

Water Quality – Questions and Answers

Questions from the Public in relation to water quality during the Oberon Council (OC) Ordinary Council Meeting on 16 April 2024

The Questions have been arranged in four different categories and advice has been sought from a specialist consultant in answering some of them:

- 1) Water Quality & Water Safety
- 2) Water Security
- 3) Water Treatment Plant (WTP) Maintenance
- 4) Business and Tourism

Water Quality & Water Safety

- Q: What does OC do to ensure town water is safe to drink?

A: OC operates a Water Treatment Plant (WTP) that treats incoming raw water sourced by Water NSW from Oberon Dam to a potable standard in line with the Australian Drinking Water Guidelines, ADWG [Australian Drinking Water Guidelines | NHMRC](#)

As part of the treatment process, suitably trained and qualified staff (operators), test the water daily at various stages during the treatment process from raw to treated water ready for distribution. The parameter tested include pH, temperature, colour, iron, manganese, chlorine, fluoride and turbidity.

OC operators also test reticulated water daily. Microbiological samples are taken weekly and sent to a NSW Health Pathology FASS (Forensic & Analytical Science Service) laboratory in Sydney. Chemistry samples are taken 6-monthly to determine all relevant physico-chemical properties of the water and also sent to a FASS lab for analysis.

- Q: What does OC do to ensure town water is suitable to be used for most domestic and business purposes?

A: Providing water in line with ADWG ensures water is suitable to be used for most domestic and business purposes.

As a Local Water Utility, OC operates under its own Drinking Water Management System (DWMS) that identifies, observes and reports on Critical Control Points (CCPs) throughout the water treatment and distribution network. Any critical CCP exceedance is reportable to NSW Health.

- Q: Does OC send off town water samples for independent testing to external laboratories?

A: In addition to the monthly microbiological and six-monthly chemistry samples, that are being sent to NSW Health FASS laboratories, reticulation samples have also been sent to a NATA (National Association Of Testing Authorities, Australia) accredited lab to verify in-house test results.

- Q: What should I do as a town water customer (residential or business) if I experience water quality issues, including dirty water?

A: A good first step would be to confirm that the water quality issue is not resulting from a property internal plumbing issue, e.g. old/rusty/deteriorated pipes. This can be done by running water from a tap nearest the Council water meter into a container and comparing it to water run into a different container from a tap furthest away from the water meter – if the water from the tap near the water meter is clear and the water from the furthest tap is dirty, then the issue causing the water quality concern is most likely stemming from property internal piping issues.

If the water with quality issue is suspected to stem from the reticulated town water supply, please contact OC on (02) 6329 8100 as soon as possible so the matter can be investigated.

- Q: Is water safe to drink when it contains manganese?

A: Yes. OC provides potable water to the town of Oberon in line with the ADWG ([Australian Drinking Water Guidelines | NHMRC](#)). The Health guideline value for manganese is 0.5 mg/L; OC's supplied drinking water has consistently been below this value.

The ADWG contain a factsheet on the physical and chemical characteristics of manganese ([Australian Drinking Water Guidelines | NHMRC](#)), including health considerations - Too little rather than too much manganese has the potential to be a health issue; *“Manganese is an essential element and is required by mammals and birds for normal growth. Manganese deficiency affects bone, the brain and reproduction in a number of animal species. Although no specific symptoms have been described in humans, it has been suggested that manganese deficiency may be associated with anaemia and, in children, with bone disorders. Owing to the low solubility of Manganese in gastric juices, only 3-8% of ingested manganese is absorbed... manganese is regarded as one of the least toxic elements.”*

Further information on the NSW Government's management of Drinking Water can be found here: [Drinking water | NSW Government](#)

- Q: Is it safe to bathe and or shower in water containing manganese?

A: Yes. Bathing and showering in water with manganese levels elevated to those historically seen in Oberon is safe.

- Q: Does manganese cause skin irritation?

A: No, see answer to “Is it safe to bathe and or shower in water containing manganese”; manganese levels in treated water supplied to Oberon Council customers remained well within the health target and far below a concentration that would cause problems.

- Q: Can manganese in town water create discolouration of appliances and laundry items?

A: Yes. When manganese is not completely removed by the treatment process and remains in the water supplied to customers, it can cause yellow to black discolouration of laundry and leave stains on plumbing fixtures. Dissolved/soluble manganese appears clear in water, but may oxidise into insoluble manganese at the point of consumption, for example, when exposed to oxidising substances, such as laundry detergents. This means that water that appears clear

coming out of the tap may cause laundry to be stained with yellow to dark brown/black particles and may cause dark films to build up on fittings and cookware such as kettles. These chemical films will tend to build up gradually and may not be immediately noticeable.

- Q: Do manganese stains wash out?

A: Yes – It may be possible to remove/reduce the staining by washing with a weak acid, such as oxalic acid or white vinegar.

- Q: Can adding fluoride to town water cause dirty water?

