2019-20

DRINKING WATER QUALITY REPORT

icon WATER

CONTENTS

SUMMARY

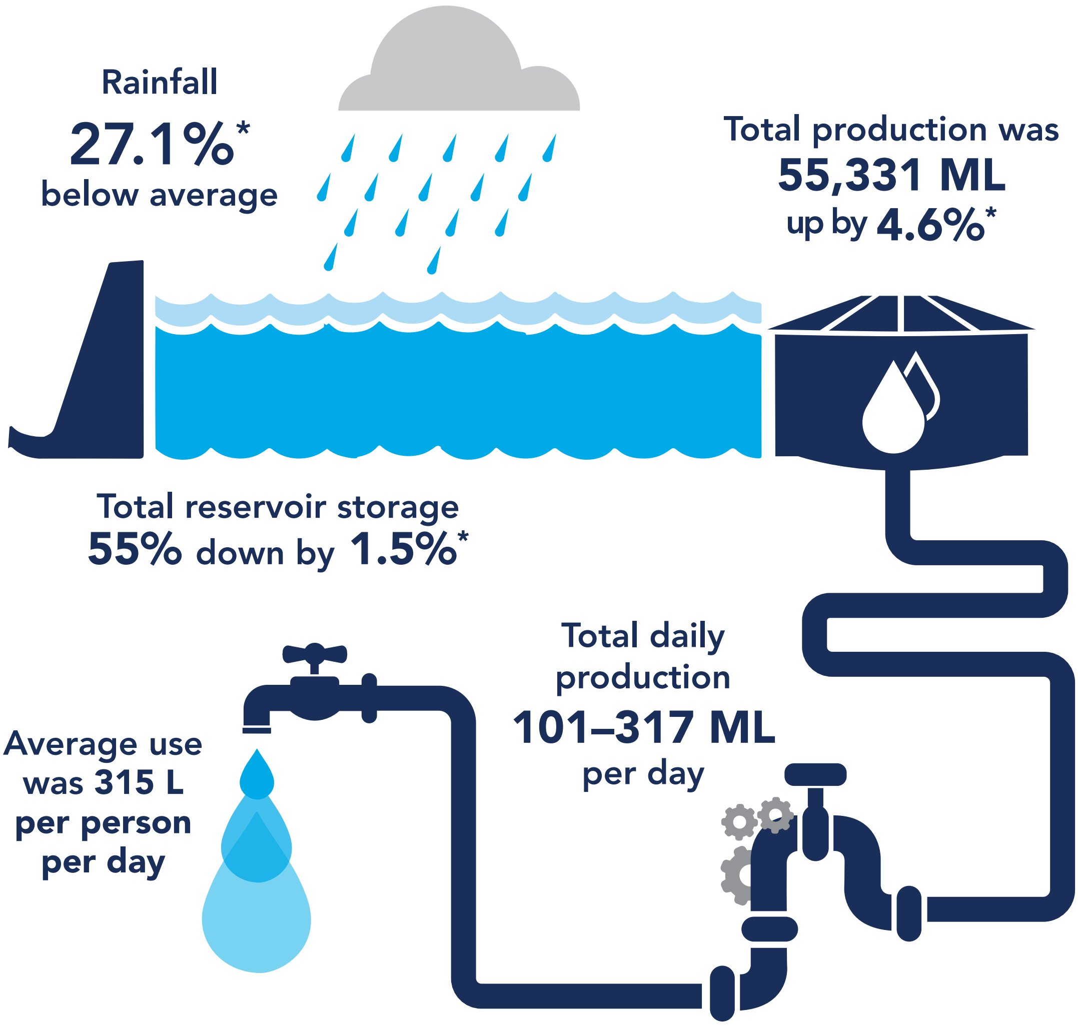
SUMMARY

Icon Water supports and protects the community and the environment by providing safe, clean drinking water.

Icon Water applies a rigorous water quality management framework that includes catchments and storage reservoirs, water treatment plants, service reservoirs and customers' taps. A core component of this management includes an extensive water quality monitoring program across the entire potable water production sequence from the storage reservoirs to the customer taps.

The information generated within this monitoring program ensures high quality water is delivered to Canberra and Queanbeyan.

At the end of June 2020, Canberra's four storage reservoirs were holding 55 per cent of their total accessible capacity. Overall daily production of drinking water throughout 2019–20 ranged between 101 and 317 megalitres (ML) per day, with a total of 55,331ML of drinking water supplied to Canberra and Queanbeyan. Total consumption was 55,270 ML, which is a 4.6 per cent increase on the previous year in the total water consumed by our commercial and residential users, which equates to approximately 315 litres per person per day.



* Compared to 2018–19.

CANBERRA'S DRINKING WATER SUPPLY SYSTEM

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 for the protection of Canberra and Queanbeyan's drinking water supply.

Icon Water abstracts raw water from the storage reservoirs and treats it 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. 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 two water treatment plants may be operated independently or in conjunction with each other in order to meet the community water supply demand.

Once treated, Icon Water distributes the water throughout Canberra using an extensive network of approximately 3,330 km of pipes and 48 service reservoirs sites. This infrastructure is maintained and closely monitored ensuring the Canberra community receives high quality drinking water.

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

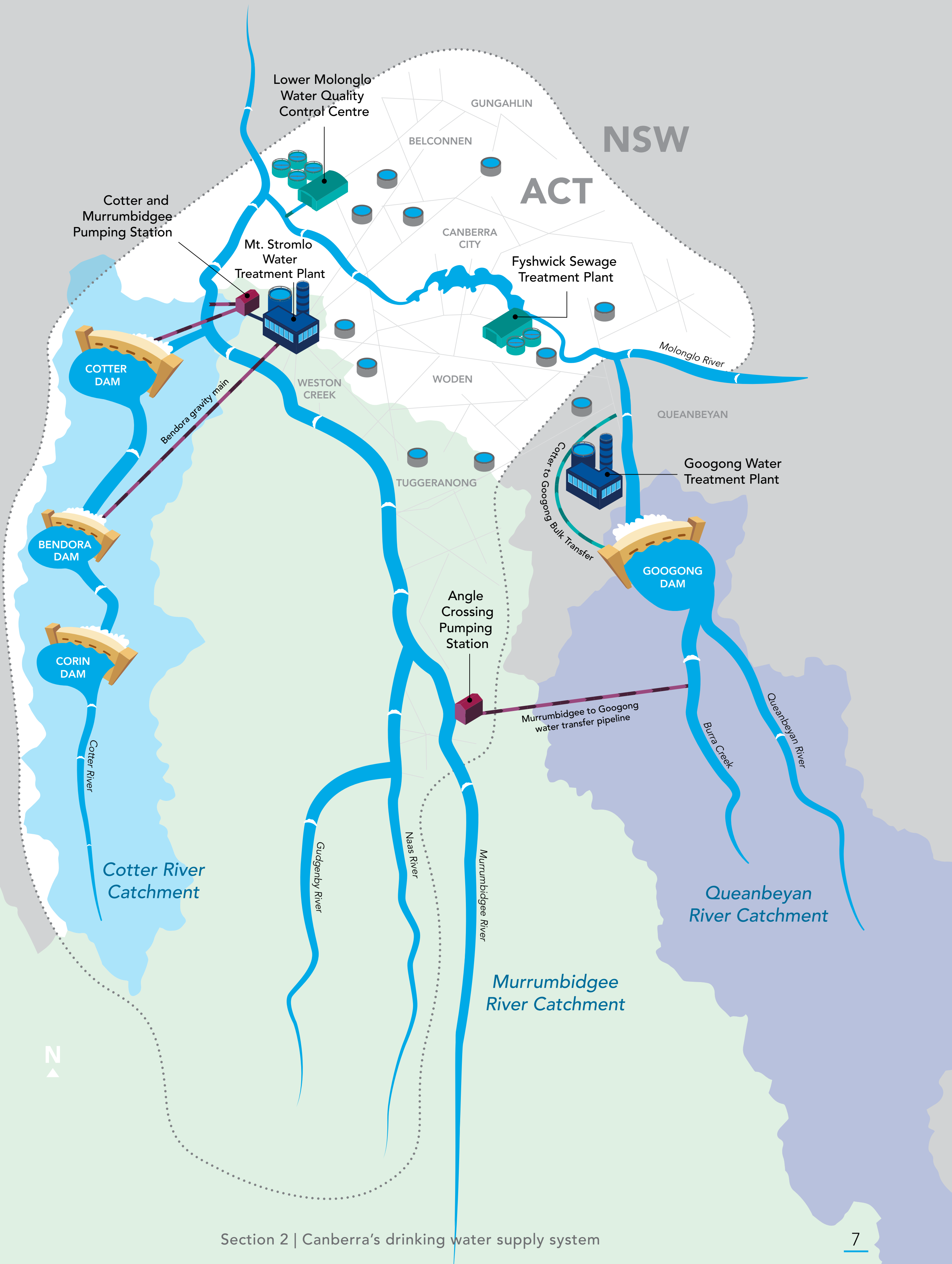
During 2019–20, Icon Water supplied 55,331 ML of drinking water to Canberra and Queanbeyan. The daily production ranged from 101 ML to 317 ML. Overall the total volume of water supplied represents an increase of approximately 4.6 per cent from the previous year.

Urban development in Canberra and Queanbeyan continues to evolve and grow. The most recent estimates put Canberra's population at 435,635[1] and Queanbeyan at 44,063[2,3], representing an annual population growth of 2 per cent. Per capita water consumed has also increased by 2 per cent from last year. Based on these figures, the average per capita consumption was 315 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

OUR NETWORK

(WATER & SEWERAGE)



MANAGING CANBERRA'S DRINKING WATER SUPPLY

MULTIPLE BARRIER APPROACH

Icon Water supports and protects the community by providing safe and 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.

The performance of these barriers is actively monitored and managed 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 uses to measure and manage 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

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.

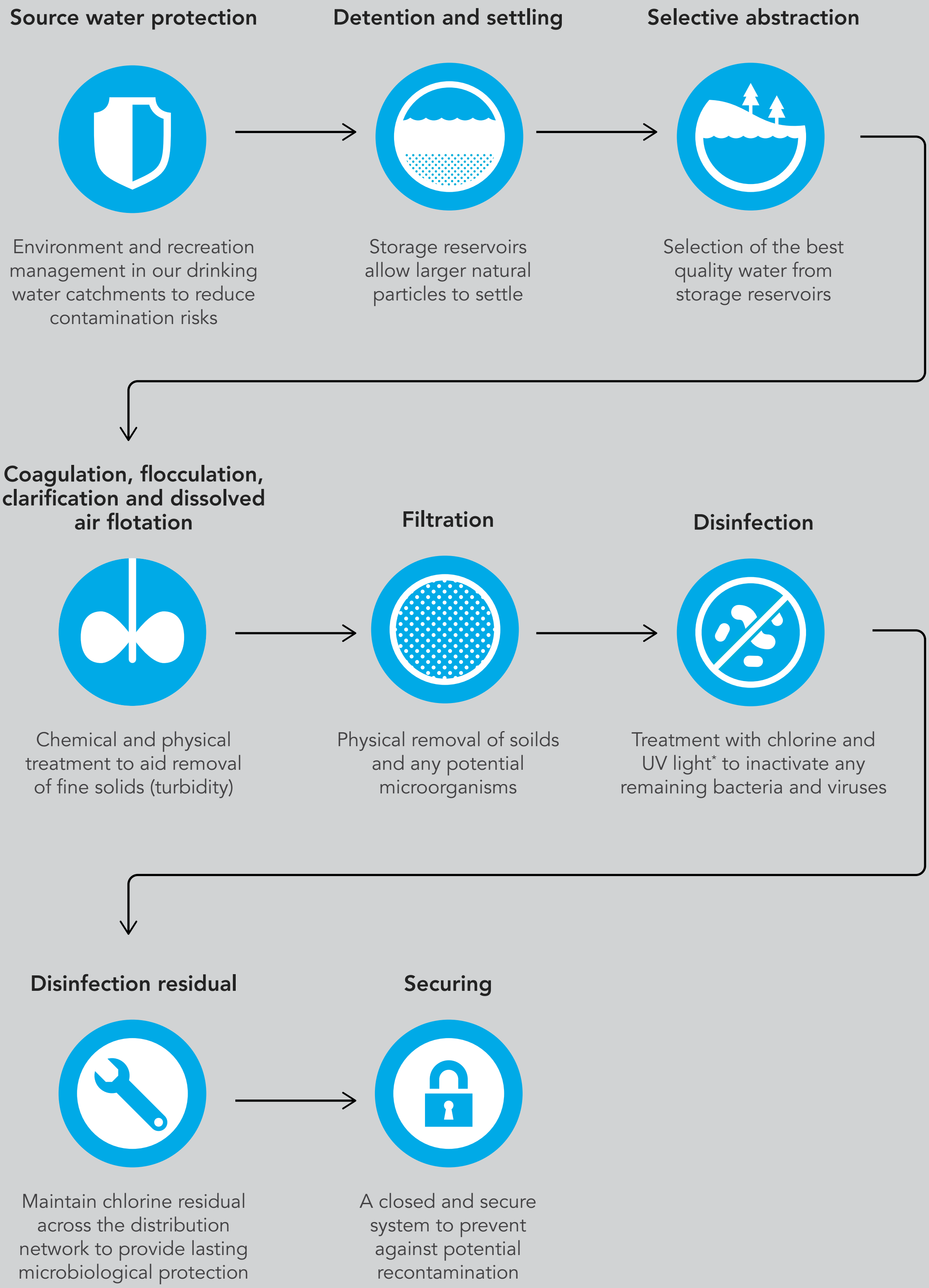
Icon Water also complies with the Public Health (Drinking Water) Code of Practice (2007) (the Code), which is issued by ACT Health.

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 9001:2015. Quality management systems
- ISO 14001:2015. 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 both the ADWG Framework for the Management of Drinking Water Quality and the HACCP system. Both systems address risks to potable 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 a potable 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 2019-20.

Figure 3.1 Drinking water supply barriers



*UV light treatment at Mount Stromlo WTP only

CANBERRA'S SOURCE WATER CATCHMENTS

SOURCE WATER SUPPLY

Canberra's source water catchments have a total available capacity of 277.8 GL, consisting of Corin (70.8 GL), Bendora (11.4 GL) and Cotter (76.2 GL) storage reservoirs on the Cotter River; the Googong (119.4 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 such as agricultural, residential and recreational activities. The sub-catchment of the Cotter reservoir is undergoing restoration following a history of forestry practice and the impact of bushfires in 2003. The Cotter River reservoirs have an available combined full capacity of 158.4 GL and were 61.4 per cent full at the end of June 2020. During 2019–20, the Cotter River reservoirs provided 58.3 per cent of the water supplied to Canberra and Queanbeyan (Figure 4-1), of which Bendora reservoir contributed 16.6 per cent and the Cotter reservoir supplied 41.8 per cent. In the last two years, the cotter reservoir has contributed over 40 per cent of the supply.

The Queanbeyan River catchment, located to the southeast of Canberra, contains a mix of developed and impacted land, including nature reserves, farm grazing and rural residential properties. NSW state agencies and local government councils regulate land-use 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 2020 Googong reservoir was at 46.4 per cent capacity. The Googong reservoir provided 41.7 per cent of the water supplied to Canberra and Queanbeyan during 2019–20 (Figure 4-1).

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 2019–20, 2,960 ML was abstracted from the Murrumbidgee River and transferred to Googong reservoir.

A bushfire in early 2020 damaged portions of the Corin and Bendora catchments. In response, Icon Water implemented a water quality event monitoring program and installed traps to reduce sediment movement and floating curtains to contain ash and suspended material within the storage reservoirs. Although the fire burnt at a high severity, water quality in these storage reservoirs was not immediately impacted until a high intensity rainfall event followed in early March 2020.

The climate and storage reservoir capacity

Overall 2019–20 was a dry year. Winter rainfall was 44 per cent below average, however large storms resulted in above average autumn rainfall. The rainfall at Canberra Airport was 27.1 per cent below the long term average and total evaporation at Burrinjuck Dam was 15.6 per cent above the long term average. Inflows to the four storage reservoirs totalled 62.8 GL, which is 56.3 per cent below the average of the last 15 years. As a result, Icon Water's storage reservoirs finished the year at 55 per cent full, a decrease on the 56.5 per cent storage recorded at the end of 2018–19.

