# Guidelines for the use of non-potable water in food businesses

These guidelines are designed to help food businesses ensure water used for food preparation and human consumption is safe in the event of a microbiologically unsafe water supply.

A water supply may not be safe due to inadequate treatment or an interruption to treatment.

Concerns and issues about the chemical safety of the water supply should be raised with the environmental health officers from your local council or Public Health Unit.

## Potable water in food businesses

Food laws require food businesses to use 'potable water' for all activities that use water on the premises, unless the use of 'non-potable water' will not affect the safety of the food.

Potable water means it is acceptable and safe for human consumption, and must be used in a food business for:

- washing food and/or food ingredients
- cooking
- adding to food and drinks
- making ice
- cleaning food contact surfaces
- cleaning food containers and utensils
- personal hygiene.

### Non-potable water

Non-potable water can be used only when it will not affect food safety, such as the flushing of toilets and cleaning non-food contact surfaces such as floors, or if it is treated to be safe for human consumption. If in doubt, please consult the environmental health officers from your local council or Public Health Unit.

A water supply is **not** guaranteed to be safe when:

a. the reticulated drinking water supply to a food business has a temporary interruption to the treatment of that supply, maybe because of water treatment plant breakdown, fire or flooding

b. a reticulated water supply does not meet drinking water standards

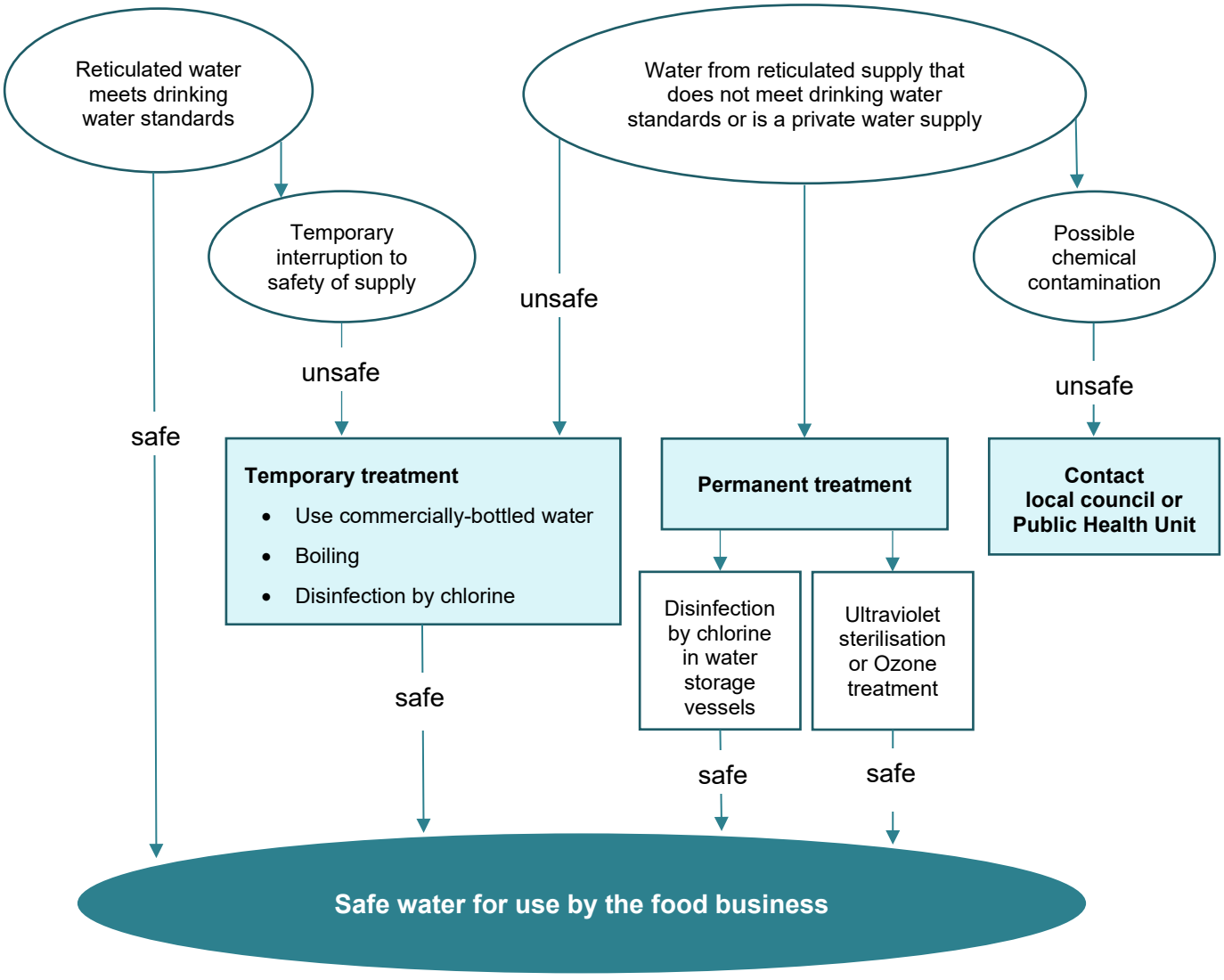
c. it is a private supply, such as:
   - rainwater tanks
   - groundwater, such as bores
   - surface water sources, such as a river or lake.

