

Common drinking water quality problems

Yellow, orange, reddish, brown or black drinking water

There are many reasons why drinking water can be yellow to black in colour or appearance. This may include the water containing fine particles. Discoloured water is usually an aesthetic issue rather than a health issue, and in all but the most severe cases the risk of illness is low.

Some discoloured water episodes may persist or be intermittent and if this happens, customers are advised to contact Power and Water for assistance.

Discoloured water confined to customer's property

The corrosion of metal pipes and fittings installed in household plumbing systems can discolour drinking water. Older homes built in the 1970s or earlier, may have galvanised iron pipes in their plumbing systems which may have rusted. This can cause drinking water to be brownish in colour and contain visible particles.

Discoloured water is most common first thing in the morning when there has been no water used overnight, or if the house has been left vacant for a while. This also occurs at seldom-used taps. The water should run clear after flushing the tap for a couple of minutes. If this problem occurs in conjunction with a noticeable reduction in water pressure, the pipes may need to be replaced.

To check if there is corroded galvanised pipe in your plumbing system, compare water samples from a front tap near the water meter and from a rear tap at the back of your house or in the backyard. If the water from the front tap is of noticeably better quality than that from a rear tap, this indicates there is corroded galvanised iron pipe in the plumbing system.

If the sample from the tap is initially discoloured and becomes clear after flushing, then all or part of the pipe before this point could be galvanised. If the water does not become clear then the problem is likely to be more widespread and occurring in other homes in the area. Normally this will only occur for a short time, however, if it persists, contact Power and Water.

Corrosion is accelerated in hot water systems. If the cold water is clear and the hot water is brownish in colour or contains noticeable particles this suggests corrosion of the hot water system. Flushing the hot water system may help to clear out the sediment buildup in the bottom of the tank. Always be careful when working with hot water systems, and you should consider consulting a plumber.

Widespread or localised discoloured water

With the first major rains or after heavy rainfall associated with cyclones, colour may increase as dissolved organic matter originating from soils and vegetable matter enters surface reservoirs. During this period customers may notice a change in colour to their drinking water and it may contain particles.

Weather conditions acting on large surface water reservoirs can also cause mixing within the reservoir which leads to increased levels of iron and manganese entering the water supply system. This can occur in the Darwin River Reservoir between November to May.

In locations where there is a large increase in water consumption patterns, there can also be widespread events of discoloured water. Early in the Dry Season in Top End locations irrigation water usage increases significantly as gardens and lawns begin to dry out. This leads to increased flows in pipes which dislodge biofilms, various materials and sediments that have built-up. Biofilms are a build-up of microorganisms that form when water is in contact with a solid surface. Other types of materials include chemical films, scale and corrosion deposits.

Cases of severe discoloured water can be experienced when these are dislodged and mobilised. As discoloured water is not appealing to drink letting the tap run for a few minutes will improve the water's colour.

The risk of illness from drinking water that is discoloured is considered to be low based on current scientific evidence. Power and Water undertakes an extensive flushing program in Darwin each year at the start of the Dry Season to reduce the potential occurrence of discoloured water.

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Sometimes the onset of discoloured water can be sudden and limited to a street or area. There may have been some activity that has changed the rate of flow or direction of flow in the water main supplying your home. This could be the operation of a major valve or fire hydrant. A burst water main can also lead to sudden, high flows in pipes. This activity causes biofilms to detach and stirs up sediments of iron, manganese and clay particles that have accumulated in pipes.

If you live in a dead-end street it may take longer for discoloured water to clear. It may be necessary for Power and Water to flush the mains in your street.

To flush discoloured water, run at least two taps for several minutes, flush the toilet a couple of times or turn on your garden irrigation system.

It is recommended not to use hot water if the cold water is discoloured, as this will fill your hot water system with discoloured water.

If you are washing clothes at the time, it is better to stop the cycle with the machine full and wait until clean water is available to finish. Emptying the machine and allowing it to go into a spin cycle can cause permanent staining. Add a stain remover or dishwashing detergent to assist with removing stains that may be present. Some research indicates that staining is less of a problem with front-loading washing machines.

Blue or green coloured water and staining

Blue or green staining seen on white baths or basins indicates there is copper in water. As well, the water may have a metallic taste. Household plumbing systems comprise copper pipes and copper alloy components. These slowly corrode over time releasing copper. Repair all leaking taps to stop constant dripping on surfaces which can make staining worse.

Water is a natural solvent, although the quality of water in some supplies may make it more corrosive than others. Power and Water is currently working on a number of projects to reduce the corrosiveness of drinking water in Darwin, Cox Peninsula and Borroloola.

Low levels of copper are essential for good health. However, the safe level for copper in drinking water is 2 mg/L. Water

with a copper level above this should not be consumed or used for food preparation.

