

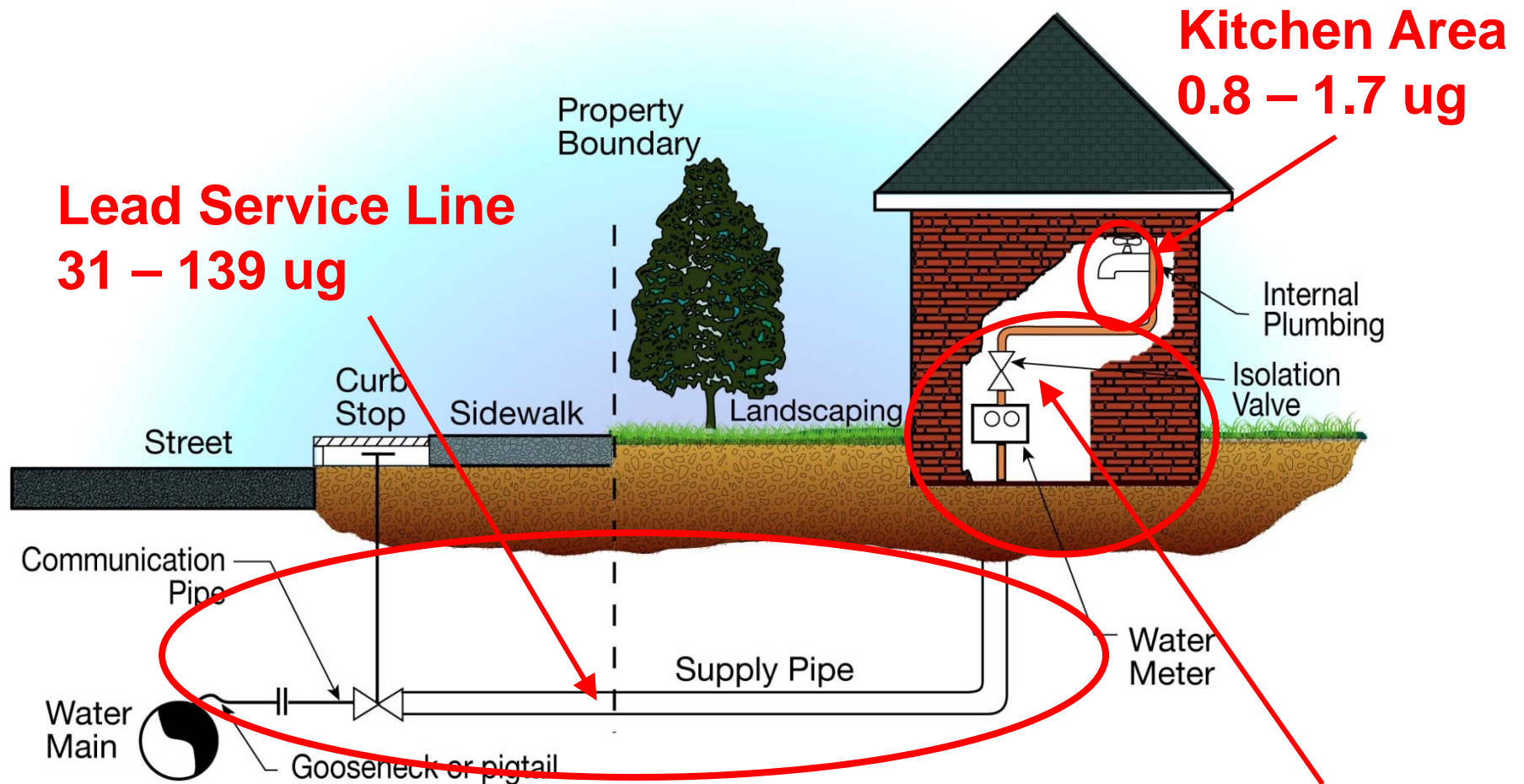


NDWAC Recommendations Related to Lead Service Line Replacements

Stephen Estes-Smargiassi
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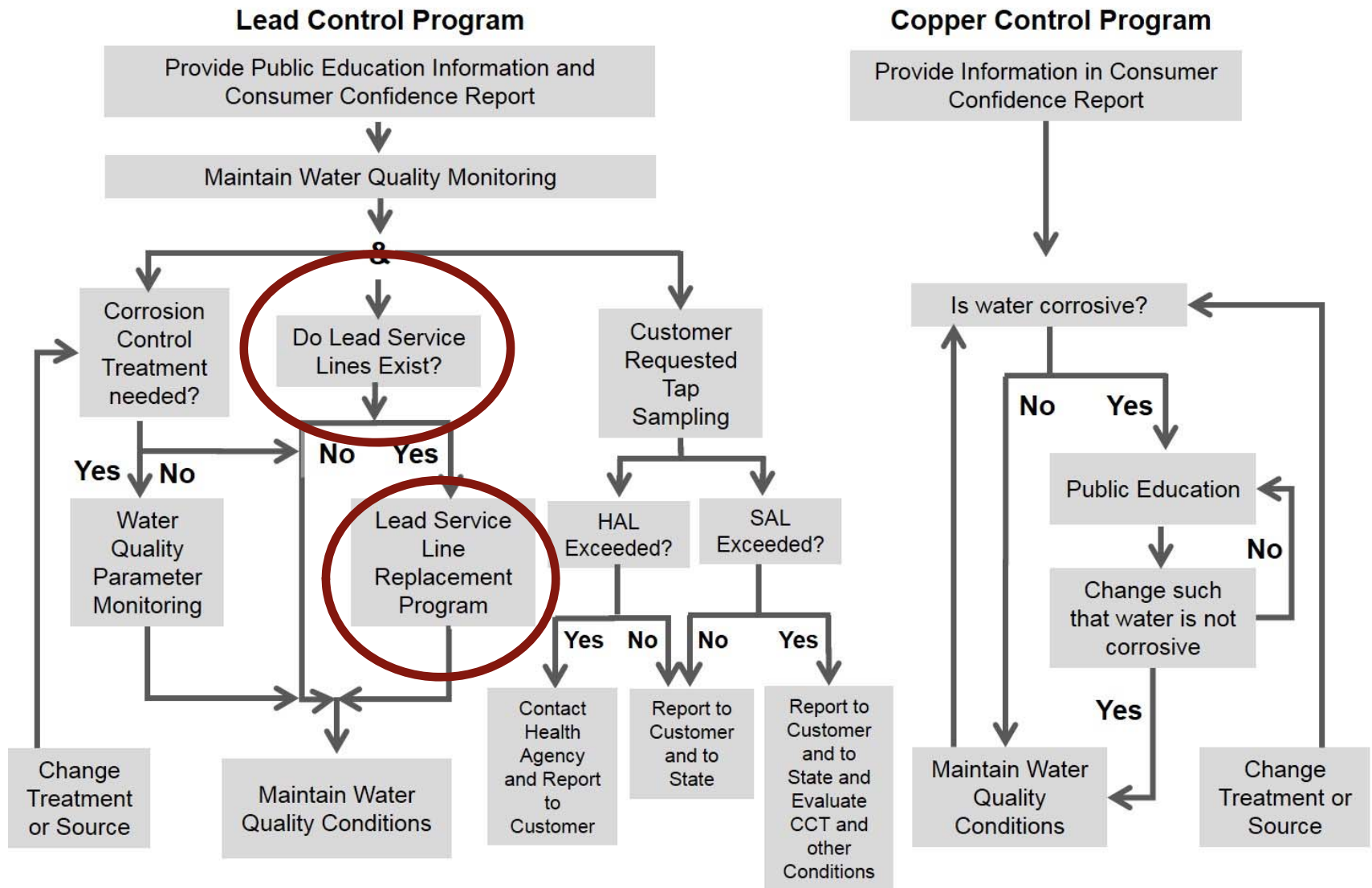
Where Does The Lead Come From?



Source: Adapted from Sandvig, A., P. Kwan, G. Kirmeyer, B. Maynard, D. Mast, R. R. Trussell, S. Trussell, A. Cantor, and A. Prescott. 2008. *Contribution of Service Line and Plumbing Fixtures to Lead and Copper Rule Compliance Issues*. Denver, Colo.: Water Research Foundation. Reprinted with permission.

