes to not allow copper piping in new construction if the corrosive water conditions cannot be eliminated.

Members provided the following general comments and suggested revisions to the draft language:

- The current LCR monitoring requirements are is not picking up places with high copper because tap sampling locations focus on lead. The suggested approach will better capture and address risks from copper.

- We are unclear on the message we should provide to the public regarding copper health effects.
- We need to consider the requirements for water systems without copper and add that to the draft report.
- Regarding page 30, individual members made the following comments:
    - Recommendation #5 currently reads, "The public education program must either provide: a) Targeted information to all new homes or newly renovated homes OR b) Information is provided to all customers annually (choice is systems)." A member suggested that we shouldn't miss the opportunity to educate those in newly renovated homes.
    - Systems know when they get a new customer. A system can learn about a new renovation from a plumbing package that contains a permit for renovation.
    - Violations are discussed in recommendation #7 but they need to be consistent with what we are doing for lead.

The Group also discussed whether the suggested requirements for copper are commensurate with the health effects for copper, such as the prevalence of those with Wilson Disease. One member did not think the Group has sufficient information to determine if the benefits are justified by the costs. Two members also pointed out that these recommendations are more targeted than a large sampling program, mandatory CCT for systems with aggressive water, more extensive copper PE would be.

2. <u>CCT for Copper and Copper Passivation</u>

The Group discussed whether CCT should be required or at least remain an option for some systems with high levels of copper in tap samples.

Some members provided reasons for not supporting a requirement for copper CCT that included:

- Putting in centralized treatment for just a couple homes is not a good use of resources.
- Many systems with water aggressive to copper already have CCT. Also some systems may have aggressive water but passivation may occur relatively quickly (e.g., 6 months) and the system will no longer have a copper ALE.
- CCT can cause other issues such as phosphate loading. Also new copper may passivate so instead of immediately triggering CCT for systems with corrosive water, we should consider other measures such as removing new copper and providing system-specific information to customers regarding passivation.
- For smaller systems, if we require more thorough and aggressive PE to the community, the community would be in the position of determining what it wants for a solution (e.g., changing out copper plumbing or wanting the system to install CCT). This is a community-by-community issue.

Some members supported requiring CCT for copper, saying that if copper has known health effects and if a system has exceeds the copper action level, it should treat. Another agreed and noted that at some point CCT should be triggered and the Group needs to determine what that trigger should be. A member commented that setting a trigger for CCT needs to be based on what is causing the water to be aggressive.

Dave Cornwell explained that systems have aggressive water when the alkalinity is too high relative to the pH. Basically the carbonate concentration equates to alkalinity. Many Midwest systems have a high alkalinity and high calcium. If these system raise their pH, their water becomes noncorrosive to copper but can result in calcium carbonate precipitation. A system may first need to soften its water if it wants to raise the pH to avoid calcium carbonate precipitation. Another option is to use more orthophosphate. These options are not straightforward for small systems. In response to this explanation, a member indicated that CCT for copper may result in the need for additional pretreatments such as softening.

Mike Schock discussed factors that influence copper passivation. He indicated that a system may not achieve passivation if it uses blended phosphate instead of orthophosphate. Other factors that influence passivation and make passivation time difficult to predict include high sulfate, chloride and/or natural organic matter (NOM). We may have missed some systems where passivation was delayed due to these other factors. However, most systems with low pH would also have lead problems and would have installed CCT under the current rule. He referred to the binning criteria he and Cornwell suggested, but added that other water quality factors make it difficult to predict whether a system will have corrosive water. The only way to determine water aggressiveness is to sample. Also, it is a policy question if PE alone is sufficient if a system takes five years to passivate.

Members provided additional comments regarding passivation:

- Regarding whether we caught systems that have not passivated under the original monitoring scheme, systems serving > 50,000 people would have already installed CCT.
- Another indicated that we should already know about those that never passivated because of secondary impacts such as blue staining of porcelain. We should be dealing with a small group of systems in the middle.
- Another added that in her state, ground water has a low pH and is soft so it is quite aggressive to copper. She thinks through LCR, about half of the CWSs in her state were kicked into CCT.

Mr. Burneson explained that if the Group does not recommend requiring CCT, in order to satisfy the requirements for a treatment technique rule, EPA would have to justify that PE is a treatment technique in and of itself. Currently, PE and LSLR are part of a CCT technique package. The mandate for a treatment technique rule is to reduce to the extent feasible the level of the contaminant. Also, EPA would need a defensible argument to demonstrate anti-backsliding

Additional comments from individual members included:

- A member expressed concern that it may be more complicated to set PE as a treatment technique, and another added that it would set a precedent that she would want to think about further before supporting.

- Another member commented the Group needs to clearly state when an assessment for CCT is necessary.

The Group decided that the copper sub-group should meet to further discuss the topic of a trigger for copper CCT.

3. Small System Variances and Waivers

A member asked Mr. Burneson if the current LCR has different requirements based on system size and whether a very small system could be triggered into treatment. In response, he explained the LCR requires CCT imposed for systems serving more than 50,000 people. Small systems have to collect fewer samples than larger systems but the rule does not excluded a group of systems from installing CCT based on size. However, the 1996 SDWA Amendments allow for variances for systems serving 10,000 or fewer people. At the time of rule promulgation, EPA has to determine that treatment is not affordable and identify an affordable technology that can reduce the contaminant. Small systems must apply to the state and demonstrate why they need a variance. States must make a judgment if they agree, hold a public hearing and decide whether to grant a variance. If granted, the state must decide how the system will operate and maintain the affordable technology, and review its decision every 5 years.

In response, members provided the following comments regarding CCT for small systems:

- A variance may not be a good option for dealing with copper CCT for small systems because it does not provide an off-ramp.

- The Group can indicate in the report that we need more study because we could be creating unintended consequences. Another member disagreed and thought that NDWAC would dismiss the recommendation if it were not more concrete. He asked if a state could attach an order to a permit instead.

- Another member noted that small systems have difficulty operating complex treatments. He noted that the worst treatment disaster in his state was when a small system made a pH adjustment chemical feed mistake that caused caustic soda burns.

The Group discussed small system waivers. One member suggested including a waiver provision in the rule for situations where adjusting CCT for copper may impact treatment for lead or when copper CCT would only impact a few houses. Systems could work with homeowners that have copper to remove their copper sources.

Other comments and questions included:

- Whether treatment is limited to chemical treatment or could include a point-of entry (POE) device or pipe replacement. In response Mr. Burneson noted that POE and point-of-use (POU) technologies are recognized under the statute as treatment, which can consider economies of scale. He also reminded the Group about the current LCR LSLR requirements.

- The term "waiver" implies that we are not requiring the system to address the problem.

- Whether a waiver for small systems would be burdensome for states or whether a waiver is easier than asking a small system to install and maintain CCT.

H. Section 4.3 Corrosion Control and Section 4.4 Monitoring Requirements

Ms. Bingham explained that the CCT/monitoring sub-group participated in three calls that clarified the following key areas for discussion by the full Group, but they did not reach agreement on an option:

- What is the role of tap sampling with respect to CCT?

- What is the role of the AL in this new framework?

- How should CCT be defined and maintained and what should the monitoring requirements be, while systems with LSLs are implementing the LSL replacement program?

The Group discussed these and other related areas. Specific discussions are provided in the following sub-sections:

1. Shift from Tap Sampling to WQP monitoring to evaluate CCT.

2. Required WQPs.

3. Optimization/Re-optimization.

4. Summary Statements and Conclusions

5. Straw Vote.

1. Shift from Tap Sampling to WQP Monitoring to Evaluate CCT

The Group discussed a proposal to move the focus of the sampling requirements from tap monitoring to WQP monitoring to assess the effectiveness of CCT. This approach would require either tighter and/or more frequent WQP monitoring, a reliance on new science for CCT and possibly the need for some systems to re-optimize. Members provided the following comments:

- One member summarized the option proposed to help ensure that systems are taking appropriate actions. He explained that first, WQPs should be based on the latest science and be used to monitor whether the treatment process is being implemented as intended. Second, he suggested that customer-requested sampling be used to monitor for lead for homes with LSLs. All results would be shared with customers, and results that exceed the HAL will be reported to

the state and LHD for further assessment and action to reduce customer exposure. For copper, systems will determine if they have corrosive water and steps needed to address it (e.g., install CCT, replace copper).

- Not all members agreed with the shift from tap samples to customer-requested samples. Specific comments included:

  - There is not a correlation between WQP exceedances and lead levels at the tap. System-wide sampling for lead will continue to be needed as a check to determine if there is exposure to lead and whether a system might need to re-optimize.

  - One member pointed out that if a system changes its source or treatment, they would need to reassess their CCT. Another member added that system that do not have CCT would still need to monitor to assess whether they are maintaining their baseline WQPs.

2. <u>Required WQPs</u>

The Group discussed whether the current list of WQPs in the LCR that includes pH, alkalinity and in some instances calcium, conductivity, and temperature is sufficient.

- One member explained that there are other parameters that are not currently required such as iron, manganese, aluminum, chloride and sulfate that can influence lead release. She suggested as a first step systems should conduct a comprehensive assessment of factors that could contribute to lead release and water aggressiveness (e.g., the system has high iron levels). Once this is done, the system can evaluate individual homes.

