LCRR Service Line Identification Guidance

Massachusetts Department of Environmental Protection Drinking Water Program's (MassDEP DWP) guide on how to identify a service line, what to include in your Service Line Inventory (SLI), and how to include unique service line arrays in your SLI workbook.

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Updated 05/28/2024.

What is a Service Line?

A service line is the pipe connecting the water main to the interior plumbing in a building. The service line may be owned wholly by the water system, the customer, OR ownership may be split between the two.

Which Service Lines Must PWS Include in the Initial Service Line Inventory?

Under the Lead and Copper Rule Revisions (LCRR) the initial service line inventory (SLI) 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 customer as well as both the system-owned (public) and customer-owned (private) portions where ownership is split (See Figure 1 for an example of ownership distinction). This also includes service lines regardless of actual or intended use, for example, service lines:
    - with non-potable applications such as fire suppression or those designated for emergency use
    - connected to vacant or abandoned buildings, even if they are unoccupied and water service is turned off because they could be repurposed in the future for a potable or non-emergency use.
- **multiple structures or buildings on a property**
- **a well to a single building such as when the system meets the definition of a Community Water System (COM) or Non-Transient Non-Community Water System (NTNC) but does not have an extensive distribution system.**

The water main is NOT a service line and is not included in the service line inventory.

EPA recommends that systems include in their inventory any pipes not connected to buildings that have the potential to be lead, such as **Goosenecks, Pigtails and Connectors. Goosenecks, pigtails, and connectors are not required in the LCRR Initial SLI but will be required in the Lead and Copper Rule Improvements (LCRI) Baseline SLI, based on the proposed LCRI.**

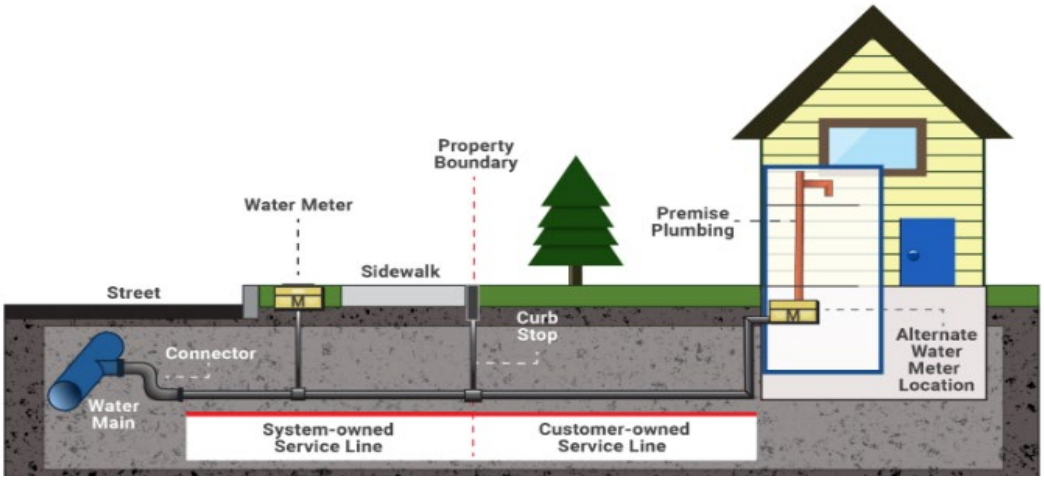
Goosenecks, Pigtails and Connectors

A gooseneck/pigtail/connector is defined as a piece of pipe typically not exceeding two feet in length that connects the water main to the service line or the service line to the water meter of a building. While EPA states that a gooseneck/pigtail/connector is not considered a part of a service line, MassDEP retains the right to include goosenecks/pigtails/connector in its definition of service lines. MassDEP expects all public water suppliers to remove any lead pigtails/goosenecks/connectors when discovered.

FIGURE 1 - SERVICE LINE OWNERSHIP

Figure 1 was originally created for the EPA Guidance for Developing and Maintaining a Service Line Inventory, which can be found here:

https://www.epa.gov/system/files/documents/2022-08/Inventory%20Guidance_August%202022_508%20compliant



Community Water Systems (COM) Service Line Configuration Examples

Typical COM Distribution System

Systems are required to identify and inventory the composition of piping that connects the water main to each building and structure. **For the purposes of the inventories, a water main is a pipe that serves more than one connection. The service line serves only one connection.** See Figure 2 below for a visual on what is considered a service line in a typical community water system.

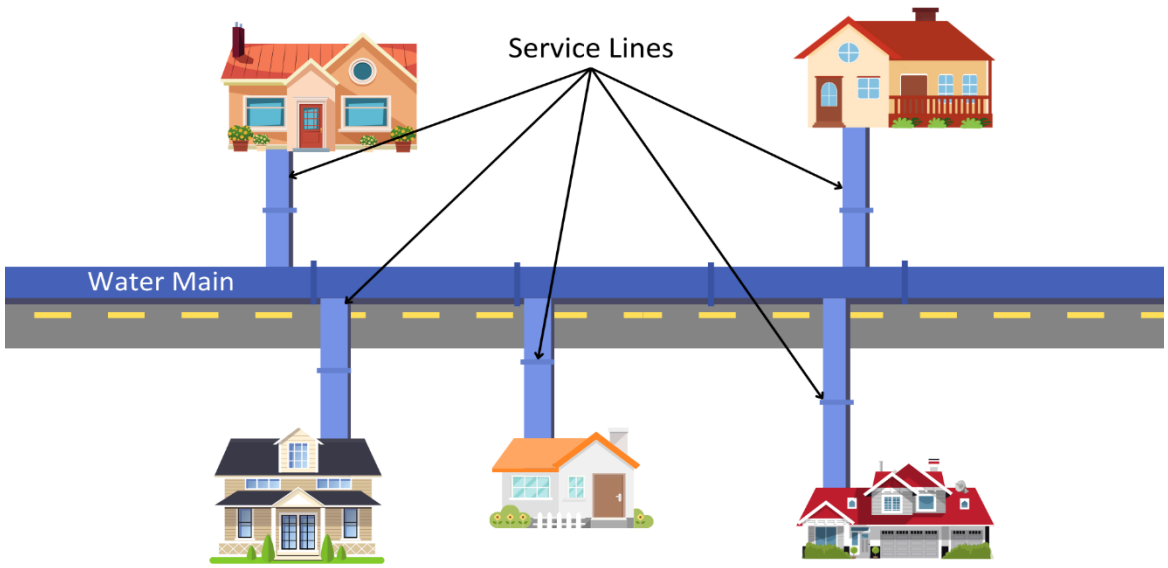


FIGURE 2 - TYPICAL SERVICE LINE ARRAYS OF COMMUNITY WATER SYSTEMS

Shared Service Lines

In the case of a situation such as in Figure 3, where a single public service line splits into multiple private service lines, each private service line is considered a separate service line and must be included and given a unique identifier in the service line inventory. A unique identifier may be considered appending a letter to each locational identifier.

