



MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

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Background

In 2018, Michigan revised its Lead and Copper Rule

- Changes in sampling method (1st and 5th liter collection at LSLs) and clarification
- Changes in tiering criteria
- Lead Service Line (LSL) notification requirements
- LSL Replacement (LSLR) requirement – including a ban on partial replacements
- Requirement for Lead and Copper sampling plans (LCSP)
- Requirement for a Preliminary Distribution System Materials Inventory (PDSMI) due January 1, 2020
- Requirement for a Complete Distribution Systems Material Inventory (CDSMI) Due January 1, 2025

Introduction

Today's topic is EGLE's initial guidance on the verification portion of the Complete Distribution System Materials Inventory (CDSMI).

Rule 1604(c)(ii)

- By January 1, 2025, a supply shall submit a complete distribution system materials inventory, including verification methodology, and provide the results of the inventory to the department in a form and manner specified by the department. The materials inventory under this subsection shall identify whether and where construction materials listed in 40 C.F.R. §141.42(d) are present in the piping, storage structure, pumps, and controls used to deliver water to the public, including service lines.

What is the Purpose of a Distribution System Materials Inventory (DSMI)

The purpose of a DSMI is to characterize, record, and maintain a comprehensive inventory of distribution system materials, including service line materials on both public and private property.

Maintenance of an accurate inventory of distribution materials supports effective asset management planning, lead service line replacement efforts, and notification of those served by a lead service line.

What is the issue?

Water systems are at various states of knowledge associated with the materials in their distribution systems.

Typically, watermains and larger assets are more well known in terms of materials.

Service line material knowledge, however, is mixed.

- Some systems may know everything about the service lines in their system
- Some may know everything about the public side with little to no knowledge of what's on the private side.
- Some may know nothing about the majority of service lines in the system.

