DESERT WATER

July 20, 2023

California State Water Resources Control Board
Division of Drinking Water
Attn: Jeanne Sabin
P.O. Box 100
Sacramento, CA 95812-0100

RE: **Lead and Copper Rule Revisions (LCRR) – Lead Service Line Inventory (LSL)**
Methods of Identification Approved on a Case-by-Case Basis
Desert Water Agency Revised Written Plan

Greetings,

The Desert Water Agency (DWA) is in the process of developing its lead service line (LSL) inventory as required by the Lead and Copper Rule Revisions (LCRR). Per the fact sheet and guidelines published by the State Board, there are methods of identifying service line material classification that may be approved for use on a case-by-case basis.

DWA submitted its original proposed method of interpolation to the State Water Resources Control Board, Division of Drinking Water (SWRCB-DDW) staff in a letter dated October 25, 2022. After reviewing the initial proposed methods, DWA staff met virtually with SWRCB-DDW staff on February 1, 2023, to discuss the original proposed method, answer questions, and suggest revisions that may help reduce the number of physical inspections by DWA staff for its LSL inventory.

After meeting with SWRCB-DDW staff, DWA reviewed additional studies and documents pertaining to the development of LSL inventories in the State of California. Based on information gathered from these various documents and studies, DWA submitted a written plan with revised method for identifying material on customer side services in its system to SWRCB-DDW staff on June 13, 2023. SWRCB-DDW staff indicated in an email dated June 22, 2023, that it could not approve the revised approach as written. SWRCB-DDW staff provided additional comments and recommended use of a 95% confidence level approach for determining the minimum number of services to be physically inspected in the system.

Included with this letter is DWA's revised written plan that utilizes the 95% confidence level approach recommended by SWRCB-DDW staff. Services with unknown customer side service material have been separated into decade groups, and the 95% confidence level approach applied to each group to generate the minimum number of services to be physically inspected.

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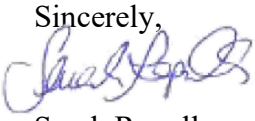
DWA appreciates the Board's time and consideration of this request. As DWA is actively working to get this list put together, we would respectively ask for guidance from SWRCB-DDW staff on our proposed method within the next thirty (30) calendar days. We look forward to working together to see this project through to completion.

Sincerely,



Sarah Rapolla
Senior Water Resources Specialist
Desert Water Agency

Desert Water Agency
Written Plan for Development of a Lead Service Line Inventory
as Required by the Lead and Copper Rule Revisions

Introduction

In 1991, the United States Environmental Protection Agency (USEPA) published the Lead and Copper Rule (LCR) in an effort to minimize the presence of lead and copper in drinking water. Several revisions were made to the original rule in 2000, 2004, and the 2007 revisions entitled "Short-Term Revisions to the Lead and Copper Rule".

Senate Bill 1398 (2016) and Senate Bill 427 (2017) required all Community Water Systems (CWS) to compile an inventory of service lines and identify material by July 1, 2018. Any unknowns in the initial inventory were required to be identified or scheduled for replacement by July 1, 2020.

In January 2021, the USEPA issued long term revisions to the federal lead and copper rule (Lead and Copper Rule Revisions, LCRR) with the intent of providing better protection for children in schools and childcare facilities as well as the residents in communities throughout the country. These revisions followed the events in Flint, Michigan, and added a greater emphasis on the removal and replacement of lead service lines (LSLs). As part of the revisions, the creation of an LSL inventory by community water systems (CWS) was required that included not just the utility-owned portion of the service line, but also the customer-owned portion. This initial inventory is required to be submitted by October 16, 2024. Further revisions are expected via the Lead and Copper Rule Improvements (LCRI) in October 2024.

