



Guidance for Developing a Lead Service Line (LSL) Inventory

Office of Water Quality – Drinking Water Branch

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The Lead and Copper Rule Revisions (LCRR) require water systems to complete an inventory of the service lines in their system and report that information. This document is intended to be used by water systems as a simple reference guide to satisfy the minimum requirements of the LCRR lead service line inventory. A good inventory will include additional information and be very useful for the water system.

Why complete a Lead Service Line (LSL) Inventory?

Service line inventories are the foundation from which water systems 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. Also, water systems must comply with the requirements of the LCRR (40 CFR §§141.80-141.91 as codified on January 15, 2021).

Who is required to complete an inventory?

All community water systems (CWSs) and non-transient non-community water systems (NTNCWSs) must prepare an inventory of ALL service lines (including those not in use) connected to the distribution system.

When is the inventory required?

All inventories must be submitted to IDEM by **October 16, 2024**. IDEM and Indiana Finance Authority (IFA) have been working with 120Water to finalize a service line inventory spreadsheet. You can start completing your service line inventory on the [IDEM Service Line Inventory Spreadsheet](#). IDEM will be working with 120Water to develop the portal for you to submit your service line inventory data and we will notify you once when the submission portal is available in Spring 2023.

What are the required elements for the service line inventory?

- The initial inventory must include all service lines regardless of ownership (40 CFR §141.84(a)(2)).
- The inventory must include information on both the system and customer-owned portions where ownership is split. This only applies to CWSs.
- Service lines must be classified as lead, Galvanized Requiring Replacement (GRR), non-lead (actual material, if known), or lead status unknown. A classification of non-lead must be supported by evidence-based records, methods, or techniques to prove it is not lead or GRR (40 CFR §141.84(a)(4)(iii)).
- The water system must create and maintain an inventory that includes the exact address associated with each service line connected to the public water system. (40 CFR §141.84(a)). It's also recommended to include the GPS coordinates of the curb box.

- The following elements are required for each service line in your inventory: Location identifier (address), Material classification, and Identification process.

What do I need to submit for the material classification?

You must select from one of the following options for each portion of each service line in the inventory (both public and private):

1. Lead
2. Galvanized Requiring Replacement (GRR)
3. Non-Lead (If known, include material type like plastic, copper, etc.)
4. Unknown

Once you have filled in these materials for each portion of the service line, an automatic determination will be made in the IDEM service line inventory template regarding the classification of the service line as a whole.

How are each of those material classifications determined?

Material	Classification
Lead	Any portion of the service line is known to be made of lead EXCEPT if the gooseneck/pigtail/connector is the only portion of the service line that is lead.
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 <u>is not and NEVER</u> was downstream of a lead service line (not including gooseneck/pigtail/connector as shown above).
Non-Lead	All portions of the service line are known NOT to be lead or GRR through an evidence-based record, method, or technique unless the only portion that is lead is a gooseneck/pigtail/connector.
Unknown	The service line material is not known to be lead or GRR. There is not enough evidence to support material classification.

What if the ownership of the service lines is shared in some way between the system and customer (Example: system owns to the curb stop and customer owns to the building)?

You need to submit the material classification for both the system-owned portion and customer-owned portion.

What methods are required to be used for developing a service line inventory?

- Water systems must use the information on lead and galvanized iron or steel that it identified in the previous materials evaluation under the original 1991 lead and copper rule when conducting the inventory of service lines in its distribution system for the initial inventory (40 CFR §141.84(a)(3)).
- Systems must review all construction and plumbing codes, permits, and existing records or other documentation which indicates the service line materials used to connect structures to the distribution system to identify service line materials for the initial inventory (40 CFR §141.84(a)(3)(i)).
- Systems must review 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, to identify service line materials for the initial inventory (40 CFR §141.84(a)(3)(ii)).
- Systems must review all inspections and records of the distribution system that indicate material composition of the service connections that connect a structure to the distribution system to identify service line materials for the initial inventory (40 CFR §141.84(a)(3)(iii)).
- If the existing records don't provide enough information to make the determinations, you need to pursue other investigation methods like visual inspection, water quality sampling, excavation, etc.

What other methods are acceptable to be used for developing a service line inventory?

- Visual inspection of service line material: The material composition of a service line can be identified through visual inspection. If visually investigating the service line via meter pit checks, you must check at least one point on each side of the meter; when applicable.
- Water quality sampling: Water quality sampling protocols have been used by water systems to detect the presence of LSLs. Below are two examples of water quality sampling used to identify if a LSL is present.
 - Targeted service line sampling involves flushing out the volume of water in the premise plumbing and collecting and analyzing a sample from the service line. The volume of water from the tap to the service line can be estimated based on pipe diameters and lengths.
 - Sequential sampling uses series of consecutive samples (typically 500 mL to 1 L) collected from an interior tap after a stagnation period (typically 6 hours or more). The number of samples needed depends on the length and diameter of the plumbing from the tap through the length of the premise plumbing and service line. Although sequential sampling can be a sensitive tool for identifying LSLs, it is relatively invasive to the resident and more complex than other water quality sampling methods.
- Excavation: if a service line is not accessible for visual inspection, the water system may need to excavate soil, and potentially remove portions of the road, sidewalk, or other obstacles to determine service line materials. Excavation methods require different levels of disturbance, time investment, and cost as well as coordination with the property owner. (Potholing can be used in either excavation method as long as you check at least one point on each side of the meter; when applicable.)

