VERMONT
ENVIRONMENTAL CONSERVATION

GUIDANCE

Drinking Water and
Groundwater Protection Division

LEAD SERVICE LINE REPLACEMENT PLANS

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Revised April 11, 2024

1 Introduction

The federal Lead & Copper Rule Revisions (LCRR) require all community and non-transient non-community public water systems to develop an initial service line inventory and submit it to the primacy agency (Vermont Department of Environmental Conservation [DEC]) by October 16, 2024.

All water systems with one or more lead, galvanized requiring replacement (GRR), or lead status unknown service lines in their distribution system inventory must also submit a lead service line replacement (LSLR) plan by October 16, 2024.

To assist water systems, DEC is providing this guidance document on the elements of an LSLR Plan, instructions on how to submit a plan online, and an appendix with examples of an LSLR Plan template and cover letter.

On November 30, 2023, the U.S. Environmental Protection Agency (EPA) published a draft rule entitled the Lead & Copper Rule Improvements (LCRI). The EPA expects the LCRI to be finalized and enforceable before October 16, 2024. The draft LCRI rule included changes to LSLR plan requirements and the due date. If and when the EPA officially finalizes the LCRI, Vermont DEC will revise this guidance document accordingly.

This revision of the guidance document revises a reference, clarifies requirements for Section 2 of the plan, modifies the text to a more accessible type, and corrects other minor clerical errors.

2 Elements of a Lead Service Line Replacement Plan

2.1 Section 1: Strategy for determining composition of unknown lines in inventory

The LSLR Plan must include a strategy for determining the composition of lead status unknown service lines in the water system's inventory.

The composition of service lines may be unknown due to a variety of causes including lack of records and non-responsiveness of property owners. Water systems must plan ways to eliminate these information gaps for all service connections. Due to each water system's unique characteristics, a single strategy is not universal for all systems. DEC recommends water systems select and implement strategies from the following list.

If a water system does not identify any unknown service lines in the inventory, then "Non-applicable" may be selected. If lead status unknown material service lines are later discovered, then the water system must revise and resubmit the LSLR Plan to DEC.

2.1.1 Water Quality Sampling

Water quality sampling protocols vary in cost, complexity, and accuracy. Customer cooperation is frequently required. Protocols include target service line sampling, flushed sampling, and sequential sampling. Further details about this service line investigation method are available in Section 5.2 of the EPA's *Guidance for Developing and Maintaining a Service Line Inventory* at https://www.epa.gov/system/files/documents/2022-08/Inventory%20Guidance_August%202022_508%20compliant.pdf.

Additionally, a draft procedure for sequential sampling is included in Appendix B as a reference. The sampling procedure implemented by a water system should be specifically designed for the water system and approved by a Vermont licensed professional engineer.

2.1.2 Excavation

Excavating to visually inspect a service line is also known as 'potholing.' With this method, the water system may need to remove soil and other infrastructure components, such as roads and sidewalks. The approaches to this method vary in cost, time, and public health risk. Further details are available in Section 5.3 of the EPA's *Guidance for Developing and Maintaining a Service Line Inventory* at https://www.epa.gov/system/files/documents/2022-08/Inventory%20Guidance_August%202022_508%20compliant.pdf.

2.1.3 Predictive and Statistical Modeling

Models use attributes from known locations to develop patterns that may be used for predicting unknown locations' data. This method is most effective when a large number of data points are included. For most water systems in Vermont, this method will most likely not be successful. Further details are available in Section 5.5 of the EPA's *Guidance for Developing and Maintaining a Service Line Inventory* at https://www.epa.gov/system/files/documents/2022-08/Inventory%20Guidance_August%202022_508%20compliant.pdf. The use of a modeling method must be approved by DEC after a water system-specific review of the proposed method.

2.1.4 Emerging and Other Methods

Beyond water quality sampling, excavation, and modeling, DEC recognizes that other and emerging methods are available in the water sector for determining the composition of lead status unknown service lines. These methods may be approved by DEC after a water system-specific review of the proposed emerging or other method.

