

Do You Have a Well?: Radon in Water A Guide For Homeowners

Well owners with elevated indoor radon levels should test their well water for radon. Radon in your water supply can increase your indoor radon level, although, in most cases, radon entering the home through water will be a small source of risk compared with radon entering from the soil. EPA estimates that indoor radon levels will increase by about **1 pCi/L for every 10,000 pCi/L of radon in water**. You can find publications and documents developed by EPA's Office of Ground Water and Drinking Water relating to radon in drinking water and the radon in drinking water rule at <http://www.epa.gov/safewater/radon.html>.

What do the results of your water test mean?

Estimate how much the radon in your water is elevating your indoor radon level by subtracting **1 pCi/L from your indoor air radon level for every 10,000 pCi/L of radon that was found in your water**. (For example: if you have **30,000 pCi/L of radon in your water**, then **3 pCi/L** of your indoor measurement may have come from radon in water.) If most of the radon is not coming from your water, fix your house first and then retest your indoor air to make sure that the source of elevated radon was not your private well. If a large contribution of the radon in your house is from your water, you may want to consider installing a special water treatment system to remove radon. EPA recommends installing a water treatment system only when there is a proven radon problem in your water supply.



How is radon removed from water?

Radon can be removed from water by using one of two methods: aeration treatment or granular activated carbon (GAC) treatment. Aeration treatment involves spraying water or mixing it with

air, and then venting the air from the water before use. GAC treatment filters water through carbon. Radon attaches to the carbon and leaves the water free of radon. The carbon may need special handling in its disposal if it is used at a high radon level or if it has been used for a long time. In either treatment, it is important to treat the water where it enters your home (point-of-entry device) so that all the water will be treated. Point-of-use devices, such as those installed on a tap or under the sink, will only treat a small portion of your water and are not effective in reducing radon in your water. It is important to maintain home water treatment units properly because failure to do so can lead to other water contamination problems. Some homeowners opt for a service contract from the installer to provide for carbon replacement and general system maintenance.

The 1996 Safe Drinking Water Act Amendments required EPA to establish several new, health-based drinking water regulations, including a multimedia approach to address the public health risks from radon.

Breathing radon in the indoor air of homes is the primary public health risk from radon, contributing to about 20,000 lung cancer deaths each year in the United States, according to a 1999 landmark report this year by the National Academy of Sciences (NAS) on radon in indoor air (BEIR VI). Radon is the second leading cause of lung cancer in the United States. Based on a second NAS report on radon in drinking water, EPA estimates that radon in drinking water causes about 168 cancer deaths per year, 89 percent from lung cancer caused by breathing radon released from water, and 11 percent from stomach cancer caused by drinking radon-containing water.

- NAS Report Executive Summary: "Risk Assessment of Radon in Drinking Water" http://www.nap.edu/catalog.php?record_id=6287
- INITIAL EPA PERSPECTIVES on NAS Report: "Risk Assessment of Radon in Drinking Water" <http://www.epa.gov/safewater/radon/remove/nasdw.html>
- NAS Report and EPA's Approach to Setting Limits for Radon in Drinking Water <http://www.epa.gov/safewater/radon/remove/approach.html>

Where and how does radon get into drinking water?

While most radon-related deaths are due to radon gas accumulated in houses from seepage through cracks in the foundation, 30 to 1,800 deaths per year are attributed to radon from household water. Showering, washing dishes, and laundering can disturb the water and release radon gas into the air you breathe.

What are the symptoms of radon exposure?

Drinking water that has high levels of radon may be a health risk, but breathing air high in radon concentration is more harmful to your health. Breathing in radon gas over a long period of time can increase your risk of getting lung cancer. Drinking water contaminated by radon may increase your chances of developing stomach cancer.

What should I do if I have concerns about radon exposure?

See your health care provider to discuss your concerns.

How is radon exposure diagnosed?

Before you test your water for radon, you should test the air. If the indoor radon level is high and you use groundwater, test your water. If the radon level is low in the air, there is no need to test your water. Test results are expressed in picocuries of radon per liter of water (pCi/l). In general, 10,000 pCi/l of radon in water contributes roughly 1 pCi/l of airborne radon throughout the house. The U.S. Environmental Protection Agency (EPA) currently advises consumers to take action if the total household air level is above 4 pCi/l.

What is the treatment for radon exposure?

For waterborne radon, a simple step is to make sure your bathroom, laundry room, and kitchen are well ventilated. If your well water only has moderate levels of radon, this may adequately reduce your exposure to waterborne radon. However, if your well has high levels of radon, you may need to use water treatment devices such as granular activated carbon (GAC) units and home aerators.

How do I remove radon from my home's drinking water?

Radon can be removed from water by using one of two methods:

- Aeration treatment—spraying water or mixing it with air and then venting the air from the water before use, or
- GAC treatment—filtering water through carbon. Radon attaches to the carbon and leaves the water free of radon. Disposing the carbon may require special handling if it is used at a high radon level or if it has been used for a long time.

In either treatment, it is important to treat the water where it enters your home (point-of-entry device) so that all the water will be treated. Point-of-use devices such as those installed on a tap or under the sink will only treat a small portion of your water and are not effective in reducing radon in your water. It is important to maintain home water treatment units properly because failure to do so can lead to other water contamination problems. Some homeowners use a service contract from the installer to provide carbon replacement and general system maintenance.