Premise Plumbing
3.4 – 125 ug

Find and Remove LSLs as Long-term Goal



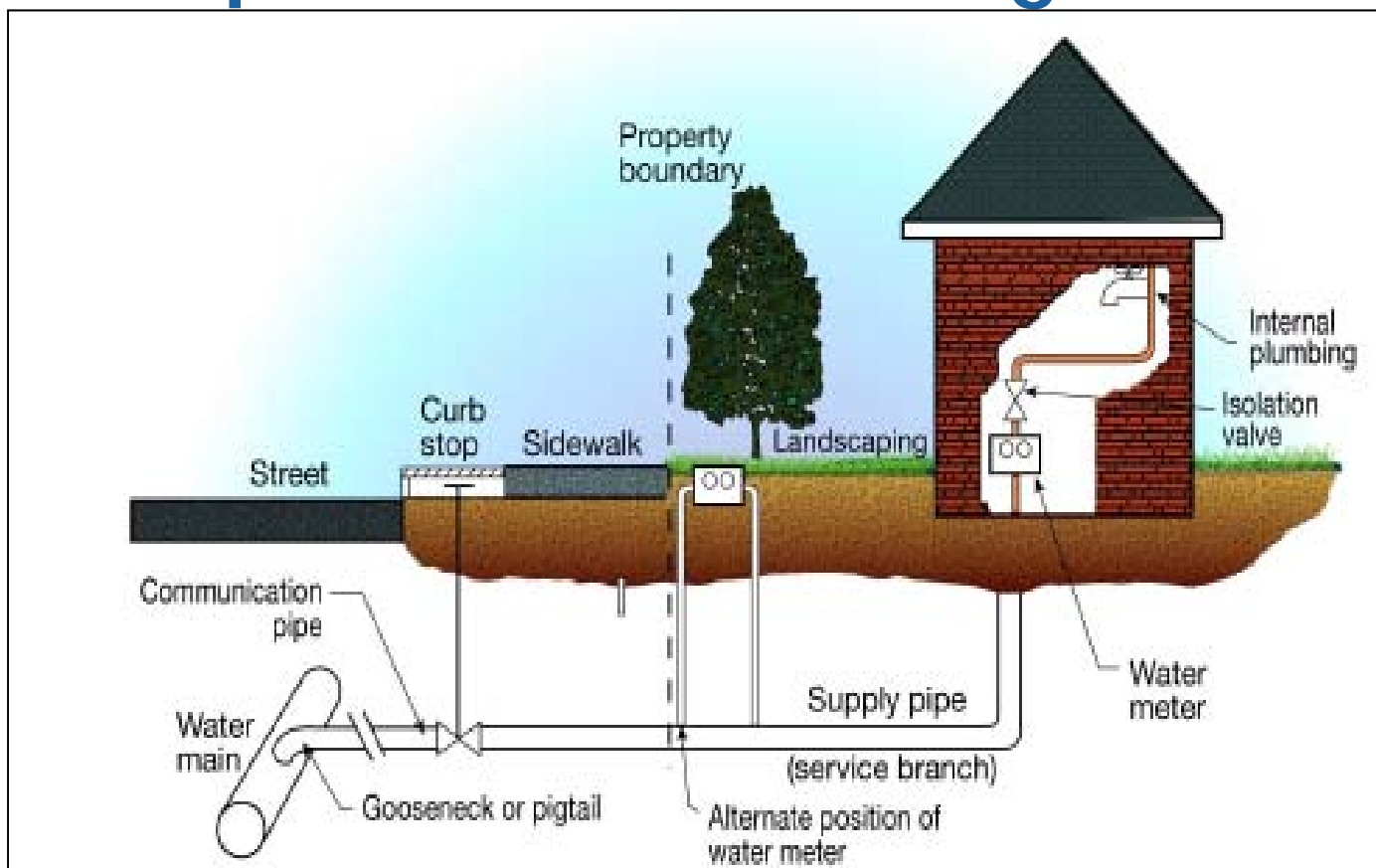
Lead Service Line Replacement Background

(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



Source: Sandvig, A., P. Kwan, G. Kirmeyer, B. Maynard, D. Mast, R. R. Trussell, S. Trussell, A. Cantor, and A. Prescott. 2008. *Contribution of Service Line and Plumbing Fixtures to Lead and Copper Rule Compliance Issues*. Denver, Colo.: Water Research Foundation. Adapted with permission.

