

Arsenic and drinking water

What is arsenic and where does it come from?

Arsenic is a naturally occurring element found in the earth's crust. As water flows through certain rock formations, the arsenic can dissolve and be carried into underground aquifers, streams or rivers that may be drinking water sources.

How can arsenic affect my health?

Arsenic is a health hazard. Drinking water with high levels of arsenic can cause health effects such as:

- Thickening and discoloration of the skin
- Stomach pain, nausea, vomiting and diarrhea
- Heart, lung, liver, immune, nervous or reproductive system disorders and diabetes
- Cancer of the bladder, lungs, skin, kidney, liver and prostate

When does arsenic in drinking water become a health concern?

Arsenic is measured in parts per billion (ppb). The federal government has established the safe drinking water standard (also called maximum contaminant level) for arsenic as 10 ppb.* If your water has arsenic levels above 10 ppb (0.010 ppm), you should switch to bottled water.

**Arsenic can also be measured in parts per million (ppm) or mg/L. For example, 10 ppb is the same as 0.010 ppm or .010 mg/L. See the conversion table below to help interpret your results.*

Units of measurement	Arsenic	
ppb	Parts per billion	ppb = ppm / 1000
ppm	Parts per million	ppm = ppb x 1000
mg/L	Milligram per liter	equal to ppm

What can I still use my water for if it is contaminated with arsenic?

Water for drinking, beverage-making or food preparation can be obtained from a known safe source and used on a temporary basis. Other uses of water pose much less hazard, but are not entirely safe if arsenic levels are significantly above the drinking water limit.

Can I wash my food with arsenic-contaminated water?

If arsenic levels in your water are above 10 ppb (0.010 ppm), you should use bottled water to wash, prepare and cook your food.

Can I irrigate or water my garden with arsenic-contaminated water?

If your water has more than 100 ppb (0.100 ppm) of arsenic, you should not use it for irrigation. The amount of arsenic in the soil may build up over a period of years to levels that are poisonous for

some plants. An increase in soil arsenic may also pose a direct hazard to humans by accumulating in food crops.

What about bathing and showering?

Arsenic does not easily enter the body through the skin. Bathing, swimming and showering with water that has levels as high as 500 ppb (0.500 ppm) is safe as long as you avoid swallowing the water. Supervise small children when they are bathing and brushing teeth to ensure they do not swallow the water.

What about washing dishes, utensils and food preparation areas?

Only a very small amount of water clings to smooth surfaces, such as dishes. Water with up to 500 ppb (0.500 ppm) of arsenic may be safely used to wash and sanitize dishes, tables and eating utensils.

What about general cleaning and laundry?

Very little water remains on washed surfaces and in laundered fabrics. Water with up to 500 ppb (0.500 ppm) of arsenic may be safely used for general cleaning and washing of clothing, bedding and linens.

What about my pets?

Animals should not drink water with arsenic levels above 10 ppb (0.010 ppm).

Learning about arsenic levels in your drinking water

For people on public water systems:

Public drinking water providers must monitor for arsenic and ensure levels remain below the drinking water standard of 10 ppb (0.01 ppm). Public water system monitoring results are available on the Oregon Drinking Water Services [Data Online](#) website. If your water comes from a community water system (you pay a water bill), your drinking water provider must provide a [Consumer Confidence Report](#) to its customers every year. This report contains the most recent arsenic test results if detected. Contact your drinking water provider to request a copy of the most recent consumer confidence report.

For private well owners:

If your drinking water comes from your own well, you will have to find an accredited laboratory that does water testing for private property owners. These labs can provide information and instructions for getting your well water tested. For a list of accredited laboratories for drinking water in Oregon refer to the following [link](#).

Information on private domestic wells is available on the OHA Domestic Well Safety Program's website at: www.healthoregon.org/wells.

Removing arsenic from drinking water

Don't boil the water!

Boiling contaminated water does not remove arsenic and can increase arsenic levels.

For public drinking water system operators:

Arsenic can be reduced or removed entirely from drinking water, but treatment processes are expensive and require careful maintenance and monitoring. Current treatments include activated alumina, electrodialysis, reverse osmosis and ion exchange resins. If treatment isn't possible for your system, you should consider developing a different water source or connecting to another safe water source in the area. Treatment has limitations and disadvantages. Not all kinds of treatment are effective, and no single treatment method can remove all contaminants from water. Before selecting treatment equipment, contact [Oregon Drinking Water Services](#) for regulatory requirements for public water systems.

Private well treatment options:

Several treatment methods can remove arsenic from drinking water. The one most commonly used is called reverse osmosis. Options include central treatment (at the well or at entry to home) or a point-of-use device (kitchen sink filter). A point-of-use device will not protect against exposure from other taps not treated with a device.

Check to be sure that any treatment system used is certified by a recognized, third-party testing organization that meets strict testing procedures established by the [American National Standards Institute](#) (ANSI) and the [National Sanitation Foundation](#) (NSF) International. Proof of certification should be available from the distributor or manufacturer. Alternatively, NSF certification for various treatment units may be verified through NSF or the [Water Quality Association](#).

Treatment equipment must be carefully maintained to work properly and may not be effective if arsenic levels are very high. It is recommended that treated water be tested at least once a year. Untreated water should be tested at least every three years.

For more information:

- Private well owners with health-related questions about arsenic in their water may call 971-673-0440, or email general.toxicology@state.or.us.
- For questions about treatment options for your domestic well, contact the drinking water specialist at your local or county health department. Here is a [list of local and county health departments](#) in Oregon with their contact information.
- [U.S. Environmental Protection Agency](#) – Arsenic in drinking water
- [Agency for Toxic Substances & Disease Registry](#) – Arsenic

Guidance for use of water contaminated with arsenic

Arsenic level	Water use	Recommendations
10 ppb or less (0.010 ppm or less)	SAFE for drinking, cooking and all other domestic uses	Test water once every three years
Between 10 and 99 ppb (between 0.010 and 0.090 ppm)	NOT SAFE for drinking, mixing into beverages, cooking or washing fruits and vegetables NOT SAFE for pets to drink SAFE for all other domestic uses, including bathing, washing dishes, doing laundry or irrigating gardens	Use bottled water (or approved water filtration system) for drinking, cooking and washing fruits and vegetables. Use bottled water for pets. Supervise children to help them avoid swallowing water while bathing, brushing teeth, etc. If you have a treatment system, test treated water at least once a year.
Between 100 and 499 ppb (between 0.100 and 0.499 ppm)	Same restrictions as above NOT SAFE for irrigating gardens – arsenic may build up in soil over time and be taken up into vegetables SAFE for all other domestic uses	Test untreated water (pre-treatment unit) at least every three years
500 ppb and higher (0.500 ppm and higher)	NOT SAFE for any domestic uses	Contact your local or state health department or the Oregon Drinking Water Services at 971-673-0405