

DRINKING WATER QUALITY IN THE HOME

Responses to Frequently Asked Questions About Lead and Copper in Water

1. What steps can I take to maintain drinking water quality in my home?

Residents can take steps to protect water quality in their home. Actions that help to preserve water quality include:

- Use cold water for drinking and preparing food.
- Flush your tap before using it for drinking or cooking any time the water in a faucet has gone unused for more than 6 hours. Flushing the tap means running the cold water for 30 seconds to 2 minutes until it gets noticeably colder.
- Clean faucet aerators and strainers monthly. Replace aerators in poor condition.
- Clean and disinfect sinks and faucets regularly.
- Replace your refrigerator and icemaker filters according to the manufacturer's recommendations.
- Replace any other water filters used according to the manufacturer's recommendations.

Flushing tap water is a simple and inexpensive measure you can take to protect your family's health. When water stands in lead pipes or pipes with lead solder for several hours or more, the lead may dissolve into your drinking water. This means the first water drawn from the tap in the morning, or later in the afternoon after returning from work or school, may contain higher levels of lead.

Additional beneficial plumbing tips include:

- Drain and flush your hot water heater annually.
- Identify and replace plumbing fixtures containing lead. Brass faucets, fittings and valves may leach lead into drinking water. Products sold after January 4, 2014, must by law contain very low levels of lead.
- Be sure backflow protection devices are installed properly.

**IF YOU HAVE QUESTIONS
REGARDING YOUR
WATER QUALITY, CONTACT
YOUR MUNICIPALITY.**



Cleaning faucet aerators monthly and running cold water to flush a faucet that hasn't been used for 6 or more hours help preserve drinking water quality in your home.

- Corrosion may be greater if grounding wires from the electrical system are attached to your pipes. Check with the licensed electrician or your local electrical code to determine if your wiring can be grounded elsewhere. **DO NOT** attempt to change the wiring yourself because improper grounding can cause electrical shock and fire hazards.

2. How do I flush my internal plumbing?

The amount of time you should run the cold water to flush your internal plumbing depends on whether you have a lead service line, the length of the lead service line and amount of plumbing in your home. Running your water until you feel a temperature change will indicate the water is from outside your premises' plumbing. Once that has occurred, flush an additional 1 to 2 minutes to ensure you are receiving water from the water main and not your service line.

Note: At one gallon per minute, a 2-minute flush for a 50-foot service line is the recommended standard.



3. How do I remove, clean and replace my faucet aerators?

Faucet aerators are used to provide a steady flow of water from the faucet with even pressure that prevents splashing and can reduce water usage. Aerators typically include a screen and rubber washer. The screen can become dirty collecting sediment and metals including particulate lead. Monthly cleaning of aerators is recommended. If the screen is in poor condition or damaged, it should be replaced. Hardware stores sell replacement parts.



To clean your aerator:

1. Unscrew the aerator housing. New faucet frequently come with a tool to remove the aerator.
2. Separate the aerator into individual rubber washer and screen parts (if possible).
3. Remove any sediment (mineral or rust build up) on the screen and other parts. If necessary, soak the parts in white vinegar for a few minutes and scrub with a brush.
4. Reassemble the aerator parts and re-attach to faucet (using tool if necessary).

4. Can construction activity in my neighborhood affect my drinking water?

Yes, when the ground is disturbed close to your home, particles can shake free from inside the network of underground pipes including your service line. Having a lead service line can increase your risk of exposure to lead when the ground is disturbed. Particulate lead is like tiny grains of sand. These tiny pieces can fall off the sides of pipes into the water. It can cause the lead level in water to go up quickly and then go back down. During construction and until your lead service line is replaced, you should take the following precautions.

- Clean your faucet aerator at least monthly. Lead particles can build up on the aerator screen so cleaning them is important.
- Flush your tap before using it for drinking or cooking any time the water in a faucet has gone unused for more than 6 hours. Flushing the tap means running the cold water for 30 seconds to 2 minutes until it gets noticeably colder.
- Use a filter when drinking or cooking particularly if you are pregnant or have children under the age of 6. A filter is especially important if you are making baby formula. 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 for more information.

