

Microbiological Failure Factsheet

This factsheet aims to provide you with some information about microbiological parameters. These are bacteria which may cause illness if found in a water supply.

Microbiological Parameter	Standard set in Regulations	Considered a 'Potential danger to human health'
Coliform Bacteria	0 in 100 ml	
Colony Counts	"Not significantly higher than usual"	
Escherichia coli (E. coli)	0 in 100 ml	≥ 1 in 100 ml
Enterococci	0 in 100 ml	≥ 1 in 100 ml

(≥ Greater than or equal to)

General Information

- Coliform bacteria are found widely in the environment. Their presence indicates that the water supply has had some form of general environmental contamination, such as surface run off into a well, dust in a storage tank, or dirt inside a tap.
- E. coli and Enterococci are present in human and animal faeces and are pathogens. This means that they can make people ill. Their presence also indicates that other harmful pathogens could be in the water.

What happens if these bacteria have been found in your water?

Notice

If E. coli and/or Enterococci have been found a Notice is likely to be served by the council. This will inform all users of the water of the failure and ensure that short term restrictions and improvements are followed (see below).

Investigation

The council may need to carry out an investigation into the failure. This could include:

- checking that the restriction measures are being followed
- investigating the possible source(s) of the contamination.
- taking further samples
- giving advice on improvement works and/or treatment options.

Please note that there is a charge for investigations and sampling.

If only coliform bacteria and/or high colony counts have been confirmed the council will not normally serve a notice or visit to investigate or re-sample, but will recommend that restrictions and improvement actions are followed to resolve the problem (see below).

Short Term Restriction Methods for drinking water and teeth cleaning

- Boil the private supply water before drinking. For cold drinks or teeth cleaning, allow to cool and store in a clean sealable container in the fridge. Replace at least daily.
- Use bottled water. If bottled water is used ensure it has a sodium concentration of less than 200mg/l. Store the water out of direct sunlight, preferably somewhere cool and dark, to prevent algal growth. Bottled water used for making baby formula must be boiled and used according to the guidelines from the baby food manufacturer.
- Collect mains water from friends or family. Use clean sealable containers and store in the fridge.

Long Term Improvement Actions

Things to check if a Private Water Supply is contaminated with bacteria (and routinely for all PWS)

The Water Source

Shallow Source

- Wells (open bodies of water, usually with a brick surround) or shallow boreholes are often contaminated with coliform bacteria because the water has been on the surface recently.

Shallow Supplies can become contaminated with enterococci and E. coli (faecal bacteria) from:

- A soak away (this should be more than 50m away from the source)
- Leaking waste pipes from the house
- Muck heap or slurry pit

It is often difficult to prove and stop this type of contamination. Treatment or changing to a deep borehole or mains water is normally the best long term solution.

- A borehole sunk through the bottom of a well can become contaminated with well water if the outer bore casing is faulty or does not extend to the surface. In this case the outer casing should be extended and/or sealed. The bore may need super chlorination (use a specialist company only), but this may not be a long term solution.
- Poorly fitting covers at ground level can allow contamination from surface water, debris, insect or rodents to get into the well water. Surround the top of a Well with a raised chamber with a sealed and locked cover.

Deep Source

- A deep borehole into the chalk aquifer should be free from bacteria if there are no other problems (see below):
 - Check that there are no gaps around the top of the bore headworks. Expandable foam spray can be used to seal gaps.
 - Bore headworks are often in a chamber. Check inside the chamber regularly to ensure that it has not let in water or vermin, which could cause contamination. Ideally, bore headworks should be above ground level with a raised chamber and a sealed locked cover.

Cold Water Storage Tanks

- Sediment build up in roof storage tanks (usually orange colour due to iron settling out of the water).
- Roof tank with no, or ill-fitting lids can allow the tank to be contaminated by dust, insects, rodents, bats or birds.

Problems caused by tanks can be improved by:

- Cleaning and disinfecting existing tank. Ensuring close-fitting lid and gauze on overflow to exclude insects
- Fitting new tank with close fitting lid and gauze on overflow. Disinfect new tanks before use.
- Replacing tank with pressure system (hydraulic accumulator).

Although it is much better to find the source of the contamination and deal with it, this is not always possible and may not guarantee that it will completely prevent further problems. Installing treatment as well as improvements to the distribution system is often the best option to ensure continued compliance with the Regulations and a safe water supply.

Treatment Options

Treatment Process	Description	Ongoing Requirements	Suitable For
Chlorination or Chlorine Dioxide	Dosing of water at the source with a chlorine solution or chlorine dioxide to kill any bacteria.	Checking and maintenance of dosing equipment. Regular monitoring of dosing level. Servicing in accordance with manufacturer's instructions.	Best suited to larger supplies that are well managed.
Ultra Violet (UV) with sediment pre-filter	UV light inactivates the bacteria. Best used with pre-filter where sediment could be present.	Checking the light is still on. Replacing the bulb and cleaning quartz sleeve as per manufacturer's instructions (normally annually).	Best suited to supplies with pressure systems. Should be installed after gravity tanks if they are present.
Treatment Process	Advantages	Disadvantages	
Chlorination	Provides residual disinfection properties. Can be installed before holding tanks. Usually small units.	Dosing chemicals need careful storage and handling. Some dosing units can be unreliable. Will affect the taste and odour of the water slightly. Occasional can produce unwanted by-products with organic compounds.	
Chlorine Dioxide – residual	Provides residual disinfection properties. Can be installed before holding tanks.	Expensive. Strict limits on residual compounds. Must have continuous monitoring.	
Ultra Violet (UV)	Very effective if maintained correctly. No taste or odour Cost effective.	No residual disinfection. Can stop working and not be noticed if not checked or alarmed. Needs clear water (low turbidity and colour) to be effective. Clear water can be achieved with pre-filter or extra filtration.	

If you decide to have a UV installed, or have one that is not working effectively, here are some tips that may help:

- Request a model that allows you to see a small glow from the bulb so you know the unit is working.
- Locate the UV where you can regularly check the 'glow' and/or fit a model with an alarm warning system.
- Have the distribution system (roof tanks and pipework) disinfected immediately after installation to kill any bacteria present – this is essential.
- Ensure the unit is serviced and the bulb is changed as per manufacturer's recommendations (usually annually). Make sure the 'quartz sleeve' is cleaned at each service as iron is often present in ground water in North Norfolk. This will build up on the sleeve and stop the UV light penetrating the water.

If the Council is not required to visit to investigate it is recommended that a specialist water treatment company is asked to check the supply and treatment and to try to establish the source of the contamination and the most effective improvement works.

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 specialise in supplying and servicing treatment for PWS. Check that the company has experience of dealing with small scale or domestic PWS.

When improvement works and/or treatment have been completed

A satisfactory re-sample result is required to end the failure investigation and lift the restriction requirement after a Notice. There is a charge for re-sampling. A re-sample is not normally required for a coliform only failure.

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.

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