

Nitrate / Nitrite Fact Sheet

This sheet is to provide you with some information about Nitrate and Nitrite.

General Information

Nitrate and Nitrite are soluble forms of nitrogen which can be naturally present in the environment. Nitrate is produced during the natural decay of vegetable matter in soil or may be added as a fertilizer to arable land. Rainfall washes nitrate from the soil into ground and this can give rise to raised concentrations in drinking water. Nitrite may be formed from Nitrate naturally in the soil. In North Norfolk higher levels are associated with Private Water Supplies from shallow ground water sources such as wells or shallow boreholes.

Parameter	Limit set in Regulations	WHO Guidelines
Nitrate	50 milligrams per litre (mg/l)	50 mg/l
Nitrite	0.5 mg/l	3 mg/l
TON Consent Parameter	"The sum of the ratios of concentration to each of its guidelines value should not exceed 1" i.e. $([\text{nitrate}]/50) + (\text{nitrite}/3) \leq 1$	

Note: The TON Consent Parameter is a calculation from Nitrate and Nitrite values and the result should be less than 1 for the water to be considered wholesome. This result is directly linked to the Nitrate and/or Nitrite values. Any actions taken to reduce the Nitrate or Nitrite will lower this value as well.

Dealing with Nitrate or Nitrite Failures

The statutory limits for nitrate in drinking water are based on World Health Organisation (WHO) recommendations to protect bottle fed infants under six months, and particularly those in the 0-3 months age range, from infantile methaemoglobinaemia or blue baby syndrome. The ability of the blood to carry oxygen to the tissues of the body is impaired in this condition. Protection of this vulnerable group results in the protection of the rest of the population.

- When **concentrations of nitrate are above 50 mg/l bottle fed infants must be prevented from consuming the water**. Follow these requirements for bottle fed infants until the supply can be made wholesome:
 - Give infants up to the age of 6 months ready-diluted liquid formula.
 - Dilute with bottled water if bottled water is used, it must have a sodium concentration of less than 200 mg/l. The water should be stored out of direct sunlight in cool and dark to prevent algal growth. Bottled water is not sterile and must be boiled, and used according to the guidelines from the baby milk manufacturer.
 - Alternatively, temporarily use mains water. Collect milk in clean containers, store in the fridge and boil before use.

Notes

Nitrates do not accumulate in breast milk and babies can safely be breast-fed.

There is no concern for other users, including pregnant women or their unborn babies.

Boiling the tap water will not reduce nitrate levels.

Absorption via the skin is extremely low, so you can still use the water for bathing and washing.

- When concentrations of **nitrate exceed 100 mg/l, or nitrite exceeds 3 mg/l, the water should not be consumed by anyone**. Follow these recommendations, in addition to those above for infants, as a temporary measure until the supply can be made wholesome.
 - Provide bottled water for drinking, cooking and teeth cleaning. The bottled water should be low sodium and should be stored out of direct sunlight somewhere cool and dark to prevent algal growth.
 - Clearly display at kitchen and bathroom sinks instructions that the 'Do not drink tap water. Bottled Water provided must be used for drinking'.

Note

The Council is obliged by the Private Water Supplies Regulations 2016 to make sure the supply is made safe if there is a 'Potential Danger to Human Health'. We will therefore require the installation of Nitrate reduction treatment and/or treatment or improvement of existing treatment if necessary.

Existing Treatment on a Supply

If you already have nitrate treatment installed then failure may indicate the treatment needs to be serviced or regenerating frequency should be increased. Treatment units generally require servicing at least annually and more frequently if required to maintain nitrate levels below 50 mg/l at all times.

Treatment Options

1. For supplies with nitrate levels of > 100 mg/l, or nitrite of > 3 mg/l you must reduce nitrate concentration by installing an appropriate plumbed-in drinking water treatment, or
2. Install an alternative supply – deep borehole or connect to the mains.

Treatment Process	Description	Ongoing Requirements	Suitable For
Ion Exchange	Treats all water, usually situated outside. Water passes through column of resin and nitrate exchanged for chloride.	Topping up with salt. Servicing as per manufacturers' recommendations (at least annually).	Supplies where more than one drinking water source is required.
Reverse Osmosis	Point of use, usually under kitchen sink.	Servicing as per manufacturers' recommendations (at least annually). Replacing membrane.	Where only one drinking water source is required.

Treatment Process	Advantages	Disadvantages
Ion Exchange	Treats all water.	Large unit needs frost free space. May increase chloride levels. Unit does not work if runs out of salt for regeneration.
Reverse Osmosis	Produces pure water due to the very fine membrane.	Only one tap with drinking water. Slow and limited flow of water. Some can reduce the pH of the water.

Local suppliers and installers of water treatment can be found in the Yellow Pages or on www.yell.com under 'Water Treatment' or 'Water Engineers' in Norfolk. These categories include a few companies who specialize in supplying and servicing treatment for PWS. Check that the company has experience of dealing with small scale or domestic PWS.

Risk Assessments

When the Private Water Supply is Risk Assessed the servicing records by fully trained water treatment personnel, a site plan, and records of regular onsite checks by the person responsible for the supply, must be available.

Commercial Team, Environmental Health
North Norfolk District Council
Holt Road, Cromer, Norfolk NR27 9EN
Email: commercial@north-norfolk.gov.uk
Tel: 01263 516008
Fax: 01263 514627

www.northnorfolk.org

