

Department of Health

health

Your private drinking water supply



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If you live in rural Victoria you may not have access to a mains reticulated water supply. You may rely on a private drinking water supply such as rainwater or bore water.

Private drinking water supplies, such as rainwater, are generally reliable and safe for drinking, but water quality can be variable. Outbreaks of gastroenteritis have occurred in Victoria as a result of people drinking contaminated water. You can minimise risks and keep your water supply system safe if you:

- make sure your drinking water comes from a good-quality source
- regularly maintain your water supply system
- where required use the right treatment steps.

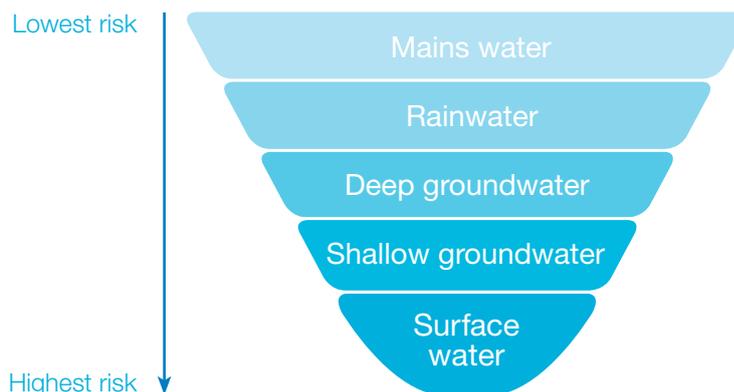
This booklet provides general information to keep your drinking water supply safe.

Choosing your drinking water source – weighing the risks

The Department of Health recommends that reticulated mains water is used for drinking and food preparation in areas where it is provided. Reticulated water is treated to a level that is safe for drinking.

When reticulated water is not available, other sources of water can be used for private drinking water supplies. Always choose the highest quality water with the lowest risk of contamination. If surface water is your only option, treat it prior to drinking. For more information regarding water treatment refer to the *Guidelines for private drinking water supplies at commercial and community facilities* (see 'Resources').

The diagram below ranks the risks of different sources of drinking water from lowest to highest risk.



Hazards that can affect your private drinking water supply

Water quality from rainwater tanks is variable, even in well maintained systems.

Your system can become contaminated with microorganisms from a range of sources such as leaf debris, animals or animal faeces.

Harmful microorganisms (pathogens) are not visible to the naked eye and may be present in water that appears to be clear. Drinking water containing these pathogens can cause illness such as mild to severe gastroenteritis. Children, older people and people with suppressed immune systems are more vulnerable to pathogens and extra care should be taken to ensure the water provided is safe for drinking.

Chemicals are another source of contamination, for example, pesticides from spray drift, or lead-based paint on flashings or roofs.

The following table shows potential hazards and ways you can prevent them from affecting your drinking water supply.

Hazard	Cause	Preventative measures
Drowning	Easy access to the tank roof	<ul style="list-style-type: none"> • Repair any gaps. • Prune back branches near the tank.
	Hatches open or roof in a poor state of repair	<ul style="list-style-type: none"> • Secure the tank cover.
Contamination from birds and small animals	Access to the tank from the roof and gutters	<ul style="list-style-type: none"> • Prune back overhanging vegetation.
		<ul style="list-style-type: none"> • Locate antennas away from roof spaces and gutters used to collect drinking water. • Regularly clean your roof and gutters to remove leaves, animal remains, dust and other debris. • Install screens between your roof and the water tank, or use a gutter guard or leaf diverter.
	Access to the tank from inlets and overflows	<ul style="list-style-type: none"> • Install a first flush device on the tank. • Protect all inlets, overflows and other openings to prevent entry by animals and insects.
Contamination from livestock, sewage or agriculture	River source water contaminated by livestock	<ul style="list-style-type: none"> • Appropriate treatment.
	Leaking septic tanks and wastewater drainage entering underground tank or bore water	<ul style="list-style-type: none"> • Protect your underground tank from overground flows and make sure the tank walls are intact.
	Drinking water pipes cross-connected with other plumbing	<ul style="list-style-type: none"> • Employ a licensed plumber to check for cross-connections, and repair or replace pipework.
	Farmyard runoff and drains contaminating groundwater	<ul style="list-style-type: none"> • Install a secure casing and an above-ground wellhead on your bore.
	Agricultural chemical residues in irrigation channels, streams and dams	<ul style="list-style-type: none"> • Install secure casing and an above-ground wellhead on your bore.