- Mechanical excavation: involves using a backhoe or other mechanical excavator to dig a “pothole” or test pit to expose the service line. This is typically done at the curb box or shutoff valve. A full trench can also be dug, exposing the entire length of the service line. Please note that mechanical excavation could cause disturbance to nearby service lines. If lead lines are present nearby and disturbed, this could cause lead particulates to be released in the drinking water. Customers need to be notified before potentially disturbing nearby lead lines. If customers have concerns about lead in drinking water, you can refer them to IDEM’s Fact Sheet: ["Lead in Drinking Water - Information for Consumers."](#)
- Vacuum excavation: involves using a water jet or compressed air to loosen soil, which is vacuumed up resulting in a small hole to access the service line. This method is faster, less intrusive, less likely to disrupt or damage the service line or other buried utilities, and cheaper than mechanical excavation.
- Predictive Modeling: looks for patterns in a dataset to develop rules or algorithms. Geostatistical models use attributes from known locations to make inferences about areas of unknown condition. Examples of model inputs may include water system or community data, such as the distribution of known materials, along with other factors, such as building age and location. These models are typically built using an initial dataset and can be continually “trained” or improved as more data is added.

A key factor in the success of predictive modeling is the use of representative data. Using a representative set of known data on service line material is important in maximizing accuracy and reliability and minimizing bias. Additional validation of predictive modeling results may be required after the initial inventory submittal if validation is not done prior to the submittal deadline.

When did Indiana ban lead pipes?

The 1986 Safe Drinking Water Act (SDWA) amendments prohibited the use of pipe, solder, and flux that were not “lead free” as defined in 1986 in new installations and repairs and directed states, as a condition of receiving grants for the Public Water System Supervision program, to enforce the provision effective 24 months after June 19, 1986, through state or local plumbing codes or other means (42 U.S. Code §300g-6(b)). Per Indiana Plumbing Code, Indiana’s lead ban went into effect on March 1, 1987. The Indiana lead ban in 1987 included solder, flux and lead pipe.

In addition to information on when LSLs were allowed and banned, municipal construction and plumbing codes can also indicate a maximum diameter of LSLs. Most LSLs are 2 inches or less in diameter and serve primarily single-family homes or small multi-family residences. Larger apartment complexes and commercial and industrial building are typically served by larger diameter service lines. There have been very few cases of installed LSLs as large as 3 inches (LSLR Collaborative, 2021).

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 state level.

What if my system has only non-lead service lines (No lead service lines, GRR, or unknown)?

Your system still needs to submit your inventory by October 16, 2024. If you indicate that your distribution systems does not have LSL or GRRs, you will still need to submit the list of addresses

with the service line materials identified.

Does the service line inventory need to be publicly available?

Under the LCRR, CWSs and NTNCs must make their inventory publicly available (40 CFR §141.84(a)(8)). When you submit your service line inventory to IDEM, the information will be made available to the public on a state website. This will help fulfill this portion of the LCRR.

In addition to the public accessibility requirements, the LCRR also requires all systems to inform all persons served by the service connection with a lead service line (LSL), galvanized requiring replacement (GRR), or unknown service line of their service line material within 30 days following completion of the initial inventory (40 CFR §141.85(e)). The information sent to the customer must include:

1. Statement that the service line material is lead, GRR, or unknown
2. Info on the health effects of lead
3. Steps to minimize exposure in drinking water
4. Additional information about replacement, financing, and further identification is also required depending on the material classification of the service line.

How does my system submit our inventory to IDEM?

IDEM and Indiana Finance Authority (IFA) have been working with 120Water to finalize a service line inventory spreadsheet. You can start completing your service line inventory on the [IDEM Service Line Inventory Spreadsheet](#). IDEM will be working with 120Water to develop the portal for you to submit your service line inventory data and we will notify you once when the submission portal is available in Spring 2023. All IDEM LCRR related information will be posted at [IDEM Drinking Water and Lead Website](#).

After I submit our inventory, am I done?

The initial inventory submittal is just the first step in this overall process to remove lead service lines from existing infrastructure. The inventories will become living documents that are routinely updated. Additional information may be received which updates the inventory. Replacements will be noted on future inventories. Public notification efforts will be required. CWSs will need to include language in their annual Consumer Confidence Report (CCR) explaining how customers can access the inventory.

Who do I contact at IDEM with questions about the inventory process?

If you have any questions, please contact IDEM's Drinking Water Branch at 317-234-7430 or DWBMGR@idem.in.gov.

Other Resources

- [IDEM Drinking Water and Lead Website](#)
- [U.S. EPA Guidance for Developing and Maintaining a Service Line Inventory](#) (U.S. EPA)
- [EPA Researchers Share Approaches to Identify Lead Service Lines](#) (U.S. EPA)
- [2020 ASDWA webinar, "Predictive Tools for Lead Service Line Inventories"](#) (ASDWA, 2020).
- [Lead Service Lines and Drinking Water Best Management Practices](#) (Wisconsin DNR)