2023–24

DRINKING WATER QUALITY REPORT

icon WATER

Three Rivers by Lynnice Church

Acknowledgement of Country

Icon Water acknowledges the traditional custodians of the Canberra region, the Ngunnawal people, and also recognises other people or families with connection to the ACT and region. We pay our respects to their Elders – past, present and emerging. We recognise and value their continuing culture and the contribution they make to the life of the city and the region. We also acknowledge the First Peoples of the broader region in which we live and work.

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SUMMARY

EXECUTIVE SUMMARY

At Icon Water our purpose is 'to sustain and enhance quality of life', and central to this is the way we support and protect the community and the environment by providing safe, clean drinking water.

To do this, we apply a rigorous management framework that includes the catchments and storage reservoirs, our water treatment plants, service reservoirs and reticulation system all the way to customers' properties. This includes a monitoring program that assesses water quality across the entire potable (drinking quality) water production sequence.

Through this framework, we ensure safe and clean water is delivered to Canberra, as well as the Queanbeyan-Palerang Regional Council.

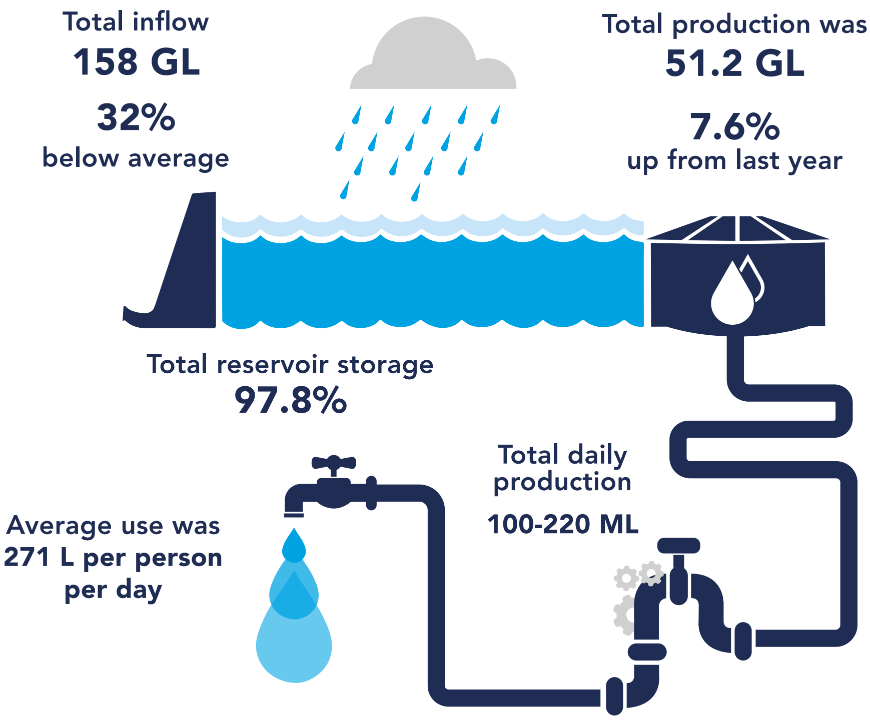
At the end of June 2024, Canberra's four water storage reservoirs held 97.8 per cent of their total accessible capacity. High summer rainfall coupled with high storage from last year kept our water storage reservoirs above 94 per cent capacity throughout the year.

Throughout 2023–24 we produced between 100 and 220 megalitres (ML) per day of drinking water for our ACT and Queanbeyan-Palerang customers, to a total of 51.2 gigalitres (GL) throughout the year. This is 7.6 per cent more than the previous year.

We achieved 100% compliance with Australian Drinking Water Guidelines (ADWG). We continually keep abreast of emerging science on contaminants and assess their potential risk of any presence. We maintain a precautionary, science based approach. For instance, we have been testing for PFAS compounds annually since 2016 in our catchments and in 2024 commenced testing water produced at our treatment plants. All test results were below the Australian Drinking Water Guideline health limits. We continue to publish updated information about testing which is available on the Icon Water website.

We have focused our efforts on ensuring water quality into the future, including preparations for when climatic events inevitably arise again and diminish the raw water quality. We reviewed and are improving a range of management controls within our treatment plants and the distribution network.

Figure 1. Summary of total storage, production and consumption



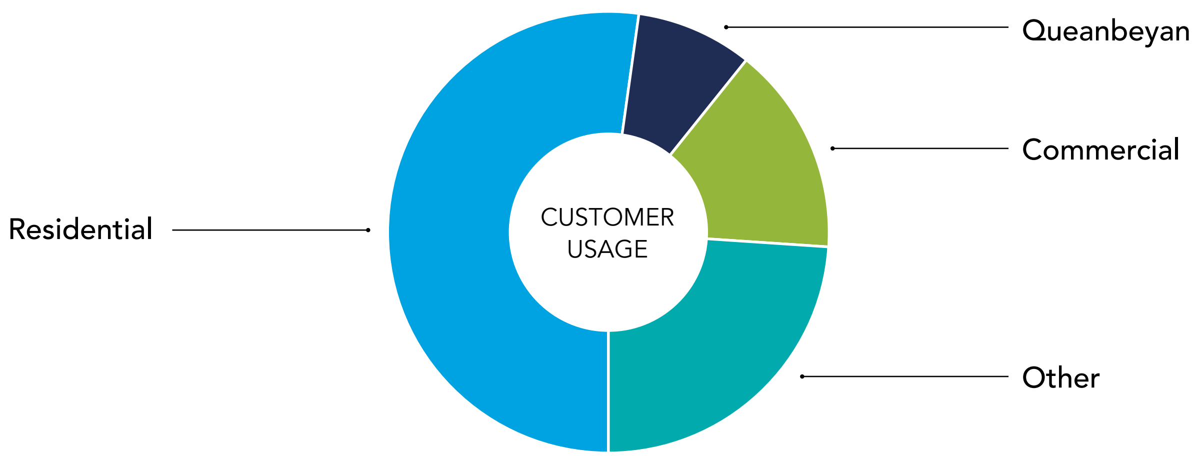
WHO ARE OUR CUSTOMERS

In 2023–24 we supplied potable (drinking quality) water to 204,085 sites within the ACT.

These sites include residential dwellings, commercial entities and other customer types such as schools, hospitals and community facilities. We also supplied bulk water to Queanbeyan-Palerang Regional Council (QPRC), which was distributed to the city of Queanbeyan, including the Googong Township. Figure 2 shows the split of customer type for sites with allocated water meter/s.

Data from the Australian Bureau of Statistics lists Canberra's population at 470,232 and Queanbeyan and Googong at 45,227 at the end of the December quarter 2023, representing an annual population growth of two per cent. This growth meant more customer connections to the water supply network.

Figure 2. Split of customer types



OUR SUPPLY SYSTEM

The process of providing water to our customers starts by drawing water from our dams.

Our dams (storage reservoirs) impound water from the Cotter and Queanbeyan rivers, and we can also abstract from two locations on the Murrumbidgee River. This ability to abstract from three diverse catchments containing different rivers and tributaries strengthens Canberra's water security in times of drought or if major events like bushfires compromise the source water quality in one catchment. Refer to page 13 for more information about our source water supply.

During 2023–24, the three Cotter River storage reservoirs (Corin, Bendora and Cotter) provided 86 per cent of the water we supplied to customers, of which the majority came from Bendora reservoir. Googong reservoir made up the balance of supply. The Murrumbidgee to Googong Transfer Pipeline (M2G) has transferred 324.83 ML during 2023–24 for infrastructure maintenance purposes.