Hazard	Cause	Preventative measures
Chemical contamination from pipe or tank materials	Old or incorrect material used for pipes or tanks	<ul style="list-style-type: none"> Flush the pipes each morning to bring fresh water into the tank.
	Breakdown of leaf litter leading to low pH and causing increased leaching from metal tanks, pipes and fittings	<ul style="list-style-type: none"> Prune back branches near the tank. Remove leaf litter from gutters and tanks
Chemical contamination from roof materials	Roofs that have been recently painted	<ul style="list-style-type: none"> Wait until after the first few rainfalls to collect the water from the tank.
	Particles from lead-based paints or flashing on older roofs and gutters	<ul style="list-style-type: none"> Use coated lead flashing or alternative materials on new roofs. Check that your pipes use Australian Standard plumbing fittings.
	Timber roofs preserved with chemicals bitumen or tar-based coatings	<ul style="list-style-type: none"> Do not use these roof spaces to collect drinking water.
	Roof spaces near flues from solid wood heaters	
Contamination from dust, agricultural or industrial materials	Dust and other matter blown onto roof from neighbouring farms or industrial land.	<ul style="list-style-type: none"> Install a first flush device on the tank. Alternatively disconnect the downpipes to your tank and clean the roof, or wait until the next rainfall before reconnecting the tank to the roof.
	Agricultural chemicals from crop dusting or spraying	
Mosquitoes	Mosquitoes breeding in the tank or guttering	<ul style="list-style-type: none"> Cover inlets and overflows with insect proof screens.
		<ul style="list-style-type: none"> Cover or repair all other access points or holes including screening.
		<ul style="list-style-type: none"> If mosquito breeding is already occurring, contain the mosquitoes by locating and sealing their point of entry.
		(As well as preventing further access, these steps will prevent the escape of emerging adult mosquitoes.)
		<ul style="list-style-type: none"> Regularly inspect gutters for standing ponding water, and clean if necessary.
		<ul style="list-style-type: none"> As an interim short-term measure, treat tanks with either domestic kerosene (1 teaspoon per 1000L); medicinal or liquid paraffin (2 teaspoons per 1000L); or S-methoprene (use according to directions).
Elevated levels of metals and nitrates in groundwater	Naturally occurring in some parts of Victoria	<ul style="list-style-type: none"> Test the chemical parameters of your groundwater every six months to ensure it is safe for use (more information at www.depi.vic.gov.au).
Taste and odour issues from algae	Algae (including blue-green algae) growing in suitable conditions such as high-nutrient water and abundant sunlight	<ul style="list-style-type: none"> Seal the tank to prevent light from entering. If a dam or stream is affected by algae avoid using the water until the bloom subsides.

How to maintain your private drinking water supply

These tips on collecting and storing water will reduce the risk of pathogens or chemical hazards contaminating your private drinking water supply.