- Do not boil water to remove lead, boiling will not remove lead.

5. What is the difference between particulate lead and soluble lead?

Soluble lead is lead that dissolves in water. Corrosion control treatment using orthophosphate reduces the amount of soluble lead in water by creating a protective layer inside the pipe.

Particulate lead is the size of tiny grains of sand. These tiny pieces can fall off the sides of pipes into the water. It can cause the lead level in water to spike and drop suddenly. Construction activity in your neighborhood can increase the risk of particulate lead, especially when the ground is disturbed close to your home.

- Use a filter if you are concerned about particulate lead. Make sure the filter you purchase is designed to remove both particulate and soluble lead, and replace the filter cartridge as recommended by the manufacturer.
- Clean your aerator at least monthly or more frequently on all your faucets since lead particles can build up on the aerator screen when construction activity is close to your home.



Consider replacing old plumbing fixtures made of brass or that contain lead. Products sold after January 4, 2014, must by law contain very low levels of lead.



Sediment, bacteria, minerals and metals can build up in your hot water heater tank. This can impact household water quality and water pressure. Drain and flush your hot water tank annually. See "How to Flush Your Hot Water Heater Tank" information sheet.

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.



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.

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.

Other information about lead is available at 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.

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.

CORROSION CONTROL AND WATER TESTING

Responses to Frequently Asked Questions about Lead and Copper in Water

CORROSION CONTROL

1. How does orthophosphate prevent lead and copper from leaching out of pipes?

Orthophosphate forms a protective layer on the inside of plumbing materials to prevent lead and other metals from dissolving in the water. This protective layer binds with internal metal surfaces of plumbing to prevent lead from leaching into the drinking water. Orthophosphate is a substance that is used in the food and beverage industry and is safe for human consumption. GLWA feeds a maintenance dose of 1.0 part per million (ppm) orthophosphate. This is the equivalent of four drops of orthophosphate in 55 gallons of water.

2. How long has GLWA been implementing a corrosion control program?

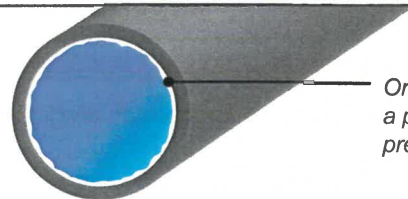
GLWA, formerly the Detroit Water and Sewerage Department, began using orthophosphate to control corrosion in 1996. Orthophosphate provides the best level of corrosion control protection based upon a corrosion control study performed in the 1990s.

3. How does GLWA determine the optimal amount of orthophosphate to add during treatment?

The optimal amount of orthophosphate was determined based on a detailed corrosion control study conducted in the 1990s, which included a desktop study, a pipe loop study, and pilot distribution system testing, including water quality parameter testing. A minimum of 7.0 pH must be maintained at the treatment tap with no more than 9 days in a 6-month period in non-compliance. A minimum orthophosphate dosage of 0.9 mg/L must be maintained at each of the five water plants on a daily basis, and an orthophosphate residual leaving the water plant should not fall below 0.8 mg/L for more than 9 days in a 6-month period.



Orthophosphate dosing is continuously monitored at each GLWA water treatment plant with an online analyzer. The accuracy of the meter is verified by a chemist at least every 8 hours.



Orthophosphate forms a protective layer to prevent pipe corrosion.

LEAD AND COPPER TESTING

4. How frequently does my community test for lead and copper in the drinking water?

Communities that have successfully met the Lead and Copper Rule requirements are required to test every 3 years. Communities that have not met the requirements must follow USEPA guidelines to re-establish compliance and are required to conduct more frequent testing until compliance is demonstrated.

Communities must follow the testing schedule established in the Safe Drinking Water Act which is regular-



ly reviewed and subject to rule changes. The purpose of lead and copper testing is to confirm that the corrosion control method used at the water treatment plant is effective in the distribution system.

