# Annual Drinking Water Quality Report 2017–18

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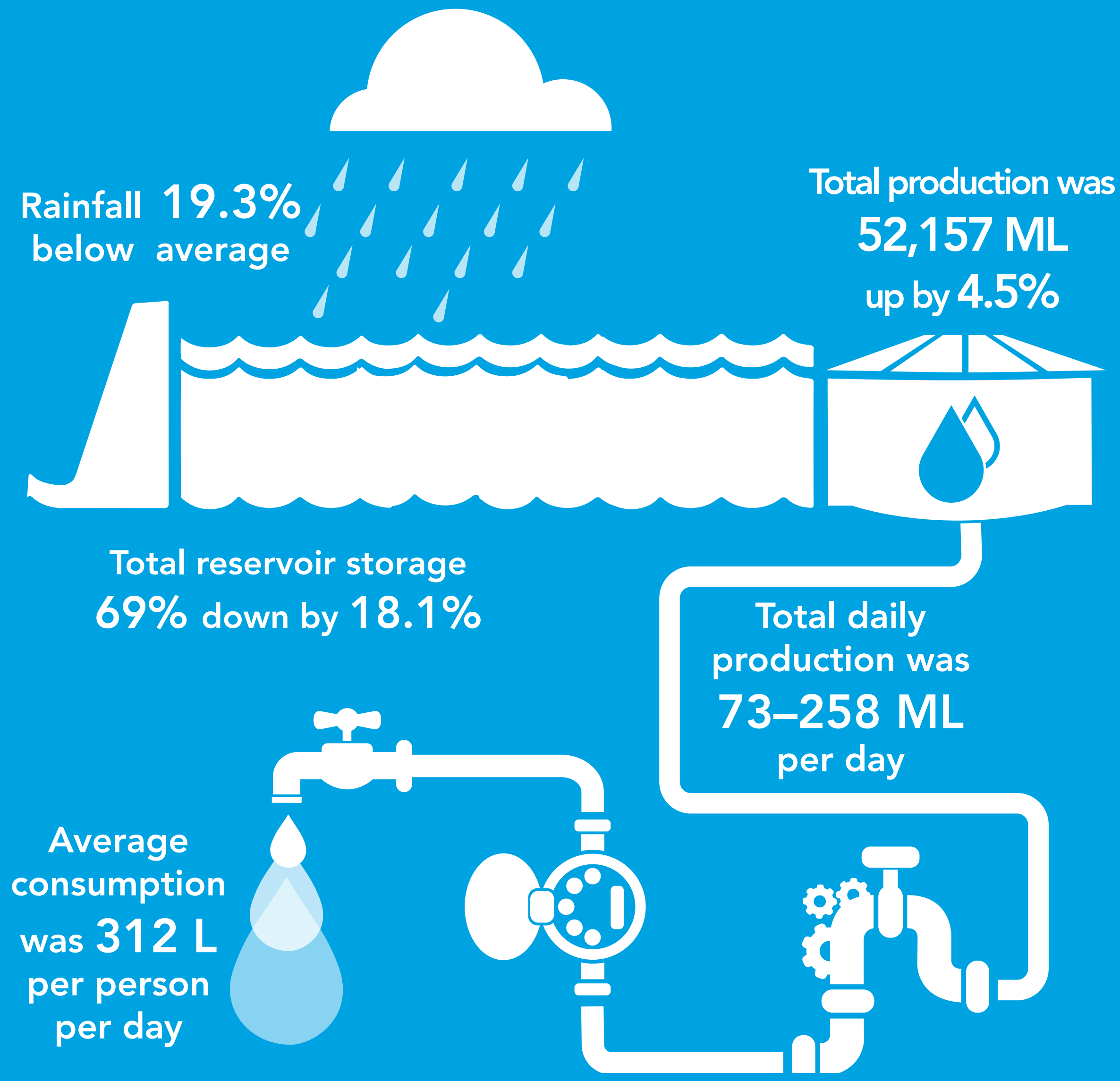
# Contents


| | | |
|---|---|---|
| Summary | | 2 |
| 1 | Canberra's drinking water supply system | 3 |
| 2 | Managing Canberra's drinking water supply | 5 |
| | Multiple barrier approach | 5 |
| | Management framework | 6 |
| 3 | Canberra's source water catchments | 7 |
| | Source water supply | 7 |
| | The climate and storage reservoir capacity | 7 |
| | Source water protection | 9 |
| | Water quality in the raw water source | 10 |
| | Cyanobacteria (blue-green algae) | 12 |
| | *Cryptosporidium* and *Giardia* | 12 |
| | Pesticide and herbicide monitoring | 13 |
| 4 | Water treatment operations | 14 |
| | Mount Stromlo water treatment plant | 14 |
| | Googong water treatment plant | 15 |
| | Water treatment plant performance | 16 |
| | Water production | 17 |
| 5 | The distribution system | 18 |
| | Service reservoirs | 20 |
| | Supply to customers' taps | 21 |
| 6 | Common water quality problems | 26 |
| 7 | Icon Water and ACT Health | 28 |
| 8 | Managing Canberra's water quality into the future | 31 |
| | Future water quality issues | 31 |
| | Water quality risk management | 31 |
| | Source water protection | 31 |
| | Water treatment plants | 32 |
| | Distribution system | 33 |
| 9 | Laboratory analysis | 34 |
| 10 | References | 60 |
| 11 | Abbreviations | 61 |




## Summary

Icon Water supports and protects the community and the environment by providing safe, clean drinking water. Icon Water carries out an extensive drinking water quality monitoring program that includes catchments and storage reservoirs, water treatment plants, service reservoirs and customers' taps. The information generated within this monitoring program assists Icon Water in its operations and ensures high quality water is delivered to Canberra and Queanbeyan.

At the end of June 2018, Canberra's four storage reservoirs were holding 69 per cent of their total accessible capacity. Overall daily production of drinking water throughout 2017–18 ranged between 73 and 258 megalitres (ML) per day, with a total of 52,157 ML of drinking water supplied to Canberra and Queanbeyan. Total consumption was 52,099 ML, which is a 4.6 per cent increase in the total water consumed by our commercial and residential users, which equates to approximately 312 litres per person per day.

# Canberra's drinking water supply system



Canberra's drinking water is primarily sourced from four storage reservoirs along the Cotter and Queanbeyan Rivers. The Cotter River catchment is predominantly within the ACT and contains the Corin, Bendora and Cotter reservoirs. The Queanbeyan River catchment lies within NSW and has a single reservoir – Googong. In addition, water can be abstracted from the Murrumbidgee River.

Icon Water works with the ACT and NSW Governments and the community to ensure these catchments are managed effectively for the protection of Canberra's drinking water supply.

Icon Water abstracts raw water from the storage reservoirs and treats at either of its two water treatment plants (WTPs) prior to distribution to the community. The Mount Stromlo WTP has operated since 1967 and can treat water from the Cotter catchment and the Murrumbidgee River, whilst the Googong WTP has operated since 1979 and can treat water from the Queanbeyan catchment and indirectly from the Murrumbidgee River (via the Murrumbidgee to Googong Transfer Pipeline). The Googong WTP may be operated in conjunction with the Mount Stromlo WTP to supplement water supply during summer peak demands, and operated independently to allow essential maintenance to occur at the Mount Stromlo WTP.

Once treated, Icon Water distributes the water throughout Canberra using a complex network of approximately 3,300 km of pipes and 48 service reservoirs sites. This infrastructure is maintained and closely monitored to ensure the Canberra community receives high quality drinking water.

Icon Water also supplies bulk water to Queanbeyan-Palerang Regional Council, which distributes the water to Queanbeyan and Googong Township.

During 2017–18, Icon Water supplied 52,157 ML of drinking water to Canberra and Queanbeyan. The daily production ranged from 73 ML to 258 ML. Overall the total volume of water supplied represents a small increase of approximately 4.5 per cent from the previous year.

Urban development in Canberra and Queanbeyan continues to evolve and grow. The most recent estimates put Canberra's population at 416,000[1] and Queanbeyan at 42,000[2,3], representing an average annual population growth of 2 per cent. Based on these figures, the average per capita consumption was 312 L per day.


[1] http://www.abs.gov.au/ausstats/abs@.nsf/mf/3101.0
[2] http://www.abs.gov.au/AUSSTATS/abs@.nsf/mf/3218.0
[3] http://www.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/SSC11704?opendocument

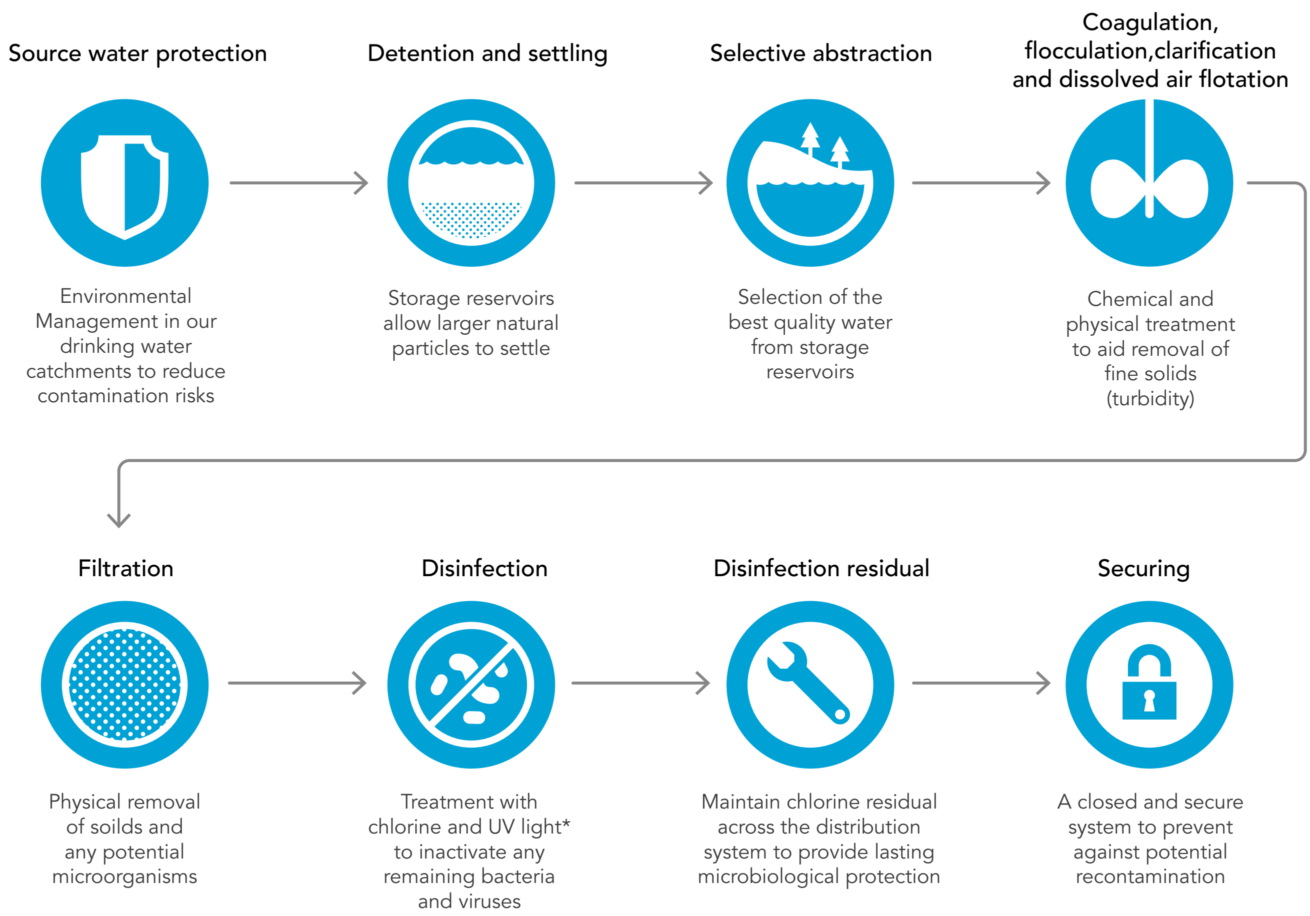

Googong reservoir

# Managing Canberra's drinking water supply

## Multiple barrier approach

Icon Water supports and protects the community by providing safe, clean drinking water. A preventative risk management approach is used to ensure the risks to water quality are minimised and controlled. Throughout its operations, Icon Water applies multiple barriers to protect the water supply from contaminants, including pathogenic microorganisms. This approach is consistent with the internationally recognised Hazard Analysis and Critical Control Point (HACCP) principles.

**Figure 2-1** Drinking water supply barriers




* UV light treatment at Mount Stromlo WTP only

The performance of these barriers is actively managed and monitored using a range of different measures to enable Icon Water to protect Canberra's water supply against potential risks to public health. This includes a source water protection program, real-time online analysers, internal laboratory testing and a routine verification sampling program conducted by a National Association of Testing Authorities (NATA) accredited independent laboratory.

The drinking water quality monitoring program measures physical, chemical and microbiological parameters of the water supplied to customers. The water quality testing results are verified for compliance with the *Australian Drinking Water Guidelines (2011)* (ADWG). The ADWG include two types of criteria that Icon Water use to manage and measure the performance of the water supply system. They are:

- a health guideline value; which is defined as the concentration or measure of a water quality characteristic that does not result in any significant risk to the consumer and is generally based on a lifetime of consumption
- an aesthetic guideline value; which is defined as the concentration or measure of a water quality characteristic that is associated with acceptability of water to the consumer; for example appearance, taste and odour.

## Management framework

Icon Water holds the following licences for the operation of a drinking water distribution and supply service:

- *Utilities Service Licence*, issued by the Independent Competition and Regulatory Commission (ICRC) under the *Utilities Act 2000*.
- *Drinking Water Utility Licence*, issued by the ACT Health Directorate (ACT Health) under the *Public Health Act 1997*.

Icon Water also complies with the P*ublic Health (Drinking Water) Code of Practice (2007)* (the Code), which is issued by ACT Health.

Icon Water operates the water supply system under an Integrated Management System to meet quality, environmental, regulatory and workplace health and safety requirements. Icon Water maintains certification and complies with the following Australian and international standards:

- ISO 9001:2008. Quality management systems
- ISO 14001:2004. Environmental management systems
- AS/NZS 4801:2001. Occupational health and safety management systems
- HACCP and Good Manufacturing Practice (GMP) - Codex Alimentarius Alinorm 2003/13A.

Icon Water's drinking water quality management is based on the ADWG Framework for the Management of Drinking Water Quality and the HACCP system. Both systems address risks to water production from the source water catchment to the customer's tap. The externally certified HACCP system was designed to address risks to food production, and has been adapted to suit the water supply process. It enhances the organisation's ability to manage drinking water quality and ensures continuous evaluation and improvement. Icon Water maintained third-party certification of its HACCP–based risk management system for water quality management in 2017–18 and achieved a rating of Excellence in HACCP and Good Manufacturing Process (GMP).

# Canberra's source water catchments

## Source water supply

Canberra's source water catchments consist of Corin (70.9 GL), Bendora (11.5 GL) and Cotter (79.4 GL) storage reservoirs on the Cotter River; the Googong (121.1 GL) storage reservoir on the Queanbeyan River; and the Murrumbidgee River.

The majority of the Cotter River catchment is within the Namadgi National Park and is largely protected from pollutants (e.g. faecal, pesticides etc.) that can be associated with more intensive land use and activities such as agriculture, residential and recreation. The Cotter River reservoirs have an available combined full capacity of 158.4 GL and were 66.5 per cent full at the end of June 2018. During 2017–18, the Cotter River reservoirs provided 73.4 per cent of the water supplied to Canberra and Queanbeyan (Figure 3-1), of which Bendora reservoir contributed 68.9 per cent and the Cotter reservoir supplied 4.5 per cent.

The Queanbeyan River catchment, located to the southeast of Canberra, contains both developed and impacted land, including forestry reserves, rural pasture and rural residential properties. NSW state agencies and local government councils regulate land planning and manage activities in this catchment. The ACT Parks and Conservation Service manage the immediate area around the Googong reservoir and recreational access to the water body and foreshore. The Googong reservoir on the Queanbeyan River is the largest of the four water supply reservoirs and represents 43.0 per cent of Canberra's storage capacity. At the end of June 2018 Googong reservoir was at 72.4 per cent capacity. The Googong reservoir provided 26.6 per cent of the water supplied to Canberra and Queanbeyan during 2017–18 (Figure 3-1).

Finally, the Murrumbidgee catchment contains a wide variety of agricultural land uses, as well as the towns of Cooma, Numeralla, Bredbo and the Canberra district of Tuggeranong. During 2017–18 no water was abstracted from this source.

## The climate and storage reservoir capacity

Overall 2017–18 was a dry year. Large storms resulted in above average summer rainfall. However, autumn rainfall was 70 per cent below average. The rainfall at Canberra Airport was 19.3 per cent below the long term average and total evaporation at Burrinjuck Dam was 12.6 per cent above the long term average. Inflows to the four storage reservoirs totalled 65 GL, which is 57 per cent below the average of the last 15 years. As a result, Icon Water's storage reservoirs finished the year at 69.0 per cent, a decrease on the 84.3 per cent storage recorded at the end of 2016–17.

**Table 3-1** Rainfall, evaporation and reservoir capacity 2017–18

| Total rainfall at Canberra Airport (mm) | Long term average rainfall at Canberra Airport (mm) | Evaporation at Burrinjuck Dam (mm) | Total reservoir volume 30 June 2018 |
|---|---|---|---|
| 498 | 617 | 1245 | 69% |

**Figure 3-1** Reservoir storage levels and drinking water production for 2017–18

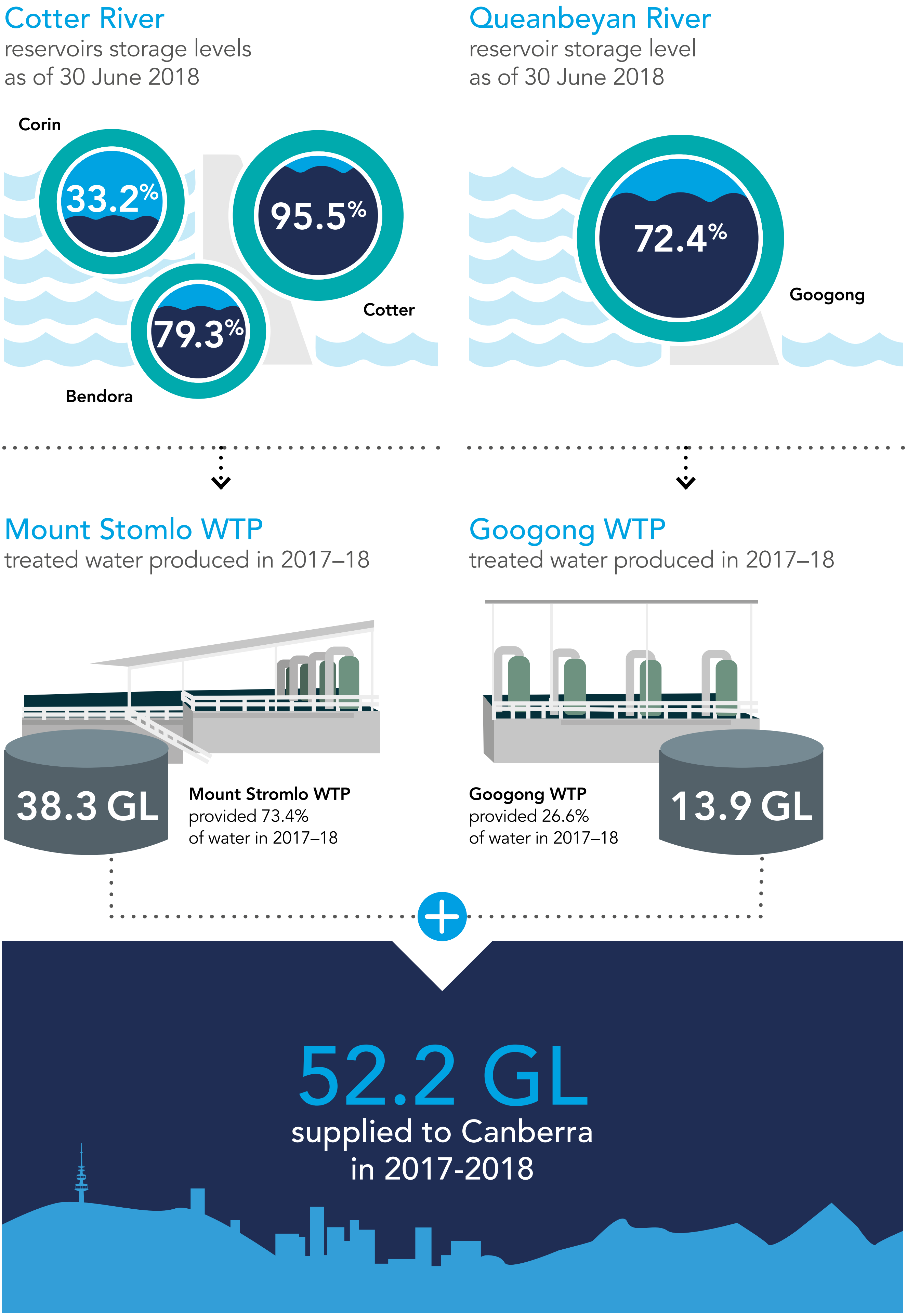
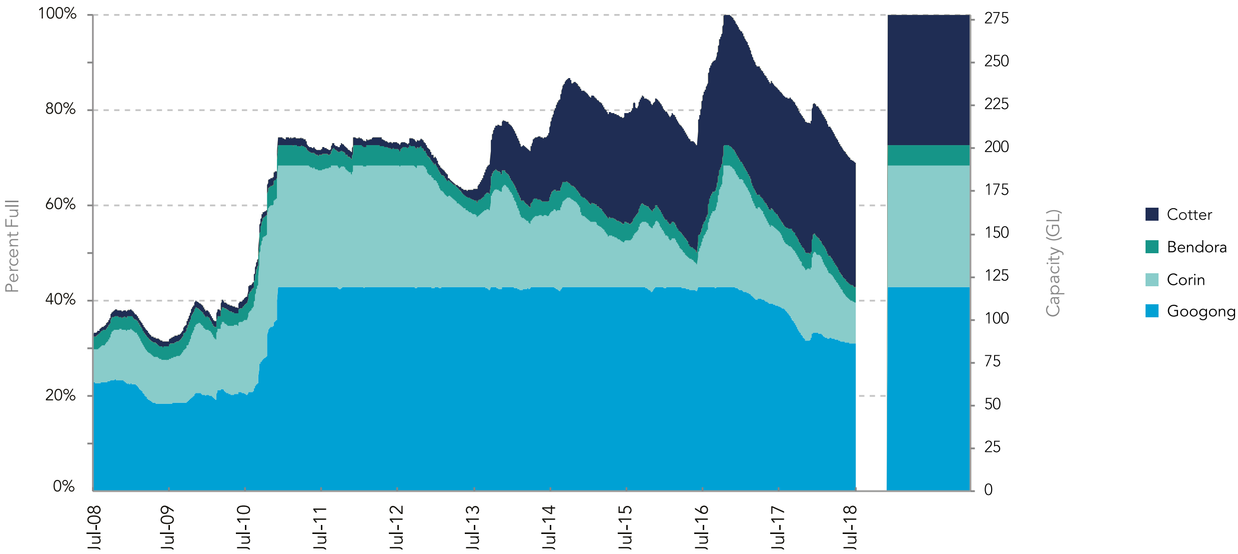


**Figure 3-2** Combined storage levels of Corin, Bendora, Cotter and Googong reservoirs from 2008–18




## Source water protection

In September 2017, Icon Water released a revised Source Water Protection Strategy (the Strategy) with the overall objective of protecting drinking water supply within ACT and NSW regions. The strategy encompasses an integrated approach to:

- monitor and survey catchment conditions and activities by collating and analysing relevant data
- manage risk by identifying hazards to water catchment health and developing mitigation plans and management controls
- engage with relevant stakeholders and land managers to build relationships and determine appropriate planning and management activities via forums, partnerships and education.

In 2017–18 Icon Water continued to work with relevant land management agencies and regional catchment groups to identify and mitigate potential contamination hazards within the catchments, the first barrier to protect the quality of water sources for potable water supply, as defined in the Code and the ADWG.

Key activities undertaken by Icon Water for protection of source water in the 2017-18 year consistent with the Strategy included:

- policy and legal protections and enhancements
- community engagement and education activities and campaigns
- on-ground works and monitoring of water quality and ecological condition.

