



Private Water Systems

Bureau of Environmental Health
and Radiation Protection

"To protect and improve the health of all Ohioans"

Private Drinking Water Lead in Drinking Water from Private Water Systems

Lead is a metal found in natural deposits and has been commonly used in household plumbing materials and water service lines.

While Lead is relatively uncommon in the ground water supplying private water system wells in Ohio, it can occur. In areas where lead is found in the ground water it is due to the localized geologic occurrence of lead bearing minerals in the aquifer.

In these areas, the construction and depth of the well completion may contribute to the levels of lead found in the groundwater supplying the well.

The more common source of lead in drinking water primarily occurs when water makes contact with plumbing materials and water service lines. Prior to the current knowledge of the health hazards of lead, it was widely used in products such as gasoline, paints, batteries, metal products and ammunition -- just to name a few.

What are the Drinking Water Standards?

The US EPA has no established maximum contaminant level (MCL) for lead in drinking water from public water systems but has instead established a lead action level of 0.015 mg/L or 15 parts per billion (ppb) for public water systems.

For source water supplied by private water systems, the Ohio Department of Health's Residential Water and Sewage Program recommends that owners of private water systems take action to remove the lead or reduce the levels of lead when levels are detected above 15 ppb. If the cause of the lead problem is not from the source water aquifer, contact the Ohio Department of Health Lead Poisoning Prevention Program at (877) 668-5323 or (614) 466-1450 or lead@odh.ohio.gov.



What are the Health Effects?

For information about the health effects of lead visit the Lead Poisoning Prevention Program Web pages for:

Lead Poisoning – Children:

http://www.odh.ohio.gov/odhprograms/eh/lead_ch/leadch1.aspx

Lead Poisoning Surveillance – Adults:

http://www.odh.ohio.gov/odhprograms/eh/l_adult/leadadults.aspx

How can the plumbing put lead into the drinking water from my private water system?

There are several **potential risk factors** that affect how much lead can get into your drinking water:

- 1) The type of plumbing materials, fixtures, and water lines used.*
 - Because lead is toxic, its use in the U.S. has been dramatically reduced since the 1980s. Homes built before 1986 are more likely to have lead pipes, fixtures and solder. However, new homes are also at risk: even legally "lead-free" plumbing may contain up to 8 percent 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, especially hot water.
- 2) The amount of time the water stays in the pipes.*
 - The longer the water sits in the pipes without being used, the more likely lead can be leached into the water.
- 3) The pH (acidity or alkalinity) of the water.*
 - Corrosive water (which has a very high or very low pH) can dissolve lead from the supply pipes, faucets, or solder and flux used to connect copper pipes. See the Private Water Systems Program Web page on pH for more information (http://www.odh.ohio.gov/en/odhprograms/eh/water/quality_treatment/pH.aspx).

4) *The mineral content of the water.*

- Soft (water with a low mineral content), acidic water can dissolve lead from the pipes or solder of household water systems.

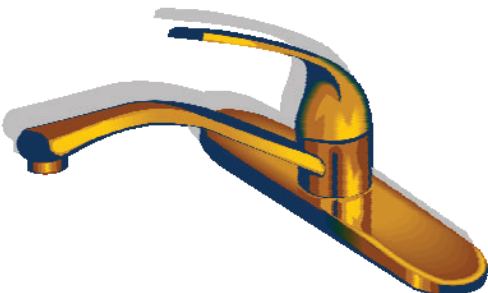
What are the Treatment Options for Lead in my Water?

First, identify if the source of the lead is the groundwater itself, part of the well or part of the household plumbing system. Ideally, you will be able to find and remove the lead source. If you have a private well, check both the well and the pump for potential lead sources. These may include brass fittings, lead in pump materials, and lead packers that were historically used in wells. A registered private water systems contractor can help you determine if any of the well components are a source of lead.

Heating or boiling your water will not remove lead. As some of the water evaporates during the boiling process, the lead concentration of the water can actually increase slightly as the water is boiled.

If the source is not the groundwater and it is not possible or cost-effective to remove the lead source of the water system or install treatment, flushing the water system before using the water for drinking or cooking may be an option. Any time a particular faucet has not been used for several hours (approximately six or more), you can flush the system by running the water for about one to two minutes or until the water becomes as cold as it will get. Flush each faucet individually before using the water for drinking or cooking. You can use the water flushed from the tap to wash dishes or clothing, or clean. Avoid cooking with or drinking hot tap water because hot water dissolves lead more readily than cold water does. Do not use hot tap water to make cereals, drinks or mix baby formula. You may draw cold water after flushing the tap and then heat it if needed.

You may also wish to consider water treatment methods such as reverse osmosis, distillation, and carbon filters specially designed to remove lead. Typically these methods are installed at the point of use and treat water at only one faucet.



Links to treatment information for lead in drinking water:

Water Systems Council wellcare® information about Well Water Treatment Options and Costs https://www.watersystemscouncil.org/download/wellcare_information_sheets/well_water_testing_&_treatment_information_sheets/DrinkingWaterTreatmentsandCostsFINAL.pdf

For more information, contact the Ohio Department of Health Lead Poisoning Prevention Program at: (877) 668-5323 or (614) 466-1450 or lead@odh.ohio.gov or http://www.odh.ohio.gov/odhprograms/eh/pbs_environmental/leadlp/lead.aspx

References and Additional Resources

Ohio Department of Health's Health Assessment fact sheet –Lead (<http://www.odh.ohio.gov/-/media/ODH/ASSETS/Files/eh/Chemical-Fact-sheets/017-Lead.pdf?la=en>)

US EPA – Lead in Drinking Water (<https://www.epa.gov/ground-water-and-drinking-water/basic-information-about-lead-drinking-water>)

US EPA – Is There Lead in my Drinking Water? (<https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=500025PW.txt>)

CDC – Lead - Water (<http://www.cdc.gov/nceh/lead/tips/water.htm>)

ATSDR Toxic Substances Portal: Lead (<http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=22>)

Where can I get more information about my private drinking water?

