Liberty – Bellview Heights (PWS No. CA3600010)

Verification of Lead Status Unknown

November 8, 2023

Acronyms

LCRR	Lead and Copper Rule Revision
LSL	Lead Service Line
PWS	Public Water System
SL	Service Line

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Background

The Lead and Copper Rule Revision (LCRR) requires the PWS to develop an inventory to identify the materials of service lines connected to the public water distribution system (40 CFR §141.84(a)). The PWS must also review sources of information to identify service line materials for the initial inventory. The water system may use sources of information if approved by the State (40 CFR §141.84(a)(3)) such as any identification method to assess service lines materials (40 CFR §141.84(a)(3)(iv)).

One identification method or verification strategy is a statistical approach. The statistical approach allows for completing a service line inventory with a 95% level of statistical confidence (with ±5% margin of error and 50% sample proportion).

A key factor in the success of the strategy mentioned above is the use of a randomly generated list of unknown service lines to be physically inspected. If ANY service line is found to be an LSL (either through the initial records review or the verification process), then this framework will not be used, and an alternate process will be discussed with the State. If NO service line is found to be lead through the records review and verification process, then the remaining unknown service lines will be classified as non-lead, and the submitted inventory will be final (e.g., containing all non-lead service lines). If, in the future, an LSL is found, then the water system will contact the state within 30 days to discuss a path forward. **Since Liberty acquired Apple Valley Ranchos - Bellview Heights in January 2016, Liberty has not encountered any lead service lines.**

Known service lines are defined as service lines where the pipe materials are classified using records [(1)]. Records that can be used to classify a SL are mentioned in 40 CFR §141.84 (a)(3)(i),(ii),(iii),(iv). Records showing that service lines were installed after the state lead ban (or local ordinance with an earlier lead ban) and service lines >2 inches (diameter allowance depends on state) will be considered known and classified as non-lead.

Unknown service lines are defined as a service line of unknown material with no/low confidence documented material history [(1)].

Identification methods or verification strategies are based on system size. The verification strategies for the identification of unknown service lines are:

- ✓ Interpolation: Best for small systems with less than 1,500 unknown service connections. For the interpolation method, the PWS must physically verify at least 20% of the total number of unknown service lines.
- ✓ Stratified Random Sampling: Best for medium systems (1,500 to 10,000 unknown service connections); for large systems (more than 10,000 unknown service connections.) For the stratified random sampling, the PWS must physically verify enough lines to reach a minimum 95% confidence level.

Identification Process

Before using the statistical approach to identify unknown service lines, Liberty completed the initial inventory using approved methodologies, such as the ones mentioned in 40 CFR §141.84 (a)(3), as well as

post-1986 construction and larger pipe diameters, to categorize service lines. Based on the applied methodologies, no LSLs were found. Therefore, it is appropriate to use the statistical approach.

The statistical method includes the following steps:

- ✓ Step 1: Identification of all service lines of unknown material.
- ✓ Step 2: Identification of the number of service lines to be physically inspected.
- ✓ Step 3: Random selection of service lines for physical inspection.
- ✓ Step 4: Physical inspection of the service lines.
- ✓ Step 5: Record of the physical inspection process.
- ✓ Step 6: Results input of unknown service lines into the inventory.
- ✓ Step 7: Retention of identification records.

Step 1: Identification of all service lines of unknown material.

Table 1 shows the total of service connections in Liberty – Bellview Heights (PWS. No. CA3600010).

Table 2 presents the total number of all the water service lines that could not be categorized using the approved methodologies shown in 40 CFR §141.84 (a)(3) for Liberty – Bellview Heights (PWS No. CA3600010).

Table 1: Total of Service Connections

System Name	Total of Service Connections
Liberty – Bellview Heights	50

Table 2: Service Lines with unknown materials

Category		Number of Service Lines
Public Side	**Private Side**	
Unknown	Unknown	0
Known (non-lead)	Unknown	50
Unknown	Known (non-lead)	0
	Total	**50**

Step 2: Identification of the Number of Service Lines to be Physically Inspected.

Liberty – Bellview Heights has fewer than 1,500 unknown service lines, so the interpolation method is appropriate. Using the interpolation method, the PWS must physically verify a minimum of 20% of the total number of unknowns. To ensure that the confidence level in the results is higher, Liberty is proposing the verification of 50% more than the minimum number required.

Table 3 presents the minimum and proposed number of unknown service lines to be physically verified.

Table 3: Minimum and Proposed Number of Unknown SLs to be Physically Verified

Statistical Approach	Total of Unknown SLs	Number of SLs to Verify (Minimum)	Number of SLs to Verify (Minimum x 1.5) (Proposed)
Interpolation	50	10	15

Step 3: Random Selection of Service Lines for Physical Inspection.

From the number of unknown service lines identified in Step 1 and the proposed number from Step 2, Liberty randomly selected service lines to be physically inspected as determined in Step 2. The selection was uniformly random and not based on any specific criteria, which could introduce bias.

The generation of the uniformly random set of service lines for inspection was created using a Microsoft Excel spreadsheet utilizing the RAND function. The RAND function in Excel is one of the functions specially designed for generating random numbers [(2)].

