Northern Territory Government

TECHNICAL FACT SHEET

Guidelines to Clean Water

Bacteria-free water is essential to our survival. A polluted water supply can cause major health problems such as gastroenteritis, diarrhoea and the more serious human diseases of typhoid, cholera and hepatitis.

There are three main types of water –rainfall, surface water and groundwater - utilised for everyday use and if not managed properly can be subject to pollution.

Rainfall is subject to airborne pollution. It picks up pollution from roofs and gutters and is easily contaminated by bird droppings. If managed correctly it can be a useful resource.

Surface water is open to pollution from animals, birds, fish and humans.

Groundwater is normally a secure water source, provided the bore is properly located, constructed and maintained, groundwater will not normally be polluted.

Preventing Sewage and Effluent Contamination
Do not locate septic tanks and other waste disposal points close or upstream to the supply source. Absorption trenches from septic tanks should be at least 100 metres away from the bore, well or banks of the watercourse pumping site. Further advice and the legal requirements for waste disposal facilities, including septic tanks, is available from the Department of Health and Community Services.

Protecting your Water Supply from Contamination

<u>Creek or Lagoon</u>

- Fence off the bank 50 metres each way from the pump intake
- Discourage swimming or fishing near the pump intake, and
- Prevent stock wading upstream of the pump intake.

<u>Bore</u>

- Ensure that surface drainage flows away from the bore head
- build a concrete slab at least one metre square around the bore, sloping away with at least 300 millimetres of bore casing protruding above the slab (Refer to “Guide to Having a Bore Drilled” for further information)
- It is important to ensure a seal is effected at the bore head. This will ensure that there should be no avenue for the ingress of vermin or other animals in the installation between the riser pipe, electrical cabling and the casing
- If an engine driven pump is used, the engine should be mounted on a separate concrete slab. Ensure fuel or oil spillage is prevented from getting in the bore. Fence off at a distance of five metres to keep animals and children away from the bore

<u>Well</u>

- Protect it in the same way as a bore supply. Roof the well in such a way to make sure that birds or domestic fowls cannot perch where droppings can get in the water. Screen openings with fly wire to prevent mosquitoes breeding

<u>Storage Tanks</u>

- Cover all drinking water storage tanks, whether elevated or ground level. Bird droppings and dust-carried bacteria will pollute the water. Screen openings with fly wire
- Do not allow “first flush” rain water to flow into the tank from roofs of buildings as it may contain bacteria and high concentrations of zinc. (“First flush” is the first rainfall after the dry season)
- Have separate inlet and outlet pipes to storage tanks. This helps chlorine mix when disinfecting
- Fit a large diameter drain tap at the bottom of the tank for waste removal when cleaning the tank. Do not allow swimming in storage tanks. Fence off ground level tanks

Pump and Pipelines

- The piping should aim to have all joints located above ground
- Do not allow pumps and valves to deteriorate to the point where leaks could allow fuel, lubricants or other mechanical waste to enter the water supply
- The system may operate under low pressure at times and liquid could be drawn into the system at leaky points
- Where water is pumped to a storage tank, do not connect users to the pipeline before the storage tank. If treatment is being applied to the water at the tank, such connections allow access to untreated water

Disinfection

If contaminated water is apparent or suspected (indicated by cases of gastric upsets or diarrhoea), immediate action should be taken

- All components of the water supply should be treated – including pump, pipes and storage tank - if the operation is to be successful
- Until the water supply has been disinfected, boil all drinking water continuously for 10 minutes.
- The cause of pollution should be identified and removed as soon as possible

Bore or Well Disinfection

- A strong solution of chlorine should be poured into the bore or well, (see quantity guide in this brochure). Switch the pump on and off several times at 10 second intervals to agitate the solution
- Care should be taken to wash the solution over all surfaces above the water level in the bore or well - including the bore head and concrete block and also the pump head unit, if applicable
- Allow to stand overnight if possible. Following the standing period, the chlorine solution should be pumped though the reticulation system - BUT NOT INTO THE STORAGE TANK. (See Storage Tank Disinfection below)
- If taps are fitted to the rising main, open one at a time and close off when there is a strong chlorine odour. When chlorinated water has reached all parts of the system, let it stand for another two hours. This strongly chlorinated water is not suitable for use. It must be flushed from the system by running the pump and opening taps until the strong odour of chlorine has gone