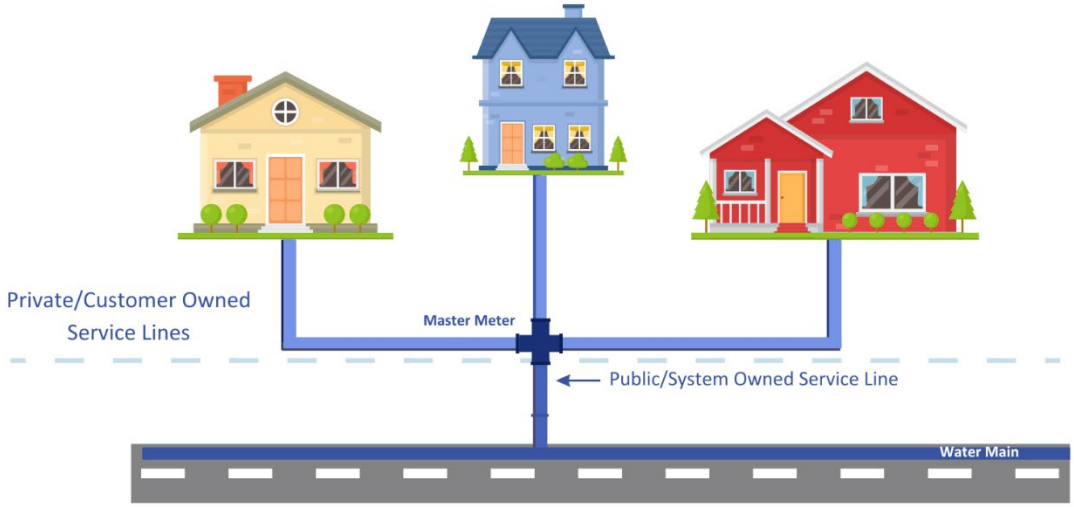
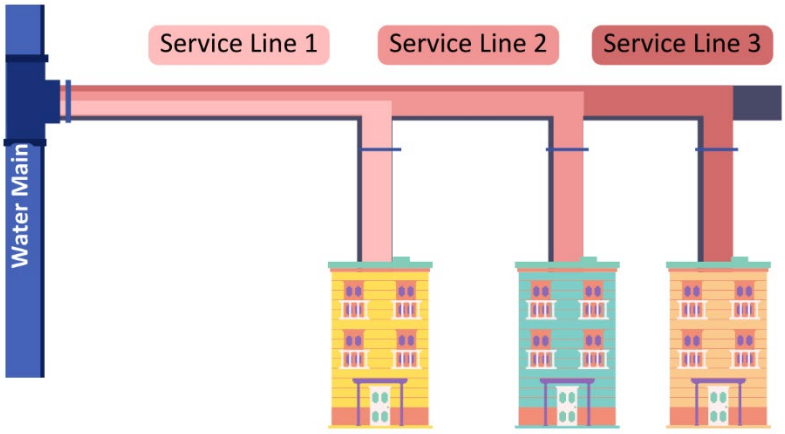


FIGURE 3 - EXAMPLE OF A COM PWS WITH A MASTER METER AND MULTIPLE SERVICE LINES

Figure 4 has a PWS with one pipe which then splits off to feed three buildings. The complexity of this scenario is that the upstream service line, perpendicular to the water main, and the composition of the first segment can impact the water quality of all three buildings. Because of this, the entirety of the upstream service line prior to it angling to the building should be included as the public/upstream portion of that service line. In the figure, this is represented through the variation of colors of pink. Service line 1 consists of the light pink, service line 2 consists of the medium pink, and service line 3 consists of the pink-red color. If there are more than two materials in the service line, than follow the instructions in **Scenario F** on how to classify such a service line.



Non-Community Non-Transient (NTNC) Service Line Configuration

Many examples provided throughout this guidance have been discovered through the *MassDEP / UMass Amherst Free Small Systems SLI / LSLRP Technical Assistance (TA) Program.* Small COM PWS and NTNCs are recommended to apply for SLI assistance through the TA Program here*:* *https://www.mass.gov/forms/massdep-service-line-inventory-and-lead-service-line-replacement-plan-technical-assistance-survey*.

Examples and Configurations with Multiple Service Lines on a Single Property

Many NTNCs will have a simple single service line connection on the property like is the case for Figure 5 below. However, other NTNCs may have multiple service lines on the property that must be inventoried. For examples on how to identify what is considered a service line for a NTNC, see the figures below.

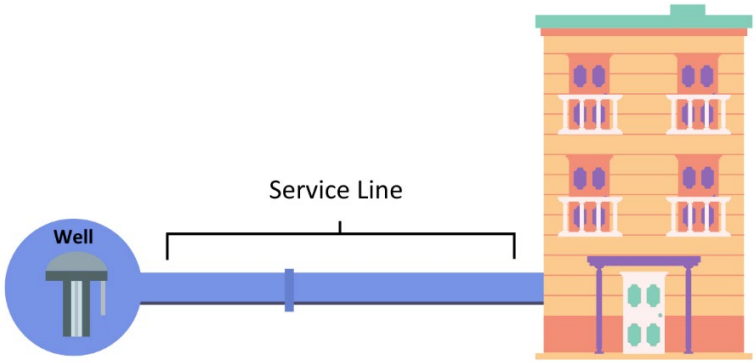


FIGURE 5 - A COMMON NTNC SYSTEM

In the case of Figure 6, the NTNC not only has a service line connecting the well, its source of water, to the building, but another service line exiting the building to connect to a concession stand. According to the EPA, both lines are service lines, and must be included in your SLI.

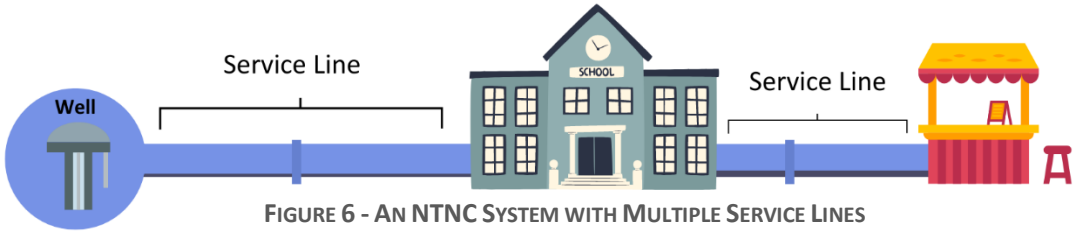


FIGURE 6 - AN NTNC SYSTEM WITH MULTIPLE SERVICE LINES

Figures 5 and 6 are based on the graphics provided in the EPA "Developing and Maintaining a Service Line Inventory: Small Entity Compliance Guide", which can be found here:

https://www.epa.gov/system/files/documents/2023-06/Final%20Small%20System%20Entity%20Inventory%20Guide_508.pdf

Figure 7 is an example of an NTNC in which the NTNC has treatment, which is provided in the middle of the connection from the well to the building. In this scenario, the pipe before the treatment is considered a raw water distribution line, and does not need to be included in your SLI. The pipe after the treatment is delivering finished water to the consumers, and is considered a service line. This service line after treatment must be included in your SLI.

