



LCCA COMPREHENSIVE GUIDE  
CHAPTER 1: WHY ESTABLISH A TESTING PROGRAM?

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*This report contains important information about your drinking water. Have someone translate it for you, or speak with someone who understands it.*

*If you need this document translated, please contact MassDEP's Diversity Director at 617 556 1139. TTY# MassRelay 1 800 439 2370.*

# INTRODUCTION: MINIMIZING LEAD AND COPPER IN DRINKING WATER

The purpose of this Comprehensive Guide is to help minimize the exposure of students and staff to lead and copper in school drinking water. Young children are most sensitive to the effects of lead and copper because their body systems are not fully developed. Chapter 1 of the guide answers frequently asked questions about lead and copper, including questions about health, how lead and copper may get into the drinking water at your school or childcare facility, and how children, teachers, and staff can avoid exposure.

The Lead Contamination Control Act (LCCA) program was established under the federal Safe Drinking Water Act in 1988 to reduce lead in the drinking water of schools and childcare facilities. The Massachusetts LCCA program includes both lead and copper because the same mechanism that leaches lead from plumbing into the drinking water can also leach copper.

All schools (K–12) and Early Education and Care (EEC) Program facilities (herein “schools”) are covered under the LCCA. This includes facilities that are on a municipal water supply and facilities that have their own water source, such as a well. Facilities that have their own source of water and serve at least 25 people 60 or more days a year are public water systems (PWSs) regulated by the Massachusetts Department of Environmental Protection (MassDEP).

MassDEP is responsible for managing the LCCA in Massachusetts. Partners include MA Department of Public Health (DPH), MA Department of Elementary and Secondary Education (ESE), MA Department of Early Education and Care (EEC), and the United States Environmental Protection Agency (US EPA). PWSs, your local board of health, and the MA Board of State Examiners of Plumbers and Gas Fitters also assist in sharing information on lead and copper reduction in drinking water.

MassDEP developed this Comprehensive Guide to help minimize the potential for elevated lead and copper levels in drinking water in schools. Children are most susceptible to the effects of lead and copper because their bodies are still undergoing development. The adverse health effects from lead include reduced IQ and attention span, learning disabilities, poor classroom performance, hyperactivity, behavioral problems, impaired growth, and hearing loss. The adverse health effects of excess copper exposure include nausea, vomiting, diarrhea, stomach cramps, and kidney and liver damage. Copper is a naturally occurring and essential nutrient for good health in low levels, but exposure to high levels of copper can harm health.

There is no federal law requiring testing of drinking water in schools, except for schools that have their own water supply and are regulated under the Safe Drinking Water Act (SDWA). States and local jurisdictions may, however, establish their own programs for testing drinking water lead and copper levels in schools.

## HOW DOES THE MASSACHUSETTS LCCA PROGRAM WORK?

MassDEP provides educational information and assistance to schools subject to the LCCA. Every five years MassDEP requests updated information from these facility administrators about lead and copper sampling and remediation efforts at their facilities. This updated information is used to provide additional training and technical assistance opportunities. Schools are encouraged to establish and implement a sampling plan as described in other sections of the Comprehensive Guide.

## HOW DO LEAD AND COPPER GET INTO DRINKING WATER?

Most lead and copper get into drinking water after the water leaves the local well or treatment plant and comes into contact with plumbing materials containing lead and copper. These include lead pipe and lead solder (commonly used until 1986) as well as faucets, valves, and other components made of copper and brass. The physical/chemical interaction that occurs between the water and plumbing is referred to as corrosion. The extent to which corrosion occurs contributes to the amount of lead and copper that can be released into the drinking water.

Your PWS may deliver water that meets all federal and state public health standards for lead and copper. As that drinking water is delivered to the faucet, corrosion within the plumbing may introduce lead or copper into your facilities' drinking water. The potential for lead and copper to leach into water increases the longer the water remains in contact with lead and copper in plumbing. As a result, facilities with intermittent water use patterns and long periods of stagnant water, such as schools, have an increased risk for elevated concentrations of lead or copper in

drinking water. Using hot water can also increase lead and copper levels in drinking water.

