

9 SYSTEM OPERATION AND MAINTENANCE

This section includes maintenance of intakes, maintenance of roofs, cleaning out of storage tanks, disinfection using household bleaches, routine checks and replacement of point-of-use devices.

Intake Maintenance

A correctly designed intake will remove a lot of the large particulate material, but the intake will still need to be cleaned periodically.

You can clean intakes manually by removing and cleaning and/or replacing, cleaning in situ and in some cases back flushing.

Where a bore has a screen, the screen can become fouled with bacterial encrustations. This build-up may not be harmful, but it reduces the size of the screen until water cannot be drawn through it. You can use chlorine down the bore to reduce this problem, but you should seek specialist advice first.

Bores can clog over time, depending on how well the bore was “developed” when it was drilled. If the bore is clogged you will need a specialist well-drilling firm to fix it.

Roof Painting and Maintenance

If you use a roof catchment for your water supplies, there are certain practices to avoid.

For instance, the metals lead, chromium and cadmium are toxic and a roof painted with paint containing these metals should not be used as a source of drinking water. Lead and chromium are more likely to be found in primers and rust control coatings.

While modern roof paints are generally labelled for their suitability for painting a roof for water supply, you should still talk to a technical representative from a paint manufacturer before painting.

A roof used for your water supply requires routine cleaning, with the water flushed to waste.

Water should be set aside for cleaning, and the line feeding the water storage tank should be disconnected.

You can use a scrubbing brush, broom and clean water to scrub down the roof and clean out and flush through the spouting. This clears the roof of dirt, animal droppings, biological growths, paint breakdown and other potentially harmful rubbish.

Cut back overhanging and nearby vegetation to reduce the load of leaves falling or blowing on to the roof and to restrict access by rats, cats and possums.

It is not uncommon in the summer in rural areas for mass migrations of flying insects to be attracted to the lights of houses, resulting in huge numbers landing on the roof. Many of these animals will have been associated with animal wastes so may be carrying protozoa and helminth eggs. It is advisable to shut the intake and clean the roof and gutters before the next rain event.

Cleaning Storage Tanks

Your tank should be large enough to allow any material to settle out, with a scour valve located at the bottom. If the drinking water is not drawn from a floating intake, ensure that it is drawn from above the sludge layer.

Your tank can be cleaned by removing all the water and then using clean water to sluice it and scrub it out. If the tank has an anti-corrosion coating, clean it carefully. The sediment should be removed, and the tank cleaned, regularly. The frequency will depend on whether leaf guards, first flush diverters and automatic desludgers are installed. Cleaning will certainly be needed if the water becomes coloured or turbid or develops tastes and odours.

WARNING: The inside of a tank can be a dangerous confined space and should only be entered if absolutely necessary, and only if you are certain it is safe. If you have to enter the tank, first read Worksafe's fact sheet about working in a confined space available at <https://worksafe.govt.nz/topic-and-industry/planning-entry-and-working-safely-in-a-confined-space/>.

Refill your tank with disinfected water. This, however, is not always practical for roof supplies.

A long-handled clean broom can be used to push all the sludge on the bottom of your tank out through the scour valve. Alternatively, a device like a swimming pool vacuum cleaner could be used.

Disinfection of Storage Tanks and Reticulation Lines

Tanks and pipework, servicing all biologically impure supplies, should be disinfected regularly to reduce the concentration of biological growth.

You will find that for normal disinfection purposes, a dose of 5 mg/L of chlorine is usually sufficient.

You can use plain household bleach for this job; do not use flavoured, scented or coloured brands. In new containers, the bleach consists mainly of sodium hypochlorite at a concentration of about 3–5 percent active chlorine. As opened or old containers will be significantly weaker than this, they should not be used.

A tank is always disinfected on a water volume basis. The volume may have been provided by the manufacturer or it can be calculated as follows.

Calculating Your Tank Volume:

(a) Square Tank

The water volume in litres is equal to length x width x depth of water x 1000. All measurements of tank dimensions should be made in metres.

- For example, a cubic tank measuring 1 m x 1 m x 1 m would have a volume of $1 \times 1 \times 1 \times 1000 = 1000$ litres.

(b) Circular Tank

Measure the diameter and the depth of water. The tank volume in litres is equal to $0.785 \times \text{diameter} \times \text{diameter} \times \text{depth} \times 1000$.

- For example, a tank 1 m diameter and 1 m deep would have a volume of $0.785 \times 1 \times 1 \times 1 \times 1000 = 785$ litres.

The Disinfection Tables, Appendix II and Appendix III (pages 24 and 25), can be used to calculate the amount of bleach or pool chlorine.

- For example, a tank with a volume of 1000 litres requiring 5 mg/L for disinfection purposes needs 167 mL of plain household bleach.

Note that some manufacturers now sell household bleach as a 5 percent solution. The volumes in Appendix II are based on a 3 percent solution. If you are confident the solution is fresh, you can multiply the volume stated in Appendix II by 0.6 (i.e., roughly between half and two-thirds). However, household bleach has a fairly poor shelf life so using the volumes in Appendix II would still be effective – the apparent overdose will have no health effects.

An accurate measure, such as a graduated measuring container, should be used to measure the bleach. Most plastic bottles today display their capacity.

After you have dosed your tank and mixed it well, the dosed water should be run through all your household lines so that the newly-disinfected water comes through the taps.