

# SOURCES OF LEAD AND COPPER AND HEALTH EFFECTS

*Responses to Frequently Asked Questions about Lead and Copper in Water*

## 1. How does lead get into drinking water?

Drinking water provided by the GLWA to your community does not contain lead. Lead may enter drinking water as a result of the corrosion or wearing away of materials in the water distribution system and household plumbing that contain lead. These materials can include lead-based solder, brass and chrome-plated brass faucets and fixtures, lead goosenecks and lead service lines connecting homes to water mains. Corrosion control practices reduce the risk of lead leaching from pipes by creating a protective film or coating inside the pipe. Orthophosphate has been used to control corrosion in the GLWA service area since 1996.

## 2. What are the major sources of lead exposure?

Lead exposure can come from paint, dust, water or soil contaminated with lead. According to the CDC, lead-based paint is the most widespread and dangerous high-dose source of lead exposure for young children. Lead was used in household paint until 1978 leaving lead contamination in homes and surrounding soils. Leaded gasoline, used until the mid-1980s, has also contributed to increased lead levels in soil. Local ordinances in the Detroit area began prohibiting the use of lead pipe in new construction as early as 1947. The use of lead pipes, solder and flux that was not "lead free" was banned nationwide in 1986.

Prior to 2014, "lead free" household plumbing fixtures could contain up to 8% lead. In January 2014, "lead free" was redefined as a weighted average of 0.25% lead. Lead can leach from these pipes and fixtures when corrosive water runs through them, hence the need for corrosion control additives. Water consumption is estimated to contribute, on average, about 10-20% of a child's total lead intake, and for infants fed formula, 40-60% of their lead exposure (Rabin, 2008).



Children under the age of 6 are most susceptible to the effects of lead. In homes with lead service lines or plumbing, water consumption can contribute about 10-20% of a child's total lead intake.

## 3. What health problems are associated with lead exposure?

Lead can affect almost every organ and system in your body. Children under the age of 6 are most susceptible to the effects of lead. According to the United States Environmental Protection Agency (USEPA), "Even low levels of lead in the blood of children can result in behavior and learning problems, lower IQ, hyperactivity, slowed growth, hearing problems and anemia." Pregnant women are at particular risk from lead exposure that can result in reduced fetus growth, stillbirth (Troesken, 2006; Edwards, 2014); and premature birth. Adults can suffer from cardiovascular effects, decreased kidney function and reproductive problems.

Contact your physician if you are concerned about lead exposure. Additional information on the health effects of lead can be found on the USEPA's website at [www.epa.gov/lead/learn-about-lead](http://www.epa.gov/lead/learn-about-lead).



#### 4. *How does copper get into drinking water?*

Like lead, copper can leach out of plumbing materials if corrosive water flows through the pipe. The protective coating created by the addition of orthophosphate can reduce the risk of copper leaching from pipes.

#### 5. *What health problems are associated with copper exposure?*

Copper is an essential nutrient. "Short term exposure to copper levels above the action level in drinking water can cause gastrointestinal distress. Long term exposure can cause liver or kidney damage. People with Wilson's disease should consult their personal doctor if the amount of copper in their water exceeds the action level." Wilson's disease is an inherited condition that causes the body to retain excess copper. Persons with Wilson's disease may be at a higher risk of health effects than the general public.

From USEPA's website at [www.epa.gov/ground-water-and-drinking-water/table-regulated-drinking-water-contaminants](http://www.epa.gov/ground-water-and-drinking-water/table-regulated-drinking-water-contaminants).

#### 6. *Where can I find lead and copper health effects information?*

Information about the health impacts of lead can be found on the Centers for Disease Control and Prevention's website at [www.cdc.gov/nceh/lead](http://www.cdc.gov/nceh/lead).

Other information about lead is available at [www.michigan.gov/egle](http://www.michigan.gov/egle).