## Policy and legal protections

Icon Water has limited direct legislative power in the management of land in the ACT and region's water supply catchments. Icon Water's key objective is to work closely with the regulators and policy makers within the NSW and ACT regulatory frameworks, which govern the water supply catchments.

In 2017–18, Icon Water reviewed non-residential development and recreational event proposals for the supply catchments and was a key stakeholder in the development of the Lower Cotter Catchment Reserve Management Plan.

Icon Water consulted with Queanbeyan–Palerang Regional Council and Snowy Monaro Regional Council to ensure adequate onsite septic system compliance inspections and consideration of development applications to protect water supply in the catchments.

Icon Water also contributes to interagency groups and the inter-jurisdictional regional catchment groups relevant to regional water management, including the ACT and Region Catchment Management Group and Upper Murrumbidgee Catchment Network.

## Community engagement and education

Icon Water undertook a range of land manager engagement and community education activities throughout 2017–18 to influence land use and recreation, which included:

- the provision of financial support to allow Waterwatch programs to continue in the Cooma-Monaro and Southern ACT regions
- the implementation of the Googong Dam Education and Engagement Strategy, providing water quality protection messages to the Googong Township community through cooperative delivery with the developers, school and the ACT Parks and Conservation Service.

# On-ground works and monitoring

In the ACT and region's water supply catchments, opportunities arise where the delivery of on-ground works can be an effective mechanism of controlling localised source water quality impacts. Such opportunities typically include partnerships with other projects or organisations.

Key on-ground works and water monitoring programs implemented by Icon Water in 2017–18 included the provision of funding to the Molonglo Catchment Group for delivery of the Burra Erosion Control Project over a two-year period, and delivery of a suite of ecological monitoring programs in all catchments. Further, a study to help establish a baseline of the sources and quantum of the sediment loads entering the Queanbeyan River and Burra Creek upstream of the Googong reservoir also commenced during this period in collaboration with catchment stakeholders. The baseline will be used to develop a Googong Actions for Clean Water (ACWA) Plan to help direct efforts to stabilise and rectify sites over time based on a prioritisation of risk to water quality in the receiving environment.

Icon Water also continues to provide advice to the ACT Parks and Conservation Service regarding on-ground rehabilitation efforts within the Lower Cotter Catchment, in order to minimise soil movement and protect the water quality of the Cotter reservoir.

Icon Water is currently preparing the 2016–18 Sanitary Survey Report that will be submitted to ACT Health in early 2019. The report summarises the condition of the ACT's drinking water catchments every three years to determine the nature and extent of likely contaminants.

# Water quality in the raw water source

Icon Water storage reservoirs are a fundamental part of the drinking water supply system. They allow water to be stored during low rainfall periods and assist in stabilising water quality through detention and settling of contaminants. This is particularly important after large rain events when inflows can transport large amounts of sediments and organics into the reservoir.

Mechanical mixers are operated in the Cotter and Googong reservoirs to reduce the degree of thermal stratification (Figure 3-3). By actively managing stratification (Figure 3-4), Icon Water has been able to increase the amount of oxygen (Figure 3-5) within each reservoir and in doing so reduce metal and nutrient concentrations in the abstraction zone. This makes available a greater volume of water for selective abstraction that is more efficiently treated and in the case of the Cotter reservoir helps to protect the population of the endangered Macquarie Perch.

**Figure 3-3** Cycle of reservoir thermal stratification

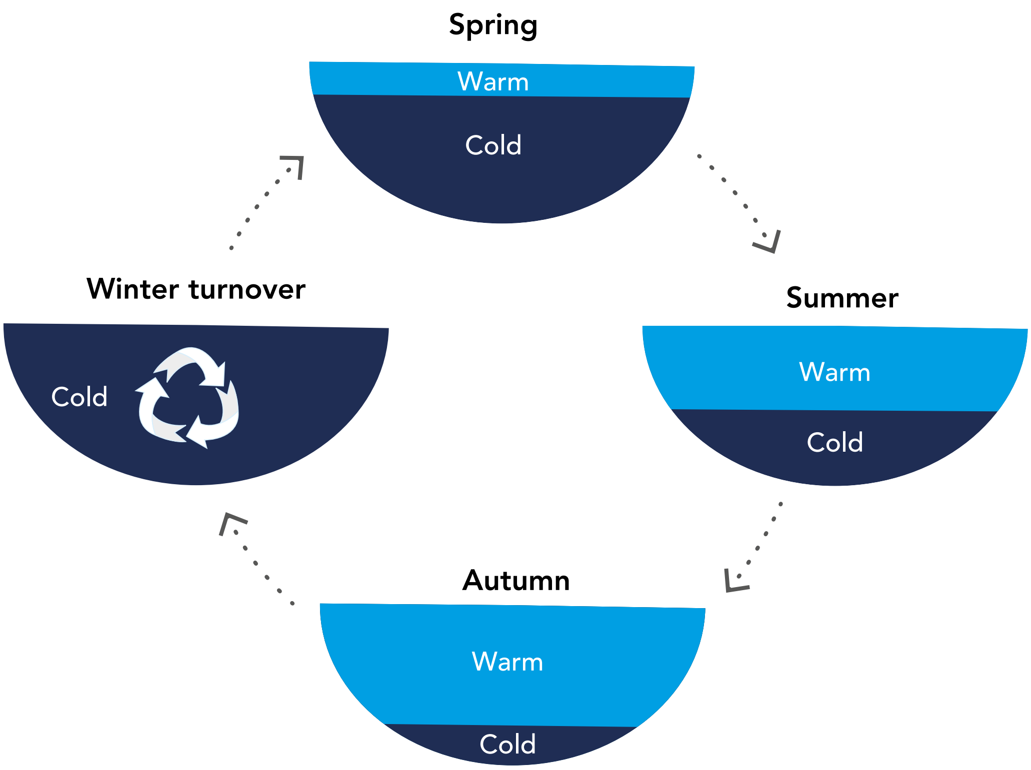


**Figure 3-4** Cotter reservoir thermal profile

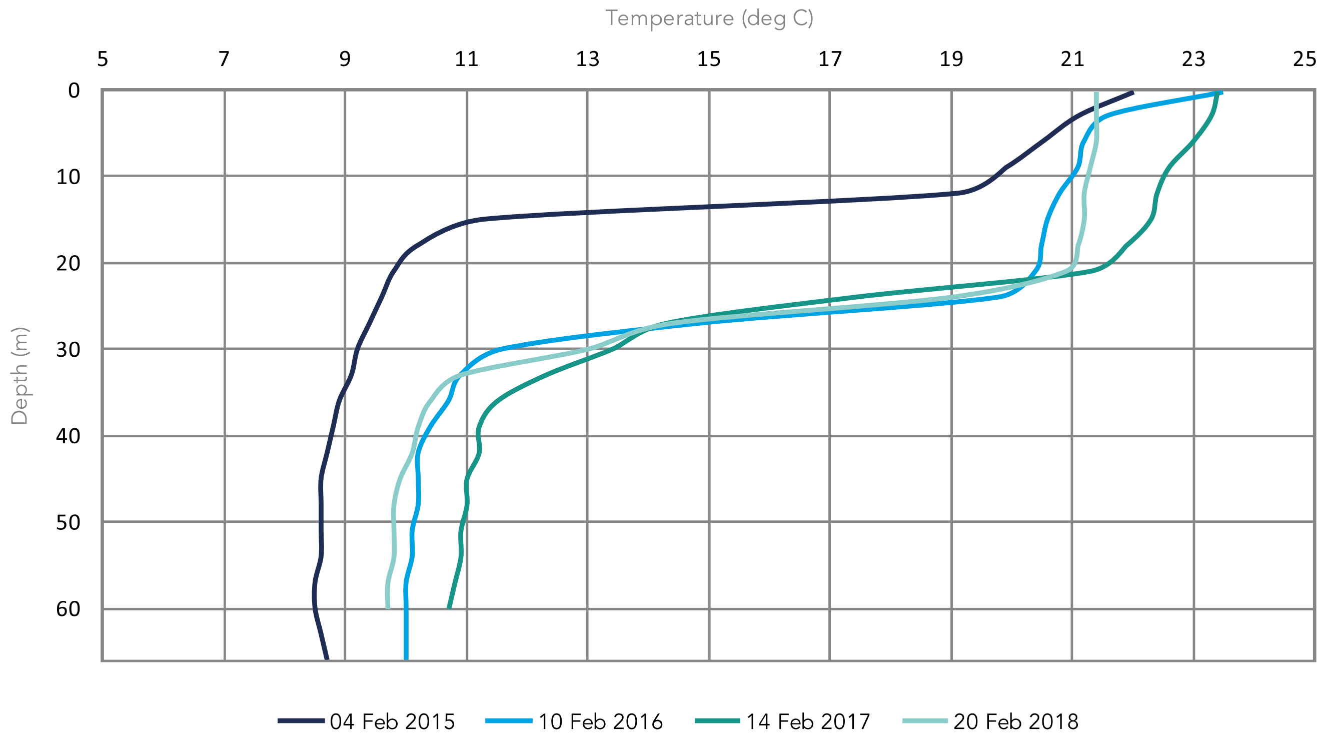
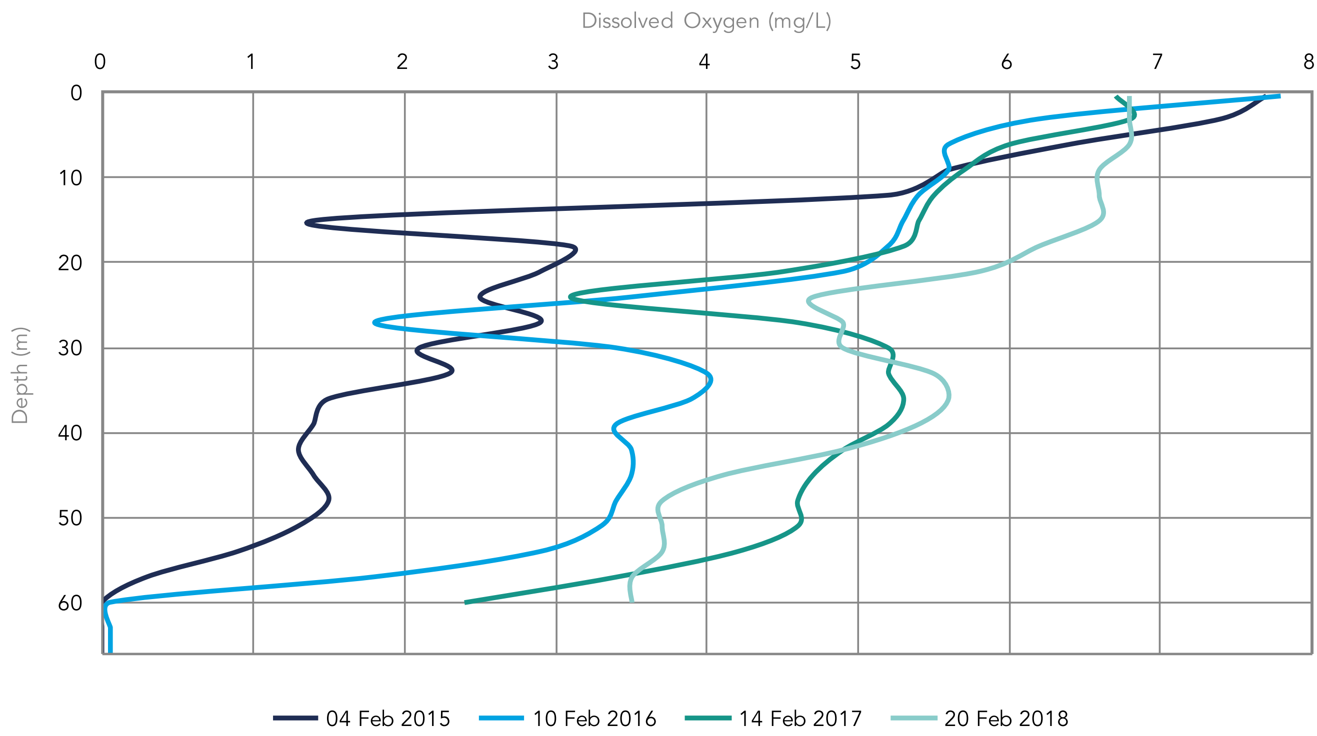



**Figure 3-5** Cotter reservoir dissolved oxygen profile




Icon Water undertakes an extensive sampling and analysis program to monitor water quality in its storage reservoirs and the Murrumbidgee River. The program, which is developed in consultation with ACT Health, is adaptively managed to ensure it continues to adequately assess the quality of source waters and identify emerging issues that could affect the drinking water supply. The parameters routinely monitored within the raw water sources are detailed in Table 3-2. In addition, the raw water sources also have continuous online monitoring for select parameters. This enables Icon Water to react rapidly to changes in the raw water quality and ensure only the best quality water is abstracted for treatment at the WTPs.

**Table 3-2** Parameters routinely monitored in raw water sources

| Microbiological | Physical | Chemical |
|---|---|---|
| *Cryptosporidium and Giardia* | Colour | Alkalinity |
| *Escherichia coli (E. coli)* | Conductivity | Chlorophyll-α |
| Heterotrophic bacteria | Dissolved oxygen | Nutrients (e.g. nitrogen and phosphorous) |
| Phytoplankton including blue-green algae | pH | Organic compounds (including herbicides and pesticides) |
| Total coliforms | Temperature | Radionuclides |
| | Turbidity | Total and dissolved metals |
| | UV absorbance | Total and dissolved organic carbon |

## Cyanobacteria (blue-green algae)

Cyanobacteria occurs naturally in water bodies, however, when the water is warm, calm and nutrient rich the conditions are highly favourable and they can grow in excessive numbers, termed 'blooms'. Icon Water's storage reservoirs, predominantly the Googong reservoir, occasionally experience blue-green algae blooms, typically of *Dolicospermum circinalis* and *Microcystis aeruginosa*, which can produce taste and odour compounds and toxins that can be harmful to humans and animals.

Icon Water carries out regular monitoring of blue-green algae in all its raw water sources. The extent and frequency of monitoring varies with the season, but is generally at its most frequent in the warmer months when algal blooms are more likely. Agriculture and other development in the Queanbeyan and Murrumbidgee catchments increase the nutrient levels in the waterways making these raw water sources more susceptible to algal blooms.

In response to an elevated detection of blue-green algae, Icon Water's blue-green algae response plan is activated and increased monitoring is conducted within the reservoir and at the associated WTP. Under the Code, ACT Health is consulted if elevated levels of blue-green algae are detected. Details of the notifications provided to ACT Health, including blue-green algae, are provided in Section 7 of this report.

Concentrations of blue-green algae (*Dolicopsermum circinalis*) in the Googong reservoir were lower in 2017–18 compared to 2016–17. In 2017–18, there were no notifiable cyanobacteria detections in the Cotter catchment reservoirs or at the Murrumbidgee River abstraction point.

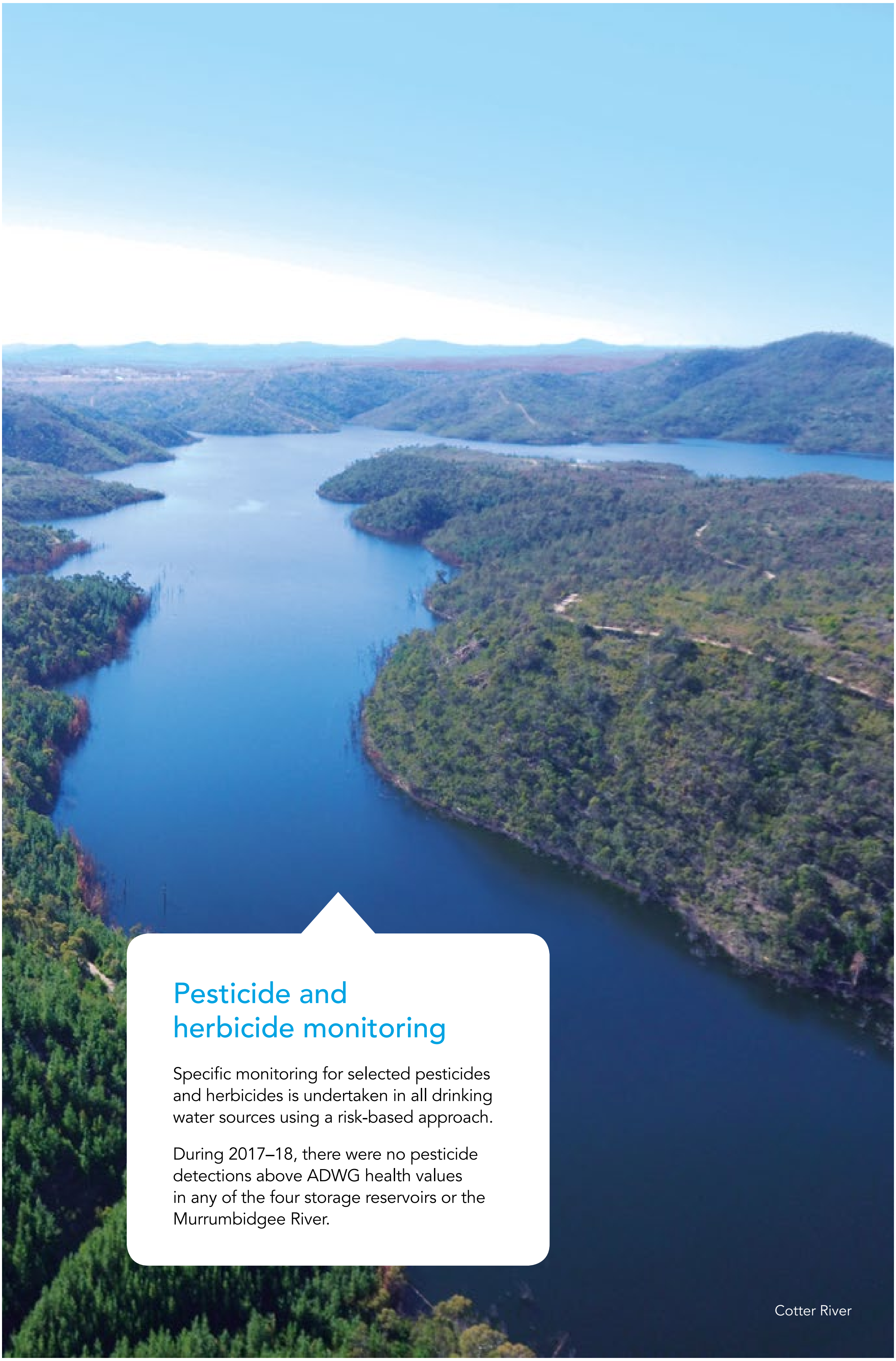
## *Cryptosporidium* and *Giardia*

*Cryptosporidium* and *Giardia* are microorganisms that can cause gastroenteritis. Infected people show either no symptoms or can suffer diarrhoea, vomiting and fever, and healthy people usually recover fully. These naturally occurring organisms are usually spread through contact with pets, farm animals or people who are already infected. There is a background level of infection by *Cryptosporidium* and *Giardia* in the community.

Testing methods for *Cryptosporidium* and *Giardia* are complex and if detected, it is difficult to confirm whether they are infectious to humans. Icon Water undertakes a routine monitoring program for *Cryptosporidium* and *Giardia* in the storage reservoirs and the Murrumbidgee River, as well as at the WTPs.

*Cryptosporidium* and *Giardia* are generally not detected in the storage reservoirs. During 2017–18, there were no detections in the routine monitoring program samples collected.

Due to the lower levels of catchment protection and brief detention time, the Murrumbidgee River is more likely to contain *Cryptosporidium* and *Giardia*. The risk increases further during rainfall events with increased runoff and therefore, in addition to routine testing, extra monitoring may be conducted if abstracting during these periods. There was one positive detection of *Giardia* and one positive detection of *Cryptosporidium* within the Murrumbidgee River during 2017–18. During this period, no water was abstracted from the Murrumbidgee River for drinking water use.



Cotter River

## Pesticide and herbicide monitoring

Specific monitoring for selected pesticides and herbicides is undertaken in all drinking water sources using a risk-based approach.

During 2017–18, there were no pesticide detections above ADWG health values in any of the four storage reservoirs or the Murrumbidgee River.

# 4 Water treatment operations

Icon Water operates two water treatment plants, the Mount Stromlo WTP, which treats water from the Cotter catchment reservoirs and the Murrumbidgee River; and the Googong WTP, which treats water from Googong reservoir.


## Mount Stromlo Water Treatment Plant

Mount Stromlo WTP has the capacity to treat 250 ML of water per day. The treatment process involves water passing through multiple treatment steps that are designed to remove contaminants from the water.

The WTP can operate in two treatment process modes; direct filtration or dissolved air flotation and filtration. The dissolved air flotation step is an optional treatment step that enhances treatment capabilities to address periods when poorer raw water quality may need to be treated.

The treatment process is shown in Figure 4-1 and involves:

- pre-treatment for pH adjustment and stabilisation with lime and carbon dioxide
- coagulation by polyaluminium chloride and/or aluminium sulphate
- flocculation aided by polyelectrolyte
- optional dissolved air flotation
- filtration
- fluoridation by sodium fluorosilicate
- disinfection by ultraviolet (UV) light
- disinfection by chlorination
- pH adjustment and stabilisation with lime.

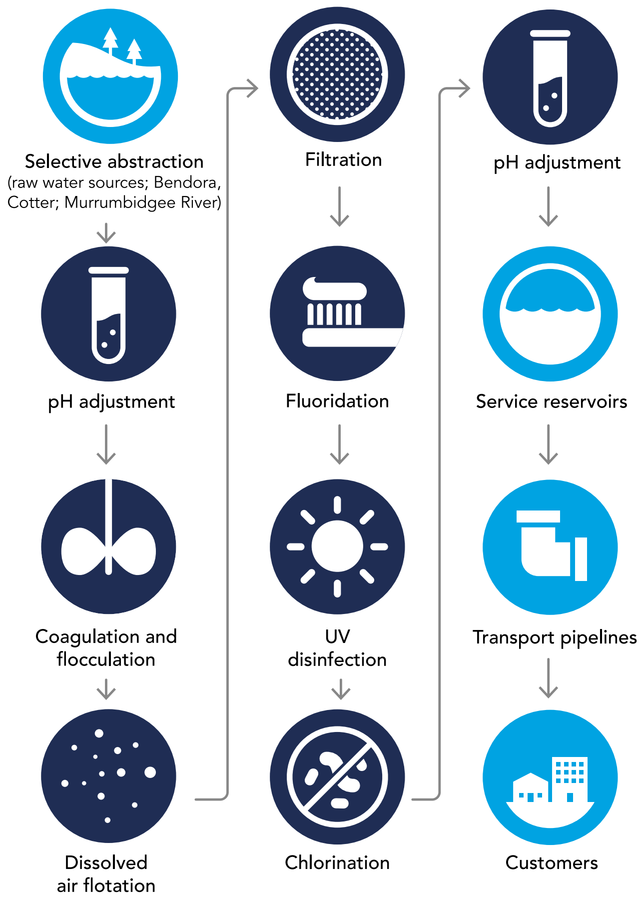



**Figure 4-1** Water supply from catchment to Mount Stromlo WTP to customers' taps


## Googong Water Treatment Plant

Googong WTP has the capacity to treat 270 ML of water per day. Googong WTP is generally used in conjunction with Mount Stromlo WTP to meet summer peak demand, or operated independently to enable maintenance tasks to be carried out at Mount Stromlo WTP.

The water treatment process used at Googong WTP is as follows:

- optional powdered activated carbon for taste and odour compound removal
- coagulation by aluminium sulphate
- flocculation aided by polyelectrolyte
- dissolved air flotation and filtration (augmented plant) or clarification and filtration (original plant), depending on operational mode
- fluoridation by sodium fluorosilicate
- disinfection by chlorination
- pH adjustment and stabilisation with lime.

