Lead and Copper Rule Sampling Guidance

For Water Systems Serving Populations up to 100,000

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This guidance document was developed to help water systems comply with the California Lead and Copper Rule. The Lead and Copper Rule requires community and nontransient-noncommunity water systems to monitor lead and copper levels at the consumers' taps. If action levels are exceeded, installation of corrosion control treatment is required. If the action level for lead is exceeded, public notification is required.

Lead Action Level = 0.015 mg/L (or 15 µg/L)
Copper Action Level = 1.3 mg/L (or 1300 µg/L)

Compliance with the lead and copper action levels is based on the 90th percentile lead and copper levels. This means that the concentration of lead and copper must be less than or equal to the action level in at least 90% of the samples collected.

To help explain how to comply with the California Lead and Copper Rule, information on the following topics is included in this document:

Attachments to this document include:

1. "Homeowner Tap Sample Collection Procedures"
2. "Lead and Copper Results Worksheet"
3. Form 141-AR "Lead and Copper Rule Sampling Report"

Section 1. Number of Tap Sample Sites Required

The number of tap sample sites required is shown in Table 1 and is based on the population served by your water system and also whether you are performing Standard or Reduced Monitoring.

Table 1. Minimum Number of Tap Sample Sites Required

	Minimum Number of Tap Sample Sites	
System Population	Standard Monitoring	Reduced Monitoring
10,001 to 100,000	60	30
3301 to 10,000	40	20
501 to 3,300	20	10
101 to 500	10	5
Less than 101	5	5

Section 2. When to Sample

- Standard Monitoring:

  Each water system must complete at least two consecutive 6-month Standard Monitoring periods with no exceedance of the lead or copper action level before the frequency of sampling can be reduced. During each 6-month Standard Monitoring period, you must collect at least one tap sample from the number of sites shown in Table 1 under Standard Monitoring.

  Therefore, during your first year of sampling, collect a set of samples in the first six months and a set of samples in the second six months. Samples must be analyzed for both lead and copper.

  If at any time your 90th percentile lead or copper level exceeds the action level, you must contact this office for further guidance.

- Reduced Monitoring:

  If you have completed at least two consecutive 6-month Standard Monitoring periods with no exceedance of the lead or copper action level, you may reduce the number of tap sample sites as shown in Table 1 under Reduced Monitoring. You may also reduce the frequency at which you collect the samples.

  In the second and third years of sampling, collect one set of samples during the months of June, July, August or September. Samples must be analyzed for both lead and copper.

  After completing the third year of sampling, if there has been no exceedance of the lead or copper action level, collect one set of samples every three years during the months of June, July, August or September. Samples must be analyzed for both lead and copper.

If at any time your 90th percentile lead or copper level exceeds the action level, you must contact this office for further guidance.

Section 3. Where to Sample

Notes:
1. If lead service lines are present in the distribution system, at least half of the samples must come from the sites served by lead service lines.
2. Do not sample from homes or buildings which have point-of-use treatment (e.g. water softener, carbon filter system, etc.).
3. Each round of sampling should be conducted at the same sampling sites. If an original sampling site is not available, you should collect a tap sample from another site meeting the same Tier criteria as the original site.

- Community Water Systems:

  Lead and copper tap samples must be collected from sampling locations which meet the following criteria:

  Tier 1 - Single family structures that contain:
  a) Lead pipes; or
  b) Copper pipes with lead solder installed after 1982; or
  c) Pipes served by lead service lines.

  If there are not enough Tier 1 sites available, samples must meet the following criteria:

  Tier 2 - Buildings and multiple-family residences that contain:
  a) Lead pipes; or
  b) Copper pipes with lead solder installed after 1982; or
  c) Pipes served by lead service lines.

  If there are not enough Tier 2 sites available, samples must meet the following criteria:

  Tier 3 - Single Family structures that contain copper pipes with lead solder installed before 1983.

- Nontransient-Noncommunity Water Systems:

  Lead and copper tap samples must be collected from sampling locations which meet the following criteria:

  Tier 1 - Buildings that contain:
  a) Lead pipes; or
  b) Copper pipes with lead solder installed after 1982; or
  c) Pipes served by lead service lines.

  If there are not enough Tier 1 sites available, samples must meet the following criteria:

  Tier 2 - Buildings that contain copper pipes with lead solder installed before 1983.

Section 4. How to Sample

Depending on the type of water system you operate, the following options are available for sample collection:

a) You can collect the samples yourself using the procedures outlined below, or

b) Residents of the water system can collect the samples for you. Letters are usually sent to find volunteers to participate in the sampling program. The attached sample collection instruction sheet must be sent to each participant. Residents collect the samples and complete the bottom portion of the instruction sheet. Sample bottles and the completed instruction sheet are then collected by you. Sample bottles are then transported to the laboratory for analysis.