- Another pointed out that systems do assess a wide range of parameters in determining their proposed CCT plan. A more limited set of WQPs are then set as process controls. States can add to the list of WQPs that is in the LCR.

- A system would need to address its high iron levels regardless of whether it is required under the LCR. Similarly, systems should monitor for any parameter that would allow them to better understand and control treatment (e.g., monitor for chloride/sulfate). Another member agreed that there may be other system-specific parameters that should be monitored by the system. He noted that systems will need to work with their regulators to determine which ones are important.

- This is a rule for all systems. Inherent in this is that WQP requirements would be tailored to a system versus requiring a more extensive list for all systems.

- Small systems don't have expertise to do extensive WQP monitoring. TCR sampling locations are representative of the distribution system and would be an efficient for WQP sampling locations to make judgments about CCT efficiency.

- The Group should use clear language when discussing WQPs that are required in the LCR as opposed to the longer list of parameters that impact lead release, used for initial assessment

purposes in developing the CCT plan. One member indicated that the term "WQPs" apply to parameters that are used as "process controls."

A member questioned the basis for assuming that if a system maintained its WQPs over time, it will control lead. She explained that WQP variations over time and in the distribution system can impact lead release. She added that without knowing the lead levels being released at the tap, we cannot know if a system's WQPs are adequate.

Others commented that:

- The proposed customer-initiated tap sampling could provide information from more homes, more frequently than available under the current LCR requirements.
- We need more frequent WQP distribution monitoring than the current requirement of every 6 months and to conduct this monitoring over more dispersed distribution system locations. He suggested using three rounds under the AL to define success.
- Under the current rule, neither tap nor WQPs deal with changes in the distribution system over time or location. Tap monitoring is typically conducted during a 4-month period every 3 years and we have infrequent WQP monitoring. More frequent WQP monitoring and more continual customer-based monitoring will provide information to better understand changes over time and location.

A member stated that the Group needs to know the following: 1) how states will decide which WQPs a specific system should monitor, 2) how states will set OWQP ranges that consider the various interactions that can impact lead release and the time lag between when a LSL is identified and replaced and 3) how systems will conduct sampling at LSLs.

Members and EPA provided the following additional comments:

- A member stated that we don't have the corrosion control science to deal effectively with random particulate release from LSLs. Most of CCT is based on uniform corrosion of soluble lead. He added that, even with better data, we will not be able to turn a dial and see immediate improvements. As long as lead is in contact with water, improvements can only be made slowly. The exception may be a system with poor CCT that can make significant improvements in a shorter period. Another member asked that this not be interpreted to mean that systems don't strive for improvements in treatment. For example, systems can modify treatment to deal with manganese and iron. Systems may decide to adjust their treatment after LSLR. He added that states and systems need updated CCT guidance. Another member noted that his system continually evaluates its treatment for possible adjustments. He added that his system fills out daily process and energy reports. Another member noted that systems will continue to balance all objectives to come up with the best overall treatment.
- Another member explained that other factors such as high manganese and iron are considered in the treatment design and when setting OWQPs.

The Group discussed how the rule can be structured such that all systems would be using the best science/guidance.

3. Optimization/Re-optimization

The Group and EPA discussed whether a system should be required to optimize or re-optimize its CCT. Specific comments included:

- One member stated that CCT has not been optimized in most utilities because CCT does not consider our current knowledge about all the relevant factors that influence lead release. Utilities should conduct treatment studies to determine OWQP targets that address all relevant factors.

- Another indicated that small and some medium systems may need an engineer to help them conduct a study and the Group needs to be mindful of the costs to those systems.

- Another stated that we need periodic re-optimization built into the rule that requires systems to look at the most current guidance to determine if WQPs should change but not require retesting. The guidance may provide new information on parameters that influence lead release and should be considered by the system. Re-optimization could be done every 6 years.

- Mr. Burneson explained that the current LCR required a CCT study for systems serving > 50,000 people and for systems under this size range if specified by the state. In addition, the 2007 LCR revisions added a requirement for systems to notify the state of a significant treatment or source change to determine if they need to adjust CCT. He added that a review of CCT to address the change in science could be accomplished by: 1) a trigger in the rule that would require a reassessment of CCT at a specified frequency or 2) the Six-Year review process. He asked the Group to provide recommendations on both approaches.

- One member stated that the rule would need to allow systems to forego this re-assessment if, during the 6-year cycle, EPA had not updated the guidance or there is no new science.

4. Summary Statements and Conclusions

One member commented that CCT should be one tool instead of the main tool for reducing lead. Other tools include lead-free materials and LSLR. Another member provided the following summary of a package of elements he would propose based on the Group's CCT/monitoring discussions:

- Consistent sources of data as follows:

    - Requiring more frequent and broader WQP monitoring and better process control to help ensure that CCT is being effectively implemented.

    - Voluntary, in-home drinking water testing that will actively target homes with LSLs but will also include homes without LSLs. This approach could provide more data than the current tap monitoring that for most systems is conducted during a 4-month period every 3 years.

The voluntary samples would be plotted and analyzed and will capture seasonal and other variations (e.g., changes in treatment chemical). Results would be provided to the consumer and any result above the HAL would be reported to the LHD for action. Currently, we don't require systems to assess why they may have a change in lead levels as long as there is no ALE.

- Both data sources could result in adjustments to existing CCT or new CCT. If the science changes, the system has a more robust data set on which to make better decisions going forward.

- States could look at data more frequently for systems for which they have concerns and also could use sanitary surveys as an opportunity to review data.

- Requiring systems to monitor their WQPs as a baseline and to maintain these WQPs.

- Having several measures that may result in a system's re-evaluating its treatment as follows:

  - A possible requirement to periodically re-assess treatment based on the most current science or updated EPA guidance.

  - Sanitary surveys that provide a great opportunity for states to discuss with systems how these updates could impact treatment.

  - Maintaining the current requirement to assess whether a change in treatment or source will impact CCT.

  - A possible requirement to find and fix problems if a system is not meeting its OWQPs.

  - A possible requirement to assess and resolve changes in lead levels based on volunteer customer sampling.

- Using proactive PE to get people to go to the EPA clearinghouse, and empowering the public by providing them with data they can use to reduce their exposure to lead. All CWSs would continue to have to prepare and deliver a CCR, as currently required.

- Requiring proactive LSLR programs, in contrast to the current program where many systems do no LSLR (because the current requirement is triggered by a lead ALE following treatment) to a goal of no LSLs.

In response, the Group provided the following general feedback:

- One member supported this approach because it provides public health protection. She stressed the role that the primacy agency can play in addressing system-specific considerations. She added that the problem with specifying too many requirements is that different regions will face different issues (water chemistry, presence of LSLs).

- Another member indicated that the proposal seems to address some issues with the current approach such as triennial monitoring and sample bias. He added that we need process control and checks, such as tap samples. We should consider making the voluntary sample results publically available to provide transparency.

- Another member underscored the value of robust PE that tells consumers that LSLs are bad and all systems with LSLs replacing them regardless of whether they have an ALE. Sampling at the tap for LSLs may not be adequate so we are suggesting WQP monitoring at an increased frequency that considers current science. If members have issues with the suggestion for voluntary sampling, remember that tap monitoring in the current rule is also voluntary, because we cannot compel people to monitor.

- Another member stated that the Group needs to consider this proposal more conceptually and give EPA some flexibility in how to implement it. The positive aspects of this proposal are that systems will be doing more and will be targeting their efforts. He suggested looking at the proposal from a higher level to determine if it has the right elements. He suggested that EPA will provide the details when they draft the proposal and that members of the Group can provide input during the comment period. He added that the report to NDWAC needs to indicate the questions the Group did not answer and why they are important and include concerns and issues (e.g., how samples will be taken).

- Another member thought that the proposal needs both basic principles and additional detail. Currently, it is very vague and raises some concerns.

Members discussed the current AL in terms of the Group's proposal. Specific comments and questions included the following:

- One member asked whether the HAL could become a surrogate MCL. He indicated that the Group should define actions when the system exceeds the AL and when it exceeds the HAL. He suggesting renaming the current AL as the "system AL".

- A member indicated that the AL may only be useful to flag a problem for a small system.

- Another member thought that the AL is valuable for triggering action. For example, if System A consistently has a lead 90th percentile level of 12 ppb and System B has variable lead levels of 3 ppb and 8 ppb, should the state tell System A to do nothing but ask System B to spend millions to address the increase? Two members indicated that this explanation helped them understand the value of the AL and why it should be retained.

- In response to a question, Mr. Burneson explained that a treatment technique is used when a system cannot measure the contaminant. For lead and copper, achieving a level below a maximum contaminant level (MCL) is outside the control of the system because these contaminants rarely occur in source water. Ms. Christ added that the turbidity and pathogens are good examples where an MCL is not used. Specifically, for pathogens, log removal is used in lieu of a number.

