



Developing and Maintaining a Service Line Inventory: Small Entity Compliance Guide

NOTICE

This guide was prepared pursuant to section 212 of the Small Business Regulatory Enforcement Fairness Act of 1996 (“SBREFA”), Pub. L. 104-121 as amended by Pub. L. Number 110-28. THIS DOCUMENT IS NOT INTENDED, NOR CAN IT BE RELIED UPON, TO CREATE ANY RIGHTS ENFORCABLE BY ANY PARTY IN LITIGATION WITH THE UNITED STATES. The statements in this document are intended solely as a guide to aid you in complying with the initial service line inventory requirements of the Lead and Copper Rule Revisions (LCRR). EPA may decide to revise this guide without public notice to reflect changes in EPA’s approach to implementing the LCRR or to clarify and update text. To determine if EPA has revised this guide and/or to obtain copies, contact EPA’s Small Business Ombudsman Office at (800) 368-5888 or (202) 566-2822 (Washington DC metropolitan calling area) or contact EPA’s Office of Ground Water and Drinking Water Safe Drinking Water Hotline at (800) 426-4791 (e-mail: safewater@epa.gov), or visit the following EPA LCRR website: <https://www.epa.gov/ground-water-and-drinking-water/revised-lead-and-copper-rule>. The full text of the rule can be found at 40 CFR Part 141 and 40 CFR Part 142 as well as in the *Federal Register* (86 FR 4198) and at docket EPA-HQ-OW-2017-0300 at <https://www.regulations.gov>.

Disclaimer: The guidance within this document can be used to comply with the requirements under the LCRR that are in effect at the time of document publication. As described in the Environmental Protection Agency’s (EPA’s) Federal Register notice of December 17, 2021 (“Notification of conclusion of review”), EPA intends to publish a proposal to revise the LCRR and take final action on the proposal by October 16, 2024, but EPA does not expect to propose changes to the requirements for information to be submitted in the initial service line inventory. However, the rulemaking could include changes to the requirements for inventory updates (USEPA, 2021a). The statutory provisions and EPA regulations described in this document contain legally binding requirements. This document is not a regulation itself, nor does it change or substitute for those provisions and regulations. Thus, it does not impose legally binding requirements on EPA, states, or the regulated community. This document does not confer legal rights or impose legal obligations upon any member of the public. Although EPA has made every effort to ensure the accuracy of the discussion in this document, the legally binding requirements applicable to public water systems are determined by statutes and regulations. In the event of a conflict between the discussion in this document and any applicable statute or regulation, this document would not be controlling. The recommendations provided here may not apply to a particular situation based upon the circumstances. Because they are recommendations, and not legally binding requirements, public water systems retain the discretion to follow the recommendations or adopt approaches that differ from those described in this document. Mention of trade names or commercial products does not constitute endorsement or recommendation for their use.

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Acronyms

µg/L	Micrograms per liter
CCR	Consumer Confidence Report
CFR	Code of Federal Regulations
CWS	Community Water System
EPA	United States Environmental Protection Agency
GRR	Galvanized Requiring Replacement
LCR	Lead and Copper Rule
LCRI	Lead and Copper Rule Improvements
LCRR	Lead and Copper Rule Revisions
LSL	Lead Service Line
LSLR	Lead Service Line Replacement
NTNCWS	Non-Transient Non-Community Water System
PWS	Public Water System
SOP	Standard Operating Procedure

Glossary

Term	Definition ¹
Curb stop	An exterior valve located at or near the property line that is used to turn on and off water service to the building. ²
Community water system	A public water system that serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents (40 CFR §141.2).
Full lead service line replacement	Replacement of a lead service line (as well as galvanized service lines requiring replacement) that results in the entire length of the service line, regardless of service line ownership, meeting the Safe Drinking Water Act (SDWA) Section 1417 definition of lead free ³ applicable at the time of the replacement. See 40 CFR §141.2 for the full regulatory definition.
Galvanized requiring replacement	A galvanized service line that is or was at any time downstream of a lead service line or is currently downstream of a lead status unknown service line. If the water system is unable to demonstrate that the galvanized service line was never downstream of a lead service line, it must presume there was an upstream lead service line (40 CFR §141.84(a)(4)(ii)).
Galvanized service line	Iron or steel piping that has been dipped in zinc to prevent corrosion and rusting (40 CFR §141.2).
Gooseneck, pigtail, or connector	A short section of piping, typically not exceeding two feet, which can be bent and used for connections between rigid service piping. For purposes of Subpart I, lead goosenecks, pigtails, and connectors are not considered to be part of the lead service line but may be required to be replaced pursuant to §141.84(c) ⁴ (40 CFR §141.2).
Lead service line	A portion of pipe that is made of lead, which connects the water main to the building inlet. A lead service line may be owned by the water system, owned by the property owner, or both. For the purposes of Subpart I, a galvanized service line is considered a lead service line if it ever was or is currently downstream of any lead service line or service line of unknown material. If the only lead piping serving the home is a lead gooseneck, pigtail, or connector, and it is not a galvanized service line that is considered a lead service line, the service line is not a lead service line (40 CFR §141.2).
Lead status unknown service line	A service line where the material is not known to be lead, galvanized requiring replacement, or a non-lead service line, such as where there is no documented evidence supporting material classification. It is not necessary to physically verify the material composition (<i>e.g.</i> , copper or plastic) of a service line for its lead status to be identified (<i>e.g.</i> , records demonstrating the service line was installed after a municipal, state, or federal lead ban ³) (40 CFR §141.2).
Non-lead	A service line that is determined through an evidence-based record, method, or technique not to be lead or galvanized requiring replacement (40 CFR § 141.84(a)(4)(iii)).

Term	Definition ¹
Non-transient non-community water system	A public water system that is not a community water system and regularly serves at least 25 of the same persons over 6 months per year (40 CFR §141.2).
Service line	The pipe connecting the water main to the interior plumbing in a building. ² The service line may be owned wholly by the water system or customer, or in some cases, ownership may be split between the water system and the customer.
State	State means the agency of the State or Tribal government that has jurisdiction over public water systems. During any period when a State or Tribal government does not have primary enforcement responsibility pursuant to Section 1413 of the Act, the term “State” means the Regional Administrator, U.S. Environmental Protection Agency (40 CFR §141.2).
Water main	A pipe that conveys water to a connector or customer's service line. In residential areas, it is usually located underground. ²
Water meter	An instrument, mechanical or electronic, used for recording the quantity of water passing through a particular pipeline or outlet. ²

Notes:

¹ Definitions without a regulatory citation are recommended definitions for use in this guide.

² Source: Seventh Drinking Water Infrastructure Needs Survey and Assessment: Lead Service Line Inventory for America’s Water Infrastructure Act – State Survey Instruction. January 2021.

³ In 1986, Congress amended the Safe Drinking Water Act (SDWA), prohibiting the use of pipes, solder, or flux that were not “lead free” in public water systems or plumbing in facilities providing water for human consumption. At the time, “lead free” was defined as solder and flux with no more than 0.2 percent lead and pipes with no more than 8 percent. In 2011, Congress passed the Reduction of Lead in Drinking Water Act (RLDWA) that amended Section 1417 of SDWA and updated the definition for “lead free” as a weighted average of not more than 0.25 percent lead calculated across the wetted surfaces of a pipe, pipe fitting, plumbing fitting, and fixture and not containing more than 0.2 percent lead for solder and flux. On September 1, 2020, EPA published the final regulation “Use of Lead Free Pipes, Fittings, Fixtures, Solder, and Flux for Drinking Water” to make conforming changes to existing regulations based on the RLDWA. <https://www.federalregister.gov/documents/2020/09/01/2020-16869/use-of-lead-free-pipes-fittings-fixtures-solder-and-flux-for-drinking-water>.

⁴ Section 141.84(c) of the January 15, 2021 Lead and Copper Rule Revisions (LCRR) specifies the operating procedures for replacing lead goosenecks, pigtails, or connectors. The LCRR is under revision and all rule provisions except for the initial inventory requirements may be subject to change.

1. Introduction

This document is published by the U.S. Environmental Protection Agency (EPA) as our official compliance guide for small entities, as required by the Small Business Regulatory Enforcement Fairness Act of 1996. Before you begin using the guide, you should know that the information in this guide was compiled and based on the Lead and Copper Rule Revisions, effective on December 16, 2021 (referred to as the “LCRR” throughout this document). EPA is continually improving and upgrading its rules, policies, compliance programs, and outreach efforts. You can determine whether EPA has revised or supplemented the information in this guide by consulting EPA’s LCRR website at: <https://www.epa.gov/ground-water-and-drinking-water/revised-lead-and-copper-rule>.

2. Who Should Use This Guide?

This guide is designed for owners and operators of small community water systems (CWSs) and non-transient non-community water systems (NTNCWSs). All CWSs and NTNCWSs must develop and maintain an inventory of each service line in their distribution system to comply with the LCRR. Water systems must submit their initial inventories to their State¹ by October 16, 2024.

Systems that might find this guide useful include those that operate the following:

- Small towns;
- Rural water districts;
- Tribal waters systems;
- Manufactured housing parks;
- Homeowners associations;
- Small private water systems; and
- Factories, schools, and religious institutions that have their own water supplies.

3. How Do I Use This Guide?

Exhibit 1 shows how this guide is organized, including where you can find rule requirements and recommendations.

¹ EPA authorizes states, territories, and Indian tribes to assume primary enforcement responsibility to implement SDWA’s Public Water System Supervision Program, for public water systems to States, territories, and Indian tribes if they meet special requirements. To date, 54 states and territories and one tribe have primacy. Wyoming, Washington D.C., and all Indian Tribes except the Navajo Nation do not have primacy. Where no state, territory, or Indian Tribe has primacy, the relevant EPA regional office implements the program. Throughout this guidance, the terms “State” or “States” are used to refer to all types of primacy agencies including U.S. territories, Indian tribes, and EPA Regions.