Storage Tank Disinfection

- Chlorine should be added to the water in the tank. (See quantity guide)
- DO NOT add the dry chlorine directly to the tank, as an undesirable sediment will form. Instead make up a solution by adding the required total weight of dry chlorine to a 20 litre container full of water. Stir the mixture and allow to settle
- Pour the clear concentrated solution into the storage tank and stir thoroughly
- Allow to stand for 30 minutes and then open each tap serviced by the tank, one at a time (including the hot water system)
- Allow to run until there is a slight chlorine odour. This water may be used normally. No flushing is required

Important

- Do not discharge large quantities of strongly chlorinated water into the septic system, livestock drinking vessels or the storage tank
- Before disinfecting the distribution systems, temporarily by-pass or disconnect any carbon filter in the system
- A rubber air-water separator in a pressure tank (if fitted) may be damaged by a strong chlorine solution

Chlorine Quantity Guide

Dry pool chlorine (calcium hypochlorite) rated at 65-70% available chlorine (600-700/kg) can be purchased from pool suppliers or hardware outlets.

Storage Tank Disinfection

For every 1000 litres in tank use 7gm of dry chlorine eg. for 4500 litres (1000 gals), use 7 x 4.5 = 31.5gm.

Bore or Well Disinfection

Make up the solution in 200 litre batches, using 60 grams dry chlorine for every 200 litres. Make up volume should be based on the 'submerged' volume in the bore plus 10 per cent to displace into the screened area. Surplus can be used to wash down bore head area. To determine the submerged volume also read the *Looking After Your Bore* factsheet.

Calculations

Volume of bore or well = Volume/metre x submergence

Bore or Well diameter (mm)	100	125	150	200	500	750	900
Litres per metre depth	8	12	18	31	196	440	635

Chlorine Testing

- Chlorine test kits are available through swimming pool supply outlets. After a 30 minute retention period, the reading with a test kit should be 0.2-0.5 milligrams of chlorine per litre of water, at a tap serviced by the tank.
- If you suspect the water is still contaminated, contact Advisory Services for further information.

Chemical Content

The chemical quality of water from bores or wells stays fairly constant but the quality of water from creeks and lagoons may undergo seasonal changes. A bitter taste, unpleasant odour or discolouring are the first signs of deterioration in the water quality.

If you suspect that non-seasonal factors are changing the chemical quality of your water supply, seek advice from the Advisory Services. You may be advised to undertake a chemical analysis using a sample of your water.

Chemical Pollution of Groundwater

Chemical or heavy metal pollution of groundwater is a permanent reminder of ignorance and misuse of chemicals or thoughtless dumping of waste. It is important to maintain a minimum of a 100m radius separation distance from your bore and your chemical storage unit.

Be careful when using pesticides, herbicides, fertilisers, fuels and oils. Avoid spills and dumping of these products close to creeks, lagoons, bores, wells or water storage tanks. Advice for the safe use and disposal of chemicals is available from the Work Health Authority.

*Iron bacteria is not harmful to your health but can reduce your bore water supply and cause iron staining of clothes and plants. For details of treatment, contact you the Water Management Branch at the nearest address below or see the *Iron Fouling of Groundwater* factsheet.

For assistance, contact the Water Management Branch:

- **Palmerston**
  4th Floor Goyder Building, PO Box 496 Palmerston NT 0831 Ph: 89 993678
- **Katherine**
  Randazzo Arcade, 16 Katherine Terrace, Katherine NT 0850, Ph: 89 738100
- **Alice Springs**
  1st Floor Alice Plaza, Todd Mall, PO Box 1120 Alice Springs NT 0871, Ph: 89 519215

Internet Site: www.nt.gov.au/nreta/naturalresources/publications