Testing drinking water in schools is important because children spend a significant portion of their day in these facilities and are likely to consume water while they are there. Drinking water outlets are locations where water may be used for consumption, such as a drinking fountain, water faucet or tap, or kitchen sinks.

The graphic at the end of this document shows possible sources of lead and copper in school drinking water.

## HOW DO LEAD AND COPPER GET INTO SOMEONE'S BODY?

Lead is present in typically low levels in a variety of different sources, such as food, drinking water, soil, dust, and air. Individuals are exposed to lead from eating food, drinking water, accidentally swallowing soil and dust, and from breathing air that contains lead. Other less common sources of lead include some handmade pottery and imported cookware, home remedies, toys, candy, jewelry, and canned food. Lead-based paint and lead-contaminated dust are the primary sources of exposure for children, but drinking water can be an important contributing source to overall exposure. Because everyone is exposed to small amounts of lead in their daily life, it is not uncommon for a low level of lead to be present in someone's body.

We regularly come into contact with small amounts of copper from breathing air, drinking water, and eating foods. Copper is not easily absorbed through the skin, but we may also come into contact with copper by touching copper, particles attached to copper, or copper compounds. Because copper is essential to good health in small "trace" amounts, everyone absorbs small amounts of copper every day. Our bodies have a natural mechanism to maintain the proper level of copper.

## WHAT IF LEAD OR COPPER LEVELS IN THE DRINKING WATER ARE HIGH?

If the levels are higher than the MassDEP action level, which is 15 parts per billion (ppb) for lead and 1,300 ppb for copper, your school should work to determine the source. Once a school is aware of elevated lead or copper in the drinking water, access to any tap or fountain above the action level should be removed and an alternate source of water should be provided as necessary.

MassDEP can provide technical assistance to schools with regard to sampling and follow-up measures. There are a number of ways that lead and copper levels can be reduced in school drinking water, such as by replacing pipes and fixtures, reducing the corrosiveness of the water, or initiating a flushing program. It is very important that your school keeps parents, teachers, and staff updated as sampling progresses and informed of the results of the sampling and follow-up actions.

Children's exposure to lead and copper in drinking water at school is only a small part of their overall potential exposure. Children typically only drink water in schools for a portion of the day. While it is unlikely that lead in drinking water at schools would cause staff or children to have significantly elevated blood lead levels, it can contribute to overall exposure. Risk will vary, however, depending on the individual, the circumstances, and the amount of water consumed. For example, infants who drink formula prepared with water containing elevated levels of lead or copper may be at a higher risk because of the large volume of water they consume relative to their body size.

## HOW DOES LEAD MAKE YOU SICK?

Lead detected above the action level does not necessarily mean a child will have elevated levels of lead in their blood. The amount of lead in a child's body depends on several factors, such as their age, nutritional status, and the various sources of lead in their environment. Lead can affect every organ system in the body, including the nervous system, kidneys, and cardiovascular system. The developing brains of infants, young children, and developing fetuses are at greatest risk. An exposure to lead that would have little effect on an adult can have a big effect on an infant, young child, and developing fetus.

Most children who have lead poisoning or high levels of lead exposure do not look or act sick. The only way to confirm lead poisoning is through a blood lead test. It is important to reduce lead exposure as much as possible, particularly for infants, young children, and pregnant women.

## HOW DOES COPPER MAKE YOU SICK?

Periodically drinking water that contains copper above the action level does not guarantee it will harm someone's health. Consuming levels of copper above the action level may cause nausea, vomiting, diarrhea, and stomach cramps. Some infants and children, people with liver disease, and people with Wilson's disease (an inherited disorder that causes too much copper to accumulate in the organs) have trouble eliminating copper from their bodies and are more likely to experience negative health effects, such as kidney and liver damage.

## SHOULD STUDENTS HAVE BLOOD TESTING DONE?

Testing all children following the detection of elevated levels of lead in a school's drinking water is not recommended. It is unlikely that lead in drinking water at schools would cause staff or children to have elevated blood lead levels. The most important thing to do is to identify and remove suspected sources of lead exposure.