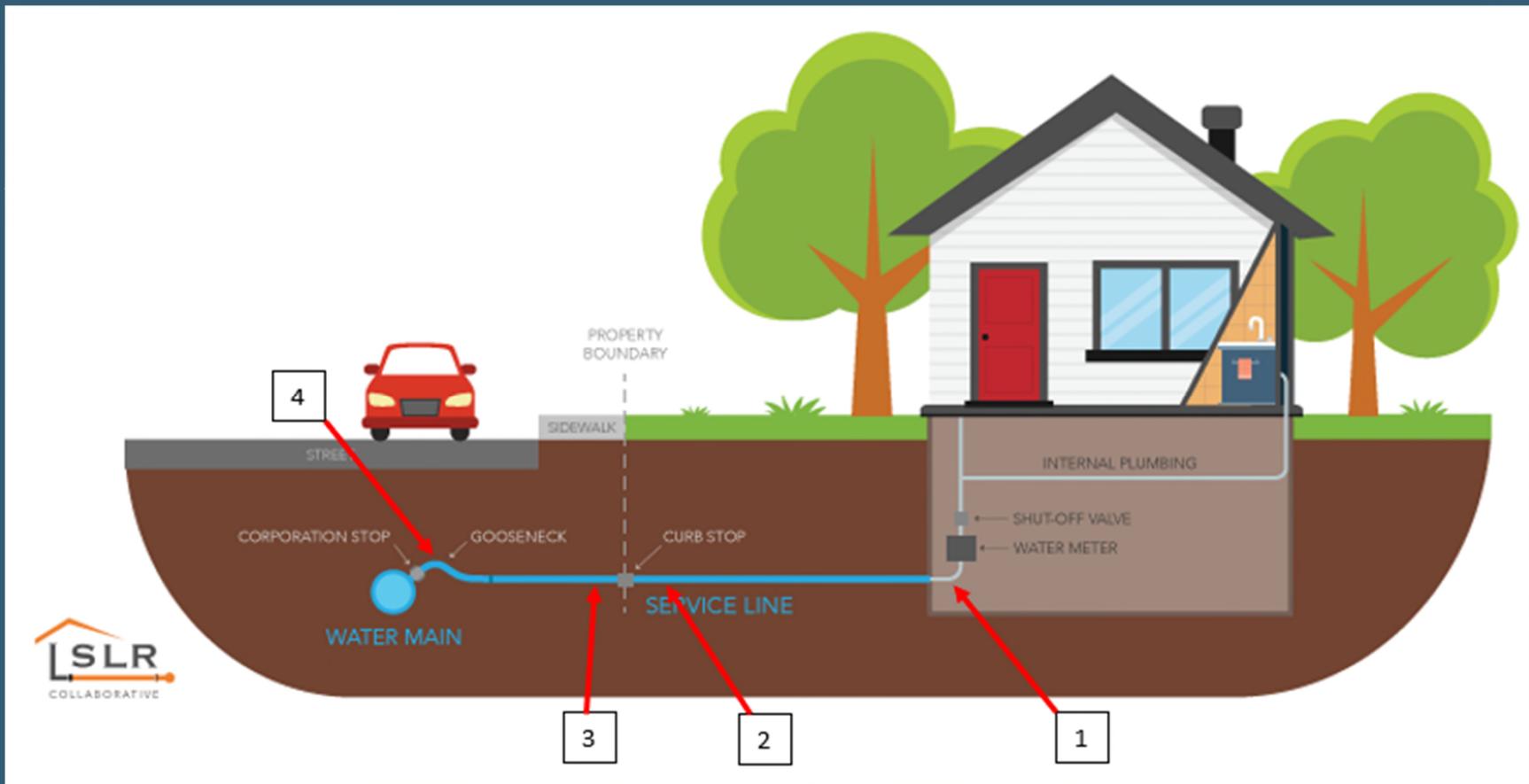
Define Terms

“Service line” means the pipe from the discharge of the corporation fitting to customer site piping or to the building plumbing at the first shut-off valve inside the building, or 18 inches inside the building, whichever is shorter.

"Lead service line" means either a service line which is made of lead or any lead pigtail, lead gooseneck, or other lead fitting that is connected to the service line, or both.

Private Side – means the portion of a service line that is privately owned.

Public Side – means the portion of a service line that is publicly owned or owned by the water system.



So what does EGLE expect?

Well...

- The expectation is that by January 1, 2025 systems have created a line-by-line inventory consisting of the materials for every service line in their distribution system regardless of ownership.
- Does EGLE expect systems to dig up and visually inspect every service line?...No
- Then how does EGLE expect systems to know what's out there?
- Que the experts...

Collaborations

EGLE worked with staff from the University of Michigan by way of a grant administered through the Mott Foundation to help identify how a system could complete the task of a CDSMI and what it might look like.

In those discussions it was brought up that some of the methodology used to help build a heat map for lead service line locations in Flint could help.

Further discussions with those folks provided a path forward with guidance to help supplies use a statistically significant method of validating what they do, or do not, know.

CDSMI “Road Map”

PDSMI

- Organize and Review Existing Records
- Notify the public
- Categorize the number of Lead, GPCL, Unknown-likely Pb, Unknown-unlikely Pb, Unknown, and Neither Lead nor GPCL.

Evaluate Existing and/or Create Inventory Tracking Tools and Procedures

 Conduct Physical Verification of Service Line Materials

Evaluate Results of Field Verification

Conduct additional, targeted verification, if necessary

Update and/or Expand Records and Complete the DSMI

Minimum SLM Verification Guidance

The purpose of this guidance

- To lay out the minimum amount of physical verification that most systems will need to complete to reasonably demonstrate the reliability of their records, and to provide data on the percent of materials typically found in the distribution system.
- To define the approach and methodology so that all systems perform verifications equally
- To generate a data set that is un-biased and statistically significant for each water system that must complete verifications.
- To produce accurate data with cost efficiency in mind.

Statistically Significant?

Why is the use of statistics to anyone's advantage?