Table 4-1 Rainfall, evaporation and reservoir capacity 2019–20

Total rainfall at Canberra Airport	447 mm
Long term average rainfall at Canberra Airport	613 mm
Evaporation at Burrinjuck Dam	1119 mm
Total reservoir volume 30 June 2020	55%

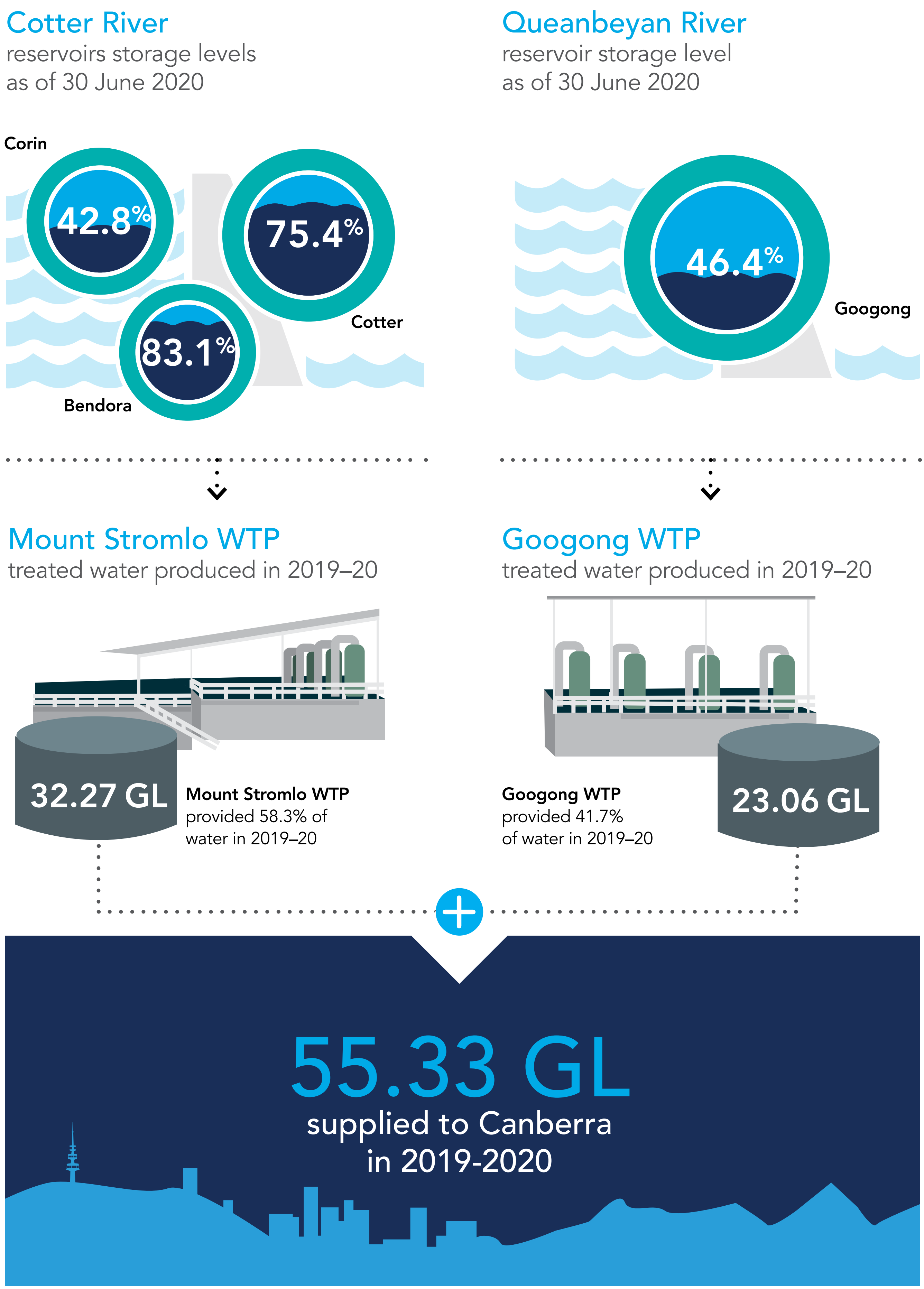


Figure 4-1 Reservoir storage levels and drinking water production for 2019–20

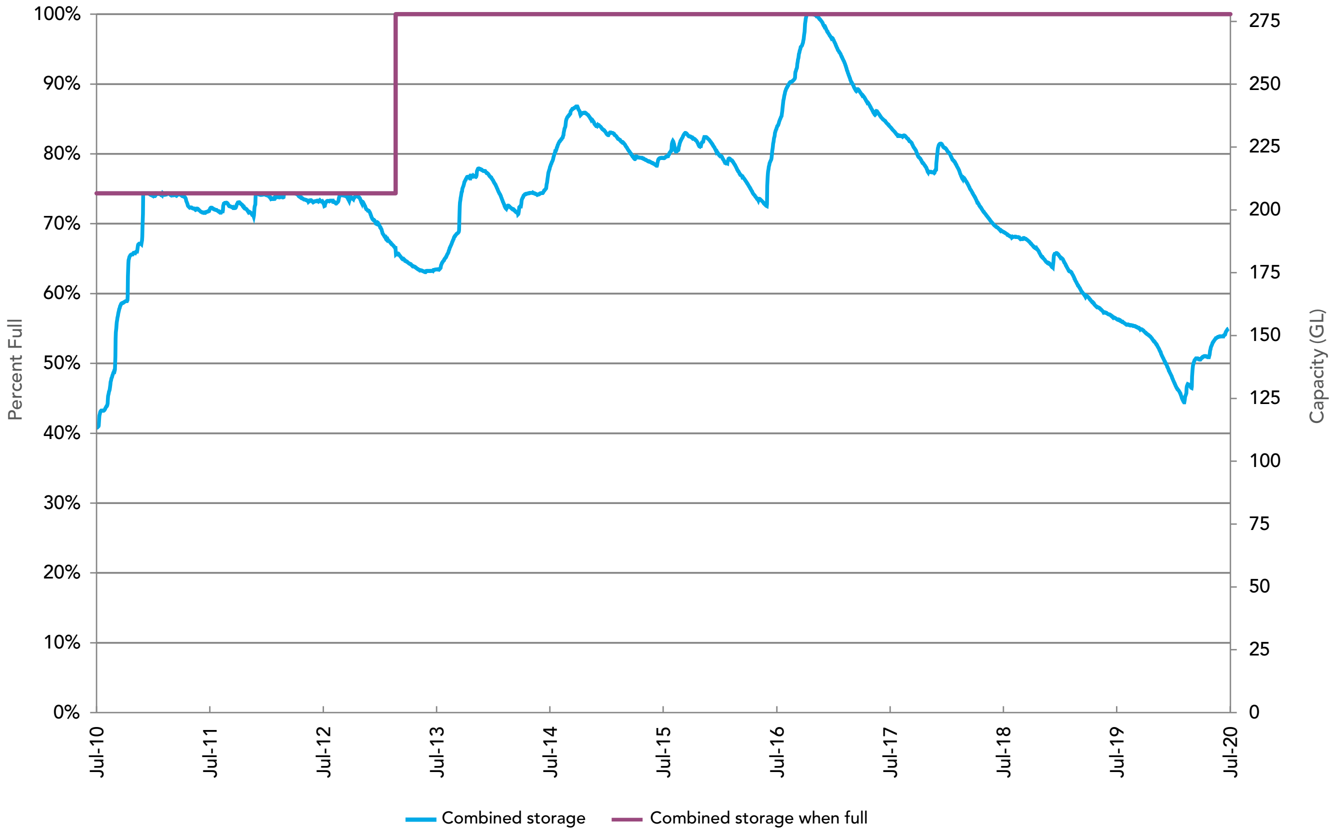


Figure 4-2 Combined storage levels of Corin, Bendora, Cotter and Googong reservoirs from January 2010 to July 2020

The Cotter Dam, 2019

SOURCE WATER PROTECTION

Icon Water operates a Source Water Protection Strategy (the Strategy) with the overall objective of protecting drinking water supply within the catchments for the Canberra and Queanbeyan water supply. 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 communicating these to the relevant land managers
- engage with relevant stakeholders and land managers to build relationships and determine appropriate planning and management activities via forums, partnerships and education.

In 2019–20 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 2019-20 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 ecological conditions within the source catchments.

Policy and legal protections

Icon Water has limited direct legislative power in the management of land in the 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 2019-20, Icon Water liaised with regulators on the potential risks to water quality and appropriate controls of proposed development and commercial applications for the supply catchments.

Icon Water also contributes to inter-agency 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 2019–20 to influence land use and recreation within the supply catchments which included:

- provision of financial support to allow Waterwatch programs to continue in the Cooma-Monaro and Southern ACT regions
- continued delivery 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
- continued direct engagement and active participation in the ACT and Region Catchment Management Coordination Group for strategic governance of healthy waterways
- direct engagement with Queanbeyan-Palerang Regional Council to develop regulatory and policy requirements for the protection of water quality entering the Googong Reservoir.

Australian Defence Force assisting to install coir logs

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.

Icon Water contributed funding for the purchase of 200 coir logs and stakes for immediate stabilistation works within the Corin and Bendora sub catchment areas after the Orroral Valley fire in early 2020. Icon Water is also participating in ACT Government catchment research programs aimed at improving the quality of water entering source water reservoirs.

Event Monitoring

Drinking water supply hazards in the ACT tend to have low frequencies of occurrence but can have significant consequences. In 2019-20 climatic events including drought and bushfire in drinking water catchments have presented an elevated risk to water quality. The potential water quality risks that arise from bushfires have been integrated into Icon Water's drinking water quality management system. The drinking water catchment sampling programs have been modified to understand the change in the risk profile of the raw water, with the priority to undertake sampling following significant post-fire rainfall events.

The Orroral Valley fire in January and February 2020 impacted the Namadgi National Park (comprising the southern region of the Cotter catchment including Corin and Bendora water supply reservoirs). 1,951 hectares of Corin catchment and 137 hectares of Bendora catchment were impacted by high severity fire. A risk assessment was completed to determine the management options in February 2020 and identified that the fire had been of a high intensity and had increased risks to water quality and water treatment needs.

The Cotter catchment bushfire was followed shortly after by a high intensity rainfall event. Rainfall events following bushfires can have a significant impact on water quality, caused by increased rates of erosion, increased sediments and turbidity, and the introduction of a range of chemicals into the water supply. Rainfall following bushfires can release inorganic nutrients from burnt plant material and lead to an increase in phosphorus and other nutrients entering waterways which can lead to future algal blooms.

To minimise impacts to the ACT and regional water supply and in response to the Cotter catchment bushfire and rainfall event, Icon Water implemented the water quality event monitoring program, installed sediment traps to reduce sediment movement in drainage lines and deployed silt curtains on Corin and Bendora reservoirs to contain ash and suspended material.

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 keep the water circulating and reduce the degree of thermal stratification where the water forms layers due to changes in temperature, oxygen and density (Figure 4-3).

By actively managing stratification, Icon Water has been able to increase the amount of oxygen within each reservoir and in doing so reduce metal and nutrient concentrations in the abstraction zone. This makes a greater volume of water available 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.

Icon Water undertakes an extensive sampling and analysis program to monitor water quality in its storage reservoirs and the Murrumbidgee River. The program 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 4-2. In addition, the raw water sources have continuous online monitoring for select parameters.
This enables Icon Water to react rapidly to changes in the raw water quality and ensure the highest quality water is abstracted for treatment at the WTPs.

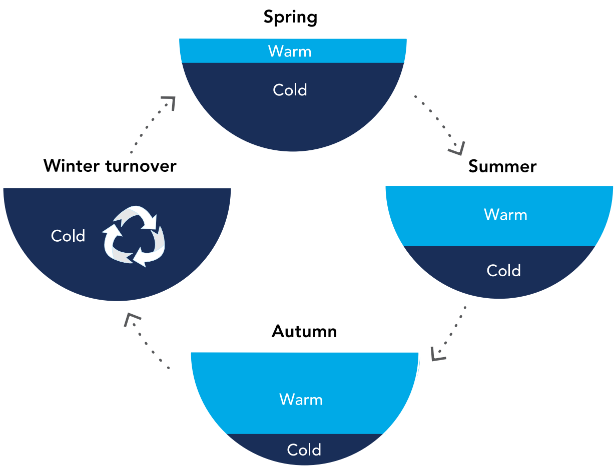


Figure 4-3 Cycle of reservoir thermal stratification

Table 4-2 Parameters routinely monitored in raw water sources

Microbiological	Physical	Chemical
Cryptosporidium and *Giardia*	Colour	Alkalinity
Escherichia coli (E. coli)	Conductivity	Chlorophyll-ɑ
Total coliforms	Dissolved oxygen	Nutrients (e.g. nitrogen and phosphorous)
Enterococci	pH	Organic compounds (including herbicides and pesticides)
Total coliforms	Temperature	Radionuclides
Phytoplankton including blue-green algae	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 Googong and Murrumbidgee catchments increase the nutrient levels in the waterways making these raw water sources more susceptible to algal blooms.

Icon Water's blue-green algae response plan, once activated can direct an increase in monitoring 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 8 of this report.

Concentrations of blue-green algae (*Dolicospermum circinalis*) in the Googong reservoir were higher in 2019–20 compared to 2018–19, particularly in the upper reaches of the reservoir. In 2019–20, there was one notifiable cyanobacteria detection in the Cotter catchment (Bendora reservoir) and no notifiable cyanobacteria detections at the Murrumbidgee River abstraction point.

Microorganisms

Cryptosporidium and *Giardia* are parasitic protozoan 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 routine monitoring for *Cryptosporidium* and *Giardia* in the storage reservoirs and the Murrumbidgee River, as well as at the WTPs.

During 2019–20, there was one detection of *Cryptosporidium* in Googong reservoir, one detection of *Cryptosporidium* in Bendora reservoir and no detections of *Giardia* in the routine monitoring of the storage reservoirs.

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 additional runoff therefore, in addition to routine testing, extra monitoring may be conducted if abstracting during these periods.

There were no detections for these microorganisms in the treated water leaving both treatment plants.

Pesticide and herbicide monitoring

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

During 2019–20, there were no pesticide detections above ADWG health values in any of the four storage reservoirs or the Murrumbidgee River.

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. The Googong reservoir can receive water from the Murrumbidgee River via the transfer pipeline.

WATER TREATMENT OPERATIONS

MOUNT STROMLO WATER TREATMENT PLANT

Mount Stromlo WTP has the capacity to treat 250 ML of water per day.

Mount Stromlo is the preferred WTP as water can be supplied by gravity from Bendora reservoir and the protected catchment provides better source water quality than the Googong reservoir.

The Stromlo 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 during periods of poorer raw water quality.

The treatment process is shown in Figure 5-1 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.

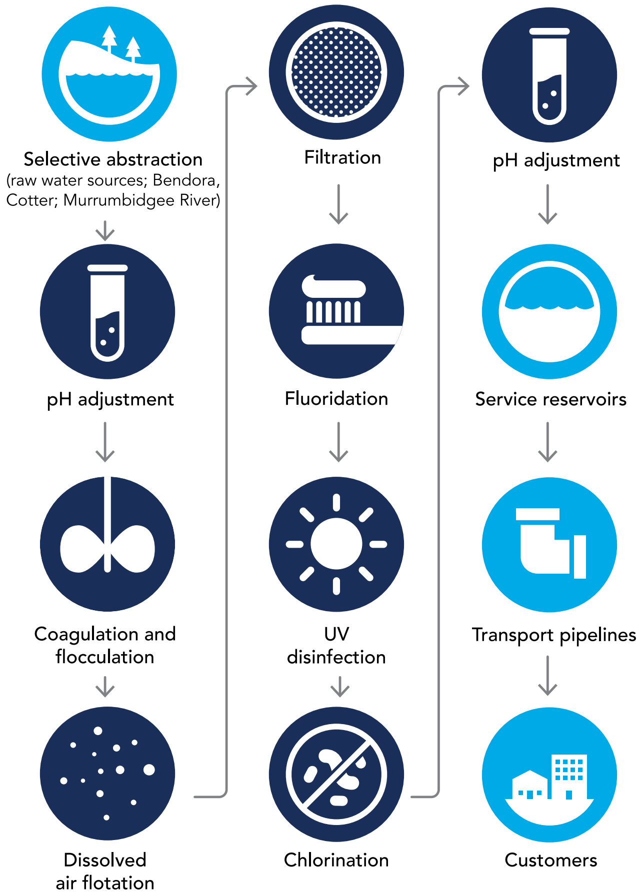


Figure 5-1 Water supply from catchment to Mount Stromlo WTP to customers' taps

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 treatment process is shown in Figure 5-2 and involves:

- 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.