Exhibit 1: Guide Organization

Section Number	Contents	Requirements	Recommendations
4	The benefits of a comprehensive and accurate inventory.		X
5	Summary of the complete initial inventory requirements of the LCRR.	X	
6	How the initial inventory requirements relate to other federal, state, and local requirements.	X	
7	Which service lines must be included in your initial inventory	X	
8	What information must be included in your initial inventory.	X	
9	Other information you could consider including in your inventory.		X
10	How to develop your initial inventory.	X	X
11	What to do if you only have non-lead service lines.	X	X
12	What information you must provide to your State and when.	X	
13	What information you must provide to your customers and the public.	X	X

Section 5 of this guide provides relevant citations to the LCRR. Note that the full rule language is available for download from the *Federal Register* at <https://www.ecfr.gov/current/title-40/chapter-I/subchapter-D/part-141/subpart-I>. Hyperlinks will take you to relevant sections of the EPA’s “Guidance for Developing and Maintaining a Service Line Inventory” (hereafter referred to as the “full guidance”), from which this guide was developed. This guide includes a template for water systems, States, and tribes to use or adapt to create their own inventory. This template is available online at <https://www.epa.gov/ground-water-and-drinking-water/revised-lead-and-copper-rule>.

This guide also contains three appendices:

- Appendix A provides web links to additional resources that you might find helpful.
- Appendix B includes blank forms from EPA’s inventory template.
- Appendix C provides a completed example of the inventory template forms for a hypothetical system.

4. What Are the Benefits of a Comprehensive and Accurate Inventory?

Service line inventories are the foundation from which systems can take action to address a significant source of lead in drinking water – lead service lines (LSLs). Establishing an inventory of service line materials and identifying the location of LSLs is a key step in getting them replaced and protecting public health. A comprehensive and accurate inventory allows you to publicly track progress on LSL identification and replacement, engaging the community and enhancing transparency. In addition to benefits related to lead service line replacement (LSLR) and public health protection, a comprehensive and accurate inventory can help all systems by supporting asset management programs and customer communications.

Given the many benefits of LSLR, EPA encourages systems to *begin LSLR as soon as possible*, regardless of the stage of inventory development.

5. What Are the Initial Inventory Requirements of the LCRR?

The initial inventory requirements under the LCRR are summarized in Exhibit 2. The remainder of this guide will cover these requirements in more detail.

EPA is currently developing a revision to the LCRR, called the Lead and Copper Rule Improvements (LCRI). All LCRR requirements aside from the initial inventory are subject to change under the LCRI.

Exhibit 2: LCRR Inventory Requirements

Inventory Requirement	40 CFR Citation
Inventory Specifications	
Material Classification: Classify each service line or portion of the service line where ownership is split as lead, galvanized requiring replacement (GRR), non-lead, or lead status unknown.	§141.84(a)(4)
All Service Lines and Ownership: Prepare an inventory that includes the system- and customer-owned portions of all service lines in the system's distribution system.	§141.84(a), (a)(2)
Information to Identify Material: Use previous materials evaluation, construction and plumbing codes/records, water system records, distribution system inspections and records, information obtained through normal operations, and State-specified information.	§141.84(a)(3)

Inventory Requirement	40 CFR Citation
Deadlines for Submission	
Initial Inventory: Submit an initial inventory by October 16, 2024.	§141.80(a)(3) ¹
Updates to State: Submit updated inventories to your State annually or triennially based on lead tap sampling frequency, but not more frequently than annually. Water systems that have demonstrated the absence of lead service lines (LSLs) by October 16, 2024, are not required to provide an update. However, if these systems subsequently find any LSLs or GRR service lines, they have 30 days to notify the State and prepare an updated inventory on a schedule established by the State.	§141.90(e)(3), §141.90(e)(3)(ii)
Public Accessibility and Consumer Confidence Report	
Public Accessibility: Make the inventory publicly available and include a location identifier for LSLs and GRR service lines. Water systems serving more than 50,000 people must provide inventories online.	§141.84(a)(8)
Consumer Confidence Report (applies to CWSs only): Include a statement that a service line inventory has been prepared (including inventories consisting only of a statement that there are no LSLs) and instructions on how to access it.	§141.153(d)(4)(xi)
Service Line Consumer Notification	
Provide notification to persons served by the water system at the service connection with a lead, GRR, or lead status unknown service line. If the water system serves communities with a large proportion of non-English speaking consumers, as determined by the State, public education materials must be in appropriate languages or contain a telephone number or address where persons served may contact the water system to obtain a translated copy of the materials or to request assistance in the appropriate language. Timing: Notification within 30 days after completion of the initial inventory and repeated annually until only non-lead remains. For new customers added after the initial inventory, water systems must also provide this notice at the time of service initiation. Content: Statement about service line material, lead health effects, and steps to minimize lead exposure in drinking water. If the service line is: • Confirmed LSL, must include opportunities to replace the LSL, any available financing programs, and statement that the system must replace its portion if property owners notify the system they are replacing their portion. • GRR, must also include opportunities for service line replacement. • Lead status unknown, must also include opportunities to verify the material of the service line. Delivery: By mail or by another method approved by the State. Reporting to States: Demonstrate that the water system delivered the notification and provide a copy of the notification and information materials to its State annually by July 1 for the previous calendar year.	§141.85(a)(1)(ii), §141.85(e) & §141.90(f)(4)

Notes:

¹ On June 16, 2021, EPA published a rule to extend the compliance date from January 16, 2024, to October 16, 2024 (40 CFR §141.90(e)(1)). *Federal Register* 86(114): 31939. June 16, 2021. Washington, D.C.: Government Printing Office.

6. How Do Service Line Inventory Requirements Relate to Other Federal, State, and Local Requirements?

Your State may have passed laws or regulations for service line inventories that are more stringent than federal requirements. This guide identifies a few examples where the State may have more stringent requirements. For the most accurate and up-to-date requirements, you should reach out to your State.

In addition, there are existing Lead and Copper Rule (LCR) requirements that rely on service line inventory information. The following requirements under the LCR are in effect until October 16, 2024:

- **Inventory-Related Requirements in the Event of Action Level Exceedance.** Under the LCR (40 CFR §141.84(b)), systems subject to LSLR requirements² must replace annually at least seven percent of the initial number of LSLs that are in place at the time the replacement program begins. Water systems must identify the initial number of LSLs in their distribution system under this requirement. EPA recommends that systems use information gathered for the initial inventory under the LCRR to help identify the required initial number of LSLs for replacement under the LCR.
- **How the Inventory Relates to the Tap Monitoring Requirements.** Required lead and copper tap monitoring under the LCR is based on a tiering system for prioritizing sample sites (40 CFR §141.86(a)). Single family homes with LSLs are in the highest tier (*i.e.*, Tier 1), meaning systems should prioritize these locations for lead and copper tap monitoring. Systems may gather more information on the location of LSLs under their initial inventory efforts.

7. Which Service Lines Must I Include in My Initial Service Line Inventory?

Your initial service line inventory **must** include:

- All service lines connecting the water main to the interior plumbing in a building, regardless of ownership status. This includes service lines owned entirely by the

² Under the LCR, systems that exceeded the lead action level of 15 micrograms per liter (µg/L) based on their 90th percentile sample result after installing corrosion control and/or source water treatment (whichever sampling occurred later) were required to replace seven percent of their LSLs annually until they no longer exceeded the lead action level for two consecutive 6-month monitoring periods (40 CFR §141.84(a)).

customer as well as both the system-owned and customer-owned portions where ownership is split.

- All service lines connecting the water main to the interior plumbing in a building, regardless of the actual or intended use. These include, for example, service lines:
 - With non-potable applications such as fire suppression or those designated for emergency.
 - Connected to vacant or abandoned buildings, even if they are unoccupied and water service is turned off.

EPA requires that these service lines be included because they could be repurposed in the future for a potable or non-emergency use.

- Service lines connecting multiple units or buildings on a property.
- Service lines connecting a well to a single building such as in cases where the system meets the definition of a CWS or NTNCWS but does not have an extensive distribution system.

EPA recommends that systems include in their inventory any pipes that are not connected to buildings that have the potential to be lead. See Exhibit 3 and Exhibit 4 for examples of service line configurations for CWSs and NTNCWSs, respectively.

Exhibit 3: Example of a Community Water System with a Master Meter and Multiple Service Lines
(Plan View)

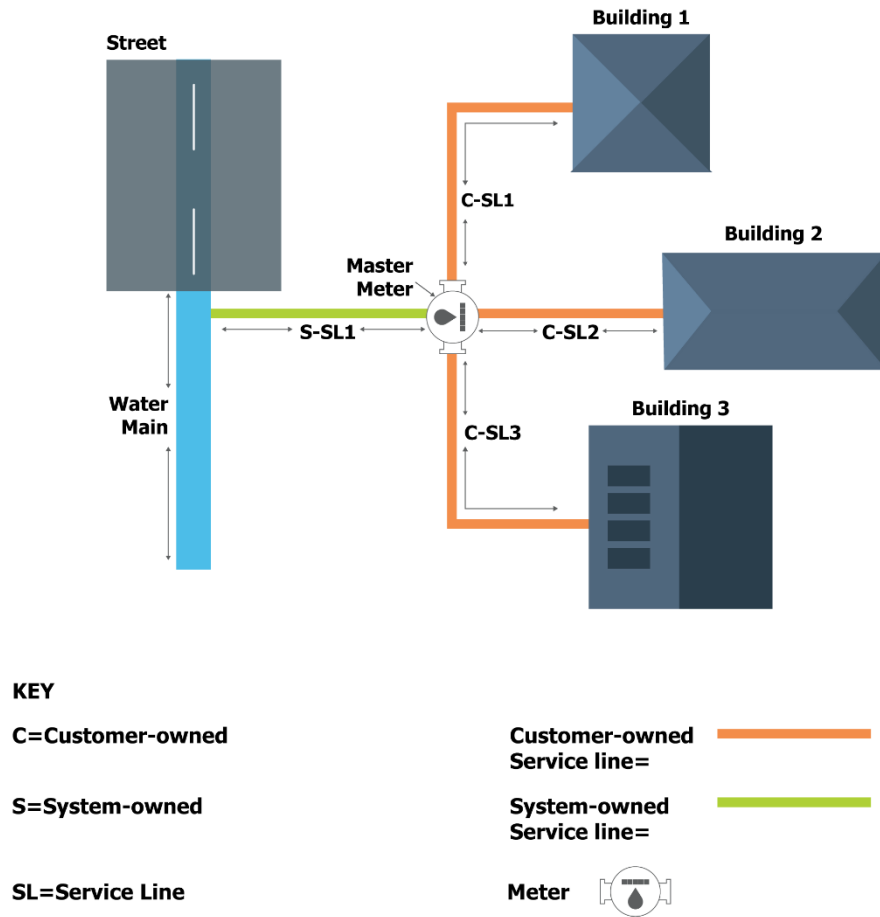
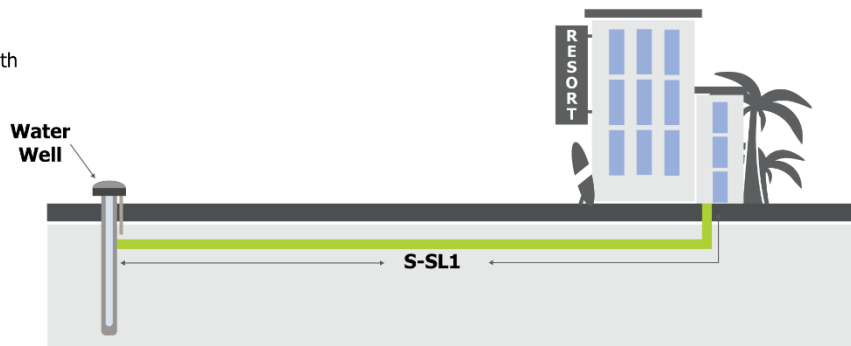
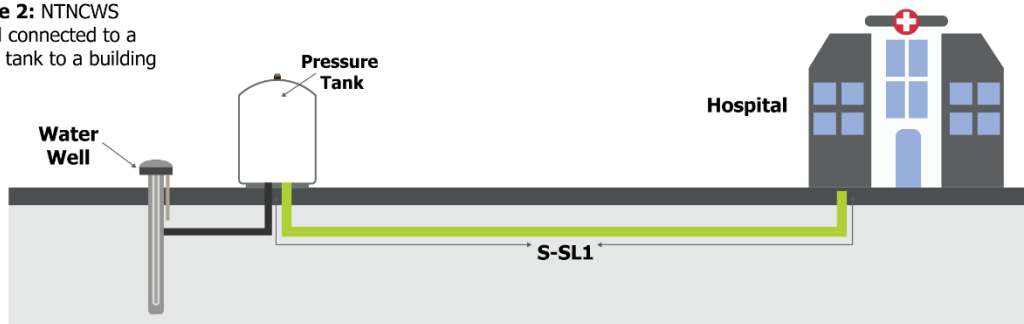