2.2 Section 2: Procedure for conducting full lead service line replacement

The LSLR Plan must include a procedure for conducting full lead service line replacement.

The procedure included in the Plan must include all aspects of conducting a full lead service line replacement including:

- Determining labor forces.
- Acquiring necessary permits.
- Acquiring property owner permissions for customer-owned portion of lines.
- Updating the water system's service line inventory.
- Providing pitcher filters or point-of-use filters certified to remove lead from drinking water.
- Offering water quality sampling after replacement.

Additionally, water systems are strongly encouraged to include a procedure for replacing lead connectors (also known as goosenecks and pigtails).

DEC does not provide a specific procedure for adoption due to each water system's unique characteristics. However, the procedure must include the six bulleted aspects listed above.

2.3 Section 3: Strategy for informing customers before a service line replacement

The LSLR Plan must include a strategy for informing customers before a full or partial lead service line replacement.

The water system must provide information to customers with lead, GRR, or lead status unknown service lines as required in 40 CFR 141.85(g). This information must:

- provide persons served by a lead, GRR, or lead status unknown service line information regarding the water system's lead service line replacement program and opportunities for replacement of the lead service line;
- be provided to persons served at the service connection with a lead, GRR, or lead status unknown service line either in-person or by mail; and
- (if applicable) be sent within 30 days of the end of the tap sampling period in which a trigger level exceedance occurred.

Sample letters, door hangers, and other materials for water systems' use can be found in the Appendix of American Water Works Association (AWWA) Document *Lead Communications Guide and Toolkit: An Opportunity to Strengthen Trust in Your Community*, which is downloadable at <https://www.awwa.org/Portals/0/AWWA/Communications/2022LeadPageAssets/2022AWWA-LeadCommunicationsGuideAndToolkit.pdf>.

For partial lead service line replacements, water systems must notify customers at least 45 days prior to the replacement of the water system-owned portion of the line. In that notification, water systems must offer to replace the portion of the line not owned by the water system (customer-owned portion).

Water systems may find guidance within AWWA Document *Communicating About Lead Service Lines: A Guide for Water Systems Addressing Service Line Repair and Replacement* and ANSI/AWWA C810-17, *Replacement and Flushing of Lead Service Lines*.

2.3.1 Public Notices

If the water system selects the "Public Notices" option for the Plan, then an additional description must be included describing where the notice will be posted.

2.3.2 Other Methods

Beyond the communication methods listed in the template, DEC recognizes that other methods may be effective for informing customers of a service line replacement. These methods may be approved by DEC after a water system-specific review of the proposed other method.

2.4 Section 4: Lead service line replacement goal rate

2.4.1 Water Systems Serving more than 10,000 Persons

For water systems serving more than 10,000 persons, the LSLR Plan must include a lead service line replacement goal rate recommended by the system in the event of a lead trigger level exceedance.

The LCRR requires water systems with lead levels of 10 parts per billion (ppb) or higher to replace lead service lines. The rate of mandatory replacement is related to the water system's exceedance of the lead action level or the lead trigger level specified in 40 CFR 141.

Water systems that exceed the **lead action level** must complete mandatory lead service line replacements at an average annual rate of at least 3%, calculated on a two-year rolling basis.

Water systems that exceed the **lead trigger level** must complete goal-based lead service line replacement. Water systems recommend a replacement goal rate in this section of LSLR Plan for DEC review and approval.

Due to each water system's unique characteristics, DEC does not provide a specific goal rate recommendation.

2.4.2 Water Systems Serving 10,000 or fewer Persons

For water systems that serve 10,000 or fewer persons, a lead service line replacement goal rate recommended by the system in the event of a lead trigger level exceedance is not required in the LSLR Plan. However, water systems may still elect to include a goal rate.

If a water system does not include a goal rate, DEC recommends including a statement in this section of the Plan, such as: "The Water System serves 10,000 or fewer persons and is not required to provide a replacement goal rate at the time of this plan's submission."

