Lead in Drinking Water – Moving Beyond Regulation to Protect Public Health

AWWA Meeting
March 16, 2017
History of Lead Use

• Plumbing derived from “plumbum” which is Latin for “lead”

• Used 1800’s and early 1900’s

• Health effects started to be observed in late 1800s

• Malleable and easy to bend

• Characterized by “bulb” shape

• Goosenecks use near water mains – also called pigtails
Where Is The Lead?

- Goosenecks
- Company service line
- Customer service line
- Customer plumbing including solder
- Customer fixtures
Health Effects of Lead

• Children Most Susceptible
  – Damage to brain, red blood cells and kidneys
  – Low IQ, hearing impairment, reduced attention span
  – Poor classroom performance

• Adults Can Be Impacted
  – Increased blood pressure
  – Pregnant women – lower birth weight and slowing of child development
Lead and Copper Rule

• Overview of LCR
  – Purpose to protect public health by reducing water corrosivity
  – Established an action level (AL) of 15 ug/L for lead
  – Based on 90th percentile of home samples
  – Number of homes sampled based on size of water system

• Sampling Plan:
  – 100% must be Tier 1 sampling sites if available (built after 1982 but before the effective date of State’s lead ban or contain lead pipes)
  – 50% must have lead service lines if possible
  – Samples must be collected after a 6-hr minimum stagnation period
  – Home cannot have Point of Entry treatment
Lead and Copper Rule (continued)

• Challenges
  – Which homes are Tier 1?
  – Where are the lead service lines?
  – Will customers provide samples?
  – Will samples be collected in accordance with protocols?

• An AL exceedance is not a violation but triggers:
  – Water quality parameter monitoring
  – Corrosion control treatment
  – Source water monitoring/treatment
  – Public education (Pb)
  – Lead service line (LSL) replacement
What Are We Doing To Protect Our Customers?

A. Customer Lead Testing and Communications

B. Lead Service Line Inventories and Communications

C. Construction-Related Procedures and Communications
A. Customer Lead Testing and Communications

1. Responding to Customer Requests for Testing

2. Special Considerations for Commercial Facilities such as Schools, Daycare Centers, Hospitals, Nursing Homes, Etc.

3. Customer Follow Up when the Lead Action Level is Exceeded

4. HomeServe Customers

5. Ongoing Follow-Up for Customers with Customer-Owned Lead Service

6. Additional Communications
Responding to Customer Requests for Testing

• Stagnation and Post-Flush Samples

• Verbal and Written Follow-Up

• Determine if Sample Needs to be Included in LCR Program
  – During LCR sampling period?
  – Tier 1 and/or has LSL?
  – Sample collected in accordance with LCR protocol?
Special Considerations for Commercial Facilities

• Provide testing at a minimum of one sample location per Aqua standard protocol

• Provide educational materials such as EPA’s 3T’s for Reducing Lead in Drinking Water in Schools, October 2006

• At school’s request, provide bottles and lead analyses for a modest fee to support extensive sampling programs

• Sampling plan and sample collection by school, not Aqua

• Provide forensic support in certain situation every circumstance is unique
Customer Follow Up for High Lead Levels

Questions to Ask

• Lead Service Line?
• Water Softener or Other Treatment?
• Extended Stagnation Period?
• Hot Water Sample?
• Recent Plumbing Change?
• Improper Grounding?
• Poor Solder Job?

Actions to Take (as appropriate)

• Forensic Evaluation (more testing)
• Recommend Customer LSL Replacement
• Replace Company LSL
• Coordinate Combined Replacement
• Verbal and Written Communications
# Forensic Case Study for Lead

<table>
<thead>
<tr>
<th>Date</th>
<th>Location/Type</th>
<th>Immediate</th>
<th>5-Minute</th>
<th>SL Flush</th>
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<tr>
<td>2/12/2016</td>
<td>Kitchen</td>
<td>140 ug/L</td>
<td>31 ug/L</td>
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<tr>
<td>2/22/2016</td>
<td>Kitchen</td>
<td>151 ug/L</td>
<td>30 ug/L</td>
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<tr>
<td>3/4/2016</td>
<td>Kitchen</td>
<td>120 ug/L</td>
<td>35 ug/L</td>
<td>42 ug/L</td>
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<tr>
<td></td>
<td>Bathroom</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td></td>
<td>Basement</td>
<td>ND</td>
<td>2 ug/L</td>
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<tr>
<td>3/8/2016</td>
<td>Kitchen #1 (250 ml)</td>
<td>135 ug/L</td>
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<tr>
<td></td>
<td>Kitchen #2 (250 ml)</td>
<td>175 ug/L</td>
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<tr>
<td></td>
<td>Kitchen #3 (250 ml)</td>
<td>146 ug/L</td>
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<tr>
<td></td>
<td>Kitchen #4 (250 ml)</td>
<td>98 ug/L</td>
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<td>4/11/2016</td>
<td>New Kitchen Faucet</td>
<td>116 ug/L</td>
<td>44 ug/L</td>
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<tr>
<td></td>
<td>Bathroom</td>
<td>ND</td>
<td>ND</td>
<td></td>
</tr>
<tr>
<td>5/2/2016</td>
<td>New Kitchen Plumbing</td>
<td>ND</td>
<td>ND</td>
<td></td>
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</table>
Location 1
Scrapings
25% Pb