Exhibit 4: Examples of a Non-transient Non-community Water System (NTNCWS) Service Configurations (Profile View)

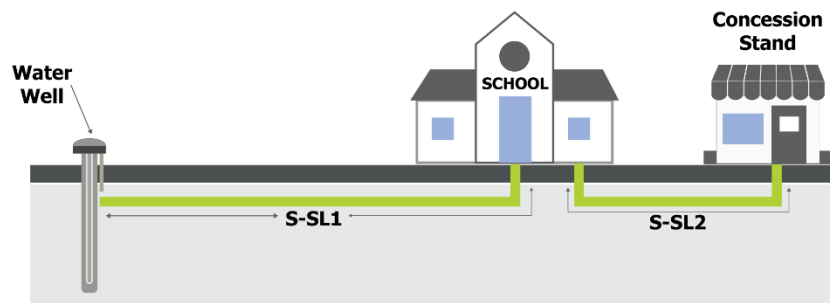
Example 1: NTNCWS with well pumped directly to a building



Example 2: NTNCWS with well connected to a pressure tank to a building



Example 3: NTNCWS with well connected to a building connected to another building



KEY

NTNCWS=Non-transient non-community water system

S=System-owned

SL=Service Line

System-owned Service line= 

Meter 

Pressure Tank 

Well 

8. What Information Must Be Included in My Initial Inventory?

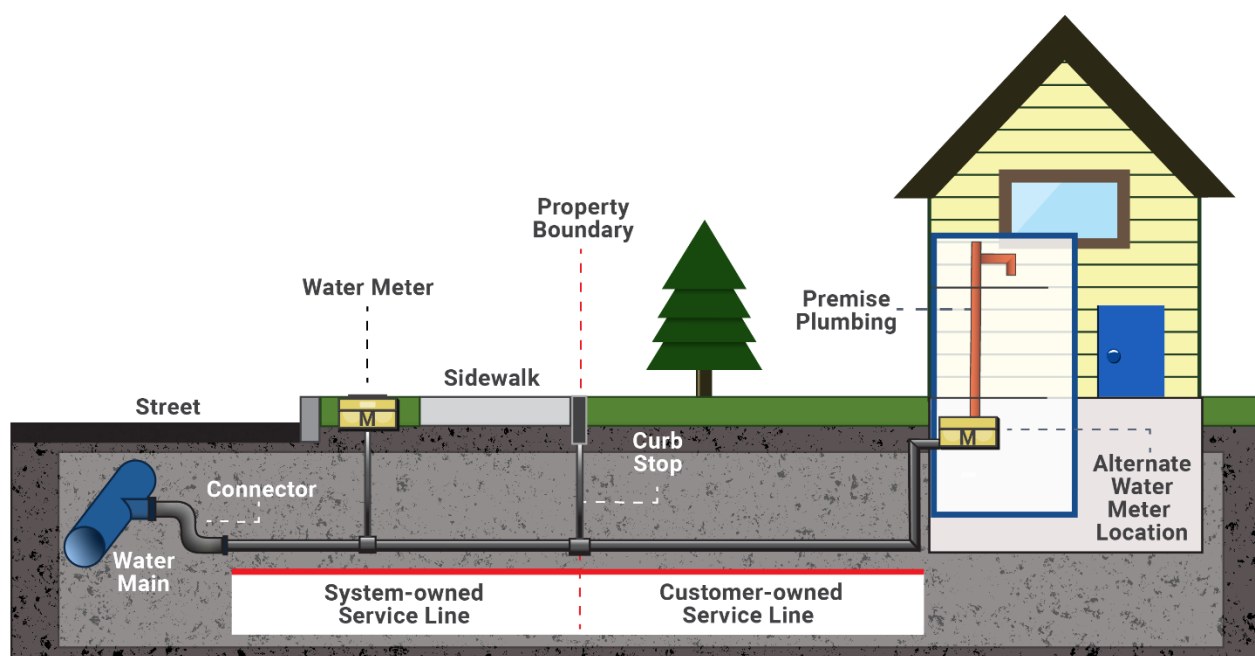
Required Service Line Material Classifications

Under the LCRR, you must use one of the following material classifications for your service lines:

- Lead;
- Galvanized requiring replacement (GRR);
- Non-lead (or the actual material, such as copper or plastic); or
- Lead status unknown service lines (or unknown).

You must include separate material classifications for the water system-owned and customer-owned portions where ownership is split (see example of split ownership in Exhibit 5).

Exhibit 5: Example of Service Line Ownership Distinction Between the Water System and Customer



Note that lead goosenecks, pigtails, or connectors **are not** considered part of the service line under the LCRR. These are defined as “a short section of piping, typically not exceeding two feet, which can be bent and used for connections between rigid service piping” (40 CFR §141.2). Section 141.84(c) of the LCRR specifies the requirements for when lead goosenecks, pigtails, or connectors must be replaced.

Your State may require you to include lead goosenecks, pigtails, and connectors in your initial inventory. Please contact your State to determine if they have additional requirements beyond those of the LCRR.

Exhibit 6 provides additional information to help you make material classifications.

Exhibit 6: Required Inventory Materials Classifications

Material Classification	Use This Classification If:
Lead	The service line is made of lead (40 CFR §141.84(a)(4)(i)). <u>Keep in Mind:</u> • The LCRR updates the definition of a lead service line (LSL) as “a portion of pipe that is made of lead, which connects the water main to the building inlet” (40 CFR §141.2). • If the only lead pipe serving the building is a lead gooseneck, pigtail, or connector, the service line is not considered an LSL under the initial inventory requirements of the LCRR. EPA recommends that the system track the material of all components that potentially contain lead, including connectors.
Galvanized Requiring Replacement (GRR)	The galvanized service line is or ever was at any time downstream of an LSL or is currently downstream of a lead status unknown service line. If your water system is unable to demonstrate that the galvanized service line was never downstream of an LSL, you must presume there was an upstream LSL (40 CFR §141.84(a)(4)(ii)). <u>Keep in Mind:</u> • Galvanized service lines that are or ever were downstream from an LSL can adsorb lead and contribute to lead in drinking water. • An example of a GRR service line is when the customer-owned portion from the meter to the building is galvanized, and the system-owned portion from the water main to the meter was previously lead but has been replaced. The customer-owned portion of the service line would be GRR. • Under the initial inventory requirements of the LCRR, a galvanized service line that was never downstream of an LSL but is downstream or previously downstream of a lead gooseneck, pigtail, or connector is not considered GRR. However, systems should check with their States if they have more stringent requirements.

Material Classification	Use This Classification If:
Non-Lead	The service line is determined through an evidence-based record, method, or technique that it is not lead or GRR (40 CFR §141.84(a)(4)(iii)). <u>Keep in Mind:</u> - You can classify your service line as non-lead if you can demonstrate that a galvanized service line was never downstream of an LSL. - You may classify the actual material of the service line (<i>e.g.</i>, galvanized, plastic, or copper) as an alternative to classifying it as non-lead. - The term “non-lead” refers to the service line material only and does not include other potential lead sources present in solder, connectors, and other plumbing materials.
Lead Status Unknown	The service line material is not known to be a lead, GRR, or non-LSL, such as where there is no documented evidence supporting material classification (40 CFR §141.84(a)(4)(iv)). <u>Keep in Mind:</u> - You have the option to use the terminology of “unknown” instead of “lead status unknown” service line. - You may elect to provide more information regarding your unknown lines as long as your inventory clearly distinguishes unknown service lines from those where the material has been determined through records or inspections.

Classifying the Entire Service Line When Ownership Is Split

In addition to separate material classifications for the water system-owned and customer-owned portions when ownership is split, a single classification per service line is needed to support various LCRR requirements, such as LSLR and tap sampling. Exhibit 7 provides guidelines to help you classify the entire service line for various system-owned and customer-owned material combinations.