## Food laws and potable water

Standard 3.2.3 clause 4 of the Australian New Zealand Food Standards Code (the Code) requires a food business to use potable water for all activities that use water on the food premises, unless the business demonstrates the use of non-potable water will not adversely affect the safety of the food handled by the food business.

In addition, Standard 3.2.3, clause 14 (2) of the Code requires hand washing facilities to be connected to, or otherwise provided with, a supply of warm, running potable water.

Figure 1 When water is safe to use in a food business



# Possible health risks from non-potable water

## Microbiological contamination

Contaminated water may contain harmful microorganisms, such as viruses, bacteria such as *Salmonella*, *Campylobacter* or *E. coli*, and gastro-intestinal parasites such as *Giardia* or *Cryptosporidium*. These harmful microorganisms, known as pathogens, are invisible to the naked eye and may be present in clear water.

Drinking water containing these microorganisms can cause severe gastroenteritis, possibly lasting for several weeks. Infants, the elderly and people with suppressed immune systems are more likely to be affected.

## Chemical contamination

Chemical contaminants are less common than microbiological contaminants but can still be present in the environment.

Soil from old industrial, mining or agricultural areas may contain arsenic, heavy metals, pesticide residues or other chemicals. If dust is blown onto roofs and is washed into rainwater tanks, chemical residues may build up in the water. Runoff from roofs in urban or industrial areas may also contain chemical pollutants from the air.

Lead-based paints or flashing used on some older roofs may also flake off and be washed into rainwater tanks. Tar-based coatings can bind other harmful organic chemicals such as pesticides to the roof surface and also make it difficult to clean.

Harmful smoky residues from solid wood heaters can also condense near flues on roofs. These chemicals may leach from the roof surface over time and may be washed into rainwater tanks.

Aerial application of fertilisers and pesticides such as 'crop dusting' can sometimes result in these agricultural chemicals entering rainwater tanks. Agricultural chemicals may also drift or be washed into drains, irrigation channels, local streams and dams.

Whatever the water source, it is the responsibility of the food business to check what possible chemical contaminants can get into the water supply.

The below treatment methods outline how to make the water supply safe if there is the possibility that the water supply is microbiologically unsafe. If you suspect that your water supply could be *chemically* unsafe, consult with your local council or Public Health Unit.

# Water treatment methods

## Temporary treatment

There can be times when a water supplier may notify that its normally potable water supply will either be shut off for maintenance or has been temporarily contaminated, which is usually microbiological but may be accompanied by dirty water. They may advise to boil the water for a short time or to treat possible contamination in the water supply.

There are things a food business can do to ensure the safety of their water supply during a short-term interruption.

Table 1 Temporary treatment

| Water used for | Action or treatment |
|---|---|
| Drinking | Use either commercially bottled water or water that has been brought to a rolling boil, that is, the water is boiling vigorously for at least one (1) minute. |
| Ice making | If you need to make ice during this time, only make it from water that is suitable for drinking. |
| Washing hands | Use a water container with a tap that contains either bottled water or water brought to a rolling boil for at least one (1) minute, or that has been disinfected with chlorine (see chlorination guide below). |
| Cleaning equipment | For cleaning equipment, such as pots, pans, cutting boards, dishes and cutlery, the following options can be considered:<br>• sanitise by immersing the utensils in hot water at or hotter than 77°C for at least 30 seconds. As it is unlikely a hot water system will deliver water at a minimum of 77°C at the sink, it may be necessary to use a water heater in the sink to maintain the temperature to at least 77°C or an urn to feed water to the sink. A rinsing basket to submerge the utensils in the water is desirable for safety reasons<br>• use a commercial dishwasher capable of sanitising<br>• use disposable cups, plates and other utensils<br>• use a chemical sanitiser for cleaning eating and drinking utensils and for other utensils that require sanitising, such as large mixing bowls and chopping boards that will not fit in the commercial dishwasher. |
| Cleaning floors and non-food contact surfaces | If you want to sanitise these surfaces, washing in water with a concentration of chlorine 100-200 mg/L is adequate.<br>Note: In sewered areas, the responsible authority should be consulted as to whether discharge of effluent containing these concentrations of chlorine is permitted. Also, care should be taken if you have a septic tank as this may compromise the septic system. Please consult your local council or Public Health Unit. |

## Permanent treatment

Food businesses can either follow the advice in the previous section on a more permanent basis or seek a longer-term solution to managing the safety of their water supply.