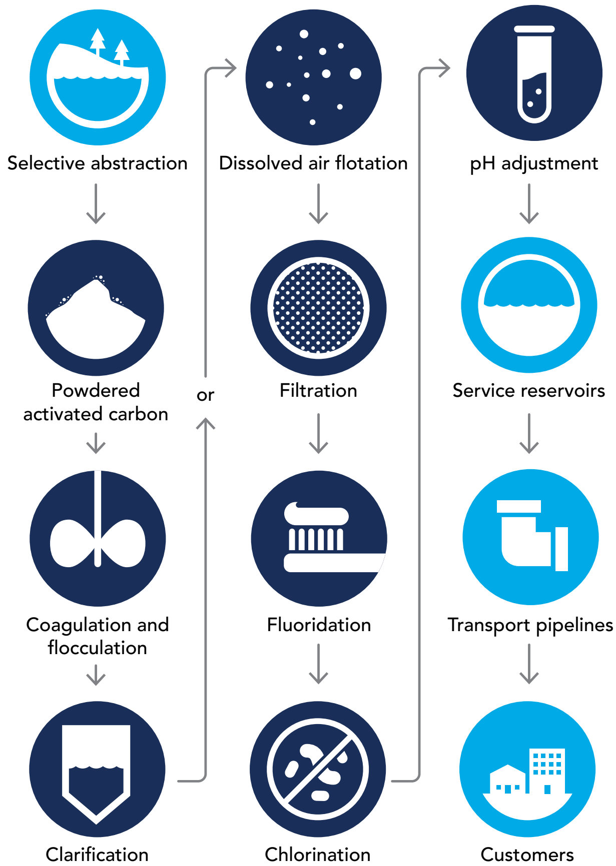


Figure 5-2 Water supply from catchment to Googong WTP to customers' taps

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 5-1 illustrates a comparison between the ADWG and the average treated water quality values for key parameters at both WTPs for 2019–20. 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 5-1 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	1.9
	Total	mg/L	5	0.6	1.6	2.0
Colour	True	Pt-Co	-	15	1.83	0.83
Cryptosporidium		oocysts/L	-†	-	<0.007	<0.007
E. coli		MPN/100 mL	<1	-	<1	<1
Fluoride		mg/L	1.5	-	0.80	0.73
Giardia		cells/L	-†	-	<0.007	<0.007
pH		pH units	-	6.5-8.5	7.7	7.7
Turbidity		NTU	-	5	0.17	0.2

\- 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 utilises this guidance and optimises operations to meet these targets at the WTPs.

During 2019–20 the turbidity of the water produced by the filters at Mount Stromlo and Googong WTPs was below 0.2 NTU 99 per cent of the time.

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 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 at or below the aesthetic guideline level. Chlorine dissipates as the water travels through the distribution network. Water transit time in the network is influenced by the rate of customer usage, which ultimately affects the chlorine levels received at the customers tap. Icon Water factors the water transit time to manage chlorination concentrations at the customers' tap

During 2019–20 chlorine concentration in the treated water leaving Mount Stromlo WTP was maintained at an average of 1.51 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 chlorine concentration (average of 1.90 mg/L in 2019–20). Chloramine is not used within Canberra's drinking water system.

In 2019–20 Icon Water achieved 100% compliance with UV disinfection

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/cm^2 for at least 95 per cent of the treated water.

The system continued to exceed this performance objective and in 2019–20, 100 per cent of the water produced received a dose greater than 27 mJ/cm^2.

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 2019–20 fluoride concentrations were maintained in the final treated water at Mount Stromlo and Googong WTPs at an average of 0.80mg/L and 0.73 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 initial pH is reduced to optimise the coagulation and flocculation treatment steps.

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 pH range targeted by Icon Water at customer taps is 6.5 to 8.5. The average pH of the final treated water at Mount Stromlo was 7.69 and for Googong WTP was 7.66 during 2019–20.

WATER TREATMENT PLANT PERFORMANCE

Between the two WTPs, 55,331 ML of water was produced during 2019–20 for distribution to the Canberra and Queanbeyan communities. The majority of this was produced by the Mount Stromlo WTP, which produced 32,270 ML (58.3 per cent), while the Googong WTP operated between September 2019 and March 2020 and produced 23,061 ML (41.7 per cent) (Figure 5-3).

Figure 5-3 Total water produced by treatment plants during 2019-20

THE DISTRIBUTION SYSTEM

Narrabundah reservoir, 2019

THE DISTRIBUTION SYSTEM

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

Icon Water operates and maintains 48 service reservoir sites, 25 pump stations and approximately 3,330 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.

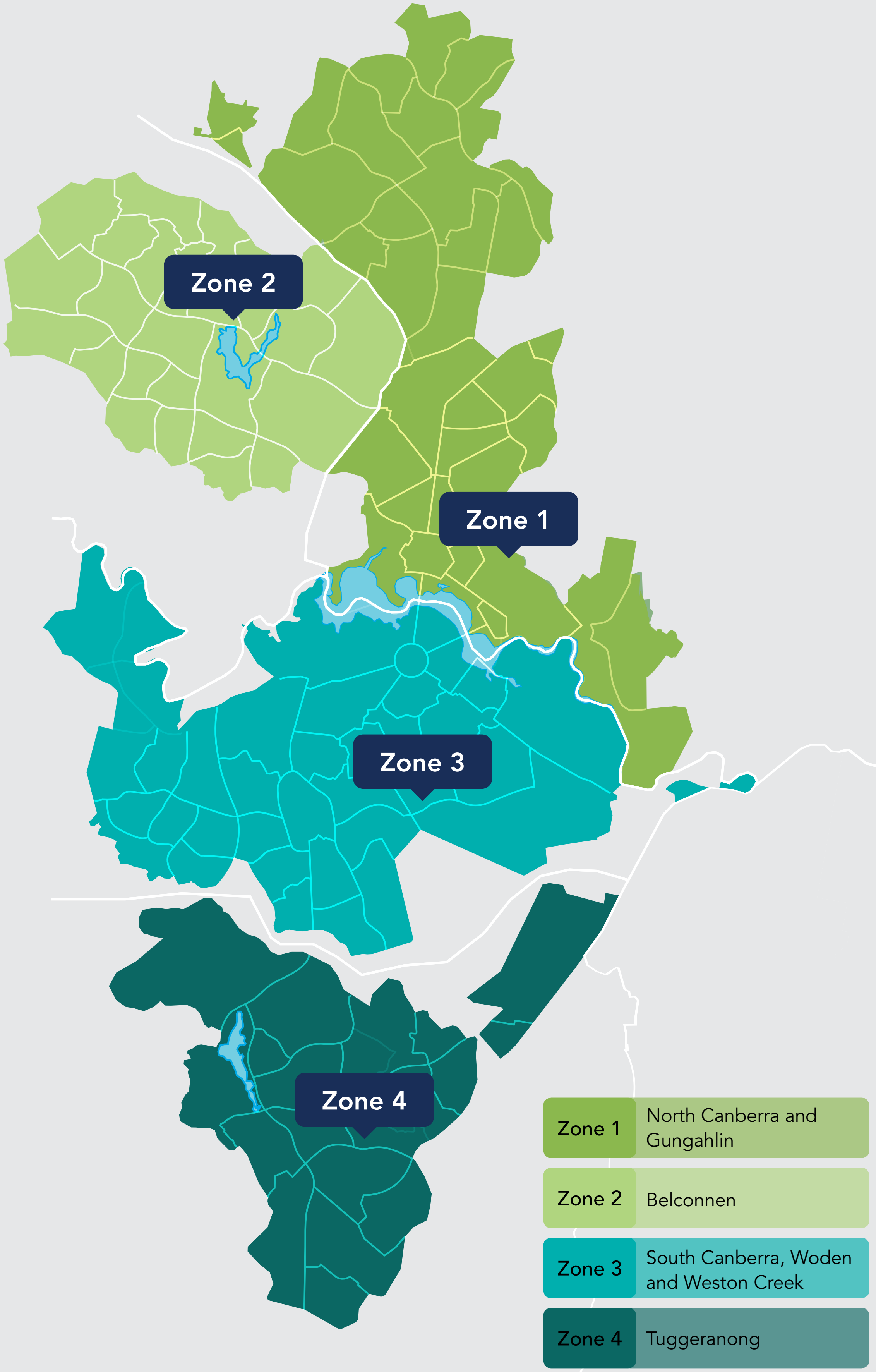
Some of the physical barriers include:

- 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 customers' taps.

The Canberra distribution system is divided into four water quality supply zones based on population, hydraulic characteristics and geography. These zones are also used to ensure the statistical representation of customer taps in the water quality monitoring program.

Figure 6.1 Water quality monitoring zone map



Service reservoirs

In 2019–20 Icon Water operated 48 service reservoirs located throughout Canberra. The reservoirs receive water from the WTPs via bulk supply and trunk mains. During 2019-2020 the reservoirs stored at any given time between 448 ML and 678 ML of water. All Canberra service reservoirs are secure structures to ensure the integrity of the distribution system is maintained and to prevent contamination.

Regular inspections are carried out to assess their external condition and the security of the sites. 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, condition 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 Table 6-1.

Table 6-1 Water quality at service reservoirs

Parameter		Units	ADWG Health value	ADWG Aesthetic value	Service reservoirs Mean result
Escherichia coli (E. coli)		MPN/100 mL	<1	-	<1
Total coliforms		MPN/100 mL	-	-	<1
Heterotrophic plate count		CFU/mL	-	-	18
Chlorine	Free	mg/L	-	-	0.76
	Total	mg/L	5	0.6	0.86
pH		pH units	-	6.5-8.5	7.8
Temperature		Degrees Celsius	-		17

- 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. To ensure a statistical representation of water received by customers, a selection of customers participate in a voluntary program where their garden tap water is sampled.

During 2019–20 a minimum of 100 customer garden taps were monitored on a monthly basis from a group of 400 locations throughout Canberra suburbs. This program enables verification of the actual water received by customers. A range of microbiological, chemical and physical parameters are tested and these are summarised in Table 6-2.

Ensuring that safe and aesthetically pleasing water is delivered to customers is a priority to Icon Water. This was reflected in the 2020 customer satisfaction survey which found that 97 per cent of residential customers are satisfied with the quality of tap water provided by Icon Water.

Table 6-2 Parameters monitored at customers' taps

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

Cotter Pumping Station

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, if the disinfection residual drops as a result of slow transit time or other distribution factors chlorine levels at service reservoirs can be boosted to maintain sufficient disinfection residuals.

In 2019–20, the concentrations of chlorine at customers' taps across all four water quality supply zones were within the ADWG health guideline level (5 mg/L). The free chlorine concentrations ranged from <0.03mg/L to 1.49mg/L. The distribution of chlorine results for customer taps across all four water supply zones is shown in Figure 6-2.

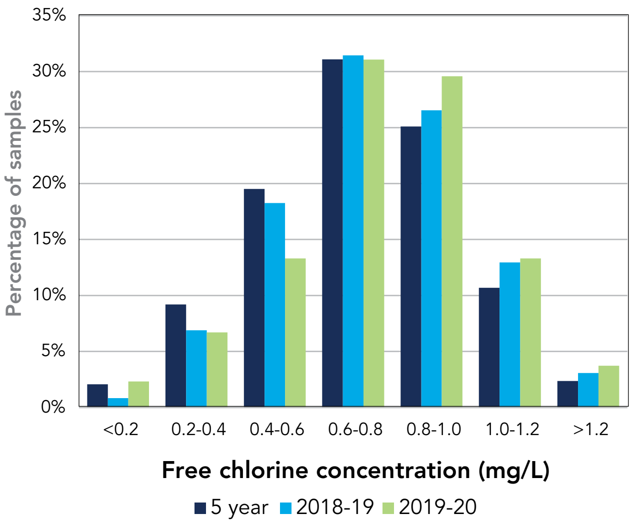


Figure 6-2 Free chlorine concentration at customers' taps

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, 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 2019–20, 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 10.

pH

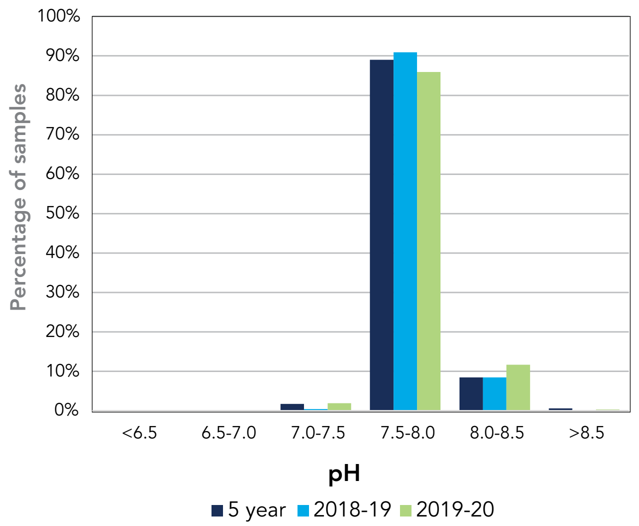


Figure 6-3 pH at customers' taps

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.

The distribution of pH results for customer taps across all four water supply zones is shown in Figure 6-3 and a summary of the results is listed in Table 6-3.

Turbidity

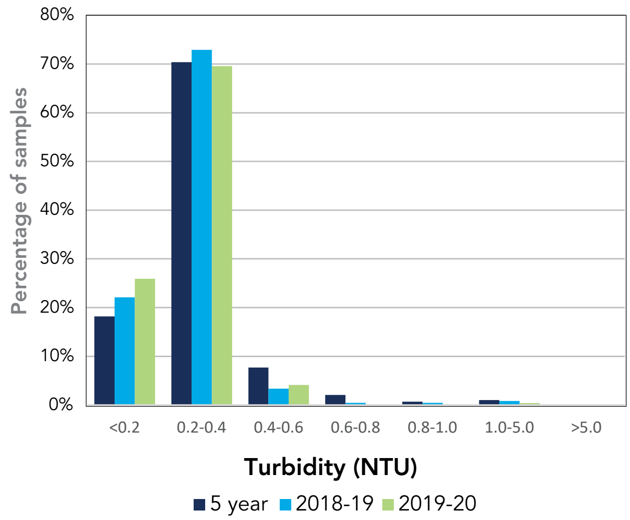


Figure 6-4 Turbidity at customers' taps

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 that is just noticeable in a glass of water.

During 2019–20 the average turbidity at customers' taps was 0.2 NTU. The distribution of turbidity results for customer taps across all four water supply zones is shown in Figure 6-4 and a summary of the results are in Table 6-3.

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 true 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 6-3.

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 a continuous program of works 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 6-3.

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 6-3.

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 6-3.