Exhibit 7: Classifying Service Line Materials When Ownership Is Split

System-Owned Portion	Customer-Owned Portion	Classification for Entire Service Line
Lead	Lead	Lead
Lead	Galvanized Requiring Replacement	Lead
Lead	Non-lead	Lead
Lead	Lead Status Unknown	Lead

System-Owned Portion	Customer-Owned Portion	Classification for Entire Service Line
Non-lead	Lead	Lead
Non-lead and never previously lead	Non-lead, specifically galvanized pipe material	Non-lead
Non-lead	Non-lead, material other than galvanized	Non-lead
Non-lead	Lead Status Unknown	Lead Status Unknown
Non-lead, but system is unable to demonstrate it was not previously Lead	Galvanized Requiring Replacement	Galvanized Requiring Replacement
Lead Status Unknown	Lead	Lead
Lead Status Unknown	Galvanized Requiring Replacement	Galvanized Requiring Replacement
Lead Status Unknown	Non-lead	Lead Status Unknown
Lead Status Unknown	Lead Status Unknown	Lead Status Unknown

Location Identifiers in Your Publicly Available Inventory

You **must** include a location identifier for any lead or GRR service line in your publicly available inventory. The location identifier can be a street address, intersection, or landmark.

You have flexibility to determine which location identifier best meets the needs of your community. If the street address is not used, you must use a meaningful location identifier. The location identifier could be, for example, a block, intersection, landmark, Global Positioning System (GPS) coordinates, emergency 911 address for systems in rural areas, or an alternate indicator (such as water meter location). Regardless of which identifier you choose, it must not be so overly broad (*e.g.*, census tract or zip code) that the public could not adequately track general LSL locations or where the system is making progress in replacing LSLs.

9. Is There Additional Information I Should Consider for My Inventory?

This section identifies additional information that could be helpful to include in your inventory. These are **recommendations only** and are not required under the LCRR. Check with your State for any additional requirements. EPA recommends water systems consider:

- 1) Further subclassifying service lines or portions of the service line to improve asset management, help target LSLR efforts, and provide greater transparency to your customers:
 - **LSL likelihood for unknown service lines:** For example, if an individual service line material is unknown but was installed when lead was not commonly used in the

system prior to the lead ban, based on interview with experience system staff and plumbers, the system could consider subclassifying the service line as “Unknown-Unlikely Lead” or a similar designation.

- **Additional information for GRR:** For example, you could document if the galvanized pipe: 1) is known to be currently downstream of an LSL, 2) was previously downstream of an LSL, or 3) does not have information to indicate it was never downstream of an LSL.
- **Lead-lined galvanized pipes:** EPA is aware of the existence of lead-lined galvanized service lines. These lines would be subject to the same LCRR requirements as other LSLs in the inventory. These service lines may be difficult to identify because their exterior is not lead. EPA recommends you consider any available information that indicates where (if ever) lead-lined galvanized pipes were used along with approaches, such as water quality sampling for lead, to identify them.
- **Actual material for non-lead service lines:** EPA recommends that you classify the actual material of the service line (*e.g.*, galvanized, plastic, or copper) as an alternative to classifying it as non-lead. Including these classifications can improve system asset management.

2) Including information on other lead-containing infrastructure in your inventory, such as:

- Goosenecks, pigtails, and connectors.
- Lead solder in service line or premise plumbing.
- Fittings and equipment connected to the service line such as curb stops and meters that may be made of older brass that pre-date the effective date for the Reduction of Lead in Drinking Water Act (January 4, 2014).

3) Documenting where service line ownership or responsibility is split between the customer and the system.

4) Including additional information for the public, such as:

- A location identifier for all service lines (*e.g.*, including unknown and non-lead).
- Consider using the street address as the location identifier for all service lines.
- Additional location descriptors if multiple service lines serve different buildings with the same listed address (*e.g.*, hospital or university campus) to allow each service line to be uniquely identified.

5) Including additional service line characteristics, such as:

- **The source(s) of information used to identify the service line material:** Tracking this information can help you assess the accuracy of historical records and service line investigation methods.

- **Pipe diameter:** Pipe diameter can be an important factor in determining service material classification because LSLs are often two inches or smaller in diameter.
- **Installation or replacement date:** The date of service line construction or replacement can be an important factor in screening for potential LSLs since LSLs were banned at the federal level in 1986 and even earlier by some states and communities. Where precise dates are not available, the year (*e.g.*, 1985) or estimated date range (1950-1960) of installation or replacement can be used.

10. How Do I Develop My Service Line Inventory?

Under the LCRR, EPA requires that water systems review certain types of information to develop their initial inventory. Specifically, water system **must** review the following:

- Information on lead and galvanized iron or steel that was identified prior to the LCR under 40 CFR § 141.42(d).³
- All construction and plumbing codes, permits, and existing records or other documentation that indicates the service line materials used to connect structures to the distribution system.
- All water system records, including distribution system maps and drawings, historical records on each service connection, meter installation records, historical capital improvement or master plans, and standard operating procedures.
- All inspections and records of the distribution system that indicate the material composition of the service connections that connect a structure to the distribution system.

Looking for ways to fund the development of your inventory? See EPA's LSLR funding page at <https://www.epa.gov/ground-water-and-drinking-water/funding-lead-service-line-replacement>

In addition, water systems **must** use any resource, information, or investigation method provided by or required by the State to develop their initial inventory.

³ Note that the LCR required systems to review information gathered under 40 CFR § 141.42(d) to identify targeted sample sites. This and other information reviewed for the LCR requirements may be helpful in identifying service line material.

Tools That Can Help You Develop and Maintain Your Inventory

EPA developed a spreadsheet template, available online at <https://www.epa.gov/ground-water-and-drinking-water/revised-lead-and-copper-rule>, as an optional tool to help water systems develop and maintain their service line inventory. The template contains five worksheets for water systems as shown in Exhibit 8.

Exhibit 8: Organization of EPA Inventory Template: Water System Worksheets

Worksheet Name	Description
PWS Information	For systems to document basic system information.
Inventory Methods	For systems to document the methods and resources they used to develop and update their inventory.
Inventory Summary	For systems to provide a summary of their service line inventory, including information on ownership, inventory format, and the number of service lines for each of the four required materials classifications. Systems can enter the totals into this worksheet or automatically generate totals based on information in the Detailed Inventory worksheet.
Detailed Inventory	Provides a customizable format water systems can use to track materials for each service line in their distribution system. Each row equals one service line connecting the water main to the customer's plumbing. Separate columns track location information, the system-owned portion, the customer-owned portion, other possible sources of lead, information for assigning a tap sample tiering classification, and information for lead service line replacement (LSLR). Systems can customize the worksheet by adding or deleting columns.
Public Accessibility Doc.	For systems to provide documentation to states on how they met the public accessibility requirements of the LCRR.

The template also contains color-coded instruction worksheets in yellow. Exhibit 9 provides an excerpt of the instructions.

Exhibit 9: Excerpt of Instructions from EPA's Inventory Template

System Template Instructions

Purpose of this worksheet: To provide detailed instructions for each worksheet for systems that elect to use this template.

Getting Started

1. Save a copy of this workbook to your hard drive or network drive. Consider adding your system PWSID or other system identifier to the filename (e.g., Inventory Template_XX0000000) and indicating in the filename if this is the "initial" inventory or "update1", "update2", etc.
2. Complete the **PWS Information**, **Inventory Methods**, **Inventory Summary**, and **Public Accessibility Documentation** worksheets by following the instructions below.
3. If you decide to use the **Detailed Inventory** worksheet in this workbook to organize information on service line material, follow the instructions below. Alternatively, you can use a different format for your inventory such as a list, custom spreadsheet, database, or map. You will be asked to describe the inventory format on the **Inventory Summary** worksheet.

The inventory template is designed for you to save a copy to your computer, enter your information electronically, and submit the entire file to your State. Blank forms from the inventory template that could be filled out by hand (except for the detailed inventory) are in Appendix B. Appendix C provides an example of the completed forms and an excerpt from a detailed inventory for a hypothetical system. Remember that EPA **does not** require you to use this template for your inventory. You should check with your State for any format requirements.

Recommendations for Developing the Service Line Inventory

- 1) EPA recommends that systems start with **planning steps**, including:
 - **Identify staff and resources:** The level of effort for the initial inventory depends on the size of your system, the availability of historical records, the format and condition of those records, the extent of LSL investigations, and methods required and/or approved by your State. **Interviews** with your experienced system staff and plumbers can be used to focus the inventory effort and verify utility practices.
 - **Select an inventory format:** Possible formats include lists, spreadsheets, databases, and maps. EPA does not require a specific inventory format, but you should check with your State. The format should be flexible enough to accommodate updates, be easily transmittable to the State, include location identifiers, and be in a format that can be

made publicly accessible. You can use part or all of EPA’s inventory template for your initial inventory; see the description of the template provided above in “Tools That Can Help You Develop and Maintain Your Inventory.”

- **Develop procedures for collecting service line information:** Inventory activities should be considered as something that can be worked into the ***day-to-day activities*** of your system rather than treated as an independent effort. Opportunities for information collection include meter reading, meter repair service line repair, service line and/or main repair or replacement, and backflow prevention inspections. You should consider developing standard operating procedures (SOPs) or modifying existing SOPs to document how your staff and contractors can collect information and use it to update your inventory. EPA recommends that systems begin tracking service line materials as they are encountered during normal operations before the LCRR requirement takes effect on October 16, 2024.

2) EPA recommends that systems consider using one of the following **approaches to historical records review**.