The Group also discussed what should happen in the event that a system did not get enough volunteer in-home samples. Specific comments included:

- A member suggested including a backstop that would include system-initiated monitoring if the number of customer-initiated samples in a 3-year window does not equal the minimum required number of tap samples in the current rule. Two other members supported this suggestion. One added that systems may not get the participation the Group is expecting. Another member suggested that failure to meet this required number should be a violation.

- Another member noted that this approach will provide an opportunity to get samples from multi-family and other locations that currently are not Tier 1 sites because they are not single family residences.

- Another member did not support adding the backstop and thought that a system's limited resources would be better used for the LSLR program.

5. Straw Vote

The Group took a straw vote on whether the proposed approach of more frequent WQPs potentially expanded to include more parameters plus a more continuous data stream of voluntary tap sampling with a backstop would be an improvement over the current rule requirements of sampling at the taps with tiers, using the AL as a trigger, and retaining the sampling frequency. (Changes to the sampling protocol were not considered in this vote.)

Two members abstained and all other members voted that the proposed approach was moving in the right direction. Ms. Bingham reiterated that this is not a final vote, but that she would include these concepts in the next draft. One member asked if there is another alternative, and members were invited to offer others if they wish. Another stated that the Group needs to revisit the proposal in a few weeks to determine how to make it more robust. A third member explained that she abstained from voting, not because she was in opposition but because she needs a more robust proposal to see if it makes sense scientifically.

I. Public Comment

Two individuals provided public comment on Day 1 and none provided comments on Day 2. Both sets of comments are summarized below.

1. Carrie Lewis, Water Utility Manager of Milwaukee Water Works

Ms. Lewis thanked the LCRWG for their good work. She indicated that the LCR is the hardest rule on which she has worked, and she comes from a city where 400,000 became ill from *Cryptosporidium*. Milwaukee stopped installing lead in 1947 and has 170,000 service lines of which 70,000 are lead. She noted that the replacement cost would translate to $70,000,000, conservatively assuming a cost of $1000 per line. She indicated that 20 years is too fast and that the funds for the replacements will take resources from other areas. The city is currently replacing 15 miles of water mains, which impact 1,500

service lines of which only 150 lines are lead. A water main replacement program does not allow access to privately owned LSLs. In addition, it is impractical to require systems to collect a sample from or provide filters to homes with LSLs (70,000 homes in Milwaukee's case). Also one sample does not provide much information, the results are hard to reproduce and may not represent the water the individual consumes. She also indicated that Milwaukee is trying to get customers served by the 150 lead services impacted by the main replacement program to allow the city to collect lead profile samples. Even outside these 150 services, there are 69,750 residences with LSLs. Managing all of these homes with LSLs will be extremely difficult and she asked the LCRWG to think about the practical aspects of what they are suggesting.

2. Paul Schwartz, Water Alliance

Mr. Schwartz asked the Group not to lose sight of the importance of addressing lead in water as they consider how to ensure lead at the tap is integrated with paint, soil and dust, and efforts are coordinated with other health agencies. A lot of lead in drinking water is being consumed by newborns or infants under 1 year, who are not typically getting their BLL tested. It is very easy to see them in competition for resources and focus. While we take a community wide approach to thinking about lead in drinking water, for paint soil and dust there is a lot of home-by-home or building-by-building intervention. The conversation about using a menu from which systems with LSLs can pick to intervene to reduce lead is important. It could come with a real cost if we do not reconcile the centralized nature of how we deal with lead in drinking water at the system level versus a more distributed focus for handling lead in paint, soil and dust. There is a lot of pushback from CDC, scientists and activists that work with lead in Healthy Homes about the importance of lead in drinking water. DC as part of a public relations attempt ramped up partial lead service line replacements (PLSLRs). Cost is important but it would be foolish to dismiss the idea that more crises like DC could occur. Interventions will be more costly than using a systemic approach. You should continue down the road of integration but make the message clear that lead in drinking water is a real issue.

J. Wrap-up

Ms. Bingham summarized the next steps as follows:

- To be scheduled:
  - Copper sub-group to discuss triggers for CCT.
  - Compliance sub-group.
- Week of April 27, 2015: Ms. Bingham will send out a new CCT/monitoring section to get comments on whether that captures the discussion at this meeting. She will provide concepts and questions/considerations for EPA for those areas for which she does not think the Group agrees.
- May 1: a few members will consult with one another and provide Ms. Bingham with ideas for:

- Table 2 (Checklist of options from which utilities could choose if replacement progress goals in Table 1 are not met).
- Copper requirements for systems that do not have copper (Section 4.6 - *Establish Separate Monitoring Requirements for Copper*)

- May 9, 2015: a few members will consult with one another and provide financing ideas for the addendum.
- May 9, 2015: Target date for third full draft report.
- Week of May 18, 2015: Target date for Compliance Sub-group meeting. One member suggested that NextGen be included as a discussion topic for this meeting.
- June 12, 2015: Date for fourth full draft. This version will include input from the Compliance Sub-group and will be used to develop the PowerPoint presentation for the NDWAC webinar.
- June 18, 19, 22, and 23: Possible dates for the full NDWAC webinar:
  - The purpose of the 2 hour webinar is to obtain feedback from the full NDWAC prior to the 7th LCRWG meeting. The goal is to obtain questions from the NDWAC during the webinar, which will be addressed in the final report.
  - Some members from sub-groups will present sections of the PowerPoint presentation.
  - NDWAC will receive the PowerPoint presentation ahead of time but not the report.
- June 24 and 25, 2015: Last LCRWG meeting at Cadmus' Arlington Office. The goal will be to refine the language in the report that will be presented to NDWAC in late July.

Mr. Burneson shared Ms. Bingham's optimism that the Group had made real progress on some challenging issues.

The following table contains action items from the April 2015 meeting and outstanding action items from prior LCRWG meetings.

Row	Action Items from April 23 and 24, 2015 Meeting	Responsibility[1]
1	Send calendar invite for June meeting	RESOLVE
2	Schedule copper sub-group meeting.	RESOLVE/Copper Sub-group
3	Schedule compliance sub-group meetings.	RESOLVE/Compliance Sub-group
4	Schedule NDWAC webinar for June.	EPA
5	Provide paragraphs for the background section on lead-free and copper history.	EPA
6	Provide suggested wording for sections of the report to NDWAC.	Gary Burlingame, Steve Estes-Smargiassi, Tom Neltner, Bob Steidel, Nse Obot Witherspoon
7	Further develop milestones and checklist activities for the LSLR Program.	LSLR sub-group
8	Distribute the third iteration of the draft report for NDWAC by May 25, 2015.	RESOLVE
9	Provide comments on the third draft report by June 4, 2015.	LCRWG
10	Distribute the fourth iteration of the draft report for NDWAC by June 12, 2015.	RESOLVE
11	Develop PowerPoint presentation for the full NDWAC webinar.	EPA/RESOLVE/LCRWG

Row	Outstanding Action Items from Past Meetings	Responsibility[1]
FEBRUARY 5 AND 6, 2015 MEETING (Numbering reflects February 2015 Action Item List)		
7	Provide information to the LCRWG on the size distribution of systems with LSLs.	EPA
NOVEMBER 11 AND 12 MEETING (Numbering reflects November 2014 Action Item List)		
3	Post Dave Cornwell's flushing study to Google Drive when it becomes available.	Dave Cornwell/EPA
FROM MAY 29 AND 30 MEETING (Numbering reflects May 2014 Action Item List)		
11	Provide estimate of the number of systems that may qualify for a copper waiver.	EPA
ACTION ITEMS FROM MARCH 25 AND 26 MEETING (Numbering reflects March 2014 Action Item List)		
10	If available, provide additional, existing background materials to LCRWG: Lead level trends for some Massachusetts systems	Steve Estes-Smargiassi
11	Assess availability of other requested information/conduct analysis as needed. 14. How many large, medium, and small systems are estimated to be required to re-optimize (i.e., how many will exceed the lead/copper action level) under new rule?	EPA

Acronyms: LCR = Lead and Copper Rule; LCRWG = LCR Working Group; LSLR = lead service line replacement; LSLs = lead service lines, NDWAC = National Drinking Water Advisory Council.

Notes: [1] Unless otherwise stated, 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 – Second draft Report of the "Lead and Copper Rule Working Group to the Full National Drinking Water Advisory Committee". April 2015.

ATTACHMENT A

Sixth NDWAC Lead and Copper Working Group Meeting

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

April 23 and 24, 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
Becki Clark: Deputy Director
Public Commenters
Carrie Lewis, Milwaukee Water Works/NDWAC
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

Sixth NDWAC Lead and Copper Working Group Meeting

List of Attendees

April 23 and 24, 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[1]	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

[1]Attended the April 23, 2015 session only.

[2]Attended the April 24, 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

April 23-24, 2015

Agenda

Meeting Objectives/Desired Outcomes:

- **Seek conceptual agreement on recommendations; and**
- **Plan next steps.**

Advance materials: NDWAC LCR Work Group Report SECOND DRAFT [4 13 2015]; see also technical references and other materials on Google Drive:

https://drive.google.com/folderview?id=0B-3D2NT30pQDaFlGTTJnTWxmZ0k&usp=sharing#list

Thursday April 23, 2015

8:45-9:00 Informal gathering

9:00-9:30 Welcome, Introductions, Meeting Objectives/Agenda, Materials and Logistics

Advance materials: Proposed agenda

Welcome: Eric Burneson, Director, Standards and Risk Management Division, Office of Groundwater and Drinking Water

Introductions: Gail Bingham, *facilitator*

9:30-10:00 Open Discussion: Follow up on Topics from Past Meetings

Objectives: Address any unanswered or follow up questions and share perspectives.

