United States Environmental Protection Agency | Office of Water 4601 | EPA 570/9-91-400 January 1995

EPA

Lead and Copper Rule

F·A·C·T·S·H·E·E·T

"Lead may leach into the water from some kinds of home plumbing."

The Lead and Copper Rule was published in the *Federal Register* on June 7, 1991. It became effective on December 7, 1992. This rule requires treatment when lead and/or copper in drinking water exceed certain levels.

Lead enters drinking water mainly from the corrosion of lead-containing household plumbing. Since lead and copper contamination generally occurs after water has left the water system, the best way for the water system operator to find out if customer water is contaminated is to test water that has come from a household faucet. This type of contamination can be prevented by controlling the corrosiveness of the water supply. If corrosion control is not sufficient, lead-containing materials within the control of the water system (such as lead service lines) may have to be replaced. At no time will a system have to replace a homeowner's pipes.

Action Levels

	MCLG (mg/L)	Action Level (mg/L)
Lead	0	0.015
Copper	1.3	1.3

Maximum Contaminant Level Goals (MCLG): Water systems should try to supply water with no lead and with no more than 1.3 milligrams of copper per liter (mg/L). These are *non-enforceable* health goals.

Action Levels: When the concentration of lead or copper reaches the action level in ten percent or more of the required samples, the water system is required to carry out the water treatment requirements of the rule. These *enforceable* treatment requirements are described below.

Monitoring Requirements

Lead/copper monitoring at high-risk homes.

Water systems must complete a materials evaluation of their distribution system and/or review other information to target homes that are at high risk of lead/copper (Pb/Cu) contamination. Monitoring is to be conducted *at the tap* in these homes, with the number of tap-sampling sites based on the population served. One sample is required at each site.

Monitoring Requirements

- **Number of Initial Sampling Sites**

System size	# at home taps for Pb/Cu	# within dist. for WQPs
>100,000	100	25
10,001-100,000	60	10
3,301-10,000	40	3
501-3,300	20	2
101-500	10	1
≤100	5	1

Additional monitoring for other water quality parameters (WQPs) affecting corrosion is required to optimize treatment and determine compliance with State lead/copper standards. Two types of systems must perform this monitoring under the following conditions:

- Large systems serving more than 50,000 persons, regardless of the lead/copper levels in tap samples.
- Smaller systems serving less than 50,000 persons, if either action level is exceeded in tap samples.

Two types of sampling sites are specified for this purpose:

- *Within* the distribution system, with the number of sites based on population served (sites may be same as for coliform sampling). Two samples are required from each site.
- Two samples at each *entry* point to the distribution system.

Monitoring Frequencies.

Initially, systems must collect home *tap* samples for lead and copper analysis and samples for other water quality parameters (WQPs) every six months. In systems that are required to install corrosion control treatment, follow-up samples for other WQPs must be taken from *within* the distribution system every six months, and from *entry* points to the distribution system every two weeks. Both the number of sampling sites and the frequency may be reduced if the action level is met or the system maintains optimal treatment.

Monitoring Requirements

- **Frequency of Sampling**

Monitoring Period	Pb/Cu	WQPs	
	Home taps	within dist.	at entry to dist.
Initial	6 mo.	6 mo.	6 mo.
After corrosion treatment	6 mo.	6 mo.	2 wk.
Reduced			
–Conditional	1 yr.	6 mo.	2 wk.
–Final	3 yr.	3 yr.	2 wk.

Water Treatment Requirements

Four types of action are required to remedy high lead levels, and two are required for high levels of copper. Once a system finds that more than 10 percent of all tap monitoring results exceed the action levels, the system must begin to carry out the first three actions.

❶ **Corrosion control treatment.** Systems are required to first monitor, and depending on its size, conduct corrosion control studies and recommend a corrosion control treatment method to the State. Upon the approval of the State, treatment is to be installed and demonstrated to be effective according to criteria set by the State. Treatment options are pH and alkalinity adjustment, calcium adjustment and silica or phosphate-based corrosion inhibition.

❷ **Source Water Treatment.** Systems must first monitor their source water for the presence of lead/copper, and, if necessary, recommend a treatment method to the State. Treatment options are ion exchange, lime softening, reverse osmosis and coagulation/filtration. Once the State approves a treatment, systems will have 2 years to install it and 1 more year to conduct follow-up monitoring. If treatment is not required, or if the treated water does not exceed the maximum lead/copper levels permitted by the State, source water monitoring will be synchronized with the system's other monitoring schedules.

❸ **Public Education.** Public education materials developed by EPA will inform customers about the health effects of lead, and explain what they can do at home to reduce their exposure. The system must begin delivering the materials within 60 days of the lead action level exceedance. The materials include public service announcements to be submitted periodically to television and radio stations, and other pamphlets to be delivered directly to customers, newspapers, hospitals, etc. This step is not required if the water system exceeds only the copper action level.

IF a system continues to exceed the lead action level after installing optimal corrosion control and source water treatment, the fourth action must be taken:

❹ **Lead Service Line Replacement.** Lead service lines that contribute more than 0.015 mg/L to tap water lead levels must be replaced. A system must replace seven percent of its lead lines each year, and must replace all lines within 15 years.

Analytical Requirements

Tap Samples
Lead
Copper
WQPs
pH
Alkalinity
Calcium
Conductivity
Orthophosphate*
Silica **
Temperature

* Only if a phosphate-based inhibitor is added.
**Only if a silicate-based inhibitor is added.

Compliance Deadlines

NOTE: assumes action levels exceeded in initial monitoring

Action	System Size: Large >50K	Medium 3,301-50K	Small ≤3,300
Begin monitoring	Jan92	Jul92	Jul93
Complete treatment study (if required by State)	Jul94	Jul95	Jul96
Recommend treatment to State			
• study not required-	N/A	Jan93	Jan94
• study required-	Jul94	Jul95	Jul96
Complete treatment installation			
• study not required-	N/A	Jul96	Jan98
• study required-	Jan97	Jan98	Jan99
Complete follow-up monitoring			
• study not required-	N/A	Jul97	Jan99
• study required-	Jan98	Jan99	Jan2000

For More Information

Call the Safe Drinking Water Hotline at: 1-800-426-4791.