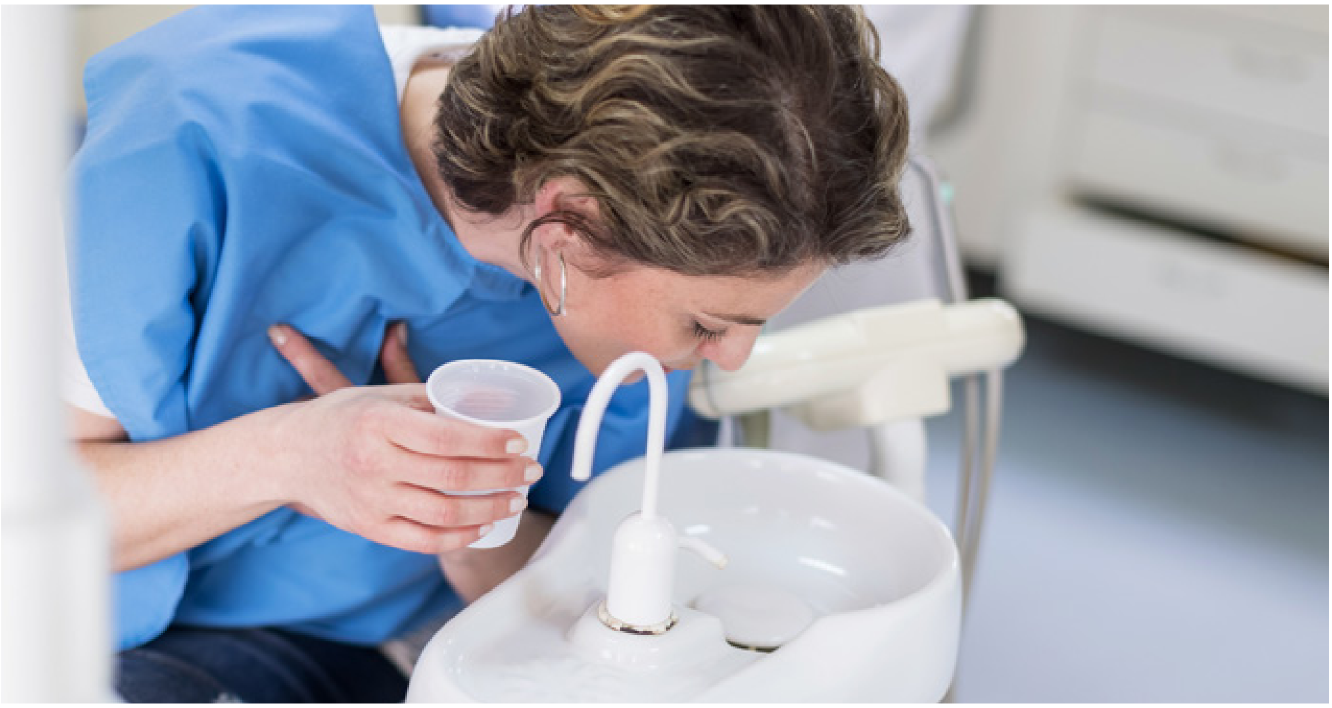
Lead

Lead is a naturally occurring metal and can enter drinking water from catchment sources or from household plumbing systems containing lead. Lead is used in the manufacture of a range of plumbing products such as brass fittings. Lead can dissolve into drinking water if it has been sitting in contact with these brass fittings for a long time.

The ADWG sets a health limit for lead of 0.01 mg/L.

The Australian Government Department of Health recommends flushing cold water taps used for drinking and cooking for about 30 seconds first thing in the morning or after periods of absence. This will draw fresh water into the tap and reduce your potential exposure to lead and other metals such as copper and nickel.

A summary of the results are in Table 6-3.



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 2019–20 the average fluoride concentration in the drinking water at customers' taps was 0.78 mg/L. A summary of the results is presented in Table 6-3.

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 some pipework whilst hydrocarbons can be used as an indicator of contamination. 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 2019–20. Full results are presented in Section 9.

Table 6-3 Water quality 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	6.89	8.84	7.84	-
Turbidity	Pt-Co	-	5	<0.1	1.4	0.2	-
Colour	NTU	-	15	<1	2	<1	-
Iron	mg/L	-	0.3	<0.01	0.09	0.01	-
Manganese	mg/L	0.5	0.1	0.001	0.079	0.009	✓
Copper	mg/L	2	1	<0.001	0.079	0.014	✓
Lead	mg/L	0.01	-	<0.0002	0.0022	0.0002	✓
Fluoride	mg/L	1.5	-	0.52	0.91	0.78	✓

COMMON WATER QUALITY PROBLEMS

COMMON WATER QUALITY PROBLEMS

Icon Water manages approximately 186,047 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. Concerns expressed by the community are investigated to determine the likely cause and, if required, corrective actions are taken.

During 2019–20, 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.

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 2019–20 a total of 84 water quality complaints were received, representing a 22 per cent reduction compared with the number of complaints received in 2018–19. Of the 84 complaints 60 per cent of the cases were related to discoloured water. A summary of the types of complaints received are detailed in Figure 7-1 and Table 7-1.

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.

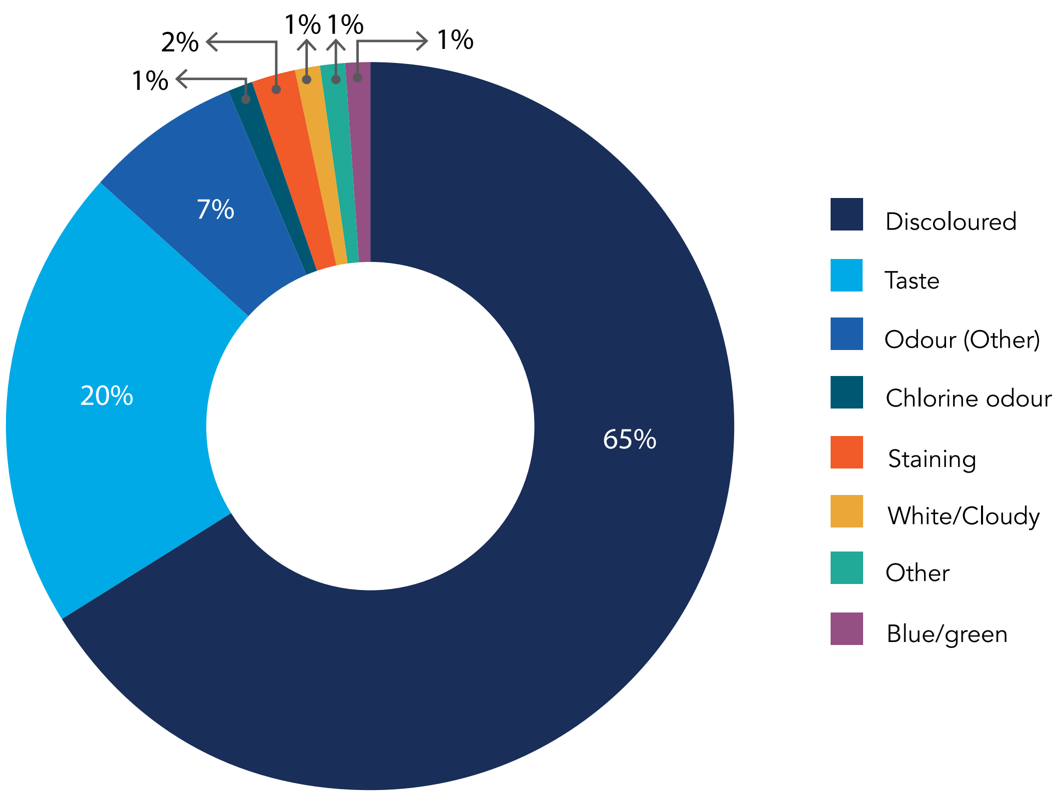
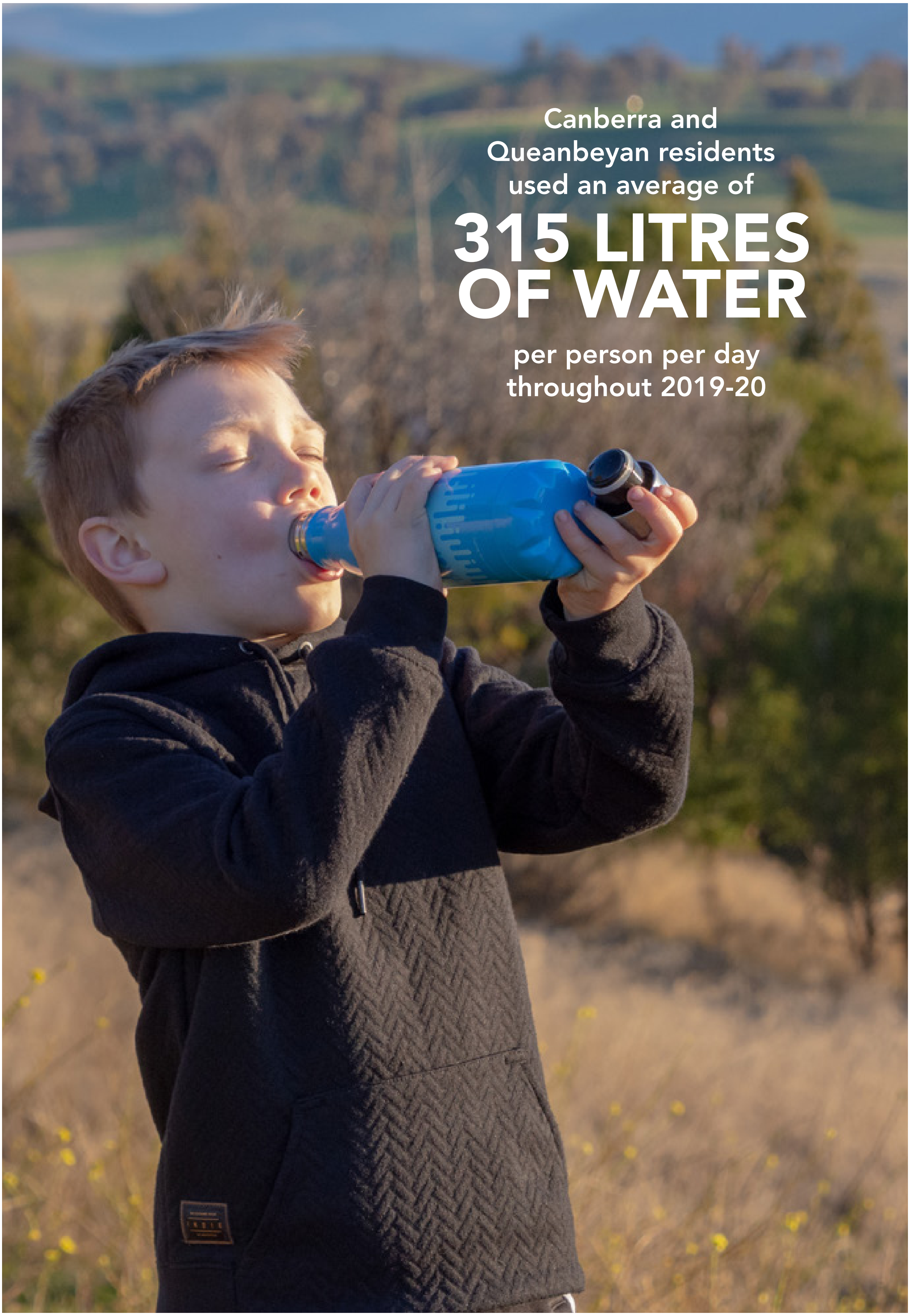


Figure 7.1 Summary of water quality issues

Table 7-1 Summary of water quality issues requiring customer resolution

Complaint	Frequency	Comments
Discoloured	55	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	1	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	1	Blue or green water can often be associated with the corrosion of copper pipes.
Staining	2	Deposits dislodged from domestic plumbing or from the water main can cause staining of washing.
Chlorine odour	1	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)	6	Miscellaneous odour enquires are investigated individually. These problems are usually short-term.
Taste	17	Miscellaneous taste enquiries are investigated individually. This also includes bitter and metallic tastes experienced by customers.
Other	1	Issues not otherwise categorised.
TOTAL	84	


Canberra and Queanbeyan residents used an average of
315 LITRES OF WATER
per person per day throughout 2019-20

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 2019–20, a number of notifications to ACT Health were issued. These notifiable incidents are captured in Table 8-1.

Table 8-1 Summary of notifications and action taken by Icon Water

Source	Date	Criteria	Incident and Action Taken
Raw water in the storage reservoir	1/07/2019	*Cryptosporidium*	*Cryptosporidium* at a concentration of 0.05 oocysts/L was detected in a composite sample at Bendora intake tower. At the time of sampling water was being abstracted and treated at SWTP. All other water quality parameters were found to be within specification and no Cryptosporidium was detected in the raw water entering the plant or the final supply.
Water within the distribution system at customer point of supply	14/11/2019	Hydrocarbons	Hydrocarbons were detected at a customer tap above the ADWG aesthetic limit, but below the health guideline. The contamination was localised within the property and no hydrocarbons were detected within the water distribution network.
Raw water in the storage reservoir	25/11/2019	*Cryptosporidium*	*Cryptosporidium* at a concentration of 0.05 oocysts/L was detected in a composite sample at Googong intake tower. At the time all other water quality parameters were found to be within specification and no *Cryptosporidium* was detected in the WTP raw water or final supply.
Googong WTP	27/11/2020	*Cryptosporidium*	*Cryptosporidium* at a concentration of 0.018 oocysts/L was detected in the raw water entering Googong WTP. At the time all other water quality parameters were found to be within specification and no *Cryptosporidium* was detected in the final supply.
Raw water in the storage reservoir	26/03/2020	Cyanobacteria	High risk cyanobacteria, *Dolicospermum* and *Microcystis* was detected at notifiable levels in surface water samples in the Googong reservoir. At the time of sampling water was being abstracted and treated at GWTP and supplied to Queanbeyan and parts of the ACT.
Raw water in the storage reservoir	22/04/2020	Cyanobacteria	High risk cyanobacteria, *Dolicospermum* was detected at a notifiable level in surface water samples in the Googong reservoir upstream of the inlet tower. At the time of sampling water was not being abstracted for supply.
Raw water in the storage reservoir	28/05/2020	Cyanobacteria	High risk cyanobacteria, *Microcystis,* was detected at notifiable levels in surface water samples at the Bendora reservoir intake tower. At the time of sampling water was being abstracted and treated at SWTP and supplied to ACT and Queanbeyan.

MANAGING CANBERRA'S WATER QUALITY INTO THE FUTURE

MANAGING CANBERRA'S WATER QUALITY INTO THE FUTURE

Icon Water is committed to the continuous improvement of water quality management practices.

Icon Water produces an annual plan for Strategic Water Quality Improvement. The 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 2019–20 and those underway in 2020–21 are detailed in the following section.

Future water quality issues

There are a number of policies, plans and projects (proposed or underway) by third parties within or near the water supply 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

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.

The Water Services Association of Australia (WSAA) have produced a manual 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 trialled the methodology developed by WSAA on the Googong Water Treatment Plant direct filtration stream in 2015. The WTP met the target requirement, placing the direct filtration stream of the plant in the 'safe' part of the continuum. With the operation of the Murrumbidgee River transfer pipeline (M2G), the HBT for Googong requires review. The Murrumbidgee River catchment has a different land-use profile than the Queanbeyan River catchment and as such offers less protection to faecal contamination. Icon Water intends to complete a source water classification assessment of Murrumbidgee River and subsequently review the appropriateness of the classification of Googong reservoir when receiving water transferred from Murrumbidgee River.


Googong Dam, 2020

Source water protection

Source Water Protection Strategy

A continuation of Icon Water's Source Water Protection Strategy is important to maintain a watching brief on emerging issues and changes to policy which could introduce new risks into the source water catchments. Communication and liaison with stakeholders is key to monitoring and responding to changes in the source catchments.

Under the Australian Capital Territory Water Resources Act 2007, the ACT Water Strategy was developed to guide the management of water resources. Key to the outcomes of this strategy are healthy catchments and water bodies. The ACT Water Strategy is implemented through a series of plans. Icon Water was nominated to take the lead in the development of catchment Actions for Clean Water (ACWA) plans, including the Upper Murrumbidgee, Googong and Cotter catchments.

The overall aim of an ACWA plan is to identify strategies to improve surface water quality and prioritise locations requiring soil stabilization in the catchment of the report.

Key on-ground works and water monitoring programs implemented by Icon Water in 2019–20 included the delivery of the Googong Dam catchment ACWA. The Googong ACWA plan establishes a baseline understanding of the sources and quantum of the sediment loads entering the Queanbeyan River and Burra Creek upstream of the Googong Reservoir. The plan will be used to direct efforts to stabilise and remediate sites over time, based on a prioritisation of risk to water quality in the receiving environment.

The Upper Murrumbidgee ACWA plan was reviewed to determine priority sources of turbidity. Key messages were developed to implement the recommendations from the report.