Blood tests are commonly used to screen children for lead poisoning. In Massachusetts, young children must have their blood lead levels tested at age 9–12 months, again at ages 2 and 3, and sometimes at age 4 depending on where they live. This scheduled approach to blood lead testing helps identify lead poisoned children and eliminate sources of lead exposure in the most sensitive population. While we do not recommend testing all children at schools where elevated levels of lead in drinking water have been identified, if a child has never been screened, or if there are specific health concerns about a child, testing could be discussed with the child's health care provider.

Medical screening for copper is not generally recommended if copper is detected in drinking water at a school. Copper is normally found in all tissues of the body. Testing of blood, urine, feces, hair, and/or nails for copper can only show if a person has been exposed to higher than normal levels of copper. It cannot be used to predict the amount of the exposure, how long the exposure occurred, or potential health effects. Specific health questions about exposure to copper should be directed to a doctor or other health care provider.

## HOW CAN I REDUCE LEAD AND COPPER EXPOSURE AT SCHOOL?

Students, teachers, and staff members can help reduce exposure if lead or copper levels are elevated in drinking water by doing these easy things:

- Obey signs identifying water outlets that are for handwashing only or shouldn't be used at all.
- Let the water run for one minute before you drink from a fountain or faucet.
- Use cold water for drinking and cooking. If you want hot water, run cold water from the faucet and warm it in the microwave or on the stove.

When mixing powdered baby formula with tap water, always use cold water and do not use hot water. Simply warm formula to serve. Bottled or filtered water should be used when mixing baby formula if lead or copper levels are known to be elevated in the drinking water. Filters installed to reduce lead in drinking water should be NSF-certified to remove lead.

## IS IT SAFE TO BATHE IN WATER WITH ELEVATED LEVELS OF LEAD OR COPPER?

Yes. Lead and copper are not easily absorbed through the skin. It is not a problem to wash hands, bathe, and/or shower in water containing lead or copper.

## CAN WATER WITH ELEVATED LEAD OR COPPER LEVELS BE USED FOR WASHING OUT CUTS?

Yes. A brief exposure to elevated levels of lead or copper in water while rinsing a cut does not pose any hazard to health.

## HOW DOES A PUBLIC WATER SYSTEM (PWS) HELP A SCHOOL ON ITS DISTRIBUTION SYSTEM?

The PWS provides an annual Consumer Confidence Report (CCR) with system-wide lead and copper detections along with information and educational material. Because lead and copper are introduced through internal plumbing, lead and copper results reported in the CCR may not be representative of the drinking water provided by the school. Any corrosion control treatment provided by the PWS will help to protect all consumers from lead and copper, including schools. Your community PWS will provide education and technical assistance to schools that may not be aware of the importance of checking for lead and copper leaching from the internal plumbing.

## WHAT ARE TYPICAL QUESTIONS SCHOOLS SHOULD ASK COMMUNITY PWSs?

- Is the water system in compliance with federal and state standards for lead and copper monitoring and treatment?
- What steps has the community system taken to maintain compliance with the Lead and Copper Rule?
- Is the community's water corrosive? If yes, what is being done to minimize/treat corrosion?
- Is a corrosion control chemical used? If yes, does the chemical form a protective coating inside the piping?
- Does the community's water distribution system have any lead piping (for example, lead goosenecks at service connections or full or partial lead service lines)? If yes, what is the system's plan to remove these sources of lead?
- Is any portion of the service line to my school made of lead?
- Where can I get more information on lead and copper?

**Note for Public Water Suppliers:** This guide does not fulfill the notification or education requirements of the Lead and Copper Rule 310 CMR 22.06B. Public Water Systems should contact MassDEP for specific Lead and Copper Rule requirements of public water systems to notify consumers of elevated lead results.

## NEED MORE INFORMATION ON DEVELOPING AN LCCA PROGRAM ON LEAD AND COPPER?

The sections of this Comprehensive Guide and the associated e-learning modules provide technical assistance information on addressing lead and copper exceedances and managing these issues with staff, parents, and local officials.

