How Lead Gets in the Water

Some public water systems are facing a complex problem, due to aging pipes. Lead can be found in the pipes and/or plumbing that carries water to its consumers.

Water Source

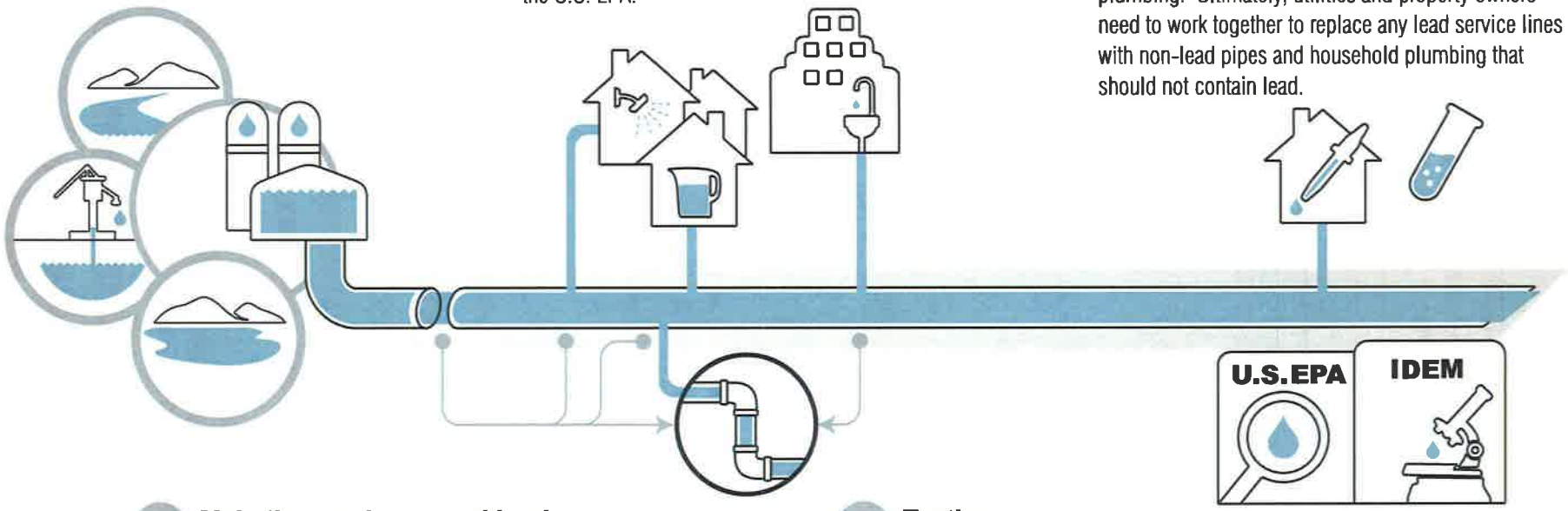
Lakes, rivers, reservoirs, and wells do not usually contain action-level lead amounts, but the water can be corrosive to lead pipes.

Treatment facility

All large systems (serving a population greater than 50,000 people) must have treatment in place to control corrosivity of the water. Small and medium-sized systems must have treatment in place if the systems exceed the lead or copper action level, as determined by the U.S. EPA.

Reducing the contamination

Utilities should test and treat water to control the corrosivity at the treatment facility. The most common treatment involves adding chemical phosphates to coat the inner lining of the service pipes to reduce contact between the water and the lead in the pipes and/or plumbing. Ultimately, utilities and property owners need to work together to replace any lead service lines with non-lead pipes and household plumbing that should not contain lead.



Main lines to home and businesses

The **main water line pipes** coming directly from the treatment plant do not contain lead. Some water mains have packing that connects pipes together, which may contain lead. **Service line pipes** (the lines running from the water main to the home) may be made of lead.

Testing

IDEM and the U.S. EPA have the same drinking water rule standards. The rule specifies kitchen or bathroom cold water taps at single family residences should be tested every three years. If more than 10% of the locations sampled have lead levels above the action level, additional action is required by the water system.

