

Nitrate

Nitrate is a compound that both occurs naturally and has many human-made sources. Nitrate is in some lakes, rivers, and groundwater in Minnesota. You cannot taste, smell, or see nitrate in water. Consuming too much nitrate can be harmful—especially for babies.

Safe Level

The U.S. Environmental Protection Agency (EPA) standard for nitrate in drinking water is 10 milligrams of nitrate (measured as nitrogen), per liter of drinking water (mg/L). 1 milligram per liter (mg/L) is the same as 1 part per million. Based on the data available at this time, this standard protects infants against methemoglobinemia. Infants are the most sensitive group of people for known health effects.

Health Risks

Consuming too much nitrate can affect how blood carries oxygen and cause methemoglobinemia (also known as a blue baby syndrome). Bottle-fed babies under six months old are at the highest risk of getting this illness. Methemoglobinemia can result in serious illness or death. It can cause the lips and skin to turn a bluish color but may be difficult to detect in infants. Symptoms will often resolve once the nitrate source is removed. People with glucose-6-phosphate-dehydrogenase deficiency or other metabolic conditions may be at higher risk of getting this illness. Science has emerged recently describing possible health impacts of long-term exposure to nitrate in drinking water at concentrations below the current regulatory standard. Potential health impacts include associations with thyroid problems, adverse pregnancy outcomes, and cancers

(particularly colorectal). Further research is necessary to confirm these observations. Minnesota Department of Health (MDH) continues to follow the research and will provide updated guidance when adequate data are available.

Prevent Contamination

- Keep nitrate sources away from your well. Sources may include fertilizer, septic systems, and animal waste.
- Construct your well in a safe spot. See the “Protecting Your Well” webpage for tips.
- Regularly inspect your well for damage. Contact a licensed well contractor if your well is damaged.

Address Contamination

Drinking water with concentrations of nitrate above 10 mg/L can cause immediate health problems. If nitrate is detected in your water at concentrations above 10 mg/L, follow these steps:

- Get your drinking water from a safe alternative source, such as bottled water.
- Make sure babies under six months old do not drink the well water.
- Do not try to boil nitrate out of the water. Boiling will make nitrate more concentrated.
- Have a licensed well contractor inspect your well.
- Find and get rid of any potential sources of nitrate contamination. The “Protecting Your Well” webpage can help you identify sources to check.

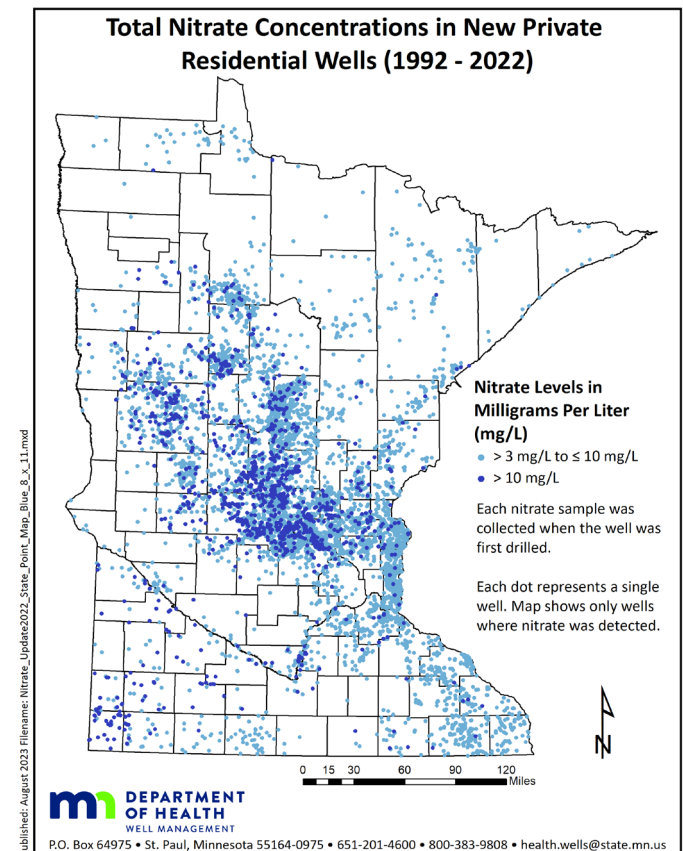
Home water treatment is also an option. Even with home water treatment, MDH recommends that no babies under six months old drink the water (a safety precaution in the event the water treatment fails).

