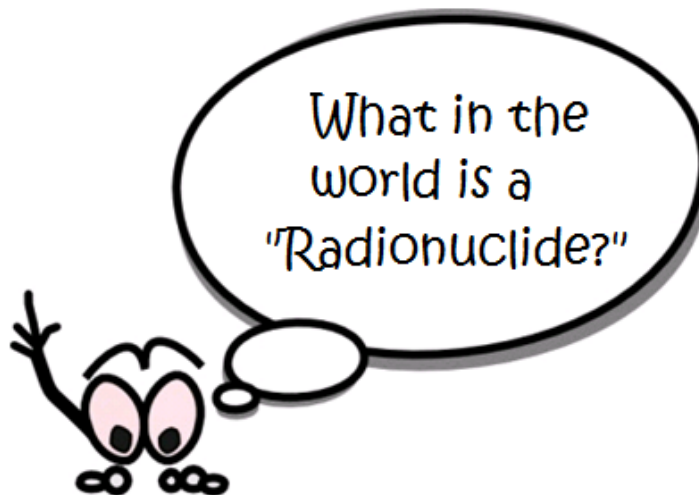


It's **YOUR** Health!

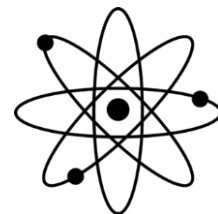


VDH's Office of Environmental Health Services has developed the "It's YOUR Health" information program to help private system owners with the educational, emergency, and service provider information needed to safeguard wells and septic systems so that they remain protective of human health and the environment. Because it's YOUR health!

Private well owners are responsible for all water quality sampling before and after the well is approved. Please keep the following in mind when determining whether you should test your private well water supply for radionuclides.

Sources

A radionuclide is a radioactive chemical that is found in water. It is usually, but not always, naturally occurring. Radionuclides contaminating water is a developing issue. Radioactivity in ground water formerly was limited to natural causes such as radon, radium, or uranium. But releases from nuclear power plants and medical facilities have added the dimension of man-made radioactivity finding its way into drinking water sources.



Source: NGWA

Health Risks Associated with Radionuclides

Exposure to ionizing radiation can lead to several types of cancer, and extremely high doses of radiation can cause death.

Radon can cause lung cancer, and drinking affected water can lead to stomach cancer. High exposure to radium-226 and radium-228 has been known to cause bone, stomach, lung, and other forms of cancer. Uranium is believed to cause bone cancer, and the EPA has stated it can be toxic to kidneys too. Gross alpha, beta, and photon emitters are considered carcinogens as well.

Sources: NGWA, US EPA

What Can You Do If You Find Radionuclides in Your Private Well Supply

Among the different types of technologies that treat radionuclides are co-precipitation with barium sulfate, greensand filtration, ion exchange, lime softening, preformed hydrous manganese oxide filtration, and reverse osmosis.

Whether or not a particular treatment removes radionuclides from drinking water effectively depends on the contaminant's chemical and physical characteristics, as well as the water system's characteristics such as size and water quality.

Treatment technologies:

- Co-precipitation with a barium sulfate is the process of adding a soluble barium salt to radium-contaminated water. It is mainly used in waste water. Data have shown success in removing 95% of the radium.
- Greensand filtration consists of a filter box with manganese greens and replacing the traditional filtration medium. Studies have indicated the sand removes up to 56% of the radium.
- Ion exchange can be used on small systems. It removes 90% of the radionuclides it encounters. The water flow must be regularly monitored, and the resin must be regenerated frequently.
- Lime softening can be used to remove radium. It has an efficiency of 80% to 95%. Adding lime to water increases its pH, and can also be a method for treating hard water.
- Preformed hydrous manganese oxide filtration is a method for radium-contaminated water. It is fairly inexpensive if filters are already in place. It requires proper dosages, and if water quality varies, the dosage must be recalibrated.
- Reverse osmosis removes multiple radionuclides, including radium and uranium. It can have a success rate up to 98%. Similar elimination totals

Source: NGWA

LINKS for Further Information

[National Groundwater Association](#)

[Virginia Household Water Quality Program](#)

[ATSDR Radionuclides \(radioactive materials\)](#)