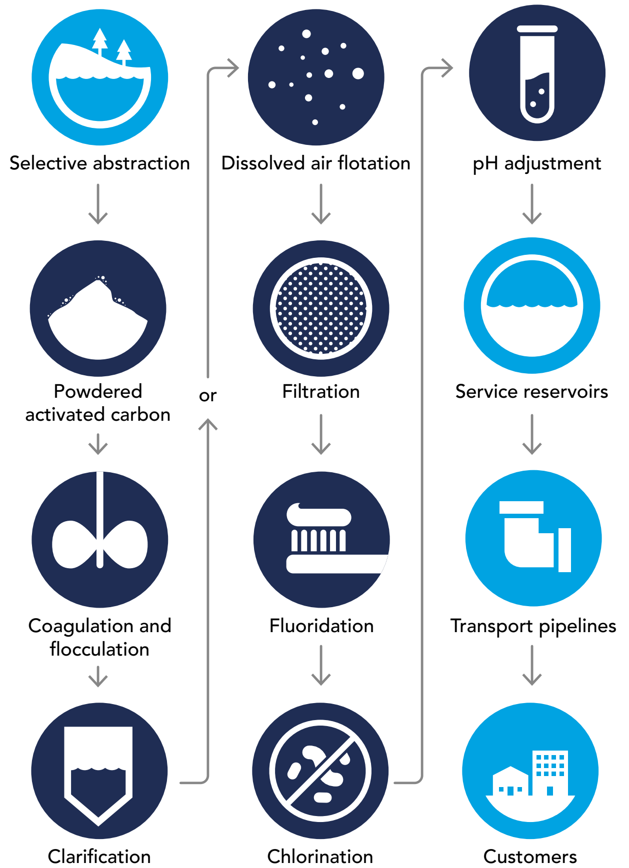



**Figure 4-2** Water supply process from catchment to Googong WTP to customers' taps

# Water treatment plant performance

Extensive monitoring of plant process operations are required to ensure optimum performance of treatment barriers. Under Icon Water's HACCP-based water quality management system, five critical control points are applied in the drinking water supply system to ensure Canberra and Queanbeyan receive high quality water. Four of these critical control points exist within the WTPs, highlighting the importance of the water treatment operations to the delivery of safe drinking water.

Both WTPs contain online analysers to enable continual monitoring of key water quality parameters so that changes in the raw or process water quality can be quickly identified and addressed. In addition, regular verification monitoring is performed and involves analysis for a range of parameters including, but not limited to, colour, turbidity, chlorine, pH, *Escherichia coli* (*E. coli*), *Cryptosporidium* and *Giardia*. The online and laboratory monitoring results are relied upon to ensure that the treatment processes are operating correctly and producing high quality water within specification.

Table 4-1 illustrates a comparison between the ADWG and the average treated water quality values for key parameters at both WTPs for 2017–18. The ADWG health guideline is the concentration or measure of a water quality characteristic that, based on present knowledge, does not result in any significant risk to the health of the consumer and is generally based on a lifetime of consumption.

**Table 4-1** Final treated water quality at WTPs

| Parameter | | Units | ADWG Health value | ADWG Aesthetic value | Mount Stromlo WTP Mean result | Googong WTP Mean result |
|---|---|---|---|---|---|---|
| Chlorine | Free | mg/L | - | - | 1.5 | 1.7 |
| | Total | mg/L | 5 | 0.6 | 1.5 | 1.8 |
| Colour | True | Pt-Co | - | 15 | 1.1 | 1.8 |
| *Cryptosporidium* | | cells/L | -† | - | <0.013 | <0.006 |
| *E. coli* | | MPN/100 mL | <1 | - | <1 | <1 |
| Fluoride | | mg/L | 1.5 | - | 0.71 | 0.63 |
| *Giardia* | | cells/L | -† | - | <0.013 | <0.006 |
| pH | | pH units | - | 6.5-8.5 | 7.6 | 7.6 |
| Turbidity | | NTU | - | 5 | 0.17 | 0.32 |

- no current ADWG health or aesthetic value

† no health guideline has been set due to the lack of a routine method to identify human infectious strains in drinking water.

# Turbidity

Turbidity is a measurement of the suspended and dissolved particulates in water. These include suspended colloidal particles, clay and silt. Water with a high level of turbidity often has a muddy or milky appearance. Continuous monitoring of turbidity at the WTPs is undertaken and is used as a key indicator of filter performance. The ADWG states 'Where filtration alone is used as the water treatment process to address identified risks from *Cryptosporidium* and *Giardia*, it is essential that filtration is optimised and consequently the target for the turbidity leaving the individual filter should be less than 0.2 NTU, and should not exceed 0.5 NTU at any time'. Icon Water utilise this guidance and optimises operations to meet these targets at the WTPs.

During 2017–18 the turbidity of the water produced by the filters at Mount Stromlo and Googong WTPs were below 0.2 NTU 99 per cent and 98 per cent of the time, respectively.

# Chlorine

All drinking water processed by the WTPs is disinfected using chlorine. Chlorine is widely used in treatment plants throughout the world to control microbiological contaminants, such as bacteria and viruses. Chlorine gas is added to Canberra's water at a concentration sufficient to disinfect the water leaving the WTPs and to provide a free chlorine residual that will continue to protect against contamination in the distribution system. The ADWG health guideline for chlorine is 5 mg/L and the aesthetic guideline is 0.6 mg/L, which is based on an odour threshold. Some customers may be sensitive to the taste or smell of chlorine and Icon Water endeavours to manage chlorination to optimise the concentrations at the customers' tap.

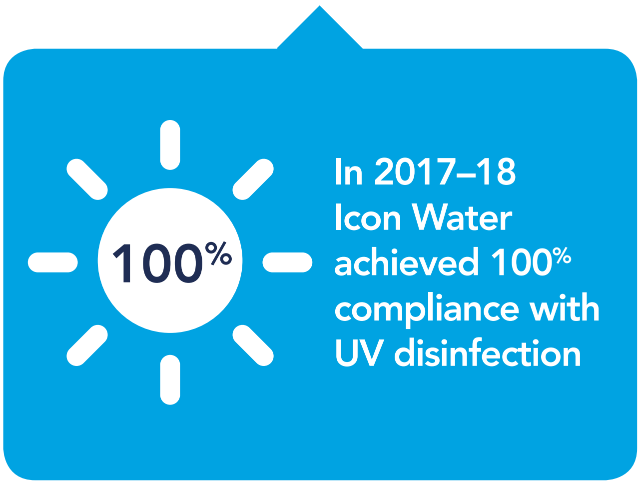
During 2017–18 free chlorine concentration in the treated water leaving Mount Stromlo WTP was maintained at an average of 1.47 mg/L. Due to its different raw water characteristics and geographical location, resulting in potential extended detention times within the distribution system, Googong WTP generally produces final treated water with a higher free chlorine concentration (average of 1.69 mg/L in 2017–18). Chloramine is not used within Canberra's water system.

## Ultraviolet disinfection

UV disinfection is used at the Mount Stromlo WTP to further reduce the risk of pathogens entering the drinking water supply. The UV system contains three parallel treatment trains, each of which have three banks of high-intensity, medium-pressure ultraviolet lamps. The quality of filtered water passing through the units is monitored online and each UV reactor includes sensors to continuously measure the UV irradiance in the water to ensure that an adequate UV dose is achieved. The power of each lamp is automatically regulated to ensure the required dose is maintained based on flow rate.

The UV system should provide a dose of greater than 27 mJ/cm2 for at least 95 per cent of the treated water.

The system continued to exceed this performance objective and in 2017–18, 99.9 per cent of the water produced received a dose greater than 27 mJ/cm2.




## Fluoride

The *Drinking Water Utility Licence*, issued by ACT Health, requires fluoride to be added to the ACT's drinking water system at a concentration between 0.6 and 1.1 mg/L.

'The aim of water fluoridation is the adjustment of the natural fluoride concentration in fluoride deficient water to that recommended for optimal dental health' (NHMRC, 2007). In order to achieve compliance with the licence, Icon Water adds sodium fluorosilicate to the drinking water at the WTPs.

In 2017–18 fluoride concentrations were maintained in the final treated water at Mount Stromlo and Googong WTPs at an average of 0.71 mg/L and 0.63 mg/L respectively.

## pH

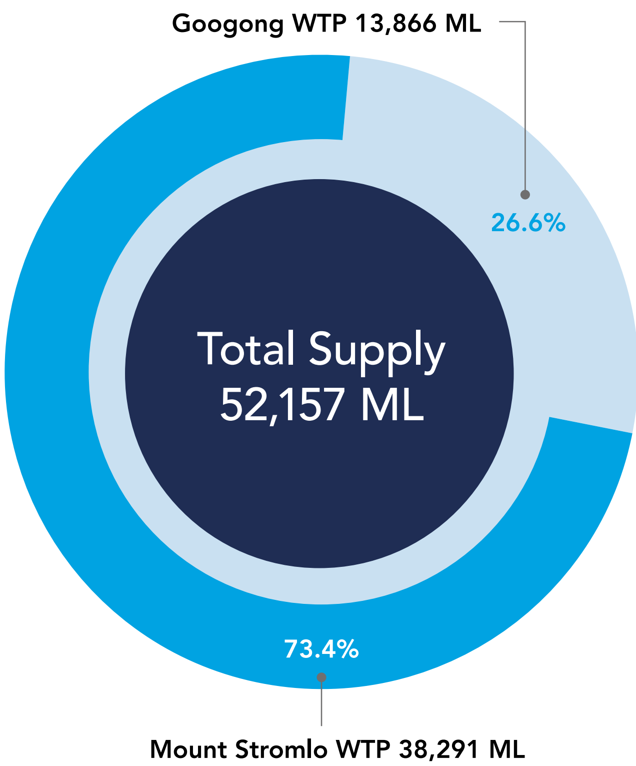
The pH of the drinking water is adjusted at the beginning of the treatment process and again prior to leaving the WTP. The pH of the water prior to coagulation and flocculation is decreased to between 6.0 and 6.2 to ensure it is within the effective range of the coagulant utilised.

The ADWG advises that 'chlorine disinfection efficiency is impaired above pH 8.0 whilst below 6.5 may be corrosive'. As such, the pH of the treated water is subsequently increased before distribution so it is within the optimal range to ensure effective disinfection potential whilst also preventing corrosion of the distribution pipelines. The optimal pH range targeted by Icon Water is 6.5–8.5. The average pH of the final treated water at both WTPs was 7.6 during 2017–18.

## Water production

Between the two WTPs, 52,157 ML of water was produced during 2017–18 for distribution to the Canberra and Queanbeyan communities. The majority of this was produced by the Mount Stromlo WTP, which produced 38,291 ML (73.4 per cent), while the Googong WTP operated between July and November, and for a short period in January, and produced 13,866 ML (26.6 per cent) (Figure 4-3).

**Figure 4-3** Total water produced by treatment plant during 2017–18



# 5 The distribution system

Icon Water distributes water throughout Canberra using a complex network of pipelines and service reservoirs. Icon Water also supplies bulk water to Queanbeyan-Palerang Regional Council, who distributes the water to Queanbeyan and the Googong Township.

Icon Water operates and maintains 48 service reservoir sites, 25 pump stations and approximately 3,300 km of potable water pipelines. This infrastructure is maintained and closely monitored to ensure the Canberra community receives high quality drinking water at their tap.

The drinking water distribution system is operated with a number of physical and chemical disinfection barriers in place to protect Canberra's water supply against potential contamination.

Some of the physical barriers include:

- the water distribution system is a closed network from the WTPs to customers' taps, preventing potential external contamination
- the water mains are operated under positive pressure to prevent contaminants entering the system
- backflow prevention devices are installed at customer supply points to protect against contaminants entering the system
- sewerage mains are generally located deeper than the water distribution system, minimising the risk of contamination through groundwater.

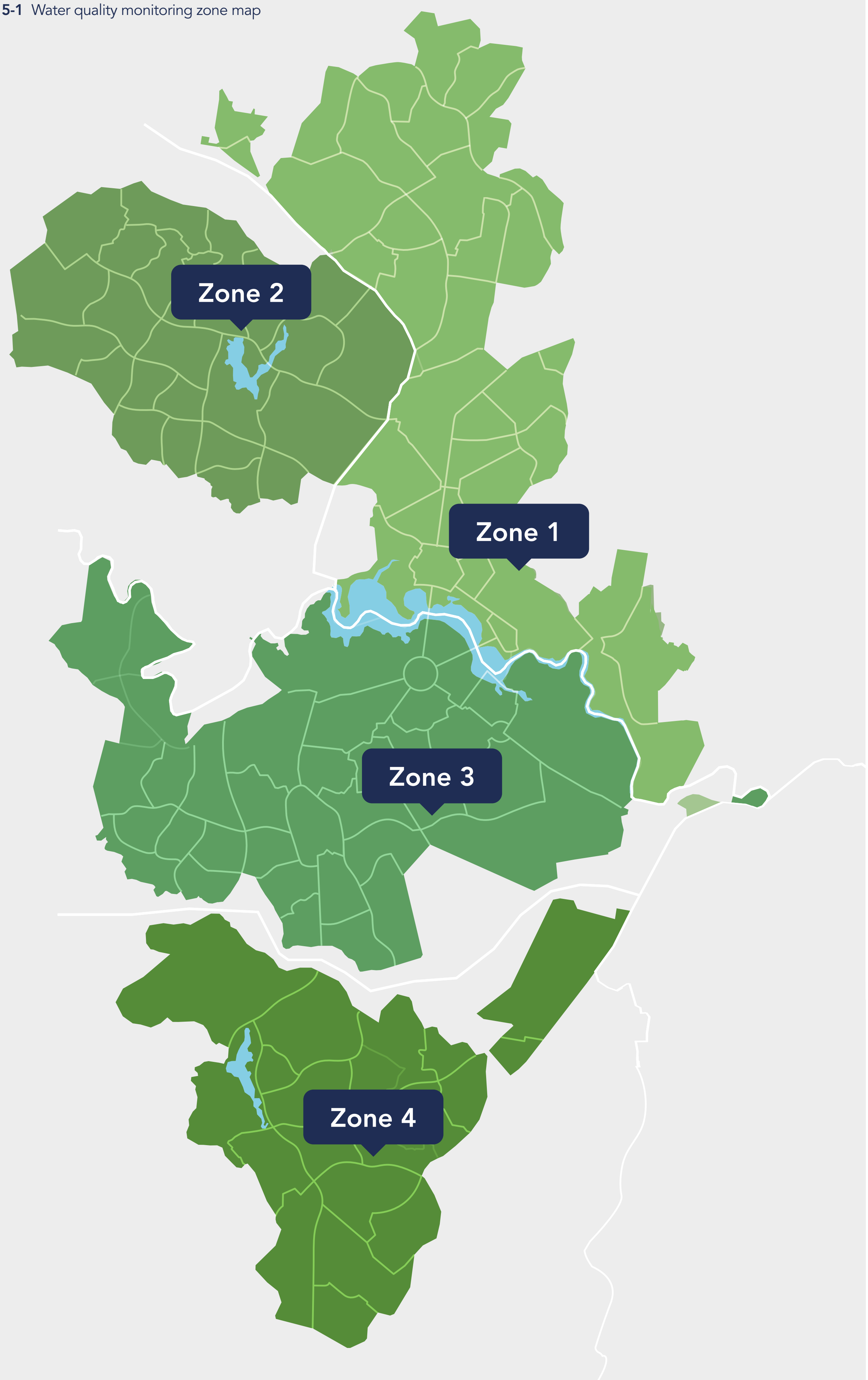
In addition to the physical barriers, a free chlorine concentration is maintained within the water distribution system to protect against microbiological contamination of the water during its journey from the WTP via the service reservoirs to the customer's tap.

The Canberra distribution system is divided into four water quality supply zones based on population, hydraulic characteristics and geography. These zones are used in Icon Water operations to assess the quality of drinking water supplied to the customer's tap.

- **Water quality zone 1**
  North Canberra and Gungahlin
- **Water quality zone 2**
  Belconnen
- **Water quality zone 3**
  South Canberra, Woden and Weston Creek
- **Water quality zone 4**
  Tuggeranong


Cotter rising main

**Figure 5-1** Water quality monitoring zone map




## Service reservoirs

In 2017–18, Icon Water operated 48 service reservoir sites located throughout Canberra. The reservoirs receive water from the WTPs via bulk supply and trunk mains and stored between 454 ML and 646 ML of water during 2017–18. All Canberra service reservoirs are secure structures to ensure the integrity of the distribution system is maintained and to prevent contamination from birds and animals.

Regular inspections are carried out to assess their external condition and the security of the site. Reservoir cleaning is also routinely undertaken with each reservoir being cleaned, on average, once every five years. During the cleaning process, the reservoir is emptied, assessed, cleaned, inspected internally and maintenance performed as required. The reservoir is subsequently disinfected and the water tested before being returned to service.

Frequent water quality monitoring occurs at each reservoir, which includes analysis for a range of parameters to verify that the water quality complies with the ADWG and to optimise system operations. A summary of water quality analysis undertaken at the service reservoirs across all four water quality supply zones is presented in the Table 5-1.

**Table 5-1** Water quality at service reservoirs

| Parameter | | Units | ADWG | ADWG | Service reservoirs |
|---|---|---|---|---|---|
| | | | Health value | Aesthetic value | Mean result |
| *Escherichia coli (E. coli)* | | MPN/100 mL | <1 | - | <1 |
| Total coliforms | | MPN/100 mL | - | - | <1 |
| Heterotrophic plate count | | CFU/mL | - | - | 2.6 |
| Chlorine | Free | mg/L | - | - | 0.71 |
| | Total | mg/L | 5 | 0.6 | 0.78 |
| pH | | pH units | - | 6.5-8.5 | 7.7 |
| Temperature | | Degrees Celsius | - | | 16 |

- no current ADWG health or aesthetic value

## Supply to customers' taps

As part of the commitment to provide high quality water, Icon Water undertakes a comprehensive routine drinking water quality monitoring program based on the ADWG to verify the water quality throughout the distribution system. During 2017–18, a minimum of 100 random customer garden taps were monitored on a monthly basis from a group in excess of 400 sites throughout Canberra suburbs. Garden taps are used as they are easily accessible and provide static sample points in the distribution system, allow for historical data acquisition and enable verification of the actual water received by customers. A range of microbiological, chemical and physical parameters are tested and these are summarised in Table 5-2.

Ensuring that safe and aesthetically pleasing water is delivered to customers is a priority to Icon Water. This was reflected in the 2018 customer satisfaction survey which found that 94 per cent of residential customers are satisfied with the quality of tap water provided by Icon Water.

**Table 5-2** Parameters monitored at customers' taps

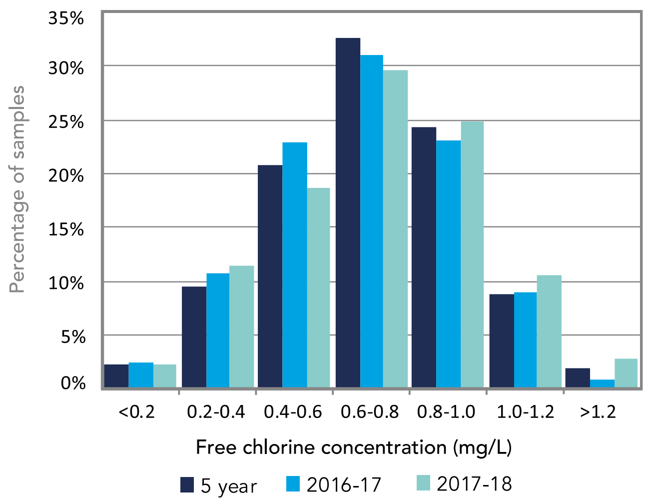
| Microbiological | Physical | Chemical |
|---|---|---|
| *Escherichia coli (E. coli)* | Conductivity | Alkalinity |
| Heterotrophic bacteria | pH | Anions |
| | Total dissolved solids | Chlorine |
| | True Colour | Fluoride |
| | Turbidity | Haloacetic acids |
| | Asbestos | Hardness |
| | | Metals |
| | | Trihalomethanes (THM) |
| | | Semi-Volatile Organic Compounds (SVOC) |

## Disinfection in the distribution system

Chlorine is added to water in the final stages of treatment at Mount Stromlo and Googong WTPs. Water entering the distribution system needs to contain an appropriate free chlorine concentration, termed disinfection residual, when delivered to customers' taps. This ensures that chlorine continues to provide protection against microbiological contamination in the distribution system. Chlorine and bacterial levels are frequently monitored in the distribution system.

In 2017–18, the concentrations of free chlorine at customers' taps across all four water quality supply zones were below the ADWG health guideline level (5 mg/L). The concentrations ranged from <0.03 mg/L to 1.76 mg/L. The distribution of chlorine results for customer taps across all four water supply zones is shown in Figure 5-2.

**Figure 5-2** Free chlorine concentration at customers' taps




## Microbiological monitoring

The WTPs are designed to remove any potential microbiological contaminants prior to distribution to customers; however, as the water moves through the water distribution system there remains a small potential for re-contamination. Therefore, a chlorine residual is maintained within the system to provide ongoing disinfection potential.

Icon Water conducts verification monitoring of *E. coli* (faecal indicator) at customers' taps to ensure the water supplied is free from microbiological contamination. The ADWG suggests that *E. coli* should not be detected in a minimum 100 mL sample of drinking water.

During 2017–18, 100 per cent of samples returned no detections of *E. coli* across all four water quality supply zones.

## Physical and chemical monitoring

Icon Water monitors a wide range of both physical and chemical parameters as part of the customer tap water quality monitoring program. Detailed information for a selection of these parameters is provided below. Results for all parameters monitored are displayed in Section 9.

### pH

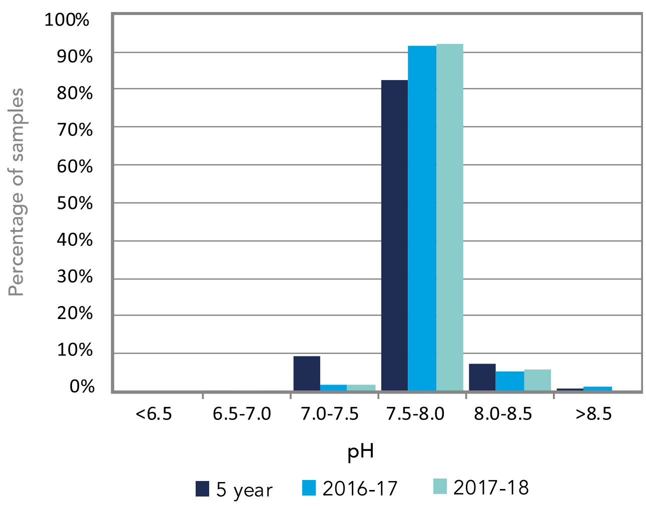
pH of drinking water generally increases as it travels through the distribution system due to leaching of lime from cement lined pipes and concrete service reservoirs. This increase is generally proportional to the detention time of the water within the distribution system.

The buffering capacity of water at the WTPs has continued to provide a positive impact on management of pH within the distribution system. An ADWG aesthetic pH value in the range of 6.5 to 8.5 is optimal for water supply systems. The upper limit of 8.5 is set to minimise the potential for taste problems or scaling of water pipelines, however this is not of particular concern in Canberra due to the low mineral content of the drinking water.

Chlorine disinfection is also affected by pH such that as pH increases the disinfection potential of chlorine decreases. However, as pH decreases the corrosion potential of the water increases, which may lead to increased levels of contaminants in the water, for example heavy metals, and cause damage to assets. It is therefore necessary to balance pH in the system to minimise corrosion while ensuring effective disinfection is maintained.

The distribution of pH results for customer taps across all four water supply zones is shown in Figure 5-3 and a summary of the results is listed in Table 5-3.

**Figure 5-3** pH at customers' taps

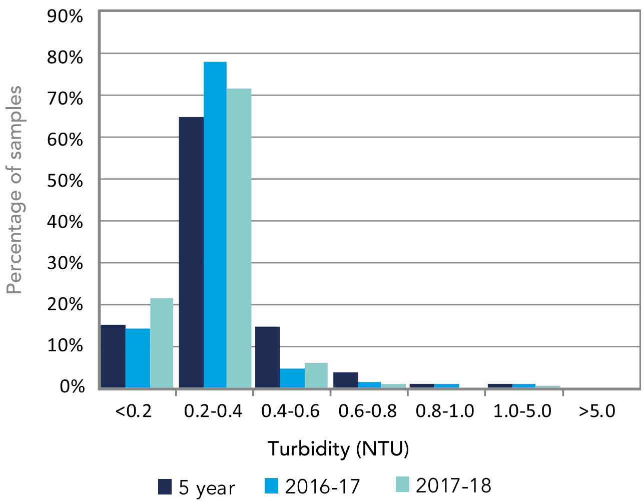


### Turbidity

Turbidity is a measurement of the suspended and dissolved particulates in water. The ADWG does not outline a health guideline; however the aesthetic value is 5 nephelometric turbidity units (NTU) – a level of turbidity that is just noticeable in a glass.