Testing is always conducted through a state certified Drinking Water Laboratory. A list of these laboratories can be found at www.michigan.gov/deq/0,4561,7-135-3307_4131_4156-36940--,00.html.

5. How does my community select homes to test for lead and copper?

Homes that are at the greatest risk of leaching lead and copper are targeted for the Lead and Copper Rule sampling program. This primarily includes single family homes with lead piping, lead goosenecks, lead service lines and/or copper piping installed with lead solder. Sampling kits are sent to the same homes each testing period as required by the Lead and Copper Rule. Often, kits are sent to more homes than required since not all residents choose to participate each sampling period.

6. Where can I find the most recent results for my community's lead and copper testing?

Communities must publish and distribute an annual Water Quality Report to all residents by July 1st of each year. This report contains information about your drinking and source water, any monitored contaminants found in the drinking water over the past 1 to 5 years, and if state and federal drinking water standards have been met. "Lead and Copper Monitoring at the Customers' Tap" is one of the detected contaminant tables provided in the report. Your community's website is the best place to check for the latest Water Quality Report. It is also important to note that the lead and copper results should provide a picture of lead and copper in the high risk homes tested in your community but do not reflect conditions in a specific household.

7. What is the 90th percentile of reported lead levels from sampling?

The purpose of lead and copper testing is to determine if the corrosion control program is effective. The 90th percentile of sampling results is used as the threshold to determine if corrosion control is performing as expected. To remain in compliance, at least 90% of the samples must be below the lead action

| Sample | Lead Result |
|--------|-------------|
| 1 | 0 ppb |
| 2 | 0 ppb |
| 3 | 0 ppb |
| 4 | 0 ppb |
| 5 | 0 ppb |
| 6 | 0 ppb |
| 7 | 0 ppb |
| 8 | 0 ppb |
| 9 | 0 ppb |
| 10 | 5.1 ppb |



← 90th percentile

After all the samples have been analyzed from a community during a compliance period and test results verified in triplicate, the 90th percentile can be determined for the community.

level. This value is calculated by listing all sample results in order, from lowest to highest, and then selecting the result of the sample in the 90th percentile slot. For example, if there are 10 samples with values ranging from 0 parts per billion (ppb) to 5.1 ppb and the 9th highest value is 0 ppb, the reported 90th percentile value will be 0 ppb. The 0 ppb value would be compared against the 15 ppb action level to measure compliance. The 0 ppb would not exceed the action level of 15 ppb.

8. What is the action level for lead and what happens if a community exceeds it?

If the 90th percentile sample test result is higher than the action level of 15 ppb for lead, the community must inform the public about steps they should take to protect their health. The community must replace at least 7% of the lead service lines every year under their control until the lead level falls below the action level again. More frequent monitoring, informing the public about lead, and optimizing corrosion control treatment will also be required until Lead and Copper Rule requirements are met.

