

RAINWATER TANKS



Water is our most precious natural resource and something that most of us take for granted. We are increasingly becoming aware of the importance of water to our survival and its limited supply, especially in such a dry continent as Australia.

Rainwater tanks can provide a renewable supply of natural, soft, clear and odourless water that can be used for a range of purposes. In some areas it may represent the primary source of household water.

Is the water safe to drink?

Generally yes. Providing the rainwater is clear, has little taste or smell and is from a well maintained water catchment system it is probably safe and unlikely to cause any illness for most users.

Water used for household purposes for drinking, food preparation or bathing should meet water quality guidelines in order to protect you and your family's health. The water should be free of harmful microorganisms or harmful levels of chemicals. By far the greatest potential risk to your health comes from contamination of water with harmful microorganisms such as bacteria, viruses and parasites.

The microbiological quality of rainwater collected in domestic tanks will be poorer than that of many public water supplies. However, providing systems are well maintained the risk of harmful organisms being present is low.

Rainwater tanks in urban areas

Those who use rainwater in urban areas should be aware of potential risks associated with chemical and microbiological contamination. Collection of rainwater for human consumption (drinking and cooking) in areas affected by heavy

traffic, incinerators, smelters or heavy industry is not recommended. Airborne contaminants and other pollutants may find their way into tanks in urban centres and industrial areas.

In large urban areas access to a reticulated potable water supply remains the most reliable source of drinking water for the community. In these areas NSW Health supports the use of rainwater tanks for all non-potable uses, such as garden watering, and car washing. The collection of rainwater conserves the potable water supply and helps to reduce stormwater. The use of rainwater tanks for drinking purposes is not recommended where a reticulated potable water supply is available.

What if I have a weakened immune system?

People with special health needs such as those who have a severely weakened immune system (the immunocompromised) including: some people with HIV and AIDS; transplant recipients; dialysis patients and cancer patients, should talk to their doctor about potential risks from drinking rainwater. These people, and the very young or very old, may wish to take

Rainwater can be disinfected by bringing to a rolling boil, and allowed to cool before drinking.

extra care by using only boiled, bottled or micro-filtered water and avoiding foods and beverages that may contain rainwater. Please contact your doctor or local Public Health Unit if you require additional information on this issue.

People should be careful when boiling water and be aware of the dangers of scalding.

Fluoride

Rainwater does not contain fluoride. Where rainwater is the major source of water for drinking and cooking, advice about alternative sources of fluoride should be sought from your local dentist, school or community dental service or from the Australian Dental Association.

How can water quality be protected?

The provision of good quality water depends on correct design and installation followed by sensible maintenance of the rainwater tank and catchment area. The collection of rainwater involves 'low maintenance not no maintenance'.

When water has not been used for extended periods of time, ie holidays, it is a good idea to flush several litres of water through the tap before using the water for drinking. This is because water that has been standing in pipework for a long time can dissolve metals such as copper and lead from the pipework. This 'first flush' of water can be used for washing up, watering plants or other uses.

The tank

Tanks are available in a wide range of materials including galvanised steel, concrete, fibreglass or plastic. All of these materials can be suitable providing the tanks have been manufactured specifically for the collection of rainwater. It is also important to note that:

- Some PVC pipes may contain lead so if the water is for drinking purposes, only high quality ('food grade') plastic pipes and fittings should be used.
- There have been some reports that water collected from metal roofs can react with steel tanks to cause corrosion.
- Some types of new tanks may have to be washed or flushed before use. The manufacturer should be able to provide advice on whether this may be necessary.

When installed the tank should be covered to prevent light from reaching the water, as it will encourage the growth of algae. Every access point should be sealed unless in use. The inlet and overflow of the tank should incorporate a mesh cover and a strainer to keep out materials such as leaves and to prevent the access of mosquitoes and other insects.

The top of the tank should have a tightly sealed access cover, to stop animals and children entering but to allow access to the tank for cleaning and inspection purposes. Any ground level covers should also be sealed to prevent stormwater entering in-ground tanks.

