



HOUSING & ENVIRONMENT

THE UNIVERSITY OF GEORGIA
COOPERATIVE EXTENSION SERVICE
JULIA W. GASKIN
PAUL F. VENDRELL
JORGE H. ATILES

YOUR HOUSEHOLD WATER QUALITY: NITRATE IN WATER

Private well owners are responsible for the safety of their drinking water. Maintaining a healthy well requires routine testing for possible contaminants, including nitrate. To assist in water safety, the EPA has set standards for nitrate levels in public drinking water systems.

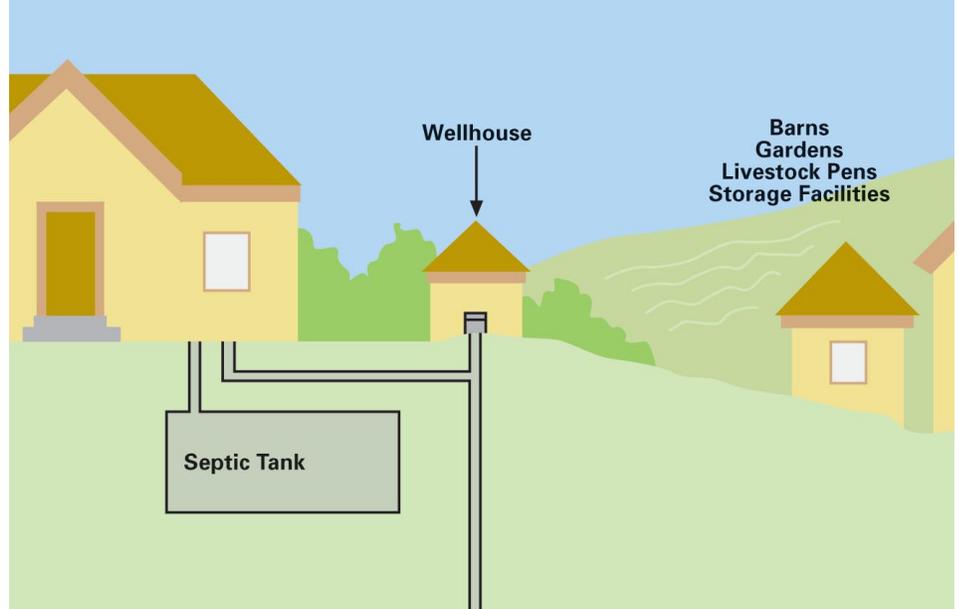
Although private well owners are not required to meet these standards, they do serve as a reference for safe drinking water. The EPA Maximum Contaminant Level is: 10 ppm (parts per million) or mg/L (milligrams per liter) nitrate-nitrogen or, if expressed as nitrate, 45 ppm.

WHAT CAUSES NITRATE CONTAMINATION?

While there are several potential sources, the three most common are:

1. Over use of nitrogen-based fertilizers
2. High concentrations of animal manure too near the well
3. Septic systems too near the well

POSSIBLE SOURCES OF WELL CONTAMINATION.



Nitrate forms naturally in soil from the decomposition of soil organic matter, from application of organic materials like animal manure, and from application of nitrogen. Contamination problems occur when nitrate from these sources is overapplied to lawns, gardens, crop land, or pastures. If there is more nitrate than plants can use, the nitrate can move easily through the soil from excess rainwater and can end up in groundwater. Poultry and livestock operations produce large amounts of manure that can be a source of nitrate. Good management practices can prevent this form of groundwater contamination. Septic systems are another source of nitrate found in well water. Septic systems that have been properly sited, installed, and maintained do not usually create a problem. However, in older developments where septic systems are used with small lot sizes, the risk of nitrate contamination is increased. Older septic systems that have not been maintained can also be a source of contamination. The closer your well is to your septic system, the higher the risk.

WHY WORRY ABOUT NITRATE?

There are potential health problems associated with high nitrate levels in drinking water. High nitrate levels can cause a condition called methemoglobinemia or blue baby syndrome. Babies under six months of age, older people, pregnant women, people with low stomach acidity, and people who lack certain enzymes can develop methemoglobinemia. Symptoms include a bluish tint to the skin, headaches, dizziness, weakness, and difficulty breathing.

WHAT SHOULD I DO IF MY WELL TESTS HIGH IN NITRATE?

There are several steps you can take if your well tests high in nitrate. What works will depend on your individual situation.

- Determine the source of contamination and try to eliminate it. For example, apply only the amount of fertilizer or manure that plants can use.
- Make sure your wellhead is adequately protected (see Circular 858-1 on Protecting Your Wellhead or Home*A*Syst/Farm*A*Syst publications).
- Use bottled water for drinking and cooking.
- Switch to the municipal water supply if possible.
- Retest to see if corrective actions or treatment systems are working.

| NITRATE - N LEVEL | RECOMMENDATION |
|-------------------|--|
| >3 ppm | Test level once or twice a year to make sure this level is not increasing |
| >10 ppm | Install water treatment system or switch to another source of water for drinking |

Nitrate is usually low in Georgia groundwater. If you have nitrate-nitrogen concentrations greater than 3 ppm, you should test your well water periodically to make sure the nitrate level is not increasing. Elevated nitrate is often an indication that other contaminants--such as bacteria--are getting into your well water. You should inspect your wellhead to make sure it is sound and properly protected, and periodically test your water for bacteria and other contaminants.

WHICH TREATMENT SYSTEM WILL REMOVE NITRATE FROM MY WELL WATER?

If your well water has nitrate-nitrogen levels of 10 ppm or more, you should consider either a water treatment system or buying water for drinking and cooking. Treatment systems effective for the removal of nitrate include distillers, anion exchange resins, and reverse osmosis. You should contact a water treatment professional to discuss the best system for your needs.

Sources:

Kelley, L.A. and A. Tyson. "Improving Drinking Water for the Rural Resident," Bulletin 1152-21, Georgia Farm*A*Syst/Home*A*Syst, The University of Georgia, College of Agricultural and Environmental Sciences, 1998. U. S. Environmental Protection Agency. Consumer Factsheet on Nitrates/Nitrites, 2002.

Reviewers: David Kissel, Mark Risse, Penny Thompson, and Carl Varnadoe, The University of Georgia; Jane Perry, Georgia Department of Human Resources; Calvin Sawyer, Clemson University.

Research Assistant: Philip M. Herrington