2.5 Section 5: Procedure for customers to flush service lines and premise plumbing

The LSLR Plan must include a description of a procedure for customers to flush service lines and premise plumbing of particulate lead.

Replacing connectors (also known as goosenecks and pigtails), LSLs, and GRR service lines will likely loosen and release lead particulates into the drinking water. It is critical that service lines and premise plumbing are flushed after work is complete to reduce the risk of lead.

When possible, notify customers in advance of service line replacements in accordance with the strategy described in Section 3 of the Plan. Exceptions include emergency repairs. Prior to working on the service line, the water system closes water flow to the building interior at a shut-off valve. Then, complete the service line replacement. After work is finished, open flow to the building and premise plumbing.

DEC is prescribing the flushing procedure below for adoption by water systems. Water systems may propose a modified procedure for DEC-approval.

- Do not consume tap water, open hot water taps, use icemaker, or use filtered water dispenser until after this flushing procedure is complete.
- Remove faucet aerators, screens, and shower heads from all cold water taps in the building.
- Beginning with the lowest level, fully open the cold water taps throughout the building including showers, baths, and hose bibs.
- After all the faucets are open, let the water run for at least 30 minutes.
- Turn off each tap starting with the taps at the lowest level of the building.
- Clean aerators and screens of solid debris then place them back on faucets.

It is recommended that customers repeat this flushing every two weeks for three months. Water quality sampling is recommended within 3-6 months after service line replacement and must be offered by the water system.

Additional guidance on flushing may be found in ANSI/AWWA C810-17, *Replacement and Flushing of Lead Service Lines*, Section 4.4 as well as AWWA Document *Communicating About Lead Service Lines: A Guide for Water Systems Addressing Service Line Repair and Replacement*.

2.6 Section 6: Lead service line replacement prioritization strategy

2.6.1 Required Prioritization Factors

The LSLR Plan must include an LSLR prioritization strategy based on factors including but not limited to targeting of known lead service lines, lead service line replacement for disadvantaged customers, and populations most sensitive to the effects of lead. DEC is providing a prioritization strategy for Vermont water systems to implement.

Removing the source of lead contaminants is the most effective action to lowering lead health hazards in drinking water. For this reason, DEC assigns a high priority value to known LSLs. Closely following LSLs, GRR service lines also receive a high priority for replacement.

Lead contamination is most significantly harmful to people who are pregnant or may become pregnant, infants, and children. To lessen lead exposures to the most sensitive populations, DEC prioritizes service line connection replacements at schools, day care centers, nursing homes, and medical facilities. Additionally, homes with children and people who are pregnant or may become pregnant are prioritized for service line replacement.

Historically, minority and low-income communities are more likely to be negatively impacted by environmental health problems. To further environmental justice for all Vermonters, DEC prioritizes service line replacements in neighborhoods and market areas that serve disadvantaged communities.

2.6.2 Supplemental Prioritization Factors

The prioritization factors described above are required in a water system's LSLR Plan replacement prioritization strategy. A water system may also consider supplemental factors including but not limited to companion projects, compact projects, service line length, and other factors listed in ANSI/AWWA C810-17, *Replacement and Flushing of Lead Service Lines*, Section II.A. These other factors are included in the table on the next page.

Companion projects are construction projects concurrently scheduled. Pairing service line replacements with other underground infrastructure work and/or highway pavement projects minimizes impacts to the community and the environment as well as reducing excavation costs.

Compact projects group multiple service line replacements in an area. This approach reduces construction mobilization costs.

Risk of lead contamination increases with pipe length. Water systems may consider lead pipe length as a factor to prioritize LSLR projects.

2.6.3 Summarized Prioritization Factors

DEC's priority replacement strategy factors are summarized in the table below.