Sample Procedures:

1) Samples are to be taken from a kitchen or bathroom cold-water faucet. Do not sample from faucets which have point-of-use treatment (e.g. water softener, carbon filter system, etc.).

2) Each sample must be collected after the water has stood undisturbed in the pipes for a minimum of 6 hours. It is best to collect the sample first thing in the morning.

3) Each sample must be one liter in volume and must contain the first water drawn from the faucet.

4) Remove the cap from the one-liter sample bottle, place the container directly below the faucet and gently open the cold-water tap. Fill the sample bottle to the line marked "1 liter or 1000-ml" and turn off the water.

   Tightly cap the sample bottle and complete the required information on the sample bottle label.

5) All samples must be analyzed by a laboratory certified by the State to perform drinking water lead and copper analyses.

Section 5. How to Calculate the 90th Percentile Lead and Copper Levels

Complete the attached "Lead and Copper Results Worksheet". If your 90^{th} percentile lead level is greater than 0.015 mg/l, you have exceeded the action level. If your 90^{th} percentile copper level is greater than 1.3 mg/l, you have exceeded the action level.

Section 6. What to Do if You Exceed the Lead or Copper Action Level

If your 90th percentile lead or copper level exceeds the action level, you must contact this office for further guidance. The lead action level is 0.015 mg/L and the copper action level is 1.3 mg/L.

Section 7. How to Report Your Sample Results

Upon completion of each sampling period, the following items must be submitted to State Water Resources Control Board, Division of Drinking Water, Drinking Water Field Operations Branch:

1) A fully completed Form 141-AR (copy attached).
2) Laboratory copies of all sample results.
3) Completed "Lead and Copper Results Worksheet".

Homeowner Tap Sample Collection Procedures

Revised Version: February 2016

These samples are being collected to determine the lead and copper levels in your tap water. This sampling effort is required by the U.S. Environmental Protection Agency and your state, and is being accomplished through the cooperation of homeowners and residents.

Tap Sample Collection Procedures:

1) Prior arrangements will be made to coordinate the sample collection event. Dates will be set for sample bottle delivery and pick-up by water system staff.
2) There must be a minimum of 6 hours during which there is no water used from the tap where the sample will be collected and any taps adjacent or close to that tap. Either early mornings or evenings upon returning home are the best sampling times to ensure that the necessary stagnant water conditions exist. Do not intentionally flush the water line before the start of the 6 hour period.
3) Use a kitchen or bathroom cold-water faucet for sampling. If you have water softeners on your kitchen taps, collect your sample from the bathroom tap that is not attached to a water softener, or a point of use filter, if possible. Do not remove the aerator prior to sampling. Place the opened sample bottle below the faucet and open the cold water tap as you would do to fill a glass of water. Fill the sample bottle to the line marked "1000-mL" and turn off the water.
4) Tightly cap the sample bottle and place in the sample kit provided. Please review the sample kit label at this time to ensure that all information contained on the label is correct.
5) If any plumbing repairs or replacement has been done in the home since the previous sampling event, note this information on the label as provided. Also if your sample was collected from a tap with a water softener, note this as well.
6) Place the sample kit in the same location the kit was delivered to so that water system staff may pick up the sample kit.
7) Results from this monitoring effort and information about lead will be provided to you as soon as practical but no later than 30 days after the system learns of the tap monitoring results. However, if excessive lead and/or copper levels are found, immediate notification will be provided (usually 1-2 working days after the system learns of the tap monitoring results).

If you have any questions regarding these directions, call:

_____
Contact Name

_____
Water System Name

_____
Phone Number

To Be Completed By Resident

Water was last used: Time_____ Date_____

Sample was collected: Time_____ Date_____

Sample Location & Faucet (e.g. Bathroom sink) _____

I have read the above directions and have taken a sample in accordance with these directions.

_____ _____

Signature *Date*

Lead and Copper Results Worksheet

System Name: _____ Sample Date(s): _____

Determine the 90th percentile lead and copper levels:

1. List all of the samples in Table 1 below.
2. Determine the 90th percentile lead level by following the instructions given in Table 2.

   Write down the 90th percentile level for lead = _____ mg/L

   If the 90th percentile lead level is greater than 0.015 mg/L, you have exceeded the action level.
3. Determine the 90th percentile copper level by following the instructions given in Table 2.

   Write down the 90th percentile level for copper = _____ mg/L

   If the 90th percentile copper level is greater than 1.3 mg/L, you have exceeded the action level.