A: No, fluoridation within the recommended ranges (< 1.2 mg/L) does not cause dirty water.

- Q: Does adding fluoride to town water create a chemical reaction with manganese?

A: No, there is no reaction between fluoride and any (low or high) residual manganese remaining in treated water leaving the WTP.

- Q: Does adding fluoride to town water accelerate tooth decay?

A: No. Adding fluoride to drinking water is a proven public health measure that has been demonstrated to prevent tooth decay in fluoridated water supplies around the world. The fluoride treatments provided by dentists as part of routine dental care are at higher concentrations than that found in drinking water. Toothpastes also contain fluoride as do many of our foods.

- Q: Does manganese in water accelerate tooth decay?

A: No. While manganese is an essential element for our metabolism and activation of enzymes and it does occur in teeth enamel and dentine it does not contribute to tooth decay.

- Q: Does fluoride deteriorate water pipes?

A: No. When dosed within the typical 0.7-1.0 mg/L range, fluoride does not impact the pipes that carry water.

- Q: Is it acceptable to experience Water Quality (WQ) issues in Australia?

A: Water treatment in Australia is an ongoing exercise in monitoring water quality, identifying and improving process shortcomings, and optimising operations to save money and resources. Ideally, any water quality issues are identified and improved quickly so as to ensure that the supply of water to customers is safe and reliable. All water authorities in Australia have regular water quality issues to manage.

- Q: Is OC collaborating with Water NSW to improve town water quality?

A: Yes- Council is part of a Customer Advisory Group (CAG) that continually liaises with Water NSW regarding raw water quality and the continual need to explore better ways of delivery of raw water in its primary form.

- Q: Do I need to buy bottled water even if connected to town water?

A: OC provides safe potable water for human consumption in line with ADWG. As such the purchase of bottled water is at the customer's discretion.

It is noted though that the per L cost would be significantly higher as would be the waste production.

- Q: Does town water smell of chlorine?

A: Yes, it can. As a public health measure, chlorine is dosed into drinking water as a disinfectant to ensure that pathogens present in the water are killed before reaching consumers. Adding enough chlorine to the water that is sent into the reticulation is necessary to maintain a free chlorine residual throughout the reticulation network. This is needed to prevent pathogenic recontamination of the water during the period when it is being stored and distributed.

The free chlorine residual in most Australian reticulated supplies is targeted to be between 0.2 and 0.5 mg/L however depending on factors such as temperature, turbidity, and detention time, it may need to be adjusted and range from 0.1 up to 4 mg/L as these conditions can reduce the amount of free chlorine available to kill pathogens.

While the ADWG health guideline is a maximum of 5 mg/L, chlorine has an odour threshold in drinking water of about 0.6 mg/L. However, some people are more sensitive to its presence and can detect amounts as low as 0.2 mg/L. To maintain an effective disinfectant residual, Council may need to exceed the chlorine odour threshold of 0.6 mg/L.

- Q: Does boiling water remove manganese from it?

A: No, boiling water does not remove manganese and will actually increase the concentration of manganese present (as there will be less water remaining after steam escapes).

Note that boiling water may help to improve taste and odour should customers find the chlorine taste and smell objectionable. However, as boiling will reduce the amount of chlorine remaining, thus compromising its ability to continue protecting from pathogens, it is recommended that boiled water be stored in a sterile, airtight, and refrigerated vessel and be consumed as quickly as possible.

- Q: Water mains pigging:
 - o what is it,
 - o why do we do it,
 - o where do we do it,
 - o how frequently do we do it, when did we last do it & when do we plan to do it again,
 - o how much does it cost & what is the budget allocated to it?

A: What is it? – Water mains “pigging” is a maintenance technique used to clean the network of pipes that distribute water from the treatment plant to customers.

Why do we do it? – At the treatment plant, particulate manganese is coagulated and settled or filtered from the water with other solid material. If the manganese is soluble or in very fine particles, it can stay in suspension through the treatment plant and carry over into the clear water. Over time, the manganese that carries over into the distribution system forms sediments/solids or gets incorporated into scale or biofilms on pipes.

Where do we do it? – When OC undertook water mains pigging in 2022/2023, the entire network was cleaned in this way.

How frequently do we do it, when did we last do it & when do we plan to do it again? – OC undertook pigging between June 2022 and October 2023; currently, it not planned to undertake the activity again during 2024/25. It is recommended that the mains cleaning is undertaken every three to five years.

How much does it cost & what is the budget allocation to it? – The pigging activities undertaken by Clearflow on behalf of OC between June 2022 and October 2023 cost \$318,583. Currently, there is no further budget allocation for this activity in the 2024-2025 financial year.

