

Nitrate-Nitrogen

USEPA Contaminant Classification: Primary, (health-related)
EPA Maximum "Safe" Levels: 10.0 mg/l

Source: The most common source of nitrate as nitrogen in drinking water is from agricultural usage of the land, specifically the use of nitrogen fertilizer in farming. Over time, (usually several years), the fertilizer seeps down to the water table increasing the nitrate levels in the aquifers. Other sources of nitrate contamination are sewage, feed lots for live stock, and normally occurring geological activity. Nitrate levels in drinking water tend to be very stable and change only very slowly over time. Nitrate can also be reduced to nitrite by naturally occurring processes. Nitrite-nitrogen is found in much lower concentrations, (usually 10-100 times) lower than the existing nitrate levels.

Health Effects: Nitrate-nitrogen in the drinking water is classified by the United States Environmental Protection Agency, (U.S. EPA) as a Primary drinking water contaminant and therefore considered a serious health concern. Nitrate as nitrogen when ingested may interfere with blood Oxygenation. This is an especially serious health concern to infants, (up to two years of age) and the elderly. Pregnant women who consume excessive amounts of nitrate as nitrogen during pregnancy runs the risk of a birth condition known as Methomoglobinemia, (Blue Baby Syndrome). This is thought to be due to Nitrate interfering with blood oxygenation across the placenta. The baby is actually born with a bluish tint due to lack of oxygen in its bloodstream.

Nitrate nitrogen is sometimes converted to Nitrosamines that are suspected to have links to cancer. Several scientific studies have shown a link between elevated Nitrate levels in drinking water and various forms of digestive system cancers.

Home Damage Effects: No home damage effects are known to be linked to elevated Nitrate as nitrogen levels in drinking water.

How to Fix Contaminated Water:

1. Reverse Osmosis Systems, (ROs)- These units very effective at removing Nitrate nitrogen, (95-98%) from drinking water. These units are usually installed under the sink and have a separate demand faucet to use for drinking and cooking. They can also be hooked up to your automatic icemaker to remove nitrate as nitrogen in the ice. These systems are usually limited by the daily amount of product water they can produce and are usually only a one-location potable water source.

2. Whole house Ion exchange units- Similar to conditioners, these units utilize a charged resin media, (positively charged instead of the negatively charged resin in traditional softeners) which remove negatively charged molecules, (Nitrate is NO_3^-). These systems offer a whole-house approach to nitrate as nitrogen removal instead of the single source provided by most reverse osmosis systems. They are expensive (\$2,000.00 to \$4,000.00) and their product water is extremely acidic and must be neutralized before it is distributed throughout the house.