Maintaining the tank and water collection system

To ensure that walkers have access to good quality potable water, volunteers with a campsite should regularly inspect and maintain the rainwater capture and storage system.

Elements of the system, at every shelter:

- Water is collected off the shelter roof
- The gutters are generally protected from leaf matter and other debris with aluminium gutter mesh or shade cloth gutter guard
- There are either one or two water tanks
- The pipe work connecting the gutter to the tank has varying methods (if any) of capturing foreign material and preventing it from entering the tank (this system is called 'first fill' or 'first flush')

The following is a list of inspection and maintenance tasks. We ask that you do as many of these as you can, taking access and safety requirements into account. Please let us know (in your campsite report) of any significant elements you couldn't complete.

- **INSPECT** the gutters, down pipes and water tank/s. Check for leaks and loose components.
- **ENSURE** all pipe work and tank covers are secure and completely sealed.
- **INSPECT** and clean any filter on the pipe draining water into the tank.
- **INSPECT AND DRAIN** any first fill capture devices; see more information below.
- **CHECK** the water level of each tank. Tap each corrugation of the tank side, ascending, and listen for an increase in the sound of reverberation as you go up past the water surface (less 'dull', more 'tinny').
- **CHECK** the tap is in good working order, with no leaks or loose parts. Taps with restricted water flow should be noted but can be considered as in good working order.
- **ASSESS** the tank water quality; see more information below.
- **ENSURE** the "Water Treatment Required" sticker is in the correct position, just above the tap (see photo below).
- **REPORT** any and all issues. Provide a detailed description of the issue and confirm this with photos where possible.

Safety

- **Volunteers are not allowed on the roofs of shelters unless authorised, have completed working at heights training and are certified accordingly.**
- **Accessing roof gutters can only be done using approved ladders and after completion of an appropriate Job Safety Analysis (JSA).**
- **At least two Volunteers must always work together when accessing gutters.**

First fill system

The pipe work connecting the gutter to the tank has varying methods of capturing foreign material and preventing it from entering the tank.

This first fill (or first flush) system traditionally takes the form of vertical pipes with unscrew-able end caps, U-shaped pipes with unscrew-able drain caps, or can have a different layout. Whatever the style, the function remains the same:

Vertical pipe with end cap

U-shaped pipe with drain cap

In-line drain cap

How do these work?

- As water flows from the gutter drainage towards the tank, any foreign material (which is likely to be heavier than water) will sink to the bottom of the first fill section.
- The water (hopefully free of foreign material!) continues to the tank.
- **The screw cap should be removed regularly to release the accumulated water and foreign material.** Several litres of water are likely to be released. Be ready to jump back to avoid the splash!
- There may be a filter and/or ball valve associated with the screw cap – this should be rinsed and replaced:

Remove the cap (with filter) and the ball valve

Take apart; rinse the cap

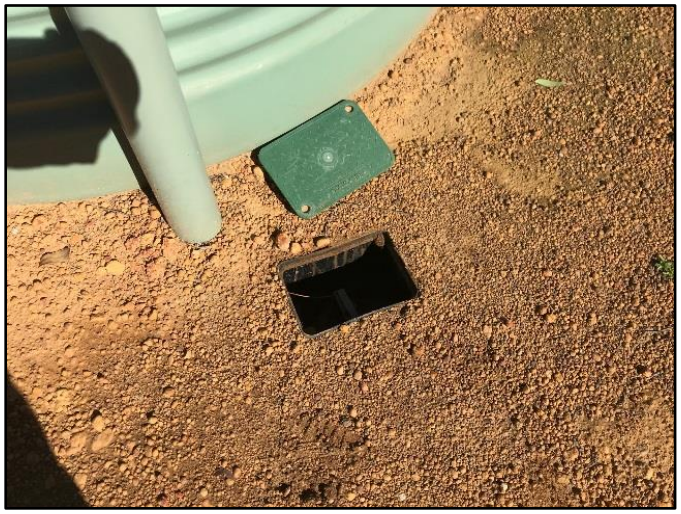
Rinse the filter; put all back together

A new type of drainage system can be found at the more recently built shelters (and, strangely, Murray CS)… Next to each tank is a covered, buried reticulation box, containing a valve and pull-up handle. To flush the drain contents, you need to pull the handle.

Caution: check for insects before placing hand in reticulation box!

