

Question & Answer: Lead and Copper Rule Revisions

By Vipin Bhardwaj
NESC Engineering Scientist

Editor's Note: In October 2004, the Washington Post ran an article describing how different cities were manipulating test results so that lead levels appeared to be within federal limits. This article prompted the U.S. Environmental Protection Agency to investigate lead sampling practices and to develop a drinking water lead reduction plan.

Why are lead and copper regulated?

Lead is a toxic metal that causes health problems, even at low levels. In infants and children, exposure to lead can adversely impact their physical and mental development and cause learning disabilities. In adults, exposure to lead over many years can cause kidney and nervous system problems and high blood pressure.

Lead is usually not present in water sources, but enters drinking water through corrosion of pipes and plumbing materials and from lead service lines. Before 1986, homes had copper pipes and solder containing lead. The most common problem is with brass or chrome-plated brass faucets and fixtures, which can leach significant amounts of lead into the water.

Like lead, copper is not usually found in water but leaches out of other materials. Ingesting copper can cause vomiting, diarrhea, stomach cramps, and nausea. The seriousness of these effects increases with increased copper levels.

What is the history of the Lead and Copper Rule?

In 1991, the U.S. Environmental Protection Agency (EPA) published the Lead and Copper Rule (LCR) to minimize exposure to lead and copper in drinking water. According to EPA, the LCR has four main functions:

1. requires water suppliers to optimize their treatment system to control corrosion in customers' plumbing;
2. determines tap water levels of lead and copper for customers who have lead service lines or lead-based solder in their plumbing system;
3. rules out the source water as a cause of significant lead levels; and
4. if action levels are exceeded, requires the suppliers to educate their customers about lead and suggests actions they can take to reduce exposure to lead through public notices and public education programs

The LCR established an action level of 0.015 mg/L for lead and 1.3 mg/L for copper. An action level is not the same as a violation but means that if amounts of lead or copper are detected above the action level, the utility may have to take certain actions (see number four above). The LCR rule is applicable to all community and non-transient community water systems.

If a water system, after installing and optimizing corrosion control treatment, still doesn't meet the lead action level, it must begin replacing lead service lines. Systems serving more than 50,000 people were required to conduct studies of corrosion control and to install state-approved optimal corrosion control treatment by January 1, 1997. Small and medium-sized systems are required to optimize corrosion control if samples taken at consumers' taps show lead or copper exceeding the action level.

In January 2000, EPA adopted the Lead and Copper Rule Minor Revisions (LCRMR), which streamline requirements, promote

Lead and Copper Tap Sampling Requirements

First draw samples must be collected by all CWSs & NTNCWSs at cold water taps in homes/buildings that are at high risk of Pb/Cu contamination as identified in 40 CFR 141.86(a). Number of sample sites is based on system size. Systems must conduct monitoring every six months unless they qualify for reduced monitoring.

Size Category	System Size	Number of Pb/Cu Tap Sample Sites		Number of WQP Tap Sampling Sites	
		Standard	Reduced	Standard	Reduced
Large	> 100K	100	50	25	10
	50,001-100K	60	30	10	7
Medium	10,001 - 50K	60	30	10	7
	3,301 - 10K	40	20	3	3
Small	501 - 3,300	20	10	2	2
	101 - 500	10	5	1	1
	# 100	5	5	1	1

Table 1

consistent national implementation, and in many cases, reduce burdens for water systems. The LCRMR do not change the original action level.

What are other key parts of the LCR and LCRMR?

The original LCR specified the number of sample sites based on system size. (See Table 1.) Systems are required to take samples every six months, unless they have readings lower than action levels over two consecutive monitoring periods, in which case, they qualify for reduced monitoring.

The revisions to the original LCR rule make clearer what is expected from water systems:

- Systems are required to operate and maintain optimum corrosion control parameters.
- Even after the systems are deemed to have optimized corrosion control, they are required to conduct water quality parameter monitoring.
- The revisions specify the number and location of tap water sampling sites.
- Spell out what will trigger re-sampling for composite source water samples.

The effective date of LCR revisions is April 11, 2000. However, systems should check with their state primacy agencies

because not all provisions may apply in their state.

If the samples show lead levels greater than the action level, the LCR mandates that systems take the following steps:

Water Quality Parameter Monitoring—adopt more stringent testing, including in the distribution system and for pH.

Corrosion Control Treatment—develop methods for making the water less corrosive and, therefore, less likely to leach lead or copper into drinking water.

Source Water Monitoring and Treatment—sample source water to rule out supply as a source.

Lead Service Line Replacement—replace at least seven percent of lead lines each year and more if the state requires it.

Public Education—inform customers when action levels are exceeded and about ways to reduce lead levels in homes.

These requirements are discussed in more detail in the guidance manuals and products listed at the end of this article.

What's different for small systems?

