



Lead Pipe

Photo Credit: Associated Press

Service Line Inventory

Department of Environmental Conservation
Drinking Water & Groundwater Protection Division
Sustainable Infrastructure Section

dec.vermont.gov/water

ANR.SLI@vermont.gov

Overview

- Lead & Copper Rule Revisions (LCRR)
- DEC's Strategies to Assist Water Systems
- Service Line Inventories
- Lead Service Line Replacement Plan
- Submitting to ANR Online
- Questions

Lead & Copper Rule Revisions and Improvements

- 2020: Final notice of LCRR published
- Early 2021: Biden-Harris Administration froze regulations
- December 2021: LCRR released and effective
- 2022: EPA announced future Lead & Copper Rule *Improvements* (LCRI)
 - Unknown timeline for release
 - Unknown changes
 - Inventories and Replacement Plan requirements remain the same

Lead & Copper Rule Revisions

- Service Line Inventory (SLI) required by October 16, 2024
- Community Water Systems
 - 409 systems with 174,140 connections
- NTNC Systems
 - 251 systems with 1,145 connections



Strategies to Assist Water Systems

- Inventory Planning Loans
 - 70 water systems are eligible
 - Serve greater than 1,000 persons
 - Loan forgiveness varies based on ‘disadvantaged community’ status
 - 2022 Amended DWSRF Intended Use Plan

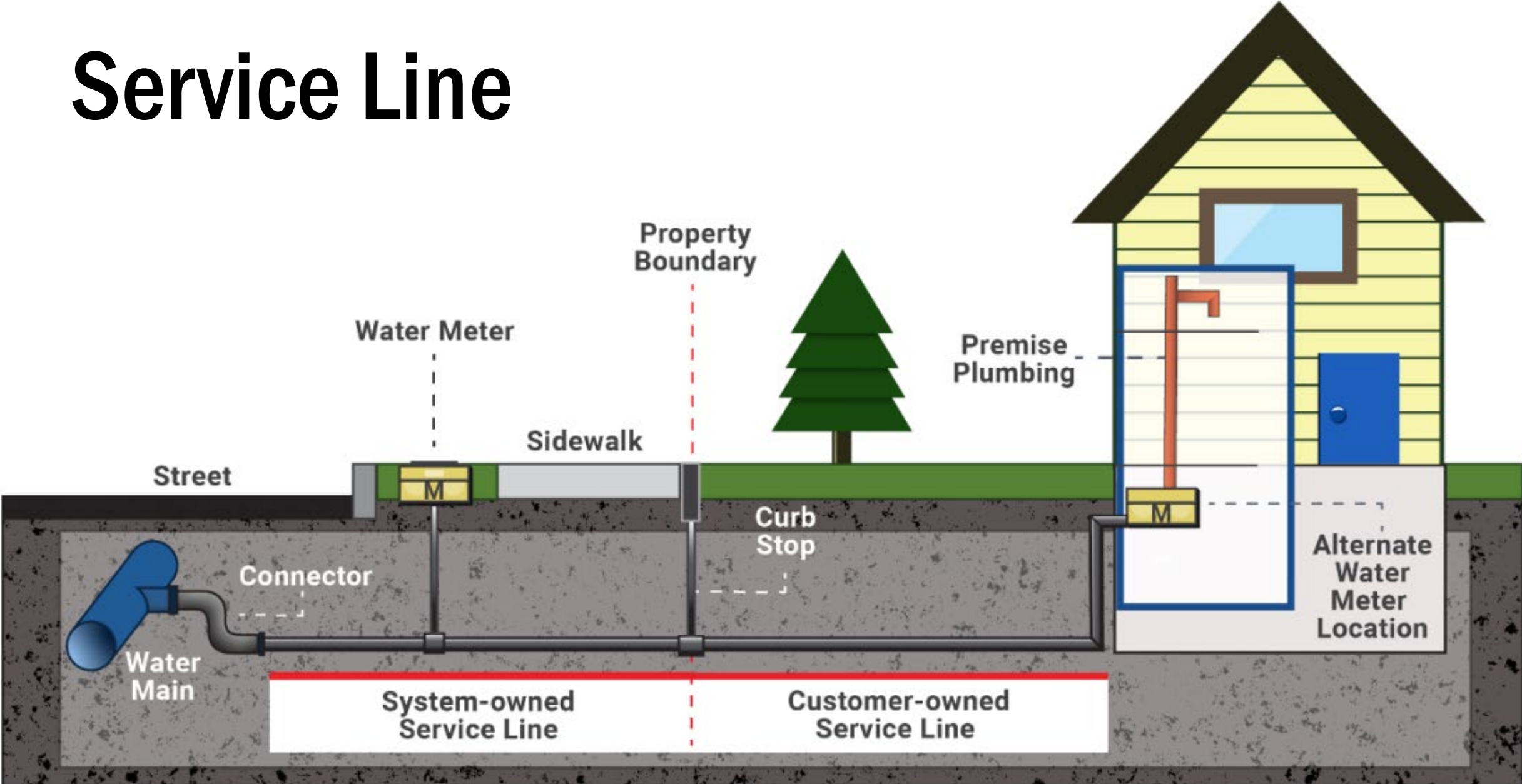
Strategies to Assist Water Systems

- Inventory Direct Contractor Assistance
 - Approximately 600 water systems are eligible
 - Serve 1,000 or fewer persons
 - DEC contractors assist with completing inventories
 - No cost to water systems
 - Water system operators and administrative staff participation

Strategies to Assist Water Systems

- DEC Staff Supporting NTNC Schools & Day Care Facilities
 - Approximately 150 water systems are eligible
 - DEC Staff assist with completing inventories
 - No cost to water systems
 - Water system operators and administrative staff participation

Service Line



SLIs: Big Picture

Unique Identifier

E911 Address*

Coordinates

Property SPAN*

Supplying Water Main

Water Main Material & Size

System-owned Service Line

Connector Material*

Service Line Material*, Size, Age

Information Source*

Customer-owned Service Line

Service Line Material*, Size, Age

Information Source*

Building Information

Staff denied entry?*

Treatment, Interior Plumbing
Characteristics

Installation Date

SLIs: 3 Types of Inventories

- Single Building Systems
 - Schools, condos, “under one roof”
- Multi-Building Systems
 - Municipalities, Fire Districts, campuses
- Non-Potable Water Systems
 - Fire Suppression, Industrial

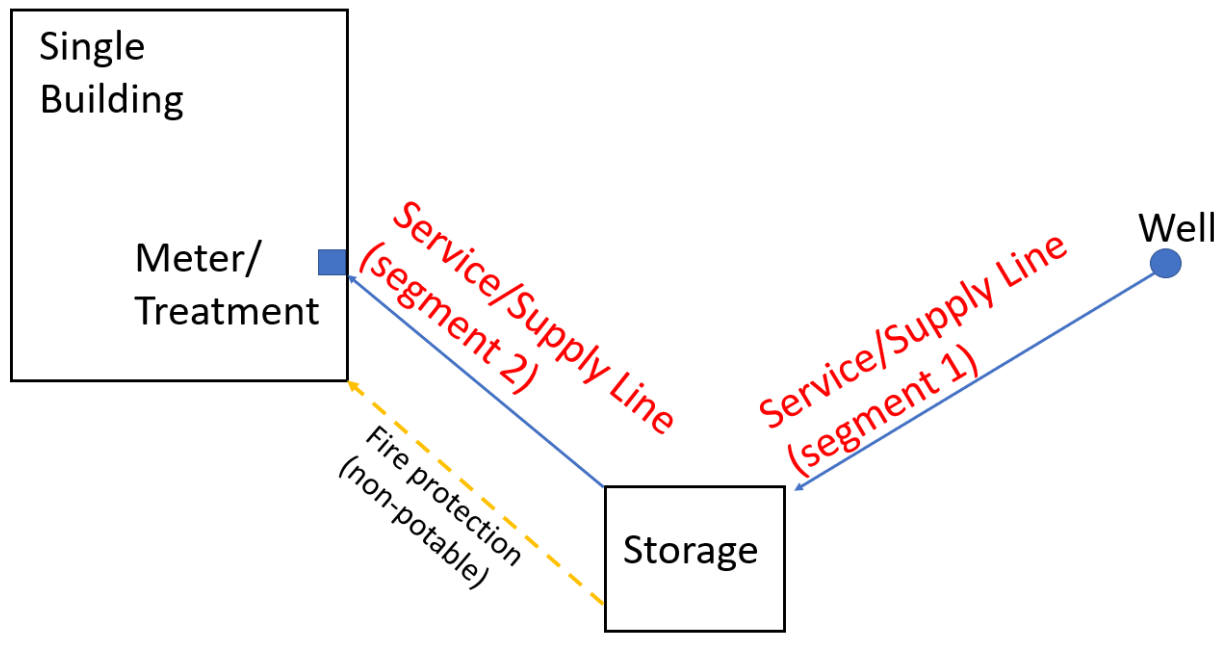
Non-Potable Service Lines

All service lines must be inventoried

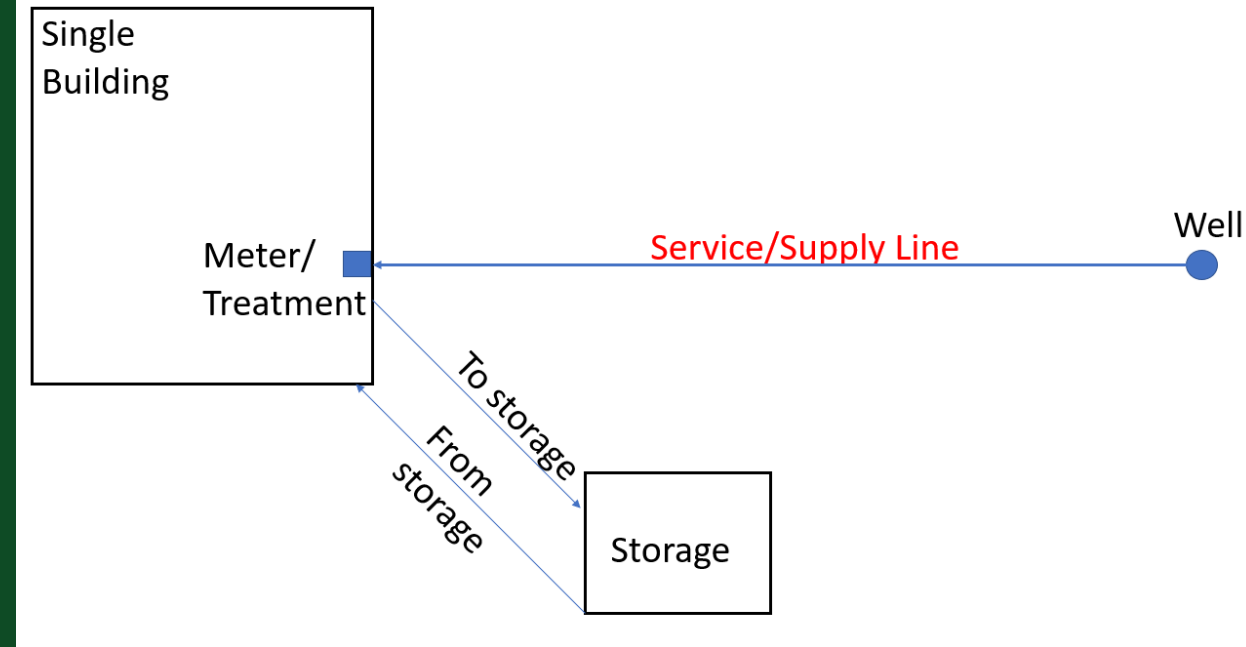
- Industrial process
- Fire protection
- Toilet flushing
- Irrigation
- Cooling