The Cotter catchment ACWA plan is currently under development and will include a separate chapter focusing on the post Orroral Valley fire landscape and medium and long term risks to water quality.

Climate Change Adaption Plan

Climate change driven impacts have been recognised as a risk to source water quality and drinking water treatment. Icon Water developed a Climate Change Adaption Plan and identified water quality risks. These include items such as ensuring the water quality monitoring program considers the predicted increase in bushfires, algal blooms and invasive aquatic species. Also considered, is the treatment capability to respond to the increase in contaminants exported from the source water catchments in response to severe weather events linked to climate change.

Googong WTP Clarifier 2 bridge installation, 2020

Water treatment plant improvements

Googong WTP clarifier system asset renewal

Clarification is an important stage of the water treatment process and is recognised as a 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. A project is underway to remediate and replace the clarifiers and ensure the process will continue to operate well into the future.

Stromlo WTP DAF design review and modifications

Stromlo WTP can be operated with an additional treatment option called Dissolved Air Flotation (DAF) when the quality of the water entering the plant is poor and turbidity is elevated. A project is underway to improve the operability of the Stromlo WTP DAF and to undertake design modifications to ensure the system can be operated safely.

Distribution system improvements

Reservoir stairwell bird control

Icon Water previously identified a potential risk of contamination of service reservoirs from birds roosting in the reservoir access stairwells. Various technologies and strategies have been trialed to prevent birds roosting in the stairwell structures. Further trials are continuing to find the most effective control method.

Water mains replacement program

During 2019-20 a total of 14.8 km of aging water mains were replaced in the reticulation network. This replacement program will reduce the incidence of pipe bursts and discolored water in the areas of works. Details on the water mains replacement program, including replacement locations, can be found on the Icon Water website: https://www.iconwater.com.au/water-education/our-projects/water-mains-renewal-program-2019.aspx

Mugga Reservoir roof replacement

A condition assessment of Mugga Reservoir deemed the roof and floor joint seals to be in poor condition, significantly reducing the operational capacity and increasing safety risks to operational staff and water quality risks to the public. Construction on replacing the roof structure and floor joint seals commenced in April 2020, with commissioning completion on track for early November 2020. On completion the reservoir will be returned to its full operational capacity of 45 ML.

LABORATORY ANALYSIS

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 2019 and in the biological area in September 2019. 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 10-1 Summary data for all water quality zones
- Table 10-2 Summary data for water quality zone 1 – North Canberra and Gungahlin
- Table 10-3 Summary data for water quality zone 2 – Belconnen
- Table 10-4 Summary data for water quality zone 3 – South Canberra, Woden and Weston Creek
- Table 10-5 Summary data for water quality zone 4 – Tuggeranong

Table 10-1 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	1210	<1	<1	<1	<1
Total coliforms	APHA 9223 B	MPN/100mL	-	<1	1210	<1	3	<1	<1
Heterotrophic plate count	APHA 9215 B	CFU/mL	-	<1	1210	<1	5900	11	12
Physical									
Conductivity	APHA 2510 B	µS/cm	-	<2	121	59	207	126	189
pH	APHA 4500-H B	pH units	-	<0.01	1209	6.89	8.84	7.84	8.10
Temperature	APHA 4500-H B	deg.C	-	<0.1	245	7.5	26.0	16.9	24.5
Total dissolved solids	APHA 2540 C	mg/L	-	<10	120	35	145	77	119
True colour	APHA 2120 B	Pt-Co	-	<1	241	<1	2	<1	2
Turbidity	APHA 2130 B	NTU	-	<0.1	243	<0.1	1.4	0.2	0.4
Inorganic									
Alkalinity bicarb	APHA 2320 A/B	mg/L	-	<0.1	241	28.0	113.0	48.9	61.3
Alkalinity carb	APHA 2320 A/B	mg/L	-	<0.1	241	<0.1	6.3	<0.1	<0.1
Alkalinity hydrox	APHA 2320 A/B	mg/L	-	<0.1	241	<0.1	<0.1	<0.1	<0.1
Alkalinity total	APHA 2320 A/B	mg/L	-	<1	241	28	113	49	61
Aluminium acid soluble	USEPA 200.8	µg/L	-	<5	121	17	117	37	60
Asbestos	AS4964-2000	Present/ Absent	-	Absent	48	Absent	Absent	Absent	Absent
Calcium dissolved	USEPA 200.7	mg/L	-	<0.05	121	9.18	20.90	13.77	17.50
Chloride	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.1	48	5.2	17.8	9.5	17.4
Chlorine combined	APHA 4500 -CL G	mg/L	-	<0.03	1210	<0.03	0.42	0.08	0.18
Chlorine free	APHA 4500 -CL G	mg/L	-	<0.03	1210	<0.03	1.49	0.77	1.16
Chlorine total	APHA 4500 -CL G	mg/L	5	<0.03	1210	<0.03	1.74	0.85	1.26
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	<0.05	121	0.52	0.91	0.78	0.88
Hardness total	APHA 2340 B	mg/L	-	<1	121	29	69	44	62
Iodide	VIC-CM078	mg/L	0.5	<0.01	48	<0.01	0.03	<0.01	<0.01
Magnesium dissolved	USEPA 200.7	mg/L	-	<0.05	121	1.20	5.27	2.37	4.93
Nitrate	APHA 21st Ed. 2005, Part 4110 B	mg/L	50	<0.1	48	<0.1	0.3	0.2	0.3
Potassium dissolved	USEPA 200.7	mg/L	-	<0.1	48	0.6	2.2	1.1	1.9
Sodium dissolved	USEPA 200.7	mg/L	-	<0.1	48	2.9	10.1	5.4	9.9
Sulphate	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.4	48	3.5	31.4	11.8	30.0
Total metals									
Aluminium total	USEPA 200.8	µg/L	-	<9	121	23	111	42	66
Antimony total	USEPA 200.8	µg/L	3	<3	121	<3	<3	<3	<3
Arsenic total	USEPA 200.8	µg/L	10	<1	121	<1	<1	<1	<1
Barium total	USEPA 200.8	µg/L	2000	<0.5	121	2.4	9.7	4.8	8.6
Beryllium total	USEPA 200.8	µg/L	60	<0.1	121	<0.1	0.1	<0.1	<0.1
Boron total	USEPA 200.7	mg/L	4	<0.01	48	<0.01	0.03	0.01	0.02
Cadmium total	USEPA 200.8	µg/L	2	<0.05	121	<0.05	<0.05	<0.05	<0.05
Chromium total	USEPA 200.8	µg/L	-	<2	121	<2	2	<2	<2
Cobalt total	USEPA 200.8	µg/L	-	<0.2	121	<0.2	0.4	<0.2	<0.2
Copper total	USEPA 200.8	µg/L	2000	<1	241	<1	79	14	44
Iron total	USEPA 200.7	mg/L	-	<0.01	241	<0.01	0.09	0.01	0.02

Table 10-1 Summary data for all water quality zones

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	Number of Samples	Minimum	Maximum	Mean	95th Percentile
Lead total	USEPA 200.8	µg/L	10	<0.2	241	<0.2	2.2	0.2	0.8
Manganese total	USEPA 200.7	mg/L	0.5	<0.001	241	0.001	0.079	0.009	0.025
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	121	<1	2	<1	<1
Nickel total	USEPA 200.8	µg/L	20	<1	121	<1	2	<1	2
Selenium total	USEPA 200.8	µg/L	10	<1	121	<1	7	<1	<1
Silver total	USEPA 200.8	µg/L	100	<1	121	<1	<1	<1	<1
Zinc total	USEPA 200.8	µg/L	-	<5	121	<5	48	<5	7
Haloacetic acids									
Bromoacetic acid	ALS: Headspace GCMS	µg/L	-	<5	121	<5	<5	<5	<5
Bromochloroacetic acid	ALS: Headspace GCMS	µg/L	-	<1	121	<1	8	3	6
Bromodichloroacetic acid	ALS: Headspace GCMS	µg/L	-	<1	121	<1	11	4	9
Dibromoacetic acid	ALS: Headspace GCMS	µg/L	-	<1	121	<1	4	<1	<1
Dibromochloroacetic acid	ALS: Headspace GCMS	µg/L	-	<10	120	<10	<10	<10	<10
Dichloroacetic acid	ALS: Headspace GCMS	µg/L	100	<1	121	<1	36	19	31
Monochloroacetic acid	ALS: Headspace GCMS	µg/L	150	<1	121	<1	4	2	3
Tribromoacetic acid	ALS: Headspace GCMS	µg/L	-	<10	121	<10	<10	<10	<10
Trichloroacetic acid	ALS: Headspace GCMS	µg/L	100	<1	121	<1	46	24	37
Sum of Haloacetic acid	ALS: Headspace GCMS	µg/L	-	<1	121	<1	97	52	83
Trihalomethanes									
Bromoform	VIC-CM047	mg/L	-	<0.001	121	<0.001	<0.001	<0.001	<0.001
Chloroform	VIC-CM047	mg/L	-	<0.001	121	0.019	0.110	0.038	0.061
Dibromochloromethane	VIC-CM047	mg/L	-	<0.001	121	<0.001	0.003	<0.001	0.002
Dichlorobromomethane	VIC-CM047	mg/L	-	<0.001	121	0.002	0.021	0.006	0.014
Trihalomethanes total	VIC-CM047	mg/L	0.25	<0.001	121	0.021	0.130	0.045	0.076
Semi volatile organic compounds (SVOC)									
Anilines and benzidines									
2-Nitroaniline	US EPA 3510/8270	µg/L	-	<4	121	<4	<4	<4	<4
3-Nitroaniline	US EPA 3510/8270	µg/L	-	<4	121	<4	<4	<4	<4
3,3`-Dichlorobenzidine	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
4-Chloroaniline	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
4-Nitroaniline	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Aniline	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Carbazole	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Dibenzofuran	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Chlorinated hydrocarbons									
1,2-Dichlorobenzene	US EPA 3510/8270	µg/L	1500	<2	121	<2	<2	<2	<2
1,2,4-Trichlorobenzene	US EPA 3510/8270	µg/L	30	<2	121	<2	<2	<2	<2
1,3-Dichlorobenzene	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
1,4-Dichlorobenzene	US EPA 3510/8270	µg/L	40	<2	121	<2	<2	<2	<2
Hexachlorobenzene	US EPA 3510/8270	µg/L	-	<4	121	<4	<4	<4	<4
Hexachlorobutadiene	US EPA 3510/8270	µg/L	0.7	<2	121	<2	<2	<2	<2

Table 10-1 Summary data for all water quality zones

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	Number of Samples	Minimum	Maximum	Mean	95th Percentile
Hexachlorocyclopentadiene	US EPA 3510/8270	µg/L	-	<10	121	<10	<10	<10	<10
Hexachloroethane	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Hexachloropropylene	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Pentachlorobenzene	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Haloethers									
4-Bromophenyl phenyl ether	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
4-Chlorophenyl phenyl ether	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Bis(2-chloroethoxy) methane	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Bis(2-chloroethyl) ether	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Nitroaromatics and ketones									
1-Naphthylamine	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
1,3,5-Trinitrobenzene	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
2-Picoline	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
2,4-Dinitrotoluene	US EPA 3510/8270	µg/L	-	<4	121	<4	<4	<4	<4
2,6-Dinitrotoluene	US EPA 3510/8270	µg/L	-	<4	121	<4	<4	<4	<4
4-Aminobiphenyl	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
4-Nitroquinoline-N-oxide	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
5-Nitro-o-toluidine	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Acetophenone	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Azobenzene	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Chlorobenzilate	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Dimethylaminoazobenzene	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Isophorone	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Nitrobenzene	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Pentachloronitrobenzene	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Phenacetin	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Pronamide	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Nitrosamines									
Methapyrilene	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
N-Nitrosodibutylamine	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
N-Nitrosodiethylamine	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
N-Nitrosodi-n-propylamine	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
N-Nitrosodiphenyl & Diphenylamine	US EPA 3510/8270	µg/L	-	<4	121	<4	<4	<4	<4
N-Nitrosomethylethylamine	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
N-Nitrosomorpholine	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
N-Nitrosopiperidine	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
N-Nitrosopyrrolidine	US EPA 3510/8270	µg/L	-	<4	121	<4	<4	<4	<4
Organochlorine pesticides									
4,4'-DDD	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
4,4'-DDE	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
4,4'-DDT	US EPA 3510/8270	µg/L	9	<4	121	<4	<4	<4	<4
Aldrin	US EPA 3510/8270	µg/L	0.3	<2	121	<2	<2	<2	<2
alpha-BHC	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
alpha-Endosulfan	US EPA 3510/8270	µg/L	20	<2	121	<2	<2	<2	<2
beta-BHC	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2

Table 10-1 Summary data for all water quality zones

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	Number of Samples	Minimum	Maximum	Mean	95^{th} Percentile
beta-Endosulfan	US EPA 3510/8270	µg/L	20	<2	121	<2	<2	<2	<2
delta-BHC	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Dieldrin	US EPA 3510/8270	µg/L	0.3	<2	121	<2	<2	<2	<2
Endrin	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Endosulfan sulfate	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
gamma-BHC	US EPA 3510/8270	µg/L	10	<2	121	<2	<2	<2	<2
Heptachlor	US EPA 3510/8270	µg/L	0.3	<2	121	<2	<2	<2	<2
Heptachlor epoxide	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Organophosphorous pesticides									
Chlorfenvinphos	US EPA 3510/8270	µg/L	2	<2	121	<2	<2	<2	<2
Chlorpyrifos	US EPA 3510/8270	µg/L	10	<2	121	<2	<2	<2	<2
Chlorpyrifos-methyl	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Diazinon	US EPA 3510/8270	µg/L	4	<2	121	<2	<2	<2	<2
Dichlorvos	US EPA 3510/8270	µg/L	5	<2	121	<2	<2	<2	<2
Dimethoate	US EPA 3510/8270	µg/L	7	<2	121	<2	<2	<2	<2
Ethion	US EPA 3510/8270	µg/L	4	<2	121	<2	<2	<2	<2
Fenthion	US EPA 3510/8270	µg/L	7	<2	121	<2	<2	<2	<2
Malathion	US EPA 3510/8270	µg/L	70	<2	121	<2	<2	<2	<2
Pirimiphos-ethyl	US EPA 3510/8270	µg/L	0.5	<2	121	<2	<2	<2	<2
Prothiofos	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Phenolic compounds									
2,3,4,6-Tetrachlorophenol	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
2,4-Dichlorophenol	US EPA 3510/8270	µg/L	200	<2	121	<2	<2	<2	<2
2,4-Dimethylphenol	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
2,4,5-Trichlorophenol	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
2,4,6-Trichlorophenol	US EPA 3510/8270	µg/L	20	<2	121	<2	<2	<2	<2
2,6-Dichlorophenol	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
2-Chlorophenol	US EPA 3510/8270	µg/L	300	<2	121	<2	<2	<2	<2
2-Methylphenol	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
2-Nitrophenol	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
3- & 4-Methylphenol	US EPA 3510/8270	µg/L	-	<4	121	<4	<4	<4	<4
4-Chloro-3-Methylphenol	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Pentachlorophenol	US EPA 3510/8270	µg/L	10	<4	121	<4	<4	<4	<4
Phenol	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Phthalates									
Bis(2-ethylhexyl) phthalate	US EPA 3510/8270	µg/L	10	<10	121	<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	121	<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	121	<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	121	<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	121	<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	121	<2	<2	<2	<2

