NDWAC Recommendations Related to Lead Service Line Replacements

Stephen Estes-Smargiassi
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Where Does The Lead Come From?

- **Kitchen Area**: 0.8 – 1.7 ug
- **Lead Service Line**: 31 – 139 ug
- **Premise Plumbing**: 3.4 – 125 ug

Find and Remove LSLs as Long-term Goal

Lead Control Program
- Provide Public Education Information and Consumer Confidence Report
- Maintain Water Quality Monitoring
- Corrosion Control Treatment needed?
  - No: Water Quality Parameter Monitoring
  - Yes: Lead Service Line Replacement Program
    - Do Lead Service Lines Exist?
      - No: Maintain Water Quality Conditions
      - Yes: Customer Requested Tap Sampling
        - HAL Exceeded?
          - Yes: Contact Health Agency and Report to Customer
          - No: Report to Customer and to State and Evaluate CCT and other Conditions
        - SAL Exceeded?
          - Yes: Report to Customer and to State and Evaluate CCT and other Conditions
          - No: Lead Service Line Replacement Program

Copper Control Program
- Provide Information in Consumer Confidence Report
- Is water corrosive?
  - No: Public Education
  - Yes: Change such that water is not corrosive
    - Yes: Maintain Water Quality Conditions
    - No: Change Treatment or Source
Lead Service Line Replacement Background

(Section 3.1, pp 13-14)

• Under the current LCR:
  – LSL replacement triggered by a lead action level exceedance
  – Action is required in a short time frame; results in many partial lead service line replacements (PLSLR)
  – The replacement requirement stops with two consecutive rounds of sampling being under the AL

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Lead Service Line Replacement Background


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Lead Service Line Replacement Background

(Section 3.1, pp 13-14)

- Science Advisory Board evaluation of effectiveness of PLSLRs concluded:
  - PLSLR does not reliably reduce lead in the short-term
  - PLSLR often associated with short-term elevated drinking water lead levels for some period of time
  - Full LSLR appears in general to effectively and reliably achieve long-term reduction of lead levels in drinking water

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What is a Partial LSL Replacement?

What About Removing LSLs?

- **What we thought we knew**
  - Removal is always beneficial

- **What we know today**
  - All removals likely cause a spike in lead levels
  - Lead levels following a partial replacement do not drop to as low a value nor get to a low level as fast as after a full LSL replacement
  - Lots of partial LSLR under current LCR mandatory LSLR requirement

Photos courtesy of Cincinnati Water
Proactive Lead Service Line Replacement
(Section 3.1.2, pp 16-18)

• All systems should establish LSLR programs, which set replacement goals, engage customers in implementing those goals, and provide improved access to information

• Recommended framework:
  – Assume lines are lead if prior to a certain date, unless PWS can demonstrate otherwise (incentive for accurate inventory)
  – Targeted outreach to customers with LSLs
  – No penalty for customer refusal; no credit for partial LSLR
  – Goosenecks removed when found

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Where are the LSLs?

- Is there an inventory of service lines?
- How can lead service lines be located?
- Are there opportunities to engage real estate and home inspectors?
If it looks like a nickel, it’s lead

If it looks like a penny, it’s copper

Information at www.mwra.com

Photos courtesy of EPA: https://www.epa.gov/il/advice-chicago-residents-about-lead-drinking-water
Proactive Lead Service Line Replacement
(Section 3.1.2, pp 16-18)

• Recommended framework continued:
  – Interim replacement milestones (3 year reporting); credit for lines determined not to be lead; increasing actions if milestones are not met (see Appendix Tables 1 and 2)
  – Failure to meet target is not a violation; failure to increase actions is
  – SOPs for planned maintenance, emergency repairs, etc. (EPA guidance/templates for small and medium systems.)

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Proactive Lead Service Line Replacement

• Benefits:
  – Primary source of lead in contact with drinking water will be largely removed over time
  – Reduced public health risk and costs of corrosion control treatment
  – Improved process for planning and replacing LSLs (e.g. can include in capital improvement programs)
  – Improved awareness of location of LSLs and PLSLs
  – Improved communication with consumers and public health partners about the risks of lead in drinking water
  – Reduced risk/consequences from treatment upsets or source water changes

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NDWAC Recommendations Related to Customer Center Sampling

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advancing the science of water
Sampling: Continuous & Customer Initiated