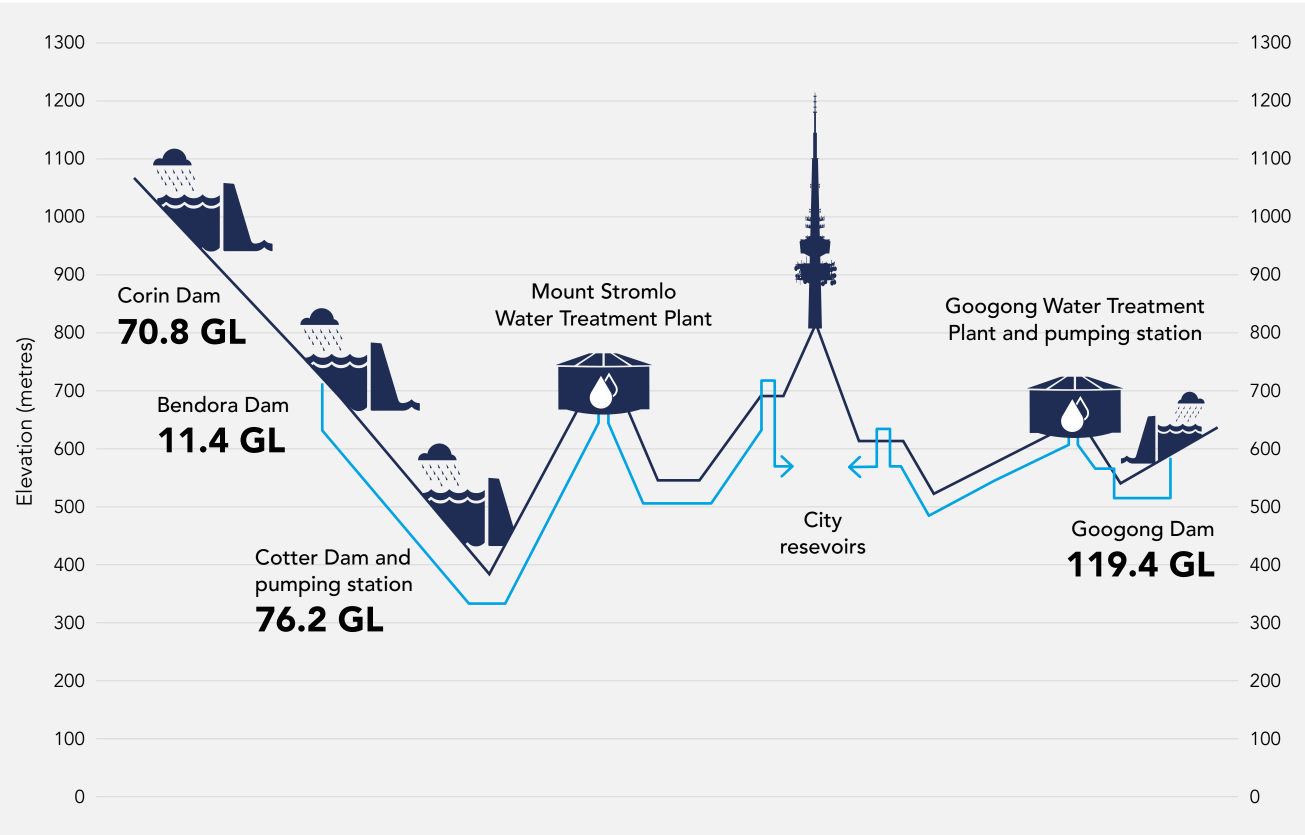
After abstraction, we treat the water to a standard that meets local and Australian health guidelines. We can treat water at either of our two water treatment plants (WTP) at Googong and Mount Stromlo.

During 2023–24 we produced 51.2 GL of treated drinking water – 44.2 GL from Stromlo WTP and 7 GL from Googong WTP. Refer to page 20 for more information about our water treatment plants.

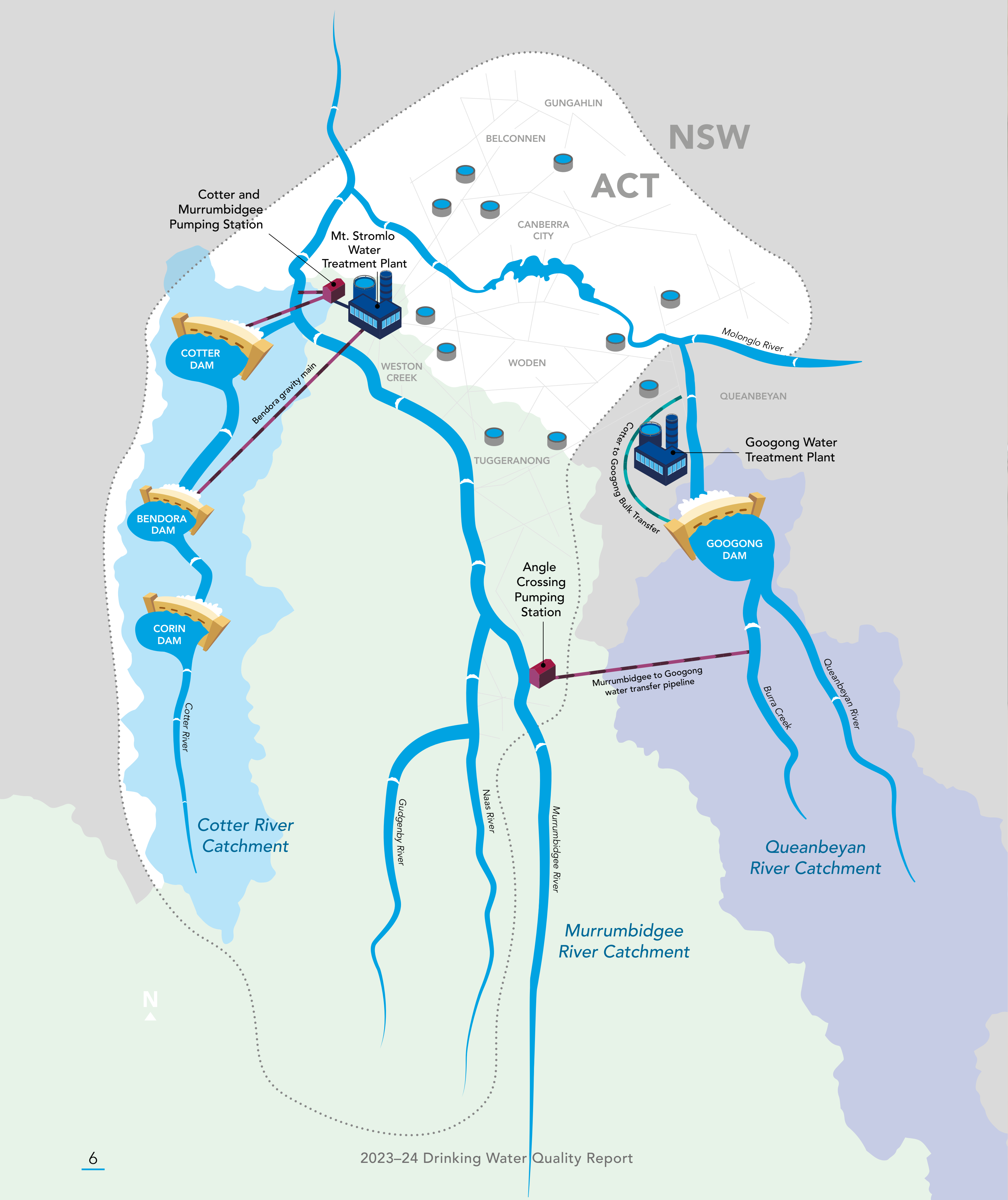
After treatment, the drinking water is fed into 50 service reservoirs (tanks) across the region, then into water mains (pipes) which connect to local service lines and finally, to customers' properties. In 2023–24 the average water used was 271L per person per day. Refer to page 26 for more information about how water gets to customers.