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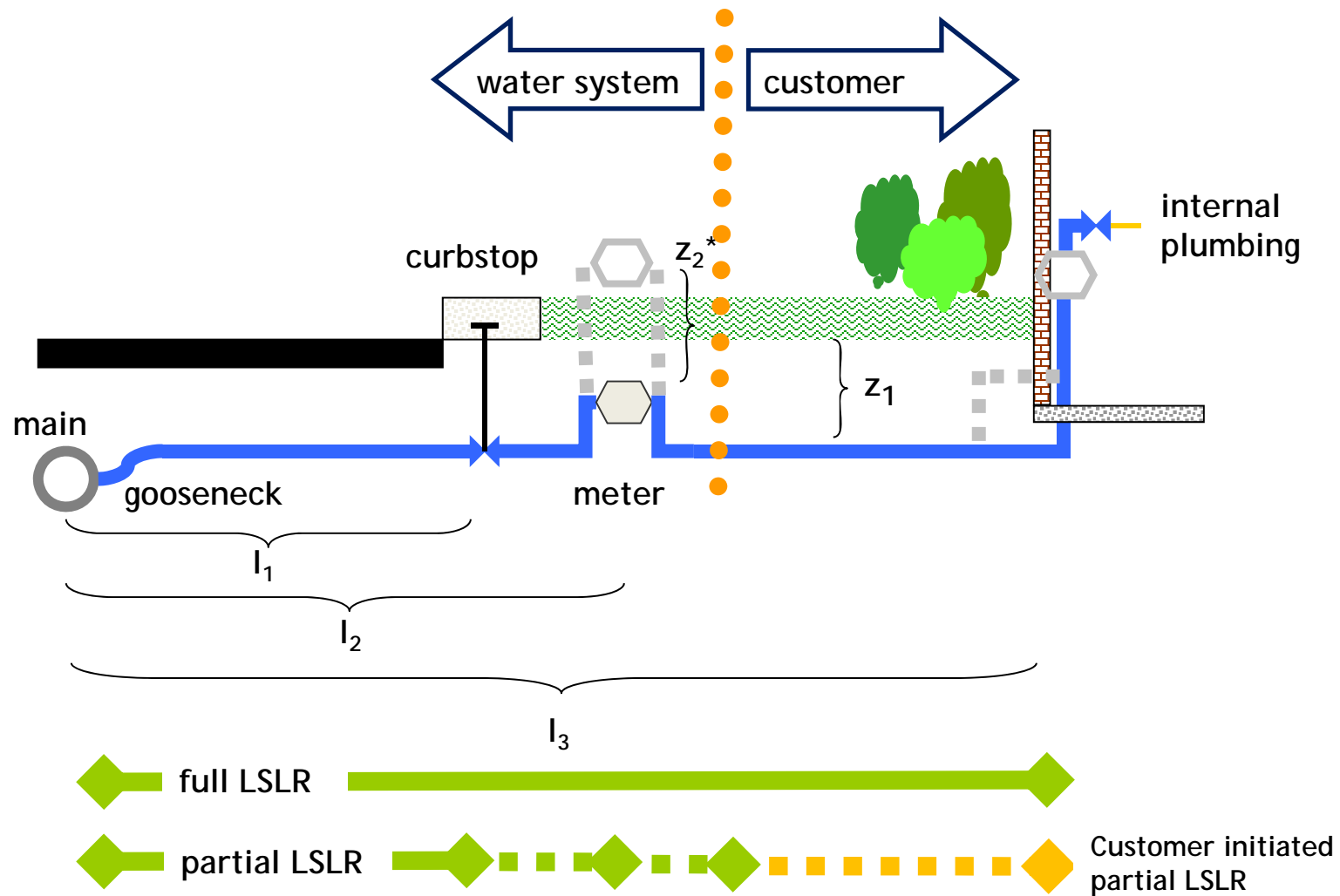
Lead Service Line Replacement Background

(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?