During 2017–18 the turbidity level at customers' taps was lower compared with previous years. The distribution of turbidity results for customer taps across all four water supply zones is shown in Figure 5-4 and a summary of the results are in Table 5-3.

**Figure 5-4** Turbidity at customers' taps




### Colour

Colour is mainly present in the raw water due to a range of natural organic compounds from small hydrophilic acids, proteins and amino acids to larger humic and fulvic acids. These compounds originate from organic matter through, or over which the water has passed in the catchment. The majority of natural organic matter is removed by coagulation in the water treatment process. The ADWG does not outline a health value, however the aesthetic guideline for apparent colour is based on what is just noticeable in a glass of water. Results are reported in platinum-cobalt units (Pt-Co) and the aesthetic guideline is 15 Pt-Co. A summary of the results are in Table 5-3.

## Metals

### Iron

Iron occurs naturally in raw water and can also be present in the water supply from the corrosion of iron or steel pipes, or other components of a plumbing system. Icon Water undertakes an annual mains renewal program to replace sections of corroded pipe, which helps lower metal concentrations.

The ADWG states that 'insufficient data are available to determine a health-based guideline value for iron in drinking water'. The ADWG aesthetic guideline value for iron is 0.3 mg/L, which is based on the taste threshold in water. A summary of the results are in Table 5-3.

### Manganese

Water percolating through soil and rocks can dissolve minerals that contain manganese. The ADWG health guideline value for manganese is 0.5 mg/L. Levels above the ADWG aesthetic guideline level of 0.1 mg/L can cause an undesirable taste and stain clothes during washing.

At concentrations above 0.1 mg/L, manganese can also contribute to the formation of biofilms on the inside of pipes, which may detach during high flows and appear as black particles. A summary of the results are in Table 5-3.

### Copper

Copper is found naturally in raw water, generally in low concentrations. Drinking water from customers' taps may contain higher levels of copper if the water has been in contact with copper plumbing and fixtures. Copper levels may increase if water stagnates in the plumbing system for long periods; for example, during holidays when residents may be away from home for an extended time. Water which contains a high level of copper often has a blue – green appearance.

The ADWG sets an aesthetic limit of 1 mg/L for copper based on the potential for staining. Copper should not exceed 2 mg/L for health considerations. The guidelines state that 'water that has been in stagnant contact (six hours or more) with copper pipes and fittings should not be used in the preparation of food and drink'. A summary of the results are in Table 5-3.

**Table 5-3** pH at customers' taps

| Parameter | Units | ADWG Health value | ADWG Aesthetic value | Minimum concentration | Maximum concentration | Mean concentration | ADWG compliance Health value |
|---|---|---|---|---|---|---|---|
| pH | pH units | - | 6.5 - 8.5 | 6.82 | 8.91 | 7.78 | - |
| Colour | Pt-Co | - | 15 | <1 | 7 | 1 | - |
| Turbidity | NTU | - | 5 | <0.1 | 1.4 | 0.2 | - |
| Iron | mg/L | - | 0.3 | <0.01 | 0.06 | <0.01 | - |
| Manganese | mg/L | 0.5 | 0.1 | <0.001 | 0.051 | 0.005 | ✓ |
| Copper | mg/L | 2 | 1 | 0.001 | 0.085 | 0.012 | ✓ |
| Fluoride | mg/L | 1.5 | - | 0.22 | 0.81 | 0.70 | ✓ |

## Fluoride

Fluoride is added to Canberra's drinking water supply at the WTPs prior to distribution to our customers. Icon Water adds fluoride to Canberra's drinking water as directed by ACT Health under the *Drinking Water Utility Licence* at concentrations between 0.6 mg/L and 1.1 mg/L.

During 2017–18 the average fluoride concentration in the drinking water at customers' taps was 0.7 mg/L. A summary of the results is presented in Table 5-3.

## Other compounds

Other substances that Icon Water monitors in the distribution system include a range of semi volatile organic compounds (SVOC). SVOCs include chemicals such as plasticisers and hydrocarbons. Plasticisers are used in a broad range of products including food packaging, whilst hydrocarbons are utilised in an array of industrial applications. Icon Water monitors for these compounds within the distribution system in line with the ADWG.

All routine monitoring results for these compounds were below the limit of reporting (i.e. not detected) during 2017–18. Full results are presented in Section 9.

> “In 2018 there was an average of 312L of water used per person per day across Canberra.”

# 6 Common water quality problems

During 2017–18, enquiries and complaints were recorded along with the actions taken to rectify any problem. A meaningful response was provided for all customer complaints and enquiries that required customer resolution. Icon Water manages approximately 179,000 connections to the water network in the ACT. Occasionally customers experience problems with the quality of their water supply and contact Icon Water for advice. Any concerns expressed by the community are investigated to determine the likely cause and, if required, corrective actions are taken.

Often issues related to water quality are short-term and may be associated with water main bursts, network renewal or expansion, maintenance work or a change in usage patterns within the water supply system. Valve operations required for maintenance work may reverse the direction of flow of water, causing shearing of pipe surfaces, which may result in discoloured water. Where customers are likely to be affected by planned maintenance activities, Icon Water endeavours to notify customers in advance.

During 2017–18 a total of 134 water quality complaints were received, representing a 21 per cent reduction compared with the number of complaints received in 2016–17. Of the 134 complaints 40 per cent of the cases were related to discoloured water. A summary of the types of complaints received are detailed in Figure 6-1 and Table 6-1.

Icon Water uses feedback from the community relating to water quality and network reviews following discoloured water events to better understand the network and the impact that our operations have on network performance. All complaints are taken seriously and we value feedback about our product.

**Figure 6-1** Summary of water quality issues

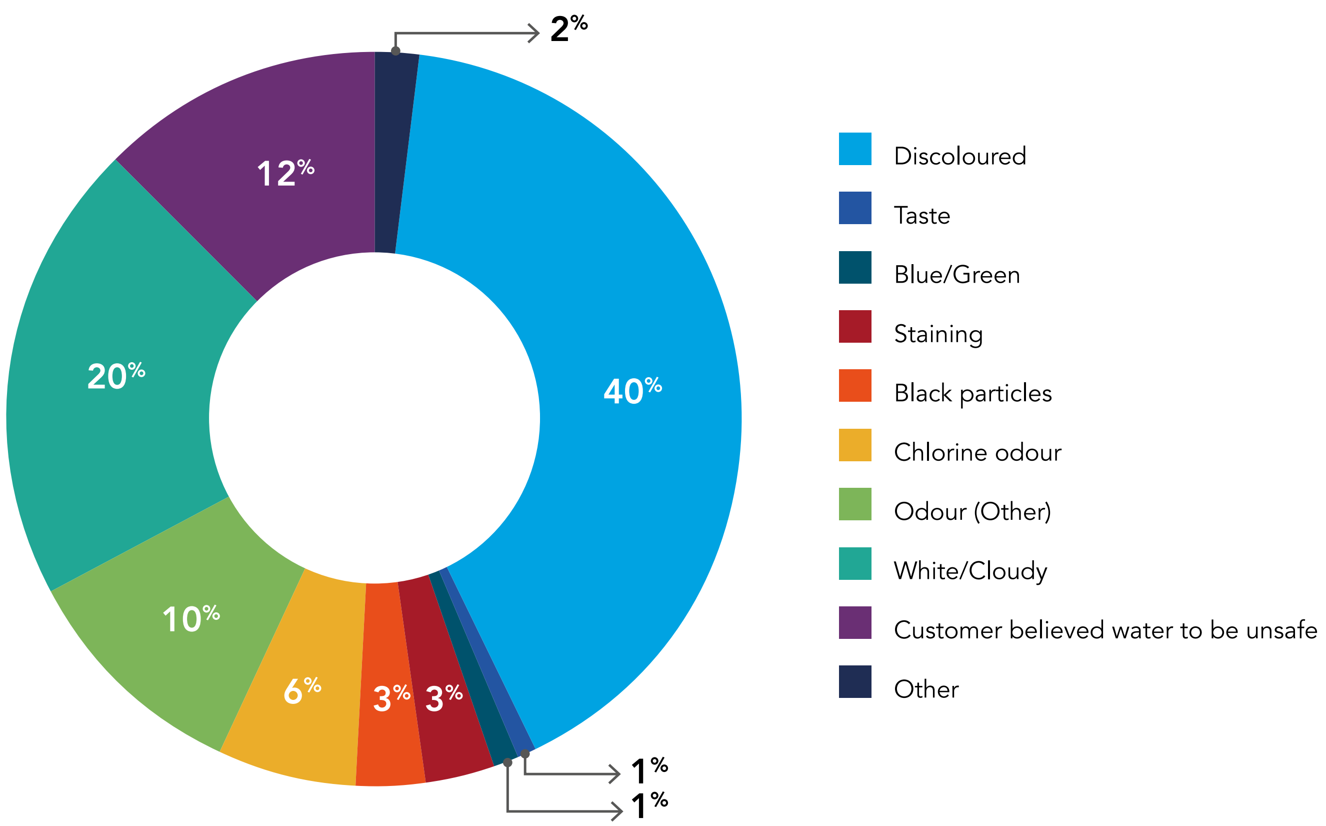


**Table 6-1** Summary of water quality issues requiring customer resolution

| Complaint | Frequency | Comments |
|---|---|---|
| Discoloured | 54 | Discoloured water is most often associated with maintenance work or a change in usage patterns but may also be associated with internal plumbing. Discoloured water resulting from maintenance work generally clears within a short period, however if a customer continues to experience problems Icon Water may flush the mains to minimise further inconvenience. |
| White/cloudy | 2 | This usually presents as cloudy water resulting from air bubbles generated by flushing of the mains, hot water units or aerators on taps. If this does not clear over a short period of time the customer is invited to contact Icon Water for further advice. |
| Blue/green | 2 | Blue or green water can often be associated with the corrosion of copper pipes. |
| Staining | 4 | Deposits dislodged from domestic plumbing or from the water main can cause staining of washing. |
| Black particles | 4 | Black particles may originate from degrading plumbing fittings such as flexible rubber hoses, flick-mixers, rubber washers and internal hot water system components. |
| Chlorine odour | 8 | Chlorination is necessary for the disinfection of the water supply. Usually these enquiries relate to a change (increase) in the level of chlorine that a customer is receiving. These problems are usually aesthetic and short-term. |
| Odour (other) | 14 | Miscellaneous odour enquires are investigated individually. These problems are usually short-term. |
| Taste | 27 | Miscellaneous taste enquiries are investigated individually. This also includes bitter and metallic tastes experienced by customers. |
| Customer believed water to be unsafe | 16 | Customers may raise concern that the water is unsafe to drink. In most cases water is tested by an independent laboratory to ensure compliance with the Australian Drinking Water Guidelines. |
| Other | 3 | Issues not otherwise categorised. |
| TOTAL | 134 | |

# 7 Icon Water and ACT Health

Icon Water complies with the *Public Health (Drinking Water) Code of Practice (2007)* (the Code) which was issued by ACT Health. Copies of the Code are available from the ACT Health website at health.act.gov.au.

The Code sets out operational, communication, reporting and response requirements for both Icon Water and ACT Health to ensure the supply of safe drinking water. The Code also sets out specific water quality events or incidents that Icon Water must notify to ACT Health.

During 2017–18, a number of notifications to ACT Health were issued. These notifiable incidents are captured in Table 7-1.

**Table 7-1** Summary of notifications and action taken by Icon Water

| Source | Date | Criteria | Incident and Action Taken |
|---|---|---|---|
| Water within the distribution system at customer point of supply | 12/12/17 | *E. coli* | *E. coli* was detected in a sample collected at a feed to a service reservoir. Icon Water contacted the potentially affected customer.<br>Additional samples collected confirmed the original *E. coli* detection. In response, the dose rate of a locally installed chlorination system was increased.<br>The investigation into the cause of the detection suggests that the presence may be due to a contaminated service reservoir. Further analysis showed that the issue was localised and results returned to normal. |
| Water within the distribution system at customer point of supply | 12/01/18 | Cross connection | Due to a raw water cross connection within the treated water system, raw water was supplied via a treated water main to a small number of customers. As soon as the cross connection was identified, it was reversed and the affected customers were notified and offered bottled water. The system was flushed to restore water supply. Samples were collected to verify the quality of the water had returned to within specification.<br>An independent investigation of this incident identified appropriate engineering and administrative controls to remove potential cross connections where possible and to ensure that controllable human factors are addressed.<br>The majority of these actions have already been implemented, including the removal of the cross connection valve which allowed this incident to occur. |
| Mount Stromlo WTP | 23/01/18 | Failure of UV lamp at Mount Stromlo WTP | A power surge at the Mount Stromlo WTP resulted in excessive flow through the UV treatment train, causing two UV lamps to break.<br>The WTP was shut down and immediately isolated from the town supply. Googong WTP was started to ensure continuity of supply. The system was subsequently drained and cleaned prior to bringing the WTP back online.<br>A root cause analysis was undertaken and automation modifications were implemented that provide additional control logic safeguards against this type of event. |
| Water within the distribution system at customer point of supply | 30/01/18 | *E. coli* | *E. coli* was detected in a sample collected at a feed to a service reservoir. Icon Water contacted the potentially affected customer.<br>An immediate retest of the original sample and a resample of the site was arranged. In both the retest and resample there was no detection of *E. coli*. Further investigation found no unusual microbiological results detected at nearby sample points. |
| Raw water in the storage reservoir | 26/04/18 | Cyanobacteria | High risk cyanobacteria, *Dolicospermum*, was detected at concentrations of 10,445 cells/mL and 2,303 cells/mL in surface samples at two sites. Each site is located at an inlet to the Googong reservoir, upstream of the Googong intake tower. Googong Water Treatment Plant was offline at the time of sampling.<br>Water quality monitoring continued at the storage reservoir as per the routine monitoring program. Data from the program was used to determine whether additional treatment would be required in the event the plant came online. |


553
552
551
550

# Managing Canberra's water quality into the future



Icon Water is committed to the continuous improvement of water quality management practices. The Strategic Water Quality Improvement Plan summarises the drinking water quality improvement activities proposed or underway throughout the ACT water supply system that address identified strategic risks associated with drinking water supply.

There are no systemic issues that result in poor quality treated water within Icon Water's supply system and as such the majority of the current and proposed water quality improvement projects relate to maintenance, risk management, or continual improvement. Many of these are longer term projects and updates on the status of these projects along with any new projects are outlined in this plan. A selection of projects from 2017–18 and those underway in 2018–19 are detailed below.

## Future water quality issues

There are a number of policies, plans and projects (proposed or underway) by third parties within or near our catchments that could impact on water quality. Icon Water maintains an active interest in these developments to ensure we can continue to adequately protect our water quality into the future.

## Water quality risk management

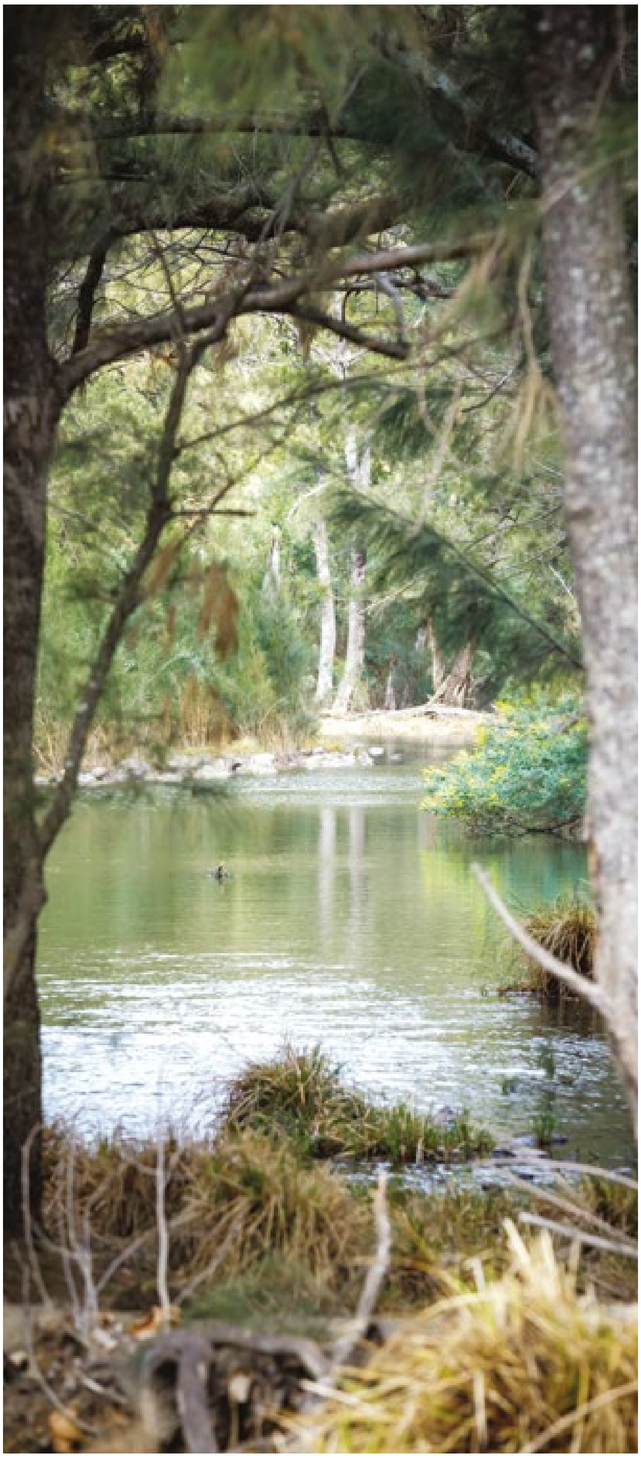
### Health based targets

It is anticipated that the National Health and Medical Research Council (NHMRC) will introduce health based targets (HBTs) for microbial drinking water quality in the next revision of the ADWG.

In early 2018 the NHMRC released for consultation a draft revision to the Australian Drinking Water Guidelines: Chapter 5 Microbial Quality of Drinking Water, incorporating a microbial health based target. Icon Water provided a submission to the NHMRC in response to the draft chapter released for consultation.

This chapter was developed in response to a draft methodology released by the Water Services Association of Australia (WSAA) for performing HBT assessments of source waters and water treatment plants. The approach considers the performance of the water treatment plant in relation to the condition of the catchments and where it sits on the 'Water Safety Continuum'.

Icon Water has trialled the methodology developed by WSAA on the Googong Water Treatment Plant direct filtration stream. The WTP met the target requirement, placing the direct filtration stream of the plant in the 'safe' part of the continuum. Icon Water will conduct assessments of all supplies once HBTs are introduced.



# Source water protection

## Source Water Protection Strategy

The Source Water Protection Strategy sets out Icon Water's approach to ensure high quality raw water supplies are available for the treatment and supply of drinking water to the community through the three approaches outlined below.

**Monitoring and surveillance**

**Maintain and communicate** awareness of catchment condition by collating data, information and analysis.

**Risk management**

**Identify and assess risk** to water catchment health and develop appropriate mitigation and management controls.

**Stakeholder engagement**

**Build partnerships** with stakeholders and land managers to ensure appropriate planning and management of activities.

# Water treatment plants

## Googong WTP Clarifier System Asset Renewal

Clarification is an important stage of the water treatment process and is recognised as a critical control point under Icon Water's HACCP-based drinking water quality management system. The Googong WTP clarifiers have been in service for many years and much of the equipment is nearing the end of its anticipated service life. Planning is underway to investigate options to remediate or replace the clarifiers and ensure the process will continue to operate well into the future.

## Chlorine dosing system upgrades

Chlorine dosing is also recognised as a critical control point in Icon Water's HACCP-based drinking water quality risk management system. The chlorine system is critical to the operation of the WTPs and ensures disinfection is continued into the water distribution system. This project has provided renewal of aged assets and upgrades to the existing systems at both the Mount Stromlo and Googong WTPs to ensure their ongoing serviceability and reliability. The upgrade of the chlorine system at the Googong WTP and the Stromlo WTP was completed in 2017.

# Distribution system

## Adoption of the WSAA Codes

Icon Water identified that the adoption of water and sewage WSAA Codes would improve the management of Icon Water's assets and better align with the rest of the urban water industry.

A gap analysis was performed between Icon Water's current standards and the WSAA Codes. The information from this assessment led to several adjustments to our current standards to facilitate the transition to the new codes. The adoption of the WSAA Codes required the creation of new Icon Water specific clauses and drawings. Throughout the project there was extensive consultation with internal and external stakeholders. Transition to the new standards occurred during the first half of 2018.

## Network Chlorine Residual Improvement

Chlorine disinfection is an integral part of the water treatment process at Icon Water's Mount Stromlo and Googong water treatment plants. Water leaving the WTPs is dosed with a suitable quantity of chlorine to provide disinfection and to maintain a residual chlorine level in the distribution system. Maintaining chlorine residual in the distribution system is important to safeguard the drinking water from possible contamination after the completion of the treatment process.

To improve the chlorine residual across the distribution system and address a number of service reservoirs that have difficulty maintaining an adequate chlorine residual, a project is being considered to model the entire system. The information from the model will identify the root causes of the issues and inform the development of targeted solutions for each reservoir in order to address the maintenance of chlorine residual across the entire distribution system.


# 9 Laboratory analysis

Icon Water contracts ALS Global to collect and analyse drinking water samples. The monitoring program is defined by a Service Level Agreement, which is revised annually to reflect Icon Water's changing needs and priorities.

ALS Global operates a NATA-registered laboratory. NATA provides specific technical evaluation combined with international recognition by its overseas counterparts, enabling laboratories accredited by NATA to be recognised worldwide.

As part of its NATA registration, ALS Global participates in regular audits and proficiency testing whereby results for identical samples are compared with other NATA-registered laboratories. The most recent NATA audits were carried out in the chemistry area in March 2017 and in the biological area in March 2018. The facility complies with the criteria of NATA Policy Circular 1 – Corporate Accreditation.

A summary of the laboratory analysis completed for the customer tap water quality monitoring program is presented in the following tables.