Additional information on water mains cleaning: How can it be done? – Cleaning the pipes can involve one or more of the following methods:

- Water flushing – this involves drawing water through a hydrant or valve, at a high enough velocity that solids and biofilms are entrained in the water and exit through the hydrant/valve. This can waste water and can lead to manganese laden water entering the environment. Some Councils have collected flushed water for returning to the WTP or used it for irrigation of gardens or fields.
- Air/ water flushing (‘scouring’) uses less water and can be a more efficient method of cleaning mains. It involves isolating a section of pipe containing water and injecting compressed air to induce cleaning.
- ‘Pigging’ is where a device is inserted into a pipeline to clean it by scouring the walls of the pipe and then flushing the dislodged debris out of the system. Pigging involves the least water wastage and is based on forcing a foam pig through the mains, which scrapes material from the walls of the mains.
- Ice pigging is also commonly used - where several slugs of ice are pushed through the pipe network.

Mains cleaning should be used as part of a multi-treatment approach to manganese, rather than being relied on as a treatment method on its own.

- Q: When will Clearflow be engaged to come back to do pigging of water mains?

A: Currently, there is no commitment to undertake another water mains pigging program, following the completion of the program between June 2022 and October 2023.

- Q: Where has the allocated budget gone that was assumably present when Clearflow was asked to come to OC and undertake pigging which was then cancelled?

A: There had been no further budget allocation for water mains pigging following the completion of the tender under which Council engaged Clearflow in 2022 – 2023. Any allocation of funding for water related maintenance is funded by the Water Fund.

The total expenditure for the water mains pigging activities undertaken by Clearflow between June 2022 and October 2023 was in excess of \$318,500.

Following complaints from the Laundry Pad after the completion of water mains pigging, Council decided to engage a specialist consultant to investigate the matter and provide recommendations.

Water Security

- Q: Do I need to install a rainwater tank even if connected to town water?

A: OC provides safe drinking water in line with ADWG, therefore installation of rainwater tanks is at the discretion of the property or business owner.

Note: Installing of rainwater tanks is a mean to increase water security to some extent by storing this water and using it when needed, especially in times of drought. Please refer to NSW Health advice on safe use of rainwater: [Rainwater tanks - Water quality \(nsw.gov.au\)](https://www.nsw.gov.au/health-and-care-services/keeping-you-and-your-family-safe/rainwater-tanks); please also refer to the NSW Health Guidelines for the Use of Rainwater Tanks Where a Public Water Supply is Available.

Water Treatment Plant (WTP) Maintenance

- Q: What is OC's program to ensure its WTP is fit for purpose (e.g. when was the last upgrade and what was it)?

A: Council's current facility continues to be fit for purpose. Proactive maintenance and continual improvement processes are provided to ensure the facility provides water compliant with the Australian Drinking Water Guidelines.

Business & Tourism

- Q: Do I need to filter my water for business use (e.g. coffee machine)?

A: Flushing is recommended each day and when any dirty water is observed. Providing a filtration system is an option but should not normally be necessary.

- Q: Does Manganese clog filters?

A: While manganese will accumulate on filter surface, appearing as yellow to black staining, this discolouration will not block filters unless allowed to accumulate over a prolonged period or when the manganese is in excessively elevated concentrations. If present, certain species of bacteria will feed off the accumulated manganese deposits, establishing a black biofilm (slime). This film may block filters if it was to develop on them or as it will periodically break off and be carried by the water passing through the system.

- Q: What can I do to improve town water quality as a business owner to comply with my business needs?

A: As a business owner, if you feel that the quality of the water supplied to you is not of the standard required for your business purposes, then you could consider installing a suitable private water filtration system to meet your specific needs. Possible systems include:

- A finer filter that filters down to at least 0.2 microns (preferably 0.05 microns) such as an ultrafiltration membrane system.
- An oxidising filtration system, where the water comes into contact with air, oxidising manganese (and other metals) and passes through a filtration medium where the particles accumulate.

- Adding sequestering agents to keep manganese soluble. Examples of sequestering agents are sodium silicate (activated silica), sodium hexametaphosphate, and sodium tripolyphosphate.
- A manganese greensand filter, which works in a similar way to an oxidising filter.

Flushing of any standing water in the pipes for 1-3 minutes to the drain at maximum flow prior to commencing the day's business operations will help remove any sediments settled in the pipework overnight.

- Q: Will OC compensate businesses for dirty water?

A: No, business owners – as well as domestic users – are required to pay for town water they have used as per Council's Statement of Revenue Policy. In 2020, Council provided a rebate to all water users as a result of known issues.

- Q: In OC opinion, how important is the laundry to Oberon, compared to outsourcing this service to an out-of-LGA business?

A: Council's Community Strategic Plan provides actions and themes outlining the importance of business in the LGA.

- Q: Does OC believe Tourism is essential to Oberon?

A: Council's Community Strategic Plan provides actions and themes outlining the importance of tourism in the LGA.

- Q: What help has OC provided to the Laundry Pad?

A: Council has been taken daily samples at the Laundry Pad to monitor water quality. Additionally, OC engaged a specialist consultant to investigate the matter and provide recommendations.