



Drinking Water Facts: Lead



Key Points

- Lead in drinking water comes from lead soldering, lead pipes, and leaded brass faucets.
- Too much lead in the human body can damage the nervous system, brain, and kidneys. Young children and fetuses are at greatest risk of toxic effects of lead.
- To lower exposure to lead in drinking water: Flush your cold water faucet about 30 seconds if water has been sitting for several hours. Never drink, cook, or prepare beverages from the hot water faucet.

What is lead?

Lead is a soft gray metal. Until it was banned by federal law in 1986 and by New Jersey law in 1987, lead was used in the solder that connects copper pipes, in pipes used in household plumbing, and in service lines that connect houses to the public water mains in the street. Some of these lead pipes may still be found in parts of New Jersey where housing is more than 50 years old. Lead in drinking water has no taste, scent, or color.

The primary source of exposure to children is lead-based paints used inside or on houses built before 1978. Lead is still used in fishing sinkers, and in car wheel weights and batteries, as well as in some imported glazed ceramic ware, crystal, and food cans. Some imported cosmetics, cultural remedies, and candies have been found to be contaminated with lead.

It is estimated that 20% or more of human exposure to lead may come from lead in drinking water, while formula-fed infants can receive 40-60% of their lead exposure from drinking water containing lead.

What factors affect how much lead can get into drinking water?

- **Type of plumbing materials:** Lead solder used for connecting pipes contains about 50% lead. Sloppy soldering can increase the amount of lead dissolved into the water. Houses built after the 1987 ban on the use of lead soldering are less likely to have lead in drinking water. Brass fixtures and faucets can contain up to 8% lead and are also a significant source of lead in drinking water.
- **Length of time water stands in pipes:** The longer the time water stands in the plumbing the more likely it is that lead will build up in drinking water.

Continued...What factors affect how much lead can get into drinking water?

- **Corrosiveness of water:** Corrosive water – caused by high acidity, low mineral content, or high chloride – can increase the amount of lead that can get into drinking water. Acidic water tends to dissolve lead from pipes or solder into the water, and high chloride can make lead water soluble. Typically, minerals tend to form a protective barrier around lead solder and decrease the amount of lead that could be dissolved. Water that has a low mineral content can dissolve lead from solder into the water. One indication of corrosion in copper pipes is a blue-green stain around a drain of a white enamel sink. The absence of such a stain does not mean that corrosion is not occurring.
- **Grounding of electrical wires to water pipes:** The grounding of electrical wiring and telephone lines to water pipes can increase the rate of corrosion.
- **If you have a private well:** Lead can get into your drinking water from well parts made of lead or from a nearby industrial waste facility or municipal landfill.

How do I know if I have lead in my drinking water?

In order to prevent or reduce the chances of health effects due to lead in drinking water “Action Levels” have been established by the EPA and the NJDEP as enforceable trigger points at which corrective action should be undertaken by the public water company. **The Action Level for lead = 15ppb (µg/L).**

If you are a private well owner, you should test your drinking water for lead using a New Jersey-certified laboratory. A list of PWTA New Jersey certified labs in your area can be obtained from <http://www.nj.gov/dep/oqa/certlabs.htm>.



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Is lead harmful to my health?

Lead can cause a variety of harmful health effects. The type and severity of these health effects depend upon how much lead has built up in the body over time. When water or food found to contain lead is swallowed, some of it is absorbed through the digestive tract. Once absorbed, lead is distributed to all parts of the body through the blood and builds up mostly in the bone. A certain amount of lead remains in the blood.

Children and fetuses are the most sensitive to the harmful effects of lead since they absorb more lead into their bodies than adults and are more susceptible to its effects on brain development. Even low levels of lead in blood may affect the ability to pay attention, academic achievement, and behavioral problems. Most children with elevated blood lead levels do not exhibit any symptoms, however effects may appear later in age. Other health effects may include kidney damage, anemia, and reductions in birth weight. Symptoms of severely elevated blood lead levels (lead poisoning) may include stomach aches, vomiting, poor appetite, or nausea.

It is the buildup of lead from all sources over time that determines whether harmful health effects will occur. Typically, drinking water alone has not been associated with elevated blood lead levels. Combined with other sources, however, the amount of lead from drinking water may be enough to increase the chances of harmful health effects in sensitive individuals, such as infants and children.

Is there a medical test to measure the level of lead in the body?

Children can be given a blood test to measure the level of lead in their blood. The Centers for Disease Control and Prevention (CDC) consider the level of blood lead of concern as levels in the top 2.5% of children ages 1-5 years in the U.S. Currently, a blood lead level equal to or greater than 5 micrograms per deciliter ($\mu\text{g}/\text{dL}$) is reportable. However, there is no safe level of lead.

NJ law requires that children be screened at both 1 and 2 years of age. Children 3 to 5 years of age should also be screened if they have not been screened before. Consult your health care provider or local health department if you have a reason to believe a member of your family has been exposed to lead.

How can I reduce my exposure to lead in drinking water?

1. If water from the cold water faucet has been sitting for several hours, you should let it run for 15 to 30 seconds until you feel the temperature of the water become and stay colder. You should flush your water before using it for drinking, cooking, or preparing beverages.
2. Lead is likely to be highest in hot water faucets so never drink, cook, or prepare beverages from the hot water faucet.
3. Boiling does not remove lead from drinking water, and excessive boiling of water for food preparation, drinking, or preparing beverages increase the lead concentration in the water by evaporation.

What should I do if my lead levels are elevated?

Washing clothes and dishes and showering and bathing are considered safe uses of water containing lead.