9. Where can I receive lead and copper sampling information/sample bottles, etc.?

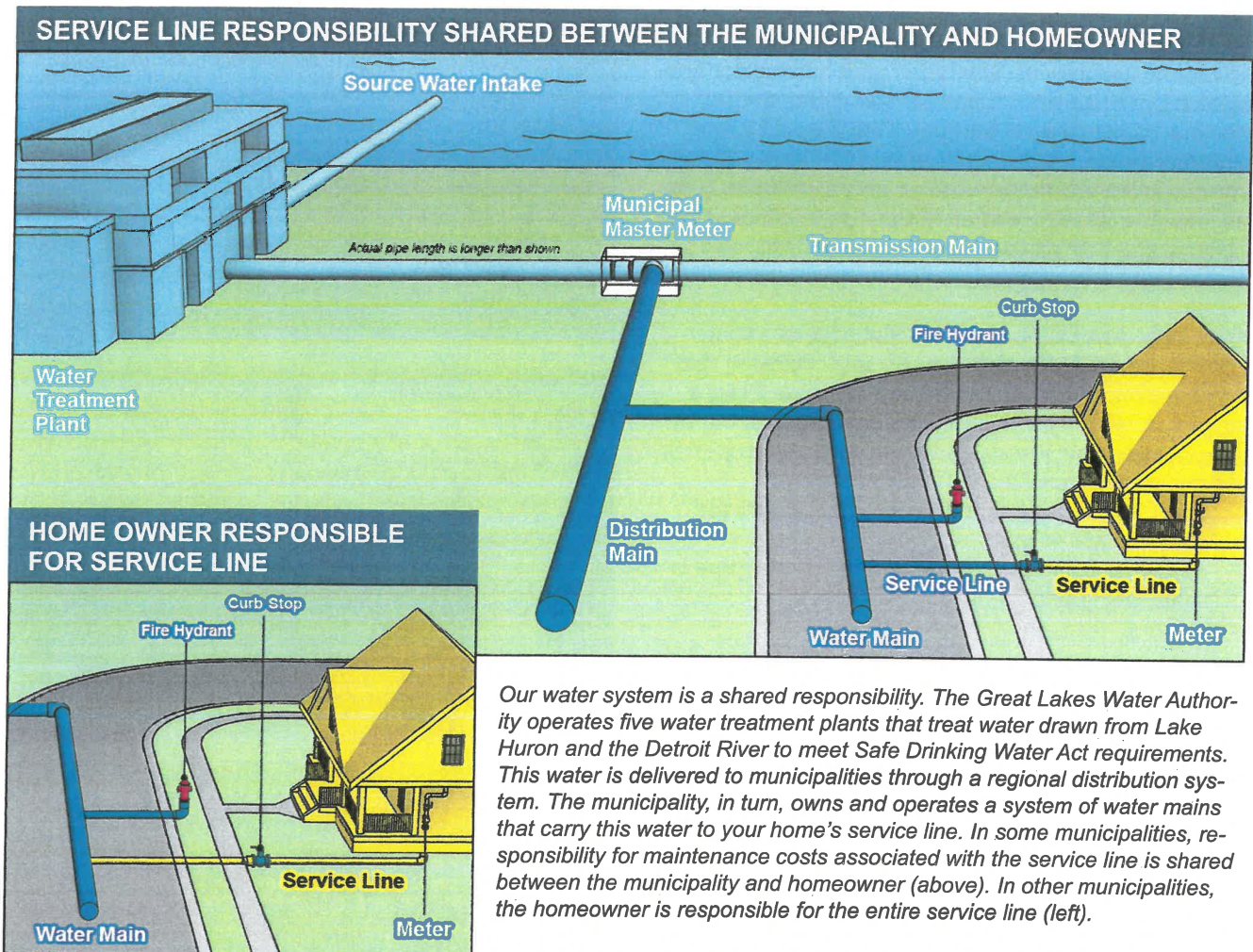
You may contact any state of Michigan certified Drinking Water Chemistry Laboratory that performs lead and copper analysis (www.michigan.gov/deq/0,4561,7-135-3307_4131_4156-36940--,00.html). You can also contact your County Environmental Health Department or the municipality you live in for further direction and information.

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 responsibility of 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.



Our water system is a shared responsibility. The Great Lakes Water Authority operates five water treatment plants that treat water drawn from Lake Huron and the Detroit River to meet Safe Drinking Water Act requirements. This water is delivered to municipalities through a regional distribution system. The municipality, in turn, owns and operates a system of water mains that carry this water to your home's service line. In some municipalities, responsibility for maintenance costs associated with the service line is shared between the municipality and homeowner (above). In other municipalities, the homeowner is responsible for the entire service line (left).

- 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 plastic, copper, lead, or galvanized steel. Local construction practices and ordinances impacted the type of pipe material used in communities at specific times. The State of Michigan Building Code of 1947 prohibited the use of lead pipe in new construction. 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.