10:00-10:45 Discuss Draft Report and Recommendations: Considerations and Background Sections

Objectives: Discuss and seek conceptual agreement on recommendations to include in the work group's report. Agree on specific wording where time permits.

Suggested Discussion Questions:

- What modifications or additions are needed to tell the history of where we are today, in the considerations section?

- Do the edits to the considerations section convey what's needed to the NDWAC? What modifications or additions are needed, if any?
- Other?

10:45-11:00 BREAK

11:00-12:15 Discuss Draft Report and Recommendations: Section 4.1 Replace Lead Service Lines

Objectives: Discuss and seek conceptual agreement on recommendations to include in the work group's report. Agree on specific wording where time permits.

Suggested Discussion Questions:

- Is there agreement on the concepts underlying 4.1.1 (combining the presumption with the credit for demonstrating a line doesn't have lead materials to create an incentive for prompt action)? Modifications/additions?
- Is there agreement on the recommendations for customer access to information (in 4.1.1)? For targeted outreach (item 4 in 4.1.2)? Modifications/additions?
- Is there agreement that all PWS should have a LSL replacement program (item 1 in 4.1.2) and what should be counted (item 3)? Modifications/additions?
- What should the pace of the replacement program look like (items 2 and 8 in 4.1.2)? e.g. faster in earlier years? Target end date? Different timing for NCNTWS?
- With this pace, what role would changing the definition of control play, if any (item 5 and explanatory text at the end of 4.1.2)?
- Other (items 6 and 7)? (e.g. what should be in the rule and what should be in guidance?)

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

1:15-1:30 Public Comment

1:30-2:30 Discuss Draft Report and Recommendations: Section 4.5 Health-Based Standard

Objectives: Discuss and seek conceptual agreement on recommendations to include in the work group's report. Agree on specific wording where time permits.

Suggested Discussion Questions:

- How might EPA's current authorities (section 1431 and/or Health Advisories) be utilized to accomplish immediate assessment and action when lead levels exceed a health-based threshold?
- Should a notification be required to "similarly situated" customers? How should that be defined?
- Other?

2:30-2:45 BREAK

2:45-4:00 Discuss Draft Report and Recommendations: Section 4.2 Public Education for Lead

Objectives: Discuss and seek conceptual agreement on recommendations to include in the work group's report. Agree on specific wording where time permits.

Suggested Discussion Questions:

- Any comments on the national clearinghouse? (4.2.1)
- What draft CCR language should be provided to EPA to have reviewed by the suggested, diverse group of experts? (4.2.2) How would the LCRWG balance the messages that should go into the CCR and its overall length? (current CCR is 12 lines; options 1 and 2 are 15 and 29 lines respectively)
- What additional recommendations does the group want to include about public access to information? (4.2.3)
- Other?

4:00-5:15 Discuss Draft Report and Recommendations: Section 4.6 Copper

Objectives: Discuss and seek conceptual agreement on recommendations to include in the work group's report. Agree on specific wording where time permits.

Suggested Discussion Questions:

- What should be added to this section about health effects as a driver for copper requirements, if anything?
- Are any modifications or additions needed for the recommendation to define requirements using a "bin" system based on aggressiveness of water to copper?
- Does the LCRWG wish to leave the ranges to EPA to determine? If so, will including examples imply otherwise?
- What should be the age break point for sample site selection?
- Other?

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

Friday, April 24, 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 conceptual agreement on recommendations to include in the work group's report. Agree on specific wording where time permits.

9:30-10:30 Discuss Draft Report and Recommendations: Section 4.4 Corrosion Control and Section 4.5 Monitoring Requirements

Objectives: Discuss and seek conceptual agreement on recommendations to include in the work group's report. Agree on specific wording where time permits.

Suggested Discussion Questions:

- What modifications or additions should be made to the shared assumptions/conclusions preceding the recommendations in 4.3?
- To the CCT recommendations?
- Is there agreement on the purposes for WQP monitoring? Modifications/additions?

10:30-10:45 BREAK

10:45-12:15 Discuss Draft Report and Recommendations: Section 4.4 Corrosion Control and Section 4.5 Monitoring Requirements (continue)

Objectives: Discuss and seek conceptual agreement on recommendations to include in the work group's report. Agree on specific wording where time permits.

Suggested Discussion Questions:

- What should the purposes be for in-home tap sampling for lead? What changes to the LCR does the group want to recommend?
- How should CCT be defined and maintained and what should the monitoring requirements be, while systems with LSLs are implementing the LSL replacement program?

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

1:15-1:30 Public Comment

1:30-2:45 Open Session (for Addendum and for issues needing additional discussion)

Objectives: Discuss and seek conceptual agreement on recommendations to include in the work group's report. Agree on specific wording where time permits.

2:45-3:00 Wrap up and Next Steps

3:00 ADJOURN MEETING

Attachment D

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

SECOND DRAFT

[NOTE: THIS DRAFT WAS PREPARED FOR DISCUSSION BY THE LCRWG AT ITS MEETING ON APRIL 23-24, 2015. THIS DRAFT IS BASED ON THE LCRWG'S FEBRUARY 5-6 MEETING AND INPUT FROM SMALL GROUP CALLS HELD IN MARCH. IT DOES NOT REFLECT A CONSENSUS OF THE WORKING GROUP. ADDITIONAL EDITS ARE ANTICIPATED.]

April 2015

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Abbreviations

AL – Action Level
ALE – Action Level Exceedance
CCR – Consumer Confidence Report
CCT – Corrosion Control Treatment
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/L – Microgram per deciliter
NDWAC – National Drinking Water Advisory Committee
OGWDW – Office of Ground Water and Drinking Water
OCCT – Optimum Corrosion Control Technology
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
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 (LCR) under the Safe Drinking Water Act (SDWA).

1.2. Findings and Recommendations

There is no safe level of lead. Lead can pose health risks to anyone, but there are heightened risks for children and other vulnerable populations with both acute and chronic exposures. The lack of resources to reduce the sources of exposure in some communities also raises important questions of disparate impact and environmental justice. The best way of preventing lead exposure through drinking water is to remove lead from the drinking water system. .

Specific recommendations of the LCRWG include revisions to the LCR to:

- Require proactive LSL replacement programs and improving 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;
- Develop stronger public education requirements for lead and LSLs;
- Strengthen corrosion control treatment (CCT);
- Modify monitoring requirements;
- Establish a health-based, substantial and imminent endangerment standard; and
- Separate the requirements for copper from those for lead.

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.

2. Considerations

There is no safe level of lead. Lead can pose health risks to anyone, but there are heightened risks for children and other vulnerable populations with both acute and chronic exposures. The lack of resources to reduce the sources of exposure in some communities also raises important questions of disparate impact and environmental justice.

The best way of preventing lead exposure through drinking water is to remove lead from the drinking water system, the primary source of which are full and partial lead service lines (LSLs) in systems where they continue to be used. Lead also can be found in plumbing materials in residential buildings, schools, office buildings and elsewhere.

Historical Trends [Comment from Gail Bingham: As requested at the February meeting, this is an attempt to tell the story of where we are today in a concise way appropriate to an introduction.]

Historically, in addition to modern uses in gasoline, food and paint (now generally prohibited as additives in the United States and many other countries) and consumer products, lead was used for water pipes, in lead allows (bronze, brass) for plumbing fittings, and in lead solders, in part due to its durability and malleability. In the early twentieth century, lead pipes were replaced by other materials, such as plastics, but existing lead pipes remain in place in many cities and lead alloys continued to be used until very recently.[1]

The U.S. Public Health Service published a non-enforceable standard for lead in 1925, consisting of a tolerance limit (blood lead level or BLL) of 0.1 mg/L.[2] Its successor, the Centers for Disease Control and Prevention, recently redefined the "level of concern" downward to 5 µg/dL (or 0.05 mg/L). The 1986 Safe Drinking Water Act amendments defined "lead-free" plumbing and prohibited the use of plumbing for public water supply that did not meet the new definition. The amendments also required EPA to set standards limiting the concentration of lead in public water systems. EPA first issued the lead and copper rule on June 7, 1991.[3] The latest modification was issued October 10, 2007. Following the adoption of the 1991 rule, public water systems serving more than 50,000 people were required to implement corrosion control, among other requirements. All public water systems had to implement tap sampling, and to take specific actions if samples exceeded an action level. (See Regulatory Background below for additional information on the regulations.)