Single Building Service Lines

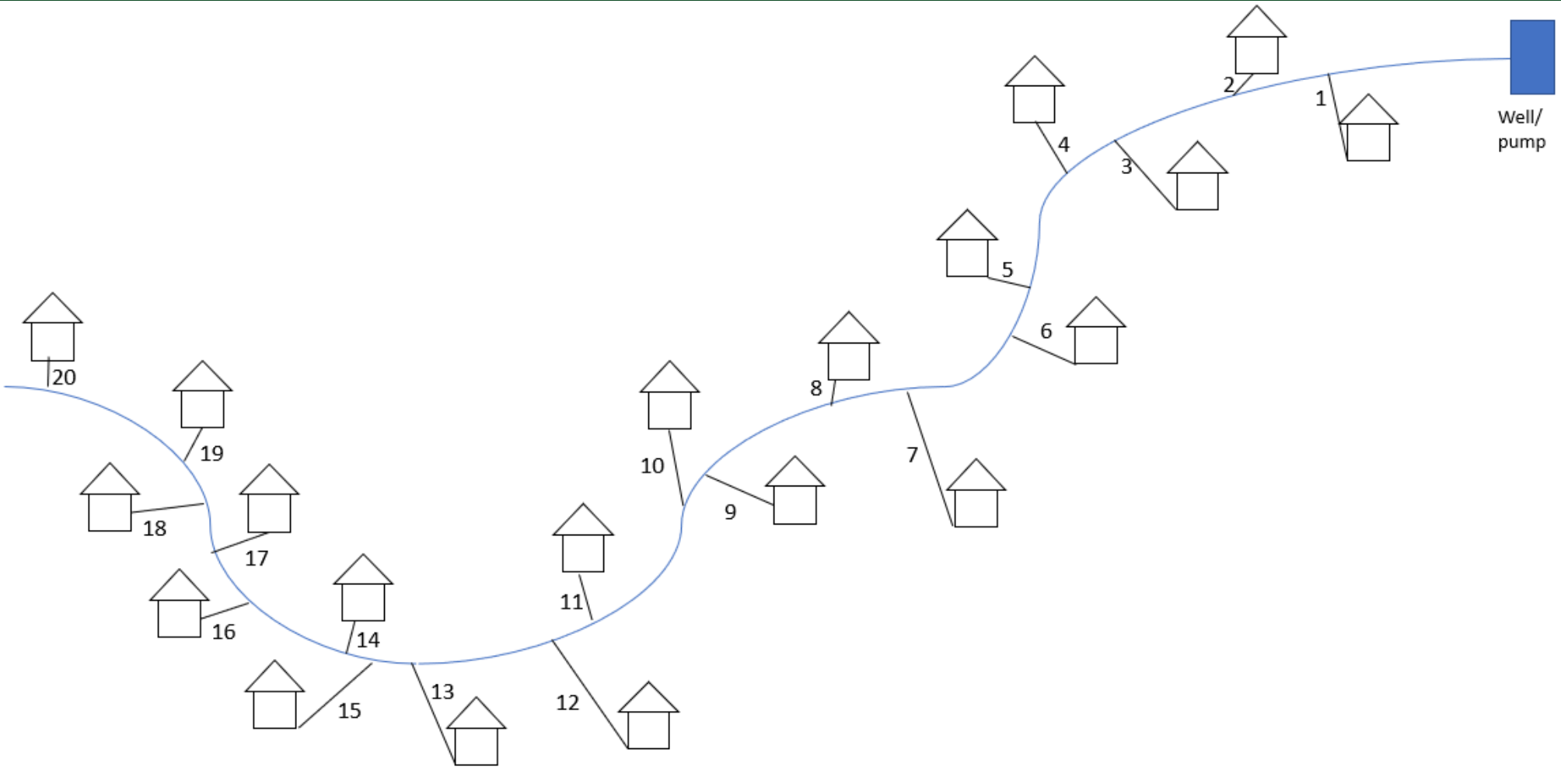


Single Building Inventory and Non-Potable Inventory



Single Building Inventory

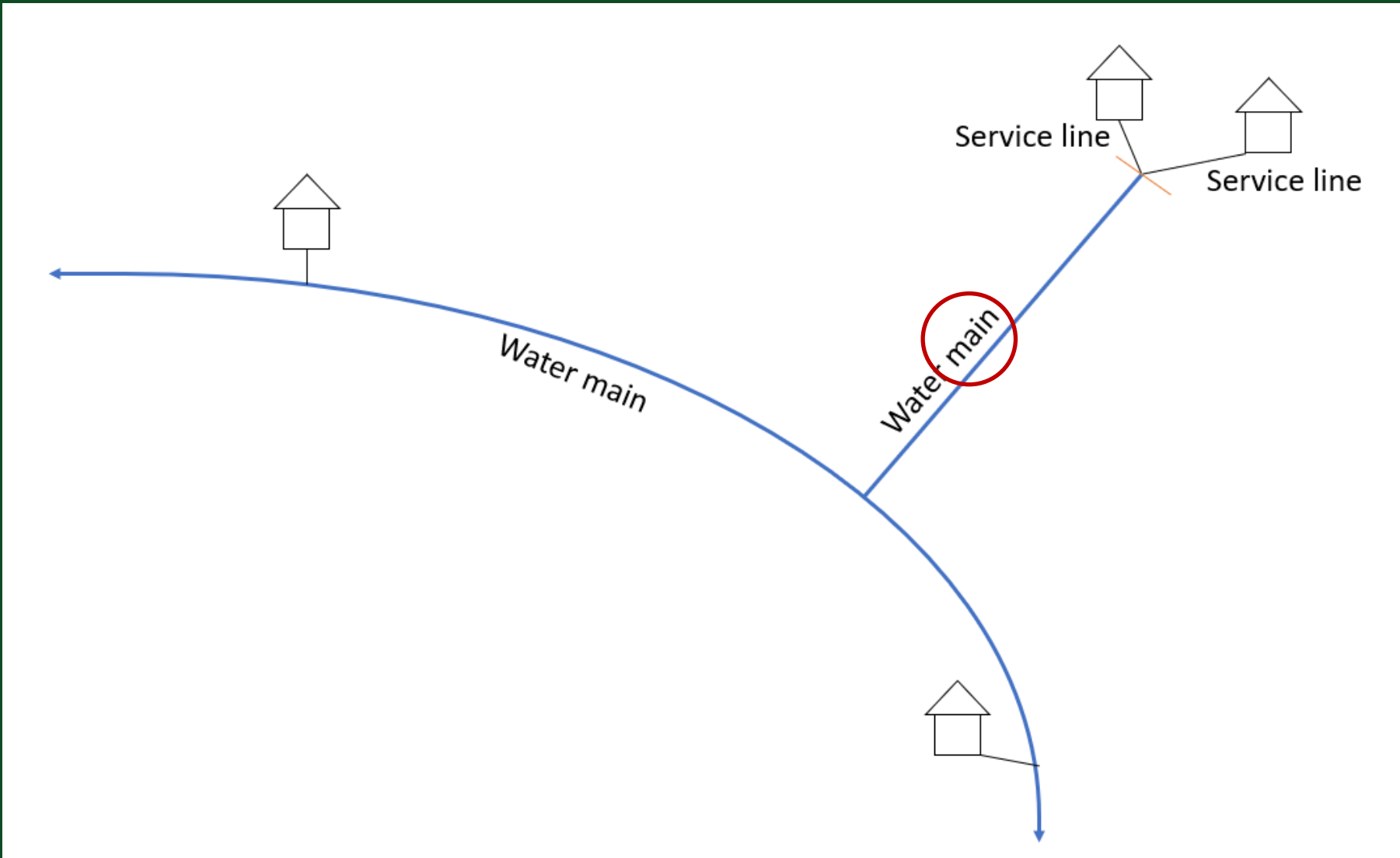
Multi-Building Service Lines



Multiple Service Lines

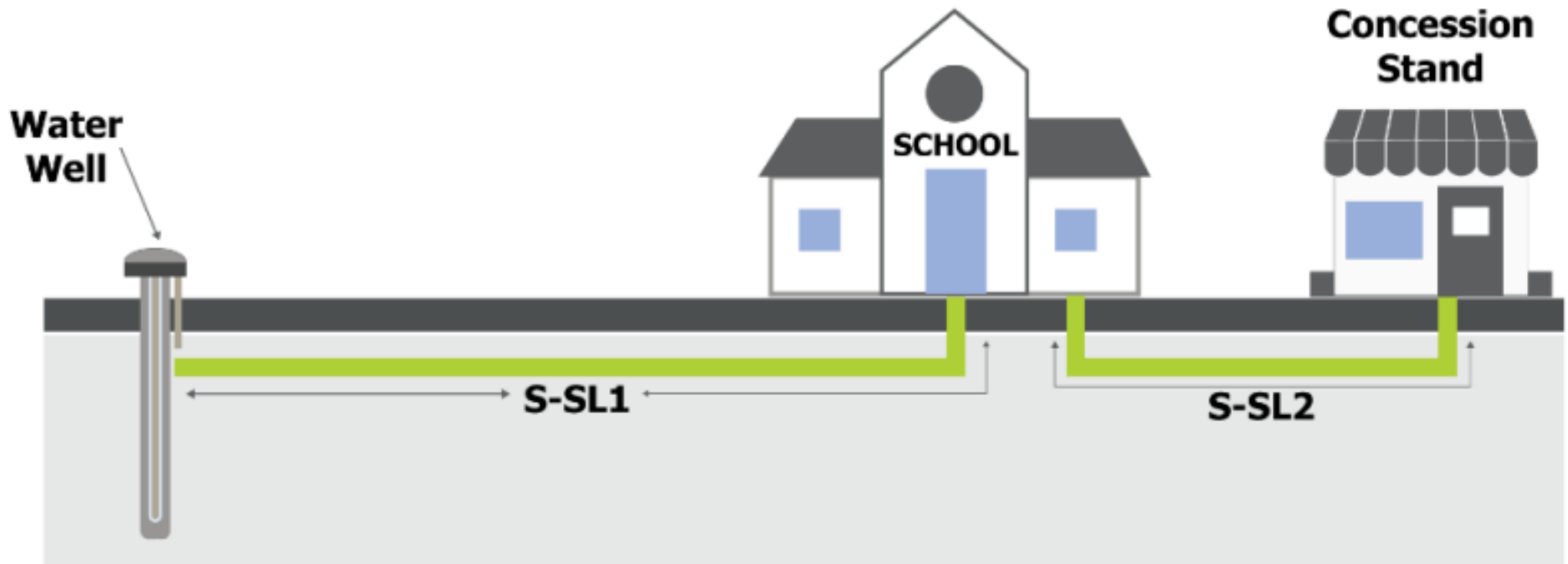


No "Shared" Service Lines

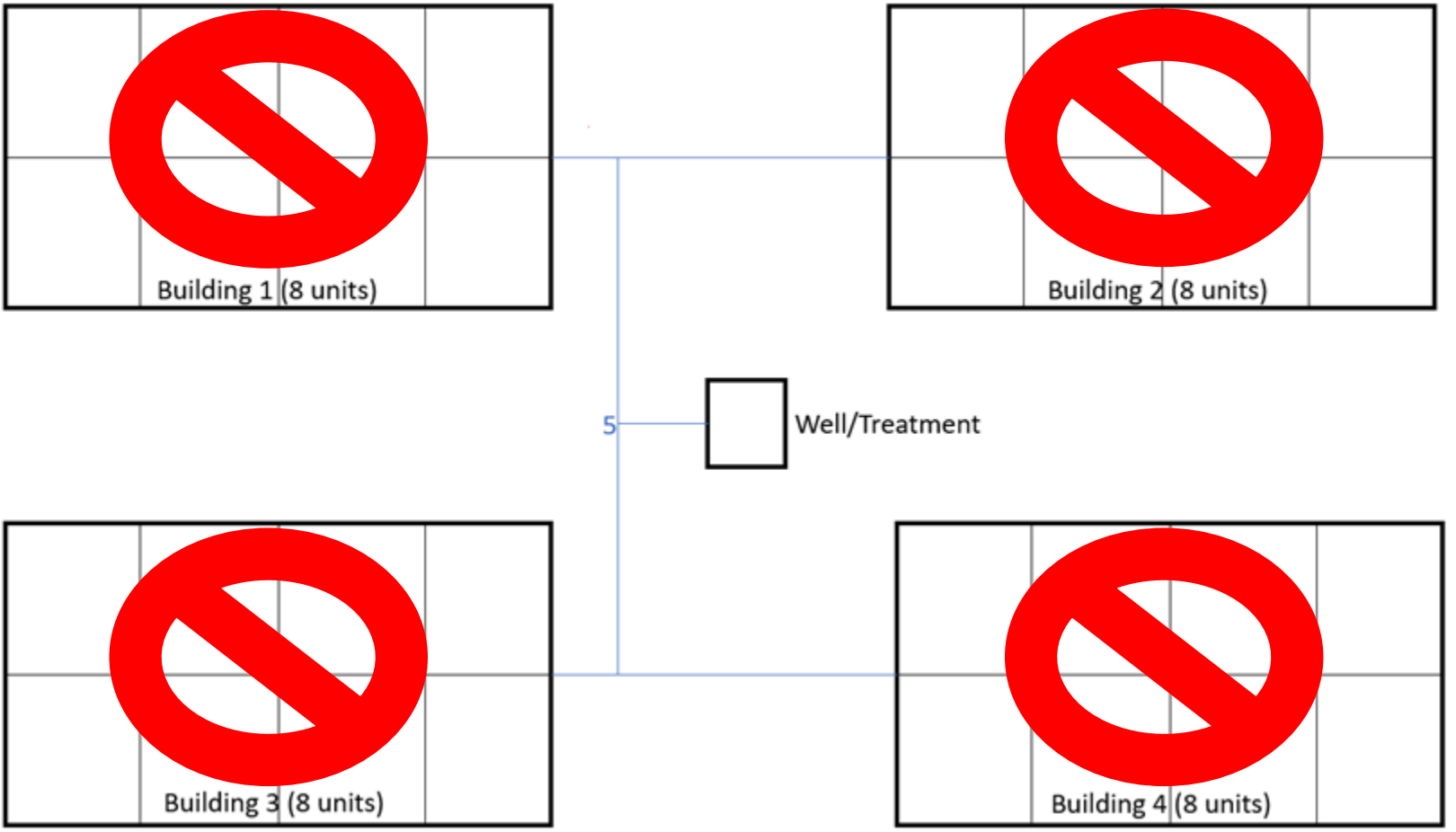


Service Lines in Series

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



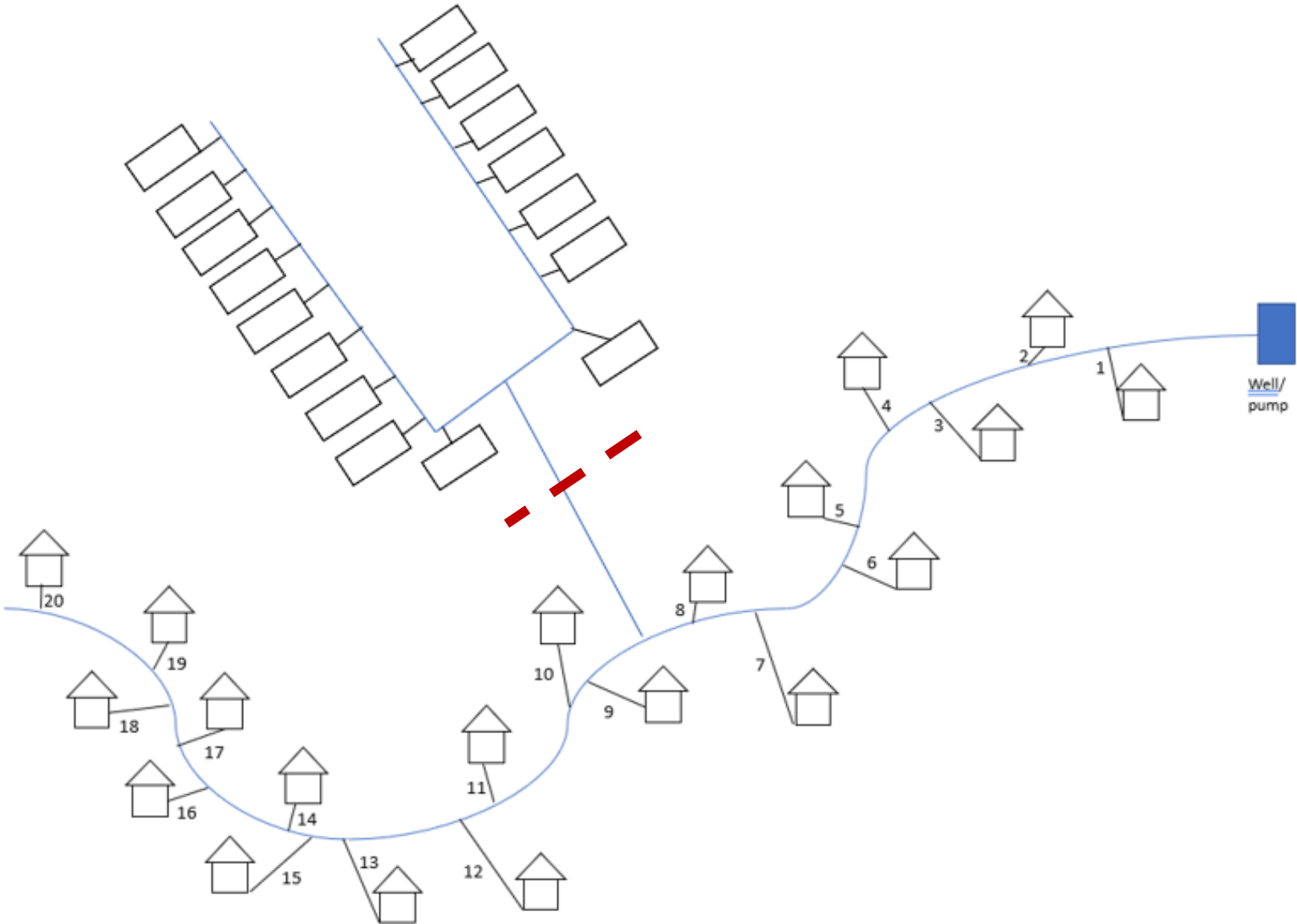
Multiple Units per Building



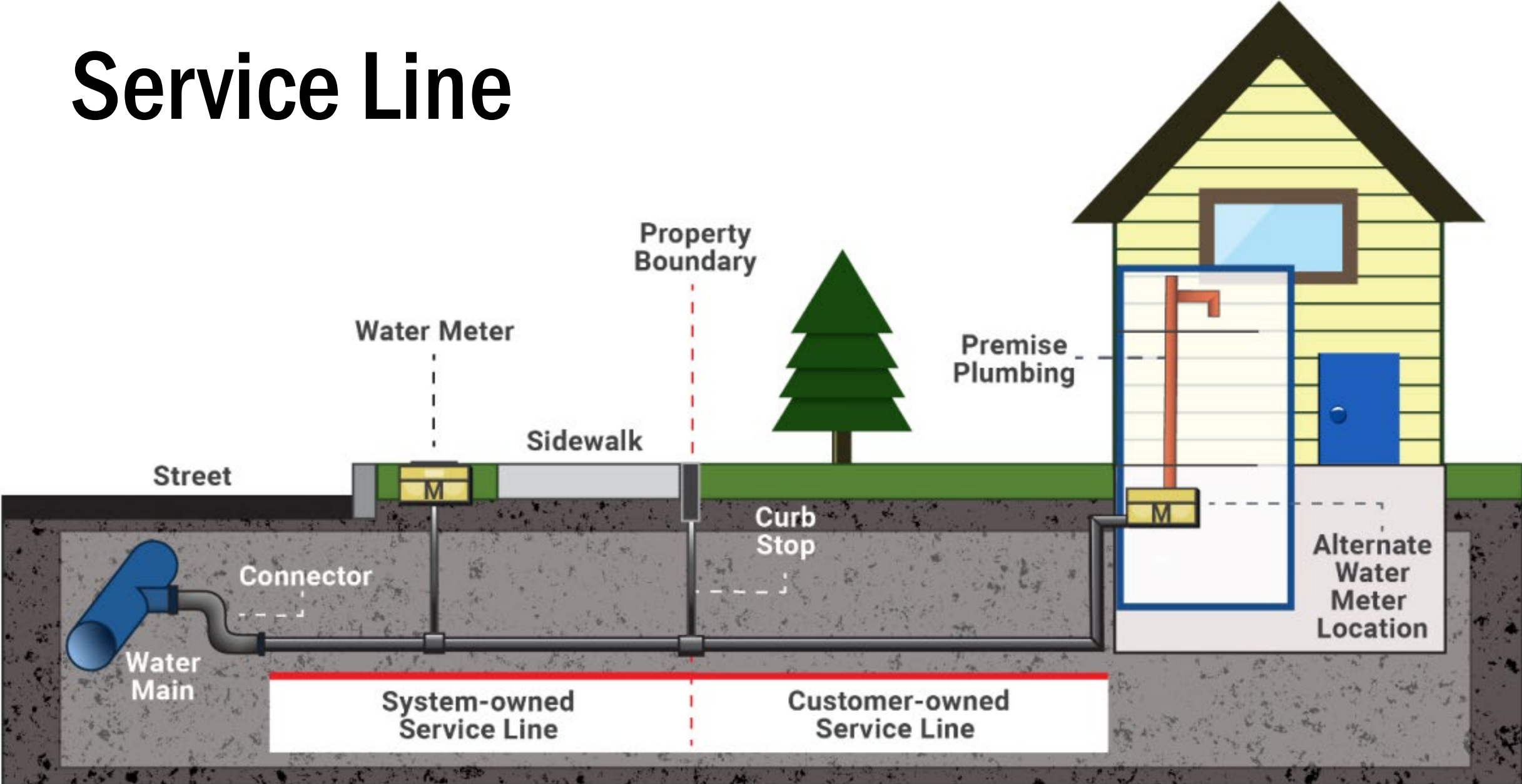
Consecutive Water Systems

- Active, regulated, own WSID#, then inventory is required and will be tracked as its own system
- Consecutive Exempt, then considered part of the supplying water system