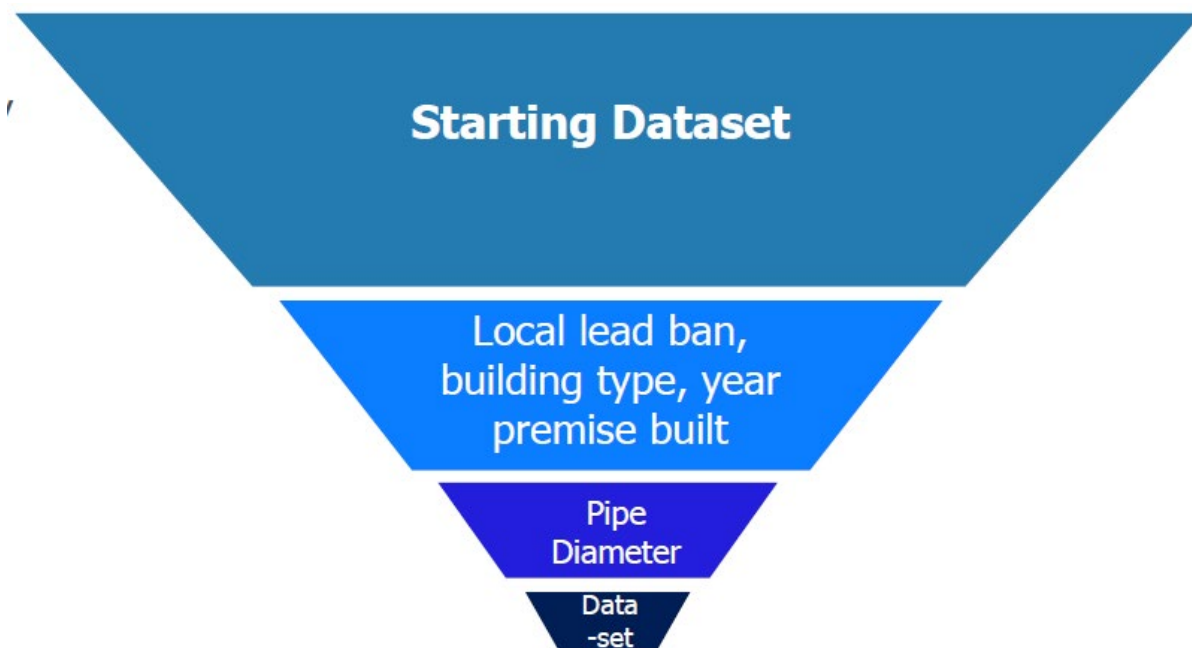
- **Initial screening process** (see Exhibit 10 below): Beginning with all service lines in your system, you can screen out non-lead service lines based on the date of the lead ban and construction records (*i.e.*, service lines constructed after your local lead ban became effective are unlikely to be an LSL). You can further reduce your data set by classifying non-lead lines based on size, such as a maximum diameter of lead pipe that was installed (typically two inches).⁴ The remaining dataset represents the service lines that could potentially be lead or GRR.

Most Lead Service Lines Are Old!

LSLs were primarily installed from the late 1800s to the 1940s (Hensley et al., 2021). Some communities, however, continued to install them through the 1980s until they were banned at the federal level.

⁴ [Preparing a Lead Service Line Inventory - LSLR Collaborative \(lslr-collaborative.org\)](https://www.lslr-collaborative.org/).

Exhibit 10: Service Material Screening Process Based on Records



Source: Liggett, J. 2021. *Revised Lead and Copper Rule Inventory Requirements [Webinar]*. AWWA Virtual Summit: Lead & Water Quality, April 7-8, 2021.

- **Asking key questions:** The LSLR Collaborative developed a flowchart with key questions to ask when starting the inventory process and points to available resources. It is available online at <https://www.lslr-collaborative.org/preparing-an-inventory-where-do-we-start.html>.
 - **Weight of evidence:** A weight of evidence approach can be useful if you have multiple sources of information for identifying service line material. Corroboration of historical records by another method makes a strong case for any service line classification. However, some water systems have reported finding conflicting records. If you have conflicts, EPA recommends a conservative approach whereby you assign the material as unknown (or lead, where one or more data sources indicate that lead is present) until the conflicts can be resolved.
- 3) EPA recommends that systems consider conducting **service line investigations** to reduce the number of unknowns as quickly as possible. EPA recommendations for service line investigations are as follows:
- Determine the **extent of service line investigations** based on the completeness of historical records, your confidence in the accuracy of historical records, potential opportunities for coordination with crews already in the field doing other work, previous investigation efforts, and number of service lines of unknown material.

- **Prioritize service line investigation:** There are many ways to prioritize locations for service line investigations, examples include prioritizing based on vulnerable or environmental justice populations, areas with the most unknowns, service lines that are most likely lead, and areas where LSLR is already occurring.
- **Select investigation methods:** Examples of investigation methods include visual identification of service line material by customer, mechanical or vacuum excavation, and water quality sampling. Note that State approval is needed to use select investigation methods for service line material classification. Additional information on investigation methods is available in Chapter 5 of EPA’s full inventory guidance.



PROTECT YOUR TAP
a quick check for lead

EPA has developed a step-by-step guide to help people identify LSLs in their homes, available online at <https://www.epa.gov/ground-water-and-drinking-water/protect-your-tap-quick-check-lead>

EPA recommends water systems develop procedures for inventorying service lines of vacant or abandoned buildings. For example, systems could consider:

- Prioritizing occupied homes for service material investigation or replacement to achieve a greater lead exposure reduction from their overall program, provided that the water is turned off at the vacant or unoccupied structure.
- Investigating these structures’ service lines if they are doing maintenance or construction work in the area.
- Identifying service material before service is restored, or not reconnecting LSLs on previously vacant homes or buildings (or new construction built after demolition).
- Using the transfer of property as an opportunity for service line identification or LSLR.

11. What If I Only Have Non-Lead Service Lines?

The requirements for developing an initial inventory are **the same** for systems with all non-lead service lines as they are for those with LSLs, GRRs, and/or service lines of unknown material. You must prepare an initial inventory of service lines in your distribution system and submit it to your State by **October 16, 2024**. Your inventory must include the system- and customer-owned portion of all service lines, and service lines should be classified as non-lead or the specific non-lead material. You must review previous materials evaluations, construction and plumbing codes/records, water system records, distribution system inspections and records, information gathered during normal operations, and State-specified information to prepare your initial inventory.

Remember that records already reviewed for service line material information under previous inventory efforts need not be reviewed again.

Although requirements are the same for developing the initial inventory, you have additional options for ***sharing information with the public***. You can make the initial inventory publicly available OR provide a written statement that your system has no LSLs, GRRs, or lead status unknown service lines along with a statement describing the methods you used to make the determination.

Recommendations for Determining That All Service Lines Are Non-Lead

Under the LCRR, you can classify a service line as non-lead by determining through an evidence-based record, method, or technique that it is not lead or GRR. You should also check with your State for any additional applicable requirement.

There are several ways to determine whether all service lines are non-lead. You may be able to use municipal codes and construction dates to show that all service lines were constructed after lead was banned in the system (*i.e.*, the system never had LSLs). Or you may be able to positively identify non-lead materials (*e.g.*, copper or PVC) for all service lines through historical records, field investigations, or both. You may be able to use a combination of evidence-based records, methods, or techniques; for example, when a portion of your distribution system was constructed after the lead ban, and the remainder is verified as non-lead based on historical records and service line investigations.

EPA recommends that you document the evidence-based records, methods, and techniques that you used to determine that all service lines are non-lead to help with customer communications, transparency, and State review.

Finding an LSL or GRR After Submitting Your Initial Inventory

EPA recognizes that even when all service lines have been classified as non-lead, an LSL or GRR may subsequently be found. If this happens, you **must**:

- Notify your State within 30 days.
- Prepare an updated inventory on a schedule established by your State.

Although not required, EPA recommends that, if your inventory has only non-lead service lines and an LSL or GRR is found, you ***replace the LSL or GRR as soon as possible*** and investigate when it was installed and who installed it. You should consider whether the discovery was an isolated event or a potential indicator of additional LSLs/GRRs in your system. If the latter, EPA recommends that you work with your State to determine which service lines should be reclassified as unknown and develop a plan for field investigations.

12. What Information Must I Report to My State and When?

You must submit your initial service line inventory to your State by **October 16, 2024**. The initial inventory must include the system- and customer-owned portions of all service lines in the system's distribution system and each service line or portion of the service line must be classified as lead, GRR, non-lead (or the actual material), or lead status unknown.

The LCRR does not require a specific format for the inventory; however, States may have additional requirements or recommendations regarding inventory format. See Section 10 for recommendations for inventory format.

13. What Information Must I Provide to the Public?

The public information requirements of the LCRR are intended to help customers understand the sources of lead in their drinking water, so that they can take steps to reduce their exposure. These requirements include: 1) public accessibility of the service line inventory, 2) revised Consumer Confidence Report (CCR) requirements, and 3) service line material notification.

Public Accessibility

[What Information to Include](#)

You **must** make the initial inventory publicly accessible. It must include at a minimum, a location identifier for each LSL and GRR. If you serve more than 50,000 people, you must provide your inventory online. The exception is if your system has all non-lead service lines. In this situation, you have the option to provide (1) a written statement that your system has no LSLs, GRRs, or unknowns and (2) a general description of the methods you used to make this determination.

EPA encourages you to consider providing additional information in your publicly available inventory (see the recommendations below). However, you should weigh the benefits of providing additional detail with the drawback of compromising a user's ability to find the most relevant information. You could consider indicating what other inventory information is available on request or including links to additional information if your inventory is available online.

Recommended Additional Information to Include in Your Publicly Accessible Inventory