Source: Via, S. "Possible changes to the LCR: implications for the potable water industry and the user - a shared responsibility?" Presentation from the 11th CECIA-IAUPR Biennial Symposium on Potable Water Issues in Puerto Rico: Science, Technology, and Regulation. February 12-13, 2015.

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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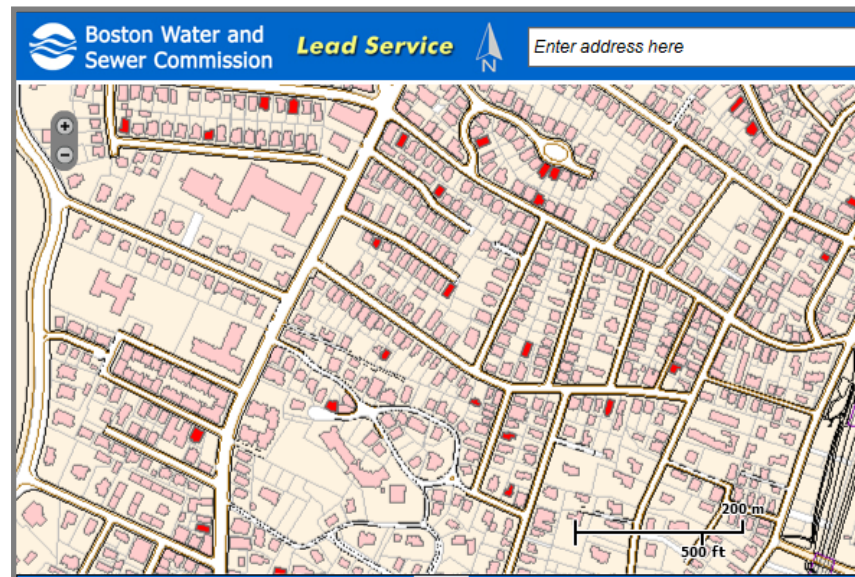
Where are the LSLs?

- Is there an inventory of service lines?
- How can lead service lines be located?
- Are there opportunities to engage real estate and home inspectors?

RETURN OF SERVICE PIPE

Date Laid *May 24-1897* Reg. No. *1077*
Owner of Premises *Chas. G. Thaxter*
Street *2 Harrison Ave.*
Main Pipe *6* inches Diam. Distance Main to Curb Stop Cock *7 1/2* feet
Foreman

| COST TO TOWN — Main to Curb Stop Cock inc. | | COST TO OWNER | |
|--|----------------------------------|----------------|---------------------------|
| <i>7 1/2</i> Feet | <i>1/2</i> Inch Lead Pipe | <i>35</i> Feet | <i>5/8</i> Inch Lead Pipe |
| <i>1</i> Inch | <i>3/8</i> Inch Corporation Stop | | |
| One | Inch Curb Stop | | |
| One | Sidewalk Box | | Inch Stop and Waste |
| | Couplings | | Elbows |
| | Elbows | | Tees |
| Hours Labor | Men | Hours Labor | Men |
| Hours Labor | Foreman | Hours Labor | Foreman |
| | | Trucking | |
| Total | | Total | |