- Table 9-1 Summary data for all water quality zones
- Table 9-2 Summary data for water quality zone 1: North Canberra and Gungahlin
- Table 9-3 Summary data for water quality zone 2: Belconnen
- Table 9-4 Summary data for water quality zone 3: South Canberra, Woden and Weston Creek
- Table 9-5 Summary data for water quality zone 4: Tuggeranong

**Table 9-1** Summary data for all water quality zones

| Analyte | Method ID | Units | ADWG (Health) | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| **Microbiological** | | | | | | | | | |
| *E. coli* | APHA 9223 B | MPN/100mL | <1 | <1 | 1,205 | <1 | <1 | <1 | <1 |
| Total coliforms | APHA 9223 B | MPN/100mL | - | <1 | 1,205 | <1 | 53 | <1 | <1 |
| Heterotrophic plate count | APHA 9215 B | CFU/mL | - | <1 | 1,205 | <1 | 243,000 | 204 | 4 |
| **Physical** | | | | | | | | | |
| Conductivity | APHA 2510 B | µS/cm | - | <2 | 120 | 84 | 175 | 118 | 172 |
| pH | APHA 4500-H B | pH units | - | <0.01 | 1,205 | 6.82 | 8.91 | 7.78 | 8.03 |
| Temperature | APHA 4500-H B | deg.C | - | <0.1 | 240 | 7.0 | 26.0 | 16.6 | 24.0 |
| Total dissolved salts | APHA 2540 C | mg/L | - | <20 | 120 | 31 | 124 | 77 | 117 |
| True colour | Lachat QuikChem Method, Colour in Waters 10-308-00-1-A | Pt-Co | - | <1 | 240 | <1 | 7 | 1 | 2 |
| Turbidity | APHA 2130 B | NTU | - | <0.1 | 240 | <0.1 | 1.4 | 0.2 | 0.5 |
| **Inorganic** | | | | | | | | | |
| Alkalinity bicarb | APHA 2320 A/B | mg/L | - | <0.1 | 240 | 33.0 | 57.7 | 43.8 | 50.0 |
| Alkalinity carb | APHA 2320 A/B | mg/L | - | <0.1 | 240 | <0.1 | 9.0 | 0.1 | <0.1 |
| Alkalinity hydrox | APHA 2320 A/B | mg/L | - | <0.1 | 240 | <0.1 | <0.1 | <0.1 | <0.1 |
| Alkalinity total | APHA 2320 A/B | mg/L | - | <1 | 240 | 33 | 58 | 44 | 50 |
| Aluminium acid soluble | USEPA 200.8 | µg/L | - | <5 | 120 | 10 | 79 | 31 | 44 |
| Asbestos | AS4964-2000 | Present/ Absent | - | Absent | 48 | Absent | Absent | - | - |
| Calcium dissolved | USEPA 200.7 | mg/L | - | <0.05 | 120 | 10.30 | 18.20 | 13.94 | 17.81 |
| Chloride | APHA 21st Ed. 2005, Part 4110 B | mg/L | - | <0.1 | 48 | 2.5 | 9.9 | 5.3 | 7.7 |
| Chlorine combined | APHA 4500 -CL G | mg/L | - | <0.03 | 1,205 | <0.03 | 0.32 | 0.07 | 0.17 |
| Chlorine free | APHA 4500 -CL G | mg/L | - | <0.03 | 1,206 | <0.03 | 1.76 | 0.72 | 1.14 |
| Chlorine total | APHA 4500 -CL G | mg/L | 5 | <0.03 | 1,205 | 0.05 | 1.88 | 0.79 | 1.20 |
| Cyanide | APHA 4500_CN | mg/L | 0.08 | <0.004 | 48 | <0.004 | <0.004 | <0.004 | <0.004 |
| Fluoride | APHA 21st Ed. 2005, Part 4110 B | mg/L | 1.5 | <0.1 | 120 | 0.22 | 0.81 | 0.70 | 0.79 |
| Hardness total | APHA 2340 B | mg/L | - | <0.1 | 120 | 30.0 | 61.0 | 42.4 | 59.0 |
| Iodide | VIC-CM078 | mg/L | 0.5 | <0.01 | 48 | <0.01 | 0.025 | <0.01 | 0.025 |
| Magnesium dissolved | USEPA 200.7 | mg/L | - | <0.05 | 120 | 0.76 | 4.35 | 1.83 | 4.19 |
| Nitrate | APHA 21st Ed. 2005, Part 4110 B | mg/L | 50 | <0.1 | 48 | <0.1 | 0.2 | <0.1 | 0.1 |
| Potassium dissolved | USEPA 200.7 | mg/L | - | <0.1 | 48 | 0.4 | 1.9 | 0.9 | 1.8 |
| Sodium dissolved | USEPA 200.7 | mg/L | - | <0.1 | 48 | 2.7 | 8.4 | 4.6 | 8.3 |
| Sulphate | APHA 21st Ed. 2005, Part 4110 B | mg/L | 500 | <0.4 | 48 | <0.4 | 24.8 | 8.1 | 24.3 |
| **Total Metals** | | | | | | | | | |
| Aluminium total | USEPA 200.8 | µg/L | - | <9 | 120 | 16 | 131 | 40 | 77 |
| Antimony total | USEPA 200.8 | µg/L | 3 | <3 | 120 | <3 | <3 | <3 | <3 |
| Arsenic total | USEPA 200.8 | µg/L | 10 | <1 | 120 | <1 | 2 | <1 | <1 |
| Barium total | USEPA 200.8 | µg/L | 2000 | <2 | 120 | 2.6 | 7.9 | 4.5 | 6.7 |
| Beryllium total | USEPA 200.8 | µg/L | 60 | <0.1 | 120 | <0.1 | 0.2 | <0.1 | 0.1 |
| Boron total | USEPA 200.7 | mg/L | 4 | <0.01 | 48 | <0.01 | 0.01 | <0.01 | 0.01 |
| Cadmium total | USEPA 200.8 | µg/L | 2 | <0.05 | 120 | <0.05 | 0.18 | <0.05 | <0.05 |
| Chromium total | USEPA 200.8 | µg/L | - | <2 | 120 | <2 | 3 | <2 | <2 |
| Cobalt total | USEPA 200.8 | µg/L | - | <0.2 | 120 | <0.2 | 0.5 | <0.2 | 0.2 |
| Copper total | USEPA 200.8 | µg/L | 2000 | <1 | 240 | 1 | 85 | 12 | 29 |
| Iron total | USEPA 200.7 | mg/L | - | <0.01 | 240 | <0.01 | 0.06 | <0.01 | 0.02 |
| Lead total | USEPA 200.8 | µg/L | 10 | <0.2 | 240 | <0.2 | 2.2 | 0.2 | 0.5 |
| Manganese total | USEPA 200.7 | mg/L | 0.5 | <0.001 | 240 | <0.001 | 0.051 | 0.005 | 0.014 |

Table 9-1 Summary data for all water quality zones (cont.)

| Analyte | Method ID | Units | ADWG (Health) | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Mercury total | USEPA 200.8 | µg/L | 1 | <0.1 | 48 | <0.1 | <0.1 | <0.1 | <0.1 |
| Molybdenum total | USEPA 200.8 | µg/L | 50 | <1 | 120 | <1 | 6 | <1 | <1 |
| Nickel total | USEPA 200.8 | µg/L | 20 | <1 | 120 | <1 | 6 | 1 | 2 |
| Selenium total | USEPA 200.8 | µg/L | 10 | <1 | 120 | <1 | 5 | <1 | 1 |
| Silver total | USEPA 200.8 | µg/L | 100 | <1 | 120 | <1 | <1 | <1 | <1 |
| Zinc total | USEPA 200.8 | µg/L | - | <5 | 120 | <5 | 19 | <5 | <5 |
| **Haloacetic acids** | | | | | | | | | |
| Bromoacetic acid | ALS: Headspace GCMS | µg/L | - | <5 | 120 | <5 | 34 | <5 | <5 |
| Bromochloroacetic acid | ALS: Headspace GCMS | µg/L | - | <1 | 120 | <1 | 20 | 2 | 5 |
| Bromodichloroacetic acid | ALS: Headspace GCMS | µg/L | - | <1 | 120 | <1 | 9 | 2 | 6 |
| Dibromoacetic acid | ALS: Headspace GCMS | µg/L | - | <1 | 120 | <1 | 7 | <1 | <1 |
| Dibromochloroacetic acid | ALS: Headspace GCMS | µg/L | - | <10 | 120 | <10 | <10 | <10 | <10 |
| Dichloroacetic acid | ALS: Headspace GCMS | µg/L | 100 | <1 | 120 | <1 | 38 | 19 | 33 |
| Monochloroacetic acid | ALS: Headspace GCMS | µg/L | 150 | <1 | 120 | <1 | 3 | 1 | 2 |
| Tribromoacetic acid | ALS: Headspace GCMS | µg/L | - | <10 | 120 | <10 | <10 | <10 | <10 |
| Trichloroacetic acid | ALS: Headspace GCMS | µg/L | 100 | <1 | 120 | 12 | 52 | 29 | 44 |
| Sum of haloacetic acid | ALS: Headspace GCMS | µg/L | - | <1 | 120 | 26 | 97 | 53 | 87 |
| **Trihalomethanes** | | | | | | | | | |
| Bromoform | VIC-CM047 | mg/L | - | <0.001 | 120 | <0.001 | 0.003 | <0.001 | <0.001 |
| Chloroform | VIC-CM047 | mg/L | - | <0.001 | 120 | <0.001 | 0.090 | 0.044 | 0.075 |
| Dibromochloromethane | VIC-CM047 | mg/L | - | <0.001 | 120 | <0.001 | 0.001 | <0.001 | <0.001 |
| Dichlorobromomethane | VIC-CM047 | mg/L | - | <0.001 | 120 | 0.001 | 0.040 | 0.005 | 0.011 |
| Trihalomethanes total | VIC-CM047 | mg/L | 0.25 | <0.001 | 120 | 0.023 | 0.100 | 0.049 | 0.087 |
| **Semi volatile organic compounds (SVOC)** | | | | | | | | | |
| **Anilines and benzidines** | | | | | | | | | |
| 2 Nitroaniline | US EPA 3510/8270 | µg/L | - | <4 | 120 | <4 | <4 | <4 | <4 |
| 3 Nitroaniline | US EPA 3510/8270 | µg/L | - | <4 | 120 | <4 | <4 | <4 | <4 |
| 3,3 Dichlorobenzidine | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| 4 Chloroaniline | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| 4 Nitroaniline | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Aniline | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Carbazole | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Dibenzofuran | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| **Chlorinated hydrocarbons** | | | | | | | | | |
| 1,2 Dichlorobenzene | US EPA 3510/8270 | µg/L | 1500 | <2 | 120 | <2 | <2 | <2 | <2 |
| 1,2,4 Trichlorobenzene | US EPA 3510/8270 | µg/L | 30 | <2 | 120 | <2 | <2 | <2 | <2 |
| 1,3 Dichlorobenzene | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| 1,4 Dichlorobenzene | US EPA 3510/8270 | µg/L | 40 | <2 | 120 | <2 | <2 | <2 | <2 |
| Hexachlorobenzene | US EPA 3510/8270 | µg/L | - | <4 | 120 | <4 | <4 | <4 | <4 |
| Hexachlorobutadiene | US EPA 3510/8270 | µg/L | 0.7 | <2 | 120 | <2 | <2 | <2 | <2 |
| Hexachlorocyclopentadiene | US EPA 3510/8270 | µg/L | - | <10 | 120 | <10 | <10 | <10 | <10 |
| Hexachloroethane | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Hexachloropropylene | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |

Table 9-1 Summary data for all water quality zones (cont.)

| Analyte | Method ID | Units | ADWG (Health) | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Pentachlorobenzene | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| **Haloethers** | | | | | | | | | |
| 4 Bromophenyl phenyl ether | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| 4 Chlorophenyl phenyl ether | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Bis(2-chloroethoxy) methane | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Bis(2-chloroethyl) ether | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| **Nitroaromatics and Ketones** | | | | | | | | | |
| 1 Naphthylamine | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| 1,3,5 Trinitrobenzene | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| 2 Picoline | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| 2,4 Dinitrotoluene | US EPA 3510/8270 | µg/L | - | <4 | 120 | <4 | <4 | <4 | <4 |
| 2,6 Dinitrotoluene | US EPA 3510/8270 | µg/L | - | <4 | 120 | <4 | <4 | <4 | <4 |
| 4 Aminobiphenyl | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| 4 Nitroquinoline-N-oxide | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| 5 Nitro-o-toluidine | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Acetophenone | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Azobenzene | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Chlorobenzilate | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Dimethylaminoazobenzene | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Isophorone | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Nitrobenzene | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Pentachloronitrobenzene | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Phenacetin | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Pronamide | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| **Nitrosamines** | | | | | | | | | |
| Methapyrilene | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| N-Nitrosodibutylamine | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| N-Nitrosodiethylamine | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| N-Nitrosodi-n-propylamine | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| N-Nitrosodiphenyl & Diphenylamine | US EPA 3510/8270 | µg/L | - | <4 | 120 | <4 | <4 | <4 | <4 |
| N-Nitrosomethylethylamine | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| N-Nitrosomorpholine | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| N-Nitrosopiperidine | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| N-Nitrosopyrrolidine | US EPA 3510/8270 | µg/L | - | <4 | 120 | <4 | <4 | <4 | <4 |
| **Organochlorine Pesticides** | | | | | | | | | |
| 4,4 DDD | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| 4,4 DDE | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| 4,4 DDT | US EPA 3510/8270 | µg/L | 9 | <4 | 120 | <4 | <4 | <4 | <4 |
| Aldrin | US EPA 3510/8270 | µg/L | 0.3 | <2 | 120 | <2 | <2 | <2 | <2 |
| alpha BHC | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| alpha Endosulfan | US EPA 3510/8270 | µg/L | 20 | <2 | 120 | <2 | <2 | <2 | <2 |
| beta BHC | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| beta Endosulfan | US EPA 3510/8270 | µg/L | 20 | <2 | 120 | <2 | <2 | <2 | <2 |
| delta BHC | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Dieldrin | US EPA 3510/8270 | µg/L | 0.3 | <2 | 120 | <2 | <2 | <2 | <2 |
| Endrin | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Endosulfan sulfate | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |

Table 9-1 Summary data for all water quality zones (cont.)

| Analyte | Method ID | Units | ADWG (Health) | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| gamma BHC | US EPA 3510/8270 | µg/L | 10 | <2 | 120 | <2 | <2 | <2 | <2 |
| Heptachlor | US EPA 3510/8270 | µg/L | 0.3 | <2 | 120 | <2 | <2 | <2 | <2 |
| Heptachlor epoxide | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| **Organophosphorous Pesticides** | | | | | | | | | |
| Chlorfenvinphos | US EPA 3510/8270 | µg/L | 2 | <2 | 120 | <2 | <2 | <2 | <2 |
| Chlorpyrifos | US EPA 3510/8270 | µg/L | 10 | <2 | 120 | <2 | <2 | <2 | <2 |
| Chlorpyrifos-methyl | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Diazinon | US EPA 3510/8270 | µg/L | 4 | <2 | 120 | <2 | <2 | <2 | <2 |
| Dichlorvos | US EPA 3510/8270 | µg/L | 5 | <2 | 120 | <2 | <2 | <2 | <2 |
| Dimethoate | US EPA 3510/8270 | µg/L | 7 | <2 | 120 | <2 | <2 | <2 | <2 |
| Ethion | US EPA 3510/8270 | µg/L | 4 | <2 | 120 | <2 | <2 | <2 | <2 |
| Fenthion | US EPA 3510/8270 | µg/L | 7 | <2 | 120 | <2 | <2 | <2 | <2 |
| Malathion | US EPA 3510/8270 | µg/L | 70 | <2 | 120 | <2 | <2 | <2 | <2 |
| Pirimiphos-ethyl | US EPA 3510/8270 | µg/L | 0.5 | <2 | 120 | <2 | <2 | <2 | <2 |
| Prothiofos | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| **Phenolic Compounds** | | | | | | | | | |
| 2,3,4,6 Tetrachlorophenol | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| 2,4 Dichlorophenol | US EPA 3510/8270 | µg/L | 200 | <2 | 120 | <2 | <2 | <2 | <2 |
| 2,4 Dimethylphenol | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| 2,4,5 Trichlorophenol | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| 2,4,6 Trichlorophenol | US EPA 3510/8270 | µg/L | 20 | <2 | 120 | <2 | <2 | <2 | <2 |
| 2,6 Dichlorophenol | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| 2 Chlorophenol | US EPA 3510/8270 | µg/L | 300 | <2 | 120 | <2 | <2 | <2 | <2 |
| 2 Methylphenol | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| 2 Nitrophenol | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| 3 & 4 Methylphenol | US EPA 3510/8270 | µg/L | - | <4 | 120 | <4 | <4 | <4 | <4 |
| 4 Chloro-3-Methylphenol | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Pentachlorophenol | US EPA 3510/8270 | µg/L | 10 | <4 | 120 | <4 | <4 | <4 | <4 |
| Phenol | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| **Phthalates** | | | | | | | | | |
| Bis(2-ethylhexyl) phthalate | US EPA 3510/8270 | µg/L | 10 | <10 | 120 | <10 | <10 | <10 | <10 |
| Bis(2-ethylhexyl) phthalate | US EPA 8270D | µg/L | 10 | <10 | 120 | <10 | <10 | <10 | <10 |
| Butyl benzyl phthalate | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Butyl benzyl phthalate | US EPA 8270D | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Diethyl phthalate | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Diethyl phthalate | US EPA 8270D | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Dimethyl phthalate | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Dimethyl phthalate | US EPA 8270D | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Di-n-butyl phthalate | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Di-n-butyl phthalate | US EPA 8270D | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Di-n-octylphthalate | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Di-n-octylphthalate | US EPA 8270D | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| **Polycyclic Aromatic Hydrocarbons** | | | | | | | | | |
| 2 Chloronaphthalene | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| 2 Methylnaphthalene | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| 3 Methylcholanthrene | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| 7,12-Dimethylbenz(a) anthracene | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Acenaphthene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |

Table 9-1 Summary data for all water quality zones (cont.)

| Analyte | Method ID | Units | ADWG (Health) | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Acenaphthylene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |
| Acenaphthylene | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Anthracene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |
| Anthracene | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Benz(a)anthracene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |
| Benz(a)anthracene | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Benzo(a)pyrene | US EPA 3510/8270 | µg/L | 0.01 | <0.5 | 120 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(a)pyrene | US EPA 3510/8270 | µg/L | 0.01 | <2 | 120 | <2 | <2 | <2 | <2 |
| Benzo(b) fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |
| Benzo(k) fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |
| Benzo(b) & benzo(k) fluoranthene | US EPA 3510/8270 | µg/L | - | <4 | 120 | <4 | <4 | <4 | <4 |
| Benzo(g,h,i)perylene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |
| Benzo(g,h,i)perylene | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Chrysene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |
| Chrysene | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Dibenz(a,h)anthracene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |
| Dibenz(a,h)anthracene | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |
| Fluoranthene | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Fluorene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |
| Fluorene | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Indeno(1,2,3-cd)pyrene | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Indeno(1,2,3-cd)pyrene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |
| N-2-Fluorenyl Acetamide | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Naphthalene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |
| Naphthalene | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Phenanthrene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |
| Phenanthrene | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| Pyrene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |
| Pyrene | US EPA 3510/8270 | µg/L | - | <2 | 120 | <2 | <2 | <2 | <2 |
| PAH (total) | US EPA 3510/8270 | µg/L | - | <0.5 | 120 | <0.5 | <0.5 | <0.5 | <0.5 |

## Table notes:

| | |
|---|---|
| ADWG (Health) | Australian Drinking Water Guidelines – Health Guideline Value |
| CFU/mL | colony forming units per millilitre |
| Deg. C | degrees Celsius |
| LOR | limit of reporting |
| µg/L | micrograms per litre |
| µS/cm | micro siemens per centimetre |
| mg/L | milligrams per litre |
| MPN/100mL | most probable number per 100 millilitres |
| NTU | nephelometric units |
| Pt-Co | platinum-cobalt units |

The 95th percentile is a statistical calculation based on 'normal' distribution. In the context of this report, it estimates the value for which 95% of all the water that passes through the distribution system in this 12 month period falls below.

**Table 9-2** Summary data for water quality zone 1: North Canberra and Gungahlin

| Analyte | Method ID | Units | ADWG (Health) | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| **Microbiological** | | | | | | | | | |
| *E. coli* | APHA 9223 B | MPN/100mL | <1 | <1 | 348 | <1 | <1 | <1 | <1 |
| Total coliforms | APHA 9223 B | MPN/100mL | - | <1 | 348 | <1 | <1 | <1 | <1 |
| Heterotrophic plate count | APHA 9215 B | CFU/mL | - | <1 | 348 | <1 | 244 | 3 | 4 |
| **Physical** | | | | | | | | | |
| Conductivity | APHA 2510 B | µS/cm | - | <2 | 36 | 88 | 175 | 116 | 172 |
| pH | APHA 4500-H B | pH units | - | <0.01 | 348 | 6.82 | 8.01 | 7.70 | 7.86 |
| Temperature | APHA 4500-H B | deg.C | - | <0.1 | 72 | 8.3 | 26.0 | 16.9 | 24.4 |
| Total dissolved salts | APHA 2540 C | mg/L | - | <20 | 36 | 38 | 122 | 77 | 111 |
| True colour | Lachat QuikChem Method, Colour in Waters 10-308-00-1-A | Pt-Co | - | <1 | 72 | <1 | 7 | 1 | 2 |
| Turbidity | APHA 2130 B | NTU | - | <0.1 | 72 | <0.1 | 0.6 | 0.2 | 0.5 |
| **Inorganic** | | | | | | | | | |
| Alkalinity bicarb | APHA 2320 A/B | mg/L | - | <0.1 | 72 | 34.5 | 57.7 | 44.1 | 51.1 |
| Alkalinity carb | APHA 2320 A/B | mg/L | - | <0.1 | 72 | <0.1 | <0.1 | <0.1 | <0.1 |
| Alkalinity hydrox | APHA 2320 A/B | mg/L | - | <0.1 | 72 | <0.1 | <0.1 | <0.1 | <0.1 |
| Alkalinity total | APHA 2320 A/B | mg/L | - | <1 | 72 | 34 | 58 | 44 | 51 |
| Aluminium acid soluble | USEPA 200.8 | µg/L | - | <5 | 36 | 11 | 79 | 30 | 42 |
| Asbestos | AS4964-2000 | Present/ Absent | - | Absent | 12 | Absent | Absent | - | - |
| Calcium dissolved | USEPA 200.7 | mg/L | - | <0.05 | 36 | 10.30 | 18.00 | 13.73 | 17.05 |
| Chloride | APHA 21st Ed. 2005, Part 4110 B | mg/L | - | <0.1 | 12 | 3.0 | 7.6 | 5.2 | 7.4 |
| Chlorine combined | APHA 4500 -CL G | mg/L | - | <0.03 | 348 | <0.03 | 0.25 | 0.07 | 0.17 |
| Chlorine free | APHA 4500 -CL G | mg/L | - | <0.03 | 348 | <0.03 | 1.41 | 0.78 | 1.19 |
| Chlorine total | APHA 4500 -CL G | mg/L | 5 | <0.03 | 348 | 0.05 | 1.44 | 0.85 | 1.23 |
| Cyanide | APHA 4500_CN | mg/L | 0.08 | <0.004 | 12 | <0.004 | <0.004 | <0.004 | <0.004 |
| Fluoride | APHA 21st Ed. 2005, Part 4110 B | mg/L | 1.5 | <0.1 | 36 | 0.22 | 0.79 | 0.70 | 0.78 |
| Hardness total | APHA 2340 B | mg/L | - | <0.1 | 36 | 31.0 | 60.0 | 41.5 | 57.5 |
| Iodide | VIC-CM078 | mg/L | 0.5 | <0.01 | 12 | <0.01 | 0.025 | <0.01 | 0.022 |
| Magnesium dissolved | USEPA 200.7 | mg/L | - | <0.05 | 36 | 0.78 | 4.26 | 1.76 | 4.19 |
| Nitrate | APHA 21st Ed. 2005, Part 4110 B | mg/L | 50 | <0.1 | 12 | <0.1 | 0.1 | <0.1 | <0.1 |
| Potassium dissolved | USEPA 200.7 | mg/L | - | <0.1 | 12 | 0.4 | 1.7 | 0.8 | 1.6 |
| Sodium dissolved | USEPA 200.7 | mg/L | - | <0.1 | 12 | 2.8 | 8.2 | 4.5 | 8.0 |
| Sulphate | APHA 21st Ed. 2005, Part 4110 B | mg/L | 500 | <0.4 | 12 | <0.4 | 24.6 | 7.5 | 24.1 |
| **Total metals** | | | | | | | | | |
| Aluminium total | USEPA 200.8 | µg/L | - | <9 | 36 | 25 | 131 | 40 | 79 |
| Antimony total | USEPA 200.8 | µg/L | 3 | <3 | 36 | <3 | <3 | <3 | <3 |
| Arsenic total | USEPA 200.8 | µg/L | 10 | <1 | 36 | <1 | <1 | <1 | <1 |
| Barium total | USEPA 200.8 | µg/L | 2000 | <2 | 36 | 3.0 | 7.9 | 4.6 | 7.0 |
| Beryllium total | USEPA 200.8 | µg/L | 60 | <0.1 | 36 | <0.1 | 0.2 | <0.1 | 0.1 |
| Boron total | USEPA 200.7 | mg/L | 4 | <0.01 | 12 | <0.01 | 0.01 | <0.01 | <0.01 |
| Cadmium total | USEPA 200.8 | µg/L | 2 | <0.05 | 36 | <0.05 | <0.05 | <0.05 | <0.05 |
| Chromium total | USEPA 200.8 | µg/L | - | <2 | 36 | <2 | 3 | <2 | <2 |
| Cobalt total | USEPA 200.8 | µg/L | - | <0.2 | 36 | <0.2 | 0.5 | <0.2 | 0.2 |
| Copper total | USEPA 200.8 | µg/L | 2000 | <1 | 72 | 1 | 44 | 13 | 31 |
| Iron total | USEPA 200.7 | mg/L | - | <0.01 | 72 | <0.01 | 0.04 | <0.01 | 0.02 |
| Lead total | USEPA 200.8 | µg/L | 10 | <0.2 | 72 | <0.2 | 1.1 | 0.2 | 0.5 |
| Manganese total | USEPA 200.7 | mg/L | 0.5 | <0.001 | 72 | <0.001 | 0.040 | 0.005 | 0.011 |