Priority Points	Prioritization Factor	LCRR Requirement
10	Known Lead Service Line	Required
10	Populations Most Sensitive to the Effects of Lead • Schools and Day Care Facilities • Homes with children and/or people who are pregnant or may become pregnant	Required
10	Disadvantaged Communities	Required
8	Known GRR Service Line	Required
5	Populations Most Sensitive to the Effects of Lead • Nursing Homes • Medical Facilities	Required
5	Companion Projects (concurrent infrastructure projects)	Not Required
5	Compact Projects (concurrent project in the same area)	Not Required
3	Long Length Lead Pipe Projects	Not Required
2	Other Factors Listed in ANSI/AWWA C810-17 § II.A. • Service lines physically disturbed by digging, excavation, repair, or other activities • Existing partial lead service line replacements • Consideration of presence of lead goosenecks or pigtails	Not Required
1	Other Factors Significant to the Water System	Not Required

2.6.4 Example Project Scoring Scenarios

Scenario #1: Project to replace a single, long-length (3 points) known lead service line (10 points) that provides drinking water to an elementary school (10 points) in a disadvantaged community (10 points). Using the rubric, this project scores 33 prioritization points.

Scenario #2: Project to replace known GRR service lines (8 points) for multiple homes (companion project: 5 points) with children residing (10 points) in an urban center (compact project: 5 points). Using the rubric, this project scores 28 points.

Scenario #3: Project to replace a single, known lead service line (10 points) that provides drinking water to an office building. Using the rubric, this project scores 10 points.

When prioritizing projects, water systems with limited technical or financial capacity may consider executing the school project first (Scenario #1), followed by the multiple homes (Scenario #2), and then the office building (Scenario #3). This strategy, with a transparent prioritization system, may assist water systems properly budget projects.

2.7 Section 7: Funding strategy for conducting lead service line replacements

The LSLR Plan must include a funding strategy for conducting lead service line replacements which considers ways to accommodate customers that are unable to pay to replace the portion they own.

The EPA provides information about federal opportunities for funding lead service line replacement projects on its website at https://www.epa.gov/ground-water-and-drinking-water/funding-lead-service-line-replacement. Additionally, the Vermont DEC Water Investment Division posts information about planning and construction loans through the Drinking Water State Revolving Fund at https://dec.vermont.gov/water-investment/water-financing/dwsrf.

The AWWA outlines funding strategies for water systems to consider in AWWA Document *Strategies to Obtain Customer Acceptance of Complete Lead Service Line Replacement*, which is downloadable at https://www.awwa.org/Portals/0/AWWA/Government/StrategiesforLSLs.pdf?ver=2013-03-29-132027-193. The section entitled "Easing the Financial Burden" (pp. 10-11) may be a useful resource for water systems when writing Section 7 of the LSLR Plan.

Due to each water system's unique characteristics, DEC does not provide a specific strategy for adoption by water systems.

3 Submitting a Lead Service Line Replacement Plan

Water systems will submit LSLR Plans to the Drinking Water & Groundwater Protection Division using the ANR Online Submission tool. Submissions must include a cover letter. Required details of the cover letter and instructions on how to submit the LSLR Plan online are described in the following sections. Examples of a cover letter and the LSLR Plan template may be found in Appendix A.

3.1 Cover Letter

The LSLR Plan must be submitted with a cover letter. The cover letter must include the following items to be considered complete:

- Date of Plan Submission
- Water System Name
- Water System Identification Number (WSID)
- Statement affirming that the Water System agrees to implement the plan
- Signature of Water System owner, authorized contact, or designated operator

3.2 ANR Online Submission

Submit a water system's LSLR Plan and cover letter by accessing the ANR Online Service Portal at https://ANROnline.Vermont.gov. If not already registered with an account, a user will need to register for an account. Follow the instructions on the web page for more information.

4 References

40 CFR 141.84 (2023) <https://www.ecfr.gov/current/title-40/chapter-I/subchapter-D/part-141/subpart-I/section-141.84>

American Water Work Association (AWWA) Document *Lead Communications Guide and Toolkit: An Opportunity to Strengthen Trust in Your Community* < https://www.awwa.org/Portals/0/AWWA/Communications/2022LeadPageAssets/2022AWWA-LeadCommunicationsGuideAndToolkit.pdf>. Accessed April 11, 2024.