Table 10-1 Summary data for all water quality zones

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	Number of Samples	Minimum	Maximum	Mean	95th Percentile
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	121	<2	<2	<2	<2
2-Methylnaphthalene	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
3-Methylcholanthrene	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
7,12-Dimethylbenz(a) anthracene	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Acenaphthene	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Acenaphthene	US EPA 3510/8270	µg/L	-	<1	120	<1	<1	<1	<1
Acenaphthylene	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Acenaphthylene	US EPA 3510/8270	µg/L	-	<1	120	<1	<1	<1	<1
Anthracene	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Anthracene	US EPA 3510/8270	µg/L	-	<1	120	<1	<1	<1	<1
Benz(a)anthracene	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Benz(a)anthracene	US EPA 3510/8270	µg/L	-	<1	120	<1	<1	<1	<1
Benzo(a)pyrene	US EPA 3510/8270	µg/L	0.01	<2	121	<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(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	121	<4	<4	<4	<4
Benzo(g,h,i)perylene	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Benzo(g,h,i)perylene	US EPA 3510/8270	µg/L	-	<1	120	<1	<1	<1	<1
Chrysene	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Chrysene	US EPA 3510/8270	µg/L	-	<1	120	<1	<1	<1	<1
Dibenz(a.h)anthracene	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Dibenz(a.h)anthracene	US EPA 3510/8270	µg/L	-	<1	120	<1	<1	<1	<1
Fluoranthene	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Fluoranthene	US EPA 3510/8270	µg/L	-	<1	120	<1	<1	<1	<1
Fluorene	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Fluorene	US EPA 3510/8270	µg/L	-	<1	120	<1	<1	<1	<1
Indeno(1,2,3-cd)pyrene	US EPA 3510/8270	µg/L	-	<2	121	<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	121	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	µg/L	-	<1	120	<1	<1	<1	<1
Phenanthrene	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Phenanthrene	US EPA 3510/8270	µg/L	-	<1	120	<1	<1	<1	<1
Pyrene	US EPA 3510/8270	µg/L	-	<2	121	<2	<2	<2	<2
Pyrene	US EPA 3510/8270	µg/L	-	<1	120	<1	<1	<1	<1
PAHs (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 10-2 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	351	<1	<1	<1	<1
Total coliforms	APHA 9223 B	MPN/100mL	-	<1	351	<1	1	<1	<1
Heterotrophic plate count	APHA 9215 B	CFU/mL	-	<1	351	<1	1600	8	13
Physical									
Conductivity	APHA 2510 B	µS/cm	-	<2	37	82	197	120	187
pH	APHA 4500-H B	pH units	-	<0.01	350	7.44	8.58	7.78	8.00
Temperature	APHA 4500-H B	deg.C	-	<0.1	74	9.5	25.5	17.1	24.2
Total dissolved solids	APHA 2540 C	mg/L	-	<10	37	35	125	71	110
True colour	APHA 2120 B	Pt-Co	-	<1	73	<1	2	<1	2
Turbidity	APHA 2130 B	NTU	-	<0.1	73	<0.1	1.4	0.2	0.4
Inorganic									
Alkalinity bicarb	APHA 2320 A/B	mg/L	-	<0.1	73	28.0	73.4	49.0	67.9
Alkalinity carb	APHA 2320 A/B	mg/L	-	<0.1	73	<0.1	<0.1	<0.1	<0.1
Alkalinity hydrox	APHA 2320 A/B	mg/L	-	<0.1	73	<0.1	<0.1	<0.1	<0.1
Alkalinity total	APHA 2320 A/B	mg/L	-	<1	73	28	73	49	66
Aluminium acid soluble	USEPA 200.8	µg/L	-	<5	37	17	72	34	50
Asbestos	AS4964-2000	Present/ Absent	-	Absent	12	Absent	Absent	Absent	Absent
Calcium dissolved	USEPA 200.7	mg/L	-	<0.05	37	10.30	19.60	13.36	16.38
Chloride	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.1	12	5.3	17.8	9.1	15.7
Chlorine combined	APHA 4500 -CL G	mg/L	-	<0.03	351	<0.03	0.31	0.08	0.17
Chlorine free	APHA 4500 -CL G	mg/L	-	<0.03	351	0.13	1.38	0.84	1.17
Chlorine total	APHA 4500 -CL G	mg/L	5	<0.03	351	0.19	1.46	0.92	1.27
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	<0.05	37	0.67	0.90	0.78	0.85
Hardness total	APHA 2340 B	mg/L	-	<1	37	31	62	42	60
Iodide	VIC-CM078	mg/L	0.5	<0.01	12	<0.01	0.03	<0.01	0.02
Magnesium dissolved	USEPA 200.7	mg/L	-	<0.05	37	1.25	4.94	2.09	4.89
Nitrate	APHA 21st Ed. 2005, Part 4110 B	mg/L	50	<0.1	12	<0.1	0.3	0.2	0.3
Potassium dissolved	USEPA 200.7	mg/L	-	<0.1	12	0.6	2.2	1.0	1.9
Sodium dissolved	USEPA 200.7	mg/L	-	<0.1	12	3.0	9.9	4.7	9.4
Sulphate	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.4	12	3.6	31.2	10.2	24.5
Total metals									
Aluminium total	USEPA 200.8	µg/L	-	<9	37	27	69	40	61
Antimony total	USEPA 200.8	µg/L	3	<3	37	<3	<3	<3	<3
Arsenic total	USEPA 200.8	µg/L	10	<1	37	<1	<1	<1	<1
Barium total	USEPA 200.8	µg/L	2000	<0.5	37	2.4	8.1	4.4	7.8
Beryllium total	USEPA 200.8	µg/L	60	<0.1	37	<0.1	<0.1	<0.1	<0.1
Boron total	USEPA 200.7	mg/L	4	<0.01	12	<0.01	0.03	0.01	0.02
Cadmium total	USEPA 200.8	µg/L	2	<0.05	37	<0.05	<0.05	<0.05	<0.05
Chromium total	USEPA 200.8	µg/L	-	<2	37	<2	<2	<2	<2
Cobalt total	USEPA 200.8	µg/L	-	<0.2	37	<0.2	0.4	<0.2	<0.2
Copper total	USEPA 200.8	µg/L	2000	<1	73	1	78	16	52
Iron total	USEPA 200.7	mg/L	-	<0.01	73	<0.01	0.09	0.01	0.02

Table 10-2 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
Lead total	USEPA 200.8	µg/L	10	<0.2	73	<0.2	2.2	0.3	1.1
Manganese total	USEPA 200.7	mg/L	0.5	<0.001	73	0.001	0.079	0.010	0.034
Mercury total	USEPA 200.8	µg/L	1	<0.1	12	<0.1	<0.1	<0.1	<0.1
Molybdenium total	USEPA 200.8	µg/L	50	<1	37	<1	2	<1	<1
Nickel total	USEPA 200.8	µg/L	20	<1	37	<1	2	<1	1
Selenium total	USEPA 200.8	µg/L	10	<1	37	<1	<1	<1	<1
Silver total	USEPA 200.8	µg/L	100	<1	37	<1	<1	<1	<1
Zinc total	USEPA 200.8	µg/L	-	<5	37	<5	40	<5	9
Haloacetic acids									
Bromoacetic acid	ALS: Headspace GCMS	µg/L	-	<5	37	<5	<5	<5	<5
Bromochloroacetic acid	ALS: Headspace GCMS	µg/L	-	<1	37	<1	6	3	6
Bromodichloroacetic acid	ALS: Headspace GCMS	µg/L	-	<1	37	<1	10	4	8
Dibromoacetic acid	ALS: Headspace GCMS	µg/L	-	<1	37	<1	4	<1	<1
Dibromochloroacetic acid	ALS: Headspace GCMS	µg/L	-	<10	37	<10	<10	<10	<10
Dichloroacetic acid	ALS: Headspace GCMS	µg/L	100	<1	37	<1	30	18	29
Monochloroacetic acid	ALS: Headspace GCMS	µg/L	150	<1	37	<1	3	2	3
Tribromoacetic acid	ALS: Headspace GCMS	µg/L	-	<10	37	<10	<10	<10	<10
Trichloroacetic acid	ALS: Headspace GCMS	µg/L	100	<1	37	<1	36	23	34
Sum of Haloacetic acid	ALS: Headspace GCMS	µg/L	-	<1	37	<1	81	48	78
Trihalomethanes									
Bromoform	VIC-CM047	mg/L	-	<0.001	37	<0.001	<0.001	<0.001	<0.001
Chloroform	VIC-CM047	mg/L	-	<0.001	37	0.019	0.059	0.035	0.054
Dibromochloromethane	VIC-CM047	mg/L	-	<0.001	37	<0.001	0.002	<0.001	0.002
Dichlorobromomethane	VIC-CM047	mg/L	-	<0.001	37	0.003	0.014	0.006	0.013
Trihalomethanes total	VIC-CM047	mg/L	0.25	<0.001	37	0.022	0.074	0.041	0.070
Semi volatile organic compounds (SVOC)									
Anilines and benzidines									
2-Nitroaniline	US EPA 3510/8270	µg/L	-	<4	37	<4	<4	<4	<4
3-Nitroaniline	US EPA 3510/8270	µg/L	-	<4	37	<4	<4	<4	<4
3,3`-Dichlorobenzidine	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
4-Chloroaniline	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
4-Nitroaniline	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Aniline	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Carbazole	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Dibenzofuran	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Chlorinated hydrocarbons									
1,2-Dichlorobenzene	US EPA 3510/8270	µg/L	1500	<2	37	<2	<2	<2	<2
1,2,4-Trichlorobenzene	US EPA 3510/8270	µg/L	30	<2	37	<2	<2	<2	<2
1,3-Dichlorobenzene	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
1,4-Dichlorobenzene	US EPA 3510/8270	µg/L	40	<2	37	<2	<2	<2	<2
Hexachlorobenzene	US EPA 3510/8270	µg/L	-	<4	37	<4	<4	<4	<4
Hexachlorobutadiene	US EPA 3510/8270	µg/L	0.7	<2	37	<2	<2	<2	<2

Table 10-2 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
Hexachlorocyclopentadiene	US EPA 3510/8270	µg/L	-	<10	37	<10	<10	<10	<10
Hexachloroethane	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Hexachloropropylene	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Pentachlorobenzene	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Haloethers									
4-Bromophenyl phenyl ether	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
4-Chlorophenyl phenyl ether	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Bis(2-chloroethoxy) methane	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Bis(2-chloroethyl) ether	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Nitroaromatics and ketones									
1-Naphthylamine	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
1,3,5-Trinitrobenzene	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
2-Picoline	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
2,4-Dinitrotoluene	US EPA 3510/8270	µg/L	-	<4	37	<4	<4	<4	<4
2,6-Dinitrotoluene	US EPA 3510/8270	µg/L	-	<4	37	<4	<4	<4	<4
4-Aminobiphenyl	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
4-Nitroquinoline-N-oxide	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
5-Nitro-o-toluidine	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Acetophenone	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Azobenzene	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Chlorobenzilate	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Dimethylaminoazobenzene	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Isophorone	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Nitrobenzene	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Pentachloronitrobenzene	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Phenacetin	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Pronamide	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Nitrosamines									
Methapyrilene	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
N-Nitrosodibutylamine	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
N-Nitrosodiethylamine	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
N-Nitrosodi-n-propylamine	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
N-Nitrosodiphenyl & Diphenylamine	US EPA 3510/8270	µg/L	-	<4	37	<4	<4	<4	<4
N-Nitrosomethylethylamine	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
N-Nitrosomorpholine	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
N-Nitrosopiperidine	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
N-Nitrosopyrrolidine	US EPA 3510/8270	µg/L	-	<4	37	<4	<4	<4	<4
Organochlorine pesticides									
4,4'-DDD	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
4,4'-DDE	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
4,4'-DDT	US EPA 3510/8270	µg/L	9	<4	37	<4	<4	<4	<4
Aldrin	US EPA 3510/8270	µg/L	0.3	<2	37	<2	<2	<2	<2
alpha-BHC	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
alpha-Endosulfan	US EPA 3510/8270	µg/L	20	<2	37	<2	<2	<2	<2
beta-BHC	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2

Table 10-2 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
beta-Endosulfan	US EPA 3510/8270	µg/L	20	<2	37	<2	<2	<2	<2
delta-BHC	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Dieldrin	US EPA 3510/8270	µg/L	0.3	<2	37	<2	<2	<2	<2
Endrin	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Endosulfan sulfate	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
gamma-BHC	US EPA 3510/8270	µg/L	10	<2	37	<2	<2	<2	<2
Heptachlor	US EPA 3510/8270	µg/L	0.3	<2	37	<2	<2	<2	<2
Heptachlor epoxide	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Organophosphorous pesticides									
Chlorfenvinphos	US EPA 3510/8270	µg/L	2	<2	37	<2	<2	<2	<2
Chlorpyrifos	US EPA 3510/8270	µg/L	10	<2	37	<2	<2	<2	<2
Chlorpyrifos-methyl	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Diazinon	US EPA 3510/8270	µg/L	4	<2	37	<2	<2	<2	<2
Dichlorvos	US EPA 3510/8270	µg/L	5	<2	37	<2	<2	<2	<2
Dimethoate	US EPA 3510/8270	µg/L	7	<2	37	<2	<2	<2	<2
Ethion	US EPA 3510/8270	µg/L	4	<2	37	<2	<2	<2	<2
Fenthion	US EPA 3510/8270	µg/L	7	<2	37	<2	<2	<2	<2
Malathion	US EPA 3510/8270	µg/L	70	<2	37	<2	<2	<2	<2
Pirimiphos-ethyl	US EPA 3510/8270	µg/L	0.5	<2	37	<2	<2	<2	<2
Prothiofos	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Phenolic compounds									
2,3,4,6-Tetrachlorophenol	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
2,4-Dichlorophenol	US EPA 3510/8270	µg/L	200	<2	37	<2	<2	<2	<2
2,4-Dimethylphenol	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
2,4,5-Trichlorophenol	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
2,4,6-Trichlorophenol	US EPA 3510/8270	µg/L	20	<2	37	<2	<2	<2	<2
2,6-Dichlorophenol	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
2-Chlorophenol	US EPA 3510/8270	µg/L	300	<2	37	<2	<2	<2	<2
2-Methylphenol	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
2-Nitrophenol	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
3- & 4-Methylphenol	US EPA 3510/8270	µg/L	-	<4	37	<4	<4	<4	<4
4-Chloro-3-Methylphenol	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Pentachlorophenol	US EPA 3510/8270	µg/L	10	<4	37	<4	<4	<4	<4
Phenol	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Phthalates									
Bis(2-ethylhexyl) phthalate	US EPA 3510/8270	µg/L	10	<10	37	<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	37	<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	37	<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	37	<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	37	<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	37	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 8270D	µg/L	-	<2	36	<2	<2	<2	<2