FACT SHEET

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Lead in Drinking Water

Information for Consumers

Office of Water Quality

(317) 234-7430 • (800) 451-6027 www.idem.IN.gov 100 N. Senate Ave., Indianapolis, IN 46204

Introduction: Public water systems are required to monitor for lead in drinking water they distribute to consumers and take corrective action where levels exceed a federal action level of 15 parts per billion. At the same time, consumers can take precautions at home to reduce their chance of exposure to unsafe levels of lead in their tap water. The Indiana Department of Environmental Management's (IDEM's) Office of Water Quality oversees public water systems in Indiana, to ensure compliance with all federal Safe Drinking Water Act requirements. This IDEM fact sheet contains information about the sources of lead in drinking water and health effects associated with lead exposure, requirements for utilities, and actions consumers can take to minimize exposure.

Sources of lead in drinking water: When lead and copper are found in tap water, it is typically due to leaching from internal plumbing materials. If the water is too corrosive, it can cause lead or copper to leach out of the plumbing materials and enter the drinking water. The potential for leaching increases, the longer the water is in contact with the plumbing components. Over the past three decades, exposure to lead in tap water has been greatly reduced. The 1986 and 1996 amendments to the Safe Drinking Water Act (www.epa.gov/dwreginfo/drinking-water-regulatory-information) and the U.S. Environmental Protection Agency's (U.S. EPA's) Lead and Copper Rule in 1991 have also led to the reduction of lead in tap water. Enhanced implementation in the areas of monitoring, treatment, customer awareness, and lead service line replacement are the result of updates to the Lead and Copper Rule in 2000, 2004 and 2007.

Requirements for drinking water utilities: The Lead and Copper Rule serves to protect public health by minimizing the corrosivity of the water to premise plumbing, and therefore, the amount of lead and copper in water supplied by public water systems. Because lead and copper in drinking water are primarily due to the corrosion of distribution pipes and household plumbing materials, the utility collects tap water samples at kitchen or bathroom cold water taps that are frequently used for consumption. This sampling criterion helps ensure residents are consuming safe drinking water. Rather than maximum contaminant levels (MCLs), which are used in the regulation of many contaminants, action levels are used for lead and copper. For lead, water samples are compared to an action level of 15 parts per billion and, if more than 10 percent show lead concentrations exceeding that level, the utility must notify customers and take these additional actions:

- Collect additional water samples to check the water for minerals, alkalinity, calcium, pH and other factors that contribute to corrosivity;
- Take steps to treat the water so that corrosion is reduced;
- Educate the public about lead in drinking water and actions consumers can take to reduce their exposure to lead; and,
- Replace portions of lead service lines (lines that connect distribution mains to customers) that are under the water system's control.

Mobile home parks, subdivisions, hospitals, correctional facilities, schools, factories, office buildings and day care centers must also sample for lead and take protective measures, where the lead action level is exceeded.

Health effects of lead: High levels of lead in tap water can cause health effects if the lead in the water enters the bloodstream and causes an elevated blood lead level. Short-term health effects include interference with red blood cell chemistry; delays in normal physical and mental development in babies and young children; slight deficits in attention span, hearing, and learning abilities of children; and slight increases in the blood pressure of some adults.

Long-term health effects can include stroke, kidney disease, and cancer. Risk will vary, depending on the individual, the circumstances, and the amount of water consumed.

Pregnant women and children six years old and under are most at risk because this is when a child's brain is developing. Even at low levels, lead exposure may cause a range of health effects including behavioral problems and learning disabilities. And while the primary source of lead exposure for most children is lead-based paint in older homes, it is important to note that lead in drinking water can add to that exposure. Infants who drink formula prepared with lead-contaminated water may be at a higher risk because of the large volume of water they consume relative to their body size.

What citizens can do:

- Consumers can ask their water provider about drinking water quality. Reports are also available online. For information, visit IDEM's Safe Drinking Water Watch at https://myweb.in.gov/IDEM/DWW/.
- Individuals on private wells can have their water tested by a certified drinking water laboratory: the Indiana State Department of Health provides a list at www.IN.gov/isdh/22452.htm.
- All consumers should use only water from the cold-water tap for drinking, cooking, and making baby formula. Where pipes are a potential source of lead, flush the tap for one to two minutes before using the water. Hot water is likely to contain higher levels, and boiling this water will NOT reduce the amount of lead in the water.
- If your water has lead at levels exceeding U.S. EPA's action level of 15 parts per billion:
  - Determine whether the service pipe (pipe from the main to your home) is a source and, if so, what the utility is doing to address it.
  - Determine whether pipes in your home are a source and explore what can be done to solve the problem.
  - Remember that the more time water has been sitting in your home's pipes, the more lead it may contain. Anytime the water in a particular faucet has not been used for six hours or longer, flush your cold-water pipes by running the water for one to two minutes. Your water utility will inform you if longer flushing times are needed to respond to local conditions. To flush the house water system, run high-volume taps such as the shower or tub valve for five minutes before flushing the kitchen tap.