A public health statement for copper can be found on the Agency for Toxic Substances & Disease Registry's website at [www.atsdr.cdc.gov/phs/phs.asp?id=204&tid=37](http://www.atsdr.cdc.gov/phs/phs.asp?id=204&tid=37).

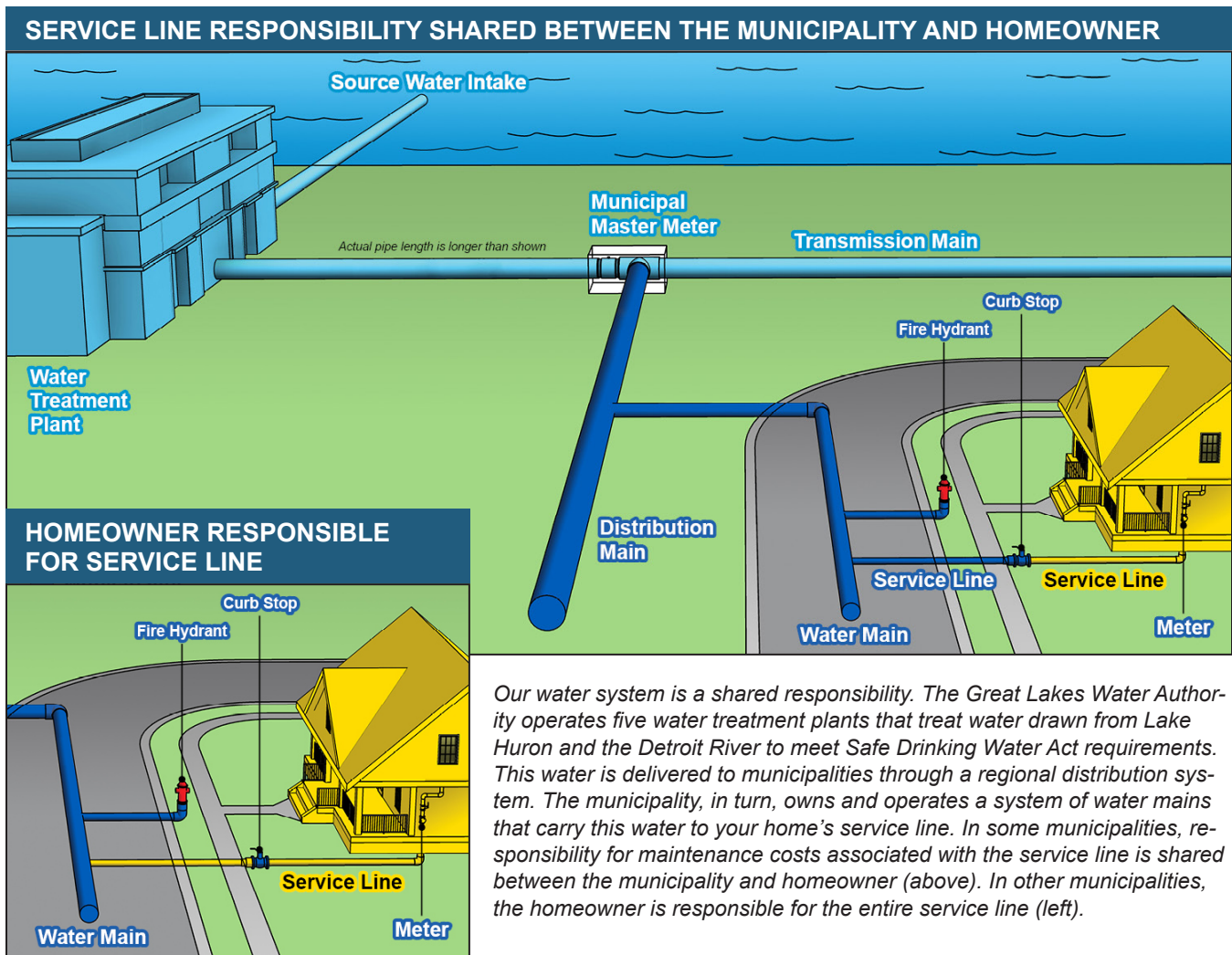
**THE WATER THAT GLWA DELIVERS TO YOUR COMMUNITY DOES NOT CONTAIN LEAD. LEAD CAN LEACH INTO DRINKING WATER THROUGH HOME PLUMBING FIXTURES, AND IN SOME CASES, CUSTOMER SERVICE LINES.**