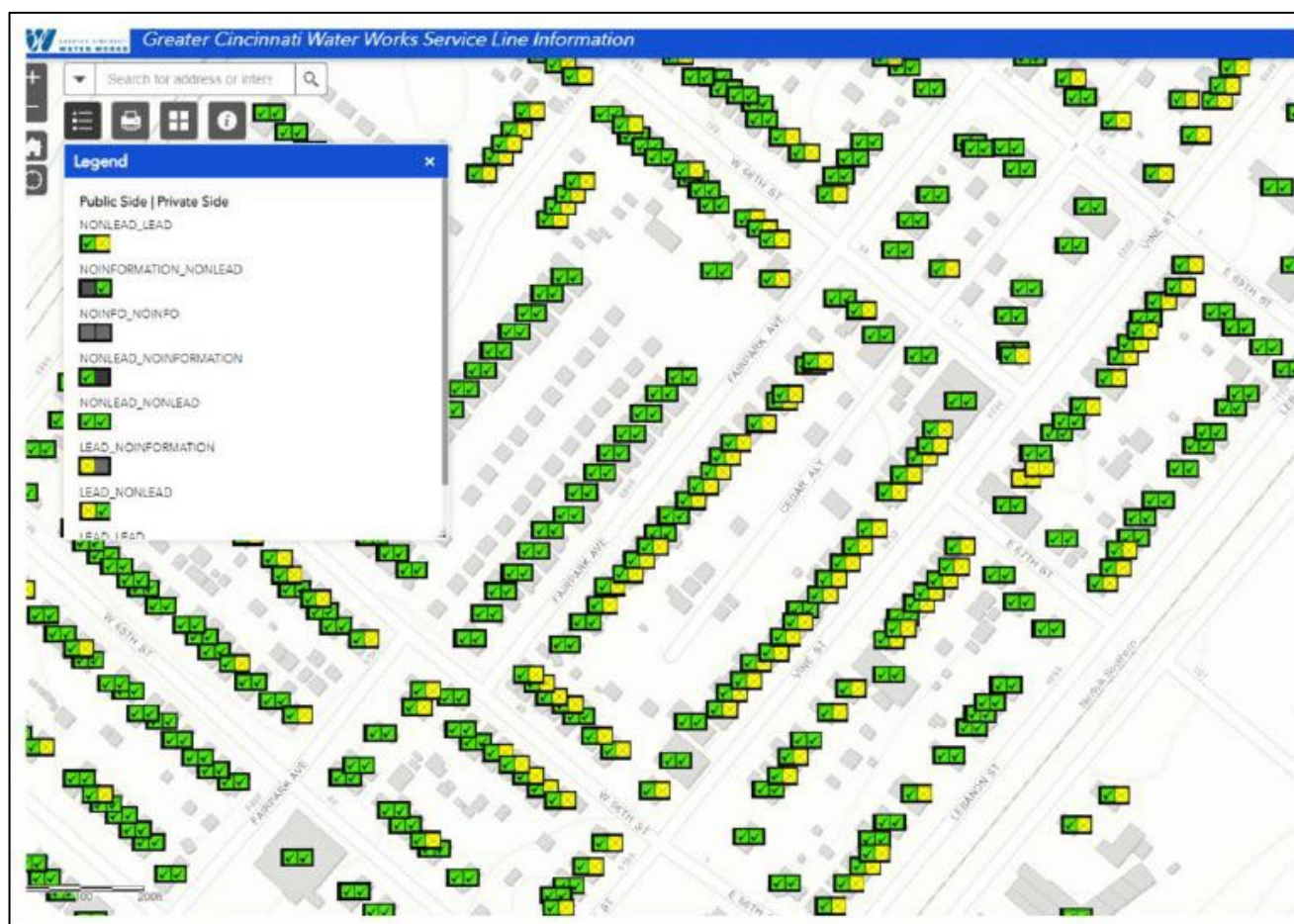
- 1) Location identifier for *all* service lines (not just LSLs and GRRs) and detailed location identifier information as previously described.
- 2) Actual material for non-lead service lines.
- 3) Additional Information about the inventory such as:
 - The total number of LSLs, GRRs, unknowns, and non-leads.
 - A schedule for investigating unknowns.
 - Instructions for the public on how to read and interpret the inventory.
 - The date of the last inventory update.
 - System contact information for questions or more information.
- 4) Clear disclaimer language to help you communicate any uncertainty inherent in your inventory, such as the varying reliabilities of some data sources.
- 5) Information to help minimize exposure to lead including:
 - The water system's actions to reduce lead.
 - How customers can test their water for lead, (*e.g.*, a system's lead testing program or a list of certified laboratories that can provide testing services).
 - Steps that consumers served by LSLs can take to protect themselves.
 - Statements that other lead sources may exist in drinking water plumbing or the building.

[How to Make the Data Publicly Available](#)

Under the LCRR, you **must** make your initial inventory publicly accessible, such as on the system's website, by mail, or in-person at your water system's office. If you serve 50,000 or fewer people, you are not required to publish your inventory online. EPA encourages all systems to provide online inventory access to reduce the time and cost associated with individual requests for inventory information.

A web-based map is an effective means for communicating service line inventory information to the public. Interested parties can view your service line materials anywhere there is internet access. The primary advantages of this format are user accessibility, data transparency, and your ability to regularly update the data. Exhibit 11 shows an example service line map created by Greater Cincinnati Water Works (GCWW). Best practices for map development include thoughtful selection of colors and symbology, displaying only the information that is most useful to the consumer, defining terminology and acronyms, and providing the text in multiple languages.

Exhibit 11: Greater Cincinnati Water Works Service Line Information Map



If you are not using a web-based map application but want to share your inventory electronically, there are many options. If your system has a website, a new webpage or subsection could be added for hosting service line inventory documents and updates. If your system does not have a website, providing your inventory online could be as simple as uploading a list, spreadsheet, or a simple map to a free files sharing service or publicly viewable social media account for the system. You can also check if your State, or county can host your inventory.

If your circumstances do not allow for web-based sharing, EPA recommends that you develop a plan for effectively distributing your inventory. Potential options for providing information without the use of electronic data sharing include:

- Printed service line maps;
- Printed tables of data;
- Information in your water system's mailings or newsletters; and
- Information available at your water system's office.

NTNCWSs could consider using email, posting the information in frequented locations (*e.g.*, breakroom or notice board), or include the information in a newsletter.

[Recommendations for Public Input and Updates](#)

Community involvement in the inventory process can lead to a more accurate inventory and more LSLR participation. You could ask for public feedback on existing material classifications or additional information where service line material is unknown. Public feedback can take many forms. For example, you can provide contact information on your website for individuals to submit corrections and updates via email or phone. Another example is a user submission form where customers identify the service line material and provide a photo.

Consumer Confidence Report Inventory Requirements

If your system is a CWS, you must include in your annual CCR, starting with reports delivered in 2025, a statement that you have prepared a service line inventory and instructions on how to access it. If all of your service lines are classified in the inventory as non-lead, you can instead provide a statement that you have no LSLs or GRRs with the description of methods used to make that determination. EPA may potentially revise these requirements under the Lead and Copper Rule Improvements (LCRI). Regardless of the final LCRI requirements, EPA recommends that you provide inventory-related information in your CCR.

Service Line Notification Requirements and Recommendations

If you have lead, GRR, or lead status unknown services lines, you **must** provide notification to people served by these lines **within 30 days** after completing the initial inventory. For new customers, added after the initial inventory is complete, you must provide the notice at the time of service initiation. The notification must be repeated annually until the entire service line is no longer a lead, GRR, or lead status unknown service line. Delivery must be by mail or another State-approved method.

You must demonstrate that you delivered the notification and provide a copy of the notification and information materials to your State annually *by July 1* for the previous calendar year.

If you serve communities with a large proportion of non-English speaking consumers, as determined by the State, you must provide public education materials in the appropriate language(s) or provide contact information where people can request a translated copy or translation assistance.

Exhibit 12 shows what must be included in the notice based on service line material.

Exhibit 12: Service Line Notification Requirements

For LSLs, the notice must include:	For GRR service lines, the notice must include:	For lead status unknown service lines, the notice must include:
• A statement that the service line material is lead • Mandatory health effects language • Steps that consumers can take to reduce exposure to lead in drinking water • Opportunities for LSL replacement opportunities • Information about any available financing • A statement that the water system must replace its portion if the property owners notify the system they are replacing their portion	• A statement that the service line material is GRR • Mandatory health effects language • Steps that consumers can take to reduce exposure to lead in drinking water • Opportunities for service line replacement	• A statement that the service line material is lead status unknown • Mandatory health effects language • Steps that consumers can take to reduce exposure to lead in drinking water • Opportunities to verify the material of the service line

The mandatory health effects language is specified in §141.85(a)(ii) of the LCRR.

Recommendations For Your Notifications

- 1) Use simple, plain language and short sentences that can be easily understood by the members of the public. Avoid long paragraphs or legalistic language.
- 2) Design notices to convey the urgency of the information, differentiate the notice from other mail that a household receives, and draw consumers' attention to key information. For example, use:
 - Colored envelopes, large-sized envelopes, or text on the external envelope to make the notice stand out compared to other mail.
 - Bold design practices to draw consumers' attention to key information, including large, bold, underlined, or colored font, bullet points or numbered points, or boxes around key information.
- 3) Make the notice action-oriented, emphasizing the key steps consumers can take and providing specific instruction on how to do so. You should consult your local health department on resources that consumers can be directed to, including water filters and blood lead level testing.

Appendix A: Additional Useful Resources

EPA Resources

- January 15, 2021 Lead and Copper Rule Revisions: <https://www.ecfr.gov/current/title-40/chapter-I/subchapter-D/part-141/subpart-I>.
- Inventory Development Materials: <https://www.epa.gov/ground-water-and-drinking-water/revised-lead-and-copper-rule>.
 - Guidance for Developing and Maintaining a Service Line Inventory.
 - Inventory Template.
 - Webinar – Getting the Lead Out: Guidance for Developing Service Line Inventories and Funding Information on the Bipartisan Infrastructure Law. August 10, 2022.
 - Fact Sheet for Developing and Maintaining a Service Line Inventory. June 2023.
- Protect Your Tap: A Quick Check for Lead: This online step-by-step guide to help people identify lead pipes, called lead service lines, in their homes. It also provides tips on actions to reduce lead exposure in drinking water, information on certified laboratories for water testing, and resources to learn more.
<https://www.epa.gov/ground-water-and-drinking-water/protect-your-tap-quick-check-lead>.
- Funding for Lead Service Line Replacement: <https://www.epa.gov/ground-water-and-drinking-water/funding-lead-service-line-replacement>.
- Lead and Copper Rule Revisions (LCRR) Data Entry Instructions (DEI). This document provides the required LCRR initial inventory and violation data that must be reported to the Safe Drinking Water Information System (SDWIS).
https://usepa.servicenowservices.com/sdwisprogram?id=kb_article_view&sysparm_article=KB0015473&sys_kb_id=bd1cc2201b67d9140a81202de54bcbae&spa=1.

LSLR Collaborative Website

- This website contains information to facilitate full lead service line replacement: <https://www.lslr-collaborative.org/>.

Examples of Customer Service Line Material Identification Instructions:

- DC Water: https://www.dewater.com/sites/default/files/Lead-Testing/DCWPipeMaterialIdentificationGuide_2021.pdf.
- Newark, NJ: <https://www.newarklead serviceline.com/check-your-line>.
- Philadelphia Water System: <https://www.phila.gov/media/20211208161245/HowToCheckYourServiceLineForLead-21.12.07.pdf>.

- Rockport, IL: <https://rockfordil.gov/city-departments/public-works/water-division/lead-and-drinking-water/>.

Example of Information Sent to Customer Prior to System’s Inspecting Customer’s Service Line Material from Menasha Utilities, Wisconsin

- Postcard developed by Menasha Utilities to schedule an appointment with customers to confirm the type of water service from the water main to the home. See Appendix C of the full guidance (<https://www.epa.gov/ground-water-and-drinking-water/revised-lead-and-copper-rule>).
- Information when appointment is scheduled:
<https://www.menashautilities.com/sites/menashautilities.com/files/Water%20Service%20Verifications%20webpage%20content%202019.pdf>.