  - After flushing your pipes, fill pitchers and containers to use for drinking water, cooking, preparation of baby formula, and other consumption.
  - Bathing and showering should be safe for you and your children; however, in cases involving highly corrosive water, additional recommendations or more stringent actions may be recommended. Check with your utility or local health department for recommendations.
  - For homes with children or pregnant women, recommendations may include using bottled water or water from a filtration system that has been certified by an independent testing organization to reduce or eliminate lead. Because most bottled water does not contain fluoride, a fluoride supplement may be necessary in these cases.
- When making repairs to copper pipes, do not use lead solder. Inspect the aerator on the end of the faucet and removing any debris such as metal particles. Test the water after plumbing work in housing with lead water lines or lead solder.

More information:

- For the Lead and Copper Rule (*found in the Indiana Administrative code at 327 IAC 8*), visit IDEM's fact sheet on its website at http://www.in.gov/idem/files/factsheet_owq_pws_lead_copper.pdf and U.S. EPA's website at www.epa.gov/dwreginfo/drinking-water-rule-quick-reference-guides#lcrgrg.
- For Public Water System information, visit Safe Drinking Water Watch at https://myweb.in.gov/IDEM/DWW/.
- Direct questions to IDEM's Drinking Water Branch at (800) 451-6027, ext. 4-7430, or (317) 234-7430.
- For topics on lead and lead poisoning, visit the Indiana State Department of Health's website at www.IN.gov/isdh/26550.htm, U.S. EPA's website at www.epa.gov/lead, and the Centers for Disease Control website at www.cdc.gov/nceh/lead/tips/water.htm.
- For regulations on bottled water, visit the Food and Drug Administration website at www.fda.gov/Food/ResourcesForYou/Consumers/ucm046894.htm. For standards and certification for bottled water, also visit the Public Health and Safety Organization at www.nsf.org and the International Bottled Water Association at www.bottledwater.org/education/labels.

FACT SHEET

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Lead and Copper Rule

Office of Water Quality

(317) 232-8603 • (800) 451-6027 www.idem.IN.gov 100 N. Senate Ave., Indianapolis, IN 46204

Introduction:

Public Water Systems that supply drinking water must follow certain federal and state safe drinking water regulations. Drinking water is any water supplied for the purpose of human consumption or domestic use. The source of the water can be ground water from wells or surface water from rivers and lakes. The purpose of this fact sheet is to define and explain the health effects lead and copper in drinking water, as well as the requirements for the Lead and Copper Rule.

What is the federal Lead and Copper Rule?	*The federal Lead and Copper Rule requires treatment when lead and/or copper in drinking water exceed certain levels. It was published in the Federal Register on June 7, 1991, and became effective on December 7, 1992. .*
What are the Health Effects of Lead and Copper?	*All water is corrosive to metal plumbing materials to some degree. Lead contamination can occur from the corrosion of lead-containing household plumbing. Short-term health effects include interference with red blood cell chemistry; delays in normal physical and mental development in babies and young children; slight deficits in attention span, hearing, and learning abilities of children; and slight increases in the blood pressure of some adults. Long-term health effects can include stroke, kidney disease, and cancer. Copper contamination generally occurs from the corrosion of household plumbing. Copper is an essential nutrient, required by the body in small amounts. However, copper can cause the following health effects: stomach and intestinal distress, liver and kidney damage, and anemia. Persons with Wilson's Disease may be more sensitive than others to the effects of copper contamination.*
What is an action level?	*The action level is the level of lead or copper in a drinking water sample that, if exceeded, triggers the water system to take further action. Concentrations must be under the action levels in at least 90 percent of the samples collected.*
What are the action levels for lead and copper?	*The Lead Action Level is 0.015 milligrams per liter (mg/L) or 15 parts per billion (ppb). The copper action level is 1.3 mg/L.*
Who is Required to Sample for Lead and Copper?	*All Community Water Systems and Nontransient Noncommunity Water Systems must sample. Examples include municipalities, mobile home parks, subdivisions, hospitals, correctional facilities, schools, factories, office buildings, and day care centers.*
How do I sample for lead and copper? What are the requirements for frequency and quantity?	*For Community Water Systems, collect samples in homes at the kitchen or bathroom cold water tap after the water has been in contact with the plumbing for at least 6 hours. For Nontransient Noncommunity Water Systems, collect samples from interior drinking water taps after the water has been in contact with the plumbing for at least 6 hours. Initial frequency is 2 consecutive 6-month monitoring periods (January to June and July to December), then may be reduced to once per year for 3 years and, ultimately, to once every 3 years. The number of samples required is based on the population served:*