Images courtesy of Framingham Water and BWSC

Lead Service Line Scratch Test

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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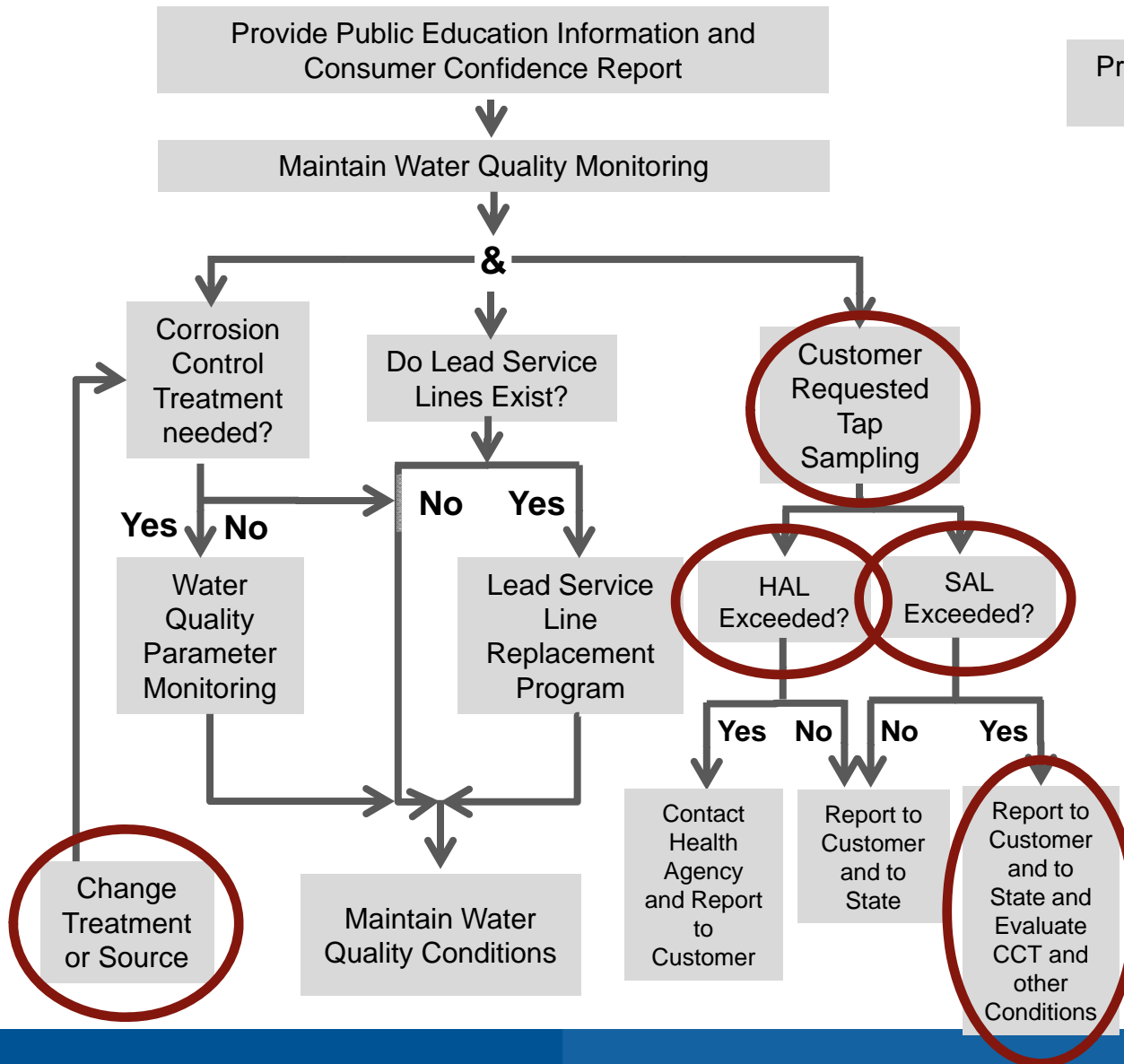
NDWAC Recommendations Related to Customer Center Sampling