Lead Control Program

- Provide Public Education Information and Consumer Confidence Report
- Maintain Water Quality Monitoring
- Corrosion Control Treatment needed?
  - Yes → Water Quality Parameter Monitoring
  - No → Do Lead Service Lines Exist?
    - Yes → Lead Service Line Replacement Program
    - No → Customer Requested Tap Sampling
      - HAL Exceeded?
        - Yes → Report to Customer and to State and Evaluate CCT and other Conditions
        - No → Maintain Water Quality Conditions
      - SAL Exceeded?
        - Yes → Report to Customer and to State and Evaluate CCT and other Conditions
        - No → Maintain Water Quality Conditions
  - Change Treatment or Source

Copper Control Program

- Is water corrosive?
  - No → Maintain Water Quality Conditions
  - Yes → Public Education
    - Change such that water is not corrosive
      - Yes → Maintain Water Quality Conditions
      - No → Change Treatment or Source
Modify Tap Sampling Requirements

- Currently PWSs conduct tap sampling for lead, with sample site selection tiers and first draw sampling protocol. If the AL is exceeded, small/med systems triggered to CCT and all systems must do PE and LSLR until results are under the AL for two monitoring periods.

- Issues with current approach:
  - Sampling protocol may not capture the highest lead levels (not from LSL, inconsistent sampling from customers, variability among properties, etc.)
  - Recruitment is difficult and labor intensive
  - Sampling is infrequent and in relatively few homes
  - Implications for CCT are complicated

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Modify Tap Sampling Requirements
(Section 3.4, pp 30-31)

• Voluntary customer initiated tap sampling (with PE encouraging sampling) to provide customers with information and PWS’s with data to identify and correct unanticipated problems
  – Targeted outreach to customers with LSLs and vulnerable populations; available to any customer

• Tap sampling results will be used to:
  – Inform and empower individual households to reduce risk
  – Report to health officials when monitoring exceeds a “household action level”
  – Evaluate effectiveness of CCT and guide reassessment

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Assessing the Effectiveness of CCT

*(Section 3.4.2, pp 33)*

- Tap samples would be reported to primacy agency on a routine bases, and include information on sampling protocols used
- The PWS should maintain the data for review to identify trends and changes; data would be available for public review
- Data to be reviewed during sanitary surveys
- Annually, at the request of the primacy agency, the PWS would provide a report which includes the three most current years of data
- If the 90th percentile of the three years of data exceeds the “System Action Level” then the PWS must assess the cause and potentially re-evaluate CCT or take other actions prescribed by the primacy agency
- Source water and treatment changes would necessitate a review of the tap sampling data in consultation with the primacy agency

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Sampling - Minor Items We Can Agree On

- Aerators - on or off - **On**

- Preflush before stagnation - **No, normal household use**

- Defined stagnation period - **Yes, but long**

- Flow rate - **Normal household use**

- Narrow or wide mouth bottle - **Wide**

- **Better instructions**

Photo courtesy of M Edwards
NDWAC Recommendations Related to Household Action Level

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Household Action Level

**Lead Control Program**
- Provide Public Education Information and Consumer Confidence Report
- Maintain Water Quality Monitoring
- Corrosion Control Treatment needed?
  - Yes: Water Quality Parameter Monitoring
  - No: Change Treatment or Source

**Copper Control Program**
- Provide Information in Consumer Confidence Report
- Is water corrosive?
  - No
  - Yes: Public Education

**Do Lead Service Lines Exist?**
- Yes
  - Customer Requested Tap Sampling
    - HAL Exceeded?
      - Yes: Contact Health Agency and Report to Customer
      - No: Maintain Water Quality Conditions
    - SAL Exceeded?
      - Yes: Report to Customer and to State and Evaluate CCT and other Conditions
      - No: Maintain Water Quality Conditions
  - No
    - Change such that water is not corrosive
- No: Maintain Water Quality Conditions

**Customer Requested Tap Sampling**
- HAL Exceeded?
  - Yes: Contact Health Agency and Report to Customer
  - No: Maintain Water Quality Conditions
- SAL Exceeded?
  - Yes: Report to Customer and to State and Evaluate CCT and other Conditions
  - No: Maintain Water Quality Conditions
Establish a Household Action Level
(Section 3.5, pp 36-37)

- Current lead action level ("system action level") is based on 90th percentile of collected tap samples
- Household action level would be based on lead concentration necessary to elevate BLL ≥ 5 µg/dL in a healthy, formula fed infant
  - Based on CDC level of concern
- PWS to notify local health department when result of tap sampling is greater than household action level - health department to take action it deems best
Questions or Comments?

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Photo courtesy of MWRA