

# Is there *Arsenic* in Your Drinking Water Well?



**Water Wells  
in Indiana are testing  
Positive for Arsenic**

**“My Well Water is Clear and Tastes Fine...  
Do I Need to Worry about Arsenic?”**

**Yes!** Because aqueous arsenic is clear and odorless, people may unknowingly consume arsenic from their drinking water well & suffer health problems.

## What is Arsenic?

Arsenic is a naturally occurring element found primarily in rocks, soil, water, and plants in many areas of the United States, including Indiana.

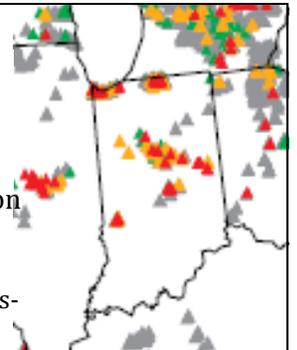
- Arsenic is a silver-gray or white brittle metal.
- Arsenic has no odor and is almost tasteless.
- Natural events can release arsenic into water
  - infiltration to water,
  - dissolution of minerals from clay, and
  - erosion of rocks,
- Arsenic can be found in groundwater, lakes, rivers, and ocean water.
- Fruits and vegetables can absorb traces of arsenic from the soil they grow in.
- Ocean fish and seafood naturally have high levels of an organic non-toxic form of arsenic.

## Have Your Water Well Tested for Arsenic Today!

### EXPLANATION (ARSENIC)

- ▲ Greater than 10 µg/L
- ▲ 5 to 9.9 µg/L
- ▲ 3 to 4.9 µg/L
- ▲ Less than 2.9 µg/L

Locations and concentration ranges of samples in the arsenic point database. (USGS, Water-Resources Investigations Report 99-4279)



Arsenic occurs naturally in the environment and as a byproduct of some agricultural and industrial activities. Arsenic can be released into the environment from industrial activities, such as wood preservation, mining, and smelting, or from leaking landfills where products that contain arsenic have mixed with organic waste. Some products manufactured with arsenic include glass, pesticides, paints, fireworks, dyes, metals, alloys, drugs, soaps, and semi-conductors.

**Find out more about arsenic and how  
to get your well tested!**

## How does Arsenic Get into my Drinking Water Well?

The arsenic found in Indiana groundwater that is naturally occurring was deposited in the soil and bedrock layers. Arsenic is tied up in sulfide minerals, which are common in bedrock formations, coal deposits, and in some glacial deposits. Arsenic can be released from soil and rock into groundwater and drawn into wells.

Scientists who have studied this problem believe arsenic can be released into groundwater at elevated levels in areas where people are now using more water than ever before. During the past ten years, about 1,000 new high-capacity wells have been constructed in Indiana.

Studies have shown that increased water demands can lower the water table in some areas. This can allow oxygen to get into the aquifers, creating chemical reactions that release arsenic into the water. In other areas of the State, different types of reactions can release arsenic that is found in Indiana from other geologic sources. Scientists are investigating sources, determining the extent of arsenic prone areas, while informing the public on the best ways to avoid arsenic problems.



## How can Arsenic Affect my Health?

Some people who drink water containing arsenic in excess of EPA's standard over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.

### Health effects might include:

- Thickening and discoloration of the skin, stomach pain, nausea, vomiting, diarrhea, and liver effects;
- Cardiovascular, pulmonary, immunological, neurological (e.g., numbness and partial paralysis), reproductive, and endocrine effects;
- Cancer of the bladder, lungs, skin, kidney, nasal passages, liver, and prostate.

Arsenic contamination of drinking water is a serious health concern. If you think you or someone in your family has symptoms from arsenic exposure talk to your doctor and have your water tested for arsenic.



## How much is Too Much Arsenic?

The U.S. EPA-established maximum contaminant level for arsenic in drinking water is 10 ppb or 10  $\mu\text{g/L}$ . The U.S. EPA does not regulate private water wells, but its drinking water rules provide a good standard by which to measure your water quality.

Arsenic in drinking water is normally measured in parts per billion (ppb) or micrograms per liter ( $\mu\text{g/l}$ ). Any value given in  $\text{mg/L}$  can be multiplied by 1000 to give the concentration in  $\mu\text{g/l}$  or ppb.

## What are the Best Methods for Reducing Arsenic in Drinking Water?

- **Buy bottled water.**

You may be able to reduce arsenic levels in your drinking water by using bottled water. It is important to note that while all public drinking water systems must meet applicable federal MCLs, no single set of standards applies to all bottled water. The standards may be more or less stringent than those for public water systems. Most major brands have water quality information on their websites.