You can also contact the MassDEP Drinking Water Program at [program.director-dwp@state.ma.us](mailto:program.director-dwp@state.ma.us) or 617-292-5770, or review the resources online at [Lead in Drinking Water](#).

## NEED MORE HEALTH INFORMATION?

Contact the [Massachusetts Department of Public Health Bureau of Environmental Health](#).

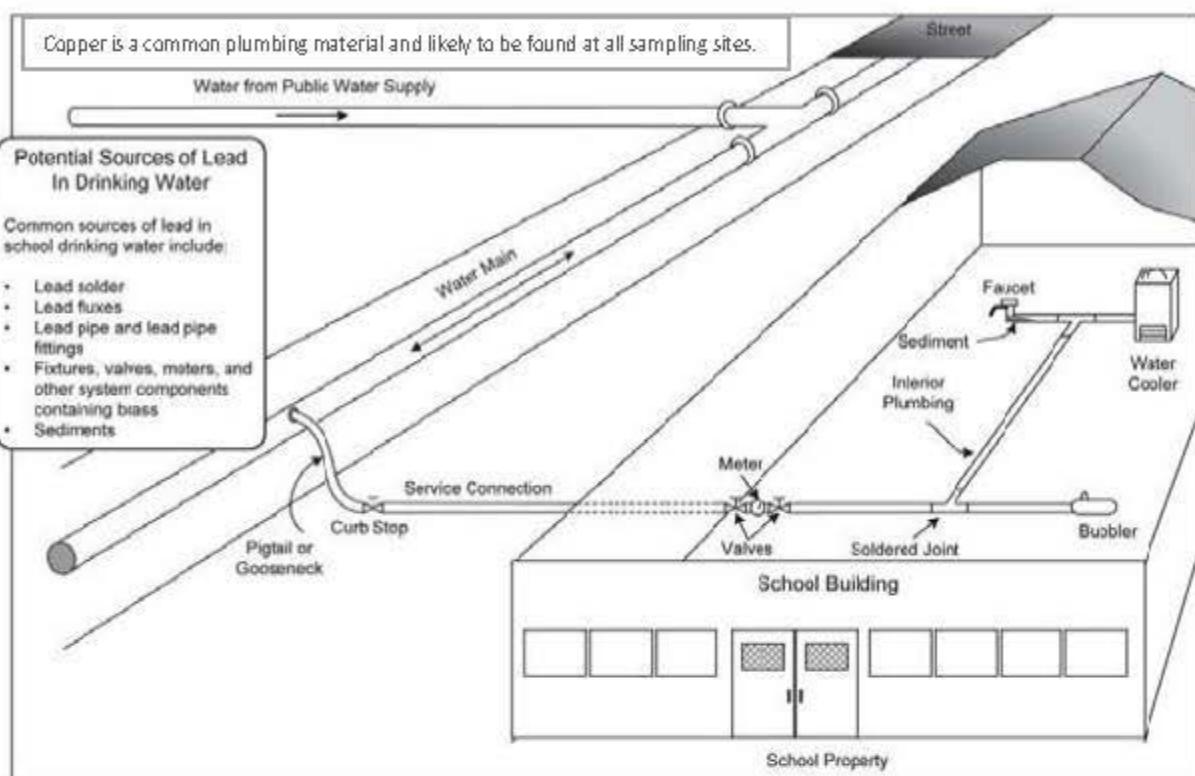
Phone: 617-624-5757 | Fax: 617-624-5777 | TTY: 617-624-5286

[Massachusetts Department of Public Health Childhood Lead Poisoning Prevention Program](#) at 1-800-532-9571.

## ADDITIONAL RESOURCES

- [Glossary of Commonly Used Terms in the LCCA Program](#)
- [Overview of Lead in Massachusetts Drinking Water](#): Explains federal legislation and the role and responsibilities of Public Water Systems.
- [Lead & Copper Rule – Public Water Systems 90th Percentile Lead Sampling Results](#): Explains lead testing responsibilities of Public Water Systems and provides 90th percentile values for the most recent sampling results, including those that are over the lead action level.

## Potential Sources of Lead and Copper in Drinking Water



## Potential Sources of Lead and Copper in Schools