Before treating for nitrate, MDH encourages you to first try to get rid of potential sources of nitrate on your property and get your well inspected and repaired.

See the “Home Water Treatment” webpage or contact MDH for guidance.

Nitrate in Minnesota Water

About 4 percent of new wells have nitrate concentrations above 3 mg/L in Minnesota. While 3 mg/L is less than the EPA standard, it suggests human-made sources of nitrate have contaminated the water and the level could increase over time.



Nitrate-Nitrogen in New Private Wells (1992-2022)

Wells Vulnerable to Nitrate

- Shallow wells.
- Wells in sand, karst, and fractured rock aquifers.
- Dug wells with casings that are not watertight.
- Wells with damaged or leaking casings or fittings.

Test Your Well Water

Test for nitrate every year.

You are responsible for keeping your well water safe and testing it as needed. MDH recommends you use an accredited laboratory to test your water. Contact an accredited laboratory to get sample containers and instructions or ask your county environmental or public health services if they provide well testing services.

Protect your health!

Test your well water for:



Testing is even more important if young children drink the water.

MDH may recommend you test for additional contaminants based on where you live.

Resources

Protecting Your Well (www.health.state.mn.us/communities/environment/water/wells/construction/protect.html).

Licensed Well and Boring Contractor Directory (www.health.state.mn.us/lwcsearch).

Search for Accredited Laboratories (www.health.state.mn.us/labsearch).

Home Water Treatment (www.health.state.mn.us/homewatertreatment).

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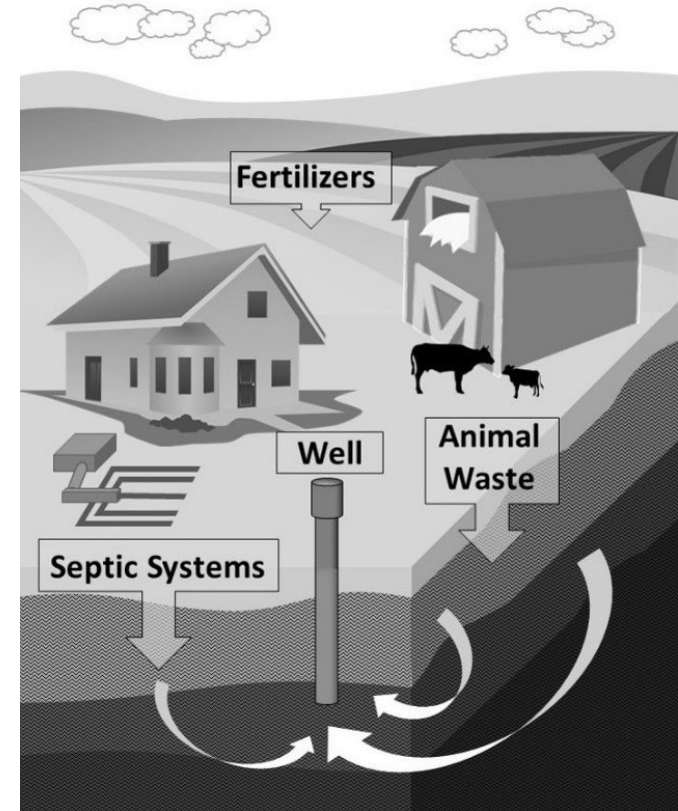
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Nitrate in Well Water



mn DEPARTMENT OF HEALTH

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To obtain this information in a different format, call:
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