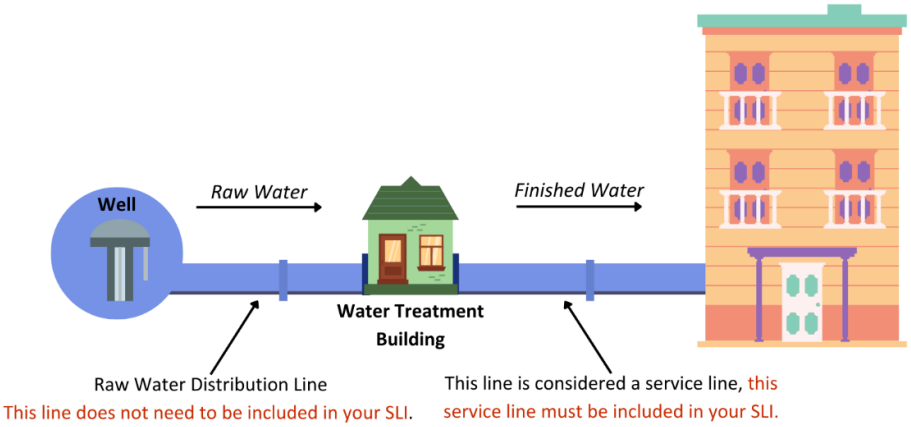


FIGURE 7 - AN NTNC SYSTEM WITH TREATMENT INSTALLED

In Figure 8, this is an example of an NTNC system, which receives its water from a well, which is then distributed to building one (blue), an outdoor water fountain, building two (orange), and an outdoor storage tank. For this and similar scenarios, all four pipes connecting building one to the other structures are considered service lines. Each service line included in the figure below would be required to be documented in your inventory. This example, does, however, bring into play a concern regarding public health. In this scenario, service line 1 is upstream of all other service lines in this system. Therefore, if service line 1 is lead, anyone drinking water from the structures afterwards is at risk of elevated lead levels. Therefore, if a system has an unknown service line, LSL, or GRR service line upstream of other service lines, such as in this example, the PWS must notify consumers downstream of that unknown (UNK), lead service line (LSL), or galvanized requiring replacement (GRR) service line of this service line, and their potential risk of lead. For this scenario, all structures with a dark blue border must be notified, or have a public notice displayed with this information.

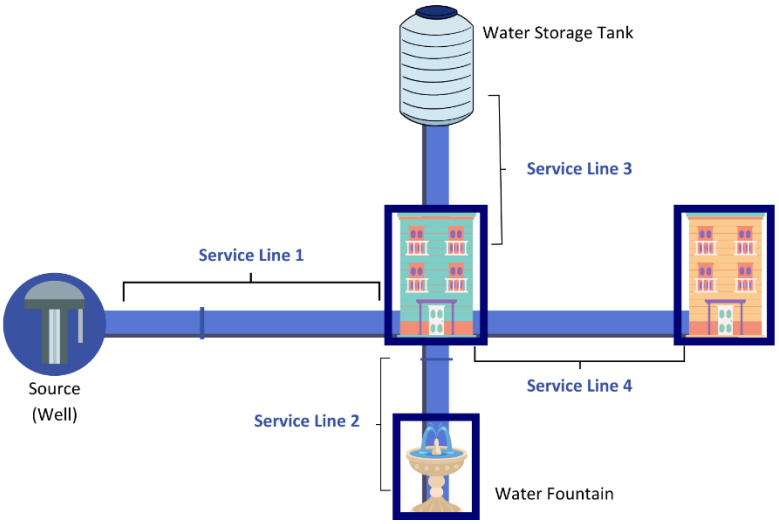


FIGURE 8 - CONSECUTIVE SERVICE LINES IN AN NTNC PWS

Figure 9 is similar to figure 8, in the sense that this is a PWS that has pipes running from one building to another, which are consecutive service lines. This example consists of three service lines; however, the composition of the upstream service line can impact the downstream service line. Therefore, if, for example, service line 1 contains lead, then the users of all buildings after service line 1 should be notified (all three buildings following service line 1).

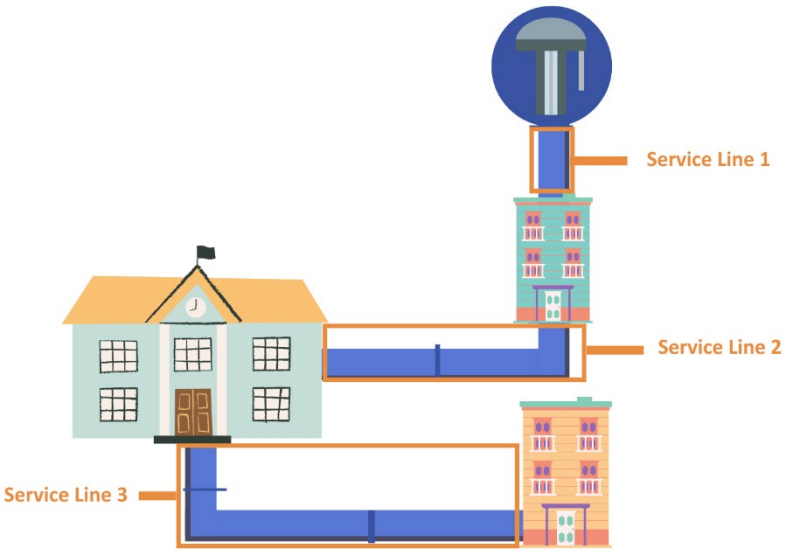


FIGURE 9 - A CONSECUTIVE SERVICE LINE CONFIGURATION FED FROM A WELL

If there is a multiple building system and the buildings have pipes connecting the structures and delivering water from the original source (for example, a well or water main), the pipes connecting the buildings and/or structures are considered service lines that will need to be included in the SLI. See figures 10 and 11 for visuals of these examples.

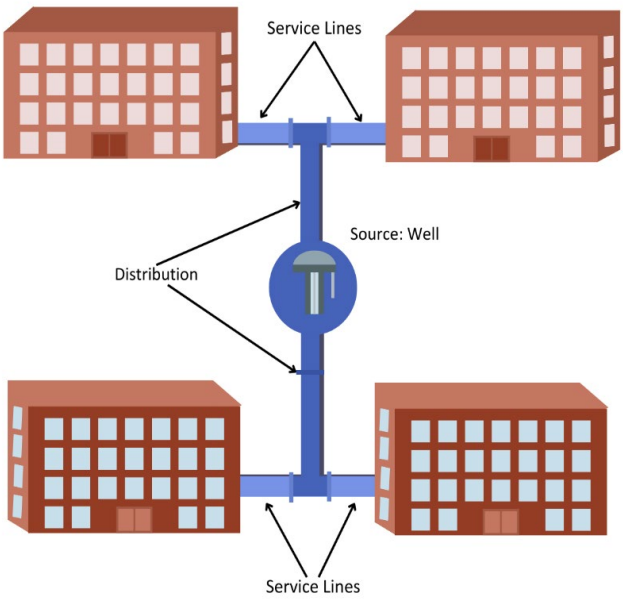


FIGURE 10 - AN EXAMPLE OF A MULTIPLE BUILDING SYSTEM SERVICE LINE ARRAY

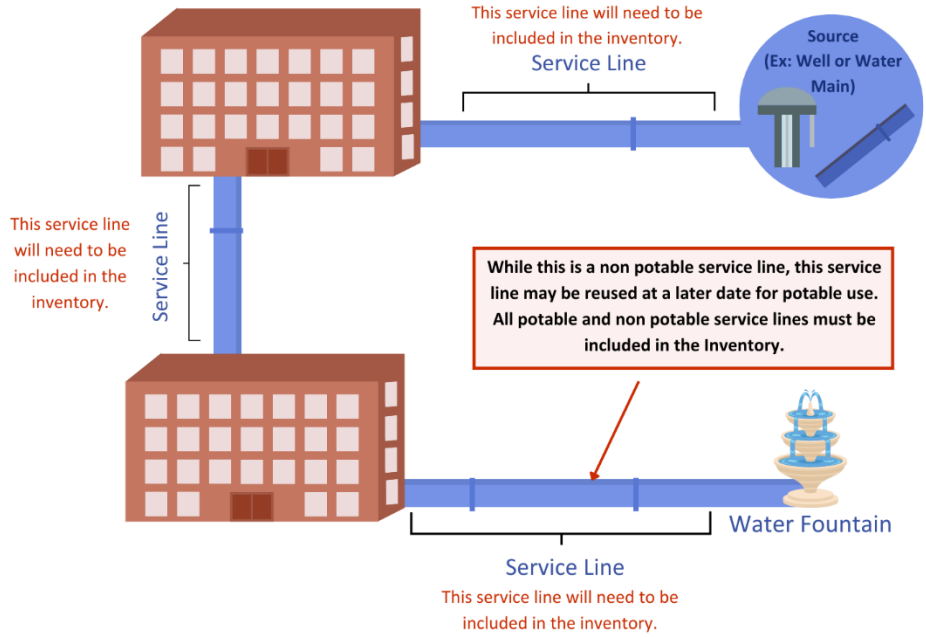


FIGURE 11 - AN EXAMPLE OF A MULTIPLE BUILDING SYSTEM WITH A WATER FOUNTAIN SERVICE LINE CONNECTION

Service Line and Tank Connection Configuration Examples

Systems with only one building, such as a school or condominium, or systems serving a building with a storage tank, may have concerns on how to document the service lines of a property based on the location of their storage tank- either **inside the building or before the water meter**. Both examples are shown below.