Desert Water Agency's Original Proposed Method

The Desert Water Agency (DWA) currently has 25,780 services in its system. DWA confirmed there were no lead services on the utility side of the system in the aforementioned 2020 report. After reviewing available records and online documents, DWA was able to reduce the total number of unknown customer side plumbing services to 18,512. The original interpolation method proposed by DWA in a letter dated October 25, 2022, included confirmation, by physical inspection, of one (1) service out of every twenty (20) services within a given residential tract. The selected residential tracts were constructed in the same year and by the same contractor; therefore, materials are likely to be the same. Under this method, DWA identified 1,292 groups comprising a total of 9,283 services. Within the identified groups, a total of 1,439 services would need to be physically inspected. The remaining 9,578 services that did not fall into a group (i.e. not part of a residential tract given the criteria) would also require physical inspection. In total, the number of services requiring physical inspection under the original proposed interpolation method is 11,017 services.

Meeting with State Water Resources Control Board

On February 1, 2023, DWA met with the State Water Resources Control Board, Division of Drinking Water (SWRCB-DDW) staff to discuss its original proposed interpolation method. SWRCB-DDW emphasized the importance of randomized sampling and suggested ways to further reduce the overall number of services requiring physical inspection. SWRCB-DDW also recommended DWA develop a written interpolation plan and submit for review.

Additional Research on Studies and Guidance

After submission of the original proposed method and the meeting with SWRCB-DDW staff, DWA came across additional documents which suggest alternative approaches to the interpolation/predictive modeling methodology. According to a study conducted by David Eugene Kimbrough, out of the eleven million community water system (CWS) owned service lines inventoried in 2020, only four were found to contain lead (see Table 1 below).

Table 1 | Lead service line inventory of California

Date	November 2018	October 2020
Inventoried	11,270,203	11,301,495
Unknown Material	860,962	92,172
Lead Fitting Not on LSL	33,039	25,220
Lead Service Lines	136	4
CWSs with LSL	3	3
CWS 1	1	1
CWS 2	85	2
CWS 3	50	1

David Eugene Kimbrough; A study of lead service lines in California. *Water Practice and Technology* 1 September 2022; 17 (9): 1769–1780. doi: https://doi.org/10.2166/wpt.2022.099

The study also detailed how the State of California effectively discontinued the use of lead in services via several iterations of the various plumbing codes. Kimbrough correctly stated it would be expensive and impractical for a CWS in California to conduct thousands of physical inspections when the probability of finding lead services is so small. In the study, Kimbrough's team reviewed available records on existing inventory within the Pasadena Water and Power (PWP) service area. Kimbrough utilized the City of Newark, New Jersey as a test case as this system has a high number of lead service lines, most of which were installed prior to 1930. Similar to Newark, it was unlikely lead was used for services lines in the PWP service area after 1930. Given this fact, Kimbrough focused physical inspections on the oldest homes in the PWP service area built between 1881 and 1930. PWP conducted physical inspection on a handful of services installed after 1930 as well. The study utilized a 3M Lead Check product to determine the presence/absence of lead in a pipe. The location on the service line for inspection was behind the meter due to California's typical setup of water meters being located within the public right of way between the

sidewalk and street. In total, PWP performed physical inspection on 133 customer side services. Twenty-four (24) locations could not be determined due to the close proximity of the backside of the meter to the wall of the meter box. Of the 108 customer side services that could be physically inspected using the Lead Check 3M product, none were found to contain lead.

In March 2023 the "Water Industry Guidance for Completing Inventory Requirements of the Federal Lead and Copper Rule Revisions" was released. This guidance was drafted by several groups and agencies in the State in collaboration with the State Water Resources Control Board. This guidance suggests, similarly to Kimbrough, that most of the LCRR-regulated public water systems in the State of California are unlikely to have customer side LSLs. The guidance refers to Chapter 6, Section 6.3 of the USEPA guidelines which makes recommendations for systems that have no LSLs. The water industry guidance provides suggestions for investigative methods to determine the presence or absence of LSLs, including predictive modeling. One suggested method includes a 1% randomized representative sampling subset of homes built prior to the lead ban in 1986. Additionally, inclusion of a focused group of the oldest services in the system is recommended as these are the most likely to contain lead.