- Pipe and tank materials should meet the Australian Standards for materials in contact with drinking water. Get advice from the installer or contact the manufacturer for more information.
- Regularly maintain your water tank. Check the bottom of your tank every two to three years for sediment (sludge) build-up. If sludge has built up on the bottom of the tank or sediment is evident in the water flow, it should be removed by siphoning or pumping the bottom of the tank or draining and cleaning the tank.
- Seal, screen and cover your tank so that insects, small animals, birds and sunlight cannot enter. This will also prevent children from accessing the tank, and will help to minimise the growth of algae.
- Keep the plumbing for your drinking water completely separate from the other plumbing or pipe systems on your property, and seal all pipe joints. Always use a licensed plumber for plumbing around your home.
- Regularly clean your roof and gutter to remove leaves, animal remains and other debris.
- Install screens between your roof and the water tank and consider installing gutter or leaf guards.
- The first rainfall after a dry period usually washes most of the contaminants off your roof. A 'first flush' or other diversion system can help prevent this dirty water from entering your water tank. First flush water can be stored in a separate tank and used for non-drinking purposes.
- Install a secure casing and an above-ground wellhead on any bore you use as a source of drinking water. Information on bores and groundwater quality is available from the Department of Environment and Primary Industries website (see 'Resources').
- Make sure that surface water runoff, irrigation water, leakage from sewer pipes, sullage drainage or shallow underground seepage cannot get into your drinking water supply.
- Don't use groundwater to prepare infant formula, as nitrates can pose risks to babies. Talk to your maternal and child health nurse or family doctor for more information.
- Disinfect your water supply if you suspect it has become contaminated with pathogens.



Disinfecting your water

If you suspect microbial contamination, you can disinfect drinking water by boiling it or adding chlorine to the water supply (see below).

Boiling

Boiling water kills pathogens, which are a common concern in tank water. Bring the water to a full rolling boil, then allow it to cool and store it in a clean container.

Chlorinating

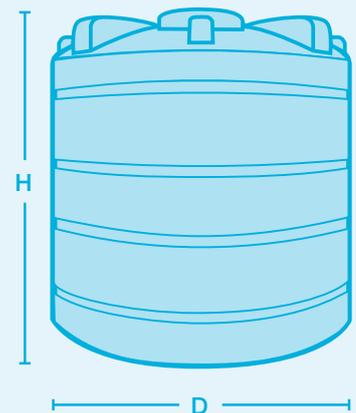
Chlorinating your water supply is a cheap and effective means of disinfection against pathogens. Enough chlorine should be added to provide a free chlorine residual of around 0.5 milligrams per litre (mg/L) after 30 minutes. An initial dose of 5 mg/L of chlorine will usually provide this residual (see box below). You can test the residual in your water tank with a swimming pool test kit or dip strips, which are available from pool shops and suppliers.

Chlorine is hazardous, so be sure to follow the label instructions including safety and handling instructions on all chlorine products. Wear appropriate hand and eye protection when handling or preparing chlorine solutions.

After chlorinating, you should ideally wait at least 24 hours before using the water to allow for pathogens to be destroyed. The chlorine may leave a harmless taste and odour in the water, which should disappear in 10 to 14 days. Boiling the water will remove most of this taste and odour.

Calculate how much chlorine to add to your tank ~for an initial dose of 5 mg/L:

1. Calculate the volume of water in your tank in kilolitres (1 kilolitre = 1,000 litres).
For a cylindrical tank the volume of water (in kilolitres)
 $= D \times D \times H \times 0.785$
D = diameter of the tank (in metres)
H = depth of water in the tank (in metres)
2. Check your calculation by comparing it with the maximum capacity of your tank.
3. For every kilolitre of water in your tank, add:
 - 40 mL of liquid pool chlorine (sodium hypochlorite (12.5 per cent available chlorine)
 - or
 - 8 grams of granular pool chlorine (calcium hypochlorite (65 per cent available chlorine).



Ultraviolet light

Another treatment method is ultraviolet light (UV). Ultraviolet light systems require very clear water to work effectively and must be carefully designed, maintained and operated.

Frequently asked questions

Do I need to disinfect my water?

In most rural areas of Victoria you shouldn't need to disinfect rainwater that's collected from a clean roof and securely piped into a rainwater tank that's been well maintained. Groundwater from deep bores that are protected by a secure casing should not require disinfection either.

However, groundwater obtained from a shallow bore, or water piped from streams and dams could be contaminated and may need to be disinfected.

If you suspect your water supply is contaminated, disinfect it before using it for drinking, food preparation or making ice.

Do I need to filter my water?

Generally, water that is cloudy or dirty is not suitable for drinking unless it is properly treated.