The Centers for Disease Control and Prevention (CDC) tracks blood lead levels (BLLs) from all sources for the non-institutionalized U.S. population through the National Health and Nutrition Examination Survey (NHANES). The percentage of children ages one through five years with BLLs ≥ 10 µg/dL has decreased over time. (See Table 1.) NHANES data from the 1970s and 1980s also showed disparities by race and income. According to a 2012 assessment published in CDC's *Morbidity and Mortality Weekly Report,* "By the 1999-2004 surveys, the percent differences in BLLs ≥ 10 µg/dL for children aged 1-5

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[1] *Check reference* Safe Drinking Water Act Amendments of 1986. "Prohibition on use of lead pipes, solder, and flux." 42 U.S.C. § 300g-6(d). Pub.L. 99–359, approved 1986-06-19.
[2] U.S. Public Health Service, Washington, DC (1925). "Report of the Advisory Committee on Official Water Standards." Public Health Rept. 40:693. April 10, 1925.
[3] EPA. "Maximum Contaminant Level Goals and National Primary Drinking Water Regulations for Lead and Copper; Final Rule." *Federal Register,* 56 F.R. 26460, 1991-06-07. 40 CFR Part 141, Subpart I.

years, by race and family income, were no longer statistically significant…"[4] It is beyond the scope of this report to attribute this trend to specific sources of exposure.

TABLE 1. Blood lead levels (BLLs) of children aged 1–5 years — National Health and Nutrition Examination Survey, United States, selected years

Year	% with BLL ≥10 µg/dL	Geometric mean BLL (µg/dL)
1976–1980	88.2	15.0
1991–1994	4.4	2.7
1999–2002	1.6	1.9

"Interpreting and Managing Blood Lead Levels <10 µg/dL in Children and Reducing Childhood Exposures to Lead" Recommendations of CDC's Advisory Committee on Childhood Lead Poisoning Prevention, MMWR, November 2, 2007 / 56(RR08);1-14;16

EPA LCR compliance monitoring data[5] also show a downward trend in the 90th percentile lead concentrations. A comparison of initial compliance monitoring by systems serving more than 50,000 persons conducted from 1992-93 with post-2000 compliance monitoring data found a decrease in lead action level exceedances. After 2000, 17 systems serving more than 50,000 persons had 90th percentile lead concentrations greater than 15 µg/L, compared to 177 systems of that size in 1992-93.[6]

However, efforts to reduce lead exposure further, including from drinking water, remain important if society is to achieve a lasting solution to lead exposure from all sources and the resulting protection of public health. For example, recent studies suggest that there can be unanticipated spikes in lead releases in drinking water. Often the compliance sampling program missed these spikes because they missed the contribution from the lead service line.[7] Further, LCR compliance data does not show a correlation between lead action level exceedances and water quality parameter violations.[8] Thus, it is reasonable to conclude that corrosion control is an important tool but is not sufficient to prevent high levels of lead from getting into drinking water, particularly from the lead service lines.

Considerations in Preparing this Report

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. However, removing lead from drinking water systems also will require renewed commitment, cooperation and effort by government at all levels and by the general public. Creative financing and robust public education also are essential. Thus, this report includes recommendations both for revisions to the LCR and for wider action. We urge EPA to play a leadership

[4] Brown M and S Margolis, "Lead in Drinking Water and Human Blood Lead Levels in the United States" (2012, MMWR)
[5] U.S. Environmental Protection Agency. 2006. Summary: Lead Action Level Exceedances for Medium (3,300-50,000) and Large (greater than 50,000) Public Water Systems. (updated as of June 1, 2004)
[6] Brown et al "Strategies for assessing optimized corrosion control treatment of lead and copper" Journal AWWA 105:5 May 2013
[7] Check reference - Schock M [insert title and date of webinar presentation]
[8] *Check reference* - EPA data provided to the LCRWG.

role not only in the revisions to the LCR but also in educating, motivating, and supporting the work of other agencies.

Several foundational concepts underlie the recommendations in this report, some of which can be accomplished by public water systems (PWSs) through the LCR and others of which may require non-regulatory action or programs by EPA and others. Additional detail is provided in the recommendations section below.

- As is emphasized above, there is no safe level of lead. Lead-bearing plumbing materials pose a risk at all times (not just when there is a lead action level (LAL) exceedance).
- Proactive action is needed to remove the sources of lead, with appropriate incentives to encourage such action both for (PWSs) and their customers. PWSs should establish lead removal programs with the goal of removing all lead from contact with drinking water over time, with risk reduction measures implemented in the meantime. In addition, stronger action must be taken when lead exposure levels pose a risk of imminent and substantial endangerment to the residents.
- 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 environmental justice concerns. 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.
- Enhanced public education must be a priority. 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 characteristics of the issues associated with lead and copper are very different. Thus, the requirements for lead and copper should be separated.
- The LCR should remain a treatment technique rule, but it can be improved, e.g. by developing more robust water quality parameter monitoring (WQP) requirements to demonstrate that a PWSs water is non-corrosive and to maintain those conditions.
- In-home sampling remains an important part of the LCR, but with a change in its purpose to site assessment sampling to provide information to residents.
- Optimum corrosion control treatment (OCCT) is very complex. Providing technical assistance to PWSs is important, including updating the guidance manual on determining and evaluating OCCT to improve minimization of lead in plumbing systems from all sources.
- Attention to unintended consequences is important in complex situations such as the LCR. Examples in this context include considering the impact of phosphate as an OCCT chemical on POTWs and receiving waters and considering the role of OCCT for metals in addition to lead and copper.

- Attention to what systems can implement and States are able to oversee and enforce also is important. This may include recognizing the limits to a water system's authority on private property, including issues of access to private property or legal prohibitions against spending public money on private property. It also may require partnering with other entities that have additional roles, such as local government in setting ordinances, local health authorities in providing public education and assistance, and customers in participating in risk reduction efforts.
- Reducing complexity by eliminating or modifying requirements that increase system burden without achieving reasonable reduction in lead and/or copper exposure can allow resources to be focused on actions that better achieve health outcomes.

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

Under the Safe Drinking Water Act (SDWA) EPA sets public health goals and enforceable standards for drinking water quality.[9] The Lead and Copper Rule (LCR) 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 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 more than 3,300 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

[9] 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."

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 better ensured drinking water consumers receive meaningful, timely, and useful information needed to help them limit their exposure to lead in drinking water.

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 six times in 2014 and 2015 to produce this report, in which it provides recommendations on the LCR LTR.

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.]

4. Recommendations for Revisions to the Lead and Copper Rule

4.1. Replace Lead Service Lines

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 cannot 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 the Addendum to this report for recommendations that complement revisions to the LCR.]

The existing LCR has not been as successful as originally envisioned at creating incentives to fully replace LSLs and other sources of lead, such as from premise plumbing because it 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.

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 reliable 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 establish a LSL replacement program 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 funding strategies;
- Targeted outreach to customers with LSLs;
- Dates by which systems should have begun and completed replacement of all LSLs and PSLSs, 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;
- Understanding where LSLs and PLSLs exist, while making action on replacement the priority;
- Programs in place addressing operations that disturb LSLs, educate consumers, and provide voluntary sampling of consumer taps; and
- Avoiding the time and expense of upfront plan approval and using simplified reporting to the states so they would only need to intervene when problems arise.

4.1.1. 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 show that it not, with

2) Providing credit to a PWS toward its replacement goals for demonstrating that a LSL does not have lead materials.

This approach is intended to create incentives for prompt action to develop an accurate inventory of LSLs and PLSLs, time to organize an effective replacement program, and an opportunity to take action to

replace LSLs rather than devoting time and resources on plan 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 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 from PWS.

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.

4.1.2. Establish active LSL replacement programs

Proactive LSL replacement programs 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 optimize CCT, because this has not resulted in the complete replacement of many LSLs across the country. [Comment from Gail Bingham: Question: is there data on how many existed when the LCR was first promulgated and how many exist now?]

Instead, a revised LCR should include a direct 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, especially when lines have been disturbed as part of a renovation. Details on these and other ideas are included in the Addendum.

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

1. *Goal:* Require PWSs to work with their customers to replace all lead service lines in their service areas within [20] years of the effective date of the rule. The LCRWG urges PWSs work with their customers to replace LSLs in their service areas more quickly, but recognizes in recommending this timeframe that a mandatory LSLR program adds a new and potentially costly requirement for utilities 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 replace the inventory of LSLs according to a sequence of three-year milestones,[10] 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. Table 1 provides an illustration of this concept. [Comment from Gail Bingham: See separate document for Table 1 illustration. (NOTE: The current version of the table is intended as an illustration of the concept; the LCRWG has not yet agreed on the pace.)] 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.

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. [Comment from Gail Bingham: Notes from small group: What level of detail about outreach methods and how much follow up is sufficient should be in the rule versus in guidance? How can this be kept simple? Allow flexibility for implementing best practices developed in the future?] 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 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 Funding Options:* 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.

[10] Three years is a standard reporting timetable for drinking water regulations.

Financial assistance options EPA may want to describe in guidance and PWSs could consider include:

- Adapt low-income assistance programs for plumbing improvements.
- Adapt service line insurance programs [clarify what this is]
- Adapt emergency bill payment relationships with community NGOs.
- Identify plumbers with appropriate training and potential provide a community-based reduced rate for LSLR.
- Community absorbing additional costs associated with street, sidewalk, and other repairs that might otherwise be shared with homeowner.
- Zero or low interest loans paid through water bill.
- Others as appropriate given local institutional arrangements.