At each of these points we apply a rigorous management framework underpinned by an extensive water quality monitoring program using a combination of online automated monitoring and sampling undertaken by an external NATA-accredited laboratory. Information about the status of water quality at each point of the supply system comprises the foundation of this publication.

Figure 3. Total storage level capacity (volume) of each reservoir



OUR NETWORK



GUNGAHLIN
BELCONNEN
NSW
ACT
CANBERRA CITY
Cotter and Murrumbidgee Pumping Station
Mt. Stromlo Water Treatment Plant
Molonglo River
COTTER DAM
WESTON CREEK
WODEN
QUEANBEYAN
Bendora gravity main
Cotter to Googong Bulk Transfer
Googong Water Treatment Plant
TUGGERANONG
BENDORA DAM
GOOGONG DAM
Angle Crossing Pumping Station
CORIN DAM
Murrumbidgee to Googong water transfer pipeline
Burra Creek
Queanbeyan River
Cotter River
Gudgenby River
Naas River
Murrumbidgee River
Cotter River Catchment
Queanbeyan River Catchment
Murrumbidgee River Catchment
N

HOW WE MANAGE YOUR WATER SUPPLY

STANDARDS WE APPLY TO CANBERRA'S DRINKING WATER

Licences

Icon Water holds the following licences which allow us to operate our drinking water distribution and supply service:

- Utility Services 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*.

We apply quality standards in accordance with the requirements of the *Public Health (Drinking Water) Code of Practice (2007)* (the Code), regulated by ACT Health. Copies of the Code are available from the ACT Legislation Register.

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

Under the operating licences and the Code, Icon Water is required to comply with the current National Health and Medical Research Council (NHMRC) *Australian Drinking Water Guidelines 2011* (ADWG).

The guidelines determine the minimum quality requirements of water in all parts of Australia and are regularly revised to ensure they represent the latest scientific evidence. The most recent update was in September 2022.

We apply an Integrated Management System to meet quality, environmental, regulatory and workplace health and safety requirements. We maintain annual certification and comply with the following Australian and international standards:

- ISO 9001:2015. Quality management systems
- ISO 14001:2015. Environmental management systems
- AS/NZS 45001:2018. Occupational health and safety management systems
- HACCP and Good Manufacturing Practice (GMP) – Codex Alimentarius Alinorm 2020/13A.

THE ADWG MANAGEMENT FRAMEWORK

The ADWG, published by the NHMRC, determine the minimum health and aesthetic quality requirements of water supplied to consumers across Australia.

In addition, the ADWG provide a framework to help utilities design a structured and systematic approach to preventative risk management of drinking water quality. The guidelines inform the holistic management of water supply systems including policy, education, customer engagement, system operation, continuous improvement, verification, and assurance activities. In all, the guidelines establish management under 12 elements, 32 components and 76 actions.

Icon Water's drinking water monitoring program operates via an external NATA (National Association of Testing Authorities)-accredited laboratory that measures the physical, chemical and microbiological parameters of the water we supply to our customers. The results of the program inform how we manage water quality and verify our compliance with the ADWG.

The ADWG include two types of criteria to measure and manage the performance of the water supply system:

- A health guideline value, defined as the concentration or measure of a water quality characteristic that, based on present scientific knowledge, does not result in any significant risk to the health of the consumer over a lifetime of consumption.
- An aesthetic guideline value, defined as the concentration or measure of a water quality characteristic that is associated with acceptability of water to the consumer, such as appearance, taste, and odour.

Providing safe drinking water to customers is our priority

We achieve this by applying a multiple-barrier approach through a framework that integrates the principles of the ADWG and the internationally recognised HACCP (Hazard Analysis and Critical Control Point) methodology. Both systems use a preventative risk management approach to ensure the risks to water quality are effectively controlled across the whole supply system.

Our barrier approach starts by applying controls in the source water catchments and continues through each step of the plant treatment process, all the way to the point at which water flows through to a customer's connection. Our barrier control measures include activities that can protect water quality directly (e.g. physical barriers to a water asset) and indirectly (e.g. promotion of safe activities around a water catchment).

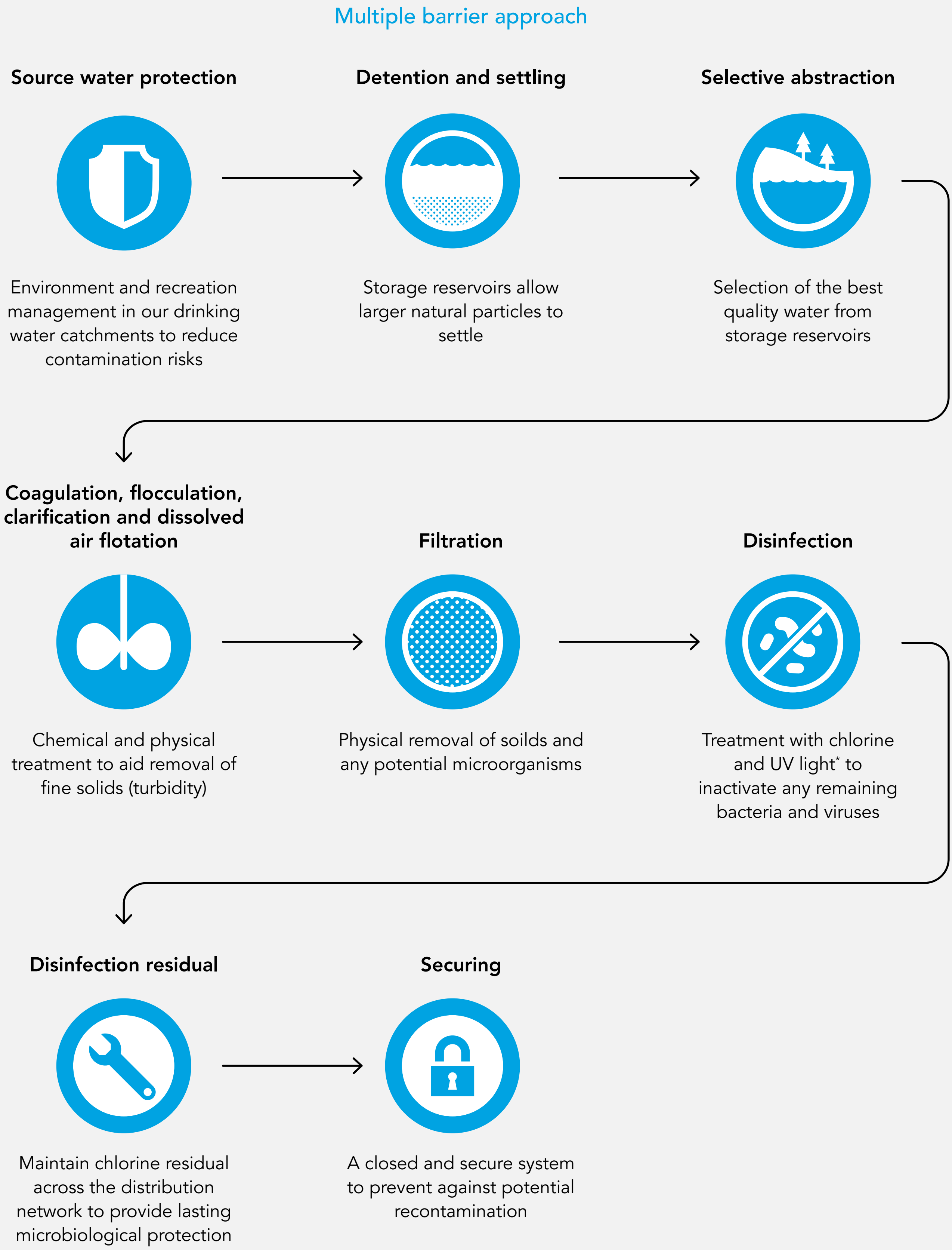
A control may remove a hazard from the supply (e.g. removing particles during water treatment) or include measures that monitor and facilitate early intervention (e.g. sampling and analysis). We don't rely on any single tool or measure to protect public health, and we continuously assess the performance of protection barriers for non-conformance and areas of improvement.