Location 3
Scrapings
9.3% Pb
B. LSL Inventories and Communications

1. Developing an Inventory

2. Creation of Maps

3. Annual Notifications to Customers with LSLs
Developing an Inventory

Sources of Data

• Tap Cards
• Customer Database
• Meter Setting and other Field Operations
• LCR Program
• Construction Projects
• Surveys and Phone Calls

Inventory Tools

• Customer Database
• Field Tablets Feeding Database
• Construction Forms
• Excel Spreadsheets
• GIS
Creation of Maps – Many Considerations

- State Requirements
- Disclaimers on Purpose
- Drawing Scale
- Use of Color
- Varying Levels of Certainty
- How to Show
  - Company vs. Customer LSL
  - Known vs. Unknown
  - Streets/Areas vs. Premises
  - Property Boundaries?
Annual Notification to Customers with LSLs

• Educational materials

• Recommendation for replacement

• Request for Aqua to be present during replacement to inspect replacement and to replace company LSL if found

• PA Pilot of 464 letters sent in February; low response rate

• Program will continue to be rolled out in PA and other states
C. Construction-Related Procedures

1. Pre-Construction Notification
2. Identification of Lead Service During Construction
3. Customer Follow-Up for Partial Replacements
4. Customer Follow-Up When Customer Side Unknown
5. Multi-Family or Multi-Business Dwellings
6. Ongoing Customer Communications for Customer LSLs
LSL Replacements

• Planned Project – “Ideal World”

• Leak Repair – “Non-Ideal World”

• Avoid Partial Replacements if Possible - could increase lead levels!
Pre-Construction Notification

What if a lead service line is encountered? (Optional language to be included if lead service lines may be encountered)

Before the project begins, Aqua will attempt to identify any lead service lines impacted by the main replacement project, and will notify you if we know or have reason to believe that there is a lead service line providing water to your premise. If there is an Aqua-owned lead service line, we will replace it during the project. If you own a lead service line, we encourage you to replace it as soon as possible.

Aqua will provide you with instructions for flushing your plumbing and will contact you within 1-2 business days to arrange for water testing if lead service lines are encountered.
Identification of Lead Service During Construction

1. Use “An Important Health Notice from Aqua” tablets when a lead service line is encountered or if potentially present.

2. Fill out AQUA block as completely as possible.

3. Check boxes to indicate where lead was observed. State to determine phone number to use.

4. Leave form at residence the day that work was done.

5. Send blue copy to Aqua office as designated by State the same or next business day.
Customer Follow Up for Partial Replacements

Call customer same or next business day to provide:

1. Summary of situation
2. Possible water quality impacts and protective measures
3. Recommendation that customer replace their lead service
4. Offer to perform lead testing (stagnation and flush samples)

After phone call and lead testing, provide:

5. Letter summarizing activities
6. Resampling after 14 days, then monthly until lead levels no longer elevated
7. All results to customer in writing
8. Information to regulatory authorities and/or health department to meet any regulatory requirements
9. Copies of correspondence to Corporate Environmental Affairs
When transferring the service line to your home at the above address, we discovered our side of the service line was lead but are uncertain as to the material of the pipe we connected to at the curb stop (your service line). We immediately replaced the pipe up to the curb stop with copper, and left information at your home instructing you on precautionary measures that you should take to minimize your likelihood of exposure to lead in your water. We encourage that you contact a plumber to evaluate your service line, and if it is lead, replace it as soon as possible.
Multi-Family or Multi-Business Dwellings

- Research for possible lead service lines in advance.

- Send letter to building owner and follow up with a call.

- Work with owner to understand materials of construction.

- Develop tenant communication plan with owner if lead service lines are found and/or for follow up water testing

- Work directly with tenants if owner not cooperative

- Provide information to regulatory authorities and/or health department to meet any regulatory requirements

- Provide copies of correspondence to Corporate Environmental Affairs
Ongoing Customer Communications for Customers with Lead Service Lines

• Send letters to customers every month for five months after the post-construction letter and/or lead testing is completed

• Maintain premise information in customer database

• Upload data to GIS

• Generate letters to customers that have lead service lines every year
Lead Service Line Replacement Collaborative

- Resource for Communities
- Provides roadmap and tools to support voluntary LSL replacement programs
- http://www.lslr-collaborative.org/
Questions?

Deborah M. Watkins, P.E.
Director of Water Quality and Environmental Compliance
dmwatkins@aquaamerica.com