If the storage tank is located within the building, for example in a basement, those lines would be considered premise plumbing and do not have to be inventoried. Note, however, that any lead lines or lead components of the lines within premise plumbing, such as lead solder, could contribute to lead in the drinking water. If the storage tank is located before the service line meets the building, then both segments of the service line must be inventoried. See figures 12 and 13 for a visual of these scenarios.

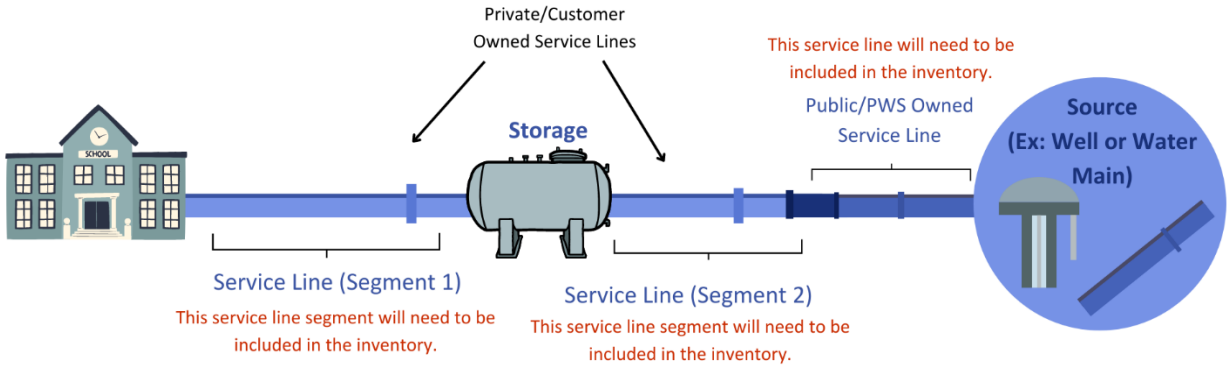


FIGURE 12 - A SERVICE LINE ARRAY WITH A STORAGE TANK

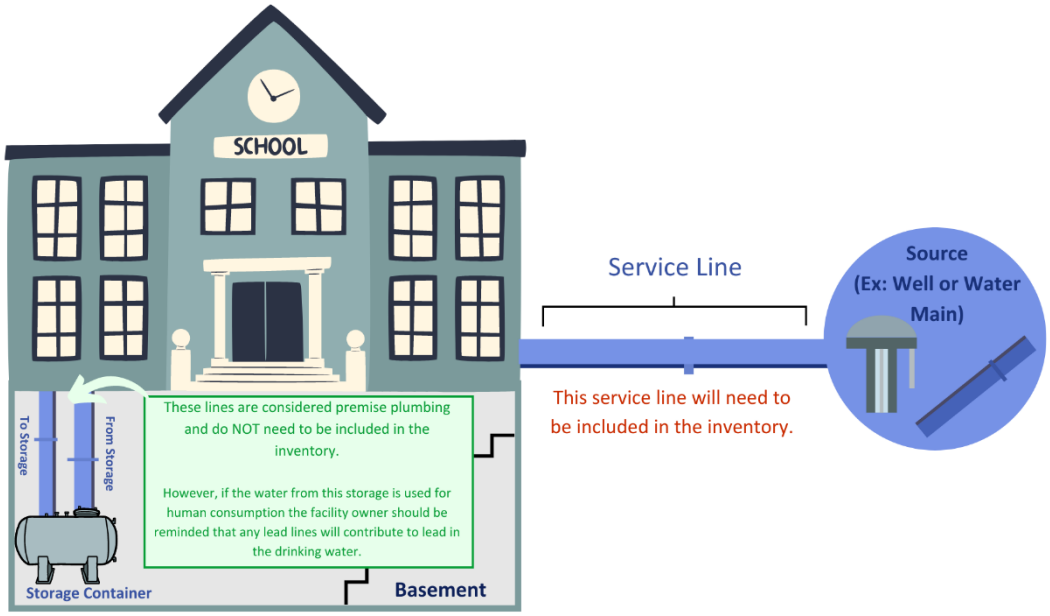


FIGURE 13 - A SERVICE LINE ARRAY WITH A STORAGE TANK CONNECTED TO PREMISE PLUMBING

Non-Potable Service Line Configuration Example

PWS must include all service lines in their inventory, regardless of the actual or intended use. These include service lines with non-potable applications such **as fire suppression or those designated for emergency**. These service lines could be repurposed in the future for a potable or non-emergency use.

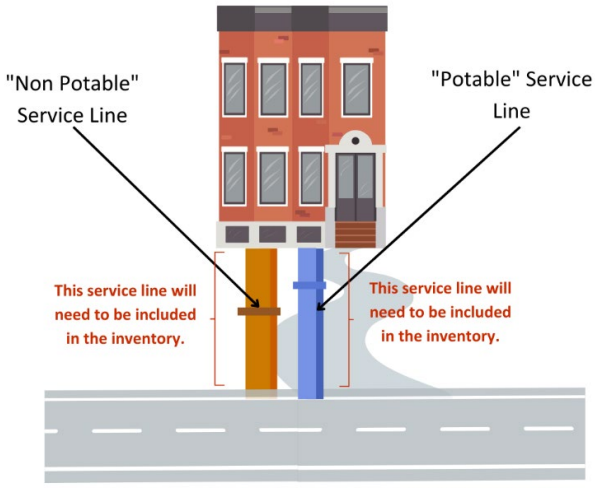


FIGURE 14 - POTABLE AND NON-POTABLE SERVICE LINES

Consecutive System Service Line Configuration Examples

Consecutive systems vary tremendously and offer multiple examples of unique service line arrays that must be inventoried, as well as connections that may not. See the following three examples on how to inventory unique service line configurations.

Figure 15 depicts a situation where one parent system distributes water to another system, the consecutive system, through a water main. Given the example, where the change in ownership between PWS is shown in the middle of a water main and not a service line, neither PWS would need to categorize this pipe in their SLI. The Water Main is not considered a service line.