It is usually more cost-effective to get your water from a good-quality source than to treat poor-quality water. However, if your drinking water supply does require filtration, make sure the filter complies with Australian Standards, and be sure to maintain the filter according to the manufacturer's instructions.

What should I do if I find a dead possum or bird in my tank?

If good-quality water is in short supply, and it is not practical to drain and refill the tank, you should remove as much of the animal carcass as possible and chlorinate the water. The point of entry for the animal should be located and repaired.

A dead animal in your tank won't necessarily cause illness if you drink the water.

Where a rainwater tank has become contaminated by a dead animal, such as a bird or rodent, it is recommended that the tank be drained and cleaned as soon as possible. If the animal is large, such as a possum or a cat, and badly decayed, impacts on taste and odour will be strong and distinct.

Where can I get my water tested?

You shouldn't need to test your drinking water supply if you are using a low risk reliable water source and properly maintaining your system. However, if you do want your water tested, contact a NATA accredited laboratory (see 'Resources').

Is there fluoride in my private drinking water supply?

Fluoride is added to most mains water supplies. Water fluoridation is the adjustment of the level of fluoride in drinking water to around 1mg/L, the level that helps to protect teeth against decay. Rainwater does not contain fluoride; however some groundwater supplies may contain fluoride which occurs naturally in the environment.

If you don't have access to a fluoridated drinking water supply, look after your teeth by healthy eating and regular brushing with fluoridated toothpaste. For children under two consult your dentist for advice. For more information on fluoride contact the Department's Water Program on 1800 651 723.

What other problems might affect my water supply?

- **Zinc** from a newly galvanised tank might give an unpleasant metallic taste to the water for a while, but is not harmful.
- Water **pH** tends to rise when stored in new concrete tanks, due to the leaching of lime from the concrete surface. You may need to flush the tank before you use it.
- **Bushfires** generate large amounts of smoke, ash and debris, which can settle on your roof. This generally doesn't present a health risk to your water, although it may affect the colour, taste and odour. If your area has been affected by a bushfire, ensure that the first rainfall is not collected in your drinking water tank. If you don't have a first flush device disconnect the downpipes from your roof to the drinking water tank. Clean the roof of ash and debris or wait until the next rainfall, then reconnect.
- **Unknown** If your water looks, smells or tastes unusual, do not use it for drinking or food preparation and do not give it to animals.

I operate a business with a private drinking water supply. Is there any additional information I should be aware of?

Commercial or community facilities such as food businesses, childcare centres, hospitals, schools or commercial accommodation are subject to strict requirements for managing private drinking water supplies.

The *Guidelines for private drinking water supplies at commercial and community facilities* are available from the Department of Health website (see 'Resources').

Contact your local council for more information.

My rainwater tank is nearly empty and I want to top it up, what do I need to consider?

Water carters can deliver potable water (fit and suitable for drinking) to your house. The *Food Act 1984* requires water carters who sell potable water to be registered with a local council.

For more information refer to the *Guidelines for drinking (potable) water transport in Victoria* available from the Department of Health website (see 'Resources').

Contact your local council for more information.



Resources

enHealth Council

Advice about using and maintaining rainwater tanks for drinking water.

Web: www.health.gov.au

Guidance on use of rainwater tanks

Department of Health, Water Program

For enquiries about the safety of your private drinking water supply.

Tel: 1300 761 874

Web: www.health.vic.gov.au/water

Guidelines for private drinking water supplies at commercial and community facilities

Guidelines for drinking (potable) water transport in Victoria

Department of Environment and Primary Industries

For information on groundwater and bore construction.

Tel: 13 61 86

Web: www.depi.vic.gov.au

Note: If you are considering constructing a bore you should also contact the rural water authority in your area.

National Health and Medical Research Council

National guidelines on drinking water.

Web: www.nhmrc.gov.au

Australian Drinking Water Guidelines 6 (2011): version 2.0 updated December 2013

National Association of Testing Authorities (NATA) accredited laboratories

For details of laboratories with accreditation for particular water quality testing.

Tel: (03) 9329 1633

Web: www.nata.asn.au

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