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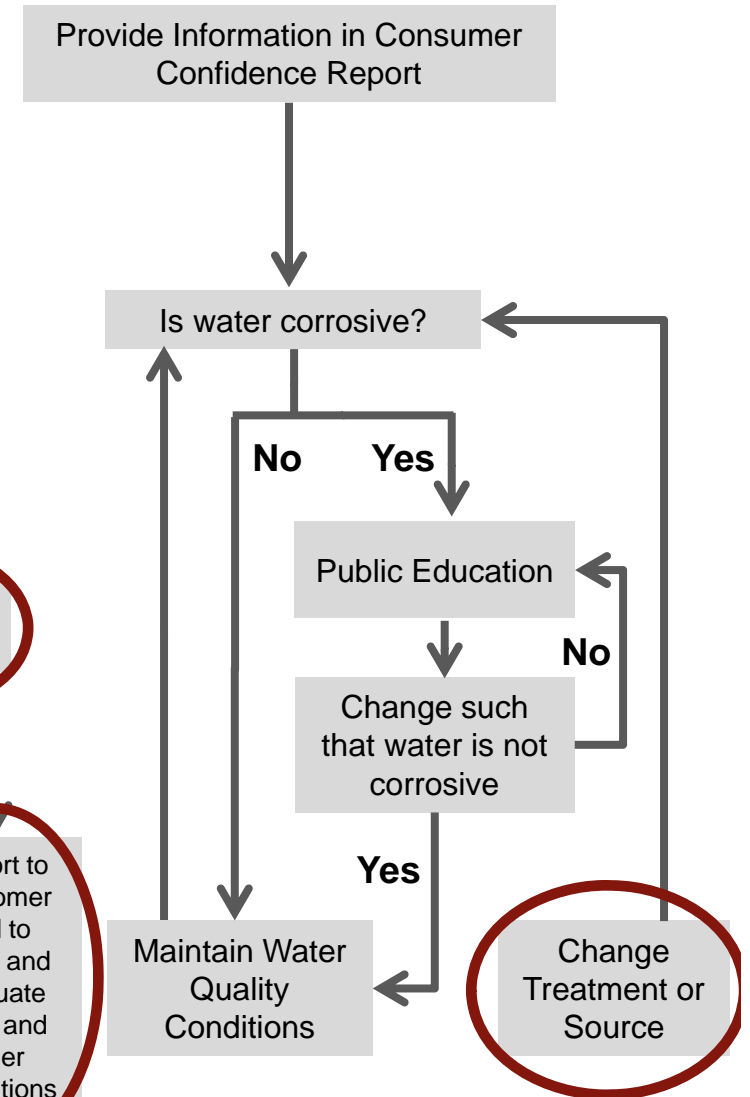
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Sampling: Continuous & Customer Initiated

Lead Control Program



Copper Control Program



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



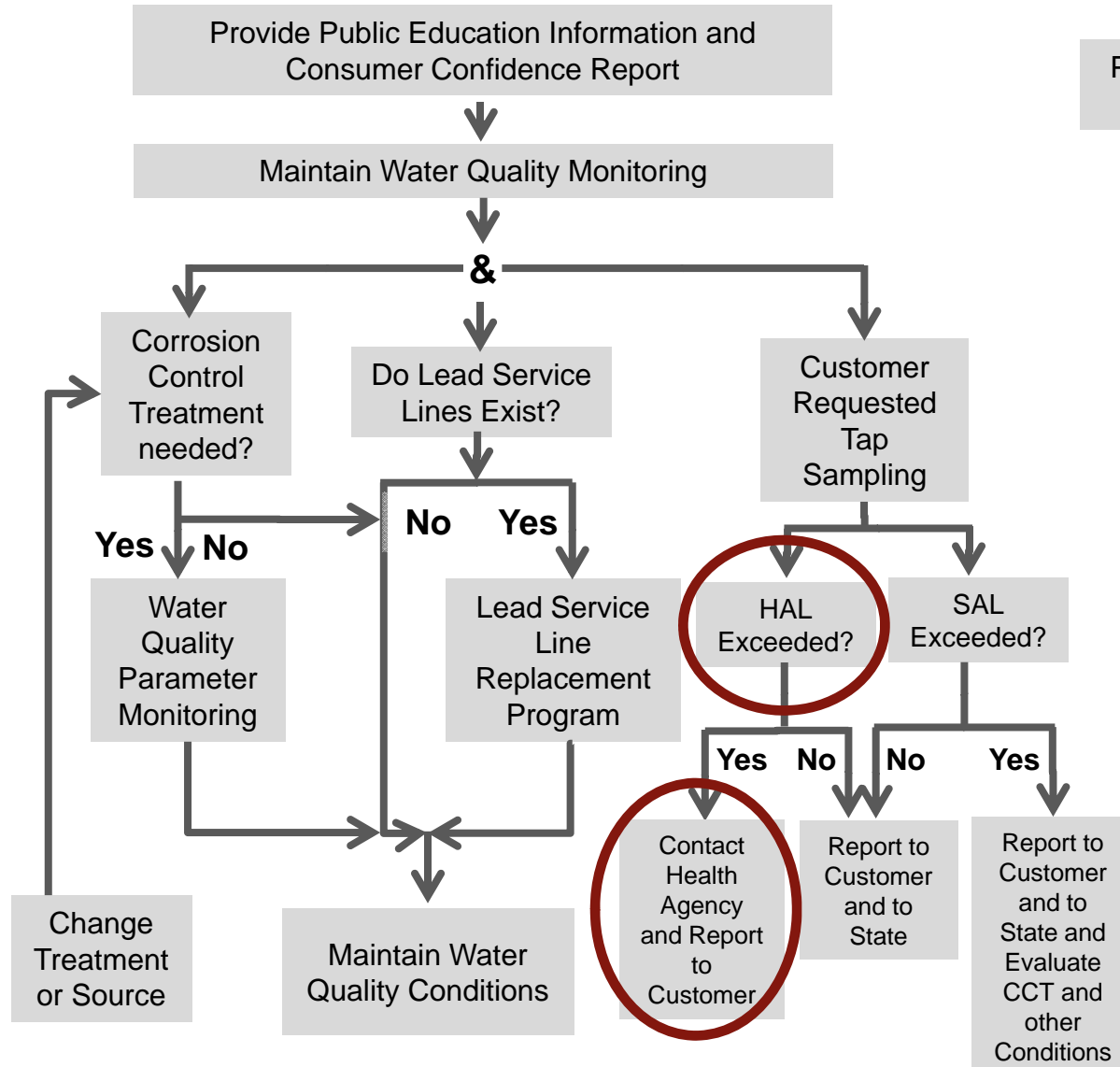
NDWAC Recommendations Related to Household Action Level