Appendix B: Blank Template Forms

PWS Information
Inventory Methodology
Inventory Summary
Public Accessibility Documentation

See EPA's website at:

<https://www.epa.gov/ground-water-and-drinking-water/revised-lead-and-copper-rule> for a downloadable, spreadsheet version of the template, which contains the forms below as well as additional sheets for inventory tracking.

PWS Information

Purpose of this worksheet: For water systems to document basic system information.

Facility Information

Water System Name:

PWSID:

Population Served
(number of people):

Number of Service
Connections:

PWS Type:

☐ CWS

☐ NTNCWS

If you are a CWS, do multi-family residences comprise at least 20% of the structures you serve?

Indicate "Yes" or "No"

Mailing Address

Street or P.O. Box:

City or Town:

State:

Zip Code:

System Contact Person

Name:

Title:

Telephone:

Email:

Person Who Prepared Inventory (if different from above)

Name:

Title/Affiliation:

Telephone:

Email:

Inventory Methodology

PWS Name:

PWSID:

Enter Date Last Updated:

Purpose of this worksheet: For water systems to document the methods and resources they used to develop and update their inventory.

Part 1: Historical Records Review

Type of Record	Describe the Records Reviewed for Your Inventory and Indicate Your Level of Confidence (e.g. , Low, Medium, or High)
1. Previous Materials Evaluation <i>Example: Locations of Tier 1 lead tap sampling locations that are served by a lead service line.</i>	
2. Construction Records and Plumbing Codes <i>Examples: Local ordinance adopting an international plumbing code. Permits for replacing lead service lines.</i>	
3. Water System Records <i>Examples: Capital improvement plans. Standard operating procedures. Engineering standards.</i>	
4. Distribution System Inspections and Records <i>Examples: Distribution system maps. Tap cards. Service line repair/replacement records. Inspection records. Meter installation records.</i>	
5. Additional Records Required by Your State	
6. Other Records	

Inventory Methodology (Continued)

Part 2: Identifying Service Line Material During Normal Operations

1. During which normal operating activities are you collecting information on service line material? Check all

- | | |
|---|--|
| ☐ Water meter reading
☐ Water meter repair or replacement
☐ Service line repair or replacement | ☐ Water main repair or replacement
☐ Backflow prevention device
☐ Other |
|---|--|

If "Other", please explain:

2. Did you develop or revise standard operating procedures to collect service line material information

Indicate "Yes" or "No"

If "Yes", please describe:

Part 3: Service Line Investigations

1. Identify the service line investigation methods your system used to prepare the inventory (check all that apply). If a water system chooses an investigation method not specified by the state under 40 CFR §141.84(a)(3)(iv), state approval is required. ***Note that investigations are not required by the LCRR but can be used by systems to assess accuracy of historical records and gather information when service line material is unknown.***

- | | |
|---|---|
| ☐ Visual Inspection at the Meter Pit
☐ Customer Self-Identification
☐ CCTV Inspection at Curb Box - External
☐ CCTV Inspection at Curb Box - Internal
☐ Water Quality Sampling - Targeted
☐ Water Quality Sampling - Flushed
☐ Water Quality sampling - Sequential | ☐ Water Quality Sampling - Other
☐ Mechanical Excavation
☐ Vacuum Excavation
☐ Predictive Modeling
☐ Other |
|---|---|

If "Other", please explain:

2. If "Predictive Modeling", please briefly describe the model and inputs used:

3. How did you prioritize locations for service line materials investigations? For example, did you consider environmental justice and/or sensitive populations, did you use predictive modeling, and/or did you target areas with high number of unknowns?

Inventory Summary

PWS Name:

PWSID:

Enter Date Last Updated:

Purpose of this worksheet: For water systems to provide a summary of their service line inventory, including information on ownership, inventory format, and the number of service lines for each of the four required materials classifications.

Part 1. General Information

1. Is this the **Initial Inventory** or an **Inventory Update**?

2a. Who **owns the service lines** in your system?

2b. Is there documentation that defines service line ownership in your system, such as a local ordinance? *If yes, please describe below and explain where ownership is split (e.g., property line, curb stop).*

3a. Describe when lead service lines were generally installed in your system.

3b. When were lead service lines banned in your system? Reference the state or local ordinance that banned the use of lead in your system.

4. Do you have lead goosenecks, pigtails or connectors in your system? *Indicate "Yes", "No", or "Don't Know"*

5. What is your overall level of confidence in the inventory (*i.e.* , "Low", "Medium", or "High.") Please explain your rationale below.

Part 2. Inventory Format

Describe your inventory format in the space provided below (*e.g.* , the **Detailed Inventory** worksheet, custom spreadsheet, GIS map). Provide the filename and/or web address if applicable. **Note that the state may require you to submit your detailed inventory of each service line in your distribution system.**

Inventory Summary (Continued)

Part 3. Inventory Summary Table ¹

Enter the number of service lines in the aqua-colored cells. Remember this is the classification for the entire service line.

Service Line Material Classification	Definition	Total Number of Service Lines (REQUIRED to be reported under the LCRR)
Lead	Any portion of the service line is known to be made of lead. ²	
Galvanized Requiring Replacement (GRR)	The service line is not made of lead, but a portion is galvanized and the system is unable to demonstrate that the galvanized line was never downstream of a lead service line.	
Non-Lead	All portions of the service line are known NOT to be lead or GRR through an evidence-based record, method, or technique.	
Lead Status Unknown	The service line material is not known to be lead or GRR. For the entire service line or a portion of it (in cases of split ownership), there is not enough evidence to support material classification.	
TOTAL		

Notes

¹ This summary table is for reporting material for the entire service line connecting the water main to the customer's plumbing. See Section 2.1 for additional guidance on assigning a materials classification to the entire service line when ownership is split. Remember that systems must track the system-owned and customer-owned portions separately in their inventory.

² A lead-lined galvanized service line is consistent with the definition of an LSL under the LCRR ("a portion of pipe that is made of lead, which connects the water main to the building inlet") (40 CFR §141.2) and must therefore be classified in the inventory as an LSL. Do NOT, however, count non-lead service lines with a lead gooseneck or pigtail as lead service lines unless required by your state.

Public Accessibility Documentation

PWS Name:

PWSID:

Enter Date Last Updated:

Purpose of this worksheet: For systems to provide documentation to states on how they met the public accessibility requirements of the LCRR.

1. Select the location identifiers that you use for your service line inventory. Check all that apply.

- ☐ Address
- ☐ Street
- ☐ Block
- ☐ Intersection
- ☐ Landmark
- ☐ GPS Coordinates
- ☐ Other

If "Other", please describe:

2. Does **every service line** have a location identifier? Indicate "Yes" or "No"

If "No", explain. Remember that location identifiers are required for service lines that are lead and galvanized requiring replacement.

3. How are you making your inventory publicly accessible? Check all that apply. Remember that if your system serves > 50,000 people, you **must** provide the inventory online.

- ☐ Interactive online map
- ☐ Static online map
- ☐ Online spreadsheet
- ☐ Printed service line map
- ☐ Printed tabular data
- ☐ Information on water utility mailings or newsletter
- ☐ Hard copy information available in water system office
- ☐ Other

If "Other", please describe:

Appendix C: Completed Inventory Template Forms for a Hypothetical System

Applewood System (Hypothetical)

- PWS Information
- Inventory Methodology
- Inventory Summary
- Public Accessibility Documentation
- Excerpt from the Detailed Inventory

This appendix contains an example of completed inventory template forms for a hypothetical water system in Virginia, called “the Applewood System.” This system is using a modified version of the detailed inventory worksheet to track the material for each service line in Excel. An excerpt of Applewood System’s inventory is included at the end of this appendix.

PWS Information for Hypothetical System

Purpose of this worksheet: For water systems to document basic system information.

Facility Information			
Water System Name:			
Applewood Water System			
PWSID:	Population Served (number of people):	Number of Service Connections:	PWS Type:
VA0000000	7,223	2,748	☒ CWS ☐ NTNCWS
If you are a CWS, do multi-family residences comprise at least 20% of the structures you serve?			No
Mailing Address			
Street or P.O. Box:			
200 South Main St.			
City or Town:		State:	Zip Code:
Applewood		VA	00000
System Contact Person			
Name:		Title:	
Joel Howard		Water Treatment Plant Superintendent	
Telephone:		Email:	
(240)001-0001		j.howard@applewoodwtp.org	
Person Who Prepared Inventory (if different from above)			
Name:		Title/Affiliation:	
Telephone:		Email:	

Inventory Methodology for Hypothetical System

PWS Name: Applewood Water System

PWSID: VA0000000

Enter Date Last Updated:

03/01/23

Purpose of this worksheet: For water systems to document the methods and resources they used to develop and update their inventory.

Part 1: Historical Records Review

Type of Record	Describe the Records Reviewed for Your Inventory and Indicate Your Level of Confidence (e.g. , Low, Medium, or High)
1. Previous Materials Evaluation <i>Example: Locations of Tier 1 lead tap sampling locations that are served by a lead service line.</i>	Applewood Summary of Materials Survey Results Updated in 2011 (High), used to identify our LCR tap monitoring locations; 2002 Applewood Evaluation Short Form for Small and Medium Public Water Systems (High).
2. Construction Records and Plumbing Codes <i>Examples: Local ordinance adopting an international plumbing code. Permits for replacing lead service lines.</i>	1973 - 2000 Virginia Uniform Statewide Building Codes (High); 1975-1999 Building Officials and Code Administrators' (BOCA's) National Building Codes (Plumbing Codes) (High); 2003 - 2018 Virginia Construction Code (High); 2015 Virginia Plumbing Code, Chapter 6, Section 605 Materials, Joints and Connections (High) ; 2013 Applewood Plumbing Permit Application (Medium).
3. Water System Records <i>Examples: Capital improvement plans. Standard operating procedures. Engineering standards.</i>	Standard Operating Procedures for Applewood Water System dated from 1960 to 2015 (High); Applewood revised Standard Operating Procedures - Lead Line Replacement - Remodeling dated in 1998 (High)
4. Distribution System Inspections and Records <i>Examples: Distribution system maps. Tap cards. Service line repair/replacement records. Inspection records. Meter installation records.</i>	Applewood Water System Service Reports (Tap Cards) dated from 1916 to 2022 (Medium); Applewood As-Built Drawings for the distribution system from 1916 to 1990 (High).
5. Additional Records Required by Your State	N/A
6. Other Records	Interviews with local plumbers in the city of Applewood (medium).