- “Private Lines” (regardless of consecutive status) need to be inventoried regardless of ownership
 - College campus with private mains and services needs to be inventoried.

Consecutive Segments



Service Line



SLIs: Big Picture



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Water Main Material & Size

System-owned Service Line

Connector Material

Service Line Material, Size, Age

Information Source

Customer-owned Service Line

Service Line Material, Size, Age

Information Source

Building Information

Staff denied entry?

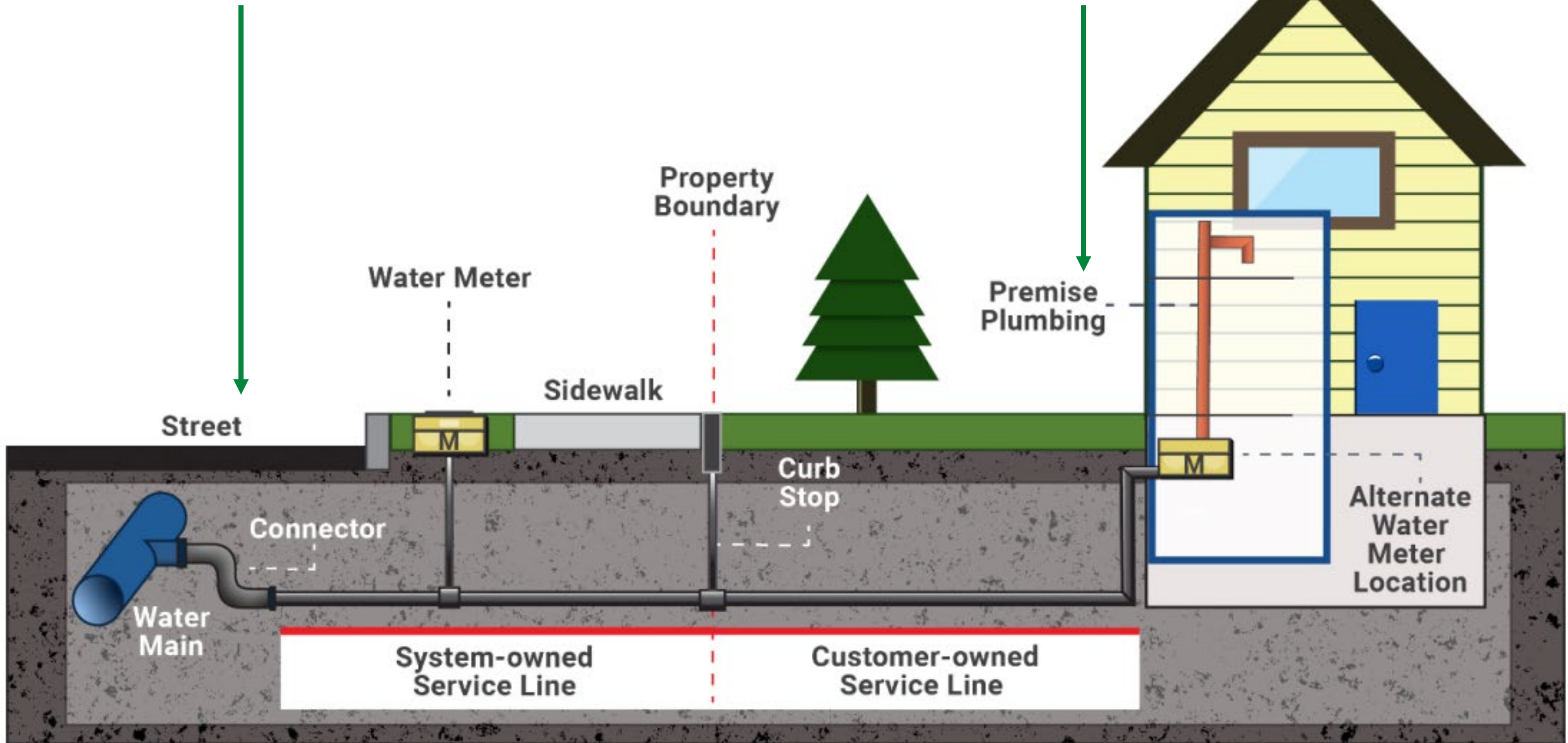
Treatment, Interior Plumbing
Characteristics

Installation Date

Coordinates of Connection from Water Main