AWWA Document *Strategies to Obtain Customer Acceptance of Complete Lead Service Line Replacement* < https://www.awwa.org/Portals/0/AWWA/Government/StrategiesforLSLs.pdf?ver=2013-03-29-132027-193>. Accessed April 11, 2024.

ANSI/AWWA C810-17, *Replacement and Flushing of Lead Service Lines*

Environmental Protection Agency (EPA), "Funding Lead Service Line Replacement" <https://www.epa.gov/ground-water-and-drinking-water/funding-lead-service-line-replacement>. Accessed April 11, 2024.

EPA, *Guidance for Developing and Maintaining a Service Line Inventory* <https://www.epa.gov/system/files/documents/2022-08/Inventory%20Guidance_August%202022_508%20compliant.pdf>. Accessed April 11, 2024.

EPA, "Proposed Lead and Copper Rule Improvements" <https://www.epa.gov/ground-water-and-drinking-water/proposed-lead-and-copper-rule-improvements>. Accessed April 10, 2024.

Vermont Department of Environmental Conservation (DEC), "Drinking Water State Revolving Fund" <https://dec.vermont.gov/water-investment/water-financing/dwsrf>. Accessed April 11, 2024.

5 Appendices

Cover Letter and LSLR Plan Templates

Draft Guidance on Sequential Sampling

5.1 Appendix A: Cover Letter and LSLR Plan Templates

Water System Name
Water System Address

DD Month YYYY

On behalf of <Water System Name> (WSID #VT0000000), the attached Lead Service Line Replacement Plan is submitted to the Vermont Department of Environmental Conservation in accordance with
40 CFR 141.84(b). <Water System Name> affirms that it will implement this plan effective immediately.

//SIGNED//
Authorized Contact

Attachment:
Lead Service Line Replacement Plan

Lead Service Line Replacement Plan
Water System Name
WSID:
DD Month YYYY

Section 1: Strategy for determining the composition of lead status unknown service lines in the inventory

The Water System determines the composition of lead status unknown service lines in its inventory by utilizing the methodologies listed below:

Water Quality Sampling
- Service Line Sampling
  - Calculate premise plumbing volume, flush out premise plumbing, then collect and analyze a service line sample.
- Flushed Sampling
  - After a set flushing time, collect and analyze a sample.
- Sequential Sampling
  - Collect and analyze a series of consecutive samples from the interior tap to the service line.

Excavation
- Mechanical Excavation
- Vacuum Excavation

Modeling
- Predictive Modeling
- Geostatistical Modeling

Emerging Method approved by Vermont Department of Environmental Conservation

Other Method approved by Vermont Department of Environmental Conservation

Non-applicable: The water system does not have lead status unknown material service lines. If lead status unknown material service lines are discovered, the water system will revise and resubmit this plan to the Vermont Department of Environmental Conservation.

Section 2: Procedure for conducting full lead service line replacement

When conducting full lead service line replacement projects, the Water System implements the procedure outlined below…

Section 3: Strategy for informing customers before a service line replacement

Before a service line replacement, the Water System will provide information to customers with lead, galvanized requiring replacement, and unknown material service lines.

The information must:

- provide persons served by a lead, GRR, or lead status unknown service line information regarding the water system's lead service line replacement program and opportunities for replacement of the lead service line;
- be provided to persons served at the service connection with a lead, GRR, or lead status unknown service line either in-person or by mail; and
- (if applicable) be sent within 30 days of the end of the tap sampling period in which a trigger level exceedance occurred.

The water system will notify customers at least 45 days prior to the replacement of a water system’s portion of a service line. In the notification, the water system will offer to replace the customer-owned portion of the service line.