# SERVICE LINES AND PLUMBING FIXTURES

Responses to Frequently Asked Questions about Lead and Copper in Water

## 1. What is a service line and who is responsible for it?

A service line is the pipe that connects a home to the water main. Homeowner (property owner) responsibility for the service line varies by community. In some communities, the homeowner is responsible for the portion of the line from the curb stop in their yard, where the shutoff valve is, into their home. In other communities, homeowners may own the entire service line from the home to the water main connection. If you have a question about who owns which components of the water system, contact your local municipality.



- Great Lakes Water Authority
- Municipality
- Property Owner



## 2. How do I determine what material my service line is made of?

Service lines can be made of galvanized steel, lead, copper, or plastic. Local construction practices and ordinances impacted the type of pipe material used in communities at specific times. Local ordinances in the Detroit area began prohibiting the use of lead pipe in plumbing codes as early as 1947. Some communities used a small connector pipe made of lead, commonly called a gooseneck, to connect a galvanized steel service line to the water main. The presence of a lead gooseneck cannot be determined by examining plumbing in your home. If you are unsure about the type of service line at your home, contact your local municipality.

Two simple tests can be performed using a screwdriver and a magnet to help determine the service line material entering your home. Locate where the service line comes through the floor or wall into your home (see bottom right picture). This should be near your main water shutoff valve and water meter.

If you have a metal pipe below the first shutoff valve, use the flat edge of a screwdriver to carefully scratch through any corrosion that may have built up on the outside of the pipe. Place a magnet on the scratched area. If the magnet sticks to the pipe, it is galvanized steel. If the magnet does not stick and the scraped area is:

- shiny, silver in color, and looks like a nickel, the pipe is made of lead.
- copper in color and looks like a penny, the pipe is made of copper.

If the pipe feels like plastic, is white or gray in color, and joined with a clamp, glued or screwed together, it is plastic and no further tests are required.

## 3. How can I tell if my plumbing fixtures have lead or lead solder in them?

If your home was built before 1986, your home's plumbing likely contains faucets and pipes with some lead content and lead solder. Brass and chrome-plated brass faucets and fittings contain some lead. Brass fixtures and copper pipes can be joined with lead solder. From 1986 to 2014, brass faucets and fittings sold in the US that were labeled as "lead free" could contain up to 8% lead. In January 2014, the Reduction of Lead in Drinking Water Act redefined "lead free" as "not more than a weighted average of 0.25% lead when used with respect to the wetted surfaces of pipes, pipe fittings, plumbing fittings, and fixtures."