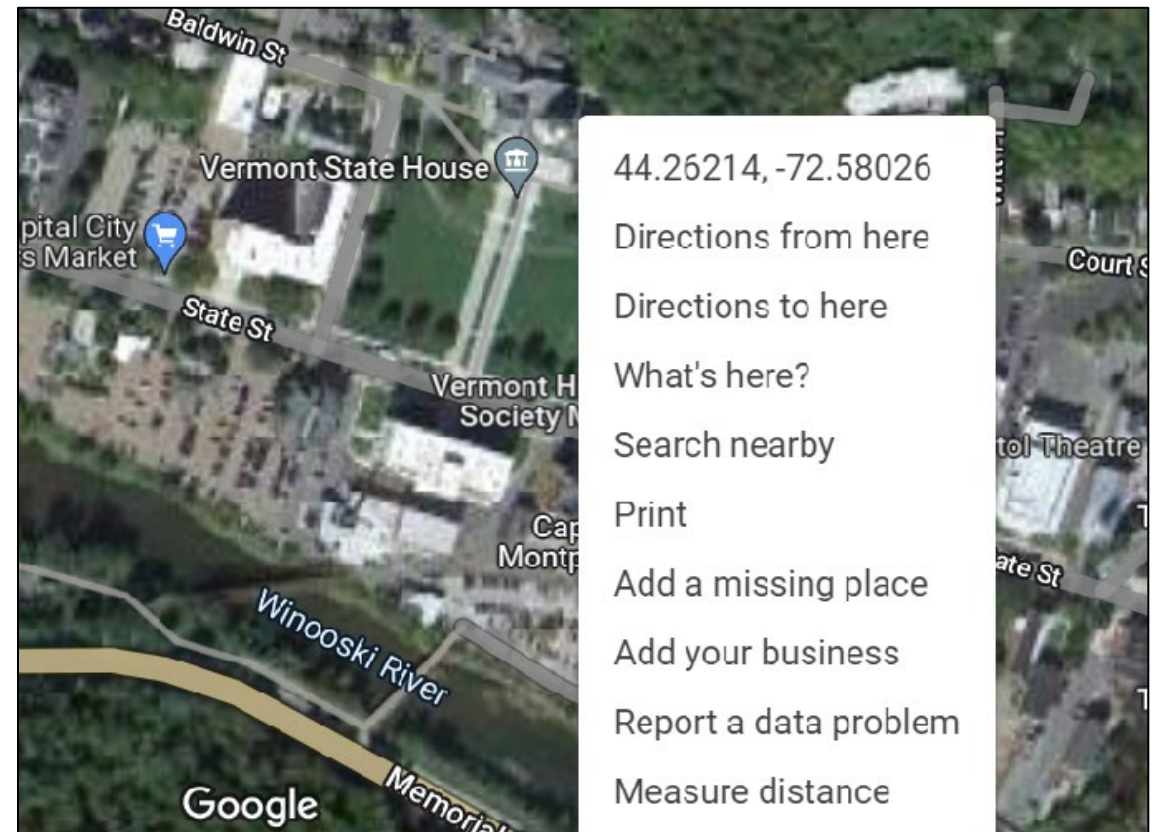
Coordinates of Connection to Building

E911 Address*
SPAN*



SLI: Addresses & Coordinates


- **E911 Address***
 - Do not use codes
 - Do not use owner's name
- **Coordinates**
 - Latitude: [42.7 to 45.1]
 - Longitude: [-71.2 to -73.5]
 - Recommend 4 decimal places
 - Google Maps
 - Bing Maps



SLI: Coordinates

F		G		H		I	
Information about the location of the service line							
Coordinates of where the service line connects to water main				Coordinates of where the service line connects to building			
Latitude		Longitude		Latitude		Longitude	
33							

Incorrect Entry

 Latitudes located in Vermont are typically located between 42.7 and 45.1. The data must be within this range.