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 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 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
      - Proper use of filters when lead levels might be high

   d) Activities of other utilities (e.g. power, cable) when those latter utilities are engaged in construction that affects water service lines or water mains to: [Comment from Gail Bingham: 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 the proper use of filters when lead levels might be high

8. A revised LCR also should include the following requirements for individual structures or campuses of buildings that are “public water systems” and own their own pipes.

- Non-community water systems with lead service lines should replace lead piping within xx [this is a placeholder] years of the effective date of the revised LCR. [Comment from Gail Bingham: Timing?]
- Individual businesses, nonprofit organizations, and governmental buildings or campuses that are operated as "public water systems" (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 funding 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. 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 and the legal basis for that decision.

4.1.3.Compliance

[Comment from Gail Bingham: Insert after further discussion.]

4.2. 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 very important for real 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.[11] 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 4.3.1).
- Revise the current CCR language to address lead service lines and update the health statements (section 4.3.2).

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[11] 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)

- Add requirements for targeted outreach to customers with lead service lines (section 4.3.3 [comment from Gail Bingham: One PE small group member suggested an edit to add vulnerable populations. Noted here as a comment since targeted outreach was discussed by a different small group.] and 4.1.2).
- Strengthen requirements for public access to information about lead service lines, tap monitoring results, and other relevant information (section 4.3.4).

4.2.1. National Information Resource About Lead in Drinking Water

The LCRWG recommends that EPA take the lead, working with other partners to establish a national, accessible information resource. [Comment from Gail Bingham: Elaborate: examples of partners?] 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).

Such a resource 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 should be included. EPA should consider best practices in branding 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 [Comment from Gail Bingham: Could this be elaborated to convey that lead particles can have high potency (e.g. exceeding the CPSC standard used to recall toys) and the risk of exposure should be taken seriously? (Question is to get at the intent of the bullet about concentrations of lead below that was hard to figure out how to word.)]
- 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 [Comment from Gail Bingham: Can forms and sources sections be combined to avoid redundancy?]

- 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

4.2.2. 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. Thus, the CCR should provide basic information and a link to the national clearinghouse described above for additional information.

The LCRWG agrees with the current requirement that community water systems (CWSs) should include a statement about lead in their CCR. EPA may want to consider an option that would allow the primacy agency to waive this requirement when a system can demonstrate that there are no lead bearing materials in contact with drinking water (e.g. a subdivision built entirely after January 2014). However, this determination should not be based solely on monitoring results. Further, the work group recommends that a revised CCR should include:

- Public health statements updated to reflect current understandings that there is no safe level of lead, that this risk pertains to everyone, and that some individuals are particularly vulnerable;
- A link to the national web site;
- 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.

The LCRWG recommends that the following redraft of the CCR 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.

> The following is a suggested revision intended to increase public awareness about LSLs and to encourage public engagement in replacing them (added language is underlined).
>
> ***Important Information from EPA about Lead*** *If present, ~~elevated levels of~~ lead can cause serious health problems, especially for pregnant women and young children. 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. 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. Protecting you against exposure to lead is a shared responsibility. You can take responsibility for identifying and removing lead materials within your home plumbing and taking steps to reduce your family's risk, such as running the water until it is fresh or using a filter. 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]* [Comment from Gail Bingham: Is there a better term or phrase than "corrosivity" that is concise?]

Alternative proposal: [Comment from Gail Bingham: The first version above reflects notes from the call. However, it was clear on the call that these ideas would be discussed further at the April LCRWG meeting. In that context, this second version was proposed after the small group call, for consideration at the meeting.]

Important Information from EPA about Lead *If lead is present, ~~elevated levels of~~ in your drinking water, it can cause miscarriage, fetal death, and serious health problems, especially for fetuses, infants dependent on reconstituted formula, ~~pregnant women~~ and young children. Lead in drinking water comes ~~is~~ primarily from materials and components associated with ~~service lines and~~ home plumbing and service lines (the pipe connecting your home ~~house~~ to the water main) and can appear sporadically, at different times of the day and year. ~~(System name) is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components.~~*

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. Your water utility is required to minimize the corrosivity of the water (i.e., the water's ability to eat away at plumbing materials and carry lead to your tap). 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. ***Protecting you against exposure to lead is a shared responsibility between your water utility and you.***

If your home was built before 2014, [comment from Gail Bingham: Question: Should this reflect the fact that some states passed "lead free" laws prior to the Reduction of Lead in Drinking Water Act's effective date of 2014 (e.g. California's law went into effect in 2010)?] *it is likely to have lead-bearing plumbing components (e.g., lead service line, lead solder, leaded brass). Lead service lines are the most significant source of lead in drinking water.* ***Some homes in our community have lead lines connecting the home to the water main. If your home has a LSL, pregnant women, infants and children should not drink the water or use it for cooking unfiltered lead release from lead service lines is very difficult to control.*** *The treatment provided by [PWS] can lower the lead levels, but cannot eliminate all risk. Contact us for information about how to find out if you have a lead service line and why you should replace it.*

As long as your home has lead-bearing plumbing, you are at risk of exposure to lead. You can identify and remove lead materials within your home plumbing and take steps to reduce your family's risk, such as running the water until it is fresh [comment from Yanna Lambrinidou: Flushing can expose people to peak lead if it isn't done correctly for their specific home. I recommend that the advice here either becomes specific, or is deleted.] *or using a filter. If you have lead service lines or lead-bearing materials in your home, you may wish to have your water tested.* [Comment from Yanna Lambrinidou: I find this statement misleading. I recommend it be deleted.] *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]*

4.2.3. Strengthen requirements for public access to information

Greater public access to information about lead in drinking water is needed. The methods for ensuring access may vary based on individual system circumstances and size. The LCRWG recommends the following requirements be included in a revised LCR:

- Utilities serving populations greater than 100,000 currently are required to post their CCR on a publically accessible web site and many have their own web site. The LCR should be revised to require that systems with their own web-sites provide information on their web-site about lead service lines, how to determine if they have one, associated risk, information about in-home sampling (as further described in Section 4.5), risk reduction options, and full-lead service line replacement options.
- Systems with the lead service line replacement program described in section 4.1 above should implement a program of targeted outreach to customers with LSLs, which would inform the customer that they have a LSL and/or how to determine if they have one, the health risks associated with exposure to lead, risk reduction options and their options for full LSL replacement. [Comment from Gail Bingham: Frequency? Delivery method? (Should that go in section 4.1?)] Targeted outreach would be based on available information, updated over time, per recommendation 4.1.1 above. When detailed understanding of LSL occurrence is lacking, then targeting can be based on more general information such as development period of home, or even distributed to communities as a whole.
- The LCR also should require that information about the risks of lead from lead-bearing plumbing generally be provided in the utility's "new account" welcome letter to all customers, and EPA should include other options for effective communication of this information in guidance. [Comment from Gail Bingham: Does the LCRWG want to elaborate? Reference the concept of consumer-centered communication?]

The following was not discussed on the small group call; it is included for discussion at the April meeting.
Option 3:

> Robust PE about the risks of lead-bearing plumbing and the benefits of a) removing this plumbing, and/or b) taking regular precautions when cooking or drinking, would be delivered regularly, regardless of a PWS's compliance with the LAL and regardless of whether there are LSLs in the service area since lead leaching can occur in buildings without LSLs.

4.3. Improve Corrosion Control

[Comment from Gail Bingham: This section includes areas of agreement from the CCT/monitoring small group, most of which were about CCT. The small group did not reach agreement on the implications for monitoring, however. That section (4.4) attempts to capture the questions/options that remain.]

PWSs subject to the LCR are required to minimize lead and copper levels at consumers' taps by controlling corrosion in the distribution system. 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 action level if ten percent or more of the tap samples collected are greater than the action level.

The LCRWG has concluded the following:

- Lead 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 an important component of the LCR, in that it is intended to achieve a water quality that minimizes dissolution of lead in water.
- 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 and other materials; and temperature. Variations in water quality also can occur within the distribution system. [Comment from Gail Bingham: Were there other factors that should be included? Or is "among others" sufficient?]
- 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, availability of certified POU filters, instructions on how to flush plumbing systems when lead could be disturbed, etc.
- Water quality conditions vary among PWSs, which in turn affect the CCT choices a PWS must make in in the context of other regulatory requirements.
- Experience to date suggests that it is possible to improve CCT, for example by setting tighter ranges to WQPs in some situations. However, given the considerations noted above, determining the most effective CCT approach is a very complex task.

Thus, the LCRWG recommends that:

- EPA release a revised CCT guidance manual as soon as possible and update this manual every three to five years;
- EPA provide increased expert assistance on CCT to PWSs;
- The LCR continue to require WQP monitoring to ensure that the CCT is achieving the treatment objectives; and
- The LCR be revised to require existing CCT plans be reassessed by the primacy agency on a *insert frequency]* basis, include in that reassessment the range of factors that can affect the dissolution of lead in water, and consider whether the WQP ranges can be tightened. [Comment from Gail Bingham: There seemed to be agreement on the small group call that WQP ranges may need to be tightened. The mechanism for doing so wasn't fully discussed. This option was mentioned, but it's not clear from the notes whether or not there was agreement (or disagreement). It is included here to prompt discussion at the April meeting.]