Our barrier measures are designed to eliminate or minimise real or potential risks to drinking water. To implement this, we set higher targets for product quality than required to meet the ADWG standards (refer to page 8 for more information about the standards that apply to Canberra's drinking water).

Our multiple-barrier approach includes:

- a source water protection program
- selective abstraction of source water for treatment
- multiple water treatment processes monitored by real-time online analysers, verified with on and offsite testing
- an enclosed distribution system with strictly limited access for maintenance and inspection
- maintaining residual disinfectant to provide lasting protection in the network
- a routine 'catchment-to-customer' verification sampling program conducted by an independent NATA-accredited laboratory (refer to page 40 to see the results of laboratory analysis).

Figure 4. Drinking water supply barriers



*UV light treatment at Mount Stromlo WTP only

HOW WE CERTIFY AND AUDIT THE MANAGEMENT OF WATER PRODUCTION

The HACCP (Hazard Analysis and Critical Control Point) system was designed to address risks to food production and has been widely adapted by the water industry to suit drinking water supply processes.

Certification of our HACCP program is conducted via external auditors. These audit processes strengthen our continuous evaluation and improvement responses across all the barriers in our supply system. In 2023–24 we maintained third-party certification of our HACCP-based risk management system.

In addition to our HACCP certification each year we conduct an internal audit focusing on one aspect of the management system. In 2023–24 our internal audit focused on the management processes for detecting and responding to test results indicating quality variation.

WHERE YOUR WATER COMES FROM

SOURCE WATER SUPPLY

The catchments feeding our storage reservoirs

In the Canberra region, our source water catchments have a total storage capacity of 277.8 gigalitres (GL). The Cotter River features three reservoirs: Corin (70.8 GL), Bendora (11.4 GL), and Cotter (76.2 GL). The Queanbeyan River and its tributaries feed the Googong reservoir, which holds 119.4 GL. Although the Murrumbidgee River does not have a dedicated storage reservoir, we can directly abstract water from two points for our supply.

During 2023–24, 324.83 megalitres (ML) of water was transferred from the Murrumbidgee River into the Googong reservoir but no water from the Murrumbidgee River was treated at Stromlo WTP.

Most of the Cotter River catchment is within the Namadgi National Park, helping to shield the Corin and Bendora reservoirs from pollutants typically associated with human activity. The lower Cotter Catchment is undergoing restoration to address past commercial forestry impacts and land degradation.

The Queanbeyan River catchment, located southeast of Canberra, includes developed and impacted lands managed by NSW state agencies and local government councils. The ACT Parks and Conservation Service manages the area immediately surrounding the Googong reservoir, controlling access to the water and foreshore. The Googong reservoir is the largest of the four reservoirs, accounting for 43 per cent of Canberra's water storage capacity.


Corin Dam


Cotter Dam


Googong Dam

CATCHMENT PROTECTION ACTIVITIES

Icon Water implements a Source Water Protection Strategy to safeguard drinking water supply catchments against development and land use pressures.

This strategy is structured around a three-tiered approach designed to:

- **Monitor catchment conditions:** We gather and analyse data to comprehensively understand catchment health through various ongoing monitoring programs.
- **Assess risks:** By identifying and evaluating catchment risks, we support a multi-barrier approach to ensuring the safety of our drinking water.
- **Forge partnerships:** We collaborate with stakeholders and land managers to ensure activities that could impact water quality are carefully planned and managed.

In 2023–24 we worked closely with land management agencies and regional catchment groups to mitigate potential contamination risks. Our efforts included reservoir and catchment monitoring and leveraging media opportunities to promote effective source water protection. We also supported catchment land managers with on-site projects and monitoring of ecological conditions.

Policy and legal protections

Icon Water does not have direct authority over land management within water supply catchments. We rely on collaboration with NSW and ACT regulators and policymakers. Throughout 2023–24, we engaged in ongoing dialogue with these entities to address potential water quality threats and implement necessary controls on proposed developments and commercial activities within the supply catchments.

We also actively participated in inter-agency and inter-jurisdictional catchment groups, including the ACT and Region Catchment Management Group and the Upper Murrumbidgee Catchment Network. These collaborations are essential for coordinating efforts and enhancing the protection of our water resources.

On-ground works and monitoring

To maintain the quality of our water sources, we monitored the water and the ground across different catchment areas. We also worked with other organisations to effectively manage local hazards and risks. For example, the ACT Government has started catchment-remediation projects, funded by the Commonwealth, to reduce the impact of erosion and sedimentation caused by fire and floods in the upper Cotter Catchment. In the lower Cotter Catchment, erosion control programs are also being implemented focusing on reducing slope length and extensive revegetation efforts in the upper slopes of the Pierces Creek Catchment.

We have also continued our financial partnership with the ACT Government to support the Water Watch program, which funds the Cooma Water Watch role. This program helps monitor conditions in the Murrumbidgee and Googong catchments and aims to achieve the objectives outlined in the Actions for Clean Water reports. Several reviews have been conducted to reassess the management of both point and diffuse sources of pollution in the upper Murrumbidgee area.

SOURCE WATER BARRIERS

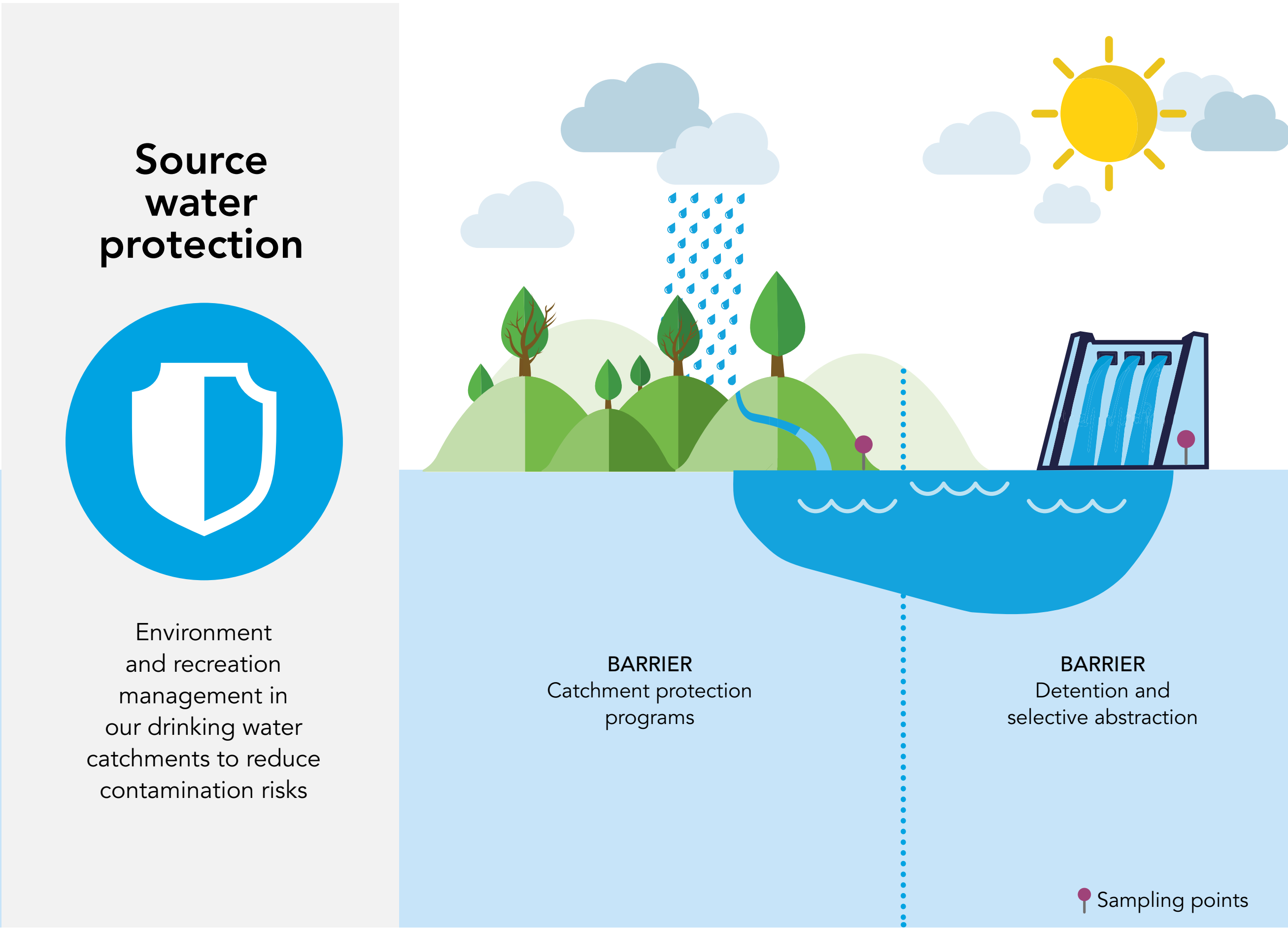
Our multi-barrier approach to managing water quality starts with control measures to protect the quality of our source water.