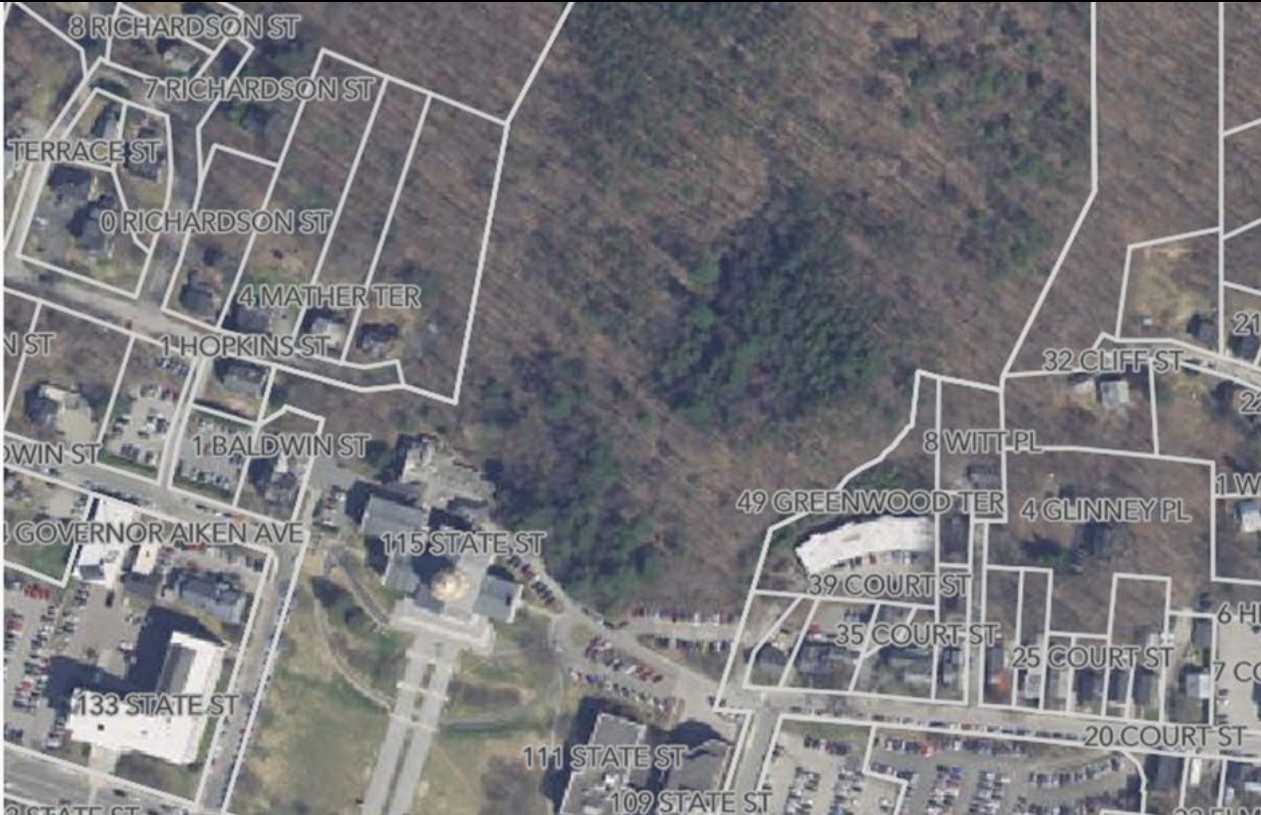
SLI: School Property Account Number*

Property Information 3

115 STATE ST, MONTPELIER
SPAN: 405-126-13234
DESCRIPTION: 23.27 ACRES; STATEHOUSE

111 STATE ST, MONTPELIER
SPAN: 405-126-13904
DESCRIPTION: SUPREME COURT LIBRARY

109 STATE ST, MONTPELIER
SPAN: 405-126-13910
DESCRIPTION: PAVILION OFFICE BLDG SUPREME COURT LIB



Dept of Tax SPAN Finder <https://tax.vermont.gov/span-finder>
ANR Atlas <https://anrmaps.vermont.gov/websites/anra5/>



Limitations of Property SPAN

85 LYMAN MDW, HINESBURG, VT, 05461

Clear search location

Results:80

Multiple results may appear below, particularly for condominium properties. If this is the case, please review the list and identify your particular unit. Please contact your landlord if you can't find your unit.

Property Information 80

13311 LYMAN MEADOW ROAD, HINESBURG

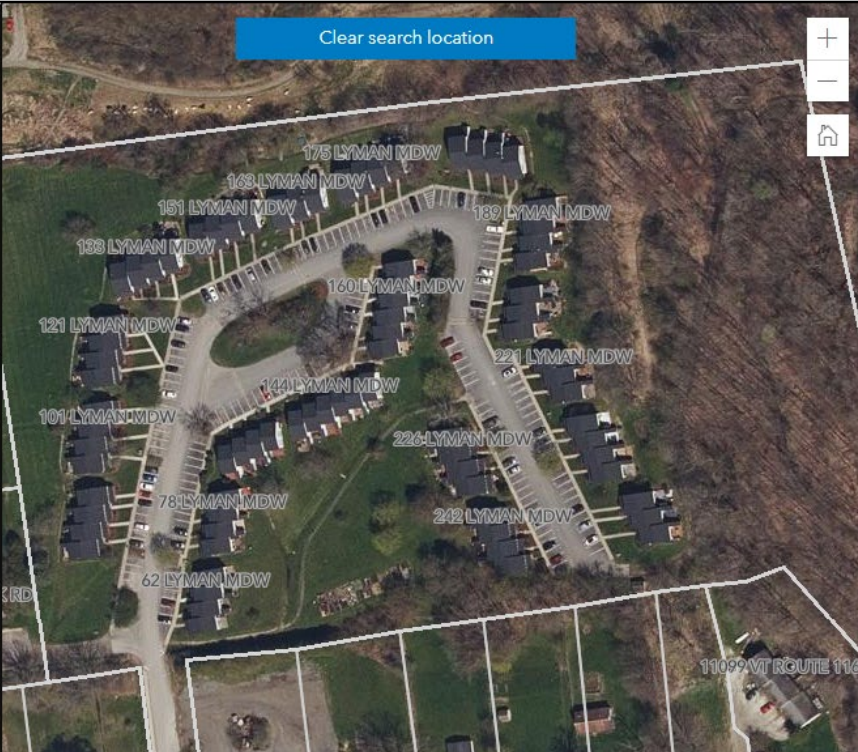
SPAN: 294-093-10036

DESCRIPTION: CONDO UNIT & 0.15A :

62A2 LYMAN MEADOW ROAD, HINESBURG

SPAN: 294-093-11840

DESCRIPTION: CONDO UNIT & 0.15A

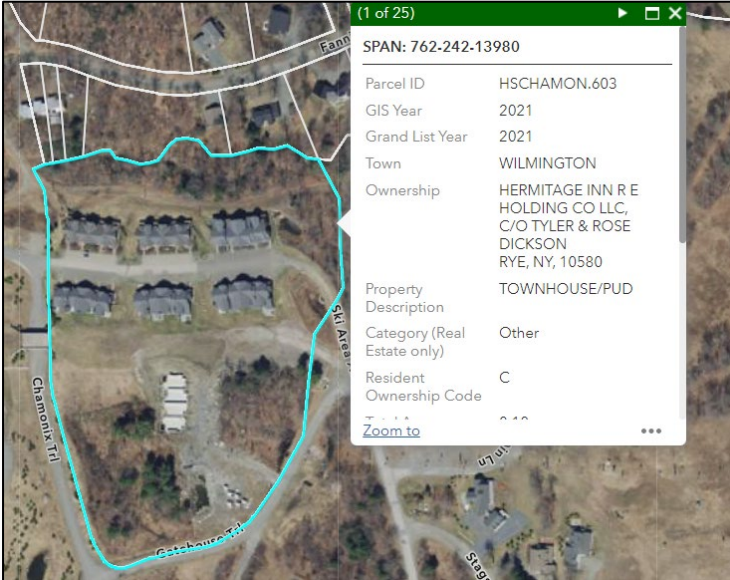


(1 of 25)

SPAN: 762-242-13980

Parcel ID	HSCHAMON.603
GIS Year	2021
Grand List Year	2021
Town	WILMINGTON
Ownership	HERMITAGE INN R E HOLDING CO LLC, C/O TYLER & ROSE DICKSON RYE, NY, 10580
Property Description	TOWNHOUSE/PUD
Category (Real Estate only)	Other
Resident Ownership Code	C

Zoom to



SLIs: Big Picture

Unique Identifiers

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System-owned Service Line

Connector Material

Service Line Material, Size, Age

Information Source

Customer-owned Service Line

Service Line Material, Size, Age

Information Source

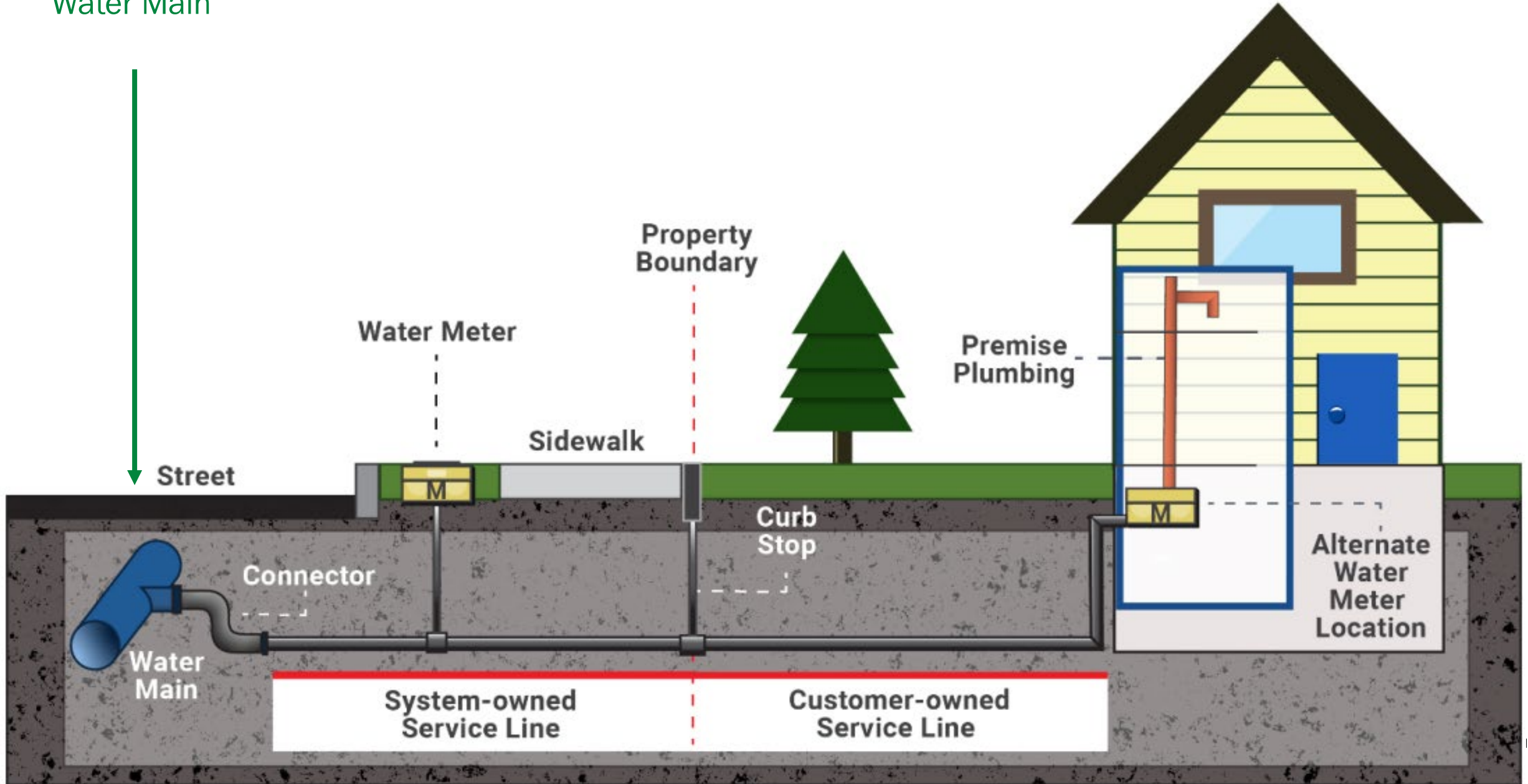
Building Information

Staff denied entry?