The list of the random set of service lines for physical inspection is presented in Appendix A.

Step 4: Physical inspection of the service lines.

The type of service line verification method that Liberty will use is:

- ✓ **Private Side**: Meter Pit Inspection.

At least one point of verification will be conducted for the portion of the unknown service line. The verification method includes meter pit inspection. If one or more of the original randomly selected sites cannot be verified, the next available location from the random number generation will be used. For example, if a system has 2,000 unknowns and has to verify 322 SLs but is only able to verify 312 SLs, then the next 10 SLs will be taken from the original random number list (e.g., 323 to 333).

Appendix B shows the LSL Field Investigation Sheet for a single site that Liberty will use in the verification process.

Step 5: Record of the physical inspection process.

Liberty will use a Microsoft Excel spreadsheet to enter the service line category and materials observed at each point. The four service line category types shown in 40 CFR §141.84 (4) are lead, non-lead, galvanized requiring replacement, and unknown. Liberty will use subclassification categories (e.g., copper, plastic) to capture the various material types for Liberty's records.

Appendix C shows the recordkeeping spreadsheet that will be used to record the findings.

Step 6: Results input of unknown service lines into the inventory.

For unknown service lines that will be inspected for the statistical sampling, Liberty will record the water system material identification method (physical inspection – meter pit inspection). Liberty will list the exact line material type in the inventory spreadsheet found in Appendix C.

For unknown service lines not needing to be inspected, Liberty will record the material identification method as "*statistical*" and service line material as *non-lead*.

Step 7: Retention of Identification Records.

Liberty will retain all the documentation of all service line identification efforts and will be available to the Division of Drinking water (DDW) if requested.

References

(1) Oregon Health Authority. Statistical Guidance for Evaluating Unknown Service Lines. March 2023.

(2) Cheusheva, Svetlana. How to generate random numbers in Excel: RAND and RANDBETWEEN functions. Available at: https://www.ablebits.com/office-addins-blog/random-number-generator-excel/

Appendix A: Random Set of Service Lines for Physical Inspection

Location	Year Built	Material on the Public Side	Material on the Private Side
17382 Neptune	1957	Non-Lead	Unknown
17397 Jupiter	1957	Non-Lead	Unknown
17377 Jupiter	1957	Non-Lead	Unknown
17316 Neptune	1957	Non-Lead	Unknown
17253 Emerson	1957	Non-Lead	Unknown
17315 Jupiter	1957	Non-Lead	Unknown
17339 Neptune	1957	Non-Lead	Unknown
17200 Dante	1957	Non-Lead	Unknown
17329 Jupiter	1957	Non-Lead	Unknown
17419 Jupiter	1957	Non-Lead	Unknown
17285 Emerson	1957	Non-Lead	Unknown
17411 Jupiter	1957	Non-Lead	Unknown
17315 Neptune	1957	Non-Lead	Unknown
17410 Jupiter	1957	Non-Lead	Unknown
17394 Neptune	1957	Non-Lead	Unknown

Appendix B: LSL Field Investigation Sheet – Single Site

LCRR Field Investigation Template

Date of Inspection: _____

Customer Name: _____

Address/Location of Service Line: _____

Meter Number: _____

Description of Meter and/or Location: _____

Material for Public Service Line

( ) Lead

( ) Galvanized Requiring Replacement

( ) Galvanized

( ) Non-Lead Copper

( ) Non-Lead Plastic

( ) Non-Lead – Other

Material for Private Service Line

( ) Lead

( ) Galvanized Requiring Replacement

( ) Galvanized

( ) Non-Lead Copper

( ) Non-Lead Plastic

( ) Non-Lead - Other

Public Side Pipe Diameter

( ) 5/8 inch ( ) ½ inch

( ) 1 inch ( ) ¾ inch

( ) 1 ½ inch

( ) 2 inch

Private Side Pipe Diameter

( ) 5/8 inch ( ) ½ inch

( ) 1 inch ( ) ¾ inch

( ) 1 ½ inch

( ) 2 inch

Is there a lead connector? (Y) / (N)

Is there a Lead Solder in the Service Line? (Y) / (N)

Describe any other fitting and equipment connected to the service line that contains lead (for example, a backflow preventer or meter containing lead):

_____

_____

Building Type:

( ) Single Family Home ( ) Building

( ) Multi-Family Home ( ) Other: _____

Appendix C: LSL Field Investigation Recordkeeping Spreadsheet.

PWS Name: _____ **PWS No.** _____

LSL Field Investigation Notes										
Investigation Date	**Unique Service Line ID (if any)**	**Address**	**City**	**ZIP Code**	**Public SL Material Classification (*)**	**Public SL Material (**)**	**Pivate SL Material Classification (*)**	**Private SL Material (**)**	**Material Identification Method (***)**	**Comments**

(*) Material classification includes: Non-lead, galvanized requiring replacement, lead, unknown.

(*) Materials include: Copper, plastic, galvanized, lead, other

(***) Meter Pit inspection or Statistical