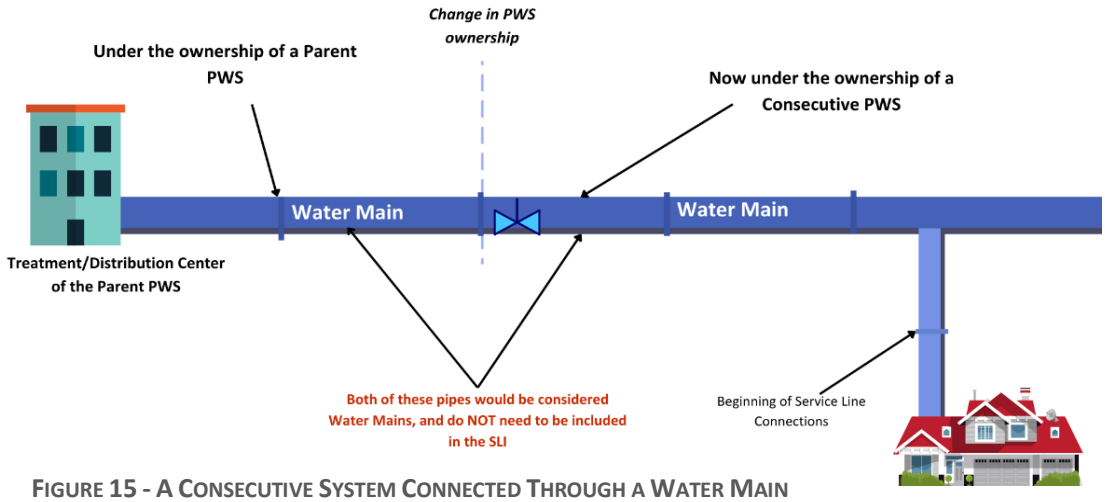


FIGURE 15 - A CONSECUTIVE SYSTEM CONNECTED THROUGH A WATER MAIN

Consecutive Systems and Treatment Configuration

Figures 16 and 17 show two different scenarios, where a consecutive PWS treats the water distributed by the parent PWS, however the treatment may vary in where it is located. The placement of the treatment, and where the PWS Ownership changes, determine how many service lines each PWS must inventory.

In Figure 16, the treatment of the consecutive PWS is inside the building. The PWS ownership changes at the building inlet. In this example, the parent PWS must inventory the entire service line to the building inlet. The consecutive PWS, however, does not have any service lines to inventory, in this example. Since the treatment is located inside the building, and the PWS ownership changes at the inlet, there are no service lines in the consecutive PWS.

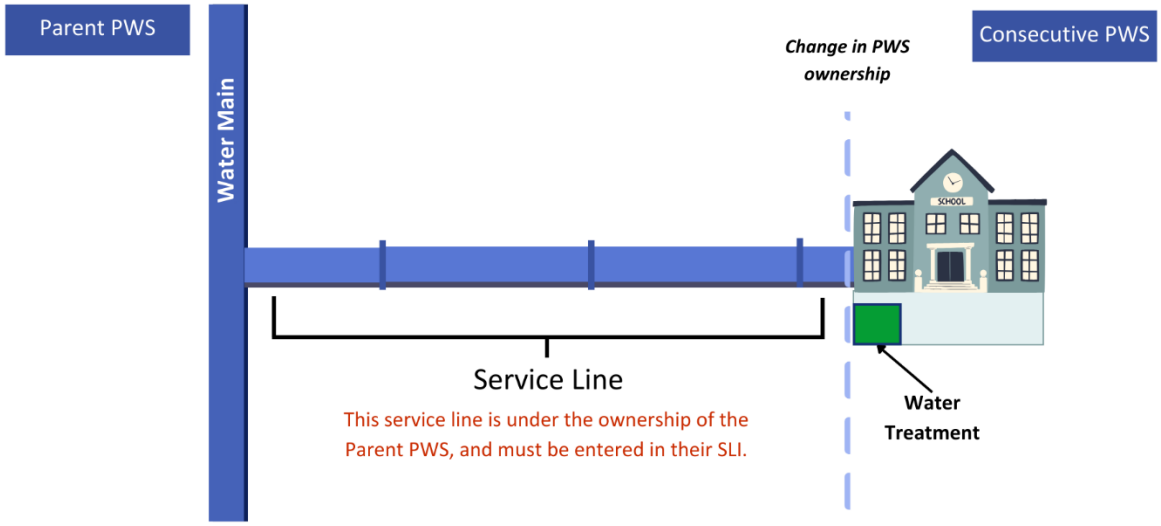


FIGURE 16 - A CONSECUTIVE SYSTEM WITH TREATMENT INSIDE THE CONSECUTIVE PWS BUILDING

Figure 17 changes where the treatment is located. This affects how the service line is inventoried. In figure 14, treatment is located outside the building of the Consecutive PWS. In this scenario, both the parent PWS and the consecutive PWS have one service line to inventory.

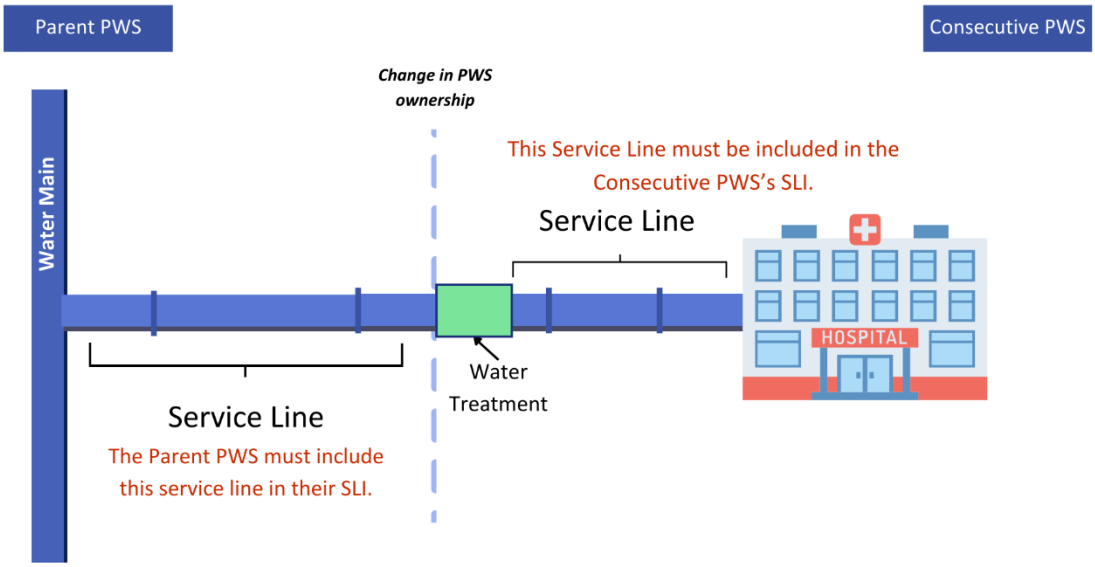


FIGURE 17 - A CONSECUTIVE SYSTEM WITH TREATMENT OUTSIDE THE CONSECUTIVE PWS BUILDING

Lead Service Line and Galvanized Service Line Configuration Examples

Galvanized Steel is a service line material that may need to be replaced based on the presence - current or historically - of lead or an unknown material. If a galvanized steel service line is downstream of a lead service line, a service line of unknown material, or a service line that is currently non-lead, but was previously lead or an unknown material, it is considered a Galvanized Requiring Replacement service line (GRR). In a scenario where there is a lead service line upstream and a galvanized service line downstream, the entire service line is classified as lead and the galvanized service line (GRR) will need to be replaced**.** In the scenario where there is a service line upstream of a galvanized service line that was previously lead, or unknown if it was lead, the galvanized service line is considered a GRR, and must be replaced. In the case of unknown service lines, if an unknown service line is found upstream of a galvanized service line, the expectation is the unknown and may be lead until proven as another material, and therefore the galvanized service line is considered GRR, unless the unknown service line is later identified as a non-lead material, and was never lead. See figure 18 for visuals of these scenarios.

