

Radium in Drinking Water

Radium occurs naturally in our environment. It is a natural component of underground rock and soil, and it can work its way into ground water. As a result, radium has been found in some Minnesota community water supplies in quantities that exceed the drinking water standard. This fact sheet addresses questions on the regulations, health effects, and options that communities have to address the issue of radium in drinking water.

What are the Health Effects of Exposure to Elevated Levels of Radium?

Exposure to radium in drinking water results in an increased risk of cancer. The radioactive particles emitted by radium can damage parts of living tissue, which can lead to the unnatural reproduction of a cell and an increased risk of cancer.

Radium and other levels of radioactivity in water are measured in picoCuries per liter (pCi/L) of water. The risk is determined in terms of lifetime exposure to a contaminant above a certain level. For radium, it is estimated that the lifetime excess cancer risk (that is, the risk that is attributable to radium) is between 1 in 10,000 and 1 in 1,000,000 when drinking water that contains more than 5.4 picoCuries per liter of radium.

How Is Radium in Drinking Water Monitored?

By law, all community water systems must be monitored for radioactivity. The testing process for water samples begins with a screening for "gross alpha particle activity," which measures the total amount of one type of radioactivity given off by the water. If gross alpha activity is found, further testing for radium is conducted.

What Happens if a Water System Exceeds the Standard for Radium?

If a water system exceeds the standard for radium or gross alpha particle activity, it must take corrective actions, which include notifying those who drink water from the system. The notification includes information on what the system is doing to remedy the situation and what precautions, if any, the people should take.

How Can Community Water Systems Correct the Problem?

Sometimes a system can find a new water source. It may also blend water from more than one source to the point that the blended water does not have unacceptable levels of radium. Another

option is to install a treatment process to reduce the radium levels. Treatment options include cation exchange (which is similar to home water softening), reverse-osmosis, lime softening, and electro dialysis. In addition, studies have shown that filtering the water through greensand or anthracite may be effective. A water system will consider many factors, including cost, in deciding on an option.

Radium (Ray-dee-um) versus Radon (Ray-don)

Radium is a radioactive metal naturally occurring in soil and rock formations in extreme trace amounts. Radon is a radioactive gas that also occurs naturally and is a byproduct of radium breaking down over many, many years on its way to ultimately forming lead. The two are often confused when the topic of radium in drinking water comes up. There is no standard for radon in drinking water, but the gas can be a concern in some areas where it may be emitted from the soils and gather in poorly ventilated dwelling spaces, such as basements. More information on radon can be found at:

www.health.state.mn.us/divs/eh/indoorair/radon/index.html