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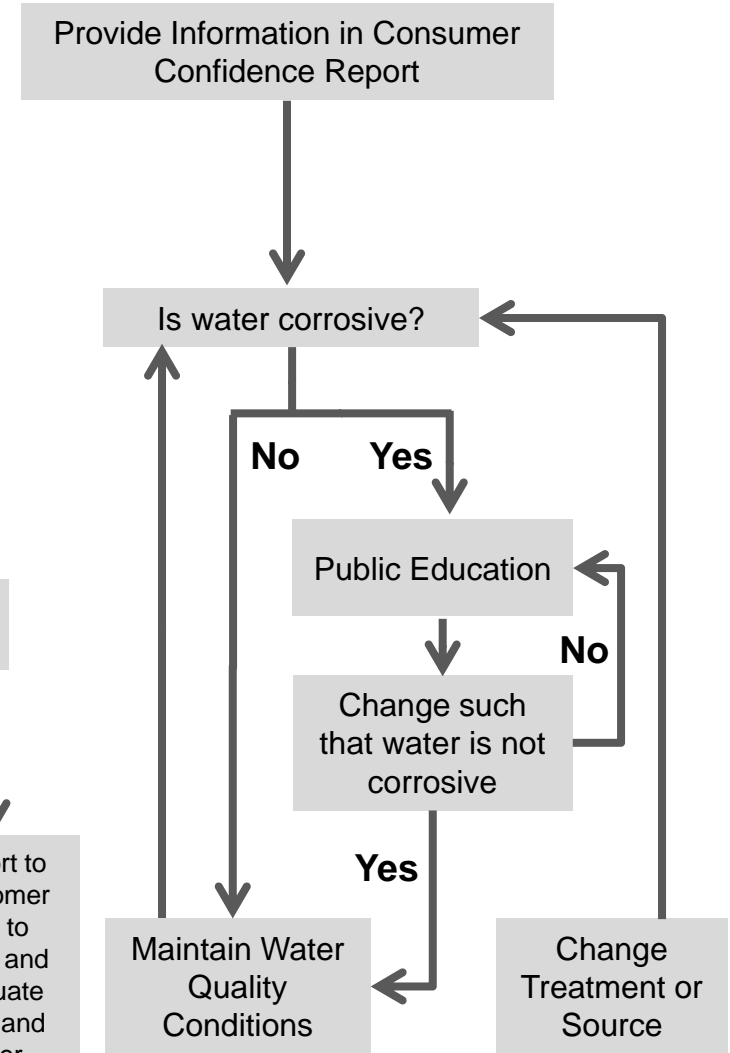
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Household Action Level

Lead Control Program



Copper Control Program



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 $\geq 5 \mu\text{g}/\text{dL}$ 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

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23

Questions or Comments?

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Photo courtesy of MWRA