The water system will utilize the methods selected below for informing customers of a service line replacement:

Door-to-door Conversations
Door Hangers
Mailings (letters and/or postcards)
E-mails
Public Notices
    Describe where the notice will be posted.
Media Outreach
Social Media Posts
Other Method approved by Vermont Department of Environmental Conservation

Section 4: Lead service line replacement goal rate

The Water System serves 10,000 or fewer persons and is not required to provide a replacement goal rate at the time of this plan's submission.

OR

In the event of a lead trigger level exceedance, the Water System has set a lead service line replacement goal rate of…

Section 5: Procedure for customers to flush service lines and premise plumbing of particulate lead

Before, during, and after a gooseneck replacement, service line replacement, or other activity necessitating this procedure, the Water System will instruct customers to follow a procedure to flush service lines and premise plumbing of particulate lead.

When possible, the Water System will notify customers in advance of service line replacements in accordance with the strategy described in Section 3 of this Plan.

Prior to working on the service line, the Water System will close water flow to the building interior at a shut-off valve. Then, the Water System will complete the service line replacement. After the work is completed, the Water System will open flow to the building and premise plumbing.

Customers will be instructed to follow this procedure for flushing service line and premise plumbing of particulate lead:

- Do not consume tap water, open hot water taps, use icemaker, or use filtered water dispenser until after this flushing procedure is complete.
- Remove faucet aerators, screens, and shower heads from all cold water taps in the building.
- Beginning with the lowest level, fully open the cold water taps throughout the building including showers, baths, and hose bibs.
- After all the faucets are open, let the water run for at least 30 minutes.
- Turn off each tap starting with the taps at the lowest level of the building.
- Clean aerators and screens of solid debris place them back on faucets.

Section 6: Lead service replacement prioritization strategy

Vermont DEC's priority replacement strategy factors are summarized in the table below.

Priority Points	Prioritization Factor	LCRR Requirement
10	Known Lead Service Line	Required
10	Populations Most Sensitive to the Effects of Lead • Schools and Day Care Facilities • Homes with children and/or people who are pregnant or may become pregnant	Required
10	Disadvantaged Communities	Required
8	Known GRR Service Line	Required
5	Populations Most Sensitive to the Effects of Lead • Nursing Homes • Medical Facilities	Required
5	Companion Projects (concurrent infrastructure projects)	Not Required
5	Compact Projects (concurrent project in the same area)	Not Required
3	Long Length Lead Pipe Projects	Not Required
2	Other Factors Listed in ANSI/AWWA C810-17 § II.A. • Service lines physically disturbed by digging, excavation, repair, or other activities • Existing partial lead service line replacements • Consideration of presence of lead goosenecks or pigtails	Not Required
1	Other Factors Significant to the Water System	Not Required

Section 7: Funding strategy for conducting lead service line replacements

The Water System will fund lead service line replacements by…

For customers that are unable to pay to replace the portion of service line they own, the Water System plans to…

5.2 Appendix B: Draft Guidance on Sequential Sampling

Lead Service Line Detection Protocol

Background

Water systems lacking accurate lead service line (LSL) records require a simple, fast, and reliable method for LSL detection in order to conduct appropriate lead monitoring and remedial actions. A previous study[1] developed and validated such a protocol for a district in Montreal, Canada. This protocol consisted of flushing the tap for 5 minutes, allowing water to stagnate for 15 minutes, then sampling and analyzing the second liter out of the tap on-site with a portable anodic stripping voltammetry (ASV) analyzer. Residences with samples above 3 µg Pb/L were predicted to have a lead service line. In a test study of this protocol at 538 sites across Montreal, 93% of sites with samples above 3 µg/L and 99.5% of sites above 9 µg/L were confirmed to have a LSL. However, 29% of the sites below 3 µg/L returned a false negative, and excavation uncovered a LSL. Further research by the same group found that fully flushed sample concentrations correlated to those of 15 and 30 minute stagnation samples. A 5MF protocol was then tested and found to correctly identify 92% of LSL sites with samples above 3µg/L.