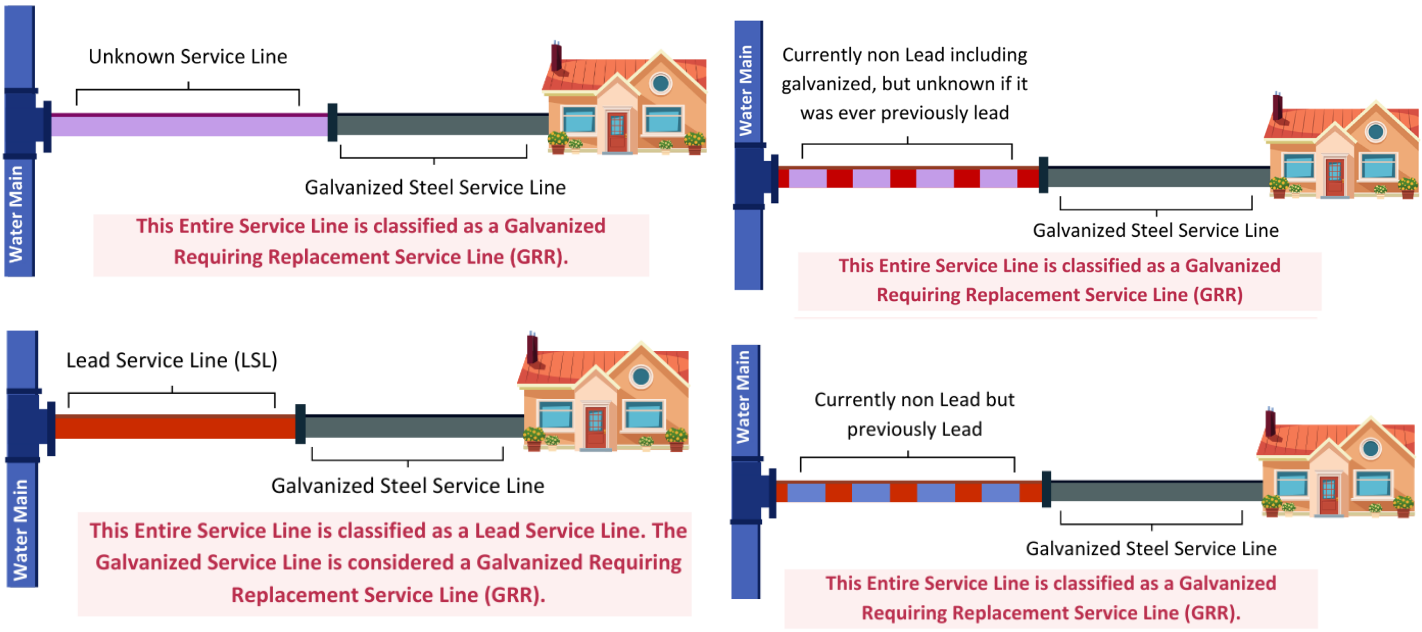


FIGURE 18 - GALVANIZED REQUIRING REPLACEMENT (GRR) SERVICE LINE ARRAYS

If a galvanized steel service line is upstream of a service line of any material, it is **not** considered a GRR service line. The upstream placement of the galvanized service line means it is not affected by lead (or possible lead) of another service line. galvanized steel service lines are also not considered a GRR service line if the material upstream is not lead, and was never previously lead. See figure 19 below for visuals of these scenarios.

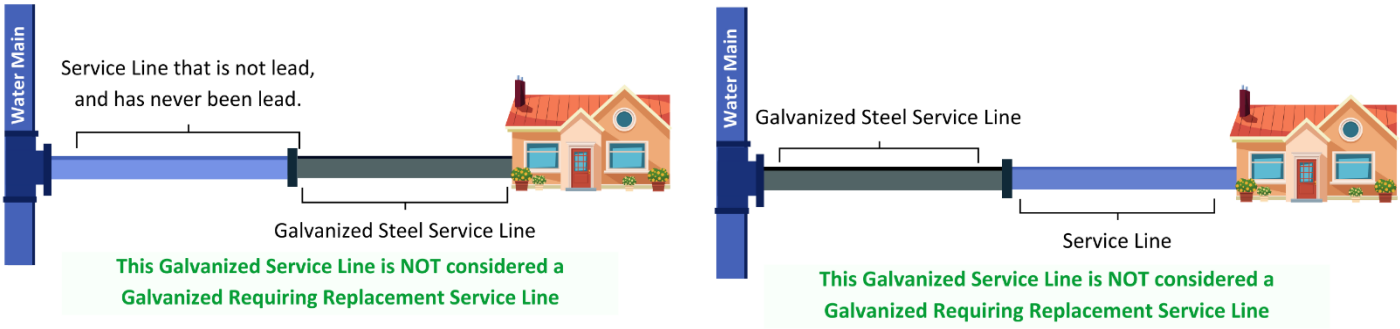


FIGURE 19 - GALVANIZED STEEL SERVICE LINES ARRAYS THAT ARE NOT CONSIDERED GALVANIZED REQUIRING REPLACEMENT (GRR)

Distribution Loop Service Line Configuration

Figure 20 shows a less common example, where the water main feeds off into a distribution loop, which is a loop of piping which then feeds into the service lines. When a scenario such as this arrives, the distribution loop is not considered a service line, only the pipes leading from the distribution loop to the building are considered service lines. The distribution loop would be considered, for this purpose, part of the water main. Whether this distribution loop is publicly owned or privately owned, the service lines to all five houses on this loop must be included in the inventory.

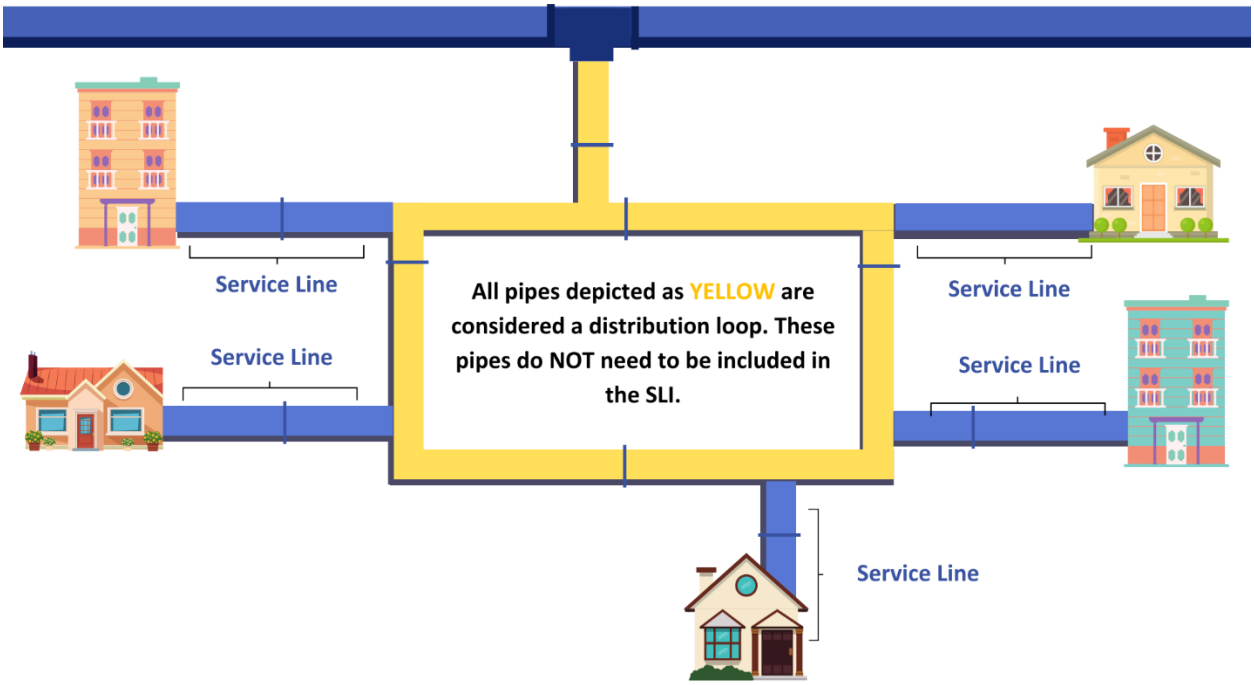


FIGURE 20 - SERVICE LINES WITH A DISTRIBUTION LOOP

Entering Unique Service Lines Configurations into the Service Line Inventory Excel Workbook