The catchment

In general, house and shed roofs are used as catchment areas. Rainwater can be collected from most types of roofs, including asbestos roofs, providing they have not been painted with lead-based paints or coated with bitumen-based material. Roofs coated with acrylic paints may contain dissolved detergents and chemicals that can affect the colour or taste of rainwater. The first few runoffs from these types of roofs may need to be discarded. Rainwater collected from the first few runoffs from new concrete tiled or metal roofs should also be discarded.

As a precaution the use of pesticide-treated timbers and lead flashing should be avoided in roof catchments. Also, if possible, rainwater should not be collected from parts of roofs incorporating flues from wood burners.

Overflows or discharge pipes from roof mounted appliances such as evaporative air conditioners or hot water systems should not be allowed to discharge onto the roof catchment area.

First flush devices

First flush devices prevent the first portion of roof run-off from entering the tank and will reduce the amount of dust, bird droppings and leaves etc, that can accumulate on roofs from being washed into tanks. The use of these devices is recommended.

Alternatively the tank inlet should be disconnected so that the first run-off of rain after a dry spell is not collected.

If your house is oversprayed by aerial chemical spraying, divert the collection pipe from your rainwater tank to prevent any pesticides from entering the tank. Clean the roof or wait until after the next rainfall before reconnecting your drinking water tank to your roof.

Tank maintenance

Proper maintenance of the tank, catchment system, roof, gutters and inlet is essential to ensure a safe supply of water and is best carried out before seasons when heavy rain is expected.

Roof catchments and gutters should be inspected and cleared of leaves and other debris every three or four months. Overhanging branches should also be removed where possible. If overhead wires are too close for safety, contact your local power authority for advice.

All screens should be cleaned regularly.

Tanks should not be allowed to become breeding sites for mosquitoes. If mosquitoes are detected in a tank the entry point should be located and closed. For most types of tanks mosquito breeding can be stopped by adding a teaspoon of domestic kerosene, which will eventually evaporate. Power kerosene should not be used as it will taint the water.

Desludging

Tanks should be examined for accumulation of sludge at least every 2-3 years. If sludge is present in the tank it should be removed by siphon or by complete emptying of the tank (desludging).

Tanks with a 'cone scour' base are easy to clean by simply opening the cleaning outlet to allow the water to gush out with the sludge then rinse with a hose. Small, flat-bottomed tanks can be drained, rinsed with a hose and tilted to drain. One method of cleaning big flat-bottomed tanks is to get inside with a bucket, shovel and broom and dig out the sludge. A second person should be present to ensure the safety of the person inside the tank.

Clean a big tank early in the morning or when the area is shaded to avoid heat exhaustion. For light inside the tank, use a battery lantern not a flame or electric extension. If chemicals are being used for repairs inside, a respirator may be necessary.

Professional tank cleaners are available in some areas.

A concrete tank could crack if it dries out. Check with the tank supplier to find out if the type you have can safely remain empty for a few weeks. It might be necessary to put water in the tank to stop it from cracking.

Plastic tanks will need some water or should be tied down to stop them from blowing over in strong winds when they are emptied.

If the tank is your only source of water, it can still be desludged regularly by siphoning the sludge off. If the sediment has been stirred up, the water can be treated chemically with chlorine and/or boiled before consumption. The best arrangement is to have two tanks and clean them out alternately.

Disinfection

Regular disinfection should not be necessary. However, if you suspect that water in the tank is contaminated, it can be chlorinated by adding powdered swimming pool chlorine (calcium hypochlorite, 65% available chlorine) or liquid chlorine (sodium hypochlorite, 12.5% available chlorine). You should not use stabilised chlorine (chlorine cyanurates).