DWA submitted a revised approach to DDW on June 13, 2023. In this approach, DWA proposed two groups – one focused and one randomized selection – as representative subgroups for the system. DDW staff responded in an email dated June 22, 2023, and indicated they could not approve the plan as written. DDW staff indicated the only statistical verification and minimum sample size calculation accepted by other states is the 95% confidence level approach. This is the approach recommended by DDW staff for larger water systems with service lines built before the 1950.

After reviewing the Kimbrough study, "Water Industry Guidance for Completing Inventory Requirements of the Federal Lead and Copper Rule Revisions", and recommendations provided by DDW staff, DWA has elected to revise its proposed method for determining the presence or absence of customer-side LSLs.

Desert Water Agency's Revised Method

Per the California Health and Safety Code section 116885, California water suppliers were required to complete an inventory of system-owned service lines by 2018. From this initial list, any unknowns were investigated further and an updated inventory was submitted in 2020. DWA submitted its initial inventory in 2018 which included several unknown utility-side services. DWA conducted additional investigations and submitted its updated inventory list in 2020 which indicated there were no utility-side LSLs in its system.

To determine customer-side service material, DWA researched available records including system maps, construction drawings, Riverside County parcel maps, and City of Palm Springs permits. Due to the State's lead ban that went into effect in 1986, all services installed from 1986 to present-day are assumed non-lead. Additionally, any services with diameter of 4 inch and larger are also assumed non-lead. Of the 25,780 services in its system, DWA was able to rule out the presence of lead in 7,268 services. This leaves a total of 18,512 services with unknown customer-side material.

Considering the two aforementioned documents and DDW staff recommendations, DWA is proposing to group services with unknown customer side material by decade (for services installed prior to 1986) and use the 95% confidence level approach to determine the likelihood of the presence of lead in the customer-owned portion of services in each group. As with the Kimbrough study, DWA will utilize the 3M Lead Check Swabs, or similar, to physically verify customer side material in these groups.

The 95% confidence level approach will be applied to each decade group to determine the number of services to be physically verified in each group as follows:

Total number of services with unknown customer side-material in the system: 18,512

Age Groups (by decade):

- 1920 – 1929
    - 29.5% of total unknown customer side services or 5,464 services in this group
    - 325 randomly selected services to be physically verified in this group
- 1930 – 1939
    - 2.6% of total unknown customer side services or 482 services in this group
    - 39 randomly selected services to be physically verified in this group
- 1940 – 1949
    - 5.0% of total unknown customer side services or 933 services in this group
    - 73 randomly selected services to be physically verified in this group
- 1950 – 1959
    - 18.2% of total unknown customer side services or 3,363 services in this group
    - 229 randomly selected services to be physically verified in this group
- 1960 – 1969
    - 15.0% of total unknown customer side services or 2,780 services in this group
    - 196 randomly selected services to be physically verified in this group
- 1970 – 1979
    - 22.2% of total unknown customer side services or 4,119 services in this group
    - 266 randomly selected services to be physically verified in this group
- 1980 – 1985
    - 7.4% of total unknown customer side services or 1,371 services in this group
    - 106 randomly selected services to be physically verified in this group

DWA will utilize the “Create Random Points” geoprocessing tool in ArcGIS to ensure randomized selection of these services. Based on the 18,512 services with unknown customer-side material, 95% confidence level approach, and decade groups, the total number of randomly selected services to be physically verified will be 1,234. The customer-side material for each randomly selected service will be physically verified using the LCRR field inspection procedures described below.