This includes activities to protect our water supply catchments from microbial pathogens, chemical contaminants and excess nutrients, as well as passive and active controls within the storage reservoir and dam structure.

The controls include:

- a long detention time in storage reservoirs which allows particles to settle and some natural microbiological disinfection to occur
- sampling upstream of our abstraction sites to anticipate potential impacts at the treatment plants
- online monitoring of source water
- avoiding transferring poor quality source water between catchments and source water storage reservoirs
- selectively abstracting water from the appropriate depth at our dam intake towers to deliver the best available quality to our water treatment plants
- deploying booms and erosion controls in response to major events (such as bushfire or emergency incidents)
- stratification control in the reservoirs.

Figure 5. Our source water protection barriers



Detention and selective abstraction control

Water storage reservoirs are a fundamental part of the quality and security of our drinking water supply system. They store water for use during low rainfall periods and help to stabilise water quality through detention and settling of contaminants. This is particularly important after large rain events when inflows can transport high concentrations of sediment and organic material into the reservoir.

We monitor the quality of the water in our catchments via online analysers at our source water sites, and we maintain a routine verification program via a NATA-accredited laboratory, which conducts sampling in the reservoir and dam intake towers where we abstract water to send to our water treatment plants.

This sampling also extends to upstream sites so we can respond quickly to source water quality changes and optimise our treatment processes (see Source water monitoring on page 17 for more detail).

When we abstract from the Murrumbidgee River, we can transfer the water directly to Stromlo WTP for treatment, or to Googong reservoir to provide long-term water security. Alternately, when we abstract water from our dam intake towers, we can vary the depth we draw from, which means we always send the best available water to Googong or Stromlo WTPs.

Stratification control measures

Thermal stratification occurs because of seasonal weather conditions and is where a water column is divided into distinct layers due to changes in temperature, oxygen and density. When these layers develop within a water body, they each form their own individual water quality zones with different properties, and this has implications for water quality and treatment. We therefore operate mechanical mixers in the Cotter and Googong reservoirs to keep water circulating and reduce thermal stratification.

By actively managing stratification and minimising these layers, we can increase the amount of oxygen within a reservoir, and thus reduce dissolved metal and nutrient concentrations in the abstraction zone. Mixing also promotes environments less favourable for cyanobacteria (blue-green algae) growth. This makes more water available for selective abstraction for effective and efficient treatment.

Figure 6. Selective abstraction

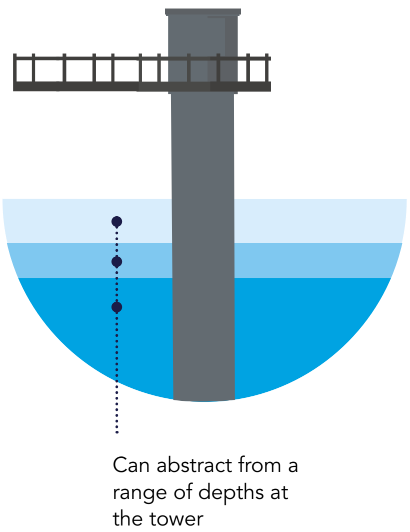
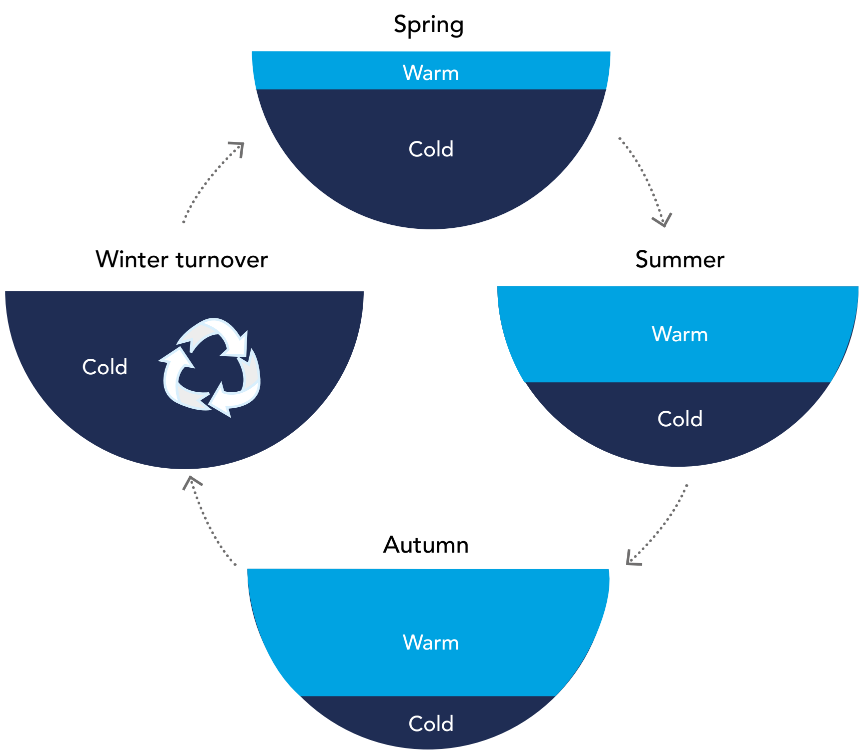


Figure 7. Water stratification process



SOURCE WATER MONITORING

Overview of source water conditions in 2023–24

Source water conditions remained relatively stable throughout 2023–24. After some challenging years due to a combination of drought, bushfires and rapid filling of our reservoirs due to high rainfall, conditions have improved, although the Googong catchment has yet to fully recover. Googong reservoir remains impacted by high organic loads which continue to challenge the treatment process and network operations; higher amounts of chlorine have been needed to maintain enough residual protective chlorine disinfection in the network. As a result, some customers temporarily received safe, but higher-than-usual chlorine residuals at their connection point in 2023. This was necessary so those located at the furthest ends of our network received above the minimum level of protection.

