

Radiochemicals and Drinking Water

Information on the occurrence of radiochemicals in public water systems (PWSs) in Texas, and what are the long-term risks to health and treatment options. Compliance determination and public notification requirements.

What is the occurrence of radiochemicals in drinking water?

Some drinking water sources contain radioactive contaminants ("radiochemicals" or "radionuclides") that are regulated in public water systems (PWSs). In Texas, the radiochemicals that are detected come from naturally occurring radioactive material (NORM). Most of the public water systems with radionuclide levels of concern use groundwater from the Hickory Aquifer in Central Texas, Ogallala Aquifer in North Texas, and the northern portion of the Gulf Coast Aquifer. By monitoring the levels of these radiochemicals, these PWSs can protect their customers from long-term risks to health. Radiochemicals occur naturally at levels above health-based standards in the groundwater at less than 50 PWSs in Texas. Approximately 50,000 people are served by these PWSs. These PWSs have been determined to be out of compliance with the maximum contaminant level (MCL) based on the running annual average (RAA).

How can I tell if my PWS is affected?

Once a year, each PWS must give its customers a water quality report called the Consumer Confidence Report, or CCR. If your PWS is among the affected water systems, the most recent CCR will show the test results. Ask your PWS for a copy of the most recent CCR. Many PWSs will post the most recent CCR on their website.

What radiochemicals are a concern?

For these PWSs, the main concern is a group of substances that produce the high-energy form of radioactivity known as alpha particles. Specifically, radium, uranium, and an overall measure of alpha radioactivity called the gross alpha standard are of concern.

How do these radiochemicals affect health?

Even at the highest levels found naturally in groundwater in Texas, radiochemicals do not pose an immediate risk to the health of anyone who drinks the water. But people who drink this water every day for a lifetime might have an increased risk of kidney damage or cancer.

How can we understand the level of risk?

The US Environmental Protection Agency studied the health risks and the costs associated with reducing it — that is, at what point do the costs of further reducing the risk outweigh the expected benefits? In this analysis, the EPA used an estimate generally considered to be conservative — the point at which the risk was no more than an additional 2 cases among 10,000 individuals.

In the EPA's analysis, that level of risk is reached by people who drink 2 liters — about a half a gallon — of water every day for 70 years at any one of these levels of radiochemical content:

- For radium, 5 picocuries per liter (combining both isotopes, radium-226 and radium-228).

- For the gross alpha standard, 15 picocuries per liter.
- For uranium, 30 micrograms per liter.

These levels are called the maximum contaminant level, or MCL, for the respective substance. Your PWS ensures that the water it distributes does not regularly exceed these MCLs.

Can't we remove the risk?

The only way to remove the risk entirely is to reduce the level of radiochemicals to zero. The cost of completely removing the radiochemicals and disposing of the resulting waste safely could make your water too expensive to use.

How can my PWS protect me from radiochemicals?

Under state and federal regulations, your PWS protects you from radiochemicals with a two-pronged approach:

- First, your PWS analyzes its water to ensure that no radiochemical is present at levels consistently above its MCL.
- When the main source of water available to your PWS does consistently exceed an MCL, your PWS must consider all options for reducing or removing the radiochemicals — and, of course, the cost of each option to its customers.

How is compliance with the MCL measured?

Because the levels of radiochemicals in groundwater can vary, the running annual average (RAA) of levels measured quarterly is used to determine whether a PWS complies with state and federal regulations. These samples are taken at each point where treated water enters the distribution system.

Because of the natural variation in levels of contaminants, a single quarterly reading that exceeds the MCL might not be a concern if levels are usually below the established MCL.

What options are available?

These are the main options available for your PWS to consider:

- Find a new source of water, and stop using water from this source.
 - Blend the water currently being used with water from another source that has lower levels of radiochemicals.
 - Consider methods for removing the radiochemicals. For example, radium and uranium can be removed by these methods:
 - Oxidation
 - Reverse osmosis
 - Lime softening
 - Filtering through greensand
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How will I know if my PWS exceeds an MCL?

If your PWS has exceeded an MCL, it must notify its customers. This notice does not mean that people will be harmed by the detected levels. Instead, it is meant to keep you and customers like you informed.

The notice should include statements like these:

- This is not an emergency.
- You do not need to use an alternative water supply.
- Some people who drink water containing these chemicals in excess of the MCL over many years may have an increased risk of cancer, kidney damage (if uranium is present), or other long-term health effects. If you are concerned, discuss this issue with your family doctor.

Also, as mentioned earlier, your PWS prepares and distributes a Consumer Confidence Report, or CCR, by July 1 of each year. If radiochemicals have been detected in your drinking water, the CCR must report the level detected. For a copy of the latest CCR, contact your PWS.

Where can I get more information about my drinking water?

Contact a member of the Public Drinking Water Section at 512-239-4691 or e-mail pdws@tceq.texas.gov for additional information or questions about your drinking water.