**Table 9-2** Summary data for water quality zone 1: North Canberra and Gungahlin (cont.)

| Analyte | Method ID | Units | ADWG (Health) | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Mercury total | USEPA 200.8 | µg/L | 1 | <0.1 | 12 | <0.1 | <0.1 | <0.1 | <0.1 |
| Molybdenum total | USEPA 200.8 | µg/L | 50 | <1 | 36 | <1 | 6 | <1 | <1 |
| Nickel total | USEPA 200.8 | µg/L | 20 | <1 | 36 | <1 | 2 | <1 | 2 |
| Selenium total | USEPA 200.8 | µg/L | 10 | <1 | 36 | <1 | 1 | <1 | <1 |
| Silver total | USEPA 200.8 | µg/L | 100 | <1 | 36 | <1 | <1 | <1 | <1 |
| Zinc total | USEPA 200.8 | µg/L | - | <5 | 36 | <5 | <5 | <5 | <5 |
| **Haloacetic acids** | | | | | | | | | |
| Bromoacetic acid | ALS: Headspace GCMS | µg/L | - | <5 | 36 | <5 | <5 | <5 | <5 |
| Bromochloroacetic acid | ALS: Headspace GCMS | µg/L | - | <1 | 36 | <1 | 20 | 2 | 5 |
| Bromodichloroacetic acid | ALS: Headspace GCMS | µg/L | - | <1 | 36 | <1 | 9 | 2 | 5 |
| Dibromoacetic acid | ALS: Headspace GCMS | µg/L | - | <1 | 36 | <1 | 7 | <1 | <1 |
| Dibromochloroacetic acid | ALS: Headspace GCMS | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Dichloroacetic acid | ALS: Headspace GCMS | µg/L | 100 | <1 | 36 | 6 | 34 | 20 | 31 |
| Monochloroacetic acid | ALS: Headspace GCMS | µg/L | 150 | <1 | 36 | <1 | 3 | 1 | 2 |
| Tribromoacetic acid | ALS: Headspace GCMS | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Trichloroacetic acid | ALS: Headspace GCMS | µg/L | 100 | <1 | 36 | 16 | 45 | 28 | 44 |
| Sum of haloacetic acid | ALS: Headspace GCMS | µg/L | - | <1 | 36 | 28 | 91 | 54 | 84 |
| **Trihalomethanes** | | | | | | | | | |
| Bromoform | VIC-CM047 | mg/L | - | <0.001 | 36 | <0.001 | <0.001 | <0.001 | <0.001 |
| Chloroform | VIC-CM047 | mg/L | - | <0.001 | 36 | 0.022 | 0.088 | 0.044 | 0.073 |
| Dibromochloromethane | VIC-CM047 | mg/L | - | <0.001 | 36 | <0.001 | <0.001 | <0.001 | <0.001 |
| Dichlorobromomethane | VIC-CM047 | mg/L | - | <0.001 | 36 | 0.001 | 0.011 | 0.004 | 0.011 |
| Trihalomethanes total | VIC-CM047 | mg/L | 0.25 | <0.001 | 36 | 0.023 | 0.097 | 0.049 | 0.084 |
| **Semi volatile organic compounds (SVOC)** | | | | | | | | | |
| **Anilines and benzidines** | | | | | | | | | |
| 2 Nitroaniline | US EPA 3510/8270 | µg/L | - | <4 | 36 | <4 | <4 | <4 | <4 |
| 3 Nitroaniline | US EPA 3510/8270 | µg/L | - | <4 | 36 | <4 | <4 | <4 | <4 |
| 3,3 Dichlorobenzidine | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 4 Chloroaniline | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 4 Nitroaniline | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Aniline | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Carbazole | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Dibenzofuran | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| **Chlorinated hydrocarbons** | | | | | | | | | |
| 1,2 Dichlorobenzene | US EPA 3510/8270 | µg/L | 1500 | <2 | 36 | <2 | <2 | <2 | <2 |
| 1,2,4 Trichlorobenzene | US EPA 3510/8270 | µg/L | 30 | <2 | 36 | <2 | <2 | <2 | <2 |
| 1,3 Dichlorobenzene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 1,4 Dichlorobenzene | US EPA 3510/8270 | µg/L | 40 | <2 | 36 | <2 | <2 | <2 | <2 |
| Hexachlorobenzene | US EPA 3510/8270 | µg/L | - | <4 | 36 | <4 | <4 | <4 | <4 |
| Hexachlorobutadiene | US EPA 3510/8270 | µg/L | 0.7 | <2 | 36 | <2 | <2 | <2 | <2 |
| Hexachlorocyclopentadiene | US EPA 3510/8270 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Hexachloroethane | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Hexachloropropylene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Pentachlorobenzene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |

**Table 9-2** Summary data for water quality zone 1: North Canberra and Gungahlin (cont.)

| Analyte | Method ID | Units | ADWG (Health) | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| **Haloethers** | | | | | | | | | |
| 4 Bromophenyl phenyl ether | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 4 Chlorophenyl phenyl ether | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Bis(2-chloroethoxy) methane | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Bis(2-chloroethyl) ether | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| **Nitroaromatics and ketones** | | | | | | | | | |
| 1 Naphthylamine | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 1,3,5 Trinitrobenzene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 2 Picoline | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 2,4 Dinitrotoluene | US EPA 3510/8270 | µg/L | - | <4 | 36 | <4 | <4 | <4 | <4 |
| 2,6 Dinitrotoluene | US EPA 3510/8270 | µg/L | - | <4 | 36 | <4 | <4 | <4 | <4 |
| 4 Aminobiphenyl | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 4 Nitroquinoline-N-oxide | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 5 Nitro-o-toluidine | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Acetophenone | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Azobenzene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Chlorobenzilate | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Dimethylaminoazobenzene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Isophorone | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Nitrobenzene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Pentachloronitrobenzene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Phenacetin | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Pronamide | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| **Nitrosamines** | | | | | | | | | |
| Methapyrilene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| N-Nitrosodibutylamine | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| N-Nitrosodiethylamine | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| N-Nitrosodi-n-propylamine | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| N-Nitrosodiphenyl & Diphenylamine | US EPA 3510/8270 | µg/L | - | <4 | 36 | <4 | <4 | <4 | <4 |
| N-Nitrosomethylethylamine | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| N-Nitrosomorpholine | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| N-Nitrosopiperidine | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| N-Nitrosopyrrolidine | US EPA 3510/8270 | µg/L | - | <4 | 36 | <4 | <4 | <4 | <4 |
| **Organochlorine pesticides** | | | | | | | | | |
| 4,4 DDD | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 4,4 DDE | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 4,4 DDT | US EPA 3510/8270 | µg/L | 9 | <4 | 36 | <4 | <4 | <4 | <4 |
| Aldrin | US EPA 3510/8270 | µg/L | 0.3 | <2 | 36 | <2 | <2 | <2 | <2 |
| alpha BHC | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| alpha Endosulfan | US EPA 3510/8270 | µg/L | 20 | <2 | 36 | <2 | <2 | <2 | <2 |
| beta BHC | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| beta Endosulfan | US EPA 3510/8270 | µg/L | 20 | <2 | 36 | <2 | <2 | <2 | <2 |
| delta BHC | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Dieldrin | US EPA 3510/8270 | µg/L | 0.3 | <2 | 36 | <2 | <2 | <2 | <2 |
| Endrin | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Endosulfan sulfate | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| gamma BHC | US EPA 3510/8270 | µg/L | 10 | <2 | 36 | <2 | <2 | <2 | <2 |

**Table 9-2** Summary data for water quality zone 1: North Canberra and Gungahlin (cont.)

| Analyte | Method ID | Units | ADWG (Health) | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Heptachlor | US EPA 3510/8270 | µg/L | 0.3 | <2 | 36 | <2 | <2 | <2 | <2 |
| Heptachlor epoxide | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| **Organophosphorous pesticides** | | | | | | | | | |
| Chlorfenvinphos | US EPA 3510/8270 | µg/L | 2 | <2 | 36 | <2 | <2 | <2 | <2 |
| Chlorpyrifos | US EPA 3510/8270 | µg/L | 10 | <2 | 36 | <2 | <2 | <2 | <2 |
| Chlorpyrifos-methyl | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Diazinon | US EPA 3510/8270 | µg/L | 4 | <2 | 36 | <2 | <2 | <2 | <2 |
| Dichlorvos | US EPA 3510/8270 | µg/L | 5 | <2 | 36 | <2 | <2 | <2 | <2 |
| Dimethoate | US EPA 3510/8270 | µg/L | 7 | <2 | 36 | <2 | <2 | <2 | <2 |
| Ethion | US EPA 3510/8270 | µg/L | 4 | <2 | 36 | <2 | <2 | <2 | <2 |
| Fenthion | US EPA 3510/8270 | µg/L | 7 | <2 | 36 | <2 | <2 | <2 | <2 |
| Malathion | US EPA 3510/8270 | µg/L | 70 | <2 | 36 | <2 | <2 | <2 | <2 |
| Pirimiphos-ethyl | US EPA 3510/8270 | µg/L | 0.5 | <2 | 36 | <2 | <2 | <2 | <2 |
| Prothiofos | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| **Phenolic compounds** | | | | | | | | | |
| 2,3,4,6 Tetrachlorophenol | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 2,4 Dichlorophenol | US EPA 3510/8270 | µg/L | 200 | <2 | 36 | <2 | <2 | <2 | <2 |
| 2,4 Dimethylphenol | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 2,4,5 Trichlorophenol | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 2,4,6 Trichlorophenol | US EPA 3510/8270 | µg/L | 20 | <2 | 36 | <2 | <2 | <2 | <2 |
| 2,6 Dichlorophenol | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 2 Chlorophenol | US EPA 3510/8270 | µg/L | 300 | <2 | 36 | <2 | <2 | <2 | <2 |
| 2 Methylphenol | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 2 Nitrophenol | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 3 & 4 Methylphenol | US EPA 3510/8270 | µg/L | - | <4 | 36 | <4 | <4 | <4 | <4 |
| 4 Chloro-3-Methylphenol | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Pentachlorophenol | US EPA 3510/8270 | µg/L | 10 | <4 | 36 | <4 | <4 | <4 | <4 |
| Phenol | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| **Phthalates** | | | | | | | | | |
| Bis(2-ethylhexyl) phthalate | US EPA 3510/8270 | µg/L | 10 | <10 | 36 | <10 | <10 | <10 | <10 |
| Bis(2-ethylhexyl) phthalate | US EPA 8270D | µg/L | 10 | <10 | 36 | <10 | <10 | <10 | <10 |
| Butyl benzyl phthalate | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Butyl benzyl phthalate | US EPA 8270D | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Diethyl phthalate | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Diethyl phthalate | US EPA 8270D | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Dimethyl phthalate | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Dimethyl phthalate | US EPA 8270D | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Di-n-butyl phthalate | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Di-n-butyl phthalate | US EPA 8270D | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Di-n-octylphthalate | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Di-n-octylphthalate | US EPA 8270D | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| **Polycyclic aromatic hydrocarbons** | | | | | | | | | |
| 2 Chloronaphthalene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 2 Methylnaphthalene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 3 Methylcholanthrene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 7,12-Dimethylbenz(a) anthracene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Acenaphthene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Acenaphthene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Acenaphthylene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |

**Table 9-2** Summary data for water quality zone 1: North Canberra and Gungahlin (cont.)

| Analyte | Method ID | Units | ADWG (Health) | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthylene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Anthracene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Anthracene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Benz(a)anthracene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Benz(a)anthracene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Benzo(a)pyrene | US EPA 3510/8270 | µg/L | 0.01 | <0.5 | 36 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(a)pyrene | US EPA 3510/8270 | µg/L | 0.01 | <2 | 36 | <2 | <2 | <2 | <2 |
| Benzo(b) fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Benzo(k) fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Benzo(b) & benzo(k) fluoranthene | US EPA 3510/8270 | µg/L | - | <4 | 36 | <4 | <4 | <4 | <4 |
| Benzo(g,h,i)perylene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Benzo(g,h,i)perylene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Chrysene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Chrysene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Dibenz(a,h)anthracene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Dibenz(a,h)anthracene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Fluoranthene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Fluorene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Fluorene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Indeno(1,2,3-cd)pyrene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Indeno(1,2,3-cd)pyrene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| N-2-Fluorenyl Acetamide | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Naphthalene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Naphthalene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Phenanthrene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Phenanthrene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Pyrene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Pyrene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| PAH (total) | US EPA 3510/8270 | µg/L | - | <0.5 | 36 | <0.5 | <0.5 | <0.5 | <0.5 |

## Table notes:

| | |
|---|---|
| **ADWG (Health)** | Australian Drinking Water Guidelines – Health Guideline Value |
| **CFU/mL** | colony forming units per millilitre |
| **Deg. C** | degrees Celsius |
| **LOR** | limit of reporting |
| **µg/L** | micrograms per litre |
| **µS/cm** | micro siemens per centimetre |
| **mg/L** | milligrams per litre |
| **MPN/100mL** | most probable number per 100 millilitres |
| **NTU** | nephelometric units |
| **Pt-Co** | platinum-cobalt units |

The 95th percentile is a statistical calculation based on 'normal' distribution. In the context of this report, it estimates the value for which 95% of all the water that passes through the distribution system in this 12 month period falls below.

**Table 9-3** Summary data for water quality zone 2: Belconnen

| Analyte | Method ID | Units | ADWG (Health) | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| **Microbiological** | | | | | | | | | |
| *E. coli* | APHA 9223 B | MPN/100mL | <1 | <1 | 327 | <1 | <1 | <1 | <1 |
| Total coliforms | APHA 9223 B | MPN/100mL | - | <1 | 327 | <1 | 1 | <1 | <1 |
| Heterotrophic plate count | APHA 9215 B | CFU/mL | - | <1 | 327 | <1 | 184 | 2 | 3 |
| **Physical** | | | | | | | | | |
| Conductivity | APHA 2510 B | µS/cm | - | <2 | 36 | 84 | 174 | 117 | 172 |
| pH | APHA 4500-H B | pH units | - | <0.01 | 327 | 7.08 | 8.42 | 7.81 | 8.01 |
| Temperature | APHA 4500-H B | deg.C | - | <0.1 | 72 | 7.0 | 25.0 | 16.4 | 23.2 |
| Total dissolved salts | APHA 2540 C | mg/L | - | <20 | 36 | 49 | 124 | 77 | 120 |
| True colour | Lachat QuikChem Method, Colour in Waters 10-308-00-1-A | Pt-Co | - | <1 | 72 | <1 | 3 | 1 | 2 |
| Turbidity | APHA 2130 B | NTU | - | <0.1 | 72 | 0.1 | 1.4 | 0.3 | 0.6 |
| **Inorganic** | | | | | | | | | |
| Alkalinity bicarb | APHA 2320 A/B | mg/L | - | <0.1 | 72 | 35.1 | 51.7 | 43.9 | 49.5 |
| Alkalinity carb | APHA 2320 A/B | mg/L | - | <0.1 | 72 | <0.1 | 9.0 | 0.2 | <0.1 |
| Alkalinity hydrox | APHA 2320 A/B | mg/L | - | <0.1 | 72 | <0.1 | <0.1 | <0.1 | <0.1 |
| Alkalinity total | APHA 2320 A/B | mg/L | - | <1 | 72 | 35 | 53 | 44 | 50 |
| Aluminium acid soluble | USEPA 200.8 | µg/L | - | <5 | 36 | 20 | 53 | 32 | 43 |
| Asbestos | AS4964-2000 | Present/ Absent | - | Absent | 12 | Absent | Absent | - | - |
| Calcium dissolved | USEPA 200.7 | mg/L | - | <0.05 | 36 | 10.90 | 18.10 | 14.02 | 18.10 |
| Chloride | APHA 21st Ed. 2005, Part 4110 B | mg/L | - | <0.1 | 12 | 2.8 | 8.5 | 5.3 | 8.1 |
| Chlorine combined | APHA 4500 -CL G | mg/L | - | <0.03 | 327 | <0.03 | 0.31 | 0.07 | 0.20 |
| Chlorine free | APHA 4500 -CL G | mg/L | - | <0.03 | 327 | 0.03 | 1.29 | 0.62 | 0.93 |
| Chlorine total | APHA 4500 -CL G | mg/L | 5 | <0.03 | 327 | 0.16 | 1.34 | 0.69 | 1.01 |
| Cyanide | APHA 4500_CN | mg/L | 0.08 | <0.004 | 12 | <0.004 | <0.004 | <0.004 | <0.004 |
| Fluoride | APHA 21st Ed. 2005, Part 4110 B | mg/L | 1.5 | <0.1 | 36 | 0.51 | 0.81 | 0.70 | 0.78 |
| Hardness total | APHA 2340 B | mg/L | - | <0.1 | 36 | 32.0 | 61.0 | 42.4 | 58.0 |
| Iodide | VIC-CM078 | mg/L | 0.5 | <0.01 | 12 | <0.01 | 0.025 | <0.01 | 0.022 |
| Magnesium dissolved | USEPA 200.7 | mg/L | - | <0.05 | 36 | 0.78 | 4.29 | 1.77 | 4.09 |
| Nitrate | APHA 21st Ed. 2005, Part 4110 B | mg/L | 50 | <0.1 | 12 | <0.1 | 0.2 | <0.1 | 0.1 |
| Potassium dissolved | USEPA 200.7 | mg/L | - | <0.1 | 12 | 0.4 | 1.7 | 0.8 | 1.7 |
| Sodium dissolved | USEPA 200.7 | mg/L | - | <0.1 | 12 | 2.7 | 8.3 | 4.5 | 8.3 |
| Sulphate | APHA 21st Ed. 2005, Part 4110 B | mg/L | 500 | <0.4 | 12 | <0.4 | 24.0 | 7.8 | 24.0 |
| **Total metals** | | | | | | | | | |
| Aluminium total | USEPA 200.8 | µg/L | - | <9 | 36 | 26 | 121 | 44 | 88 |
| Antimony total | USEPA 200.8 | µg/L | 3 | <3 | 36 | <3 | <3 | <3 | <3 |
| Arsenic total | USEPA 200.8 | µg/L | 10 | <1 | 36 | <1 | <1 | <1 | <1 |
| Barium total | USEPA 200.8 | µg/L | 2000 | <2 | 36 | 2.8 | 6.4 | 4.4 | 6.3 |
| Beryllium total | USEPA 200.8 | µg/L | 60 | <0.1 | 36 | <0.1 | 0.1 | <0.1 | 0.1 |
| Boron total | USEPA 200.7 | mg/L | 4 | <0.01 | 12 | <0.01 | 0.01 | <0.01 | <0.01 |
| Cadmium total | USEPA 200.8 | µg/L | 2 | <0.05 | 36 | <0.05 | <0.05 | <0.05 | <0.05 |
| Chromium total | USEPA 200.8 | µg/L | - | <2 | 36 | <2 | 2 | <2 | <2 |
| Cobalt total | USEPA 200.8 | µg/L | - | <0.2 | 36 | <0.2 | 0.4 | <0.2 | 0.2 |
| Copper total | USEPA 200.8 | µg/L | 2000 | <1 | 72 | 1 | 26 | 11 | 23 |
| Iron total | USEPA 200.7 | mg/L | - | <0.01 | 72 | <0.01 | 0.04 | <0.01 | 0.02 |
| Lead total | USEPA 200.8 | µg/L | 10 | <0.2 | 72 | <0.2 | 2.2 | 0.2 | 0.4 |

**Table 9-3** Summary data for water quality zone 2: Belconnen (cont.)

| Analyte | Method ID | Units | ADWG (Health) | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Manganese total | USEPA 200.7 | mg/L | 0.5 | <0.001 | 72 | 0.001 | 0.051 | 0.006 | 0.016 |
| Mercury total | USEPA 200.8 | µg/L | 1 | <0.1 | 12 | <0.1 | <0.1 | <0.1 | <0.1 |
| Molybdenum total | USEPA 200.8 | µg/L | 50 | <1 | 36 | <1 | 1 | <1 | <1 |
| Nickel total | USEPA 200.8 | µg/L | 20 | <1 | 36 | <1 | 6 | 1 | 2 |
| Selenium total | USEPA 200.8 | µg/L | 10 | <1 | 36 | <1 | 1 | <1 | <1 |
| Silver total | USEPA 200.8 | µg/L | 100 | <1 | 36 | <1 | <1 | <1 | <1 |
| Zinc total | USEPA 200.8 | µg/L | - | <5 | 36 | <5 | 6 | <5 | <5 |
| **Haloacetic acids** | | | | | | | | | |
| Bromoacetic acid | ALS: Headspace GCMS | µg/L | - | <5 | 36 | <5 | <5 | <5 | <5 |
| Bromochloroacetic acid | ALS: Headspace GCMS | µg/L | - | <1 | 36 | <1 | 6 | 2 | 4 |
| Bromodichloroacetic acid | ALS: Headspace GCMS | µg/L | - | <1 | 36 | <1 | 6 | 2 | 6 |
| Dibromoacetic acid | ALS: Headspace GCMS | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Dibromochloroacetic acid | ALS: Headspace GCMS | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Dichloroacetic acid | ALS: Headspace GCMS | µg/L | 100 | <1 | 36 | 6 | 38 | 19 | 31 |
| Monochloroacetic acid | ALS: Headspace GCMS | µg/L | 150 | <1 | 36 | <1 | 3 | <1 | 2 |
| Tribromoacetic acid | ALS: Headspace GCMS | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Trichloroacetic acid | ALS: Headspace GCMS | µg/L | 100 | <1 | 36 | 20 | 46 | 30 | 45 |
| Sum of haloacetic acid | ALS: Headspace GCMS | µg/L | - | <1 | 36 | 31 | 97 | 53 | 82 |
| **Trihalomethanes** | | | | | | | | | |
| Bromoform | VIC-CM047 | mg/L | - | <0.001 | 36 | <0.001 | <0.001 | <0.001 | <0.001 |
| Chloroform | VIC-CM047 | mg/L | - | <0.001 | 36 | 0.023 | 0.090 | 0.044 | 0.079 |
| Dibromochloromethane | VIC-CM047 | mg/L | - | <0.001 | 36 | <0.001 | 0.001 | <0.001 | <0.001 |
| Dichlorobromomethane | VIC-CM047 | mg/L | - | <0.001 | 36 | 0.001 | 0.013 | 0.005 | 0.011 |
| Trihalomethanes total | VIC-CM047 | mg/L | 0.25 | <0.001 | 36 | 0.025 | 0.100 | 0.049 | 0.091 |
| **Semi volatile organic compounds (SVOC)** | | | | | | | | | |
| **Anilines and benzidines** | | | | | | | | | |
| 2 Nitroaniline | US EPA 3510/8270 | µg/L | - | <4 | 36 | <4 | <4 | <4 | <4 |
| 3 Nitroaniline | US EPA 3510/8270 | µg/L | - | <4 | 36 | <4 | <4 | <4 | <4 |
| 3,3 Dichlorobenzidine | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 4 Chloroaniline | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 4 Nitroaniline | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Aniline | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Carbazole | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Dibenzofuran | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| **Chlorinated hydrocarbons** | | | | | | | | | |
| 1,2 Dichlorobenzene | US EPA 3510/8270 | µg/L | 1500 | <2 | 36 | <2 | <2 | <2 | <2 |
| 1,2,4 Trichlorobenzene | US EPA 3510/8270 | µg/L | 30 | <2 | 36 | <2 | <2 | <2 | <2 |
| 1,3 Dichlorobenzene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 1,4 Dichlorobenzene | US EPA 3510/8270 | µg/L | 40 | <2 | 36 | <2 | <2 | <2 | <2 |
| Hexachlorobenzene | US EPA 3510/8270 | µg/L | - | <4 | 36 | <4 | <4 | <4 | <4 |
| Hexachlorobutadiene | US EPA 3510/8270 | µg/L | 0.7 | <2 | 36 | <2 | <2 | <2 | <2 |
| Hexachlorocyclopentadiene | US EPA 3510/8270 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Hexachloroethane | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Hexachloropropylene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |

