

wellcare® information for you about Nitrate and Nitrite & Well Water

What are Nitrate and Nitrite?

Nitrate and nitrite are nitrogen-based chemicals which occur naturally in water, soil, plants and food. Nitrate and Nitrite are found more commonly in groundwater than in surface water, and are two of the more commonly detected well water contaminants.

Principle sources of nitrate or nitrite contamination are fertilizers, septic tank waste, livestock manure, and erosion of natural deposits. The most vulnerable wells are those in farm communities or areas with large numbers of aging septic tanks.

What are the health effects of Nitrate and Nitrite?

Ingestion of water containing high nitrate or nitrite concentrations can be fatal to infants (especially <6 months of age). When ingested, nitrate is converted to nitrite by bacteria in saliva and in the digestive tract. In babies, this process can interfere with the ability of the child's blood to carry oxygen, which can lead to a blood disorder called methemoglobinemia or "blue baby syndrome". Symptoms include shortness of breath and blue coloring to skin. For these reasons, water containing nitrate or nitrite should not be used to prepare food or formula for infants less than 6 months of age.

Nitrate and nitrite are rarely a problem for people older than 6 months. However, some individuals are more susceptible to health problems from nitrate or nitrite due to certain health conditions. These include:

- Women who are pregnant or trying to become pregnant, as some studies have shown an increased risk of spontaneous abortion or birth defects.
- Persons without sufficient stomach acids to metabolize and excrete nitrate or nitrite.
- Persons who lack the enzyme, methemoglobin reductase, which converts affected red blood cells back to normal.

In addition, long term exposure to nitrate and nitrite can lead to diuresis, starchy deposits, and hemorrhaging of the spleen.

If you suspect contamination or experience illness, stop drinking or cooking with the water immediately, and do not resume use until testing has proven it to be safe. Always seek the advice of your medical doctor if you have any health concerns.

How do I test for Nitrate and Nitrite?

You should test for nitrate and nitrite annually, as their levels can fluctuate over time. Contact your state or local health department for a list of state-certified laboratories in your area.

Your test results may show levels of nitrate, nitrite, and a total nitrate/nitrite level. The EPA's maximum limit for nitrate in drinking water is 10 milligrams per liter (mg/L), or 10 parts per million (ppm); for nitrite, the limit is 1 ppm. The sum of the amount of nitrate and nitrite in drinking water should not total more than 10 ppm.

For example, if the nitrate level of your well is 10 ppm and the nitrite level is 1 ppm, the total nitrate/nitrite level is 11 ppm, which exceeds the maximum safe limit set by the EPA and should be treated.

Contaminant	EPA Limit
Nitrate as N	10 parts per million
Nitrite as N	1 part per million
Total (Nitrate + Nitrite) as N	10 parts per million

Although your testing laboratory may report nitrate as N as listed above, it can also be reported as nitrate NO₃. **If your result is reported as nitrate NO₃**, you should **refer to the maximum level of 45 ppm** which is equivalent to 10 ppm nitrate as N. Some states may set limits for nitrate and nitrite even lower than those set by the EPA. Check with your local health department or state environmental agency for maximum levels used in your state.

What are the treatments for Nitrate and Nitrite in drinking water?

Treatments to reduce nitrate and nitrite include anion exchange, distillation, electrodialysis and reverse osmosis processes. These technologies may have a wide range of effectiveness based on the amount of nitrate or nitrite in the water supply and other contaminants that may be present in the water. A water treatment professional can help you select the right treatment.

NOTE: Boiling your water WILL NOT remove nitrate or nitrite, and in fact will increase their concentration in your water.

FOR MORE INFORMATION to help you maintain your well and protect your water supply



wellcare® is a program of the **Water Systems Council (WSC)**. WSC is the only national organization solely focused on protecting the health and water supply of the 43 million people nationwide who depend on household wells for their water supply.

This publication is one in a series of wellcare® information sheets. There are more than 90 information sheets available FREE at www.watersystemscouncil.org.

Well owners and others with questions about wells or groundwater can also contact the FREE wellcare® Hotline at 1-888-395-1033 or visit www.wellcarehotline.org.

JOIN THE WELLCARE® WELL OWNERS NETWORK!

By joining the FREE wellcare® Well Owners Network, you will receive regular information on how to maintain your well and protect your well water.

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