Treatment, Interior Plumbing
Characteristics

Installation Date

Supplying
Water Main



Water Main Size & Material



SLIs: Big Picture

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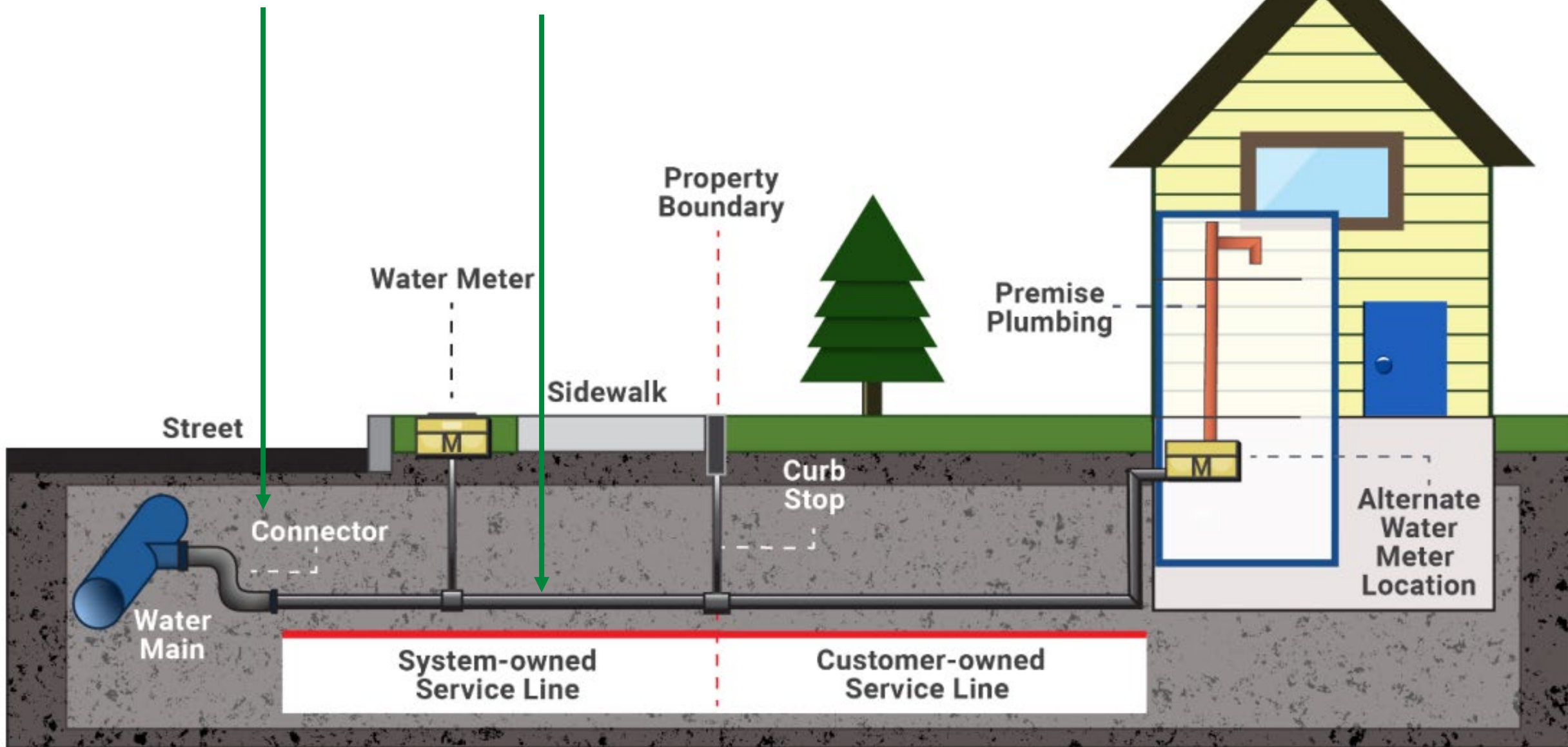
Treatment, Interior Plumbing
Characteristics

Installation Date

Connector
Material*

System-owned SL
Material*, Size, Age

Information
Source*



Connectors: goosenecks & pigtails

Does this service line have a lead gooseneck, pigtail, or other connector?



Lead gooseneck:
not a service line but
must be replaced
when encountered.

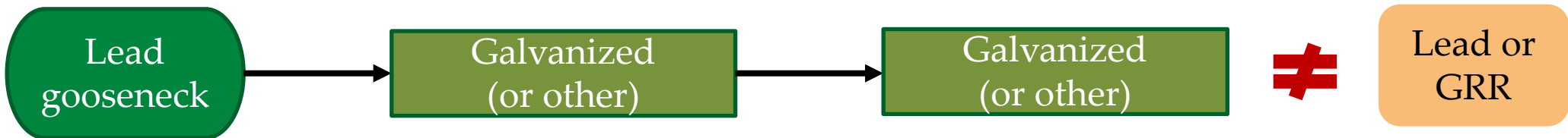
Less than 24 inches



Lead "bull horns"

Not a connector
Probably a SL

May be found at
meters



Operational Requirements with Connections

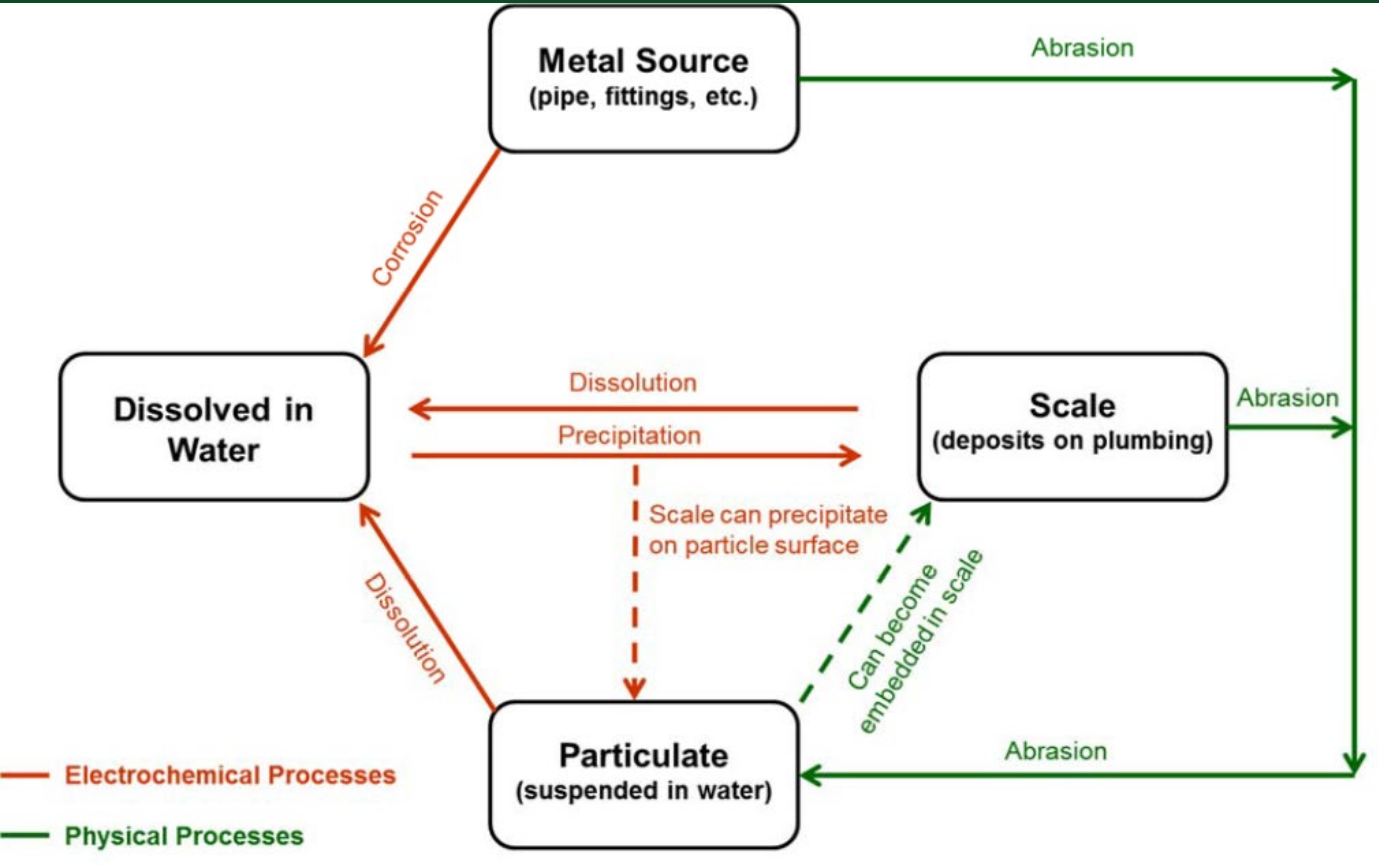
- Systems must replace all system-owned lead connections when encountered
- System must offer to replace customer-owned connection
 - System not required to pay for replacement
 - Replacement not required if customer denies offer
- Connector replacement is not lead service line replacement
- Replacements must follow risk mitigation measures
 - System must provide users with information about potentially elevated lead levels in drinking water.
 - System must provide a pitcher filter or point-of-use filter for lead removal for six months.

Resources to Identify SL Materials

Source of information	Examples
Water System Maps/Drawings	As-built Record Drawings, distribution system maps, other maps or drawings believed to be accurate and complete.
Local/State Permits	Act 250 Permits, Wastewater System and Potable Water Supply Permits, Building permits, etc.
Asset Management Plan	Plans identifying the equipment, their materials, their age, etc.
Water System/Municipal Records	Tie cards, meter inspection records, lister information, other records believed to be accurate and correct.

Source of information	Examples
Visual Inspection – Water System	Visual inspection by water system personnel or personnel contracted by the State or water system. Information/photographs verified by system personnel.
Visual Inspection – Other	Visual inspection from plumbers, homeowners, or other non-system personnel
Swab Test	Using swabs to test the metal of the pipe for lead content.
Local Codes/Regulations	Codes or by-laws prohibiting lead or requiring certain materials after a certain date.
Other	Other resources believed to be accurate and complete.

How is galvanized steel or iron pipe related to lead?