Reticulation box

Pull-up handle (one style)



Reticulation box

Pull-up handle (another style)

The sump (a.k.a. cesspit)

Below the tap at most campsites is a drain sump, covered by a grill. Drainage pipes lead off this.
Ideally, walkers should not 'wash up' at the tap – the inevitable result is food debris washed into the sump! Unfortunately, a build-up of debris can lead to blockage of the drain and the sump filling with water (and more debris!).
If you're able, remove the grill and clear the debris and sediment. You may choose to include some rubber gloves and a small trowel in your maintenance kit for this purpose.

At the other end of the system…

From each tank, the drainage out of the sump and the overflow pipe join and run underground to a good drainage point on the edge of the campsite pad. You may be able to identify the drain location by examining the apparent departure angle of the pipe from the tank or sump.
The opening of the drain should be kept clear of sediment, vegetation regrowth and other potential sources of blockage. The pipe usually has a flip-cap covering (to prevent animals getting into and moving up the pipe) – this needs to move freely.
The drain opening may be overgrown by roots flourishing in the damp environment and need significant clearing. If there is any damage, please include as much detail as you can in your maintenance report; and collect and send photos.


A well cleared drainage outlet


Excavating and unblocking…


Finally running free!

Tank water quality

Good quality water has no distinctive tastes, colours or odours. There are many factors that can affect the quality of water in a tank. Other than dead animals and insects, sources of taste, colour and odour occurring in our environment include:

- **Sediment and slime** accumulating in the bottom of tanks and pipework holding stagnant water.
- **Debris** including soil and decaying vegetation accumulating in gutters.
- **By-products** e.g. tannin (from leaf material).
- **Algae** growth in pipework and water tanks.

	**<u>CAUTION</u>** **Water which is clear, free from particulates and odourless is not necessarily safe to drink.**

Basic tank water quality assessment

A basic water quality assessment involves:

- Using a clean white container that can take a reasonable amount of water – a white icecream or yoghurt container would work well.
- Run the tap for 10 seconds to ensure a representative sample of tank water is taken.
- Visually assess the water for colour and particulates; smell it for odour.

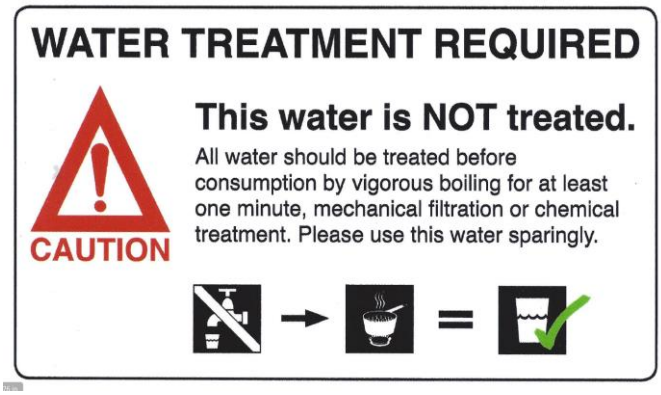
  Colour
  - White (Cloudy).
  - Green (Light or Dark).
  - Brown (Light or dark). Tannins can give water a light brown colour.

  Particulates
  - Is sediment present?
  - Are larvae present?

  Odour
  - Smells (rotting, musty, sulphur).
  - Severity of odour (no odour, intense odour).

We recognise that these tests are a guide only, and individual results in determining the odour and colour of tank water may vary.

(Reference: CSIRO (September 2014). Survey of savings and conditions of rainwater tanks (Project no. 10TR4-001). Retrieved from https://waterportal.com.au/swf/images/swf-files/10tr4-001-csiro-swf-final-report.pdf).



'Water treatment required' sticker

Correct location of sticker: on the tank, just above the tap

Additional reference

For the monitoring and maintenance of tank and water collection systems, the following should occur:

- **Gutters:** will need to be inspected and leaf material and debris removed.
- **Roof**: checked for the build-up of debris including leaf material and plant matter. Where practical and safe to do so, over hanging tree branches should be cut back.
- **Tank Inlets**: should be in good order and leaf filters, where installed, checked, emptied and cleaned.
- **Tank and Tank Roof**: Check for damage and corrosion. Ensure tank covers are properly secured and sealed fully, to ensure foreign matter cannot enter the tank, especially where pipework enters the water tank. Check the rubber boot and replace if perished or showing signs of deterioration.
- **Pipework:** check for damaged or leaking pipework. Any pipework that captures first fill from the roof, should be emptied on a regular basis.

(Australian Department of Health (March 2011). Guidance on use of water tanks. Retrieved from http://www.health.gov.au/internet/publications/publishing.NSF/content/OHP-ENHealth-raintank-cnt-L).

Thanks to Charlie Soord for drafting this sheet.