We undertake extensive sampling and analysis to monitor water quality in the source water storage reservoirs and the Murrumbidgee River. Our program is adaptively managed to ensure it adequately assesses the quality of source water and identifies emerging issues that could impact on the effectiveness of treatment and the safety, or aesthetic quality of the drinking water supply, including those identified through Catchment Sanitary Surveys.

The NHMRC specify criteria in the ADWG for a wide range of measurable water quality characteristics that can be found in water and may affect its safety or aesthetic quality. They fall into several categories. Within these categories the key parameters we routinely monitor in the raw water sources are detailed in Table 1.

Table 1. Parameters routinely monitored in raw water sources

Microbiological	▪ *Cryptosporidium* and *Giardia* ▪ *Escherichia coli (E. coli)* ▪ Total coliforms	▪ *Enterococci* ▪ Phytoplankton (e.g. Algae cyanobacteria (blue-green algae) and associated pigments (chlorophyll-*αα*)
Physical	▪ Turbidity ▪ Conductivity ▪ Dissolved oxygen ▪ pH	▪ Temperature ▪ UV absorbance ▪ True colour
Chemical	▪ Alkalinity ▪ Nutrients (e.g. nitrogen and phosphorous) ▪ Synthetic organic compounds (including herbicides, pesticides, fungicides, insecticides and industrial chemicals such as PFAS)	▪ Total and dissolved metals e.g. Iron and manganese ▪ Total and dissolved organic carbon ▪ Taste and odour compounds associated with cyanobacteria (Geosmin and MIB)
Radiological	▪ Radionuclides	

The following summaries explain the key source water quality components that we monitor to maintain and assess the performance of our source water barriers.

Cyanobacteria (blue-green algae)

Cyanobacteria are true bacteria, but are often referred to as 'blue-green algae' because they resemble green algae in appearance, habitat and photosynthetic abilities. Cyanobacteria occur naturally in water bodies, but when the water is warm, calm and nutrient-rich the conditions are highly favourable and they can grow in excessive numbers, called 'blooms'.

As well as environmental conditions such as drought and bushfire, the agricultural activities and other development in the Googong and Murrumbidgee catchments can increase the nutrient levels in the waterways, making these raw water sources more susceptible to algal blooms (refer to page 13 for more information about our catchments). Our storage reservoirs (predominantly Googong) occasionally experience blue-green algae blooms. These are typically of the *Dolichospermum* and *Microcystis* genera, which can at times produce toxins harmful to humans and animals.

We carry out regular monitoring of cyanobacteria, generally most often in warmer months when blooms are more likely. Our cyanobacteria response plan, once activated, can increase monitoring within the reservoir and at the associated WTP, and actions including further treatment to protect the drinking water from harmful cyanobacteria and cyanotoxins, and to reduce aesthetic impacts.

Under the Code, ACT Health is consulted if elevated levels of cyanobacteria are detected.

Concentrations of cyanobacteria in all our catchments, including Googong reservoir, were lower in 2023–24 compared to the previous year. There were no notifiable cyanobacteria detections within any of our catchments.

Microorganisms

Cryptosporidium and *Giardia* are microorganisms (parasitic protozoan) that can cause gastroenteritis. There is a background level of infection of *Cryptosporidium* and *Giardia* in the general community, and the organisms are usually spread through contact with pets, farm animals or people who are already infected. Infected people show either no symptoms or may experience diarrhoea, vomiting and fever. Healthy people usually recover fully.

If found in the source water supply these organisms indicate faecal contamination of the waterway (from either human or animal sources).

Beyond testing for the presence or absence of these organisms, more investigatory testing methods (to confirm if the sample contained species which are human-infectious), are complex and are used when required. We undertake routine monitoring for *Cryptosporidium* and *Giardia* in the storage reservoirs and the Murrumbidgee River, as well as at our WTPs. We also sample for other faecal indicators like *Enterococci* and *E. coli* (which can have both environmental and human/animal source pathways).

Monitoring for microorganisms in the source water is important to the design and operation of our treatment plant barrier performance and to emphasise catchment protection mechanisms.

Due to the lower levels of catchment protection and brief detention time, the Murrumbidgee River typically contains more *Cryptosporidium* and *Giardia* than our storage reservoirs. The risk increases across all catchments during rainfall events with additional runoff carrying faecal contaminants into the waterways. Therefore, in addition to routine testing, additional monitoring may be conducted if abstracting after high flow events or abstracting from the Murrumbidgee River.

During 2023–24, there were no detections of protozoa in any catchment, or within the treatment plants.

Synthetic compound monitoring

Synthetic compounds include items such as pesticides, herbicides, fungicides, insecticides, and industrial chemicals such as Per- and Polyfluoroalkyl substances (PFAS).

We conduct specific monitoring in all drinking water catchment sources for these groups of parameters using a risk-based approach. We also maintain relationships with land managers and the community close to the drinking water supply to protect the source water from these types of contaminants.

Perfluoroalkyl and polyfluoroalkyl substances (PFAS) are a group of several thousand synthetic human-made chemicals that have been in use since the 1940s. PFAS chemicals include perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA) and perfluorohexane sulfonate (PFHxS) amongst a large group of other compounds. They are long-lasting chemicals that are thermally and chemically stable, and can repel water and grease. These properties have resulted in PFAS being used in a wide range of products, including non-stick coatings, clothing, food packaging, paints, personal care products, firefighting foam and pesticides.

The characteristics of PFAS that made them so versatile also means that they are slow to breakdown within the environment. The testing limit for PFAS has improved over time and this year we adopted a more sensitive methodology to be able to test to an ultra-low level of PFAS for the most prevalent species down to as low as <0.002 ug/L. This level of testing means the instrumentation can detect down to the equivalent of one drop in five Olympic swimming pools worth of water.

The Australian Drinking Water Guidelines (ADWG) specify limits for PFOS, PFOA, and PFHxS in drinking water. The current health-based guideline values for PFAS are:

- The sum of PFOS and PFHxS should not exceed 0.07 micrograms per litre.
- PFOA should not exceed 0.56 micrograms per litre.

Canberra is fortunate, with raw water supply coming from high in catchments with low levels of industry and we have assessed there is a low risk of contamination levels of concern in our catchments.

We maintain a precautionary approach, staying abreast of the science and testing our source water as early as 2016. We have been conducting routine annual sampling for PFAS since 2020 in our source water catchments with all test results below the ADWG.

Currently, the National Health and Medical Research Council (NHMRC) is conducting an independent review of the health-based guideline values for PFAS. We will continue to monitor our performance against these guidelines and continue to collaborate with the ACT Environment Protection Authority (EPA), ACT Health and local industry as part of our water quality management to manage the risk of synthetic chemicals to our drinking water supply. During 2023–24, there were no detections of synthetic compounds above ADWG health values in any of the four storage reservoirs or the Murrumbidgee River.

HOW YOUR WATER IS TREATED

WATER TREATMENT PLANTS

Icon Water operates two water treatment plants (WTPs), one located on Mount Stromlo (ACT) and the second adjacent to Googong Dam (NSW).

We abstract raw water from our storage reservoirs and treat it at one of our WTPs before we send it to the community.

The Stromlo WTP has operated since 1967 and was rebuilt in 2004 and can treat water from the Cotter catchment and the Murrumbidgee River. Googong WTP has capacity of 270 ML of water per day. Stromlo WTP can treat 250 ML of water per day and is the preferred WTP as water can be supplied by gravity from Bendora reservoir, which is more sustainable and economical.

