Uranium & PRIVATE WELLS

What is uranium?

Uranium is a radioactive metal that occurs naturally throughout the environment in rocks, soil, water, and air. Uranium can be introduced into the environment through industrial processes including mining, milling and uranium enrichment processes. Uranium can also be introduced into the environment through the production of phosphate fertilizers as phosphate rocks containing uranium are crushed.

How does uranium get in my private well water?

Low levels of uranium in well waters are mostly attributed to the underlying bedrock composition. Some geologic areas may cause well water to be higher than normal in uranium. Uranium can also enter groundwater through areas with a history of uranium mining and related facilities.

How can uranium affect my health?

All the following health effects come from the chemical interactions of uranium in target organs and not the radioactivity uranium exhibits. Uranium has not been classified as to its carcinogenicity because of limited and inconclusive studies.

Uranium exposure, at high exposure levels, can cause a variety of symptoms depending upon the route of exposure. All exposure routes of uranium can result in kidney damage. There is limited evidence in animals of uranium exposures affecting reproductive processes and causing developmental effects. However, these effects have not been observed in humans. Additionally, children are not considered more sensitive to uranium exposures than adults

Dermal absorption from naturally occurring uranium in groundwater is not a primary exposure route. The general public primarily intakes naturally occurring uranium via food and drinking water.

What level of uranium should I be concerned about?

The **U.S. Environmental Protection Agency** developed a public drinking water standard of **30 micrograms of uranium per liter of groundwater (ug/L)**. Public drinking water standards are based on public health protection and cost of treatment/ testing at large utilities.

Where is uranium found in NC?

Groundwater uranium is generally found in the geologic areas known as the Raleigh Belt, Carolina Slate Belt, and the Charlotte and Milton belts. The Raleigh Belt was found to have the highest naturally occurring uranium water levels. The general range of uranium in North Carolina is from 0 to 30 ug/L, with a small amount as high as 250 ug/L.

Uranium

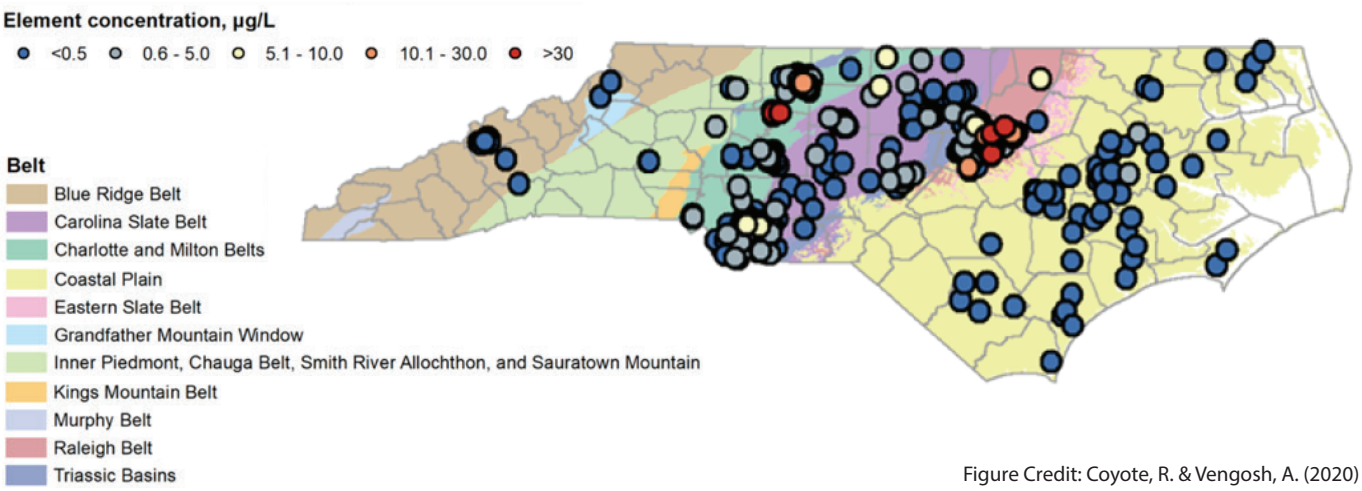

Figure Credit: Coyote, R. & Vengosh, A. (2020)

How do I test for uranium in my private well?

Use a certified lab test on your well water for uranium every 2 years, as part of the inorganic panel screen. Contact the private well program at your county health department to assist you with getting your water tested. Pricing of testing varies from county to county.

What if my uranium levels are high?

You can install a treatment system to reduce the levels of uranium in your private well. Treatment systems that reduce the levels of uranium in your well water include:

- Reverse Osmosis
- Ion exchange

You can also reduce your exposure by using bottled water or connecting to a public water supply, if possible.

Where can I find more information about uranium and my well?

You can visit the NC Division of Public Health's Private Well and Health Program website: http://epi.publichealth.nc.gov/oee/programs/wellwater.html.

There you can find:

- Contacts for your county private well program
- Uranium in well water maps
- A guide for selecting a treatment system
- Other private well resources

You can also call the NC DPH's Private Well and Health Program at 919-707-5900.

Where did this information come from?

Agency for Toxic Substances & Disease Registry
www.atsdr.cdc.gov/toxfaqs/tfacts150.pdf
www.atsdr.cdc.gov/csem/uranium/exposure_pathways.html

U.S. Environmental Protection Agency
www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations#Inorganic

Journal Publication
Coyote, R. & Vengosh, A. (2020). Factors controlling the risks of co-occurrence of the redox-sensitive elements of arsenic, chromium, vanadium, and uranium in groundwater from the eastern United States. *Environmental Science & Technology, 54*(7), 4367-4375. https://doi.org/10.1021/acs.est.9b06471