Table 10-2 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
Polycyclic aromatic hydrocarbons									
2-Chloronaphthalene	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
2-Methylnaphthalene	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
3-Methylcholanthrene	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
7,12-Dimethylbenz(a) anthracene	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Acenaphthene	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Acenaphthene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Acenaphthylene	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Acenaphthylene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Anthracene	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Anthracene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Benz(a)anthracene	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Benz(a)anthracene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Benzo(a)pyrene	US EPA 3510/8270	µg/L	0.01	<2	37	<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(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	37	<4	<4	<4	<4
Benzo(g,h,i)perylene	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Benzo(g,h,i)perylene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Chrysene	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Chrysene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Dibenz(a.h)anthracene	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Dibenz(a.h)anthracene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Fluoranthene	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Fluoranthene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Fluorene	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Fluorene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Indeno(1,2,3-cd)pyrene	US EPA 3510/8270	µg/L	-	<2	37	<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	37	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Phenanthrene	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Phenanthrene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Pyrene	US EPA 3510/8270	µg/L	-	<2	37	<2	<2	<2	<2
Pyrene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
PAHs (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 10-3 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	325	<1	<1	<1	<1
Total coliforms	APHA 9223 B	MPN/100mL	-	<1	325	<1	3	<1	<1
Heterotrophic plate count	APHA 9215 B	CFU/mL	-	<1	325	<1	442	3	6
Physical									
Conductivity	APHA 2510 B	µS/cm	-	<2	35	59	207	119	184
pH	APHA 4500-H B	pH units	-	<0.01	325	6.89	8.34	7.85	8.10
Temperature	APHA 4500-H B	deg.C	-	<0.1	73	8.0	25.5	16.8	24.0
Total dissolved solids	APHA 2540 C	mg/L	-	<10	35	42	125	73	110
True colour	APHA 2120 B	Pt-Co	-	<1	71	<1	2	<1	1
Turbidity	APHA 2130 B	NTU	-	<0.1	71	0.1	0.6	0.2	0.5
Inorganic									
Alkalinity bicarb	APHA 2320 A/B	mg/L	-	<0.1	71	33.2	113.0	48.5	61.7
Alkalinity carb	APHA 2320 A/B	mg/L	-	<0.1	71	<0.1	0.9	<0.1	<0.1
Alkalinity hydrox	APHA 2320 A/B	mg/L	-	<0.1	71	<0.1	<0.1	<0.1	<0.1
Alkalinity total	APHA 2320 A/B	mg/L	-	<1	71	33	113	48	62
Aluminium acid soluble	USEPA 200.8	µg/L	-	<5	35	18	84	36	52
Asbestos	AS4964-2000	Present/ Absent	-	Absent	12	Absent	Absent	Absent	Absent
Calcium dissolved	USEPA 200.7	mg/L	-	<0.05	35	10.40	18.50	13.59	16.78
Chloride	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.1	12	5.5	17.4	9.3	16.5
Chlorine combined	APHA 4500 -CL G	mg/L	-	<0.03	325	<0.03	0.23	0.07	0.15
Chlorine free	APHA 4500 -CL G	mg/L	-	<0.03	325	<0.03	1.40	0.73	1.09
Chlorine total	APHA 4500 -CL G	mg/L	5	<0.03	325	<0.03	1.42	0.80	1.17
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	<0.05	35	0.52	0.90	0.77	0.88
Hardness total	APHA 2340 B	mg/L	-	<1	35	32	61	43	60
Iodide	VIC-CM078	mg/L	0.5	<0.01	12	<0.01	<0.01	<0.01	<0.01
Magnesium dissolved	USEPA 200.7	mg/L	-	<0.05	35	1.36	4.89	2.15	4.57
Nitrate	APHA 21st Ed. 2005, Part 4110 B	mg/L	50	<0.1	12	<0.1	0.3	0.2	0.3
Potassium dissolved	USEPA 200.7	mg/L	-	<0.1	12	0.7	1.8	1.0	1.7
Sodium dissolved	USEPA 200.7	mg/L	-	<0.1	12	3.1	9.1	4.8	9.0
Sulphate	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.4	12	3.5	30.2	9.8	24.0
Total metals									
Aluminium total	USEPA 200.8	µg/L	-	<9	35	23	111	41	61
Antimony total	USEPA 200.8	µg/L	3	<3	35	<3	<3	<3	<3
Arsenic total	USEPA 200.8	µg/L	10	<1	35	<1	<1	<1	<1
Barium total	USEPA 200.8	µg/L	2000	<0.5	35	2.7	8.4	4.6	7.3
Beryllium total	USEPA 200.8	µg/L	60	<0.1	35	<0.1	<0.1	<0.1	<0.1
Boron total	USEPA 200.7	mg/L	4	<0.01	12	<0.01	0.02	0.01	0.02
Cadmium total	USEPA 200.8	µg/L	2	<0.05	35	<0.05	<0.05	<0.05	<0.05
Chromium total	USEPA 200.8	µg/L	-	<2	35	<2	<2	<2	<2
Cobalt total	USEPA 200.8	µg/L	-	<0.2	35	<0.2	0.4	<0.2	<0.2
Copper total	USEPA 200.8	µg/L	2000	<1	71	1	79	12	35

Table 10-3 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
Iron total	USEPA 200.7	mg/L	-	<0.01	71	<0.01	0.06	<0.01	0.02
Lead total	USEPA 200.8	µg/L	10	<0.2	71	<0.2	0.9	<0.2	0.4
Manganese total	USEPA 200.7	mg/L	0.5	<0.001	71	0.001	0.048	0.009	0.023
Mercury total	USEPA 200.8	µg/L	1	<0.1	12	<0.1	<0.1	<0.1	<0.1
Molybdenium total	USEPA 200.8	µg/L	50	<1	35	<1	2	<1	<1
Nickel total	USEPA 200.8	µg/L	20	<1	35	<1	2	<1	1
Selenium total	USEPA 200.8	µg/L	10	<1	35	<1	7	<1	<1
Silver total	USEPA 200.8	µg/L	100	<1	35	<1	<1	<1	<1
Zinc total	USEPA 200.8	µg/L	-	<5	35	<5	8	<5	5
Haloacetic acids									
Bromoacetic acid	ALS: Headspace GCMS	µg/L	-	<5	35	<5	<5	<5	<5
Bromochloroacetic acid	ALS: Headspace GCMS	µg/L	-	<1	35	<1	8	3	7
Bromodichloroacetic acid	ALS: Headspace GCMS	µg/L	-	<1	35	<1	11	4	9
Dibromoacetic acid	ALS: Headspace GCMS	µg/L	-	<1	35	<1	2	<1	<1
Dibromochloroacetic acid	ALS: Headspace GCMS	µg/L	-	<10	35	<10	<10	<10	<10
Dichloroacetic acid	ALS: Headspace GCMS	µg/L	100	<1	35	<1	34	19	32
Monochloroacetic acid	ALS: Headspace GCMS	µg/L	150	<1	35	<1	4	1	2
Tribromoacetic acid	ALS: Headspace GCMS	µg/L	-	<10	35	<10	<10	<10	<10
Trichloroacetic acid	ALS: Headspace GCMS	µg/L	100	<1	35	<1	40	25	36
Sum of Haloacetic acid	ALS: Headspace GCMS	µg/L	-	<1	35	<1	91	51	84
Trihalomethanes									
Bromoform	VIC-CM047	mg/L	-	<0.001	35	<0.001	<0.001	<0.001	<0.001
Chloroform	VIC-CM047	mg/L	-	<0.001	35	0.021	0.060	0.037	0.056
Dibromochloromethane	VIC-CM047	mg/L	-	<0.001	35	<0.001	0.002	<0.001	0.002
Dichlorobromomethane	VIC-CM047	mg/L	-	<0.001	35	0.003	0.013	0.006	0.012
Trihalomethanes total	VIC-CM047	mg/L	0.25	<0.001	35	0.024	0.073	0.044	0.070
Semi volatile organic compounds (SVOC)									
Anilines and benzidines									
2-Nitroaniline	US EPA 3510/8270	µg/L	-	<4	35	<4	<4	<4	<4
3-Nitroaniline	US EPA 3510/8270	µg/L	-	<4	35	<4	<4	<4	<4
3,3`-Dichlorobenzidine	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
4-Chloroaniline	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
4-Nitroaniline	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Aniline	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Carbazole	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Dibenzofuran	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Chlorinated hydrocarbons									
1,2-Dichlorobenzene	US EPA 3510/8270	µg/L	1500	<2	35	<2	<2	<2	<2
1,2,4-Trichlorobenzene	US EPA 3510/8270	µg/L	30	<2	35	<2	<2	<2	<2
1,3-Dichlorobenzene	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
1,4-Dichlorobenzene	US EPA 3510/8270	µg/L	40	<2	35	<2	<2	<2	<2
Hexachlorobenzene	US EPA 3510/8270	µg/L	-	<4	35	<4	<4	<4	<4

Table 10-3 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
Hexachlorobutadiene	US EPA 3510/8270	µg/L	0.7	<2	35	<2	<2	<2	<2
Hexachlorocyclopentadiene	US EPA 3510/8270	µg/L	-	<10	35	<10	<10	<10	<10
Hexachloroethane	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Hexachloropropylene	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Pentachlorobenzene	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Haloethers									
4-Bromophenyl phenyl ether	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
4-Chlorophenyl phenyl ether	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Bis(2-chloroethoxy) methane	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Bis(2-chloroethyl) ether	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Nitroaromatics and ketones									
1-Naphthylamine	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
1,3,5-Trinitrobenzene	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
2-Picoline	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
2,4-Dinitrotoluene	US EPA 3510/8270	µg/L	-	<4	35	<4	<4	<4	<4
2,6-Dinitrotoluene	US EPA 3510/8270	µg/L	-	<4	35	<4	<4	<4	<4
4-Aminobiphenyl	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
4-Nitroquinoline-N-oxide	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
5-Nitro-o-toluidine	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Acetophenone	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Azobenzene	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Chlorobenzilate	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Dimethylaminoazobenzene	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Isophorone	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Nitrobenzene	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Pentachloronitrobenzene	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Phenacetin	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Pronamide	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Nitrosamines									
Methapyrilene	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
N-Nitrosodibutylamine	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
N-Nitrosodiethylamine	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
N-Nitrosodi-n-propylamine	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
N-Nitrosodiphenyl & Diphenylamine	US EPA 3510/8270	µg/L	-	<4	35	<4	<4	<4	<4
N-Nitrosomethylethylamine	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
N-Nitrosomorpholine	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
N-Nitrosopiperidine	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
N-Nitrosopyrrolidine	US EPA 3510/8270	µg/L	-	<4	35	<4	<4	<4	<4
Organochlorine pesticides									
4,4'-DDD	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
4,4'-DDE	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
4,4'-DDT	US EPA 3510/8270	µg/L	9	<4	35	<4	<4	<4	<4
Aldrin	US EPA 3510/8270	µg/L	0.3	<2	35	<2	<2	<2	<2
alpha-BHC	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2

Table 10-3 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
alpha-Endosulfan	US EPA 3510/8270	µg/L	20	<2	35	<2	<2	<2	<2
beta-BHC	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
beta-Endosulfan	US EPA 3510/8270	µg/L	20	<2	35	<2	<2	<2	<2
delta-BHC	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Dieldrin	US EPA 3510/8270	µg/L	0.3	<2	35	<2	<2	<2	<2
Endrin	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Endosulfan sulfate	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
gamma-BHC	US EPA 3510/8270	µg/L	10	<2	35	<2	<2	<2	<2
Heptachlor	US EPA 3510/8270	µg/L	0.3	<2	35	<2	<2	<2	<2
Heptachlor epoxide	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Organophosphorous pesticides									
Chlorfenvinphos	US EPA 3510/8270	µg/L	2	<2	35	<2	<2	<2	<2
Chlorpyrifos	US EPA 3510/8270	µg/L	10	<2	35	<2	<2	<2	<2
Chlorpyrifos-methyl	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Diazinon	US EPA 3510/8270	µg/L	4	<2	35	<2	<2	<2	<2
Dichlorvos	US EPA 3510/8270	µg/L	5	<2	35	<2	<2	<2	<2
Dimethoate	US EPA 3510/8270	µg/L	7	<2	35	<2	<2	<2	<2
Ethion	US EPA 3510/8270	µg/L	4	<2	35	<2	<2	<2	<2
Fenthion	US EPA 3510/8270	µg/L	7	<2	35	<2	<2	<2	<2
Malathion	US EPA 3510/8270	µg/L	70	<2	35	<2	<2	<2	<2
Pirimiphos-ethyl	US EPA 3510/8270	µg/L	0.5	<2	35	<2	<2	<2	<2
Prothiofos	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Phenolic compounds									
2,3,4,6-Tetrachlorophenol	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
2,4-Dichlorophenol	US EPA 3510/8270	µg/L	200	<2	35	<2	<2	<2	<2
2,4-Dimethylphenol	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
2,4,5-Trichlorophenol	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
2,4,6-Trichlorophenol	US EPA 3510/8270	µg/L	20	<2	35	<2	<2	<2	<2
2,6-Dichlorophenol	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
2-Chlorophenol	US EPA 3510/8270	µg/L	300	<2	35	<2	<2	<2	<2
2-Methylphenol	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
2-Nitrophenol	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
3- & 4-Methylphenol	US EPA 3510/8270	µg/L	-	<4	35	<4	<4	<4	<4
4-Chloro-3-Methylphenol	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Pentachlorophenol	US EPA 3510/8270	µg/L	10	<4	35	<4	<4	<4	<4
Phenol	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Phthalates									
Bis(2-ethylhexyl) phthalate	US EPA 3510/8270	µg/L	10	<10	35	<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	35	<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	35	<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	35	<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	35	<2	<2	<2	<2

Table 10-3 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
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	35	<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	35	<2	<2	<2	<2
2-Methylnaphthalene	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
3-Methylcholanthrene	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
7,12-Dimethylbenz(a) anthracene	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Acenaphthene	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Acenaphthene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Acenaphthylene	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Acenaphthylene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Anthracene	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Anthracene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Benz(a)anthracene	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Benz(a)anthracene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Benzo(a)pyrene	US EPA 3510/8270	µg/L	0.01	<2	35	<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(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	35	<4	<4	<4	<4
Benzo(g,h,i)perylene	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Benzo(g,h,i)perylene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Chrysene	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Chrysene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Dibenz(a.h)anthracene	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Dibenz(a.h)anthracene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Fluoranthene	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Fluoranthene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Fluorene	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Fluorene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Indeno(1,2,3-cd)pyrene	US EPA 3510/8270	µg/L	-	<2	35	<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	35	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Phenanthrene	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Phenanthrene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
Pyrene	US EPA 3510/8270	µg/L	-	<2	35	<2	<2	<2	<2
Pyrene	US EPA 3510/8270	µg/L	-	<1	36	<1	<1	<1	<1
PAHs (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 10-4 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	268	<1	<1	<1	<1
Total coliforms	APHA 9223 B	MPN/100mL	-	<1	268	<1	3	<1	<1
Heterotrophic plate count	APHA 9215 B	CFU/mL	-	<1	268	<1	242	4	6
Physical									
Conductivity	APHA 2510 B	µS/cm	-	<2	25	89	188	128	185
pH	APHA 4500-H B	pH units	-	<0.01	267	7.01	8.10	7.81	7.98
Temperature	APHA 4500-H B	deg.C	-	<0.1	51	9.0	26.0	16.9	24.8
Total dissolved solids	APHA 2540 C	mg/L	-	<10	24	36	141	81	115
True colour	APHA 2120 B	Pt-Co	-	<1	49	<1	2	<1	2
Turbidity	APHA 2130 B	NTU	-	<0.1	50	0.1	0.6	0.2	0.4
Inorganic									
Alkalinity bicarb	APHA 2320 A/B	mg/L	-	<0.1	49	37.4	60.8	48.0	57.6
Alkalinity carb	APHA 2320 A/B	mg/L	-	<0.1	49	<0.1	<0.1	<0.1	<0.1
Alkalinity hydrox	APHA 2320 A/B	mg/L	-	<0.1	49	<0.1	<0.1	<0.1	<0.1
Alkalinity total	APHA 2320 A/B	mg/L	-	<1	49	37	61	48	58
Aluminium acid soluble	USEPA 200.8	µg/L	-	<5	25	23	117	40	49
Asbestos	AS4964-2000	Present/ Absent	-	Absent	12	Absent	Absent	Absent	Absent
Calcium dissolved	USEPA 200.7	mg/L	-	<0.05	25	9.18	17.20	13.64	16.86
Chloride	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.1	12	5.3	17.3	9.9	16.5
Chlorine combined	APHA 4500 -CL G	mg/L	-	<0.03	268	<0.03	0.42	0.09	0.17
Chlorine free	APHA 4500 -CL G	mg/L	-	<0.03	268	<0.03	1.41	0.81	1.20
Chlorine total	APHA 4500 -CL G	mg/L	5	<0.03	268	<0.03	1.55	0.90	1.27
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	<0.05	25	0.62	0.91	0.78	0.88
Hardness total	APHA 2340 B	mg/L	-	<1	25	29	63	45	62
Iodide	VIC-CM078	mg/L	0.5	<0.01	12	<0.01	0.02	<0.01	0.01
Magnesium dissolved	USEPA 200.7	mg/L	-	<0.05	25	1.24	5.27	2.57	5.14
Nitrate	APHA 21st Ed. 2005, Part 4110 B	mg/L	50	<0.1	12	<0.1	0.3	0.2	0.3
Potassium dissolved	USEPA 200.7	mg/L	-	<0.1	12	0.7	1.8	1.2	1.8
Sodium dissolved	USEPA 200.7	mg/L	-	<0.1	12	2.9	9.9	6.2	9.7
Sulphate	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.4	12	3.7	29.7	13.4	23.7
Total metals									
Aluminium total	USEPA 200.8	µg/L	-	<9	25	27	55	41	53
Antimony total	USEPA 200.8	µg/L	3	<3	25	<3	<3	<3	<3
Arsenic total	USEPA 200.8	µg/L	10	<1	25	<1	<1	<1	<1
Barium total	USEPA 200.8	µg/L	2000	<0.5	25	2.4	8.7	4.9	7.7
Beryllium total	USEPA 200.8	µg/L	60	<0.1	25	<0.1	0.1	<0.1	<0.1
Boron total	USEPA 200.7	mg/L	4	<0.01	12	<0.01	0.02	<0.01	0.02
Cadmium total	USEPA 200.8	µg/L	2	<0.05	25	<0.05	<0.05	<0.05	<0.05
Chromium total	USEPA 200.8	µg/L	-	<2	25	<2	<2	<2	<2
Cobalt total	USEPA 200.8	µg/L	-	<0.2	25	<0.2	<0.2	<0.2	<0.2
Copper total	USEPA 200.8	µg/L	2000	<1	49	2	45	15	37
Iron total	USEPA 200.7	mg/L	-	<0.01	49	<0.01	0.04	0.01	0.02