Galvanized Requiring Replacement

- If galvanized pipe was downstream of a lead service line
- It is unknown if galvanized pipe was never downstream of a lead service line
- LCRR does not apply this rule to lead connections a.k.a. “goosenecks”

Galvanized Requiring Replacement?
No
Yes



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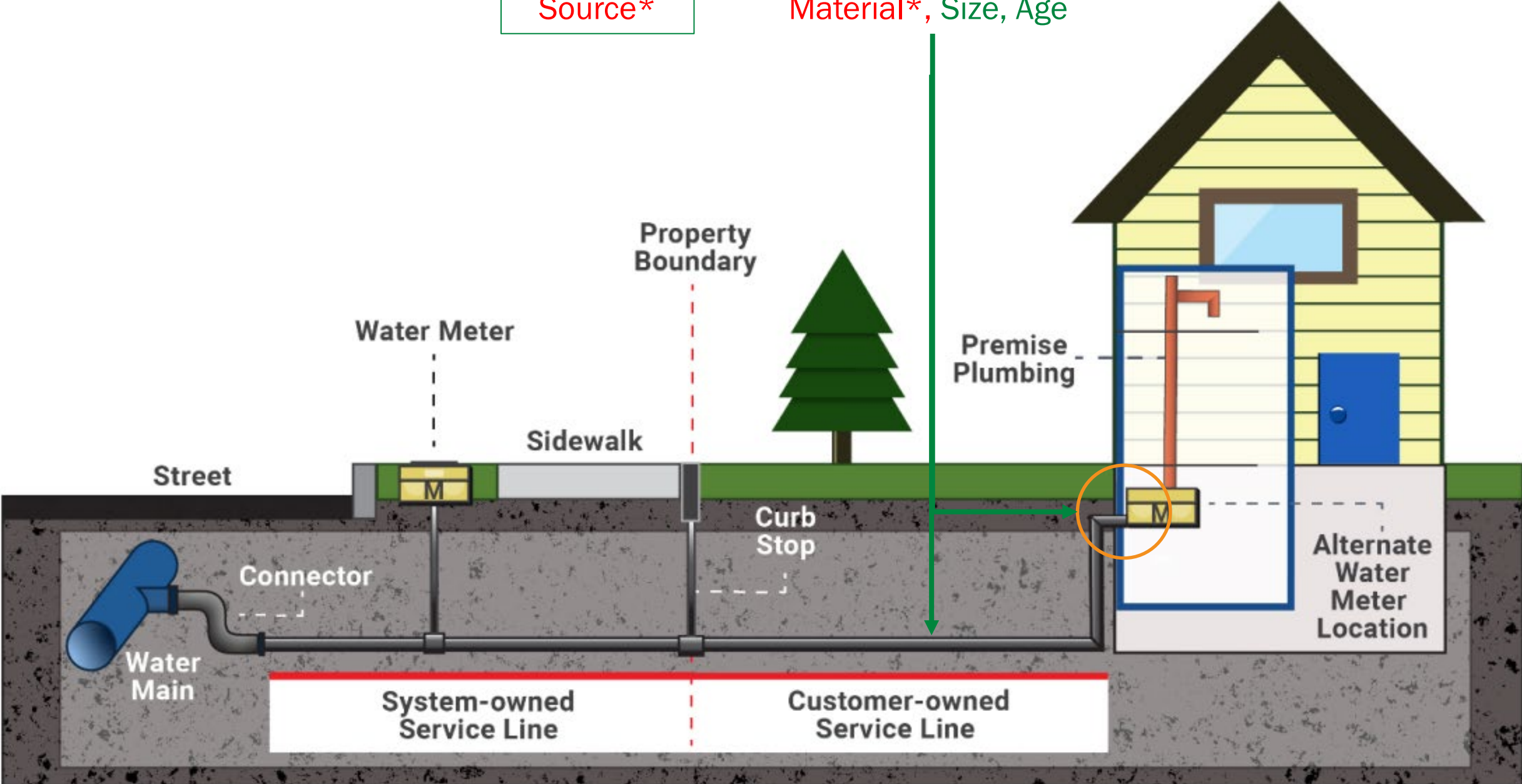
Staff denied entry?

Treatment, Interior Plumbing
Characteristics

Installation Date

Information Source*

System-owned SL Material*, Size, Age




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Visual Identification of Material

Lead



Lead pipes **widen** at base and often form a **"bulb."**


Galvanized Iron




Magnet sticks

Galvanized pipes have "threads" at connections.

Copper



Brass



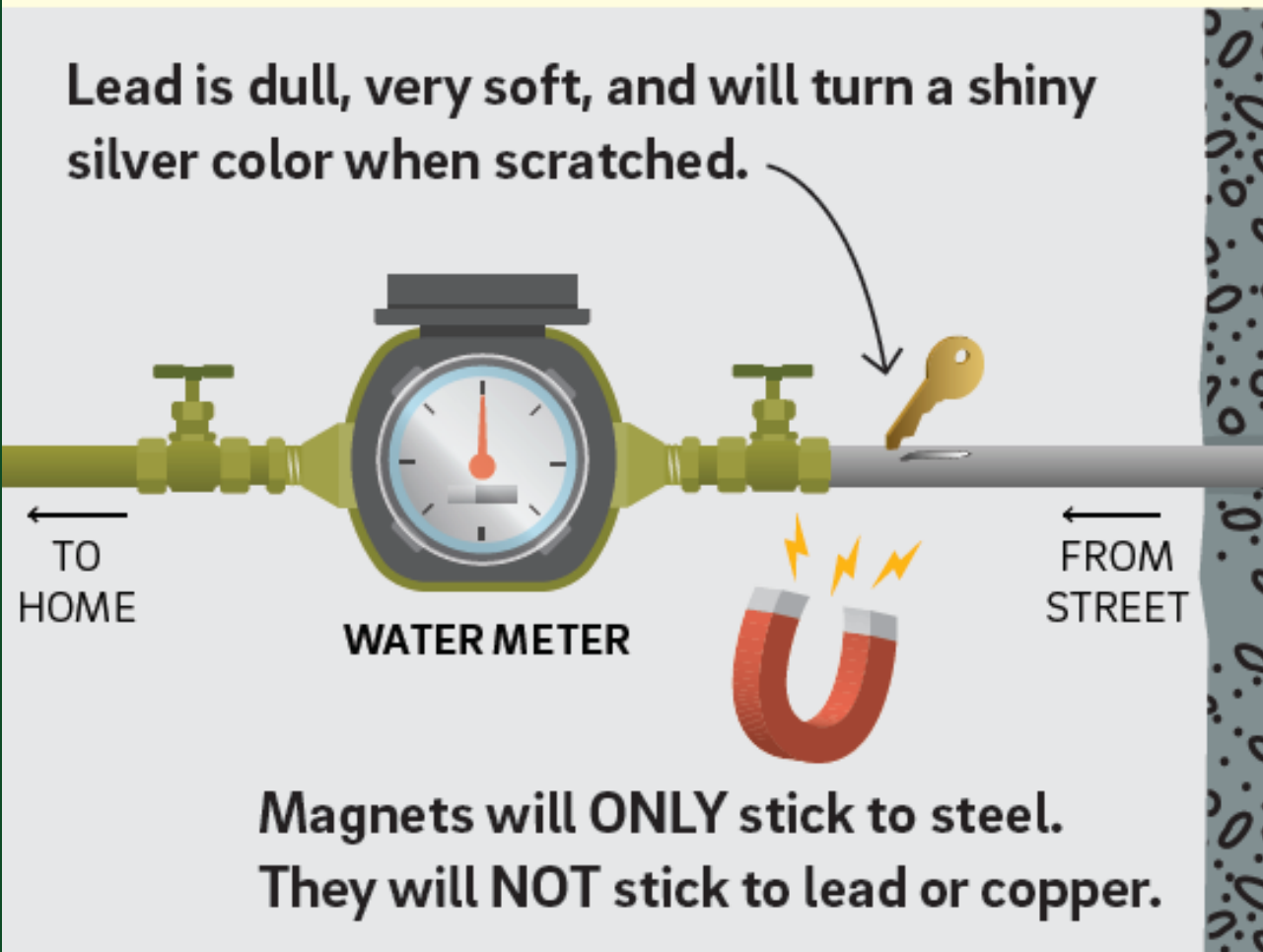
Brass has "threads".



City of Newark, NJ

Visual Identification of Material

Lead is dull, very soft, and will turn a shiny silver color when scratched.



The diagram shows a water meter assembly. On the left, a pipe is labeled "TO HOME" with an arrow pointing left. In the center is a "WATER METER" with a dial. On the right, a pipe is labeled "FROM STREET" with an arrow pointing left. A key is shown scratching the pipe on the right side. Below the pipe, a red horseshoe magnet is shown with yellow lightning bolts indicating it is attracted to the pipe. A vertical pipe with a dotted pattern is on the far right.

Magnets will **ONLY** stick to steel.
They will **NOT** stick to lead or copper.



City of Newark, NJ

Scratch, Magnet, Tapping Tests



Lead Pipes

The Scratch Test

If the scraped area is shiny and silver, your service line is lead.

The Magnet Test

A magnet will not stick to a lead pipe.

The Tapping Test

Tapping a lead pipe with a coin will produce a dull noise.



Copper Pipes

The Scratch Test

If the scraped area is copper in color, like a penny, your service line is copper.

The Magnet Test

A magnet will not stick to a copper pipe.

The Tapping Test

Tapping a copper pipe with a coin will produce a metallic ringing noise.



Galvanized Pipes

The Scratch Test

If the scraped area remains a dull gray, your service line is galvanized steel.

The Magnet Test

A magnet sticks to a galvanized pipe.

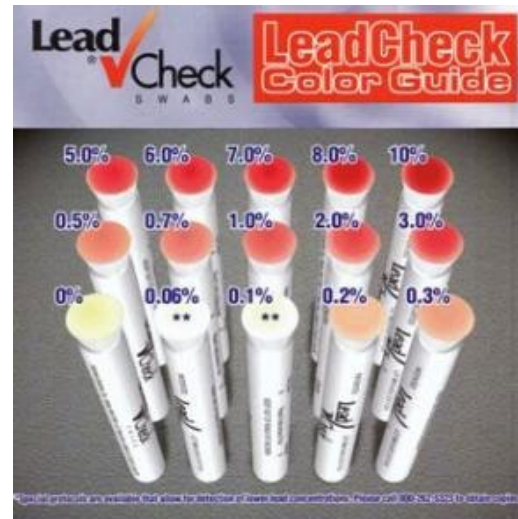
The Tapping Test

Tapping a galvanized pipe with a coin will produce a metallic ringing noise.



Lead Detection Swaps

- Ensure that metal of the pipe is swabbed.
- False readings may be caused by paint or other materials.
- <https://www.epa.gov/lead/lead-test-kits>



Lead Packed Joints

- Packed joints are not classified as lead service lines.
- Typically found connecting cast iron water mains.



