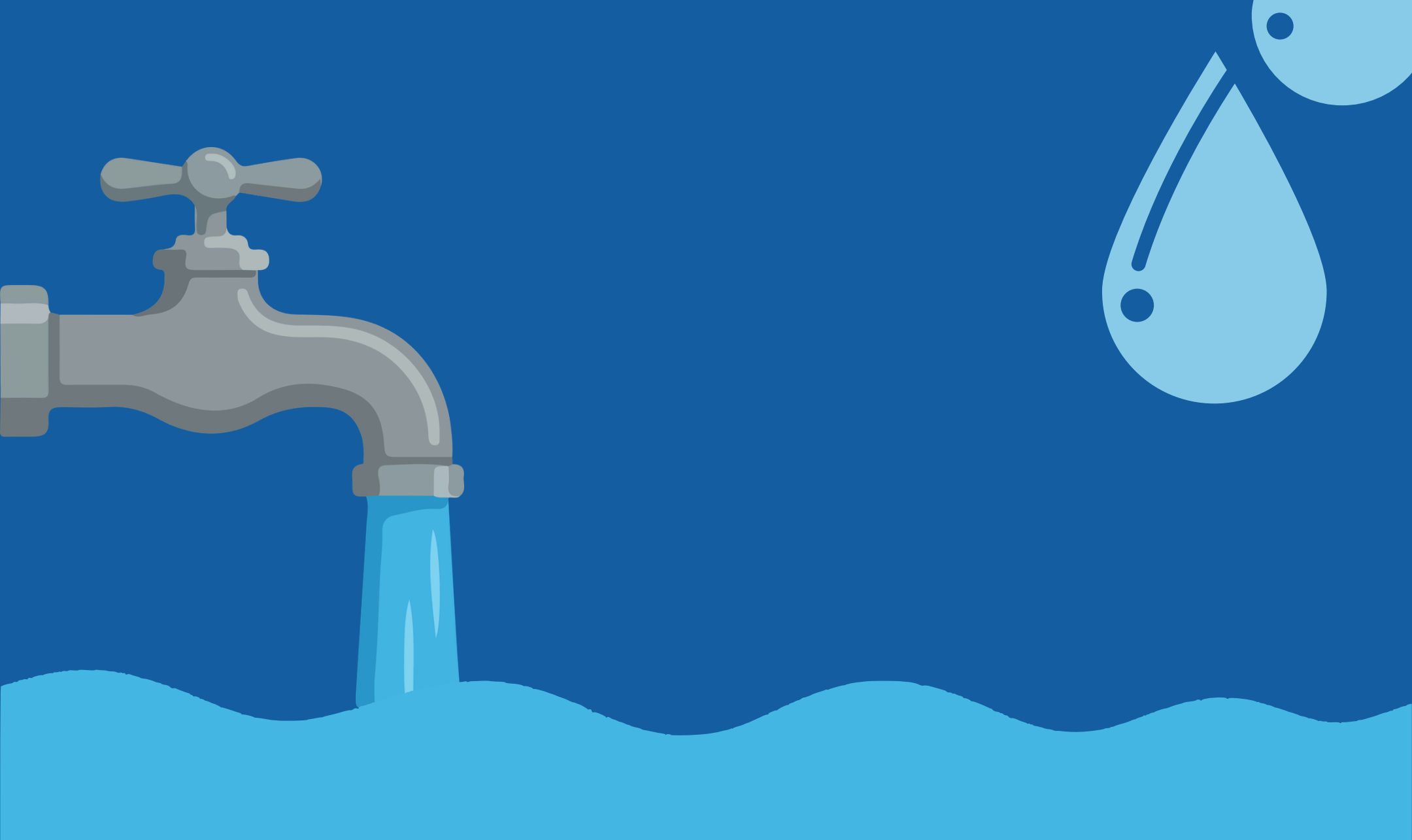
NITRATE IN DRINKING WATER

What do you need to know?



What is nitrate?

Nitrogen is an essential nutrient for all living things. Nitrate is a form of nitrogen and one of the primary ingredients in fertilizers.

Nitrate contamination of water comes from sources such as fertilizers, onsite sewage systems, and animal waste.

High levels of nitrate in drinking water can pose a health risk to humans and livestock.

While municipalities regularly test drinking water for nitrate, private domestic wells must be tested by the owners to ensure water is safe for consumption.

What are the health effects?

Human infants younger than 6 months and pregnant or nursing women are the most vulnerable.

In human infants, nitrate poisoning presents as “blue baby syndrome” which is a sign of low blood oxygen.

Nitrate poisoning affects livestock (cows, sheep, baby pigs, chicks) in the same way as it affects human babies.

Nitrate poisoning can be treated and most humans and animals recover, but it can be fatal if left untreated.

How do you test for nitrate?

According to the EPA, the max safe concentration of nitrate-N for humans is 10 mg/L (10 ppm). Research suggests 100 ppm as the max for livestock.

Nitrate is colorless, tasteless, and odorless so chemical testing must be done to determine levels.

Water testing should be done annually. Avoid testing when there hasn't been heavy rainfall as this could show a misleadingly low result.

How do you remove nitrate?

Nitrate can be removed from water in three ways: demineralization, ion exchange, and blending.

There are two methods of demineralization: distillation or reverse osmosis. Both of these methods are high maintenance.

Ion exchange requires multiple steps to properly manage the cleaned water and backwash brine.

Blending involves adding water with a low concentration of nitrate to lower the overall concentration. These levels will never be safe for human infants but can be used for livestock.

Learn more about these methods in the article linked on the last page and in the caption.

How do you prevent nitrate contamination?

Nitrate contamination is best managed by managing surface application of nitrogen like fertilizers. Consider using manure from livestock to reduce fertilizer use.

Both new and existing wells need to be properly cased and protected from surface and subsurface drainage.

Water high in nitrate is safe to use for tasks other than drinking such as bathing and washing dishes.

More information about this topic. More information about nitrate testing for private domestic wells.
More information about well placement and protection.
Free well water testing resources.