MassDEP Drinking Water Program
Electrical Resistance Testing Guidance for Evaluating Unknown Service Lines

Introduction: The Lead and Copper Rule Revisions (LCRR) Requirements

The 2021 EPA LCRR requires public water systems (PWS) to develop a complete inventory of all service lines. This includes identifying the materials of both public and private portions of the service lines. In this document, a "known service line" is defined as a service line where the pipe material is categorized using records or other means. "Unknown service line" is defined as a service line of unknown material with no documented material history.

The electrical resistance testing approach provides a method to complete a service line inventory by identifying unknown service lines while potentially reducing the amount of disruption to the average customer.

What is Electrical Resistance Testing?

Electrical Resistance Testing is a service line identification method where a probe is placed into a service line which then detects and transmits an electrical resistance signal of the service line material the probe is in contact with. Pre-established resistance ranges for common pipe materials then allow the user to identify service line materials.

Some Considerations When Evaluating Electric Resistance Testing Products:

Will the product meet your objectives?

- Increase service line identifications.
- Accurately identifying service line materials.
- Minimizing disruption to customers.
- Meeting the LCRR October 2024 service line inventory reporting deadline.
- Provide a Service Line Inventory acceptable for MassDEP reporting (See MassDEP Service Line Inventory (SLI) Workbook at https://www.mass.gov/media/2480901. Instructions can be found at https://www.mass.gov/media/2480886/)

Cost?

A common selling point of many electrical resistance testing products/services is the lack of disruption to customers to identify their service line. In comparison to pot holing, electrical resistance scanning is less invasive and disruptive to customers. However, this verification, through the scraping of the interior of the service line, can disrupt the service line. To protect the customer from potential increases in lead if the service line is Lead or Galvanized Requiring Replacement (GRR) and disrupted, MassDEP will require steps taken by PWS

after the line is tested. With this additional required step, this method may be more costly to systems, because of the cost of provided filters and lead testing required after the service line is tested.

- Upfront cost
- Cost of filters
- Cost of lead testing

Required Steps to Use Electrical Resistance Testing (Electro Scanning) as a Verification Method

If your PWS is planning to use electrical resistance testing to verify unknown service line materials, follow the steps outlined below:

1. Prior to beginning testing, PWS must submit a plan to use the technology for MassDEP approval. The plan should outline information regarding the technology to be used and how this technology will be applied. The plan should also outline the strategy to distribute filters, include flushing instructions for households where the technology will be used, and draft notices for MassDEP approval.
2. After testing in a household, the PWS must:
   a. Give instructions to residents for flushing. *(See the MassDEP Building Flushing Information Guidance for approved flushing language) [https://www.mass.gov/doc/massdep-building-flushing-information/download]*
   b. Give resident a drinking water filter that has been certified by a third-party certification body listed in the EPA's Consumer Tool for Identifying drinking water filters certified to reduce lead. *(See Filter Cartridge Notice below).*
   c. Take a lead water test from a regularly used faucet.
   d. If the service line is detected as lead, or the lead water test detects lead over 10 parts per billion (ppb)[1], offer the resident 6 month of filter cartridge replacements.
   e. If the lead water test has detected lead over 10 ppb and the service line has not been detected as a LSL, PWS should follow up with a more in depth field inspection to confirm the service line is not a GRR Service Line.

   All instruction and notices must be provided to MassDEP/Drinking Water Program for review and approval PRIOR to use with consumers.

PLEASE NOTE: MassDEP does not endorse or promote any particular technology, but we encourage consultants and others to educate their clients on the particular product being considered so that they can make an informed decision. Public Water Systems (PWS) considering electro scan technology (e.g. Swordfish Electroscan) or any other type of technology for gathering service line information required under the Lead and Copper Rule Revisions (LCRR), need to ensure the product meets their goals for both the short and long-term including whether the technology can disrupt or destroy the existing coating on the pipe possibly causing more lead to be released after using the technology. MassDEP recommends

[1] This method cannot identify galvanized piping downstream of an LSL (GRR) or lead soldering by electrical conductivity alone. If a water sample is positive for lead when no LSLs were found, this may indicate a galvanized service line downstream of an LSL or lead solder joints.

that PWS fully evaluate the options and ask all the necessary questions to make an informed decision prior to agreeing to any contract. PWS are again reminded to carefully evaluate all products to reduce any increase lead impact on the consumer.

PWS NAME HERE

Filter Cartridge Notice

Replace or add text personalized to your system as needed if text is highlighted in yellow.

Dear Water Customer,

The PWS NAME HERE is supplying you with a [Name of Filter Provided] for use after your service line inspection, for use until your service line material is confirmed as not lead and that your water does not have lead levels exceeding 10 parts per billion (ppb). Should your service line be confirmed as lead or have lead levels exceeding 10 ppb, PWS NAME HERE will provide a 6-month replacement supply of filters for [Name of Filter Provided] and discuss service line replacement options. This precautionary measure is intended to mitigate any potential lead concentration in your drinking water following the field inspection. Please follow the instructions below to ensure proper use.

[Type of] CERTIFIED LEAD REMOVAL PITCHER AND FILTER INSTRUCTIONS:

1. This lead removal pitcher and filter is certified by NSF/ANSI Standard 53 to remove lead levels below 10 ppb with proper flushing and cartridge replacement.
2. Prior to filtering with your pitcher run your cold water for at least 5 minutes.
3. Follow the manufacturer's instructions for changing filters (attached to notice),
4. Clean faucet aerator/screens every 3-4 weeks.