### PIPE MATERIALS USED IN SERVICE LINES



**GALVANIZED STEEL**



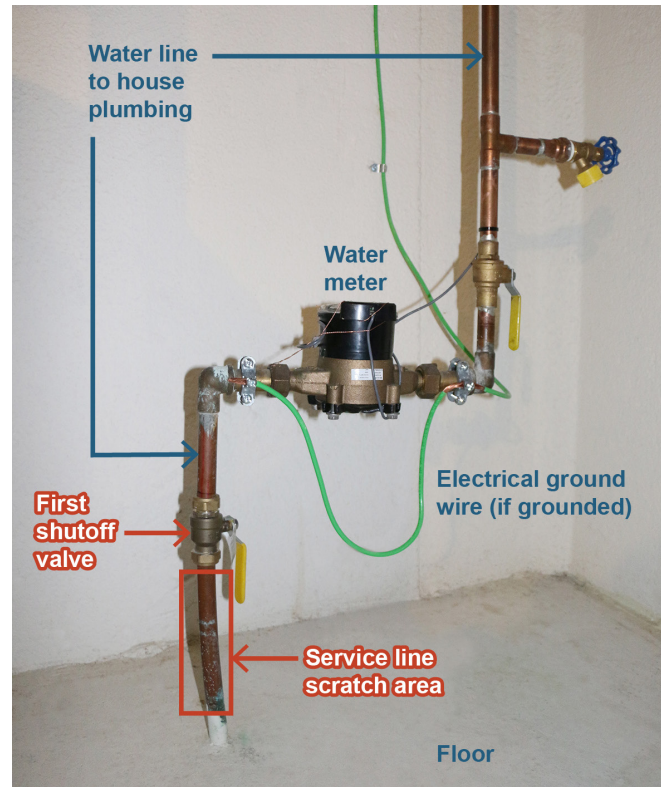
**LEAD**



**COPPER**



**PLASTIC**



Identify a test area on the pipe between where the service line comes into the home (typically the floor) and the first shutoff valve. If the pipe is covered or wrapped, expose a small area of metal. Follow instructions in response to Question 2 to determine the pipe material.

**NOTE:** The piping above the shutoff valve, known as the water line to house plumbing, should not be tested as it is likely made of a different material than the service line.

Consumers can increase their confidence level by purchasing products certified as meeting the Safe Drinking Water Act lead-free requirements. Information can be found at [www.nsf.org/newsroom\\_pdf/Lead\\_free\\_certification\\_marks.pdf](http://www.nsf.org/newsroom_pdf/Lead_free_certification_marks.pdf).

#### 4. Do I need to test my water for lead if I have a lead service line or plumbing with lead solder?

Testing is the only way to confirm if lead is leaching from your plumbing into your drinking water. Samples are taken from the faucet that is normally used for drinking water.

If you are concerned, a lead test can cost between \$10.00 and \$75.00. A list of local certified drinking water chemistry laboratories that perform lead and copper testing can be found on the Michigan Department of Environmental Quality's website at [www.michigan.gov/deq/0,4561,7-135-3307\\_4131\\_4156-36940--,00.html](http://www.michigan.gov/deq/0,4561,7-135-3307_4131_4156-36940--,00.html). Some local communities offer lead testing for their residents. Contact your community for further direction and information. You can also contact your County Environmental Health Department.

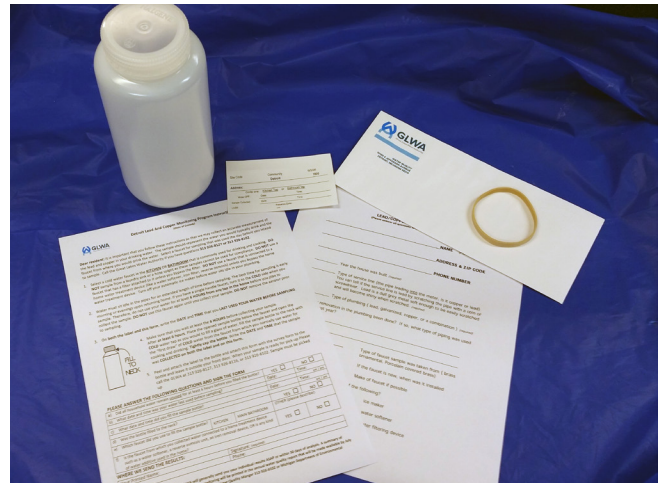
Some laboratories report results in different units of measurement. Parts per billion (ppb), the detection level unit for lead, is the equivalent of micrograms per liter (ug/L).

#### 5. What should I do if my water quality results indicate a presence of lead?

A measure of household consumer safety for acceptable lead levels in drinking water has not yet been determined. The USEPA has established a Maximum Contaminant Level Goal for lead of 0 ppb. Therefore, if your analytical results reveal a presence of lead, you may consider the following practices to minimize your exposure to lead:

- Running your water is a simple and inexpensive measure you can take to protect your family's health. Run your cold water for 30 seconds to 2 minutes any time the water in a faucet has gone unused for 6 hours or more, such as in the morning, when you've been away during the day, when you return from vacation, and when an individual tap in your home is not used regularly. Household water usage activities such as showering, washing clothes and running the dishwasher are effective methods for flushing the pipes.