System Size	# Required/Initial Monitoring	# Required/Reduced Monitoring
> 100,000	100	50
10,001 to 100,000	60	30
3,301 to 10,000	40	20
501 to 3,300	20	10
101 to 500	10	5
< 101	5	5

What must I do if an action level is exceeded?	*If you exceed either the lead or copper action level, you should contact IDEM's Drinking Water Branch immediately at (317) 234-7430. For lead and copper exceedances, you will be required to:* • *Collect additional samples for water quality parameters (alkalinity, calcium, conductivity, pH, temperature, and orthophosphate and/or silicate if either or both are added to your system) and for lead and copper in your source water,* • *Make required corrosion control recommendations/treatment(s) to reduce the corrosivity of the water (its ability to leach metals from plumbing), and* • *Implement an IDEM-approved public education campaign. Community Water Systems must deliver information to each customer, in addition to other outreach requirements. Nontransient Noncommunity Water Systems may obtain approval for electronic distribution of information.*
What Is the Consumer Notice of Lead Result in Drinking Water and Certification form?	*The Consumer Notice of Lead Result in Drinking Water is a state form that must be completed by the Public Water System (PWS). It contains two parts. The first part is a notice that the PWS must complete and deliver to occupants of each location sampled within 30 days of knowing the sample results. The second part is a certification that the PWS must complete and mail to IDEM, along with a sample copy of the notice sent to consumers, not later than 3 months following the end of the monitoring period.*

IDEM's Role:
The Indiana Department of Environmental Management (IDEM) is responsible for protecting human health and the environment while providing for safe industrial, agricultural, commercial and governmental operations vital to a prosperous economy. IDEM's Office of Water Quality, Drinking Water Branch regulates, monitors, permits and licenses drinking water facilities and operators.

Public Water System's Role:
Community Water Systems must understand and comply with regulations for monitoring, treating and reporting. Community Water System owners and operators may contact IDEM's Drinking Water Branch at (317) 234-7430 to request free compliance and technical assistance.

Rule Citations: State rules are found in the Indiana Administrative Code under 327 IAC 8-2-36 through 327 IAC 8-2-47. Federal rules are found in the Code of Federal Regulations at 40 CFR Part 141.

Citizen's Role:
Citizens can find drinking water quality information by visiting IDEM's Drinking Water Watch website at https://myweb.in.gov/IDEM/DWW/ and contacting their local Community Water Supply for the latest Consumer Confidence Report. Citizens can find information about source water protection at http://www.in.gov/idem/4142.htm.

Additional Information:
- Extensive information on the federal Lead and Copper Rule is provided by the United States Environmental Protection Agency (U.S. EPA) online at http://water.epa.gov/lawsregs/rulesregs/sdwa/lcr/compliancehelp.cfm. For Indiana's rules on Drinking Water Standards (327 IAC 8), visit http://www.in.gov/legislative/iac/t03270/a00080.pdf.
- IDEM provides compliance information for Indiana Public Water Systems at http://in.gov/idem/cleanwater/2386.htm. In addition to IDEM's Office of Water Quality Drinking Water Branch at (317) 234-7430, U.S. EPA's Safe Drinking Water Hotline, at 1-800-426-4791, offers assistance to Public Water System owners and operators and the public.
- For lead prevention information, contact the National Lead Information Center (NLIC) at 1 (800) 424-LEAD [5323].

This fact sheet is intended solely as guidance and does not have the effect of law or represent formal Indiana Department of Environmental Management (IDEM) decisions or final actions. This fact sheet shall be used in conjunction with applicable rules and statutes. It does not replace applicable rules and statutes, and if it conflicts with these rules and statutes, the rules and statutes shall control.