Inventory Methodology for Hypothetical System (Continued)

Part 2: Identifying Service Line Material During Normal Operations

1. During which normal operating activities are you collecting information on service line material? Check all that apply.

- | | |
|--|--|
| ☐ Water meter reading | ☒ Water main repair or replacement |
| ☒ Water meter repair or replacement | ☐ Backflow prevention device inspection |
| ☒ Service line repair or replacement | ☐ Other |

If "Other", please explain:

2. Did you develop or revise standard operating procedures to collect service line material information during normal operation?

Yes

If "Yes", please describe:

In August of 2022, the Applewood Standard Operating Procedures were updated to require maintenance crews to record service line materials during water meter, water main, and service line repair and replacement projects. This information is reported to the water system manager and used to update the service line inventory.

Part 3: Service Line Investigations

1. Identify the service line investigation methods your system used to prepare the inventory (check all that apply). If a water system chooses an investigation method not specified by the state under 40 CFR §141.84(a)(3)(iv), state approval is required. **Note that investigations are not required by the LCRR but can be used by systems to assess accuracy of historical records and gather information when service line material is unknown.**

- | | |
|--|---|
| ☒ Visual Inspection at the Meter Pit | ☐ Water Quality Sampling - Other |
| ☒ Customer Self-Identification | ☒ Mechanical Excavation |
| ☐ CCTV Inspection at Curb Box - External | ☐ Vacuum Excavation |
| ☐ CCTV Inspection at Curb Box - Internal | ☐ Predictive Modeling |
| ☐ Water Quality Sampling - Targeted | ☐ Other |
| ☒ Water Quality Sampling - Flushed | |
| ☐ Water Quality sampling - Sequential | |

If "Other", please explain:

2. If "Predictive Modeling", please briefly describe the model and inputs used:

3. How did you prioritize locations for service line materials investigations? For example, did you consider environmental justice and/or sensitive populations, did you use predictive modeling, and/or did you target areas with high number of unknowns?

We targeted older areas of the distribution system where we didn't know the customer-owned portion. We also requested a list of licensed family day homes from Virginia Department of Education and prioritized those for investigation.

Inventory Summary for Hypothetical System

PWS Name: Applewood Water System

PWSID: VA0000000

Enter Date Last Updated: 03/01/23

Purpose of this worksheet: For water systems to provide a summary of their service line inventory, including information on ownership, inventory format, and the number of service lines for each of the four required materials classifications.

Part 1. General Information

1. Is this the **Initial Inventory** or an **Inventory Update**?

Initial Inventory

2a. Who **owns the service lines** in your system?

Ownership is split, meaning that the system owns a portion and the customer owns a portion.

2b. Is there documentation that defines service line ownership in your system, such as a local ordinance? *If yes, please describe below and explain where ownership is split (e.g., property line, curb stop).*

City of Applewood Municipal Code 12-1-15: The City shall be responsible for city owned water mains lying within City rights-of-way. The property owner shall be responsible for the repair and maintenance of their water service line from the meter to their building.

3a. Describe when lead service lines were generally installed in your system.

The first phase of the Applewood distribution system was constructed in 1916, and there were two major expansions in 1946 and 1990. As Virginia referred to the BOCA plumbing codes and lead was banned for water distribution in the 1981 BOCA plumbing code, there was a possibility that service lines built between 1916 and 1981 were made of lead.

3b. When were lead service lines banned in your system? Reference the state or local ordinance that banned the use of lead in your system.

1981. Virginia referred to the BOCA plumbing codes and starting in 1981, Lead as a material for water distribution was banned in the BOCA plumbing code. Also, Maryland and Virginia banned the use of lead solder in plumbing on August 9, 1986.

4. Do you have lead goosenecks, pigtails or connectors in your system? **No**

5. What is your overall level of confidence in the inventory (*i.e.* , "Low", "Medium", or "High")? Please explain your rationale below.

Medium. Although all the information above can be located in historical records, the exact years when lead service lines were installed and where the lead service lines are located are still not confidently confirmed, because some tap cards are too old to be readable. Also service line replacement records were not kept in a consistent way until the 1980's.

Part 2. Inventory Format

Describe your inventory format in the space provided below (*e.g.* , the **Detailed Inventory** worksheet, custom spreadsheet, GIS map). Provide the filename and/or web address if applicable. **Note that the state may require you to submit your detailed inventory of each service line in your distribution system.**

Detailed inventory worksheet. We started with addresses from our billing system. We customized the detailed inventory worksheet to remove columns that we are not using.

Inventory Summary for Hypothetical System (Continued)

Part 3. Inventory Summary Table ¹

Enter the number of service lines in the aqua-colored cells. **Remember this is the classification for the entire service line.**

Service Line Material Classification	Definition	Total Number of Service Lines (REQUIRED to be reported under the LCRR)
Lead	Any portion of the service line is known to be made of lead. ²	745
Galvanized Requiring Replacement (GRR)	The service line is not made of lead, but a portion is galvanized and the system is unable to demonstrate that the galvanized line was never downstream of a lead service line.	26
Non-Lead	All portions of the service line are known NOT to be lead or GRR through an evidence-based record, method, or technique.	1,501
Lead Status Unknown	The service line material is not known to be lead or GRR. For the entire service line or a portion of it (in cases of split ownership), there is not enough evidence to support material classification.	476
TOTAL		2,748

Notes

¹ This summary table is for reporting material for the entire service line connecting the water main to the customer's plumbing. See Section 2.1 for additional guidance on assigning a materials classification to the entire service line when ownership is split. Remember that systems must track the system-owned and customer-owned portions separately in their inventory.

² A lead-lined galvanized service line is consistent with the definition of an LSL under the LCRR ("a portion of pipe that is made of lead, which connects the water main to the building inlet") (40 CFR §141.2) and must therefore be classified in the inventory as an LSL. Do NOT, however, count non-lead service lines with a lead gooseneck or pigtail as lead service lines unless required by your state.

Public Accessibility Documentation for Hypothetical System

PWS Name: Applewood Water System

PWSID: VA0000000

Enter Date Last Updated:

03/01/23

Purpose of this worksheet: For systems to provide documentation to states on how they met the public accessibility requirements of the LCRR.

1. Select the location identifiers that you use for your service line inventory. Check all that apply.

- ☒ Address
- ☒ Street
- ☐ Block
- ☐ Intersection
- ☐ Landmark
- ☐ GPS Coordinates
- ☐ Other

If "Other", please describe:

2. Does **every service line** have a location identifier? **Yes**

If "No", explain. Remember that location identifiers are required for service lines that are lead and galvanized requiring replacement.

3. How are you making your inventory publicly accessible? Check all that apply. *Remember that if your system serves > 50,000 people, you **must** provide the inventory online.*

- ☐ Interactive online map
- ☐ Static online map
- ☒ Online spreadsheet
- ☐ Printed service line map
- ☒ Printed tabular data
- ☒ Information on water utility mailings or newsletter
- ☐ Hard copy information available in water system office
- ☐ Other

If "Other", please describe:

Excerpt from the Detailed Inventory for the Hypothetical System

Location Information		System-Owned Portion									Customer-Owned Portion							Entire Service Line Material Classification
Unique Service Line ID	Location Identifier	System-Owned Portion Service Line Material Classification	If Non-Lead in Column G, Was Material Ever Previously Lead?	Service Line Installation Date	Service Line Size	Basis of Material Classification	Was the Service Line Material Field Verified?	If "Yes" Service Line Material Was Field Verified:		Notes	Customer-Owned Portion Service Line Material Classification	Service Line Installation Date	Service Line Size	Basis of Material Classification	Was the Service Line Material Field Verified?	If "Yes" Service Line Material Was Field Verified:		
	Street Address							Describe the Field Verification Method	Enter the Date of Field Verification							Describe the Field Verification Method	Enter the Date of Field Verification	
100	31 Applewood Drive, Applewood VA 00000	Non-Lead - Plastic	Yes	1997	2	Installation date after lead ban	Yes	Visual inspection at the meter pit	11/1/2022		Non-Lead - Plastic	1997	2	Installation date after lead ban	No			Non-Lead
101	66 Main Street, Applewood VA 00000	Non-Lead - Plastic	No	Fall 1980	2	Installation record (e.g., tap card)	Yes	Mechanical excavation at one location	10/10/2022		Galvanized	Fall 1980	2	Installation record (e.g., tap card)	Yes	Mechanical excavation at one location	10/10/2022	Non-Lead
102	167 Birch Drive, Applewood VA 00000	Non-Lead - Copper	Don't know	1985	1 1/2	Service line repair or replacement record	No				Galvanized	1922	1 1/2	Installation record (e.g., tap card)	No			Galvanized Requiring Replacement
103	15 Oak Ave, Applewood VA 00000	Unknown - Likely Lead		1940's	2		No				Galvanized	1940's	2		Yes	Customer self-identification	2/2/2023	Galvanized Requiring Replacement
104	The Children's Place, 127 Oak Ave, Applewood VA 00000	Unknown - Material Unknown		1950-1960	3/4		No				Unknown - Material Unknown	1950-1960	3/4		No			Unknown
105	33 First Ave, Applewood VA 00000	Lead-lined galvanized		1955	2	Installation record (e.g., tap card)	Yes	Water quality sampling	10/26/2022		Lead-lined galvanized	1955	2	Installation record (e.g., tap card)	Yes	Water quality sampling	10/26/2022	Lead
106	93 Maple Drive, Applewood VA 00000	Non-Lead - Copper	Yes	2015	2	Service line repair or replacement record	No				Galvanized	1950 - 1955	2	Installation record (e.g., tap card)	Yes	Customer self-identification	2/26/2023	Galvanized Requiring Replacement
107	99 Main Street, Applewood VA 00000	Non-Lead - Copper	Don't know	2015	2	Service line repair or replacement record	No				Unknown - Material Unknown	1940's	2		No			Unknown

Note: Although not shown here, this hypothetical system is also using the detailed inventory worksheet to track where the service connection is to a school or day care, other sources of lead, which service connection addresses are also LCR compliance monitoring locations, and lead and GRR service lines that have been replaced and when.