- Well, if you are willing to tolerate some risk/error, then you can use an appropriate sample size to provide data about the system as a whole, based on the sum of its parts.
- If we use the appropriate sample size, we can use data from those samples to project the likelihood of occurrence across the rest of the system
- Simply put, with statistics we can have a reasonable estimate as to the extent of a system's knowledge or make up in the most efficient manor.

What's the Method? (Overview)

1. Identify all potable water service lines of “unknown” material;
2. Identify how many service lines should be physically verified;
3. Randomly select service lines for physical verification;
4. Create a tool for tracking records and materials during verification;
5. Conduct 3- or 4-point physical verifications;
6. Record results of physical verification; and
7. Evaluate results of physical verification.

What's the Method? (Details)

1. Figure out what service lines have “Known” materials

- For the purposes of **VERIFICATION ONLY**; to be considered “known”, and therefore excluded from the pool of sites from which a random sample will be drawn, a service line must meet one of the following criteria:
 - The service line was recently¹ physically verified and all of the following apply:
 - ALL points were recently physically verified;
 - The physical verification was well documented as to the material at each point; AND
 - The water supply has not observed deviations from these records during operations and maintenance.

OR

- Ordinances or controls were in place and all of the following apply:
 - Ordinances² or other controls³ were in place at the time the service line was installed specifying materials used in service line construction AND
 - The water supply has not observed deviations from these ordinance(s) or control(s) during operations and maintenance.

Method Continued

Any service line that does not meet one of the two criteria above, is considered “unknown” for the purpose of this verification process and should be included in the list of locations from which a set of sites will be uniformly randomly selected for verification. Please note that this definition of “known” and the 3 or 4-point verification (that I will define later) are specific to this baseline verification process and may not necessarily apply to other aspects of the Complete Distribution System Material Inventory (CDSMI) process.

Footnotes

1. “Recently” in this context is water supply-specific. Supplies must define recent to include a time after which its records have been demonstrated to be reliable. No records prior to 1989 may be considered recent for this purposes of this portion of verification process. The use of lead service lines was officially prohibited in Michigan in 1988 and, therefore, the health risk due to unreliable records is higher before this date. This does not mean that all service line records prior to 1989 have no value. They may have great value in finalizing a system’s final DSMI. These records just do not preclude a system from having to perform this verification step.
2. An ordinance is defined as: A law, statute, or regulation enacted by a municipal corporation. An ordinance is a law passed by a municipal government. A municipality, such as a city, town, village, or borough, is a political subdivision of a state within which a municipal corporation has been established to provide local government to a population in a defined area.
3. A control, for the purposes of this guidance, is defined as: A general set of approved specifications or binding construction documentation, that explicitly demonstrates that there were controls in place dictating the material usage in all public and private portions of a service line. Any controls must first have been explicitly adopted by the water system or directly defined for each blueprint used in construction.

How Many Lines?

Water supplies with fewer than 1,500 “unknown” service lines must physically verify at least 20 percent of the total number of “unknown” lines.

Water supplies with 1,500 or more “unknown” service lines must physically verify enough lines to reach a 95 percent confidence level.

Number Needed for 95 Percent Confidence Level

Number of "Unknown" Service Lines*	Number to Physically Verify
Fewer than 1,500	20% of "unknown" lines
1,500	306
1,600	310
1,700	314
1,800	317
1,900	320
2,000	322
2,200	327
2,400	331
2,600	335
2,800	338
3,000	341
3,500	346
4,000	351
4,500	354
5,000	357
6,000	361
7,000	364
8,000	367
9,000	368
10,000	370
15,000	375
20,000	377
30,000	379
40,000	381
60,000	382
90,000	383
225,000 or more	384



Random Selection of Sites

Why a randomly uniform sample?

How do you get a randomly uniform sample set?