If contaminants are found in your well water above the action level, you should retest your well water to make sure that the first sample was collected and analyzed properly. If lead is found in the second sample take steps to reduce the levels in your well water. Contact your lab, local health department, or NJDOH, for help in understanding your test results and for advice on steps you can take to reduce contaminants in your well water.

What can I do to remove lead from my private well water?

Point-of use (POU) devices can remove lead at your tap, and **point-of-entry (POE) devices** can reduce corrosivity at the point where the water enters your home. NSF International is a non-profit organization which tests and certifies (POU/POE) drinking water treatment standards. More information about certified drinking water treatment devices can be found at: [<http://info.nsf.org/Certified/DWTU/>]

Water softeners and reverse osmosis units will remove lead from water, but can also make the water more corrosive to lead solder and plumbing by removing certain minerals. The installation of softeners or reverse osmosis units at the point of entry on older homes that may have lead plumbing should only be done under supervision of a qualified water treatment professional.

Frequently Asked Questions Protecting New Jerseyans from Lead in Water

The primary lead concern in New Jersey has been the old lead-based paint in our old housing stock. New Jersey is a leader in the nation in protecting children and addressing lead contaminated housing. Very rarely is lead ever found in the sources of our drinking water. However, this page identifies how it can leach into water delivery systems and the precautions that can be taken.

What laws and regulations are in place to protect the public against lead in its drinking water?

The United States Environmental Protection Agency issued regulations in 1991 (known as the Lead and Copper Rule), which were revised in 2000 and again in 2007, to minimize lead and copper levels in drinking water.

The regulations focus on two areas:

- Periodic testing for lead
- Educating the public on minimizing lead in its drinking water

The State of New Jersey adopted these regulations by reference, which means New Jersey implements the federal regulations.

How does lead enter the drinking water system?

In the vast majority of cases, lead enters the drinking water through the water delivery system itself when it leaches from either lead pipes, household fixtures containing lead, or lead solder. The leaching of lead is caused by corrosive properties in water. Very rarely is lead present in the sources of drinking water.

What steps are taken by drinking water systems to minimize the leaching of lead into drinking water?

Some drinking water utilities add anti-corrosive materials (inhibitors) and/or adjust the pH of the water to reduce the likelihood of lead leaching into the water before it comes out of the customers' taps. The corrosion control treatment may have been added by the system on its own or as a result of a lead or copper action level exceedance. Other drinking water utilities do not need to add inhibitors or adjust pH to comply with the Lead and Copper Rule.

How often is testing for lead required?

The Lead and Copper Rule contains schedules that determine how often water utilities are required to test for lead.

Initially, water is tested for two consecutive six-month periods, once during the first half of the calendar year and again during the second half of the calendar year. Initial monitoring occurs when a new water system comes online or may be required when a water utility switches the source of its water or changes its treatment process.

If fewer than 10% of the lead and copper results from the initial sampling are greater than the levels that require remedial action, then the water utility can reduce their monitoring frequency to test once a year for the following two consecutive years. These tests must be conducted between June 1 and September 30. This is the period when it is most likely that water temperature increases and pH decreases, and therefore the period when water may be more corrosive than during the colder months.

If, after three consecutive years of testing, the water is not found to contain lead above the level requiring remedial action, then the water utility is required to test for lead every three years.

What is the testing looking for?

The testing takes place to determine if drinking water contains lead at levels that require remedial action to reduce the corrosivity of the water. The level at which action is required is known as the Action Level. The Action Level is 0.015 milligrams of lead per liter of water (0.015 mg/L).

Under a formula developed by EPA, when a certain number of results exceed the Action Level, the water utility must take steps to reduce the corrosivity of the water to minimize the leaching of lead.

Where is testing performed?

Water utilities are required to test the water at locations that are most susceptible to high lead concentrations. Because in the vast majority of cases lead enters the water supply through the delivery system (the pipes and fixtures) and not at the source, samples are generally taken at the tap in areas that have older homes (constructed before 1986). These buildings are more likely to have either lead service lines, copper pipes with lead solder, or fixtures that contain lead.

How is the testing conducted?

Because lead tends to enter water in the delivery system, water is drawn from the taps at the ultimate destination (usually customers' homes). The water utility sends instructions and collection bottles to a statistically significant number of customers in their service areas.

The customers who receive the testing collection kits are selected by the water utility taking into account the age of the infrastructure in a particular area, since older homes are more likely to be serviced by lead service lines or to contain copper pipes with lead solder or plumbing fixtures containing lead.

Customers are instructed how to collect the water sample (first thing in the morning from a water faucet in the kitchen or bathroom that has not been used for at least six hours). The sample is then returned to the water utility for testing.

What is a water utility required to do if testing finds the water exceeds the Action Level for lead?

The utility is required to take the following steps:

- Inform the public of the results and provide guidance on how to reduce the level of lead in their drinking water
- Perform Water Quality Parameter monitoring (WQP), to determine the extent of the corrosive nature of the water
- Monitor the source water and if necessary make recommended source water treatment for lead
- Initiate corrosion control treatment to reduce the likelihood of lead leaching into water

What steps can water users take to minimize the presence of lead in their drinking water?

Consumers can flush their water lines each morning by running their cold bathroom or kitchen taps for about a minute, so that any water that has been sitting in the pipes into which lead has leached is removed from their pipes. Consumers can tell when their lines have been flushed when the water turns cooler than what originally came out of the tap.

Who should consumers contact if they are concerned about possible lead levels in their water?

Consumers should contact their water utility. Water utilities are required to provide consumers with information on how to get their water tested.

If consumers are served by a private well rather than by a water utility, they can hire a New Jersey-certified laboratory to have their drinking water sampled and analyzed.