

# Arsenic in Drinking Water

August 2015

## Contact

North Dakota Department of Health  
Water Quality Division  
918 East Divide Avenue  
Bismarck, ND 58501  
701.328.5210

## North Dakota Laboratories

### Mineralogical Testing

Astro-Chem Lab Inc.  
4102 2nd Ave W  
PO Box 972  
Williston, ND 58801  
701.572.7355

Fargo-Cass Public Health  
Environmental Laboratory  
435 14th Ave S  
Fargo, ND 58103  
701.298.6997

Minnesota Valley  
Testing Laboratories, Inc.  
2616 E Broadway  
Bismarck, ND 58501  
701.258.9720 or  
800.279.6885

N.D. Department of Health-Division of Laboratory Services  
2635 E Main Ave  
PO Box 937  
Bismarck, ND 58502  
701.328.6142

## What is arsenic?

Arsenic is a trace element that occurs naturally in the environment. A natural source of arsenic is the dissolution of certain rock formations. Arsenic also has various uses in industrial and agricultural industries. In 2006, the federal and state Safe Drinking Water Act standard for arsenic in drinking water was changed from 50 parts per billion (ppb) to 10 ppb. Ten parts per billion arsenic is roughly equivalent to a drop of water in an Olympic-size swimming pool.

## How common is arsenic in North Dakota groundwater?

Naturally occurring arsenic is common in North Dakota groundwater. The concentrations of arsenic vary throughout the state.

## How is arsenic regulated in drinking water?

**MUNICIPAL WATER:** Public or municipal water systems must comply with the Safe Drinking Water Act's 10 ppb arsenic standard. Public water systems are required to routinely test and if they do not meet the 10 ppb standard, treat arsenic in their drinking water. **PRIVATE WATER:** All wells must be constructed according to Article 33-18 in the North Dakota Century Code. However, water quality in private wells is not regulated.

## Can arsenic in drinking water affect human health?

While there can be risk associated with long-term arsenic exposure, there have not been enough studies to indicate whether arsenic in drinking water will affect you or what the effects might be. The risk of health problems from drinking water contaminated with arsenic is dependent on:

- ◆ Your individual sensitivity to arsenic
- ◆ The amount of arsenic in the water
- ◆ How much water you consume
- ◆ How many years you drink the water

When evaluating the risk, other factors should also be considered. These factors may include diet, genetic makeup, lifestyle, exposure to other chemicals and preexisting illnesses.



## North Dakota Laboratories for Well Water Testing

### Bacteriological and Nitrate Testing

Astro-Chem Lab Inc.  
4102 2nd Ave W  
PO Box 972  
Williston, ND 58801  
701.572.7355

City of Grand Forks  
Environmental Laboratory  
503 4th St  
Grand Forks, ND 585201  
701.746.2594

Fargo-Cass Public Health  
Environmental Laboratory  
435 14th Ave S  
Fargo, ND 58103  
701.298.6997

First District Health Unit  
801 11th Ave SW  
PO Box 1268  
Minot, ND 58702-1268  
701.852.1376

Minnesota Valley  
Testing Laboratories, Inc.  
2616 E Broadway  
Bismarck, ND 58501  
701.258.9720 or  
800.279.6885

Southwestern District  
Health Unit  
2869 3rd Ave W  
Dickinson, ND 58601  
701.7483.0171 or  
800.697.3145

## What should I do about arsenic in my drinking water?

If your drinking water comes from a public water system, your water is already being tested for arsenic and treated, if necessary. If you have your own water supply, i.e., a private well, you are responsible for maintaining and routinely testing the water quality of your well. The first step is to contact a certified water testing laboratory. A list of state-certified laboratories for well water testing is included with this document. The laboratory will provide instructions on how to collect the sample or send out a sampling kit. The most common water quality tests are for bacteria, nitrate and mineral content. Well owners should contact a mineralogical testing laboratory for an arsenic analysis if they are concerned about the presence of arsenic in groundwater. The typical cost of an arsenic test is about \$30.

If private wells used for drinking water purposes have arsenic levels that exceed the drinking water standard, options to limit risk include:

- ◆ Household point-of-use treatment/water purification units installed at owners' homes.
- ◆ Connection to a public water supply, if available. Contact your regional rural water system for more information.

## What are some household point-of-use treatment systems?

- ◆ Reverse osmosis systems - The most cost-effective method for removing arsenic from a private water supply is reverse osmosis, also called RO. Reverse Osmosis works by moving water through a special membrane that has microscopic pores that allow water molecules to move through, while trapping larger molecules like lead, iron, chromium and arsenic. Studies have shown that RO can be up to 95 percent effective for arsenic removal. <https://www.ag.ndsu.edu/pubs/h2oqual/watsys/wq1047.pdf>
- ◆ Anionic exchange system - These systems use a physical/chemical process to exchange ions between a resin bed and water passing through. These systems soften water, remove iron and manganese, and lower nitrate and arsenic levels. Specific contaminant removal is determined by the composition of the resin bed. <https://www.ag.ndsu.edu/pubs/h2oqual/watsys/wq1031.pdf>
- ◆ Iron oxide filter systems -These granular filters have large amounts of surface area and an affinity for arsenic to adhere to their surfaces. These filters can be used on their own or to enhance the performance of an RO system. <https://www.ag.ndsu.edu/pubs/h2oqual/watsys/wq1030.pdf>

Routine testing and maintenance is important for any treatment system. Contact a professional water system dealer for installation and maintenance information.

### References

- ◆ U.S. Environmental Protection Agency. (2000). Technologies and Costs for Removal of Arsenic from Drinking Water. (EPA Publication 815-R-00-028). Rockville, MD: U.S. Environmental Protection Agency.
- ◆ National Research Council. (2001). Arsenic in Drinking Water 2001 Update. Washington, D.C.: National Academy Press.
- ◆ U.S. Department of Health and Human Services. (2007). Toxicological Profile for Arsenic. Atlanta, GA: Agency of Toxic Substances and Disease Registry.

### For more information:

<http://www.cdc.gov/healthywater/drinking/private/wells/disease/arsenic.html>

<http://water.epa.gov/drink/contaminants/basicinformation/arsenic.cfm>

<http://www.ndhealth.gov/WQ/GW/pubs/>