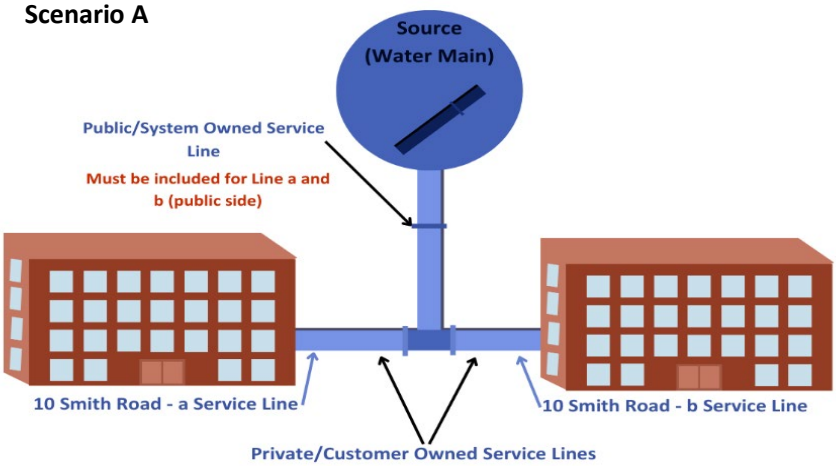
	SITE ID	LOCATIONAL IDENTIFIER	LCR SAMPLING LOCATION?	CONNECTOR (GOOSENECK / PIGTAIL) CURRENTLY PRESENT?	CONNECTOR (GOOSENECK /PIGTAIL) MATERIAL	CURRENT PUBLIC SERVICE LINE MATERIAL	WAS PUBLIC SERVICE LINE MATERIAL EVER PREVIOUSLY LEAD?	PUBLIC SERVICE LINE SIZE (inches)	PUBLIC SERVICE LINE INSTALL DATE (YYYY)	CURRENT PRIVATE SERVICE LINE MATERIAL	PRIVATE SERVICE LINE SIZE (inches)	PRIVATE SERVICE LINE INSTALL DATE (YYYY)	ENTIRE SERVICE LINE CLASSIFICATION
Scenario A:	1	10 Smith Road – a	NO	NO		HDPE	NO	1"	1995	C	1"	2012	NON-LEAD
	2	10 Smith Road – b	NO	NO		HDPE	NO	1"	1995	PVC	1"	2012	NON-LEAD
Scenario B:	3	2 David Street	NO	NO		PVC	YES	1"	1998	C	1"	1990S	NON-LEAD
	4	4 David Street	NO	NO		PVC	YES	1"	1998	C	1"	2000	NON-LEAD
	5	6 David Street	NO	NO		PVC	YES	1"	1998	PVC	1"	2005	NON-LEAD
Scenario C:	6	46 State Avenue	NO	YES	C	C	NO	1"	1980S	L	1"	1980S	LEAD
Scenario D:	7	56 Sally Road – a	NO	NO		HDPE	NO	3"	1990S	C	1.5"	1990S	NON-LEAD
	8	56 Sally Road – b	NO	NO		HDPE	NO	1.5"	1990S	HDPE	3"	1990S	NON-LEAD
Scenario E:	9	167 Veronica Road – a	NO	NO		C	NO	1.5"	1997	C	1"	1997	NON-LEAD
	10	167 Veronica Road – b	NO	NO		C	NO	1"	1997	C	1"	1997	NON-LEAD
Scenario F:	12	18 School Lane – b	NO	NO		PVC	UNK	1"	1998	L	1"	1980s	LEAD

Scenario A: A location with multiple service lines on the property.

	A	B
	SITE ID	LOCATIONAL IDENTIFIER
Scenario A:	1	10 Smith Road – a
	2	10 Smith Road – b

If there is a location with multiple service lines on the property, such as a school, college, condominium, and other facilities with multiple separate buildings/structures on the property, the service lines should be documented with the same address, but include additional identifiers, such as a, b, and c. In scenario A, this is shown for sites one and two, for the location 10 Smith Road. The two service lines on this property are listed as “10 Smith Road – a,” and “10 Smith Road – b.” The comment section may be used for further identification/clarification for each service line, e.g., “Line to Condo Building A,” “Line to Condo Building B” or “Line connecting Smith Building to Jones Hall.”

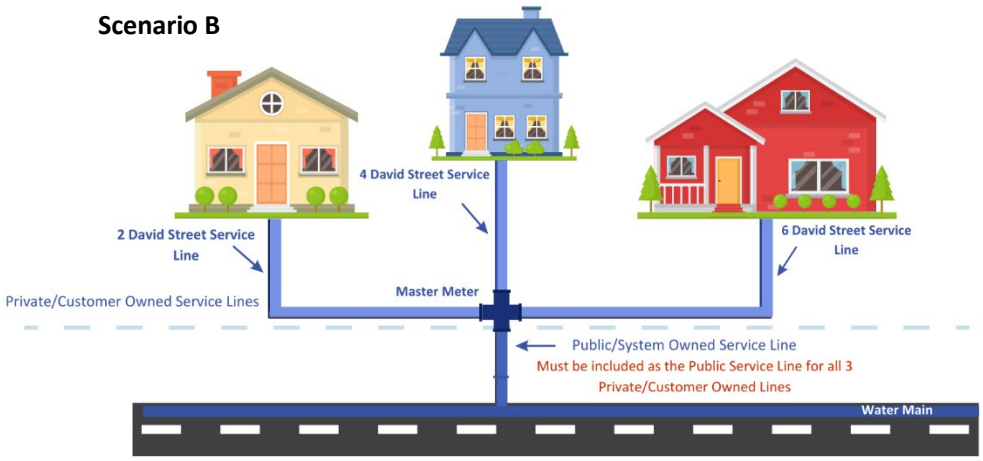
Scenario A



Scenario B: Three Locations with a “shared” public service line

	A	B
	SITE ID	LOCATIONAL IDENTIFIER
Scenario B:	3	2 David Street
	4	4 David Street
	5	6 David Street

If there is a set of locations in your inventory that each have their own private service line, but meet at one public service line, this could be considered a “shared” public service line. If this situation is found in your inventory, each private service line must be included in the SLI and include the same information for the public service line portion. Specifics of this situation can be included in the comments for future reference (see Figure 9).



Scenario C: A service line with an identified lead gooseneck/pigtail.

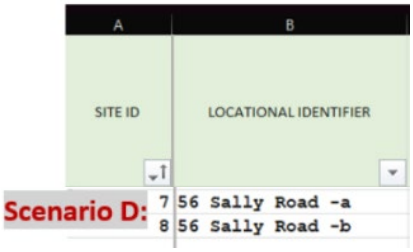
	SITE ID	LOCATIONAL IDENTIFIER	LCR SAMPLING LOCATION?	CONNECTOR (GOOSENECK / PIGTAIL) CURRENTLY PRESENT?	CONNECTOR (GOOSENECK /PIGTAIL) MATERIAL
Scenario C:	6	46 State Avenue	NO	YES	C

Any goosenecks/pigtails found during the inventory process must be documented in the SLI. Scenario C includes an example of how to document a gooseneck/pigtail found during normal operations when replaced. See Figure 21 below for an example of how to document if a gooseneck was replaced in the comments column.