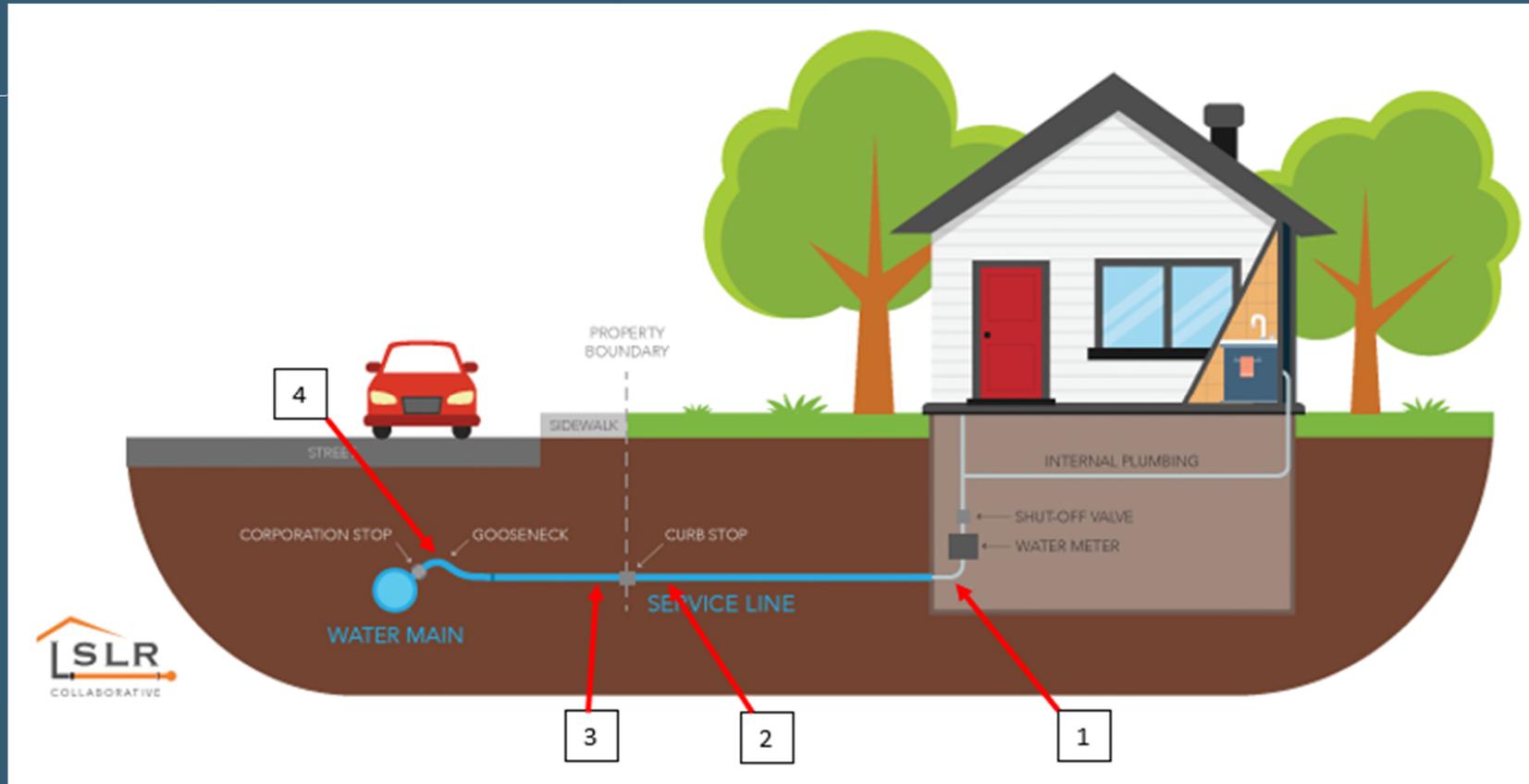
- Use Excel!
- <https://www.youtube.com/watch?v=zsMaVcLxDZs>

Tracking Tool(s)

Get everyone on board with what and how you will track the data in the field. Think it through and mindfully adjust as you do the work.