Water with copper levels between 3-5 mg/L can cause nausea, abdominal pain, vomiting and diarrhoea. Prolonged exposure to high levels of copper over many months can cause more serious problems. Some people are more susceptible than others. Water with a copper level of 2 mg/L or higher is usually cloudy or has a blue or green tinge and blue or green particles. When the water is boiled in a kettle or saucepan the water or particles may change colour to brown or black and the particles may float to the surface.

To obtain an approximate idea of the level of copper in water run an open tap into a white container like a bucket or an ice cream container. Do this first thing in the morning and if possible after not using any water overnight. Flush the tap at full flow, collect at least two to three litres of water and then let the water stand for a few seconds. If the water appears blue or green, or if there are blue or green particles in the container, then the copper level may be close to or above 2 mg/L.

If this is the case, empty the container and flush the tap into the container for a further 30 seconds. Check this and if the water is clear, then the water is acceptable for consumption. If the water is not clear, repeat the flushing process until clear water is observed. Establish a process of flushing your plumbing system each morning before using water for drinking or food preparation. This will occur if, for example, you shower first. When water has not been used for some time, flush the system using this process.

Cloudy, white or milky drinking water

Cloudy drinking water is usually caused by the presence of harmless, tiny air bubbles in the water. If you notice cloudy water, fill a clean, clear glass with cold water and let it sit on a bench. If the water starts to clear at the bottom of the glass, the colouring has been caused by air bubbles, and it is safe to drink.

Air is introduced into drinking water in a number of ways. Sudden filling of a glass by quickly opening a tap can do this. Many taps are also fitted with aerators that introduce air into the water stream to reduce splashing and to provide a

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uniform flow. Sometimes the aerator can become blocked and you should regularly clean them. Water coming from hot water systems can also be aerated and appear cloudy.

If air is sputtering from taps, this could be from recent repair works on your plumbing system or for a burst water main. Air becomes trapped in pipes when they are refilled with water. Power and Water will usually flush repaired mains to release trapped air. All trapped air will be released from taps as water is used.

Another cause of cloudy water could be mild corrosion of copper pipes contained in your plumbing system.

Earthy or musty taste and odour

Before the onset of the Wet Season in the Top End elevated levels of algae can form in large surface storages like Darwin River Reservoir. These algae can result in compounds forming in the water which can change the taste and odour.

To reduce the earthy or musty taste or odour, flush your tap for several minutes. Then collect the fresher water into a clean container for future drinking or cooking purposes. Adding a few drops of lemon juice or a slice of lemon can also help improve the taste.

Hard water and scaling

Many locations in the Northern Territory rely on groundwater supplies that are characterised by 'hard' water. Medical research has established that 'hard' water is safe to drink.

'Hard' water reacts chemically with soap and requires more soap to form lather. It may also leave spots on drinking glasses, windows and shower screens. Above a certain level of hardness it can cause scale formation on hot water systems, pipes, fittings and domestic appliances that can reduce or block the flow of water.

Power and Water is trialling a Calgon chemical dosing system at Elliott. The system does not actually reduce hardness nor remove the existing scale build-up but is expected to reduce further scale build-up. Surface water is 'softer' and where possible, Power and Water will blend groundwater with surface water from a reservoir or river to improve drinking water quality.

Chlorinous odour

Chlorine is added to drinking water to kill harmful micro-organisms to ensure it is safe to drink. A minimum free chlorine residual of 0.2 mg/L is needed to control bacterial contamination, however, a minimum of

0.5 mg/L is required to control *Naegleria fowleri* which has been found in drinking water in the Northern Territory.

The Australian Drinking Water Guidelines (ADWG) recommend a maximum limit of 5 mg/L for free chlorine based on health considerations. Levels less than 2 mg/L are normally measured in the distribution system. Chlorine levels decay through the water supply system so higher levels are experienced closer to the point where dosing takes place.

The ADWG recommend a limit of 0.6 mg/L for free chlorine based on the sensitivity of some consumers to the odour of chlorine. Some individuals are sensitive to chlorine odour and can detect levels as low as 0.05-0.1 mg/L.

As a consequence of maintaining a free chlorine residual of at least 0.5 mg/L at all locations in the distribution system most of the system will experience free chlorine residuals greater than 0.6 mg/L, including customers' taps.

Customers sensitive to chlorine odour are advised to collect water into a clean container and let it sit overnight for future drinking or cooking purposes. Adding a few drops of lemon juice or a slice of lemon can also help improve the taste.

Floating white particles

Customers in the Darwin, Palmerston and rural areas on reticulated water may occasionally notice small white particles in drinking water. This is likely to be *Botryococcus braunii* a species of green algae that has been found in Darwin River Reservoir. After entering the water supply system these algae die in response to chlorination and light deprivation but can be seen as bleached floating or suspended particles.

Further help or information

If you have questions or issues with your drinking water, contact Power and Water on 1800 245 092.