The above protocols are valid only for the unique distribution of plumbing configurations and signature lead concentrations specific to Montreal. The following is a generic protocol to be used to customize the LSL screening framework for individual water systems.

Protocol

Preliminary Sample Collection

Select at least ten houses from each of the following three categories: 1. Sites with full or partial lead service lines, confirmed by reliable records or recent plumbing work; 2. Sites with confirmed non-leaded service lines but which have lead solder, common among houses built from 1980-1986; 3. Sites with confirmed non-leaded service lines and no lead-containing solder.

For category 1 homes: flush the kitchen tap for 5 min (5MF) at a flow rate of 5.5 L/min (average normal use) and collect 1 L. Then flush the tap at a flow rate of 2 L/min (very low to amplify lead) for 5 minutes and collect 1 L. Next allow the water to stagnate for 30 minutes. While water is stagnating, conduct a premise plumbing inspection, noting the piping diameter, length of plumbing from the kitchen faucet to the service line, and plumbing material types. Calculate the premise plumbing volume, and analyze the two 5MF samples using a portable ASV analyzer. After 30 minutes of stagnation, take 1 L sequential samples at a normal flow rate, analyzing samples as you go, until the concentration reaches the 5MF normal flow rate concentration. Based on the sequential sample profiles and visual premise plumbing inspection, determine the liter number that is most likely to capture the service line. (Liter A)

[1] Cartier, C., A. Bannier, M. Pirog, S. Nour and M. Prevost (2012). "A Rapid Method for Lead Service Line Detection." Journal - American Water Works Association: 596-607.

For category 2 and 3 homes: Perform 5MF at 5.5 L/min and collect 1L. Next perform 5MF at 2 L/min and collect 1 L. Allow water to stagnate for 30 min, and collect a 1 L sample from the liter most likely to capture the service line, as determined in category 1 sampling (Liter A). Analyze all 3 samples with the ASV analyzer.

Data Analysis and LSL Threshold Development

Analyze the collected sampling data. First determine if there is a difference between 5MF sample concentrations collected at the normal and low flow rates for each category. If the low flow rate produces an average increase of 1 µg/L or more for each category, use the low flow rate for system-wide LSL screening. Otherwise use the normal flow rate. Next compare the average concentration and spread for the 5MF of chosen flow rate samples across the three categories. If there is a clear distinction between the 3 categories, use Option 1. If there is significant concentration overlap between the categories, use Option 2.

Option 1: Determine the concentration below which samples only came from non-LSL sites. This will be the LSL/solder threshold concentration (Concentration C). Next determine if there is a concentration below which the samples only came from lead solder and non LSL sites. This will be the threshold concentration for LSLs (Concentration D).

Option 2: Determine the lowest concentration above which samples only came from LSL sites. This will be the screening concentration for LSLs (Concentration E); if a sample concentration is above this threshold, you can be fairly certain that an LSL is present. For samples below this concentration, develop a threshold concentration for LSLs based on the highest 30MS from a non-LSL house, below which there are no samples from LSL sites (Concentration F). Sites with sample concentrations above this threshold likely contain either solder or a LSL.

System-Wide LSL Screening

Option 1: Flush the kitchen tap for 5 minutes if using the normal flow rate, or 15 minutes if using the low flow rate. Collect a 1 L sample and analyze on site with an ASV analyzer. If the concentration is above Concentration D, a LSL is likely present. If the concentration is between concentrations C&D, the site likely has lead solder and no LSL.

Option 2: Flush the kitchen tap for 5 minutes if using the normal flow rate, or 15 minutes if using the low flow rate. Collect a 1 L sample and analyze on site with an ASV analyzer. If the concentration is above Concentration E, a LSL is likely present. If the concentration is below Concentration E, allow the water to stagnate for 30 minutes. Collect a 1 L sample from liter A, as determined during preliminary sampling. If the concentration is above Concentration F, a LSL is likely present.