



What is uranium?

Uranium is a naturally occurring radioactive metallic element. Small amounts of uranium are present in certain types of soils and rocks, especially granite. Natural uranium is composed of three forms or isotopes: uranium-234, uranium-235 and uranium-238. More than 99 percent of uranium found in nature is uranium-238.



Uranium breaks down very slowly into other elements including radium and radon gas. Uranium deposits associated with lignite coal beds are found throughout North Dakota and are most common in the southwestern part of the state.

How does uranium get into drinking water?

Naturally occurring uranium in groundwater results from the dissolution of uranium-bearing minerals. The concentration of uranium will vary, depending on the geological environment and contact with groundwater.

Are uranium levels in drinking water regulated?

MUNICIPAL WATER: Public or municipal water systems must comply with the federal 30 parts per billion (ppb) uranium drinking water standard. Public water systems are required to test and if they do not meet the 30 ppb standard, treat the uranium or provide an alternative water source.

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 by the state of North Dakota.

Can uranium in drinking water affect human health?

Despite its radioactive nature, the chemical properties of uranium in drinking water are of greater health concern than its radioactivity. Most ingested uranium is from food intake, and most uranium is generally rapidly eliminated from the body. However, a small amount is absorbed and carried through the bloodstream. Long-term consumption of elevated uranium in drinking water can increase a person's risk of kidney damage and cancer. The risk of health problems from drinking water contaminated with uranium is dependent on the:

- Concentration of uranium in the water
- Amount of water you drink
- Length of time you drink the water

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



Contact Information

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North Dakota Laboratories for Well Water Testing

Fargo-Cass Public Health Environmental Laboratory

Fargo, North Dakota
701-298-6997

Minnesota Valley Testing Laboratories, Inc.

Bismarck, North Dakota
701-258-9720
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North Dakota Department of Environmental Quality

Division of Chemistry
Bismarck, North Dakota
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RMB Environmental Laboratories, Inc.

Watford City, ND
701-444-2202

REFERENCES

Sorg, T.J. (1988). Methods for Removing Uranium from Drinking Water. V. 80. Number 7. Journal - American Water Works Association.

U.S. Department of Health and Human Services. (2013). Toxicological Profile for Uranium. Atlanta, GA: Agency of Toxic Substances and Disease Registry.

World Health Organization (WHO). (2005). Uranium in Drinking Water (update) 2005. WHO/EOS Geneva.

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What should I do about uranium in my drinking water?

If your drinking water comes from a public water system, your water is already being tested for uranium and treated if the uranium amount is above the federal standard. If you have 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 provided in this document. The laboratory will provide instructions on how to collect a sample or will send you a sampling kit. The most common water quality tests are for bacteria, nitrate and mineral content. Well owners should contact a mineralogical and uranium testing laboratory for a uranium analysis if they are concerned about the presence of uranium in groundwater. The cost of a uranium test is typically less than \$30. If private wells used for drinking water purposes have uranium levels that exceed the drinking water standard, options to limit risk include:

- Household 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.)
- Use of bottled drinking water

What household treatment systems are available?

There are two main types of household water treatment systems. A household point-of-entry system treats all the water you use in your home. A household point-of-use system treats water at a point such as a kitchen faucet. Some common treatment systems for removing uranium for household use are:

- Reverse osmosis systems
- Anionic exchange systems

The effectiveness of a treatment system will vary depending on water chemistry. The North Dakota Department of Environmental Quality recommends having a water treatment professional evaluate your household to determine the right water treatment system for your use. Proper maintenance of the selected treatment system is essential to effectively reducing uranium in drinking water. Contact your local water purification professional for an evaluation and estimate of cost. Some useful publications about household water supplies can be found at the NDSU Extension Service website: <https://www.ag.ndsu.edu/publications/environment-natural-resources/household-water-supply>

FOR MORE INFORMATION

<https://www.epa.gov/radiation/radionuclide-basics-uranium>

<https://www.cdc.gov/healthywater/drinking/private/wells/disease/radon.html>