The Googong WTP has operated since 1979 and can treat water from the Queanbeyan River catchment and indirectly from the Murrumbidgee River (via the Murrumbidgee to Googong transfer pipeline). The two water treatment plants can be operated independently or in conjunction with each other to meet the community's water supply demand.

Our Googong WTP operated between October and December 2023, producing 7,036 ML (14 per cent of annual total production), with Stromlo WTP operating for the remainder of the period, producing 44,160 ML (86 per cent of total annual production, see Figure 8).

The two plants did not run concurrently over the year. The production at our treatment plants varies to meet customer demand throughout the year and seasons. Production over the period ranged between 100 ML and 220 ML per day, a similar summer peak water demand to the previous year.

Summary of our treatment process

Due to their age and the difference in the characteristics of source water they treat, the plants operate slightly differently, including the treatment barriers in place.

Stromlo WTP can operate in two process modes – direct filtration or dissolved air flotation and filtration. Dissolved air flotation is an optional treatment step that gives us extra capabilities when raw water quality is diminished. For disinfection, Stromlo WTP has both chlorination and ultraviolet (UV) which deactivates microbiological organisms that remain after filtration. Figure 9 shows the treatment barriers for Stromlo WTP.

Googong WTP has an optional treatment step using powdered activated carbon (PAC), which may be used to remove some of the taste and odour compounds prevailing in the Queanbeyan River catchment. This plant does not have UV disinfection. The treatment process is shown in Figure 9.

Figure 8. Water treatment plant drinking water production volumes

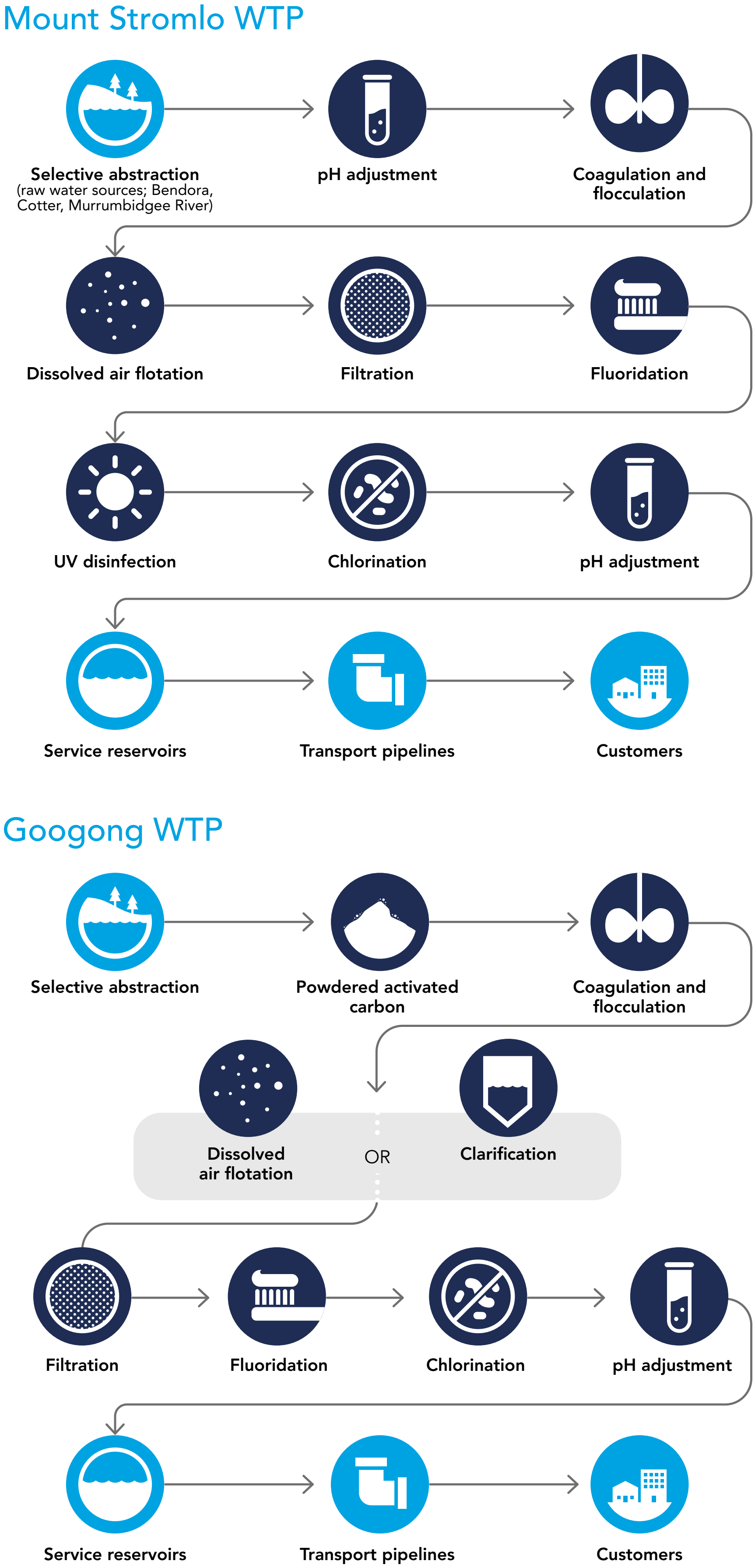
Treatment steps at Mount Stromlo WTP

- Selective abstraction (raw water sources: Bendora, Cotter, Murrumbidgee River)
- 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
- Distribution to the network.

Treatment steps at Googong WTP

- Selective abstraction (raw water source: Googong)
- Optional powdered activated carbon for cyanobacteria and taste and odour compound removal
- Optional pre-treatment for pH adjustment with lime
- Coagulation by aluminium sulphate
- Flocculation aided by polyelectrolyte
- Dissolved air floatation and filtration; or clarification and filtration, depending on operational mode
- Fluoridation by sodium fluorosilicate
- Disinfection by chlorination
- pH adjustment and stabilisation with lime
- Distribution to the network.

Figure 9. Water treatment steps of water supplied from WTPs to customers



MONITORING AND MAINTAINING OUR TREATMENT OPERATIONS

It's critical that we extensively monitor to control operations at our WTPs to ensure each treatment barrier is functioning optimally.

Under our HACCP-based water quality management system, five critical control points are applied in the drinking water supply system. Four of these exist within the WTPs highlighting the importance of the water treatment operations in the delivery of safe drinking water.

Both WTPs contain analysers to continuously monitor key water quality parameters, so we can rapidly respond to changes in the raw or processed water quality. Our dedicated treatment operators run and monitor plant processes, to ensure the supply is not compromised by any single point of failure.

Electrical, instrumentation and automation teams calibrate and maintain these control systems, along with the maintenance team, who support this with a scheduled service and repair program.

Together, these teams ensure control systems are performing effectively and are producing high quality water within our specifications.

In addition to continuous operational monitoring by operators onsite, our external NATA-accredited laboratory verifies our treatment barrier performance by analysing a range of parameters.

The parameters routinely monitored at the water treatment plants are detailed in Table 2.

The following summaries explain more about the key parameters continuously monitored at our water treatment plants to manage critical treatment steps: filtration, fluoride management, UV disinfection and chlorination.

Table 2. Parameters routinely monitored at the water treatment plants.