4.4. 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 is difficult. Customers are not professional samplers and, thus, may implement the sampling protocols inconsistently. Research on sampling protocols 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.

In addition, while such sampling is intended to assess the effectiveness of CCT to achieve public health protection rather than as a direct measure of public health protection itself, concerns about residents of individual households still being exposed to high levels of lead are understandable, whether or not the system as a whole exceeds the AL. Concerns that adjustments to CCT can't reduce public health risk when high lead levels in individual samples may come from particulate lead also must be taken seriously, particularly given the risk of changes to CCT causing unintended consequences to other aspects of drinking water treatment.

The LCRWG agreed that there is a role for both WQP monitoring and lead sampling in homes. [Comment from Gail Bingham: Elaborate what these purposes are after the April meeting. The description below of the purposes for WQP monitoring may capture the discussion on the small group call. Differences remain about the purpose for tap sampling. One question is whether/how to use tap sampling as a reality check to catch problems with CCT related to lead release. Options discussed by the small group include: use of the voluntary tap sampling in some way, sampling stations, and strengthening the current tap sampling requirements (see option 2 below from the last draft).]

Purposes for WQP monitoring

[Comment from Gail Bingham: The following text was shared with the CCT/monitoring small group and is included here for discussion by the full group.]

As a centralized treatment, CCT needs to be monitored for chemical feed and for its intended effects (to keep certain water quality conditions within a certain range appropriate for the overall, individual PWS). That is the primary purpose for WQP sampling.

CCT is a treatment process, centrally applied. Its purpose is to provide a stable water quality that, according to the latest science and individual PWS sources of lead, would minimize lead dissolution (and maximize insoluble lead) without causing other water quality problems (such as scaling) or causing the PWS to violate a health-based MCL (such as for DBPs). CCT can take years to establish. Or the intended effects of CCT, such as developing insoluble lead scales, can take years to establish. But some changes in water quality, such as the change from free chlorine to chloramine to reduce DBPs, can quickly disrupt CCT's positive effects.

A PWS' WQP monitoring plan, WQ limits, and tracking/reporting can be improved so that it is clearer as to whether CCT is being maintained as permitted by the State:

- The States can set tighter WQP ranges in a more consistent manner so that treatment is better maintained and so that variations do not reverse the positive effects of CCT. [Comment from Gail Bingham: This may belong in section 4.3 but is included here for completeness.]
- WQP monitoring can be done more frequently. Rather than once every 6 months, for example, they could be monitored monthly.

- The locations for sampling WQPs could be more representative of the distribution system for each PWS, such as by using DBP monitoring locations which are set at near, mid and far locations in a distribution system.
- Tracking of the WQPs to make sure they stay within their limits, and setting upper and lower bounds that would require find and fix action to correct the treatment as needed, could be established by using control charts (which could follow an AWWA industry best practice standard).

Purposes for Lead Sampling in Homes

In discussions about CCT and monitoring, the question of lead sampling comes up likely because it's a trigger in the existing LCR that when exceeded requires CCT. But there could be different reasons for wanting lead sampling in homes that may or may not be connected with CCT.

1. To Trigger the Need for CCT: For all PWSs that have lead sources in their communities, OCCT should be a base requirement. For larger systems it already is. However, for smaller systems, many may not yet be required to have CCT. LCR monitoring has shown that lead levels are already very low. Perhaps their natural water is already in a state of CCT? If we count this as natural CCT then we could still require that they maintain WQPs and report to the State any changes that occur. Could this simplify the Rule structure and changes that will be proposed?
2. Validate the Selection of an CCT as a Reasonable Centralized Treatment for a Specific PWS: Past LCR data could potentially be used to help validate the selection of utility specific CCT. For example, if a PWS with CCT has three consecutive rounds of meeting the AL then CCT as selected seems to be a reasonable treatment option to maintain as centralized treatment such that from here on in, WQPs would be used to maintain OCCT as specified by the State.
3. Maintain CCT as a Reasonable Centralized Treatment at a Specific PWS: WQPs are the basic way to maintain a treatment process. One controls the feed of chemicals to adjust water quality to stay within a certain range. In a treatment technique process, one usually establishes a baseline and then monitors for changes from that baseline, especially since conditions can vary from PWS to PWS. This would identify upsets in the system, or the need for re-optimization because treatment or source waters or other changes have occurred. The question here is: How do we monitor for lead to develop a baseline for maintaining CCT? One idea was to set up sentinel sampling locations that get sampled more frequently over time to indicate whether lead levels were changing or not.
4. Customer Requested: This is not CCT related. Its purpose would be to help customers make informed decisions about mitigating lead in their specific homes. Customers would be told that they can get this testing done, but would have to request it since their help would be needed to accomplish it. Strong education would be needed, though, to get participation and since a negative/low lead result could be misleading whereas a high lead result could potentially be followed up with action.
5. Find Worst Case Homes: This is not CCT related. Other actions are needed in addition to CCT for lead control, depending on the community's sources of lead. CCT may be in place but it may not be able to mitigate all sources of lead. So there may be a need to identify homes that need action. This is similar to the #4 above.

The following option attempts to meet two purposes: check CCT and find worst-case homes.

Existing In-Home Sampling Scheme and AL:

6. Small PWSs could simply keep using this scheme. If they exceed the AL then they are to either evaluate CCT or determine another option for controlling lead (maybe the homes causing the exceedance have LSLs and it would be better to remove the LSLs than install CCT, or provide coupons to have faucets replaced with lead-free alternatives). The lead in-home sampling and AL might remain the simplest scheme for small PWSs to use to confirm water quality and lead, and to find worst-case homes (since over time they can actually cover many homes in their system by rotating through them).
7. PWSs that already have CCT in place would use this sampling (it's likely they already have the data) to confirm that the CCT they have selected is a reasonable treatment technique for a particular PWS. They would need a one-time set of 3 consecutive rounds not exceeding the AL while CCT is in place (the 3 rounds could come from grandfathered LCR compliance data already in existence). Once this is achieved and the State has approved a permit for CCT, they would monitor WQPs and offer to have customer requested samples tested for lead. If source water or treatment changes are made and water quality is affected, then the State could require another round of inhome sampling to determine the need for re-evaluation of CCT or allow the PWS to use other means to re-evaluate CCT.

In-home Sampling after obtaining a CCT Permit from the State:

- Once the PWS has CCT in place under a State permit, then the PWS would provide PE on lead in drinking water along with providing customer requested sampling for lead.
    - The primary purpose would be to help find the worst-case homes and help them reduce their exposure to lead. Each home would receive test results in a thoroughly explained letter with a contact for questions. Negative or low lead would not be used to indicate there's no exposure. Elevated lead would provide some actionable information toward reducing lead exposure in that home.
    - The secondary purpose would be for the system to use these data and any follow-up with the customer to continually evaluate their control of lead in their system. The State would also get a copy of the letter and results, and if they start seeing a pattern of elevated lead results coming in without reasons (such as LSL identified, kitchen faucet to be replaced) then they can re-consider the actions being taken by the PWS and the CCT permit. Resampling of homes that tested high but no cause was found would also be counted towards meeting this purpose.

Text that follows is from the draft sent prior to the February meeting:

Option 1:

Thus, the LCRWG recommends a shift in the functions of monitoring at the tap and of water quality parameter (WQP) monitoring in the LCR. The rationale for this approach is that WQP monitoring is a more direct way to ensure CCT is optimized. It should be strengthened.

The LCRWG believes there is a role for in-home tap monitoring and suggests that it be used to understand and take action to reduce lead exposure in specific premises as part of a robust program of lead removal as described above, where households with LSLs have been identified, informed that they have a LSL, can participate in a LSLR program and need information to reduce the risks of lead exposure directly until their LSL is replaced.

CCT and appropriate monitoring of and adherence to water quality parameters, plus a more aggressive approach to LSL replacement reduces the value of in home sampling for regulatory

purposes. Tap sampling would continue at the request of customers with LSLs, as an off-ramp from the current approach (systems that are over the action level would work with their State on appropriate next steps for transition, which may include some samples) and also may be part of investigative research when treatment or sources change.

Option 2:

PWS compliance with the LCR would be linked to a LAL that is set to reflect a specific level of risk in a specific vulnerable population and used as a trigger to *escalate* corrective measures, not to determine whether such measures are needed, since to some degree public health protection measures are needed at all times whenever lead is in contact with drinking water.

Public water system compliance with the LCR would *not* be linked to water quality parameters. Water quality parameters would be used simply for guiding CCT, not for achieving regulatory compliance.

In-home water sampling would be restricted to a sampling protocol that is designed to capture highest lead levels in truly highest-risk homes, whether the leaching comes from LSLs, leaded brass, lead solder, or non-lead particles that have absorbed lead from other lead-bearing plumbing components.