It takes about 5 milligrams of chlorine per litre to disinfect your tank. This is equivalent to 7 grams of calcium hypochlorite or 40 millilitres of sodium hypochlorite per 1000 litres of water. A level dessert spoon may be used as an approximate measure for 7 grams of powdered calcium hypochlorite. A lot of the chlorine may be used up during disinfection. There should be at least 0.5 milligrams per litre free chlorine, 30 minutes after the chlorine is added – you can use a pool chlorine test kit to measure how much chlorine is in the water. Note that milligrams per litre is the same as parts per million.

You should be able to smell the chlorine faintly an hour or so after treating the water. If you can't, you may need to add a similar amount of chlorine again. Ideally the tank shouldn't be used for at least 24 hours to allow the chlorine taste and smell to dissipate and for harmful microorganisms to be destroyed.

To maintain a safe water supply after the initial dosage, 1 gram of calcium hypochlorite or 4 millilitres of sodium hypochlorite per 1000 litres should be added to the rainwater tank and allowed to stand for a minimum of two hours. The water will be safe to drink provided the chlorine smell is not too strong.

It is important to mix the chlorine in a plastic bucket IN THE OPEN AIR before adding it to the tank. Mix it thoroughly with the tank water. Do not pour water into chlorine. Always add chlorine to water.

Other forms of water treatment may also be used, such as disinfection with ultraviolet light (UV) or filtration. Not all filters remove or inactivate harmful microorganisms. If a filter is used for health reasons, then it should be certified against an appropriate standard (such as AS/NZS 4348 or ANSI/NSF 53). Units that incorporate boiling, distillation or reverse osmosis processes are also satisfactory. An additional disinfection unit may be necessary to inactivate bacteria and viruses. It is important to follow the manufacturer's instructions. Filters should be maintained and replaced regularly otherwise they will become ineffective and can allow bacteria to grow that are then released into the filtered water. Please contact your local Public Health Unit for further advice on disinfection and filtration.

Choosing a rainwater tank

The size of the tank required to meet household needs will depend on a number of factors including:

- **Rainfall** – the average annual rainfall, the pattern of distribution throughout the year and the variation from year to year.
- **Roof area** – which places an upper limit on the amount of water that can be collected.
- **Acceptable level of security** – the risk or possibility of the tank running dry. A higher level of security will be required where tanks are the sole source of supply.
- **Demand** – which varies enormously from household to household and season to season depending on:
 - number of people in the household
 - their water use habits
 - what the rainwater is used for
 - the number and type of water saving appliances.

Where a tank is to provide an alternative or secondary supply (eg to mains water), the size of the tank is not such a critical issue and often will depend on considering user requirements (watering garden, car washing etc) balanced against cost.

What if I need more water from another source?

Rainwater may be supplemented by water from other sources such as rivers, creeks and dams (surface water) or bores (groundwater). However, water from these sources may require additional treatment, such as filtration and disinfection, to maintain water quality.

If you top up your tank from a water carter you should ensure that you are being supplied with clean (potable) drinking water from a clean tank.

For additional information

- **Your local Public Health Unit**
For information on water quality and health Tel. Look under 'NSW Department of Health' in the Telstra *White Pages* or www.health.nsw.gov.au/public-health/phus/phus.html
- **Your family doctor**
To discuss any specific health concerns
- **'Guidance on the Use of Rainwater Tanks'**
A book with detailed information about managing and using rainwater tanks. Published by the National Environmental Health Forum in 1998 (ISBN 0 642 320160) Available from AusInfo Bookshops on Tel. (02 9242 8500) and copies can be printed from the NSW Health website www.health.nsw.gov.au/public-health/ehb/water/rainwater.html
- **Analytical laboratories**
For advice on chemical, microbiological and algal testing of water. If you wish to have some water tested your local Public Health Unit can help you find an accredited laboratory or look in the Telstra *Yellow Pages* under the heading 'Analysts'.
- **Your local council**
For information on any building or planning regulations for rainwater tanks in your area.

A copy of this brochure can be down-loaded from the NSW Health website www.health.nsw.gov.au