Ohio Department of Health
Residential Water and Sewage Program

246 N High Street
Columbus, Ohio 43215
Phone: (614) 644-7558
Fax: (614) 466-4556
BEH@odh.ohio.gov

Copper - ToxFAQs™

What is copper?

Copper (Cu) is an element and metal. It is found in rocks, soils, water, and air. Copper is an essential nutrient for humans and is in many foods. It's also essential to animals and plants. Copper and substances containing copper are used in many industries in the U.S.. Copper can be found in materials and products such as wiring, plumbing, pesticides, cookware, and dietary supplements, among others. Copper scrap can be combined with other metals to make brass and bronze pipes. In the U.S., copper is mined and recovered from metal through smelting.



What happens to copper in the environment?

- Copper is released from natural sources, such as windblown dusts, decaying vegetation, and from human activities like municipal solid waste management and fossil fuel burning.
- In air, copper usually attaches to particles (particulate matter) and can travel far from its source.
- In water, copper will usually attach to soils if possible, or dissolve.
- Copper attaches to soils, where it can be taken up by plants.
- Mollusks, such as clams and oysters, can build up copper in their bodies.
- Copper does not break down in the environment.

Ingesting copper in food is necessary for human health. Too much copper can be harmful.

How can I be exposed to copper?

- People ingest copper from drinking water and food, inhale copper from air, and may touch copper or products that contain copper.
- Drinking water can contain high levels of copper if your home has copper pipes and acidic water. This is more likely to occur in new or recently renovated buildings/homes using copper plumbing.
- Blue copper sulfate crystals are available to purchase and have been accidentally ingested by people who confused them for candy or toys.
- You may be exposed to copper fumes if you work or live near a site that uses copper in mining, agriculture, or in a facility that processes copper.
- Soils near mines, processing facilities, or waste dump sites may have a lot of copper.

How can copper affect my health?

It is essential for people to ingest small amounts of copper everyday in food and water. Ingesting too much or too little copper can lead to illness and/or disease. Ingesting a high amount of copper, usually in drinking water, can cause vomiting, nausea, abdominal pain, and/or diarrhea. Ingesting higher than recommended amounts of copper every day over time, such as in water or in copper supplements, can lead to severe illness, such as kidney and liver damage.

Breathing in copper dusts, sprays, or crystals can irritate your nose and throat, and cause dizziness and headaches. People who have ingested these substances have gotten very sick and/or died.

Copper is essential to the development of babies and children, and is found in breastmilk. Babies and children are expected to have symptoms similar to adults when exposed to high levels of copper in air, water, or food. If you have a disorder that causes copper to build up in your body, like Wilson's disease, you may be especially vulnerable to high copper levels in air, food, or water.

Copper

Can copper cause cancer?

The U.S. Department of Health and Human Services (DHHS) has not evaluated the carcinogenicity (whether it causes cancer) of copper.

The U.S. Environmental Protection Agency (EPA) has not classified if copper is carcinogenic (cancer causing) to humans.

The International Agency for Research on Cancer (IARC) has not evaluated the carcinogenicity of copper. IARC lists copper 8-hydroxyquinoline as a group 3 agent indicating the carcinogenicity in humans cannot be classified due to lack of cancer studies in humans and animals.

Can I get a medical test to check for copper?

There are tests to measure the amount of copper in your blood, urine, nails, and hair. Your medical provider can help decide if a test is needed and which is the most appropriate for you. High levels of copper in these tests can show if you have been exposed to a lot of copper or if there is a problem with copper regulation in the body. These tests will not predict if you will have health problems. These tests are not part of standard health tests that are done at your doctor's office and are done through a special lab. If you think you may have been exposed to high levels of copper, talk to your doctor, nurse, or clinic, or call poison control.

How can I protect my family from copper exposure?

If your water is metallic or bitter in taste or smell, and/or is green-blue in color this may be a sign that there is too much copper in your drinking water. If you have copper piping, it can leach into water if your home is new or recently renovated, or if your water is corrosive. Regularly cleaning or flushing out your system can help avoid this. There are tests available to check if your water is corrosive or if copper levels in your water are high.

Safely store copper powders, crystals, or dusts away from children, pets, or other adults.

Monitor your copper intake if you are adding more copper to your diet, such as by taking dietary supplements with copper, to make sure you are not eating too much. Talk to your doctor, nurse, or clinic to figure out if you are taking the proper amount of copper.

If you work with copper, wear the necessary protective clothing and equipment, and always follow safety procedures. Shower and change your clothes before going home each day.

Want more information?

Call **CDC-INFO** at 1-800-232-4636, or submit your question online at <https://wwwn.cdc.gov/dcs/ContactUs/Form>

Go to ATSDR's [Toxicological Profile for Copper](#)

Go to ATSDR's Toxic Substances Portal: <http://www.atsdr.cdc.gov/substances/index.asp>

If you have any more questions or concerns, you can also find & contact your ATSDR Regional Representative at http://www.atsdr.cdc.gov/DRO/dro_org.html