**Table 9-3** Summary data for water quality zone 2: Belconnen (cont.)

| Analyte | Method ID | Units | ADWG (Health) | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Pentachlorobenzene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| **Haloethers** | | | | | | | | | |
| 4 Bromophenyl phenyl ether | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 4 Chlorophenyl phenyl ether | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Bis(2-chloroethoxy) methane | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Bis(2-chloroethyl) ether | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| **Nitroaromatics and ketones** | | | | | | | | | |
| 1 Naphthylamine | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 1,3,5 Trinitrobenzene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 2 Picoline | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 2,4 Dinitrotoluene | US EPA 3510/8270 | µg/L | - | <4 | 36 | <4 | <4 | <4 | <4 |
| 2,6 Dinitrotoluene | US EPA 3510/8270 | µg/L | - | <4 | 36 | <4 | <4 | <4 | <4 |
| 4 Aminobiphenyl | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 4 Nitroquinoline-N-oxide | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 5 Nitro-o-toluidine | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Acetophenone | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Azobenzene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Chlorobenzilate | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Dimethylaminoazobenzene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Isophorone | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Nitrobenzene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Pentachloronitrobenzene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Phenacetin | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Pronamide | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| **Nitrosamines** | | | | | | | | | |
| Methapyrilene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| N-Nitrosodibutylamine | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| N-Nitrosodiethylamine | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| N-Nitrosodi-n-propylamine | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| N-Nitrosodiphenyl & Diphenylamine | US EPA 3510/8270 | µg/L | - | <4 | 36 | <4 | <4 | <4 | <4 |
| N-Nitrosomethylethylamine | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| N-Nitrosomorpholine | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| N-Nitrosopiperidine | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| N-Nitrosopyrrolidine | US EPA 3510/8270 | µg/L | - | <4 | 36 | <4 | <4 | <4 | <4 |
| **Organochlorine pesticides** | | | | | | | | | |
| 4,4 DDD | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 4,4 DDE | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 4,4 DDT | US EPA 3510/8270 | µg/L | 9 | <4 | 36 | <4 | <4 | <4 | <4 |
| Aldrin | US EPA 3510/8270 | µg/L | 0.3 | <2 | 36 | <2 | <2 | <2 | <2 |
| alpha BHC | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| alpha Endosulfan | US EPA 3510/8270 | µg/L | 20 | <2 | 36 | <2 | <2 | <2 | <2 |
| beta BHC | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| beta Endosulfan | US EPA 3510/8270 | µg/L | 20 | <2 | 36 | <2 | <2 | <2 | <2 |
| delta BHC | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Dieldrin | US EPA 3510/8270 | µg/L | 0.3 | <2 | 36 | <2 | <2 | <2 | <2 |
| Endrin | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Endosulfan sulfate | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |

Table 9-3 Summary data for water quality zone 2: Belconnen (cont.)

| Analyte | Method ID | Units | ADWG (Health) | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| gamma BHC | US EPA 3510/8270 | µg/L | 10 | <2 | 36 | <2 | <2 | <2 | <2 |
| Heptachlor | US EPA 3510/8270 | µg/L | 0.3 | <2 | 36 | <2 | <2 | <2 | <2 |
| Heptachlor epoxide | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| **Organophosphorous pesticides** | | | | | | | | | |
| Chlorfenvinphos | US EPA 3510/8270 | µg/L | 2 | <2 | 36 | <2 | <2 | <2 | <2 |
| Chlorpyrifos | US EPA 3510/8270 | µg/L | 10 | <2 | 36 | <2 | <2 | <2 | <2 |
| Chlorpyrifos-methyl | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Diazinon | US EPA 3510/8270 | µg/L | 4 | <2 | 36 | <2 | <2 | <2 | <2 |
| Dichlorvos | US EPA 3510/8270 | µg/L | 5 | <2 | 36 | <2 | <2 | <2 | <2 |
| Dimethoate | US EPA 3510/8270 | µg/L | 7 | <2 | 36 | <2 | <2 | <2 | <2 |
| Ethion | US EPA 3510/8270 | µg/L | 4 | <2 | 36 | <2 | <2 | <2 | <2 |
| Fenthion | US EPA 3510/8270 | µg/L | 7 | <2 | 36 | <2 | <2 | <2 | <2 |
| Malathion | US EPA 3510/8270 | µg/L | 70 | <2 | 36 | <2 | <2 | <2 | <2 |
| Pirimiphos-ethyl | US EPA 3510/8270 | µg/L | 0.5 | <2 | 36 | <2 | <2 | <2 | <2 |
| Prothiofos | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| **Phenolic compounds** | | | | | | | | | |
| 2,3,4,6 Tetrachlorophenol | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 2,4 Dichlorophenol | US EPA 3510/8270 | µg/L | 200 | <2 | 36 | <2 | <2 | <2 | <2 |
| 2,4 Dimethylphenol | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 2,4,5 Trichlorophenol | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 2,4,6 Trichlorophenol | US EPA 3510/8270 | µg/L | 20 | <2 | 36 | <2 | <2 | <2 | <2 |
| 2,6 Dichlorophenol | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 2 Chlorophenol | US EPA 3510/8270 | µg/L | 300 | <2 | 36 | <2 | <2 | <2 | <2 |
| 2 Methylphenol | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 2 Nitrophenol | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 3 & 4 Methylphenol | US EPA 3510/8270 | µg/L | - | <4 | 36 | <4 | <4 | <4 | <4 |
| 4 Chloro-3-Methylphenol | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Pentachlorophenol | US EPA 3510/8270 | µg/L | 10 | <4 | 36 | <4 | <4 | <4 | <4 |
| Phenol | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| **Phthalates** | | | | | | | | | |
| Bis(2-ethylhexyl) phthalate | US EPA 3510/8270 | µg/L | 10 | <10 | 36 | <10 | <10 | <10 | <10 |
| Bis(2-ethylhexyl) phthalate | US EPA 8270D | µg/L | 10 | <10 | 36 | <10 | <10 | <10 | <10 |
| Butyl benzyl phthalate | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Butyl benzyl phthalate | US EPA 8270D | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Diethyl phthalate | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Diethyl phthalate | US EPA 8270D | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Dimethyl phthalate | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Dimethyl phthalate | US EPA 8270D | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Di-n-butyl phthalate | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Di-n-butyl phthalate | US EPA 8270D | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Di-n-octylphthalate | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Di-n-octylphthalate | US EPA 8270D | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| **Polycyclic aromatic hydrocarbons** | | | | | | | | | |
| 2 Chloronaphthalene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 2 Methylnaphthalene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 3 Methylcholanthrene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| 7,12-Dimethylbenz(a) anthracene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Acenaphthene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |

**Table 9-3** Summary data for water quality zone 2: Belconnen (cont.)

| Analyte | Method ID | Units | ADWG (Health) | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Acenaphthylene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Acenaphthylene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Anthracene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Anthracene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Benz(a)anthracene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Benz(a)anthracene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Benzo(a)pyrene | US EPA 3510/8270 | µg/L | 0.01 | <0.5 | 36 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(a)pyrene | US EPA 3510/8270 | µg/L | 0.01 | <2 | 36 | <2 | <2 | <2 | <2 |
| Benzo(b) fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Benzo(k) fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Benzo(b) & benzo(k) fluoranthene | US EPA 3510/8270 | µg/L | - | <4 | 36 | <4 | <4 | <4 | <4 |
| Benzo(g,h,i)perylene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Benzo(g,h,i)perylene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Chrysene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Chrysene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Dibenz(a,h)anthracene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Dibenz(a,h)anthracene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Fluoranthene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Fluorene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Fluorene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Indeno(1,2,3-cd)pyrene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Indeno(1,2,3-cd)pyrene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| N-2-Fluorenyl Acetamide | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Naphthalene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Naphthalene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Phenanthrene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Phenanthrene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| Pyrene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Pyrene | US EPA 3510/8270 | µg/L | - | <2 | 36 | <2 | <2 | <2 | <2 |
| PAH (total) | US EPA 3510/8270 | µg/L | - | <0.5 | 36 | <0.5 | <0.5 | <0.5 | <0.5 |

## Table notes:

| | |
|---|---|
| **ADWG (Health)** | Australian Drinking Water Guidelines – Health Guideline Value |
| **CFU/mL** | colony forming units per millilitre |
| **Deg. C** | degrees Celsius |
| **LOR** | limit of reporting |
| **µg/L** | micrograms per litre |
| **µS/cm** | micro siemens per centimetre |
| **mg/L** | milligrams per litre |
| **MPN/100mL** | most probable number per 100 millilitres |
| **NTU** | nephelometric units |
| **Pt-Co** | platinum-cobalt units |

The 95th percentile is a statistical calculation based on 'normal' distribution. In the context of this report, it estimates the value for which 95% of all the water that passes through the distribution system in this 12 month period falls below.

**Table 9-4** Summary data for water quality zone 3: South Canberra, Woden and Weston Creek

| Analyte | Method ID | Units | ADWG (Health) | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| **Microbiological** | | | | | | | | | |
| *E. coli* | APHA 9223 B | MPN/100mL | <1 | <1 | 265 | <1 | <1 | <1 | <1 |
| Total coliforms | APHA 9223 B | MPN/100mL | - | <1 | 265 | <1 | 3 | <1 | <1 |
| Heterotrophic plate count | APHA 9215 B | CFU/mL | - | <1 | 265 | <1 | 243,000 | 919 | 2 |
| **Physical** | | | | | | | | | |
| Conductivity | APHA 2510 B | µS/cm | - | <2 | 24 | 87 | 174 | 117 | 172 |
| pH | APHA 4500-H B | pH units | - | <0.01 | 265 | 7.10 | 8.13 | 7.74 | 7.93 |
| Temperature | APHA 4500-H B | deg.C | - | <0.1 | 48 | 9.0 | 23.9 | 16.3 | 23.0 |
| Total dissolved salts | APHA 2540 C | mg/L | - | <20 | 24 | 31 | 123 | 73 | 117 |
| True colour | Lachat QuikChem Method, Colour in Waters 10-308-00-1-A | Pt-Co | - | <1 | 48 | <1 | 2 | 1 | 2 |
| Turbidity | APHA 2130 B | NTU | - | <0.1 | 48 | 0.1 | 0.5 | 0.2 | 0.4 |
| **Inorganic** | | | | | | | | | |
| Alkalinity bicarb | APHA 2320 A/B | mg/L | - | <0.1 | 48 | 34.5 | 55.4 | 43.4 | 50.2 |
| Alkalinity carb | APHA 2320 A/B | mg/L | - | <0.1 | 48 | <0.1 | <0.1 | <0.1 | <0.1 |
| Alkalinity hydrox | APHA 2320 A/B | mg/L | - | <0.1 | 48 | <0.1 | <0.1 | <0.1 | <0.1 |
| Alkalinity total | APHA 2320 A/B | mg/L | - | <1 | 48 | 34 | 55 | 43 | 50 |
| Aluminium acid soluble | USEPA 200.8 | µg/L | - | <5 | 24 | 10 | 60 | 34 | 58 |
| Asbestos | AS4964-2000 | Present/ Absent | - | Absent | 12 | Absent | Absent | - | - |
| Calcium dissolved | USEPA 200.7 | mg/L | - | <0.05 | 24 | 10.70 | 17.50 | 13.62 | 16.81 |
| Chloride | APHA 21st Ed. 2005, Part 4110 B | mg/L | - | <0.1 | 12 | 3.0 | 7.1 | 5.1 | 7.1 |
| Chlorine combined | APHA 4500 -CL G | mg/L | - | <0.03 | 266 | <0.03 | 0.27 | 0.07 | 0.17 |
| Chlorine free | APHA 4500 -CL G | mg/L | - | <0.03 | 266 | 0.05 | 1.76 | 0.79 | 1.14 |
| Chlorine total | APHA 4500 -CL G | mg/L | 5 | <0.03 | 266 | 0.15 | 1.88 | 0.86 | 1.20 |
| Cyanide | APHA 4500_CN | mg/L | 0.08 | <0.004 | 12 | <0.004 | <0.004 | <0.004 | <0.004 |
| Fluoride | APHA 21st Ed. 2005, Part 4110 B | mg/L | 1.5 | <0.1 | 24 | 0.26 | 0.80 | 0.70 | 0.80 |
| Hardness total | APHA 2340 B | mg/L | - | <0.1 | 24 | 30.0 | 58.0 | 41.8 | 57.9 |
| Iodide | VIC-CM078 | mg/L | 0.5 | <0.01 | 12 | <0.01 | 0.025 | <0.01 | 0.014 |
| Magnesium dissolved | USEPA 200.7 | mg/L | - | <0.05 | 24 | 0.81 | 4.35 | 1.90 | 4.22 |
| Nitrate | APHA 21st Ed. 2005, Part 4110 B | mg/L | 50 | <0.1 | 12 | <0.1 | 0.1 | <0.1 | <0.1 |
| Potassium dissolved | USEPA 200.7 | mg/L | - | <0.1 | 12 | 0.4 | 1.9 | 0.9 | 1.8 |
| Sodium dissolved | USEPA 200.7 | mg/L | - | <0.1 | 12 | 2.8 | 8.4 | 4.7 | 8.3 |
| Sulphate | APHA 21st Ed. 2005, Part 4110 B | mg/L | 500 | <0.4 | 12 | <0.4 | 23.8 | 7.9 | 23.7 |
| **Total metals** | | | | | | | | | |
| Aluminium total | USEPA 200.8 | µg/L | - | <9 | 24 | 26 | 80 | 39 | 56 |
| Antimony total | USEPA 200.8 | µg/L | 3 | <3 | 24 | <3 | <3 | <3 | <3 |
| Arsenic total | USEPA 200.8 | µg/L | 10 | <1 | 24 | <1 | 2 | <1 | <1 |
| Barium total | USEPA 200.8 | µg/L | 2000 | <2 | 24 | 2.6 | 7.0 | 4.5 | 6.3 |
| Beryllium total | USEPA 200.8 | µg/L | 60 | <0.1 | 24 | <0.1 | 0.1 | <0.1 | <0.1 |
| Boron total | USEPA 200.7 | mg/L | 4 | <0.01 | 12 | <0.01 | 0.01 | <0.01 | <0.01 |
| Cadmium total | USEPA 200.8 | µg/L | 2 | <0.05 | 24 | <0.05 | <0.05 | <0.05 | <0.05 |
| Chromium total | USEPA 200.8 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Cobalt total | USEPA 200.8 | µg/L | - | <0.2 | 24 | <0.2 | 0.2 | <0.2 | <0.2 |
| Copper total | USEPA 200.8 | µg/L | 2000 | <1 | 48 | 2 | 21 | 9 | 18 |
| Iron total | USEPA 200.7 | mg/L | - | <0.01 | 48 | <0.01 | 0.06 | 0.01 | 0.02 |
| Lead total | USEPA 200.8 | µg/L | 10 | <0.2 | 48 | <0.2 | 1.2 | 0.2 | 0.6 |
| Manganese total | USEPA 200.7 | mg/L | 0.5 | <0.001 | 48 | 0.001 | 0.019 | 0.005 | 0.017 |

**Table 9-4** Summary data for water quality zone 3: South Canberra, Woden and Weston Creek (cont.)

| Analyte | Method ID | Units | ADWG (Health) | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Mercury total | USEPA 200.8 | µg/L | 1 | <0.1 | 12 | <0.1 | <0.1 | <0.1 | <0.1 |
| Molybdenum total | USEPA 200.8 | µg/L | 50 | <1 | 24 | <1 | 2 | <1 | <1 |
| Nickel total | USEPA 200.8 | µg/L | 20 | <1 | 24 | <1 | 4 | 1 | 3 |
| Selenium total | USEPA 200.8 | µg/L | 10 | <1 | 24 | <1 | 5 | <1 | 2 |
| Silver total | USEPA 200.8 | µg/L | 100 | <1 | 24 | <1 | <1 | <1 | <1 |
| Zinc total | USEPA 200.8 | µg/L | - | <5 | 24 | <5 | 12 | <5 | 8 |
| **Haloacetic acids** | | | | | | | | | |
| Bromoacetic acid | ALS: Headspace GCMS | µg/L | - | <5 | 24 | <5 | 34 | <5 | <5 |
| Bromochloroacetic acid | ALS: Headspace GCMS | µg/L | - | <1 | 24 | <1 | 5 | 2 | 4 |
| Bromodichloroacetic acid | ALS: Headspace GCMS | µg/L | - | <1 | 24 | <1 | 6 | 2 | 6 |
| Dibromoacetic acid | ALS: Headspace GCMS | µg/L | - | <1 | 24 | <1 | 3 | <1 | <1 |
| Dibromochloroacetic acid | ALS: Headspace GCMS | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Dichloroacetic acid | ALS: Headspace GCMS | µg/L | 100 | <1 | 24 | <1 | 34 | 17 | 33 |
| Monochloroacetic acid | ALS: Headspace GCMS | µg/L | 150 | <1 | 24 | <1 | 3 | <1 | 3 |
| Tribromoacetic acid | ALS: Headspace GCMS | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Trichloroacetic acid | ALS: Headspace GCMS | µg/L | 100 | <1 | 24 | 12 | 49 | 28 | 43 |
| Sum of haloacetic acid | ALS: Headspace GCMS | µg/L | - | <1 | 24 | 26 | 92 | 50 | 90 |
| **Trihalomethanes** | | | | | | | | | |
| Bromoform | VIC-CM047 | mg/L | - | <0.001 | 24 | <0.001 | <0.001 | <0.001 | <0.001 |
| Chloroform | VIC-CM047 | mg/L | - | <0.001 | 24 | 0.021 | 0.075 | 0.042 | 0.071 |
| Dibromochloromethane | VIC-CM047 | mg/L | - | <0.001 | 24 | <0.001 | 0.001 | <0.001 | <0.001 |
| Dichlorobromomethane | VIC-CM047 | mg/L | - | <0.001 | 24 | 0.002 | 0.011 | 0.004 | 0.010 |
| Trihalomethanes total | VIC-CM047 | mg/L | 0.25 | <0.001 | 24 | 0.023 | 0.085 | 0.046 | 0.081 |
| **Semi volatile organic compounds (SVOC)** | | | | | | | | | |
| **Anilines and benzidines** | | | | | | | | | |
| 2 Nitroaniline | US EPA 3510/8270 | µg/L | - | <4 | 24 | <4 | <4 | <4 | <4 |
| 3 Nitroaniline | US EPA 3510/8270 | µg/L | - | <4 | 24 | <4 | <4 | <4 | <4 |
| 3,3 Dichlorobenzidine | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 4 Chloroaniline | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 4 Nitroaniline | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Aniline | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Carbazole | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Dibenzofuran | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| **Chlorinated hydrocarbons** | | | | | | | | | |
| 1,2 Dichlorobenzene | US EPA 3510/8270 | µg/L | 1500 | <2 | 24 | <2 | <2 | <2 | <2 |
| 1,2,4 Trichlorobenzene | US EPA 3510/8270 | µg/L | 30 | <2 | 24 | <2 | <2 | <2 | <2 |
| 1,3 Dichlorobenzene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 1,4 Dichlorobenzene | US EPA 3510/8270 | µg/L | 40 | <2 | 24 | <2 | <2 | <2 | <2 |
| Hexachlorobenzene | US EPA 3510/8270 | µg/L | - | <4 | 24 | <4 | <4 | <4 | <4 |
| Hexachlorobutadiene | US EPA 3510/8270 | µg/L | 0.7 | <2 | 24 | <2 | <2 | <2 | <2 |
| Hexachlorocyclopentadiene | US EPA 3510/8270 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Hexachloroethane | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Hexachloropropylene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Pentachlorobenzene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |

**Table 9-4** Summary data for water quality zone 3: South Canberra, Woden and Weston Creek (cont.)

| Analyte | Method ID | Units | ADWG (Health) | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| **Haloethers** | | | | | | | | | |
| 4 Bromophenyl phenyl ether | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 4 Chlorophenyl phenyl ether | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Bis(2-chloroethoxy) methane | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Bis(2-chloroethyl) ether | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| **Nitroaromatics and ketones** | | | | | | | | | |
| 1 Naphthylamine | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 1,3,5 Trinitrobenzene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 2 Picoline | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 2,4 Dinitrotoluene | US EPA 3510/8270 | µg/L | - | <4 | 24 | <4 | <4 | <4 | <4 |
| 2,6 Dinitrotoluene | US EPA 3510/8270 | µg/L | - | <4 | 24 | <4 | <4 | <4 | <4 |
| 4 Aminobiphenyl | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 4 Nitroquinoline-N-oxide | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 5 Nitro-o-toluidine | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Acetophenone | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Azobenzene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Chlorobenzilate | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Dimethylaminoazobenzene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Isophorone | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Nitrobenzene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Pentachloronitrobenzene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Phenacetin | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Pronamide | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| **Nitrosamines** | | | | | | | | | |
| Methapyrilene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| N-Nitrosodibutylamine | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| N-Nitrosodiethylamine | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| N-Nitrosodi-n-propylamine | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| N-Nitrosodiphenyl & Diphenylamine | US EPA 3510/8270 | µg/L | - | <4 | 24 | <4 | <4 | <4 | <4 |
| N-Nitrosomethylethylamine | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| N-Nitrosomorpholine | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| N-Nitrosopiperidine | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| N-Nitrosopyrrolidine | US EPA 3510/8270 | µg/L | - | <4 | 24 | <4 | <4 | <4 | <4 |
| **Organochlorine pesticides** | | | | | | | | | |
| 4,4 DDD | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 4,4 DDE | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 4,4 DDT | US EPA 3510/8270 | µg/L | 9 | <4 | 24 | <4 | <4 | <4 | <4 |
| Aldrin | US EPA 3510/8270 | µg/L | 0.3 | <2 | 24 | <2 | <2 | <2 | <2 |
| alpha BHC | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| alpha Endosulfan | US EPA 3510/8270 | µg/L | 20 | <2 | 24 | <2 | <2 | <2 | <2 |
| beta BHC | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| beta Endosulfan | US EPA 3510/8270 | µg/L | 20 | <2 | 24 | <2 | <2 | <2 | <2 |
| delta BHC | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Dieldrin | US EPA 3510/8270 | µg/L | 0.3 | <2 | 24 | <2 | <2 | <2 | <2 |
| Endrin | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Endosulfan sulfate | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| gamma BHC | US EPA 3510/8270 | µg/L | 10 | <2 | 24 | <2 | <2 | <2 | <2 |

**Table 9-4** Summary data for water quality zone 3: South Canberra, Woden and Weston Creek (cont.)

| Analyte | Method ID | Units | ADWG (Health) | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Heptachlor | US EPA 3510/8270 | µg/L | 0.3 | <2 | 24 | <2 | <2 | <2 | <2 |
| Heptachlor epoxide | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| **Organophosphorous pesticides** | | | | | | | | | |
| Chlorfenvinphos | US EPA 3510/8270 | µg/L | 2 | <2 | 24 | <2 | <2 | <2 | <2 |
| Chlorpyrifos | US EPA 3510/8270 | µg/L | 10 | <2 | 24 | <2 | <2 | <2 | <2 |
| Chlorpyrifos-methyl | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Diazinon | US EPA 3510/8270 | µg/L | 4 | <2 | 24 | <2 | <2 | <2 | <2 |
| Dichlorvos | US EPA 3510/8270 | µg/L | 5 | <2 | 24 | <2 | <2 | <2 | <2 |
| Dimethoate | US EPA 3510/8270 | µg/L | 7 | <2 | 24 | <2 | <2 | <2 | <2 |
| Ethion | US EPA 3510/8270 | µg/L | 4 | <2 | 24 | <2 | <2 | <2 | <2 |
| Fenthion | US EPA 3510/8270 | µg/L | 7 | <2 | 24 | <2 | <2 | <2 | <2 |
| Malathion | US EPA 3510/8270 | µg/L | 70 | <2 | 24 | <2 | <2 | <2 | <2 |
| Pirimiphos-ethyl | US EPA 3510/8270 | µg/L | 0.5 | <2 | 24 | <2 | <2 | <2 | <2 |
| Prothiofos | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| **Phenolic compounds** | | | | | | | | | |
| 2,3,4,6 Tetrachlorophenol | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 2,4 Dichlorophenol | US EPA 3510/8270 | µg/L | 200 | <2 | 24 | <2 | <2 | <2 | <2 |
| 2,4 Dimethylphenol | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 2,4,5 Trichlorophenol | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 2,4,6 Trichlorophenol | US EPA 3510/8270 | µg/L | 20 | <2 | 24 | <2 | <2 | <2 | <2 |
| 2,6 Dichlorophenol | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 2 Chlorophenol | US EPA 3510/8270 | µg/L | 300 | <2 | 24 | <2 | <2 | <2 | <2 |
| 2 Methylphenol | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 2 Nitrophenol | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 3 & 4 Methylphenol | US EPA 3510/8270 | µg/L | - | <4 | 24 | <4 | <4 | <4 | <4 |
| 4 Chloro-3-Methylphenol | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Pentachlorophenol | US EPA 3510/8270 | µg/L | 10 | <4 | 24 | <4 | <4 | <4 | <4 |
| Phenol | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| **Phthalates** | | | | | | | | | |
| Bis(2-ethylhexyl) phthalate | US EPA 3510/8270 | µg/L | 10 | <10 | 24 | <10 | <10 | <10 | <10 |
| Bis(2-ethylhexyl) phthalate | US EPA 8270D | µg/L | 10 | <10 | 24 | <10 | <10 | <10 | <10 |
| Butyl benzyl phthalate | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Butyl benzyl phthalate | US EPA 8270D | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Diethyl phthalate | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Diethyl phthalate | US EPA 8270D | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Dimethyl phthalate | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Dimethyl phthalate | US EPA 8270D | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Di-n-butyl phthalate | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Di-n-butyl phthalate | US EPA 8270D | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Di-n-octylphthalate | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Di-n-octylphthalate | US EPA 8270D | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Polycyclic aromatic hydrocarbons | | | | | | | | | |
| 2 Chloronaphthalene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 2 Methylnaphthalene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 3 Methylcholanthrene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 7,12-Dimethylbenz(a) anthracene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Acenaphthene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Acenaphthene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Acenaphthylene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |

**Table 9-4** Summary data for water quality zone 3: South Canberra, Woden and Weston Creek (cont.)

| Analyte | Method ID | Units | ADWG (Health) | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthylene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Anthracene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Anthracene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Benz(a)anthracene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Benz(a)anthracene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Benzo(a)pyrene | US EPA 3510/8270 | µg/L | 0.01 | <0.5 | 24 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(a)pyrene | US EPA 3510/8270 | µg/L | 0.01 | <2 | 24 | <2 | <2 | <2 | <2 |
| Benzo(b) fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Benzo(k) fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Benzo(b) & benzo(k) fluoranthene | US EPA 3510/8270 | µg/L | - | <4 | 24 | <4 | <4 | <4 | <4 |
| Benzo(g,h,i)perylene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Benzo(g,h,i)perylene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Chrysene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Chrysene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Dibenz(a,h)anthracene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Dibenz(a,h)anthracene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Fluoranthene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Fluorene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Fluorene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Indeno(1,2,3-cd)pyrene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Indeno(1,2,3-cd)pyrene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| N-2-Fluorenyl Acetamide | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Naphthalene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Naphthalene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Phenanthrene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Phenanthrene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Pyrene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Pyrene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| PAH (total) | US EPA 3510/8270 | µg/L | - | <0.5 | 24 | <0.5 | <0.5 | <0.5 | <0.5 |

## Table notes:

| | |
|---|---|
| ADWG (Health) | Australian Drinking Water Guidelines – Health Guideline Value |
| CFU/mL | colony forming units per millilitre |
| Deg. C | degrees Celsius |
| LOR | limit of reporting |
| µg/L | micrograms per litre |
| µS/cm | micro siemens per centimetre |
| mg/L | milligrams per litre |
| MPN/100mL | most probable number per 100 millilitres |
| NTU | nephelometric units |
| Pt-Co | platinum-cobalt units |

The 95$^{th}$ percentile is a statistical calculation based on 'normal' distribution. In the context of this report, it estimates the value for which 95% of all the water that passes through the distribution system in this 12 month period falls below.

