

# 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 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, and 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. The GLWA, formerly the Detroit Water and Sewerage Department, has used orthophosphate to control corrosion since 1996.

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

Lead exposure can come from paint, dust, water or soil contaminated with lead. The most common cause of lead poisoning is from contaminated paint chips and dust. 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. Lead was used in drinking water service lines in Michigan until 1947 in some areas and lead-based solder on copper pipes installed in household plumbing until 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 can contribute about 10-20% of a child's total lead intake and 40-60% of lead exposure from infants drinking formula prepared with tap water (Rabin, 2008).



*Children 6 years old and younger 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 6 years old and younger 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 film created by the addition of orthophosphates can also 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 EPA'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/deq](http://www.michigan.gov/deq).

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.**