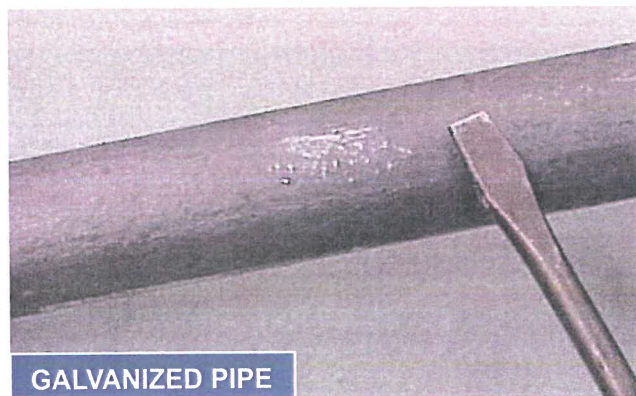
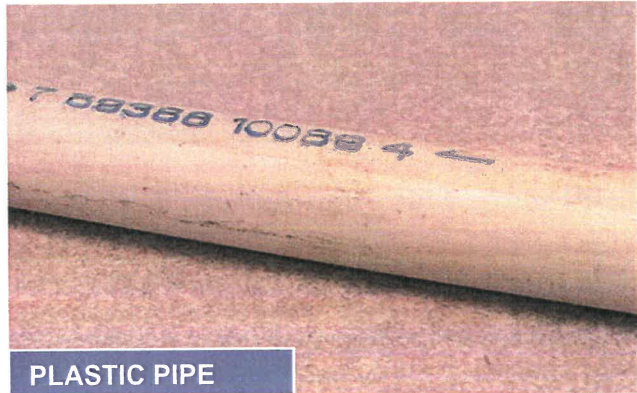
Two simple tests can be performed using a screwdriver and a magnet to help determine the service line material entering your home. Locate where the service line comes into your house. This should be near your main water shutoff valve and water meter. If the pipe, feels like plastic, is white or gray in color, look to see how it is joined together. If the pipe is joined with a clamp, glued or screwed together, it is plastic and no further tests are required.

If you have a metal pipe, 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 a 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.

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."



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.

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 Michigan Department of Environmental Quality's website at www.michigan.gov/deq/0,4561,7-135-3307_4131_4156-36940--,00.html. You can also contact your County Environmental Health Department or the municipality you live in for further direction and information.

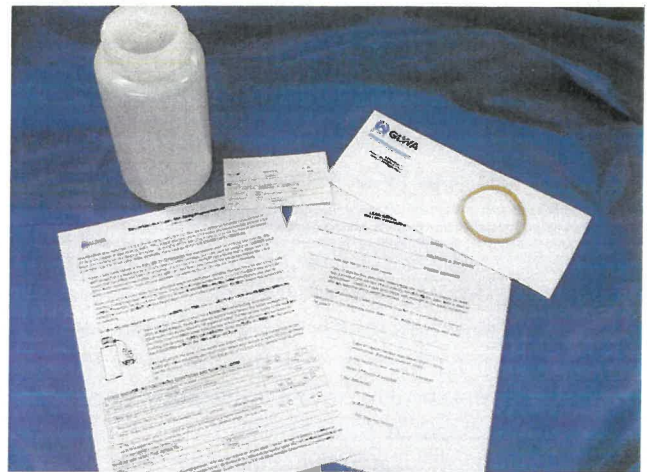
Some laboratories report results in different units of measurement. Parts per billion (ppb), the detection level unit for lead, is the equivalent of micrograms per liter (ug/L).

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. 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.
- 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

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.

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 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.



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 dispenser 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), then 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

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 to apply for the loan to overseeing all repair work and paying our pre-qualified contractors.

Macomb County Home Investment Partnership Act Program

mca.macombgov.org/?q=MCA-CommunityDevelopment-HOME

Wayne County Home Investment Partnership Act Program

www.waynecounty.com/hhs/home-program.htm#FirstTime