Table 1 - Sample Results

	Sample Address	Lead Level (mg/L)	Copper Level (mg/L)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			

	Sample Address	Lead Level (mg/L)	Copper Level (mg/L)
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			

Table 2 - Determining the 90th Percentile Lead or Copper Level

Number of Tap Samples Collected	How to Determine the 90th Percentile Lead or Copper Level
5	Average the 4th and 5th highest sample results to get the 90th percentile level.
5 or more	Place results in ascending order and assign each sample a number, 1 for the lowest value. Multiply the total number of samples by 0.9. Round down to the nearest whole number if the decimal is 0.4 or lower and round up if the decimal is 0.5 or higher. The sample result that corresponds with the nearest whole number is the 90th percentile.

LEAD AND COPPER RULE SAMPLING REPORT

System's Name:_____ Type: ☐ CWS ☐ NTNCWS

Address:_____ Size: ☐ >100,000
☐ 50,001 to 100,000
☐ 10,001 to 50,000
☐ 3,301 to 10,000
☐ 501 to 3,300
☐ 101 to 500
☐ ≤ 100

Telephone Number:_____

System ID Number:_____

Contact Person:_____ Sample Date(s):_____

SAMPLE SITE IDENTIFICATION

Number of sample sites in each category:

- Single-family structures with copper pipes with lead solder installed after 1982; or lead pipes; or lead service lines. _____
- Multi-family structures with copper pipes with lead solder installed after 1982; or lead pipes; or lead service lines. _____
- Buildings containing copper pipes with lead solder installed after 1982; or lead pipes; or lead service lines. _____
- Single family structures with copper pipes with lead solder installed before 1983. _____

Total: _____

Number of lead service lines present in the distribution system: _____

Number of samples collected from sites served by lead service lines: _____

The following sources have been explored to determine the number of structures which have interior lead pipe or copper pipe with lead solder:

☐ Plumbing and/or building codes.
☐ Plumbing and/or building permits.
☐ Contacts with the building department, municipal clerk's office, or state regulatory agencies.
☐ Water quality data.
☐ Interviews with building inspectors
☐ Survey of service area plumbers about when and where lead solder was used from 1982 to present.
☐ Survey of residents.
☐ Interviews with local contractors & developers.

The following sources have been explored to determine the number of lead service lines in the distribution system:

☐ Distribution system maps and record drawings.
☐ Capitol improvement plans and/or master plans for distribution system development.
☐ Standard operating procedures and/or operation & maintenance manuals for the types of materials used for service connections.
☐ Utility records including meter installations, customer complaint investigations .
☐ Water quality data.
☐ Interviews with senior personnel.
☐ Conduct service line sampling where lead service lines are suspected to exist.
☐ Review of permit files
☐ Survey of residents.
☐ Interviews with local pipe supplies, contractors and/or developers.

RESULTS OF SAMPLING

Results of Lead And Copper Tap Water Samples: (*Attach copy of all results to this form*.)

Number of tap samples required:_____ 90th Percentile Lead level:_____mg/L

Number of tap samples collected & submitted:_____ 90th Percentile Copper level:_____mg/L

Results of Water Quality Parameter (WQP) Samples: (*Complete only if system is required to collect WQP samples*.)

Number of WQP samples required to be collected:_____

Number of WQP samples collected & submitted:_____

Number of WQP entry point samples required to be collected: _____

Number of WQP entry point samples collected and submitted _____

CERTIFICATION OF COLLECTION METHODS

I certify that:

- Each first draw tap sample for lead and copper is one liter in volume and has stood motionless in plumbing system of each sampling site for at least six hours.
- Each first draw sample collected from a single-family residence has been collected from the cold water kitchen tap or bathroom sink tap.
- Each first draw sample collected from a non-residential building has been collected at an interior tap from which water is typically drawn for consumption.
- Each first draw sample collected during an annual or triennial monitoring period has been collected in months of June, July, August, or September.
- Each resident who volunteered to collect tap water samples from his or her home has been properly instructed in the proper methods for collecting lead and copper samples. I do not challenge the accuracy of those sampling results.
- Enclosed is a copy of the material distributed to residents explaining the proper collection methods, and a list of the residents who performed sampling.

CHANGE OF SAMPLING SITES

Original site address: _____

New site address: _____

Distance between sites (approximately): _____

Targeting Criteria: New Site: ☐ Tier 1 ☐ Tier 2 ☐ Tier 3 Old Site: ☐ Tier 1 ☐ Tier 2 ☐ Tier 3

Reason for sample site change:

_____

_____

SIGNATURE: **DATE:**

_____ _____

_____ _____

Print Name Title