Best way is likely either a tablet, or good old paper and pictures

Conduct the 3- or 4-Point Physical Verification



Verification Points

What are the points?

1. Interior portion of the service line up to the first shutoff valve or 18 inches inside the building, whichever is shorter;
2. Curbstop-to-building, a minimum of 18 inches from the curbstop; and
3. Main-to-curbstop, a minimum of 18 inches from the curbstop.
4. Goosenecks (when necessary)

When the 4th point?

Service lines with a lead connector (gooseneck/pigtail) must also verify the following fourth location. In this context, a gooseneck or pigtail is a short section of material, typically not exceeding two feet, which can be bent and used for connection between a rigid fitting (corporation stop) and the service line piping. A water supply must EITHER:

- Conduct a physical verification or have a control in place demonstrating they were never used.

OR

- Assume locations with galvanized service lines between the main and the curb-stop contain a lead connector, and therefore, will not be required to conduct a physical verification.

Note: Unless the water supply is assuming lead, most water supplies with galvanized service lines between the main and curb stop will be required to physically verify the connector material. Remember when physically verifying any service line to always record/document the exact material witnessed for each segment identified, even if the material was as expected.

Evaluate Verification Results

What is there to evaluate?

- Did you have records for sites that you verified?
- Did they match?
- Is there a pattern to the results?
- Did you find what you expected?

Example Table

Service Line ID & Location		Service Line Material Based on HISTORICAL RECORDS							Service Line Material Based on FIELD VERIFICATION					
Parcel ID/ Service Line ID	Address	Connector (gooseneck)	Historical Record Main-to- Curbstop	Historical Record Curbstop- to-Home	Interior (18" or 1 st shutoff)	Date of Historical Record	Type of Record	Year Built	Connector (gooseneck)	Verified Material Main-to- Curbstop	Verified Material Curbstop -to-Home	Interior (18" or 1 st shutoff)	Date Verified	Method
123456789	23 Main St	NA	Copper	Copper	Unknown			1958	NA	Copper	Copper	Copper	1/2/2020	Hydrovac
123456790	60 1st Ave	NA	Copper	Copper	Unknown	12/1/1956	Note card	1951	NA	Copper	Copper	Copper	12/6/2019	Hydrovac
123456794	12 Michigan Ave	Unknown	Unknown	Copper	Copper			1927	Lead	Galvanized	Lead	Lead	6/20/2020	Excavation
123456795	34 2nd Ave	Lead	Galvanized	Copper	Copper				NA	Copper	Copper	Copper	11/22/2020	Hydrovac
123456796	941 W Main St	NA	Copper	Copper	Copper	3/15/1986	Permit	1954	NA	Copper	Copper	Copper	11/13/2019	Hydrovac
123456798	24 North St	Lead	Galvanized	Copper	Copper			1935	Lead	Galvanized	Lead	Lead	10/25/2020	Excavation
123456800	26 Grand Ave	Unknown	Unknown	Copper	Unknown	6/15/1929	Note card	1926	NA	Copper	Lead	Copper	11/28/2019	Excavation
123456803	13 24th St	Lead	Galvanized	Copper	Unknown	1/11/1952	Note card	1871	NA	Lead	Galvanized	Galvanized	5/25/2020	Hydrovac

Beyond Verification

Notify residents if lead is found in a service line

Finalize the rest of the inventory

- This includes material assessments for the remainder of service lines not physically verified
- All water mains
- Towers
- Pumps
- Etc.

What's Next?

More to come!

- We intend to release guidance in stages and are working on the next set of guidance docs now.

Visit WWW.MICHIGAN.GOV/LCR for more information

LCR Reminders

- 2021 is the beginning of the 20 year, 5% on average, replacement period
- Partial Lead Service Line Replacements are Banned!
 - Except in conjunction with an emergency repair – Follow the provisions of the rule for emergencies
- All Lead Service Line Replacements are to be done at water system expense.
- Systems must notify residents within 30 days of knowing or presuming lead is present in a service line.



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