Unknown Material Service Lines

- Not a best practice to default to “unknown”
 - Records review & assessment of installation date
 - Denied visual inspection
- Water system will be required to create and implement a Lead Service Line Replacement Plan
 - Strategy to identify unknown materials
 - After 2024, begin *digging* into the unknowns

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Information Source

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Staff denied entry?*

Treatment, Interior Plumbing
Characteristics

Plumbing Installation Date

SLIs: Public Accessibility

- All CWSs & NTNCs:
 - Must make the inventory public available
 - Must inform users how to access the inventory in the Consumer Confidence Report (CCR)
- Systems serving greater than 50,000 persons must have the inventory on the system's website.



SLIs: Day-to-Day Operations

- Inventories must be updated as more info is discovered
 - Meter Readings
 - Installation & Maintenance Projects
- Updated SLI must be submitted to DEC according to LCR sampling frequency
- Changes to infrastructure or new information will dictate future sampling locations

Demonstration of the SLI Template

- Template Layout: Intro, Instructions, Content
- Moving between Excel tabs/worksheets
- Fillable/typable fields
- Frozen panes
- Required fields
- Coordinate inputs and errors
- GRR auto-fill
- Dates (MM/DD/YYYY or YYYY)
- Saving the file
- Submitting to ANR Online

Bipartisan Infrastructure Law Funds

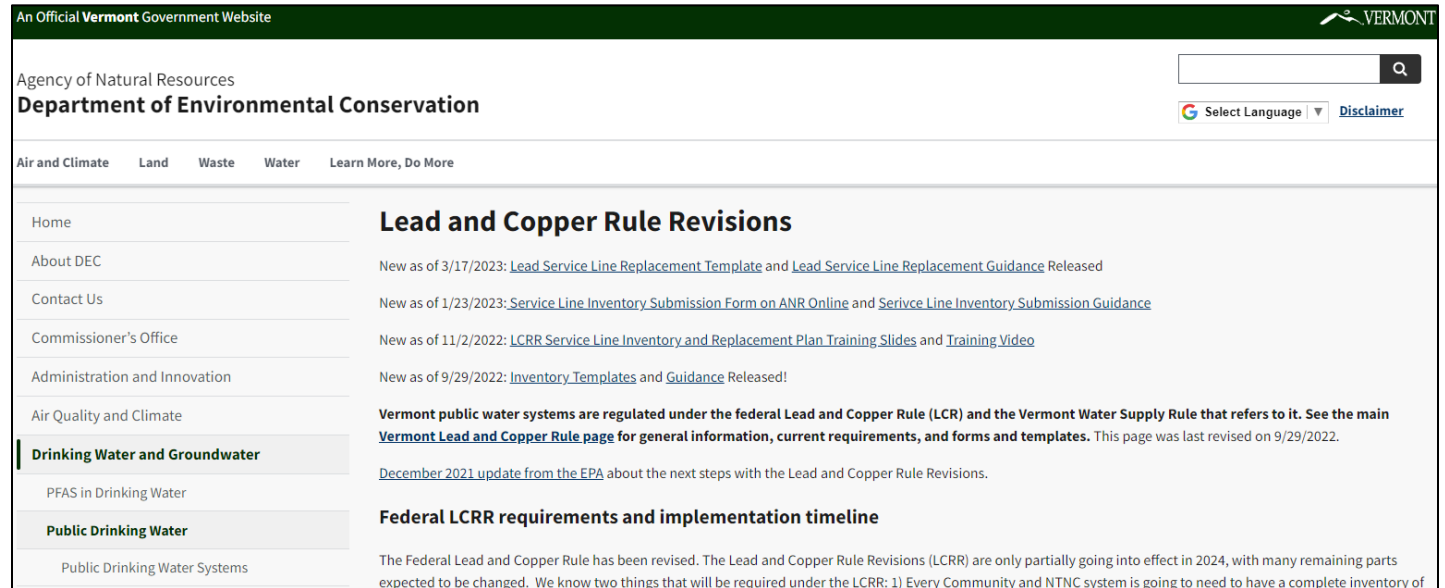
- Systems service more than 1,000 people
 - Eligible for forgivable loans up to \$100,000
 - Above \$100,000: low interest rate
- NTNC Schools & Day Care Facilities
 - DEC staff assisting with inventories
- Other NTNC and Community Systems
 - Contract support: funded & managed by DEC
 - Assist operators with inventories

Use of Federal Funds

- Federal funds may not be used for partial lead service line replacement--only full service line replacements.
- Federal funds may not be used for plumbing and fixture replacements in community systems.
- Federal funds *could* be used for premise plumbing replacements in non-profit NTNC systems if the SRF eligibility requirements are met.

DWGPD LCRR Webpage

- <https://dec.vermont.gov/water/drinking-water/water-quality-monitoring/lead-copper-rule-revision>
- SLI Templates
- LSLR Plan Template
- Guidance
- How-to Instructions



An Official Vermont Government Website

Agency of Natural Resources
Department of Environmental Conservation

Air and Climate Land Waste Water Learn More, Do More

Home
About DEC
Contact Us
Commissioner's Office
Administration and Innovation
Air Quality and Climate
Drinking Water and Groundwater
PFAS in Drinking Water
Public Drinking Water
Public Drinking Water Systems

Lead and Copper Rule Revisions

New as of 3/17/2023: [Lead Service Line Replacement Template](#) and [Lead Service Line Replacement Guidance](#) Released

New as of 1/23/2023: [Service Line Inventory Submission Form on ANR Online](#) and [Service Line Inventory Submission Guidance](#)

New as of 11/2/2022: [LCRR Service Line Inventory and Replacement Plan Training Slides](#) and [Training Video](#)

New as of 9/29/2022: [Inventory Templates](#) and [Guidance](#) Released!

Vermont public water systems are regulated under the federal Lead and Copper Rule (LCR) and the Vermont Water Supply Rule that refers to it. See the main [Vermont Lead and Copper Rule page](#) for general information, current requirements, and forms and templates. This page was last revised on 9/29/2022.

[December 2021 update from the EPA](#) about the next steps with the Lead and Copper Rule Revisions.

Federal LCRR requirements and implementation timeline

The Federal Lead and Copper Rule has been revised. The Lead and Copper Rule Revisions (LCRR) are only partially going into effect in 2024, with many remaining parts expected to be changed. We know two things that will be required under the LCRR: 1) Every Community and NTNC system is going to need to have a complete inventory of

Lead Service Line Replacement Plans

- LSLR Plan's 7 Sections
- Strategies for ID'ing unknown lines
- <https://dec.vermont.gov/water/drinking-water/water-quality-monitoring/lead-copper-rule-revision>
- Guidance Document
- Plan Template
- ANR Online Submission

Lead Service Line Replacement Plans

1. Strategy for identifying lead status unknown lines
2. Procedure for conducting full lead line replacement
3. Strategy for informing customers before LSL replacement
4. LSL replacement goal rate
5. Procedure for customers to flush service lines and premise plumbing of particulate lead
6. LSL prioritization strategy
7. Funding strategy for conducting replacements

“Unknowns”

- Not in the PWS’s best interest to default to ‘unknown’
 - If the pipe is dug up and not lead, then the replacement doesn’t count towards the minimum replacement goals
- Do your best to find records or perform a visual observation
- If material type is unknown, then note installation year
 - Service Lines installed after July 1, 1989 VT lead ban
- After 2024 → ‘digging’ into the unknowns (pre-lead ban)

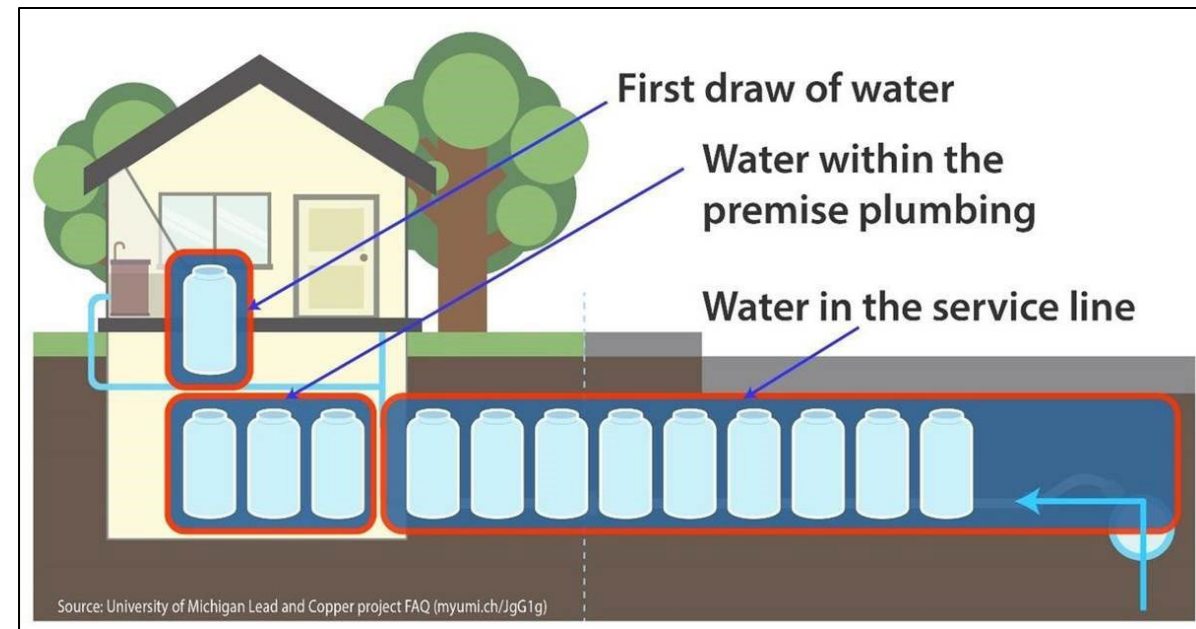
Excavation

- PWSs should not be excavating to develop initial inventory
- Possible Next Step in 2025+
- Digging/trenching or hydrdo-vac/potholing



Water Quality Sampling

- Water Quality analysis COULD be used to ID unknown lines
 - System-by-system approach
 - Cannot always confirm non-lead
 - Helpful to ID line that IS lead
- Sampling Techniques
 - Targeted
 - Flushed
 - Sequential



LSLR Plan Template & Guidance

Lead Service Line Replacement Plan

Water System Name

WSID: #####

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

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

Water Quality Sampling

- Service Line Sampling
Calculate premise plumbing volume, flush out premise plumbing, then collect and analyze a service line sample.
- Flushed Sampling
After a set flushing time, collect and analyze a sample.
- Sequential Sampling



Guidance on Lead Service Line Replacement Plans

Lead Service Line Replacement Plans

- Strategies for ID'ing unknown lines
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Summary

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- DEC's Strategies to Assist Water Systems
- Service Line Inventories
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Bruce King | Bruce.King@Vermont.gov

Sustainable Infrastructure Section Supervisor

802-622-4840