**IF YOU HAVE QUESTIONS REGARDING YOUR SERVICE LINE, CONTACT YOUR MUNICIPALITY**



Testing is the only way to confirm the presence of lead in your drinking water. Tests must be performed by a certified drinking water chemistry laboratory that will send you a sampling kit. A list of certified laboratories can be found on the Michigan Department of Environmental Quality's website.

- Always use cold water for drinking, cooking, and preparing baby formula.
- If you have a lead service line, you should use a water filter for preparing baby formula. You may also choose to use a water filter for drinking and cooking, particularly if you are pregnant or have children under age 6. Make sure the filter meets the National Sanitation Foundation (NSF) standard 53 for lead removal. Follow the manufacturer's recommendations for replacement. Contact NSF International at 800-NSF-8010 or visit their website at [www.nsf.org](http://www.nsf.org) for more information.
- Remove and clean the faucet screen/aerator monthly.
- Consider replacing faucets installed prior to 2014.

Additional information can be found at [www.epa.gov/safewater/lead](http://www.epa.gov/safewater/lead).



Always use cold water for drinking, cooking and preparing baby formula.

**6. If corrosion control is working, how can there still be higher levels of lead in the first draw sample in the morning, after water has sat in the pipe?**

Orthophosphate treatment is provided to reduce the amount of lead that can leach into your drinking water. It does not remove lead from the water but binds with the lead plumbing material, reducing the amount of lead dissolved in the water. The longer water is in contact with lead plumbing materials, the more likely lead will dissolve into the water.

**7. How do I flush my service line after it has been replaced?**

Homeowners and contractors should flush the service line and internal plumbing to reduce the amount of lead-containing particles and sediment entering the home immediately following work on lead service lines.

- Do not consume tap water, open hot water faucets, or use icemaker or filtered water dispensers until flushing is complete.
- Immediately after a lead service line replacement, flush the service line by running water from an available outside tap or from the inside cold water tap closest to where the service line enters the home. Flush the line at full flow for 30 minutes. If the cold water tap has an aerator (or screen), remove it prior to flushing, and rinse it free of debris prior to replacing it.

- After an initial flush of the replaced service line is complete:
  1. Remove faucet aerators from all cold water taps in the home.
  2. Beginning in the lowest level of the home, fully open the cold water taps throughout the home.
  3. Let the water run for at least 30 minutes at the last tap you opened (top floor).
  4. Turn off each tap starting with the taps in the highest level of the home. Be sure to run water in bathtubs and showers as well as faucets.

*From American Water Works Association's "Communicating About Lead Service Lines: A Guide for Water Systems Addressing Service Line Repair and Replacement."*

**8. Where can I go for help with my home's internal plumbing?**

Oakland County Community & Home Improvement Division  
[www.oakgov.com/advantageoakland/residents/Pages/CPHADivision.aspx](http://www.oakgov.com/advantageoakland/residents/Pages/CPHADivision.aspx)

248-858-0493

Low and moderate income homeowners may qualify for an interest-free deferred payment loan to make needed home repairs, improve accessibility, and increase energy efficiency. Oakland County staff is with you all the way from helping you apply for the loan to overseeing all repair work and paying their pre-qualified contractors.

Macomb County Home Investment Partnership Act Program

[mca.macombgov.org/?q=MCA-CommunityDevelopment-HOME](http://mca.macombgov.org/?q=MCA-CommunityDevelopment-HOME)

Wayne County Home Investment Partnership Act Program

[www.waynecounty.com/hhs/home-program.htm#FirstTime](http://www.waynecounty.com/hhs/home-program.htm#FirstTime)