LCRR Field Inspection Procedures

Assumptions:

- Assumed non-lead and excluded from sample groups
    - All homes built 1986 – present
    - Any services with diameter 4” and larger

Group 1:

- Built in 1920 - 1929
    - 325 physical verifications
    - Age determined by Riverside County parcel data for year built
    - Randomized selection using “Create Random Points” geoprocessing tool in ArcGIS

Group 2:

- Built in 1930 - 1939
    - 39 physical verifications
    - Age determined by Riverside County parcel data for year built
    - Randomized selection using “Create Random Points” geoprocessing tool in ArcGIS

Group 3:

- Built in 1940 - 1949
    - 73 physical verifications
    - Age determined by Riverside County parcel data for year built
    - Randomized selection using “Create Random Points” geoprocessing tool in ArcGIS

Group 4:

- Built in 1950 - 1959
    - 229 physical verifications
    - Age determined by Riverside County parcel data for year built
    - Randomized selection using “Create Random Points” geoprocessing tool in ArcGIS

Group 5:

- Built in 1960 - 1969
    - 196 physical verifications
    - Age determined by Riverside County parcel data for year built
    - Randomized selection using “Create Random Points” geoprocessing tool in ArcGIS

Group 6:

- Built in 1970 - 1979
    - 266 physical verifications
    - Age determined by Riverside County parcel data for year built
    - Randomized selection using “Create Random Points” geoprocessing tool in ArcGIS

Group 7:

- Built in 1980 - 1985
    - 106 physical verifications
    - Age determined by Riverside County parcel data for year built
    - Randomized selection using “Create Random Points” geoprocessing tool in ArcGIS

Materials Required:

- Water spray bottle
- Paper towels
- 3M Lead Check Swabs (or similar)
- Strong magnet
- Paper marker with identifying information to note address/sample #/acct number
- Tablet to enter information in GIS program and take photo of service material

Visual Observations Reference Guide:

- Copper
    - Orange in color
    - Possible patina if oxidation has occurred
    - No visible corrosion
- Plastic
    - White in color
    - Non-metallic
    - No visible corrosion
- Iron Pipe / Galvanized Pipe
    - Orange to brown in color
    - Threaded joints
    - Visible corrosion may be present
- Lead
    - Gray in color
    - No external corrosion
    - Wiped joints or joined by brass coupling or union
    - Significantly wider outside diameter

Physical Inspection Procedures:

1. Open app in tablet and select address/account number to be inspected

2. If Customer Control Valve (CCV) Box is Present
    a. Remove box roof and lid from CCV box
    b. Clean interior of box to remove bulk debris and insects
    c. Spray pipe behind CCV with water and wipe down with a paper towel to clean
    d. Visually inspect customer side behind CCV and note pipe condition and material type
        i. Copper
            1. Input material type into app
            2. **No swab needed!**
            3. Take photo of customer side pipe with paper marker that includes legible, identifying information (i.e. physical address, account number, etc.)
            4. Upload photo to app
        ii. Plastic

1. Input material type into app
2. **No swab needed!**
3. Take photo of customer side pipe with paper marker that includes legible, identifying information (i.e. physical address, account number, etc.)
4. Upload photo to app

iii. Other Metal

1. Break 3M Lead Check swab (or similar) in two spots as indicated on tube
2. Squeeze to moisten sponge
3. Swab customer side pipe behind CCV for 30 seconds
    a. If red/pink spot is visible on the pipe and sponge = lead
    b. If no color is visible = non-lead
        i. Perform Magnet Test
            1. Galvanized or Black Iron = strong magnet will stick to pipe
4. Input material type into app
5. Take photo of customer side pipe with paper marker that includes legible, identifying information (i.e. physical address, account number, etc.)
6. Upload photo to app