Escalation of remedial measures during a LAL exceedance (or repeated LAL exceedances) OR during exceedance of a health-based threshold level (i.e., health-based standard) as follows:

+ **For PE**: During a LAL exceedance or when a health-based threshold level of lead in water (or health-based standard) was exceeded in any home in a PWS's sampling pool (this bullet echoes CDC's 1/19/11 recommendation to EPA; although escalation of PE requirements during a LAL exceedance is already part of the Rule, it needs serious improvement).

+ For LSL replacement: If the LAL were exceeded twice (or re-exceeded again at a future time), PWSs would be required to continue with full LSL replacement until all LSLs were out regardless of the PWSs' ability to fall back under the LAL. [Comment from Gail Bingham: Does/how does this relate to section 4.1?]

[Sections 4.5.1 and 4.5.2 below provide additional detail on option 1.]

4.4.1. Sampling for Customers, Changes in Treatment or Source Water, and for CCT Compliance

A revised LCR should require the following:

- Households with LSLs must be given the opportunity to have tap water samples tested by the PWS, be provided the results, and be provided information on ways to reduce lead exposure, including but not limited to LSL removal. Samples should be taken using a protocol that captures water that had been in the LSL for some time.
- PWSs making a major change in treatment (e.g. change in disinfectant) or adding a new water source should evaluate CCT, which may or may not require sampling at the tap. This determination should be made in consultation with the primacy agency.
- PWSs in compliance (either with a lead removal program or that have no LSLs in their distribution system) may transition from in-home sampling for lead to water quality parameter

(WQP) monitoring for assessing the effectiveness of CCT or of their water quality characteristics, whether or not the system's treatment system was designed for corrosion control.

4.4.1.1. Sampling for Customers

While in-home sampling may not be useful for determining compliance with CCT requirements as part of a revised LCR, in-home sampling does provide information about a specific premise that can help a customer put appropriate risk reduction measures in place. PWSs should respond to customers about lead generally and must give households with LSLs an opportunity to have their tap water sampled by the PWS.

In-home sampling also can be used to:

- Build awareness of lead in drinking water with local health agencies
- Inform changes in drinking water treatment and source water changes (assuming the same sites are being monitored)
- Be part of full investigation by health agency in homes where children have elevated BLL

EPA should provide sampling guidance for in-home sampling that would assist systems and customers to take samples that are "fit for purpose." Such purposes include: screening, understanding the exposure at a single structure, evaluating sources of lead in a specific home, and understanding impacts from changes in treatment or source.

Other considerations in sampling for customers:

- Utility may process samples for customers on request or direct customers to state approved laboratories
- When a utility processes such samples, the system will retain the observed values for use to inform future analyses of system water quality
- If compliance monitoring no longer includes lead sampling in the home, then CWS should provide screening, by way of sample analysis as a component of public education

4.4.1.2. Changes in Treatment or Water Source

Requirements of the current LCR should continue. PWSs making a major change in treatment (e.g. change in disinfectant) or adding a new water source should evaluate CCT, which may or may not require sampling at the tap. This determination should be made in consultation with the primacy agency.

4.4.1.3. Transition to CCT Compliance Monitoring

PWSs in compliance (either with a lead removal program or that have no LSLs in their distribution system) may transition from in-home sampling for lead to WQP monitoring for assessing the effectiveness of CCT or of their water quality characteristics, whether or not the system's treatment system was designed for corrosion control.

Condition	Monitoring for Pb with in-home sampling required.

Condition	Monitoring for Pb with in-home sampling required.
• If below current AL (Pb= 15 ppb) (e.g., in-home monitoring for lead is no longer required for LCR compliance monitoring)	• Two most recent consecutive rounds below the AL. • Maintain OCCT conditions during past satisfactory performance period • No change in source or treatment.
• If above current Lead AL ([Pb] > 15 ppb)	• Work with primacy agency to optimize corrosion control

4.4.2. Water Quality Parameter Monitoring (frequency and number of locations)

If WQPs are to be used as the focus of ensuring that corrosion control is continuing to be appropriately practiced, the revised LCR should include requirements to make the sampling fit for that purpose.

- Systems that manage pH and/or alkalinity or add a corrosion inhibitor for purposes of optimized corrosion control should maintain a record of practice.
    i. No less frequently than daily observation of finished water (point-of-entry-to-the-distribution system) pH, alkalinity, and/or corrosion inhibitor as applicable to the system's corrosion control strategy.
    ii. Logs of chemical usage including chemical and weight applied.
- All community water systems should monitor distribution system water quality parameters (whether or not CCT is employed).
    i. Sample locations
        1. Located to capture variability in the distribution system
        2. Coordinated with other distribution system sampling schemes (TCR, DBPR)
        3. Reflected in a plan approved by the State and available to be reviewed in Sanitary Survey

    ii. Samples per sample site / monitoring period
        1. Monitoring described as single sample per sample site per monitoring event
        2. Monitoring to be distributed throughout the monitoring period and calendar year
        3. Number of samples per year does not need to be large in order to capture relevant variability. Number of sites would increase as a function of system size and number of sources / treatment
        4. Frequency is increased, but number of sites might be able to be decreased

    iii. Frequency (Routine)
        1. Monitoring should be monthly
        2. Frequency could be lower for GW systems than SW systems
        3. Frequency could be lower for systems with less corrosive water [comment from Gail Bingham: Add "or more chemically stable."]

    iv. Frequency (Reduced)
        1. No reduced monitoring provision for water quality parameter monitoring

    v. Frequency (Waiver)
        1. No waiver provision for water quality parameter monitoring

4.4.3. Sample Invalidation Criteria

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."

4.5. Establish a Health Based, Substantial and Imminent Endangerment Standard

[Comment from Gail Bingham: At the February meeting, the LCRWG discussed EPA's existing authorities, including section 1431 and Health Advisories. One question for discussion at the April meeting is whether/how the LCRWG might want to build on either or both of these for this section of the report.]

The current LCR attaches PWS compliance to two main requirements: staying within a set range of water quality parameters and staying under the LAL. However, neither requirement directly corresponds to consumer exposure to lead in water or associated health risks from such exposure. In other words, neither requirement is designed to directly protect public health. Specifically, staying within a set range of water

quality parameters does not address all the factors that cause lead to leach into the water, and staying below the LAL does not address the health hazard of exposure to lead for many homes (whether lead levels tend to be <15 ppb but above the MCLG of zero, or whether they tend to be >15 ppb). This leaves large segments of the public unprotected from exposure to lead in water but assured that their water is safe to drink.

Thus, in addition to the public education and LSL removal programs described in earlier sections of this report, the LCR should be revised to establish a health based standard that identifies a "substantial and imminent endangerment" threat from lead in water. This concept can be found under other environmental programs (e.g. CERCLA) where exposure risks are considered so high that immediate action must be taken. For example, this would be analogous to a situation in which EPA's Superfund program would require bottled water to be provided to individuals with drinking water from wells where ground water samples of lead reached this level of concern. In a SDWA context, this could be a threshold set such that an infant on formula would be expected to have blood lead levels above the current threshold of concern of 5 micrograms per deciliter set by the Centers for Disease Control and Prevention (CDC). *[A handout distributed at a meeting referred to an EPA web site that identified 40 ppb for school-aged children.]*

The LCRWG recommends EPA calculate such a level of concern and, where in-home tap samples exceed the level of concern regardless of whether there is an AL exceedance, require PWSs to communicate directly with the customer, recommend blood lead testing for residents, provide water filters rated effective for the lead levels found in the samples taken, and provide the customer an opportunity to participate in a full LSL replacement program. In addition, the PWS should be required to notify other similarly situated customers in the service area. [Comment from Gail Bingham: A question raised at the February meeting was whether/how it would be possible to define "similarly situated" customers.]

4.6. 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 plumbing[12] 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 should have no further copper monitoring requirements. This could be written into the rule, rather than require a monitoring "waiver." Systems with water quality parameters that are aggressive to copper should implement appropriate

[12] New copper is generally understood to be up to six months to three years of age.

corrosion control treatment and water quality parameters for copper. This could be written into the rule, rather than require a monitoring "waiver."

Thus, 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:

    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 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)

        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.

    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. Targeted information to all new homes or newly renovated homes

    OR

    b. Information is provided to all customers annually (choice is systems)

    In addition, in guidance, EPA should encourage PWSs to notify contractors, plumbing suppliers, plumbers of copper corrosivity and to work with building codes to not allow 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. 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).

7. A violation would be:

    a. Failure to implement PE, for PWSs that have not demonstrated their water chemistry is not aggressive to copper.
    b. Failure to maintain a monitoring program representative of the distribution system that demonstrates the system has water chemistry not aggressive to copper.
    c. 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).

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.

5. Addendum: Recommendations for Additional Action

[Comment from Gail Bingham: THIS HAS NOT BEEN EDITED TO REFLECT THE DISCUSSION AT THE FEBRUARY MEETING.]

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 for reducing exposure to lead from drinking water in the meantime also 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, and will be edited after the February discussion.]

- 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 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..

- Zoning, 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.

6. Conclusion

[Conclusions will be added after the April meeting.]

ATTACHMENT A

NDWAC Lead and Copper Working Group

Members
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
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