

# Nitrate in well water: What you should know

Nitrate is a naturally occurring form of nitrogen that has no color, smell or taste. It is an essential component of living things. Although nitrate can occur naturally in groundwater, high levels are often associated with human activities.

Nitrate is a major part of animal manure, human sewage waste and commercial fertilizers. Nitrate in your well water is a potential health hazard.

## Nitrate and your well water

The only way to know if you have nitrate in your well water is to test. Contact an accredited laboratory for specific instructions on how to collect, store and send the sample. The test will cost between \$20 and \$40. To find accredited labs in Oregon, visit [www.healthoregon.org/wells](http://www.healthoregon.org/wells).

Nitrate is measured in parts per million (ppm) or milligrams per liter (mg/L) (1 mg/L = 1 ppm). Nitrate occurs naturally in surface water and groundwater at concentrations up to 2 mg/L and is not harmful at these levels. The safe drinking water standard (also called maximum contaminant level or MCL) for nitrate is 10 mg/L. If your water has nitrate levels above 10 mg/L, you should switch to bottled water or another source of safe drinking water and seek treatment options.

## Nitrate and your health

Presence of nitrate in drinking water can cause a variety of long- and short-term effects. Infants fed baby formula mixed with nitrate-contaminated water above 10 mg/L are at risk for blue baby syndrome, a condition causing decreased ability of red blood cells to carry oxygen.<sup>1</sup> Breastmilk is safe for infants even if the water the mother is drinking has more than 10 mg/L nitrate.<sup>2</sup> Women who are pregnant or may become pregnant should not drink water with high nitrate. There is some evidence that drinking water with nitrate above 10 mg/L can increase the risks of miscarriage and certain birth defects.<sup>1</sup>

There is weak and inconclusive evidence that long-term consumption of nitrates above 10 mg/L may increase risk of:

- Thyroid issues
- Cancer of the stomach or bladder



**You should test for nitrate at least once a year.**

### For more information:

- Private well users with health-related questions about nitrate in their water, well testing and maintenance recommendations, call 971-673-0440 or email [domestic.wells@odhsoha.oregon.gov](mailto:domestic.wells@odhsoha.oregon.gov).
- For questions about treatment options for your domestic well, contact the drinking water specialist at [your local health department](http://yourlocalhealthdepartment.com/DWcontacts) (<http://tinyurl.com/DWcontacts>).
- If you live in the Lower Umatilla Basin Groundwater Management Area (parts of northern Morrow and northwest Umatilla Counties), you may learn more about nitrates and well testing by visiting [testmywell.oregon.gov](http://testmywell.oregon.gov).

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## Interpreting your nitrate results

Nitrate results	Water use	Recommendation
10 mg/L (ppm) or less	<b>SAFE</b> for all uses. Concentrations above 4 mg/L may indicate contamination.	Test water at least once a year.
Between 11 mg/L and 40 mg/L (ppm)	<b>NOT SAFE</b> to drink for infants who rely on baby formula, children under 3, or women who are or may become pregnant, and to use for tooth brushing in children under 3. <b>SAFE</b> to drink short term, up to a year*, by people ages 3 years and older (except pregnant women). <b>SAFE</b> for other domestic uses, including bathing, washing dishes, laundry and garden irrigation.	Use bottled water or water from a safe source. Boiling the water does not help. It might even increase the concentration due to water loss. Supervise children to help them avoid swallowing water while bathing, brushing teeth, etc. Contact your local drinking water specialist for treatment advice.
More than 40 mg/L (ppm)	<b>NOT SAFE</b> for drinking. <b>SAFE</b> for other domestic uses, including bathing, washing dishes, laundry and garden irrigation.	Contact your local drinking water specialist for treatment advice.

\* Drinking water containing over 10 mg nitrate per liter for more than one year poses risk for all.

## References

1. Agency for Toxic Substances and Disease Registry (ATSDR). 2017. Toxicological profile for Nitrate and Nitrite. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.
2. Pediatric Environmental Health Specialty Units (PEHSU). 2014. Nitrates, Blue Baby Syndrome, and Drinking Water: A Factsheet for Families. Retrieved December 8, 2022, from [https://ldh.la.gov/assets/oph/Center-EH/envepi/PWI/Documents/PEHSU\\_Nitrates\\_Consumer\\_1.20.15FINAL.pdf](https://ldh.la.gov/assets/oph/Center-EH/envepi/PWI/Documents/PEHSU_Nitrates_Consumer_1.20.15FINAL.pdf).

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