**Table 9-5** Summary data for water quality zone 4: Tuggeranong

| Analyte | Method ID | Units | ADWG (Health) | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| **Microbiological** | | | | | | | | | |
| *E. coli* | APHA 9223 B | MPN/100mL | <1 | <1 | 265 | <1 | <1 | <1 | <1 |
| Total coliforms | APHA 9223 B | MPN/100mL | - | <1 | 265 | <1 | 53 | <1 | <1 |
| Heterotrophic plate count | APHA 9215 B | CFU/mL | - | <1 | 265 | <1 | 105 | 2 | 9 |
| **Physical** | | | | | | | | | |
| Conductivity | APHA 2510 B | µS/cm | - | <2 | 24 | 87 | 175 | 122 | 173 |
| pH | APHA 4500-H B | pH units | - | <0.01 | 265 | 7.50 | 8.91 | 7.88 | 8.29 |
| Temperature | APHA 4500-H B | deg.C | - | <0.1 | 48 | 9.0 | 24.5 | 16.6 | 23.8 |
| Total dissolved salts | APHA 2540 C | mg/L | - | <20 | 24 | 38 | 118 | 79 | 108 |
| True colour | Lachat QuikChem Method, Colour in Waters 10-308-00-1-A | Pt-Co | - | <1 | 48 | <1 | 2 | 1 | 2 |
| Turbidity | APHA 2130 B | NTU | - | <0.1 | 48 | 0.1 | 0.5 | 0.2 | 0.3 |
| **Inorganic** | | | | | | | | | |
| Alkalinity bicarb | APHA 2320 A/B | mg/L | - | <0.1 | 48 | 33.0 | 57.1 | 43.5 | 49.6 |
| Alkalinity carb | APHA 2320 A/B | mg/L | - | <0.1 | 48 | <0.1 | 5.7 | 0.2 | <0.1 |
| Alkalinity hydrox | APHA 2320 A/B | mg/L | - | <0.1 | 48 | <0.1 | <0.1 | <0.1 | <0.1 |
| Alkalinity total | APHA 2320 A/B | mg/L | - | <1 | 48 | 33 | 57 | 44 | 50 |
| Aluminium acid soluble | USEPA 200.8 | µg/L | - | <5 | 24 | 21 | 50 | 31 | 42 |
| Asbestos | AS4964-2000 | Present/ Absent | - | Absent | 12 | Absent | Absent | - | - |
| Calcium dissolved | USEPA 200.7 | mg/L | - | <0.05 | 24 | 11.10 | 18.20 | 14.46 | 17.83 |
| Chloride | APHA 21st Ed. 2005, Part 4110 B | mg/L | - | <0.1 | 12 | 2.5 | 9.9 | 5.7 | 8.7 |
| Chlorine combined | APHA 4500 -CL G | mg/L | - | <0.03 | 264 | <0.03 | 0.32 | 0.06 | 0.15 |
| Chlorine free | APHA 4500 -CL G | mg/L | - | <0.03 | 265 | 0.04 | 1.38 | 0.68 | 1.17 |
| Chlorine total | APHA 4500 -CL G | mg/L | 5 | <0.03 | 264 | 0.15 | 1.51 | 0.75 | 1.23 |
| Cyanide | APHA 4500_CN | mg/L | 0.08 | <0.004 | 12 | <0.004 | <0.004 | <0.004 | <0.004 |
| Fluoride | APHA 21st Ed. 2005, Part 4110 B | mg/L | 1.5 | <0.1 | 24 | 0.36 | 0.78 | 0.71 | 0.77 |
| Hardness total | APHA 2340 B | mg/L | - | <0.1 | 24 | 31.0 | 61.0 | 44.2 | 59.9 |
| Iodide | VIC-CM078 | mg/L | 0.5 | <0.01 | 12 | <0.01 | 0.025 | <0.01 | 0.022 |
| Magnesium dissolved | USEPA 200.7 | mg/L | - | <0.05 | 24 | 0.76 | 4.33 | 1.94 | 4.01 |
| Nitrate | APHA 21st Ed. 2005, Part 4110 B | mg/L | 50 | <0.1 | 12 | <0.1 | <0.1 | <0.1 | <0.1 |
| Potassium dissolved | USEPA 200.7 | mg/L | - | <0.1 | 12 | 0.4 | 1.8 | 0.9 | 1.7 |
| Sodium dissolved | USEPA 200.7 | mg/L | - | <0.1 | 12 | 2.8 | 8.4 | 4.7 | 8.3 |
| Sulphate | APHA 21st Ed. 2005, Part 4110 B | mg/L | 500 | <0.4 | 12 | <0.4 | 24.8 | 9.1 | 24.6 |
| **Total metals** | | | | | | | | | |
| Aluminium total | USEPA 200.8 | µg/L | - | <9 | 24 | 16 | 63 | 37 | 56 |
| Antimony total | USEPA 200.8 | µg/L | 3 | <3 | 24 | <3 | <3 | <3 | <3 |
| Arsenic total | USEPA 200.8 | µg/L | 10 | <1 | 24 | <1 | <1 | <1 | <1 |
| Barium total | USEPA 200.8 | µg/L | 2000 | <2 | 24 | 2.7 | 6.8 | 4.5 | 6.7 |
| Beryllium total | USEPA 200.8 | µg/L | 60 | <0.1 | 24 | <0.1 | <0.1 | <0.1 | <0.1 |
| Boron total | USEPA 200.7 | mg/L | 4 | <0.01 | 12 | <0.01 | 0.01 | <0.01 | 0.01 |
| Cadmium total | USEPA 200.8 | µg/L | 2 | <0.05 | 24 | <0.05 | 0.18 | <0.05 | <0.05 |
| Chromium total | USEPA 200.8 | µg/L | - | <2 | 24 | <2 | 2 | <2 | <2 |
| Cobalt total | USEPA 200.8 | µg/L | - | <0.2 | 24 | <0.2 | 0.2 | <0.2 | <0.2 |
| Copper total | USEPA 200.8 | µg/L | 2000 | <1 | 48 | 2 | 85 | 13 | 46 |
| Iron total | USEPA 200.7 | mg/L | - | <0.01 | 48 | <0.01 | 0.02 | <0.01 | 0.02 |
| Lead total | USEPA 200.8 | µg/L | 10 | <0.2 | 48 | <0.2 | 1.9 | <0.2 | 0.3 |
| Manganese total | USEPA 200.7 | mg/L | 0.5 | <0.001 | 48 | <0.001 | 0.016 | 0.004 | 0.006 |

**Table 9-5** Summary data for water quality zone 4: Tuggeranong (cont.)

| Analyte | Method ID | Units | ADWG (Health) | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Mercury total | USEPA 200.8 | µg/L | 1 | <0.1 | 12 | <0.1 | <0.1 | <0.1 | <0.1 |
| Molybdenum total | USEPA 200.8 | µg/L | 50 | <1 | 24 | <1 | <1 | <1 | <1 |
| Nickel total | USEPA 200.8 | µg/L | 20 | <1 | 24 | <1 | 5 | 1 | 3 |
| Selenium total | USEPA 200.8 | µg/L | 10 | <1 | 24 | <1 | 2 | <1 | 1 |
| Silver total | USEPA 200.8 | µg/L | 100 | <1 | 24 | <1 | <1 | <1 | <1 |
| Zinc total | USEPA 200.8 | µg/L | - | <5 | 24 | <5 | 19 | <5 | 12 |
| **Haloacetic acids** | | | | | | | | | |
| Bromoacetic acid | ALS: Headspace GCMS | µg/L | - | <5 | 24 | <5 | <5 | <5 | <5 |
| Bromochloroacetic acid | ALS: Headspace GCMS | µg/L | - | <1 | 24 | <1 | 5 | 2 | 5 |
| Bromodichloroacetic acid | ALS: Headspace GCMS | µg/L | - | <1 | 24 | <1 | 6 | 3 | 6 |
| Dibromoacetic acid | ALS: Headspace GCMS | µg/L | - | <1 | 24 | <1 | 2 | <1 | <1 |
| Dibromochloroacetic acid | ALS: Headspace GCMS | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Dichloroacetic acid | ALS: Headspace GCMS | µg/L | 100 | <1 | 24 | 6 | 34 | 19 | 33 |
| Monochloroacetic acid | ALS: Headspace GCMS | µg/L | 150 | <1 | 24 | <1 | 3 | 1 | 3 |
| Tribromoacetic acid | ALS: Headspace GCMS | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Trichloroacetic acid | ALS: Headspace GCMS | µg/L | 100 | <1 | 24 | 17 | 52 | 30 | 43 |
| Sum of haloacetic acid | ALS: Headspace GCMS | µg/L | - | <1 | 24 | 34 | 90 | 55 | 87 |
| **Trihalomethanes** | | | | | | | | | |
| Bromoform | VIC-CM047 | mg/L | - | <0.001 | 24 | <0.001 | 0.003 | <0.001 | <0.001 |
| Chloroform | VIC-CM047 | mg/L | - | <0.001 | 24 | <0.001 | 0.085 | 0.047 | 0.074 |
| Dibromochloromethane | VIC-CM047 | mg/L | - | <0.001 | 24 | <0.001 | 0.001 | <0.001 | 0.001 |
| Dichlorobromomethane | VIC-CM047 | mg/L | - | <0.001 | 24 | 0.002 | 0.040 | 0.008 | 0.027 |
| Trihalomethanes total | VIC-CM047 | mg/L | 0.25 | <0.001 | 24 | 0.032 | 0.099 | 0.054 | 0.085 |
| **Semi volatile organic compounds (SVOC)** | | | | | | | | | |
| **Anilines and benzidines** | | | | | | | | | |
| 2 Nitroaniline | US EPA 3510/8270 | µg/L | - | <4 | 24 | <4 | <4 | <4 | <4 |
| 3 Nitroaniline | US EPA 3510/8270 | µg/L | - | <4 | 24 | <4 | <4 | <4 | <4 |
| 3,3 Dichlorobenzidine | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 4 Chloroaniline | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 4 Nitroaniline | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Aniline | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Carbazole | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Dibenzofuran | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| **Chlorinated hydrocarbons** | | | | | | | | | |
| 1,2 Dichlorobenzene | US EPA 3510/8270 | µg/L | 1500 | <2 | 24 | <2 | <2 | <2 | <2 |
| 1,2,4 Trichlorobenzene | US EPA 3510/8270 | µg/L | 30 | <2 | 24 | <2 | <2 | <2 | <2 |
| 1,3 Dichlorobenzene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 1,4 Dichlorobenzene | US EPA 3510/8270 | µg/L | 40 | <2 | 24 | <2 | <2 | <2 | <2 |
| Hexachlorobenzene | US EPA 3510/8270 | µg/L | - | <4 | 24 | <4 | <4 | <4 | <4 |
| Hexachlorobutadiene | US EPA 3510/8270 | µg/L | 0.7 | <2 | 24 | <2 | <2 | <2 | <2 |
| Hexachlorocyclopentadiene | US EPA 3510/8270 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Hexachloroethane | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Hexachloropropylene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Pentachlorobenzene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Haloethers | | | | | | | | | |

**Table 9-5** Summary data for water quality zone 4: Tuggeranong (cont.)

| Analyte | Method ID | Units | ADWG (Health) | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| 4 Bromophenyl phenyl ether | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 4 Chlorophenyl phenyl ether | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Bis(2-chloroethoxy) methane | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Bis(2-chloroethyl) ether | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| **Nitroaromatics and ketones** | | | | | | | | | |
| 1 Naphthylamine | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 1,3,5 Trinitrobenzene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 2 Picoline | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 2,4 Dinitrotoluene | US EPA 3510/8270 | µg/L | - | <4 | 24 | <4 | <4 | <4 | <4 |
| 2,6 Dinitrotoluene | US EPA 3510/8270 | µg/L | - | <4 | 24 | <4 | <4 | <4 | <4 |
| 4 Aminobiphenyl | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 4 Nitroquinoline-N-oxide | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 5 Nitro-o-toluidine | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Acetophenone | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Azobenzene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Chlorobenzilate | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Dimethylaminoazobenzene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Isophorone | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Nitrobenzene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Pentachloronitrobenzene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Phenacetin | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Pronamide | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| **Nitrosamines** | | | | | | | | | |
| Methapyrilene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| N-Nitrosodibutylamine | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| N-Nitrosodiethylamine | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| N-Nitrosodi-n-propylamine | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| N-Nitrosodiphenyl & Diphenylamine | US EPA 3510/8270 | µg/L | - | <4 | 24 | <4 | <4 | <4 | <4 |
| N-Nitrosomethylethylamine | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| N-Nitrosomorpholine | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| N-Nitrosopiperidine | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| N-Nitrosopyrrolidine | US EPA 3510/8270 | µg/L | - | <4 | 24 | <4 | <4 | <4 | <4 |
| **Organochlorine pesticides** | | | | | | | | | |
| 4,4 DDD | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 4,4 DDE | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 4,4 DDT | US EPA 3510/8270 | µg/L | 9 | <4 | 24 | <4 | <4 | <4 | <4 |
| Aldrin | US EPA 3510/8270 | µg/L | 0.3 | <2 | 24 | <2 | <2 | <2 | <2 |
| alpha BHC | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| alpha Endosulfan | US EPA 3510/8270 | µg/L | 20 | <2 | 24 | <2 | <2 | <2 | <2 |
| beta BHC | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| beta Endosulfan | US EPA 3510/8270 | µg/L | 20 | <2 | 24 | <2 | <2 | <2 | <2 |
| delta BHC | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Dieldrin | US EPA 3510/8270 | µg/L | 0.3 | <2 | 24 | <2 | <2 | <2 | <2 |
| Endrin | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Endosulfan sulfate | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| gamma BHC | US EPA 3510/8270 | µg/L | 10 | <2 | 24 | <2 | <2 | <2 | <2 |
| Heptachlor | US EPA 3510/8270 | µg/L | 0.3 | <2 | 24 | <2 | <2 | <2 | <2 |
| Heptachlor epoxide | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |

**Table 9-5** Summary data for water quality zone 4: Tuggeranong (cont.)

| Analyte | Method ID | Units | ADWG (Health) | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| **Organophosphorous pesticides** | | | | | | | | | |
| Chlorfenvinphos | US EPA 3510/8270 | µg/L | 2 | <2 | 24 | <2 | <2 | <2 | <2 |
| Chlorpyrifos | US EPA 3510/8270 | µg/L | 10 | <2 | 24 | <2 | <2 | <2 | <2 |
| Chlorpyrifos-methyl | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Diazinon | US EPA 3510/8270 | µg/L | 4 | <2 | 24 | <2 | <2 | <2 | <2 |
| Dichlorvos | US EPA 3510/8270 | µg/L | 5 | <2 | 24 | <2 | <2 | <2 | <2 |
| Dimethoate | US EPA 3510/8270 | µg/L | 7 | <2 | 24 | <2 | <2 | <2 | <2 |
| Ethion | US EPA 3510/8270 | µg/L | 4 | <2 | 24 | <2 | <2 | <2 | <2 |
| Fenthion | US EPA 3510/8270 | µg/L | 7 | <2 | 24 | <2 | <2 | <2 | <2 |
| Malathion | US EPA 3510/8270 | µg/L | 70 | <2 | 24 | <2 | <2 | <2 | <2 |
| Pirimiphos-ethyl | US EPA 3510/8270 | µg/L | 0.5 | <2 | 24 | <2 | <2 | <2 | <2 |
| Prothiofos | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| **Phenolic compounds** | | | | | | | | | |
| 2,3,4,6 Tetrachlorophenol | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 2,4 Dichlorophenol | US EPA 3510/8270 | µg/L | 200 | <2 | 24 | <2 | <2 | <2 | <2 |
| 2,4 Dimethylphenol | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 2,4,5 Trichlorophenol | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 2,4,6 Trichlorophenol | US EPA 3510/8270 | µg/L | 20 | <2 | 24 | <2 | <2 | <2 | <2 |
| 2,6 Dichlorophenol | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 2 Chlorophenol | US EPA 3510/8270 | µg/L | 300 | <2 | 24 | <2 | <2 | <2 | <2 |
| 2 Methylphenol | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 2 Nitrophenol | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 3 & 4 Methylphenol | US EPA 3510/8270 | µg/L | - | <4 | 24 | <4 | <4 | <4 | <4 |
| 4 Chloro-3-Methylphenol | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Pentachlorophenol | US EPA 3510/8270 | µg/L | 10 | <4 | 24 | <4 | <4 | <4 | <4 |
| Phenol | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| **Phthalates** | | | | | | | | | |
| Bis(2-ethylhexyl) phthalate | US EPA 3510/8270 | µg/L | 10 | <10 | 24 | <10 | <10 | <10 | <10 |
| Bis(2-ethylhexyl) phthalate | US EPA 8270D | µg/L | 10 | <10 | 24 | <10 | <10 | <10 | <10 |
| Butyl benzyl phthalate | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Butyl benzyl phthalate | US EPA 8270D | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Diethyl phthalate | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Diethyl phthalate | US EPA 8270D | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Dimethyl phthalate | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Dimethyl phthalate | US EPA 8270D | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Di-n-butyl phthalate | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Di-n-butyl phthalate | US EPA 8270D | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Di-n-octylphthalate | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Di-n-octylphthalate | US EPA 8270D | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| **Polycyclic aromatic hydrocarbons** | | | | | | | | | |
| 2 Chloronaphthalene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 2 Methylnaphthalene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 3 Methylcholanthrene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| 7,12-Dimethylbenz(a) anthracene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Acenaphthene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Acenaphthene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Acenaphthylene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Acenaphthylene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Anthracene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |

**Table 9-5** Summary data for water quality zone 4: Tuggeranong (cont.)

| Analyte | Method ID | Units | ADWG (Health) | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Anthracene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Benz(a)anthracene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Benz(a)anthracene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Benzo(a)pyrene | US EPA 3510/8270 | µg/L | 0.01 | <0.5 | 24 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(a)pyrene | US EPA 3510/8270 | µg/L | 0.01 | <2 | 24 | <2 | <2 | <2 | <2 |
| Benzo(b) fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Benzo(k) fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Benzo(b) & benzo(k) fluoranthene | US EPA 3510/8270 | µg/L | - | <4 | 24 | <4 | <4 | <4 | <4 |
| Benzo(g,h,i)perylene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Benzo(g,h,i)perylene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Chrysene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Chrysene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Dibenz(a,h)anthracene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Dibenz(a,h)anthracene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Fluoranthene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Fluorene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Fluorene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Indeno(1,2,3-cd)pyrene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Indeno(1,2,3-cd)pyrene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| N-2-Fluorenyl Acetamide | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Naphthalene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Naphthalene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Phenanthrene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Phenanthrene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| Pyrene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Pyrene | US EPA 3510/8270 | µg/L | - | <2 | 24 | <2 | <2 | <2 | <2 |
| PAH (total) | US EPA 3510/8270 | µg/L | - | <0.5 | 24 | <0.5 | <0.5 | <0.5 | <0.5 |

## Table notes:

| | |
|---|---|
| **ADWG (Health)** | Australian Drinking Water Guidelines – Health Guideline Value |
| **CFU/mL** | colony forming units per millilitre |
| **Deg. C** | degrees Celsius |
| **LOR** | limit of reporting |
| **µg/L** | micrograms per litre |
| **µS/cm** | micro siemens per centimetre |
| **mg/L** | milligrams per litre |
| **MPN/100mL** | most probable number per 100 millilitres |
| **NTU** | nephelometric units |
| **Pt-Co** | platinum-cobalt units |

The 95$^{th}$ percentile is a statistical calculation based on 'normal' distribution. In the context of this report, it estimates the value for which 95% of all the water that passes through the distribution system in this 12 month period falls below.

# 10 References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# Abbreviations

| | |
|---|---|
| **ACT** | Australian Capital Territory |
| **ACT Heath** | ACT Health Directorate |
| **ADWG** | *Australian Drinking Water Guidelines (2011)* |
| **ADWG (Health)** | *Australian Drinking Water Guidelines* – health guideline value |
| **AS/NZS** | Australian Standards/New Zealand Standards |
| **CFU** | colony forming units |
| **cm** | centimetre |
| **$cm^2$** | centimetre squared |
| **Deg. C** | degrees Celsius |
| *E. coli* | *Escherichia coli* |
| **GL** | gigalitre |
| **GMP** | good manufacturing process |
| **HACCP** | hazard analysis and critical control point |
| **HBTs** | health based targets |
| **ICRC** | Independent Competition and Regulatory Commission |
| **ISO** | International Standards Organisation |
| **km** | kilometre |
| **L** | litre |
| **LOR** | limit of reporting |
| **mg** | milligram |
| **mJ** | megajoule |
| **ML** | megalitre |
| **mL** | millilitre |
| **mm** | millimetre |
| **$mm^3$** | millimetres cubed |
| **MPN** | most probable number |
| **µg** | micrograms |
| **µS** | microsiemens |
| **NATA** | National Association of Testing Authorities |
| **NHMRC** | National Health and Medical Research Council |
| **NSW** | New South Wales |
| **NTU** | nephelometric turbidity units |
| **Pt-Co** | platinum-cobalt units |
| **SVOC** | semi volatile organic compound |
| **The Code** | *Public Health (Drinking Water) Code of Practice (2007)* |
| **The Strategy** | Source Water Protection Strategy |
| **THM** | trihalomethanes |
| **UV** | ultraviolet light |
| **WSAA** | Water Services Association of Australia |
| **WTP** | water treatment plant |

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# Notes