GUIDELINES FOR THE COLLECTION, CARE AND CONTROL OF RAINWATER IN TANKS

FACT SHEET

Rainwater tanks can provide a supply of good quality potable water with proper management of the tank and roof catchment.

The Tank & Reduction of Water Consumption

Tanks are available in galvanised steel, zincalume, fibreglass and concrete and all are suitable for the storage of potable water.

Rainwater tanks should protect water from contamination. Contaminants such as industrial pollutants, dust, leaves, pollens, pesticide sprays, fertilisers, debris, vermin, birds, small animals and insects should be prevented from gaining access to the water.
Whenever possible tanks should be installed in a shady position but away from trees from which falling leaves might clog screens or contaminate the water.

Cover, Lids and Screens

Tanks should be covered and all openings provided with close fitting lids or gauze mesh screens.

Inlet Screens

Water should be screened before entering the tank to reduce the introduction of contaminants which could foul or discolour the water and contribute to the build-up of sludge. Larger contaminant material can be filtered from water entering a tank by a suitably fitted gauze mesh screen. Various in-line screens and filtering devices have been marketed in South Australia. However, if such screens are not available as a standard item they can readily be made to order.

Screens and filters need to be positioned and fitted so that they are readily accessible for regular cleaning, particularly where leaves fall onto the catchment area.

The locating of the inlet filling pipe so as to discharge in a central position immediately over the tank access opening (manhole), but so as not to inhibit regular cleaning of screening, is a recommended practice. The access opening should be screened in a manner such that the screen mesh gauze fits onto the bottom of a collar approximately 50mm in depth thus providing a sunken dished reservoir on the roof of the tank to allow for effective water entry into the tank.

It is not recommended that brass or copper screens be used in contact with galvanised steel tanks nor be in the water which is in contact with the galvanised steel as these materials may accelerate corrosion of the tank.

Screening also needs to mosquito proof the tank
See details under heading MOSQUITO CONTROL.

Algal Growth

Light will stimulate the growth of algae in stored water and therefore it is necessary to exclude as much light as possible from the interior of the tank to minimise algal growth. Most algae will not make the water unsuitable for human consumption however, they may affect the odour, colour and taste of the water.

As some fibre glass tanks do not completely exclude light, undesirable algal growth may occur. Where this problem exists algal control may be achieved by painting the external surface of the tank. Some new fibre glass tanks are constructed to exclude light and thus prevent algal growth. For this assurance and information regarding painting a tank check with the manufacturer.

Where an algal problem exists it is best to drain and clean the tank. The information listed under the heading “Tank Cleaning and Precautions” should be observed.

Discard First Rains

The first rain after a dry period may wash dust, bird droppings and other contaminants from the roof catchment area and should be prevented from discharging into the tank.

An alternative to the above is to hose down the roof catchment area with potable water prior to the first rains and likewise discard the wash down water.

First rain or wash down water diversion may be achieved by disconnecting the roof to tank connection pipe. It is suggested that provision for this practice be made during initial tank installation.

New Tank Protection

Galvanised steel is inherently resistant to corrosion but if the initial corrosion of its surface takes place under suitable conditions a thin adherent film can form which reduces any further corrosion to a very low level.

To ensure satisfactory film formation and subsequently reduce corrosion a dispenser containing crystals of metaphosphate compounds (e.g. Tect-A-Tank) may be placed in the tank prior to the entry of any water. Protection will then occur automatically as the tank fills.

Galvanised steel with longlife food grade polymer coating laminated to the internal surface of the tank provides a permanent corrosion barrier (AquaPlate™).

Interconnected galvanised or zincalume steel tanks should be installed so that each tank received some water directly from the catchment. The aim of this “parallel connection” is to avoid differences in water purity and siltation between the tanks which may reduce tank life.

For further information on this topic, please contact Council

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Roofing Materials and Water Contamination

Roofing Materials

The first few run-offs from new cement or metal tiles should not be used for drinking.

Water from fibre cement roofs should not be collected until after one entire winter due to the leaching of lime.

Timber preserved by the impregnation process involving copper, chrome and arsenate (e.g. Perm-A-Pine) should not be used in the water catchment area.

Such timber has been used to support solar heating panels on roof catchment areas with resulting contamination of the tank water.

Paints and Coatings

Lead-based paints including primers are totally unsuitable for use on roof catchments used for collecting potable water.

Acrylic-painted catchments may leach out substances including detergents which cause "frothing" in the collected water. The first few run-offs from roofs painted with acrylic paints should be discarded.

Bitumen based roof coating materials are generally not recommended as they may taint and possible impart injurious qualities to the water. Such materials may be satisfactory if guaranteed by the manufacturer as being suitable for such usage.

As a general rule, water collected on new roofs or repainted roofs should be run to waste until it is free of any taint.

Before purchasing materials or paint to be used on roof catchments collecting drinking water, read and observe the manufacturers recommendations on labels and brochures. Look for warnings. If in doubt check with the manufacturer.

Water Disinfection

Where the bacteriological quality of the water is in doubt it can be sterilised by boiling small quantities prior to consumption or disinfected by chlorination in the tank itself.

Boiling

Vigorous boiling of water for five (5) minutes will kill harmful bacteria. Boiled water may be improved in taste by pouring it back and forth from one container to another or by allowing it to stand for a few hours to increase the dissolved oxygen level.

Chlorination

Chlorine is a useful disinfectant for drinking water as it is effective against bacteria commonly associated with water borne disease.

When chlorine is added to water it reacts with organic matter and other impurities in the water and will be gradually used up. In general, highly polluted water containing large quantities of organic material is not suitable for chlorination. Where this condition exists in a rainwater tank, first remove the organic material and then chlorinate.