### Treating water in a water storage vessel – such as a water tank

If the water source is from a non-potable water supply, groundwater or surface water, a practical way to ensure the water supply is safe is to periodically fill a water storage vessel from the water supply and treat the water in the vessel with chlorine.

Storage vessels for treated water should:

- be clean
- have covers
- be above ground level
- be in a cool position
- be cleaned periodically
- be mosquito proof
- be unlikely to taint the water (seek advice from manufacturer).

## Chlorination guide

- The initial dose should give a free chlorine residual of 5.0 mg/L.
- There should be enough chlorine to give a free chlorine residual of 1.0 mg/L after 30 minutes contact time.
- Check after 30 minutes using a colour comparator, like the ones used for swimming pools.
- If necessary, add more chlorine to ensure that the required minimum of 1.0 mg/L maintained for 30 minutes, is achieved.
- Each time the storage vessel is running low, refill it and re-treat with chlorine.
- Chlorinate each time the storage vessel is filled with water from a non-potable source.
- Tables 2, 3, and 4 outline how much available chlorine is required to achieve the free chlorine residual target.
- Some household bleach contains alkalis and other chemicals such as perfumes. The alkalis in these products will increase the pH of the water, often above pH 9 which is not satisfactory. Make sure to source a suitable chlorine product.

Table 2 Volume of household bleach (4% available chlorine) required to achieve the free chlorine residual target

| Water volume to be treated | To achieve a concentration of | | |
|---|---|---|---|
| | 5mg/L | 100mg/L[1] | 200mg/L[1] |
| 5 litres | 0.63 ml | 12.5 ml | 25 ml |
| 1,000 litres | 125 ml | N/A | N/A |
| 5,000 litres | 625 ml | N/A | N/A |

[1] Only for cleaning of floors and non-food contact surfaces.

Table 3 Volume of liquid sodium hypochlorite (12.5% available chlorine) required to achieve the free chlorine residual target

| Water volume to be treated | To achieve a concentration of | | |
|---|---|---|---|
| | 5mg/L | 100mg/L[1] | 200mg/L[1] |
| 5 litres | 0.2 ml | 4 ml | 8 ml |
| 1,000 litres | 40 ml | N/A | N/A |
| 5,000 litres | 200 ml | N/A | N/A |

Table 4 Amount of swimming pool chlorine (HTH) (65% available chlorine) required to achieve the free chlorine residual target

| Water volume to be treated | To achieve a concentration of 5mg/L |
|---|---|
| 1,000 litres | 8 gm |
| 5,000 litres | 40 gm |

## Alternative permanent water sterilisation methods

There are many methods that can be used to treat the water supply for microbiological safety. Two such treatment methods that are chemical free are ultraviolet sterilisation and ozone treatment.

Search online for 'water treatment or equipment' for alternative water sterilisation methods.

If you have any doubts as to what to do, employ the services of a water treatment expert to advise the best solution to meet your business needs, or contact your local council or Public Health Unit.

Table 5 Alternative permanent water sterilisation methods

| Method | Details |
|---|---|
| Ultraviolet (UV) steriliser | UV sterilisers can be installed at point of entry of water to the business to destroy pathogenic organisms.<br>UV disinfection is less effective in dirty or cloudy water as the light cannot penetrate the water. Filtration may be necessary to remove suspended particles before UV disinfection. |
| Ozone treatment | Uses ozone gas to treat the water. Consult a water treatment expert for advice. |
| Other methods | Consult a water treatment expert or the local council or Public Health Unit. |

## Regular microbiological and chemical testing

Verify that the water treatment methods are working by arranging periodic samples for microbiological analysis.

Chemical analysis of the water is also advisable, particularly when a new bore is used or to test rainwater tanks following bushfires. Consult your local council or Public Health Unit about what to sample and how often.

## Water testing

Many analytical laboratories in NSW can advise on chemical, microbiological and algal testing of water. Search for 'water testing' online to find a local laboratory.

## Acknowledgements

This document was originally reproduced with permission from the Food Safety Unit, Victorian Government Department of Health and Human Services, Melbourne, Victoria. The content has been updated and adapted to include other references.

## More information

- NSW Health advice on water quality, available via health.nsw.gov.au/environment/water
- NSW Private Water Supply Guidelines (PDF, 874 KB), available via health.nsw.gov.au
- Australian Government Department of Health Guidance on use of rainwater tanks (PDF,
- 565 KB), available via health.gov.au
- Visit foodauthority.nsw.gov.au
- Email food.contact@dpird.nsw.gov.au
- Phone 1300 552 406