The LCRMR takes into account the limitations for small systems and, hence, grants them some flexibility. Accommodations made for small systems include:

- Systems that can demonstrate that their lead and copper levels are less than the action levels are not

All you have to do is **ASK!**

Where can I find more information?

EPA has a great deal of information about lead on their Web site. A good place to start is their "Lead in Drinking Water" page at www.epa.gov/safewater/lead/index.html.

The National Environmental Services Center has several products about lead and copper in drinking water.



"Lead in Drinking Water: An Annotated List of Publications" provides an annotated list of selected publications about lead in drinking water from organizations such as the EPA, the NESC, and the American Water Works Association. Product #DWBLGN19



"Lead in Drinking Water" explains how even moderate levels of lead can be harmful to human health and particularly to the health of small children and developing fetuses. This factsheet discusses lead in the environment and in drinking water. Recommendations are included for correcting lead contamination in water, including private wells. Product #DWFSGN60



"Lead Ban: Preventing the use of Lead in Public Water Systems and Plumbing Used for Drinking Water" discusses the lead ban provisions of the Safe Drinking Water Act Amendments of 1986. It addresses ways to prevent lead's use in public water systems. Product #DWBRGN02



"Lead and Copper Rule Decision Diagram" shows a step-by-step process for small community water systems to follow in complying with the Lead and Copper Rule. Product #DWPSPE10

required to do continuous monitoring. EPA recognizes that small systems have tight budgets and there is little value in requiring them to spend resources on frequent monitoring.

- Small and medium-sized systems can avoid corrosion control steps if readings for samples are below the action level in two consecutive six-month monitoring periods.
- Water quality parameter monitoring is less stringent for systems that have water below the action level.
- If, after two consecutive six-month monitoring periods, samples show levels of 0.005 mg/L for lead and 0.65 mg/L for copper (or lower), small systems can collect tap water samples every three years (also known as accelerated, reduced tap monitoring).
- Small systems have more flexibility in language for doing public education.

What did the EPA find in its review and what's in store?

EPA conducted an extensive study in 2004-05. They found that the LCR had been effective in more than 96 percent of systems serving 3,300 or more people. Nevertheless, EPA decided to launch a *Drinking Water Lead Reduction Plan* to "strengthen, update, and clarify existing requirements for water utilities and states to test for and reduce lead in drinking water."

By early 2006, EPA plans to propose regulatory changes to the LCR in the following areas:

- *Monitoring*—To ensure that water samples reflect the effectiveness of lead controls, to clarify the timing of sample collection, and to tighten criteria for reducing the frequency of monitoring.
- *Treatment Processes*—To require that utilities notify states prior to changes in treatment so that states can provide direction or require additional monitoring. EPA will also revise



Lead in School Drinking Water provides information about the effects lead has on children. It explains how to detect lead in school drinking water supplies and how to pinpoint its source. Ways to reduce or eliminate lead in drinking water and personnel training for sampling and remedial programs are included. Product #DWBLPE06



Monitoring Guidance Documents for the Lead and Copper Rule—Product #DWBLRG12 (Systems serving 3,301-10,000); #DWBLRG13 (Systems serving 501-3300); #DWBLRG14 (Systems serving 101-500); and #DWBLRG15 (Systems serving fewer than 100).



“Lead Leaching from Submersible Well Pumps” explains various aspects of submersible pumps, including lead leaching from brass components and available treatment options to reduce lead levels in drinking water. Product #DWBLPE154

Control of Lead and Copper in Drinking Water discusses regulatory and monitoring issues for lead and copper. It also explores tests that can be conducted to assess corrosion control and presents recommendations to utilities for performing corrosion control studies. Product #DWBKRE11

To order any of these products, call NESC at (800) 624-8301 or fax (304) 293-3161, or e-mail info@mail.nesc.wvu.edu. Make sure to include the products you want and their corresponding product number, and your name, organization, address, and phone number with each order. Quantities are limited to one each per order. If you need bulk copies, please call to make arrangements.

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existing guidance to help utilities maintain corrosion control while making treatment changes.

- *Customer Awareness*—To require that water utilities notify occupants of the results of any testing that occurs within a home or facility. EPA will also seek changes to allow states and utilities to provide customers with utility-specific advice about tap flushing to reduce lead levels.
- *Lead Service Line Management*—To ensure that service lines that test below the action level are re-evaluated after any major changes to treatment that could affect corrosion control.
- *Lead in Schools*—The agency will update and expand 1994 guidance on testing for lead in school drinking water. EPA will emphasize partnerships with other federal agencies, utilities, and schools to protect children from lead in drinking water.

“We need to free people from worrying about lead in their drinking water,” says Ben Grumbles, EPA assistant administrator for water. “This plan will increase the accuracy and consistency of monitoring and reporting, and it ensures that where there is a problem, people will be notified, and the problem will be dealt with quickly and properly.”

NDWC Engineering Scientist **Vipin Bhardwaj** has a bachelor’s degree in chemical engineering and master’s degrees in environmental engineering and agriculture from West Virginia University.



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