Table 10-4 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
Lead total	USEPA 200.8	µg/L	10	<0.2	49	<0.2	0.9	0.2	0.6
Manganese total	USEPA 200.7	mg/L	0.5	<0.001	49	0.001	0.045	0.009	0.024
Mercury total	USEPA 200.8	µg/L	1	<0.1	12	<0.1	<0.1	<0.1	<0.1
Molybdenium total	USEPA 200.8	µg/L	50	<1	25	<1	<1	<1	<1
Nickel total	USEPA 200.8	µg/L	20	<1	25	<1	2	<1	2
Selenium total	USEPA 200.8	µg/L	10	<1	25	<1	<1	<1	<1
Silver total	USEPA 200.8	µg/L	100	<1	25	<1	<1	<1	<1
Zinc total	USEPA 200.8	µg/L	-	<5	25	<5	48	<5	<5
Haloacetic acids									
Bromoacetic acid	ALS: Headspace GCMS	µg/L	-	<5	25	<5	<5	<5	<5
Bromochloroacetic acid	ALS: Headspace GCMS	µg/L	-	<1	25	<1	7	3	6
Bromodichloroacetic acid	ALS: Headspace GCMS	µg/L	-	<1	25	<1	9	4	8
Dibromoacetic acid	ALS: Headspace GCMS	µg/L	-	<1	25	<1	<1	<1	<1
Dibromochloroacetic acid	ALS: Headspace GCMS	µg/L	-	<10	24	<10	<10	<10	<10
Dichloroacetic acid	ALS: Headspace GCMS	µg/L	100	<1	25	12	32	20	31
Monochloroacetic acid	ALS: Headspace GCMS	µg/L	150	<1	25	<1	3	2	3
Tribromoacetic acid	ALS: Headspace GCMS	µg/L	-	<10	25	<10	<10	<10	<10
Trichloroacetic acid	ALS: Headspace GCMS	µg/L	100	<1	25	14	37	23	35
Sum of Haloacetic acid	ALS: Headspace GCMS	µg/L	-	<1	25	29	84	52	82
Trihalomethanes									
Bromoform	VIC-CM047	mg/L	-	<0.001	25	<0.001	<0.001	<0.001	<0.001
Chloroform	VIC-CM047	mg/L	-	<0.001	25	0.019	0.061	0.036	0.058
Dibromochloromethane	VIC-CM047	mg/L	-	<0.001	25	<0.001	0.002	<0.001	0.002
Dichlorobromomethane	VIC-CM047	mg/L	-	<0.001	25	0.002	0.015	0.006	0.014
Trihalomethanes total	VIC-CM047	mg/L	0.25	<0.001	25	0.021	0.075	0.043	0.074
Semi volatile organic compounds (SVOC)									
Anilines and benzidines									
2-Nitroaniline	US EPA 3510/8270	µg/L	-	<4	25	<4	<4	<4	<4
3-Nitroaniline	US EPA 3510/8270	µg/L	-	<4	25	<4	<4	<4	<4
3,3`-Dichlorobenzidine	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
4-Chloroaniline	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
4-Nitroaniline	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Aniline	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Carbazole	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Dibenzofuran	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Chlorinated hydrocarbons									
1,2-Dichlorobenzene	US EPA 3510/8270	µg/L	1500	<2	25	<2	<2	<2	<2
1,2,4-Trichlorobenzene	US EPA 3510/8270	µg/L	30	<2	25	<2	<2	<2	<2
1,3-Dichlorobenzene	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
1,4-Dichlorobenzene	US EPA 3510/8270	µg/L	40	<2	25	<2	<2	<2	<2
Hexachlorobenzene	US EPA 3510/8270	µg/L	-	<4	25	<4	<4	<4	<4
Hexachlorobutadiene	US EPA 3510/8270	µg/L	0.7	<2	25	<2	<2	<2	<2

Table 10-4 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
Hexachlorocyclopentadiene	US EPA 3510/8270	µg/L	-	<10	25	<10	<10	<10	<10
Hexachloroethane	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Hexachloropropylene	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Pentachlorobenzene	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Haloethers									
4-Bromophenyl phenyl ether	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
4-Chlorophenyl phenyl ether	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Bis(2-chloroethoxy) methane	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Bis(2-chloroethyl) ether	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Nitroaromatics and ketones									
1-Naphthylamine	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
1,3,5-Trinitrobenzene	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
2-Picoline	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
2,4-Dinitrotoluene	US EPA 3510/8270	µg/L	-	<4	25	<4	<4	<4	<4
2,6-Dinitrotoluene	US EPA 3510/8270	µg/L	-	<4	25	<4	<4	<4	<4
4-Aminobiphenyl	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
4-Nitroquinoline-N-oxide	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
5-Nitro-o-toluidine	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Acetophenone	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Azobenzene	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Chlorobenzilate	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Dimethylaminoazobenzene	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Isophorone	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Nitrobenzene	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Pentachloronitrobenzene	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Phenacetin	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Pronamide	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Nitrosamines									
Methapyrilene	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
N-Nitrosodibutylamine	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
N-Nitrosodiethylamine	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
N-Nitrosodi-n-propylamine	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
N-Nitrosodiphenyl & Diphenylamine	US EPA 3510/8270	µg/L	-	<4	25	<4	<4	<4	<4
N-Nitrosomethylethylamine	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
N-Nitrosomorpholine	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
N-Nitrosopiperidine	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
N-Nitrosopyrrolidine	US EPA 3510/8270	µg/L	-	<4	25	<4	<4	<4	<4
Organochlorine pesticides									
4,4'-DDD	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
4,4'-DDE	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
4,4'-DDT	US EPA 3510/8270	µg/L	9	<4	25	<4	<4	<4	<4
Aldrin	US EPA 3510/8270	µg/L	0.3	<2	25	<2	<2	<2	<2
alpha-BHC	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
alpha-Endosulfan	US EPA 3510/8270	µg/L	20	<2	25	<2	<2	<2	<2

Table 10-4 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
beta-BHC	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
beta-Endosulfan	US EPA 3510/8270	µg/L	20	<2	25	<2	<2	<2	<2
delta-BHC	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Dieldrin	US EPA 3510/8270	µg/L	0.3	<2	25	<2	<2	<2	<2
Endrin	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Endosulfan sulfate	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
gamma-BHC	US EPA 3510/8270	µg/L	10	<2	25	<2	<2	<2	<2
Heptachlor	US EPA 3510/8270	µg/L	0.3	<2	25	<2	<2	<2	<2
Heptachlor epoxide	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Organophosphorous pesticides									
Chlorfenvinphos	US EPA 3510/8270	µg/L	2	<2	25	<2	<2	<2	<2
Chlorpyrifos	US EPA 3510/8270	µg/L	10	<2	25	<2	<2	<2	<2
Chlorpyrifos-methyl	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Diazinon	US EPA 3510/8270	µg/L	4	<2	25	<2	<2	<2	<2
Dichlorvos	US EPA 3510/8270	µg/L	5	<2	25	<2	<2	<2	<2
Dimethoate	US EPA 3510/8270	µg/L	7	<2	25	<2	<2	<2	<2
Ethion	US EPA 3510/8270	µg/L	4	<2	25	<2	<2	<2	<2
Fenthion	US EPA 3510/8270	µg/L	7	<2	25	<2	<2	<2	<2
Malathion	US EPA 3510/8270	µg/L	70	<2	25	<2	<2	<2	<2
Pirimiphos-ethyl	US EPA 3510/8270	µg/L	0.5	<2	25	<2	<2	<2	<2
Prothiofos	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Phenolic compounds									
2,3,4,6-Tetrachlorophenol	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
2,4-Dichlorophenol	US EPA 3510/8270	µg/L	200	<2	25	<2	<2	<2	<2
2,4-Dimethylphenol	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
2,4,5-Trichlorophenol	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
2,4,6-Trichlorophenol	US EPA 3510/8270	µg/L	20	<2	25	<2	<2	<2	<2
2,6-Dichlorophenol	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
2-Chlorophenol	US EPA 3510/8270	µg/L	300	<2	25	<2	<2	<2	<2
2-Methylphenol	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
2-Nitrophenol	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
3- & 4-Methylphenol	US EPA 3510/8270	µg/L	-	<4	25	<4	<4	<4	<4
4-Chloro-3-Methylphenol	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Pentachlorophenol	US EPA 3510/8270	µg/L	10	<4	25	<4	<4	<4	<4
Phenol	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Phthalates									
Bis(2-ethylhexyl) phthalate	US EPA 3510/8270	µg/L	10	<10	25	<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	25	<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	25	<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	25	<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	25	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 8270D	µg/L	-	<2	24	<2	<2	<2	<2

Table 10-4 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
Di-n-octylphthalate	US EPA 3510/8270	µg/L	-	<2	25	<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	25	<2	<2	<2	<2
2-Methylnaphthalene	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
3-Methylcholanthrene	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
7,12-Dimethylbenz(a) anthracene	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Acenaphthene	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Acenaphthene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Acenaphthylene	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Acenaphthylene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Anthracene	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Anthracene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Benz(a)anthracene	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Benz(a)anthracene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Benzo(a)pyrene	US EPA 3510/8270	µg/L	0.01	<2	25	<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(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	25	<4	<4	<4	<4
Benzo(g,h,i)perylene	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Benzo(g,h,i)perylene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Chrysene	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Chrysene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Dibenz(a.h)anthracene	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Dibenz(a.h)anthracene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Fluoranthene	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Fluoranthene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Fluorene	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Fluorene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Indeno(1,2,3-cd)pyrene	US EPA 3510/8270	µg/L	-	<2	25	<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	25	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Phenanthrene	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Phenanthrene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Pyrene	US EPA 3510/8270	µg/L	-	<2	25	<2	<2	<2	<2
Pyrene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
PAHs (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 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 10-5 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	266	<1	<1	<1	<1
Total coliforms	APHA 9223 B	MPN/100mL	-	<1	266	<1	<1	<1	<1
Heterotrophic plate count	APHA 9215 B	CFU/mL	-	<1	266	<1	5900	32	24
Physical									
Conductivity	APHA 2510 B	µS/cm	-	<2	24	91	197	145	197
pH	APHA 4500-H B	pH units	-	<0.01	266	7.48	8.84	7.92	8.26
Temperature	APHA 4500-H B	deg.C	-	<0.1	47	7.5	25.5	16.8	24.5
Total dissolved solids	APHA 2540 C	mg/L	-	<10	24	46	145	88	124
True colour	APHA 2120 B	Pt-Co	-	<1	48	<1	2	<1	1
Turbidity	APHA 2130 B	NTU	-	<0.1	49	0.1	0.4	0.2	0.4
Inorganic									
Alkalinity bicarb	APHA 2320 A/B	mg/L	-	<0.1	48	40.8	65.3	50.4	60.5
Alkalinity carb	APHA 2320 A/B	mg/L	-	<0.1	48	<0.1	6.3	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	41	65	50	62
Aluminium acid soluble	USEPA 200.8	µg/L	-	<5	24	18	69	39	65
Asbestos	AS4964-2000	Present/ Absent	-	Absent	12	Absent	Absent	Absent	Absent
Calcium dissolved	USEPA 200.7	mg/L	-	<0.05	24	11.60	20.90	14.80	19.19
Chloride	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.1	12	5.2	17.8	9.8	15.7
Chlorine combined	APHA 4500 -CL G	mg/L	-	<0.03	266	<0.03	0.29	0.10	0.20
Chlorine free	APHA 4500 -CL G	mg/L	-	<0.03	266	0.05	1.49	0.67	1.13
Chlorine total	APHA 4500 -CL G	mg/L	5	<0.03	266	0.10	1.74	0.77	1.28
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	<0.05	24	0.65	0.87	0.78	0.85
Hardness total	APHA 2340 B	mg/L	-	<1	24	34	69	49	66
Iodide	VIC-CM078	mg/L	0.5	<0.01	12	<0.01	<0.01	<0.01	<0.01
Magnesium dissolved	USEPA 200.7	mg/L	-	<0.05	24	1.20	5.20	2.91	5.06
Nitrate	APHA 21st Ed. 2005, Part 4110 B	mg/L	50	<0.1	12	<0.1	0.3	0.2	0.3
Potassium dissolved	USEPA 200.7	mg/L	-	<0.1	12	0.6	1.9	1.2	1.9
Sodium dissolved	USEPA 200.7	mg/L	-	<0.1	12	2.9	10.1	5.9	10.0
Sulphate	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.4	12	3.6	31.4	13.7	24.5
Total metals									
Aluminium total	USEPA 200.8	µg/L	-	<9	24	33	93	45	74
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	<0.5	24	2.5	9.7	5.8	9.4
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	0.02	0.01	0.02
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	<1	50	11	24
Iron total	USEPA 200.7	mg/L	-	<0.01	48	<0.01	0.03	<0.01	0.02

Table 10-5 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
Lead total	USEPA 200.8	µg/L	10	<0.2	48	<0.2	0.9	<0.2	0.5
Manganese total	USEPA 200.7	mg/L	0.5	<0.001	48	0.001	0.028	0.008	0.023
Mercury total	USEPA 200.8	µg/L	1	<0.1	12	<0.1	<0.1	<0.1	<0.1
Molybdenium total	USEPA 200.8	µg/L	50	<1	24	<1	2	<1	<1
Nickel total	USEPA 200.8	µg/L	20	<1	24	<1	2	<1	2
Selenium total	USEPA 200.8	µg/L	10	<1	24	<1	1	<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	11	<5	5
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	7	3	6
Bromodichloroacetic acid	ALS: Headspace GCMS	µg/L	-	<1	24	<1	9	5	9
Dibromoacetic acid	ALS: Headspace GCMS	µg/L	-	<1	24	<1	1	<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	10	36	21	33
Monochloroacetic acid	ALS: Headspace GCMS	µg/L	150	<1	24	<1	4	2	4
Tribromoacetic acid	ALS: Headspace GCMS	µg/L	-	<10	24	<10	<10	<10	<10
Trichloroacetic acid	ALS: Headspace GCMS	µg/L	100	<1	24	12	46	28	44
Sum of Haloacetic acid	ALS: Headspace GCMS	µg/L	-	<1	24	26	97	58	94
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	0.110	0.046	0.086
Dibromochloromethane	VIC-CM047	mg/L	-	<0.001	24	<0.001	0.003	0.001	0.003
Dichlorobromomethane	VIC-CM047	mg/L	-	<0.001	24	0.003	0.021	0.008	0.016
Trihalomethanes total	VIC-CM047	mg/L	0.25	<0.001	24	0.024	0.130	0.055	0.098
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

Table 10-5 Summary data for water quality zone 4: Tuggeranong

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	Number of Samples	Minimum	Maximum	Mean	95^{th} Percentile
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									
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

Table 10-5 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
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
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

Table 10-5 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
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	-	<2	24	<2	<2	<2	<2
Acenaphthene	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
Acenaphthylene	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
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
Benz(a)anthracene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
Benzo(a)pyrene	US EPA 3510/8270	µg/L	0.01	<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(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	-	<2	24	<2	<2	<2	<2
Benzo(g,h,i)perylene	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
Chrysene	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
Dibenz(a.h)anthracene	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
Fluoranthene	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
Fluorene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
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	-	<2	24	<2	<2	<2	<2
Naphthalene	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
Phenanthrene	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
Pyrene	US EPA 3510/8270	µg/L	-	<1	24	<1	<1	<1	<1
PAHs (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 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.

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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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