- **Install a water treatment system.**

Remember that while some treatment systems can be useful for other purposes, systems such as conventional water softeners and activated carbon filters will not alone remove arsenic. Boiling water will only concentrate the arsenic, due to evaporation of some of the water. Before you buy a home water treatment system, make sure that it will meet your needs. Choose a treatment system that is certified by an independent certifying organization to assure effectiveness. After the treatment system is installed, it is important to follow the manufacturer's recommendations for maintaining the system. Also, have the treated water tested periodically to make sure that the treatment system is working properly.

There are several types of water treatment systems that can effectively reduce arsenic levels in drinking water. These include:

- Specialty Media.** Special removal medias have now been developed by many water treatment companies to specifically remove arsenic from water. They typically use ferric (iron) hydroxide, ferric oxide, or iron-enhanced ion exchange resins.

- Reverse Osmosis systems with pre-oxidation.** Reverse Osmosis (RO) is a water treatment process that removes most dissolved, inorganic contaminants from water by forcing the water through a semi-permeable membrane. The reverse osmosis unit should be checked regularly because the membrane can deteriorate over time.

- Distillation systems.** Distillation is a water treatment process that boils water, then cools the steam until it condenses into a separate container. This type of treatment uses a considerable amount of energy in its operation.

- **Construct a new well.**

In some areas, a new well constructed into a different water-bearing formation may produce water with less natural arsenic. Drilling a new well may be a good option if you already want to replace your existing well for other reasons. It may be less expensive in the long run than maintaining a treatment system. However, a new well may still contain natural arsenic even if the well is properly constructed and in an appropriate location. For more information about new well construction, contact a licensed water well contractor, or a water-resource specialist at Indiana DNR Division of Water.

- **Connect to a community public water system.**

In some cases, connection to a community public water supply system may be possible. All community public water systems are regularly tested for arsenic and other contaminants and must comply with all EPA standards.

## More Information:

- For more information on arsenic in drinking water, visit U.S. EPA's website at:  
[www.epa.gov/safewater/arsenic/index.html](http://www.epa.gov/safewater/arsenic/index.html).
- For more information on arsenic levels in drinking water throughout Indiana, visit IDEM's searchable database at:  
[www.in.gov/apps/idem/sdwis\\_state/](http://www.in.gov/apps/idem/sdwis_state/).
- For more information on testing your well for arsenic, contact your local health department. A directory of phone numbers and websites can be found at the ISDH website at: [www.in.gov/isdh/24822.htm](http://www.in.gov/isdh/24822.htm)
- For a list of labs in Indiana certified to test for arsenic, please visit the ISDH website at: [www.in.gov/isdh/22452.htm](http://www.in.gov/isdh/22452.htm) or call (317) 921-5571
- For more information on the health effects and arsenic exposure, contact the ISDH Environmental Epidemiology at: (317) 233-9264
- For more information on well treatment options, visit U.S. EPA website at:  
[www.epa.gov/ogwdw/arsenic/pdfs/brochure\\_arsenic\\_treatment\\_vendor-guide.pdf](http://www.epa.gov/ogwdw/arsenic/pdfs/brochure_arsenic_treatment_vendor-guide.pdf)
- For more information on arsenic health effects, please visit the US Center for Disease Control website:  
[www.atsdr.cdc.gov/toxprofiles/phs2.htm](http://www.atsdr.cdc.gov/toxprofiles/phs2.htm)

Have your well tested today!  
And see how you can contribute to  
Arsenic awareness in Indiana at  
[www.inwmc.org](http://www.inwmc.org)

## Should I have my Well Tested for Arsenic?

**Yes!** If you live in Indiana and depend on your well water for drinking water, you should have your well tested for arsenic by a certified laboratory.

Indiana Department of Environmental Management suggests conducting at least two tests annually as water quality may vary with season, rainfall, and other conditions.

- An arsenic test can be acquired through an accredited lab and generally costs around \$25.00 per sample. When you contact a lab, they will send you the appropriate sample bottle and directions for proper sampling procedures.
- The Indiana State Department of Health (ISDH) provides guidance to homeowners and a list of labs certified to test for arsenic.

You can share test results with the Indiana Water Monitoring Council, Groundwater Focus Committee. They are gathering information on the extent and degree of arsenic levels throughout the state and may use your results anonymously for their study.

For more information go to the website:

<http://www.inwmc.org/>



**Indiana Water Monitoring Council  
Groundwater Focus Committee**