3. If Customer Control Valve (CCV) Box is Absent
    a. Remove box roof and lid from meter box
    b. Clean interior of box to remove bulk debris and insects
    c. Spray pipe behind meter with water and wipe down with paper towel to clean
    d. Visually inspect customer side behind meter and note pipe condition and material type
        i. Copper
            1. Input material type into app
            2. **No swab needed!**
            3. Take photo of customer side pipe with paper marker that includes legible, identifying information (i.e. physical address, account number, etc.)
            4. Upload photo into app
        ii. Plastic
            1. Input material type into app
            2. **No swab needed!**
            3. Take photo of customer side pipe with paper marker that includes legible, identifying information (i.e. physical address, account number, etc.)
            4. Upload photo into app
        iii. Other Metal
            1. Break 3M Lead Check swab (or similar) in two spots indicated on tube
            2. Squeeze to moisten sponge
            3. Swab customer side pipe, minimum 18 inches behind meter, for 30 seconds
                a. If red/pink spot is visible on the pipe and sponge = lead

   b. If no color is visible = non-lead
      i. Perform Magnet Test
         1. Galvanized or Black Iron = strong magnet will stick to pipe
4. Input material type into app
5. Take photo of customer side pipe with paper marker that includes legible, identifying information (i.e. physical address, account number, etc.)
6. Upload photo into app

If there are no lead services found upon completion of physical inspection of all randomly selected services within each age group, DWA will classify all other services in each group installed prior to 1986 as "non-lead" via statistical verification. If a lead service is identified during the physical inspection of one or more groups, DWA will conduct additional physical inspections for services with similar age and location to determine if there are any other customer-side lead services present in the system.

LCRR LSL Inventory Update (Office Staff) Procedures

1. Desktop Analysis:
    a. Frequency: Completed (Ongoing)
        i. In Esri application, label all services installed from 1986 to present as non-lead via lead ban. Include the actual material, if possible. Additional services installed post-1986 may be identified at a later date as additional resources become available. If found, update the application and label as non-lead.
        ii. In Esri application, label all services with diameter four inch and larger as non-lead via diameter exclusion (option in State's spreadsheet). Include the actual material, if possible. Additional services with diameter four inch and larger may be identified at a later date as additional resources become available. If found, update the application and label as non-lead.

2. Track Progress of Physical Inspection for Predictive Modeling Groups
    a. Frequency: Ongoing
    b. Description:
        i. Due to the nature of the Arc GIS real time data, a progress dashboard can be viewed at any time.
        ii. Identify any customer side services that were found to be lead which would trigger an update to the inspections per the Physical Inspection Procedures herein.
        iii. Confirm when all services in predictive modeling groups have been physically inspected and data has been entered into application.

3. Document Records Review
    a. Frequency: Weekly
    b. Description:
        i. General records review
        ii. Confirm success of real time data uploads

4. QA/QC of Field Data Collected
    a. Frequency: Monthly
    b. Description
        i. Conduct a monthly review of all data collected in the application.
        ii. Verify all forms have been fully completed.
        iii. Verify photos have been taken for each service.
        iv. Verify there are no contradictory findings for a specified account.
5. If no lead is present at the conclusion of all physical inspections for focused group and randomized subset, update the online portal for all unknown customer-side material as "non-lead" based on statistical verification.

6. If lead is identified during physical inspection of the groups, assemble list of services with similar age and location to be physically inspected. Follow the LCRR Field Inspection Procedures and LCRR LSL Inventory Update Procedures listed above.

Conclusion

At the recommendation of SWRCB-DDW staff, DWA's revised written plan utilizes the 95% confidence level approach which is a method accepted by several states. In total, DWA will physically inspect, via the method described above, approximately 1,234 services in its system. If no lead is found to be present in any of the services physically verified, it is reasonable to say there is no lead present in the customer-owned portion of the system. For all services not included in the randomly selected service subsets, services would be identified as non-lead via statistical verification.

Additionally, DWA is developing a written Standard Operating Procedure (SOP) for staff. This SOP will address the process for collecting information by field staff as well as procedures for office staff recording the collected information based on the procedures included in this written plan. This SOP will enable regular updates of the LSL inventory during normal operations by Agency staff.