To achieve effective disinfection it is necessary to add sufficient chlorine to give a 1.0mg per litre residual of available chlorine after a contact time of 30 minutes.

The amount of chlorine required will depend on the organic and bacterial content of the water to be treated. The only sure way of knowing the necessary free residual chlorine level present and therefore disinfection achieved, is by testing the water with a suitable chlorine test kit using DPD reagents. Such kits are used to test chlorine levels in swimming pools.

Chlorine yielding substances available for domestic use are granular calcium hypochlorite and liquid sodium hypochlorite.

As a general guide the addition of 35ml of sodium hypochlorite (12.5% available chlorine) per 1000 litres of water will give a reasonable assurance of effective disinfection. The above dose rates should give a free residual chlorine level of not less than 1.0mg per litre after 30 minutes contact time.

To ensure distribution of chlorine throughout the rainwater tank the water should be stirred with a paddle immediately after chlorination.

The chlorine taste and smell resulting from this treatment will dissipate within approximately three days.

Chlorination is only recommended when the bacteriological quality of the water is in doubt. Routine chlorination is generally unnecessary. Routine dosing of rainwater with chlorine in galvanised steel tanks may increase corrosion of the tank.

When handling and storing chlorine compounds it is important to carefully read and follow safety directions given on the package label.

Dead Animals in Tank

Where rainwater has become contaminated by a dead animal as much as possible of the animal should be carefully removed and then the water chlorinated.

If the animal is of a larger variety (possum, cat) and badly decayed, the taste of the water may be affected. It may be best to drain, clean and disinfect the tank in such cases. The information listed under the heading "Tank Cleaning and Precautions" should be observed.

If chlorinating, the water should be dosed as previously recommended under the heading "Chlorination". Where larger and badly decayed animals are involved double the amount of chlorine should be used.

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Fluoridation

The dosing of rainwater with fluoride is not recommended. Fluoride tablets can be taken orally to help prevent dental decay. Check details with your dentist.

Mosquito Control

Unless proper measures are taken rainwater tanks can readily become a major mosquito breeding source. Prevention of breeding can be achieved by application of the following measures.

Exclusion of Adult Mosquitoes

Ensure that any tops, lids, covers and inlet downpipes are close-fitted to exclude mosquitoes.

A removable mosquito proof gauze screen not coarser than 1 millimetre aperture mesh (approximately 16 to 18 meshes per 25mm2) should be fitted to the water inlet and overflow pipes of the tank.

Screens should be positioned so that they are readily accessible for regular cleaning.

The inlet screens previously mentioned in regard to reduction of water contamination should be designed to also exclude entry of mosquitoes into the tank. If inlet screens do not incorporate this mosquito proofing quality additional screening is necessary.

Control of Mosquito Larvae (Wrigglers)

The most effective control is to prevent the female mosquito from entering the tank to lay her eggs on the water.

If larvae are detected, seal the tank as described under the heading "Exclusion of the Adult Mosquitoes" to prevent the hatched mosquitoes flying out.

As an interim measure 5 to 10ml (1 or 2 teaspoons) of household kerosene may be added to the water surface as a larvicide.

Care should be taken as the use of more than the prescribed amount of kerosene may taint the water. The addition of kerosene to tanks made of AquaPlate™ is not recommended as it can lead to degeneration of the polymer coating.

The treatment of tank water with a biological mosquito larvicide containing the active ingredient Bacillus thuringiensis var. israelensis (B.t.i.) is a suitable alternative for short term control. The larvicide should be used in accordance with the manufacturer's directions.

Maintenance of the Catchment Area and Tank

Roof catchment areas should be kept clear of overhanging vegetation.

Gutters should be regularly cleaned of leaves and dirt. If vegetation overhang is present more frequent cleaning of gutters is required.

Devices are available which shield the guttering from leaves whilst allowing the collection of rainwater.

Gutters should have sufficient fall to prevent "pooling" of water. Such pools of water allow the growth of algae and are a potential mosquito breeding area.

The inlet and overflow pipe screens need to be regularly cleaned.

Overflow, discharge or bleed off from roof mounted appliances such as evaporative air conditioners, hot water services and solar heaters should not discharge onto the water catchment area.

Tank Desludging

Periodically tanks may require desludging. Sludge build up depends on the volume of solids which enter the tank. The bottom of the tank should be checked for sludge build-up every 2-3 years or if sediment is evident in the water flow.

If a drain plug is provided at the base of the tank it may be sufficient to run water to waste through the plug hole to discharge the sludge.

Alternatively, if the tank is emptied, the sludge can be swept up and removed through the access opening.

Sludge may be removed without draining the water by siphoning using an inverted funnel in the end of a hose and moving it carefully across the bottom of the tank.

If leaves and coarser debris are present in the sludge this method is unsuitable unless a siphon hose of approximately 50mm is used.

Sludge may also be pumped from the tank with minimum loss of water head by using a suitable motor operated pump and attachments.

Sludge may be disposed of by spreading and digging into a garden area.

Tank Cleaning and Precautions

When cleaning a tank it is important to check its structural condition to ensure that damage does not occur due to the cleaning methods employed.

Galvanised steel tanks will be in varying stages of deterioration and aggressive cleaning methods could damage the tank and subsequently accelerate corrosion and reduce tank life. Tank life is influenced by the presence of an adherent film which forms on the walls inside the tank. Removal of this film accelerates corrosion of the tank. Only removal of gross material is recommended, however care should be taken to remove sediment that would become suspended into the water column on refilling of the tank.

After cleaning it is recommended that the internal walls and floor of the tank be rinsed with potable water. The resulting water and sediment should be removed or run to waste.

Disposal of Overflow of Discarded Water

Overflow or discarded water should be diverted away from buildings and other structures.

For further information on this topic, please contact Council