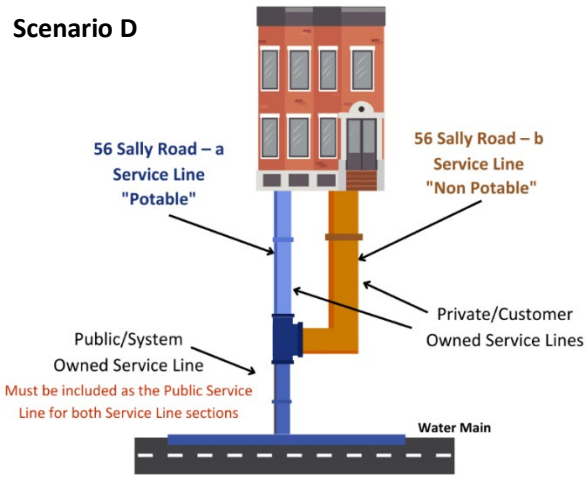
SITE ID	LOCATIONAL IDENTIFIER	COMMENTS
1	10 Smith Road – a	
2	10 Smith Road – b	
3	2 David Street	
4	4 David Street	
5	6 David Street	
6	46 State Avenue	Gooseneck was originally lead, was replaced during field inspection.
7	56 Sally Road – a	
8	56 Sally Road – b	
9	167 Veronica Road – a	
10	167 Veronica Road – b	
11	18 School Lane – a	
12	18 School Lane – b	

FIGURE 21 - USING THE COMMENTS FIELD

Scenario D: A location with a non-potable and potable service line.



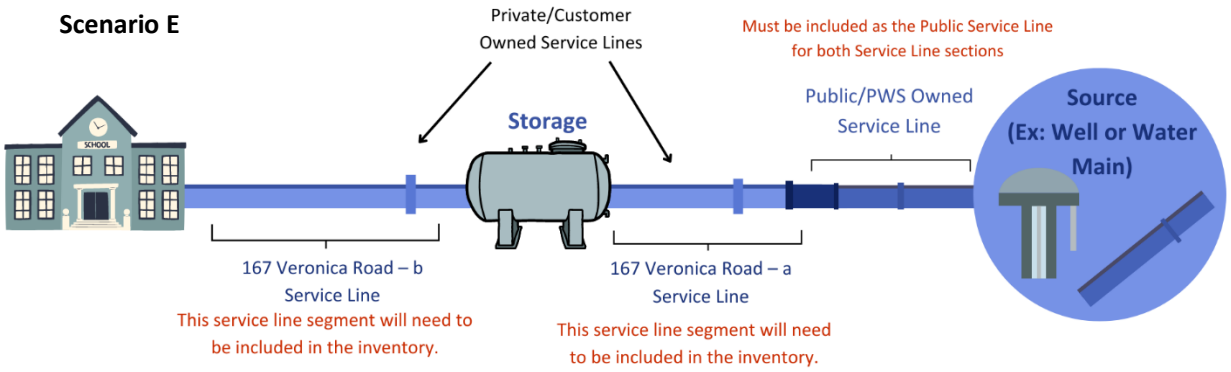
If there is a location that includes multiple service lines, such as a non-potable and a potable service line, the process for documenting the service lines is similar to that of scenario A. Both service lines must be documented with the locational identifier used, in this case the address, with a second unique identifier, in this case “a” or “b” appended to the location identifier. For this example, the two locational identifiers are “56 Sally Road – a” and “56 Sally Road – b”. Both service lines should have the materials, date of installation, size, and so on completed as normal. In the comments field, the non-potable service line will need to be identified (see Figure 9). The same will be expected for any service lines documented that are vacant or abandoned. Use “potable” or “P” for potable lines, and “non-potable” or “NP” for non-potable lines.



Scenario E: A service line with a storage tank located between two service lines.

	SITE ID	LOCATIONAL IDENTIFIER
Scenario E:	9	167 Veronica Road -a
	10	167 Veronica Road -b

If there is a set of service lines with a storage tank, or a similar device, located between the two service lines, both lines must be documented separately in the SLI. Document these service lines similarly to scenarios A and D, with the locational identifiers and additional unique identifiers. In the case of this example, the identifiers are “167 Veronica Road – a” and “167 Veronica Road – b”. Both service lines must be documented, and any additional information can be included in the comments section of the inventory (see Figure 9).



Scenario F: A service line with 2 or more materials in one segment of the service line

	SITE ID	LOCATIONAL IDENTIFIER
Scenario F:	12	18 School Lane

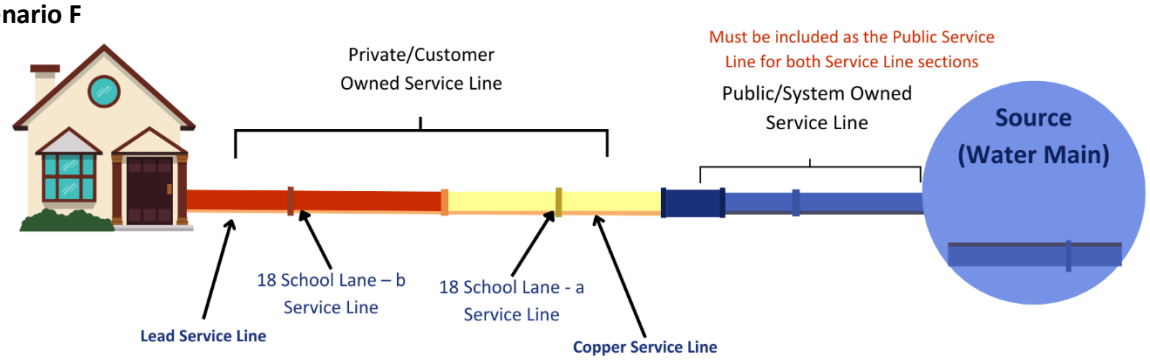
In this scenario, the public service line of the home is a non-lead material, however, the private portion of the service line has two different materials. These materials, in this scenario, are lead and copper. To inventory any service line where one portion of the service line (private/customer owned or public/PWS owned) has two or more materials, then the service line material that makes up the largest amount , i.e. percentage or majority, of the service line should be entered into the corresponding inventory column, and the other material(s) should be entered into the comments field, **unless the smaller portion of the service line is lead, galvanized, or unknown**. If the materials of a service line are equal length, use the ranking below to decide which material to enter into the main column that tracks service line material:

The rank of risk of contributing higher lead levels is as follows, with 1 being the highest priority, and 5 being the lowest.

1. Lead
2. Galvanized
3. Unknown
4. Iron/Steel and other Metal Materials
5. Plastic

In scenario F, the private service line is made of 2 materials of equal length, lead and copper. Based on the ranking above, the private side must be categorized as “L” (Lead), and the copper portion should be noted in the comments section.

Scenario F



Enter in Private Service Line Columns.

Enter in Comments section.

For more examples of service line configurations, MassDEP DWP has created another, condensed version of the Service Line Identification Guidance focusing on common NTNC and small COM service line configurations. See the *LCRR Non-Transient Non-Community (NTNC) and Small Community (COM) PWS Service Lines Identification Guidance* here: https://www.mass.gov/info-details/lead-and-copper-rule-revisions.