# FACT SHEET: Lead and Copper (LCR) Rule(s)

**Background:**

- Purpose is to protect public health by minimizing lead and copper levels found in drinking water supplies.
- Found in drinking water primarily due to corrosion of plumbing materials used to distribute drinking water supply, less frequently due to source water.
- Established an action level 0.015 mg/L Lead and 1.3 mg/L Copper based on percentage of tap water samples (the 90%ile is calculated by multiplying the number of samples taken by 0.9).

  **Examples:**
  30 samples x 0.9 = 27; the 27th highest sample is the 90th %ile
  20 samples x 0.9 = 18; the 18th highest sample is the 90th %ile
  10 samples x 0.9 = 9; the 9th highest sample is the 90th %ile
  5 samples x 0.9 = 4.5; the average of the 4th and 5th highest samples is the 90th %ile

  An action level exceedance may trigger certain actions to be taken by the PWS including:
  Water quality parameter monitoring
  Corrosion control treatment
  Source water monitoring/treatment
  Public education
  Lead service line replacement

- Three LCR-related rules have been promulgated:
  **LCR** - June 7, 1991
  **LCR Minor Revisions** - Jan 12, 2000
  **LCR Short Term Revisions** - Oct 7, 2007

- A **Long Term Revision** to the LCR is under consideration involving the National Drinking Water Advisory Group and the Lead and Copper Working Group, with input from the Science Advisory Board, tribal consultations and environmental justice considerations.

**Basic Requirements of the LCR:**

- Require water suppliers to optimize treatment system to control corrosion in the distribution system.
- Determine tap water lead and copper levels.
- Rule out source water as a significant source of lead.
- If action levels are exceeded, require suppliers to educate customers and suggest actions to take to reduce lead exposure exceeded via public notices and public education programs.

**Corrosion Control Provisions:**

- Treatment required to be initiated by PWSs to reduce corrosion in the distribution system, limiting release of lead and copper. Referred to as corrosion control treatment (CCT).

- The CCT strategy selected by the PWS must be optimized (maximum and efficient treatment to reduce lead and copper corrosion at a specific system) and is referred to as optimized corrosion control treatment (OCCT).
- The OCCT is approved by the primacy agency once the PWS selects the strategy.
- Water quality parameters (WQPs) are used to confirm that the approved OCCT strategy is being maintained. WQPs include specified physical and chemical parameters and are monitored based on population served and differ from the tap water monitoring since they are collected at entry point to the distribution system (leaving treatment plant and entering the distribution system).
- Corrosion control options include the following two major categories:
  pH adjustment
  orthophosphate addition
  - Must consider: pH, dissolved inorganic carbonate, orthophosphate concentration, alkalinity, and hardness.
  - Also must consider lead and copper results, characterization of the water chemistry, and secondary impacts when performing simultaneous compliance efforts with other rules (i.e. chlorination of water may impact the corrosion control).
  - Once all of the above has been considered, the PWS will need to which strategy to use to provide corrosion control. The following strategies and combinations are typical:
    - Raising the pH using soda ash, potash, caustic and sodium bicarbonate, limestone contactor or aeration,
  - Orthophosphate addition and pH/alkalinity adjustment
    - Adjusting dissolved inorganic carbonate and pH/alkalinity adjustment
    - Use of blended phosphate.
    - All of the above strategies are dependent on many factors, including the considerations indicated above, presence of raw water iron and/or manganese, whether both lead and copper are present, or just lead, or just copper, etc.

**Optimization:** Overall process of optimal corrosion control treatment can be summarized by the following sequence of actions:

- Description of corrosion control treatment requirements - PWS must complete all applicable corrosion control treatment requirements, unless it is considered to have controls in place that the PWS meets the action levels for lead and copper. If this situation is met, the PWS is deemed to have optimized corrosion control.
  - There are a number of criteria to determine this designation:
    - PWS will recommend to the State, (based on lead and copper results and water quality parameters) installation of appropriate treatment.
    - The state may require a PWS to perform corrosion control studies to evaluate the effectiveness of the broad categories of treatment options.
    - Based on results of the studies, the State will designate optimal corrosion control treatment by either approving the recommendation of the PWS or designating an alternative treatment process. The State will notify the PWS of the designation.
    - Once the PWS has the appropriate treatment notification from the State, it will install and operate the optimal corrosion control.

- The State reviews the treatment and specification of optimal water quality parameters to insure proper installation and operation of the optimal corrosion control designated by the State.
- The PWS is required to maintain the water quality parameter values that were designated by the State per the review as indicated in the above bullet.
- The State may modify the treatment decisions per criteria specified in ___ CFR 141.82(h).

**Source Water Provisions:**

- Source water sampling is required at PWSs that exceed the action level and is used to rule out source contribution of lead and copper from a ground water or a surface water source.
- If a source is determined to contribute lead copper levels that cause an exceedance of the action level, then the PWS is required to install Source Water Treatment. The primacy agency establishes maximum permissible levels (MPL) for lead and copper based on initial and follow-up source sampling results.

**Lead Service Line Replacement (LSLR) Provisions:**

- LSLR requires PWSs that continue to exceed lead action level after installation of CCT and/or Source Water Treatment to replace a specified amount of lead service lines on an annual basis.
- Two of the major changes specified in the LCR Minor Revisions Rule (2000) regarding LSLR:
  - Requires PWSs to replace portions of the LSL that they own
  - Notify residents of partially replaced LSLs and that there may be temporary increases of lead levels until it stabilizes, which means that appropriate measures, i.e. filters installed on faucets, should be taken by resident until lead levels reduce.

**Major Monitoring Provisions:**

- All Community Water Supply (CWS) and Non-Transient Non-Community Water Supply (NTNCWS) systems are required to monitor at specific high-risk sites within the distribution system for first-draw tap samples. The Transient Non-Community Water Supply (TNCWS, i.e. train or bus stations) are not required to monitor.
- Water Quality Parameters are required for:
  - Systems serving over 50,000 (large CWS)
  - Systems serving less than 50,000 during the monitoring period in which an action level is exceeded (medium, small CWS and NTNCWS)
- Rule allows for reduced and standard monitoring with sampling based on system size differentiation (go from quarterly to every 3 years - if the sampling shows stable results without exceedances).

**Public Education Provisions:**

- Required only for lead action level exceedances.
- PWSs are required to deliver public education materials after an exceedance of lead action level.
- Three of the major changes specified in the LCR Short Term Revisions rule (2007) address:
  - specific content of the message provided to consumers

    - method of delivery to consumers
    - Time frame for delivery of the message to consumers.
- Requires educational statements about lead in drinking water to be placed in the Consumer Confidence Reports provided annually to consumers.

**Violations:**

A system can be in violation of the LCR in several ways. There are Monitoring/Reporting (MR) violations and Treatment Technique (TT) violations (TT is considered a health based type of violation):

- Failure to sample for lead & copper (MR)
- Failure to sample for Water Quality Parameters (MR)
- Failure to sample Source Water (MR)
- Failure/Late to complete a Corrosion Control Study or Recommendation (TT)
- Failure/Late to install Corrosion Control Treatment (TT)
- Failure/Late to replace Lead Service Lines (TT)
- Failure to conduct Public Education to consumers (TT)