

Radionuclides

Exposure to radionuclides has the potential to harm your health. Contact with any hazardous substances can cause health effects. The occurrence and nature of the effects depend on how much, how long and how one comes into contact with the substance.

What are radionuclides?

Radionuclides are a specific set of contaminants that have radioactivity associated with them. There are four radionuclides that are associated with groundwater contamination.

Gross alpha: Are alpha particles that can travel short distances and cannot travel through your skin.

Gross beta: Are beta particles that can penetrate through your skin, but are unable to travel through your body.

Both alpha and beta particles can be released as a product of radioactive decay.

Uranium: Natural uranium is a mixture of three isotopes: ^{234}U , ^{235}U , and ^{238}U . The most common isotope is ^{238}U which make up over 99% of natural uranium. ^{238}U is the least radioactive of the three isotopes.

Radium 226/228: Radium is formed when uranium and thorium break down in the environment. Uranium and thorium are found in small amounts in most rocks and soil.

Approximately 80% of exposure to radioactivity is natural and the rest comes from man-made sources. For example, exposure can occur from naturally occurring radiation from the emission of radon gas from rocks and soil, and radioactive elements in groundwater.

How could I be exposed to radionuclides?

Individuals can be exposed to radionuclides by ingestion (eating or drinking) and inhalation (breathing). Dermal (skin) exposures to radionuclides are not considered to significantly contribute to increased health risks.

Certain rock types which have naturally occurring trace amounts of mildly radioactive* elements that serve as the "parent" to other radioactive contaminants ("daughter products"). These radioactive contaminants, depending on their chemical properties, may accumulate in drinking water sources at levels of concern.

*Mildly radioactive elements are defined as elements with very long half-lives.

What are the health effects of radionuclides exposure?

The primary health concern associated with exposure to radionuclides is an increased risk of developing cancers such as bone, liver, breast, etc. This increased risk of developing cancer comes from drinking water in excess of the Maximum Containment Level (MCL) or breathing air with elevated radon over many years.

How can I limit or prevent my exposure to radionuclides?

- Avoid radionuclides exposure sources.
- Test your drinking water for radionuclides. If elevated, consider installing a reverse osmosis treatment system to remove radionuclides from the water.
- Test your home for radon. If your test results indicate elevated radon levels, consider installing a radon mitigation system.
- If you work around radionuclides, use proper personal protective equipment while working, and wash clothes and/or skin that comes in contact with radionuclides.

Is there a medical test to show if I have been exposed to radionuclides?

There are many ways to see if you have radioactive material in your body. Radioactive material can be measured in your blood, feces, saliva, urine, and throughout your entire body by specialized instruments. The instrument is chosen based on the type of radiation that is to be measured. Consult with your healthcare provider to determine if such a test is recommended and where to receive the appropriate test. Also, these tests cannot tell the level of exposure, nor can they be used to predict whether you will develop harmful health effects.

Additional Information

Call the N.C. Department of Health and Human Services, Division of Public Health at (919) 707-5900 for additional information.

References

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