Microbiological	▪ *Cryptosporidium* and *Giardia* ▪ *Escherichia coli (E. coli)* ▪ Total coliforms ▪ Heterotrophic plate counts
Physical	▪ Turbidity ▪ Temperature ▪ True colour ▪ Conductivity ▪ pH ▪ UV absorbance ▪ Total dissolved solids
Chemical	▪ Chlorine ▪ Fluoride ▪ Alkalinity ▪ Total and dissolved metals ▪ Total and dissolved organic carbon ▪ Hardness ▪ Synthetic organic compounds (including herbicides, pesticides, fungicides, insecticides and industrial chemicals) ▪ Trihalomethanes ▪ Haloacetic acids

Controlling physical water quality parameters

Turbidity

Turbidity is a measurement of the light-scattering property of water caused by suspended particulates. These include suspended colloidal particles, clay and silt. Water treatment plants are designed to convert dissolved components into a solid form that can be coagulated and flocculated with other particles and any pathogens present in the raw water. These aggregates (flocculant) are formed and removed from the raw water via filtration. The filters at our water treatment plants are a water safety barrier and are considered a critical control point where performance is paramount. We use turbidity as a key indicator of filter performance.

The ADWG recommends the turbidity of water leaving individual filters should be less than 0.2 NTU and should not exceed 0.5 NTU at any time. During 2023–24, both Stromlo and Googong Water Treatment Plants were 100% compliant with treated water turbidity values below the maximum allowable level.

pH

While not considered a direct barrier to the safety of supplied drinking water, the pH of the water plays an important role in maximising the effectiveness of other treatment controls. We adjust pH at the beginning of the treatment process and again before the water leaves the WTP using lime.

We control the pH of raw water entering our plant to optimise the coagulation and flocculation treatment steps which remove solid particles. Adjusting the pH of treated water before it leaves the WTPs ensures effective disinfection potential while drinking water travels through our distribution pipelines. Consistent with the ADWG the pH range we target for drinking water when it arrives at the customer supply point is between 6.5 and 8.5. The average pH of the final treated water at Stromlo was 7.36 and for Googong WTP was 7.27 during 2023–24.

Controlling microbiological water quality parameters

We have two barriers for the control of microbial contaminants in the raw water. Our primary barrier is filtration to remove microbiological organisms attached to solid particles. This is followed by a disinfection treatment step to deactivate or kill any remaining organisms. The two disinfection treatment options we have are chlorine and UV. UV has an immediate but no residual effect for disinfection and is only available at the Stromlo WTP, whereas chlorine is used at both plants to provide a residual effect in water travelling to customers' connections.

Chlorine

Chlorine is widely used in treatment plants throughout the world. We add chlorine gas to Canberra's water at a concentration sufficient to provide a chlorine residual for lasting protection against contamination in the distribution system. Critical controls are in place to ensure the level of chlorine in the water is safe to drink and performing as an effective barrier.

The ADWG has a health limit of 5 mg/L of free chlorine. During 2023–24 the free chlorine concentration in the drinking water leaving Stromlo WTP was maintained at an average of 1.52 mg/L. Due to its different raw water characteristics and longer transit time within the distribution system, Googong WTP generally operates with final treated water of a higher free chlorine concentration (average of 2.37 mg/L in 2023–24).

As all drinking water processed by our WTPs is disinfected using chlorine, customers who choose to adjust the water to a different standard (brewers, aquarium owners etc.) should be mindful that chloramine is not used within Canberra's drinking water system.

Ultraviolet light

UV disinfection is used at the Stromlo WTP to further reduce the risk of pathogens entering the drinking water supply. UV lamps provide a 'UV dose' to the water to irradiate and inactivate microorganisms by damaging the nucleic acids that form their DNA.

The quality of filtered water passing through the UV reactor can influence the effectiveness of the dose to penetrate the water. We monitor the quality of water entering the reactor via online sensors. The power of each UV lamp is optimised to ensure the required dose is maintained based on flow rate. ACT Health set the benchmarks for the irradiance dose.

This treatment step continued to meet the ACT Health performance objectives, and in 2023–24 99.68 per cent of the treated water received a dose greater than the target value.

Additional treatment, addition of 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 process of adjusting the amount of fluoride in drinking water' (NHMRC, 2017). To achieve compliance with our licence, we add sodium fluorosilicate to the drinking water at our WTPs.

Fluoride is monitored as a critical control point to ensure the concentration in the water is safe to drink and meets the requirements of our licence.

In 2023–24 fluoride concentrations in the treated water at Stromlo and Googong WTPs averaged 0.75 mg/L and 0.74 mg/L respectively.

Narrabundah reservoir

HOW WATER GETS TO YOUR HOUSE

DELIVERING WATER TO YOUR DOOR – PIPES, PUMPS AND TANKS

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

We operate and maintain 50 service reservoir sites, 25 pump stations and approximately 3,400 km of water pipelines. This infrastructure is maintained and closely monitored and includes a number of physical and chemical control measures to protect against potential contamination.

These measures include:

- The water distribution system is a closed network from the WTPs to customers' points of supply which prevents external contaminants entering the treated water.
- Water mains are operated under positive pressure to prevent contaminants infiltrating pipes.
- Backflow prevention devices are installed at customer supply points to protect against contaminants.
- A disinfection residual, free chlorine concentration, is maintained within the water distribution system to protect against microbiological growth or establishment during its journey from the WTP to our customers' points of connection.

Service reservoirs

Potable (drinking quality) water from our water treatment plants is fed into service reservoirs (tanks) that are spread out across the city. These reservoirs provide temporary storage to manage the variation in Canberra's demand for water across 24 hours, as well as emergency storage for firefighting. Tanks also provide water pressure when customers turn on the tap. From these tanks, water mains carry the drinking water to each customer's connection.

We have 50 reservoirs currently in service to supply potable water in the distribution network. They range in age from 109 to three years old. Reflective of the era in which they were built our reservoirs comprise five categories of construction types and material composition. Our reservoirs stored up to a maximum of 689 ML of potable water at any given time in 2023–24.

All Canberra service reservoirs are secure structures to protect the integrity of the distribution system and prevent contamination. We inspect them regularly to assess the security of the sites and their external condition. Reservoir cleaning is routinely undertaken with each reservoir being cleaned, on average, once every five years. When this happens, we empty the reservoir, inspect its condition, clean it, and perform maintenance as required. Before returning the tank to the supply system we disinfect the reservoir and test the water quality in the freshly filled tank.

Supply to customers' points of connection

On average, new urban development adds 40 km of new distribution pipework each year. New suburbs under development such as Taylor and Jacka stage 2 in the city's north, Strathnairn and Macnamara in Belconnen and Denman Prospect and Whitlam in the Molonglo district are examples of extensions to the water supply network.

The network varies by materials, construction methodology and age, and we have factored these variables into our predictive modelling to determine which parts of the network to schedule for inspection, maintenance or replacement. We have a rolling replacement program for pipes which are approaching their end of life or susceptible to failure (bursts).

One group of pipes identified for replacement are the cast iron unlined water mains, which remain in place from our city's early establishment and are likely to contain deposits of rust. Replacing these unlined water mains reduces water quality variability because turbidity and staining can occur when the rust is disturbed during high demand like when a pipe breaks or during firefighting.

Another suite of scheduled pipe replacements is water mains installed between 1965 and 1978. This group of mains account for approximately three quarters of structural failures in the distribution network.

MONITORING THE DISTRIBUTION SYSTEM

As part of our commitment to high water quality, we undertake a comprehensive routine drinking water quality monitoring program based on criteria set by the ADWG to verify water quality throughout the distribution system.

We monitor water quality routinely at each reservoir (tank) to verify that the water quality complies with the ADWG and to optimise system operations. The quality of water travelling through the pipe work is monitored at approximately 360 locations across the city. To ensure a statistical representation of the water received by customers, a selection of customers participate in a voluntary program where their garden tap water is sampled randomly throughout the year.

During 2023–24 an average of 100 customer garden taps were monitored each month from approximately 360 locations around Canberra.

The monitoring includes a variety of physical, microbial and chemical parameters. We compare the results to criteria set by the NHMRC within the ADWG. The key parameters routinely monitored are summarised on page 27–29.

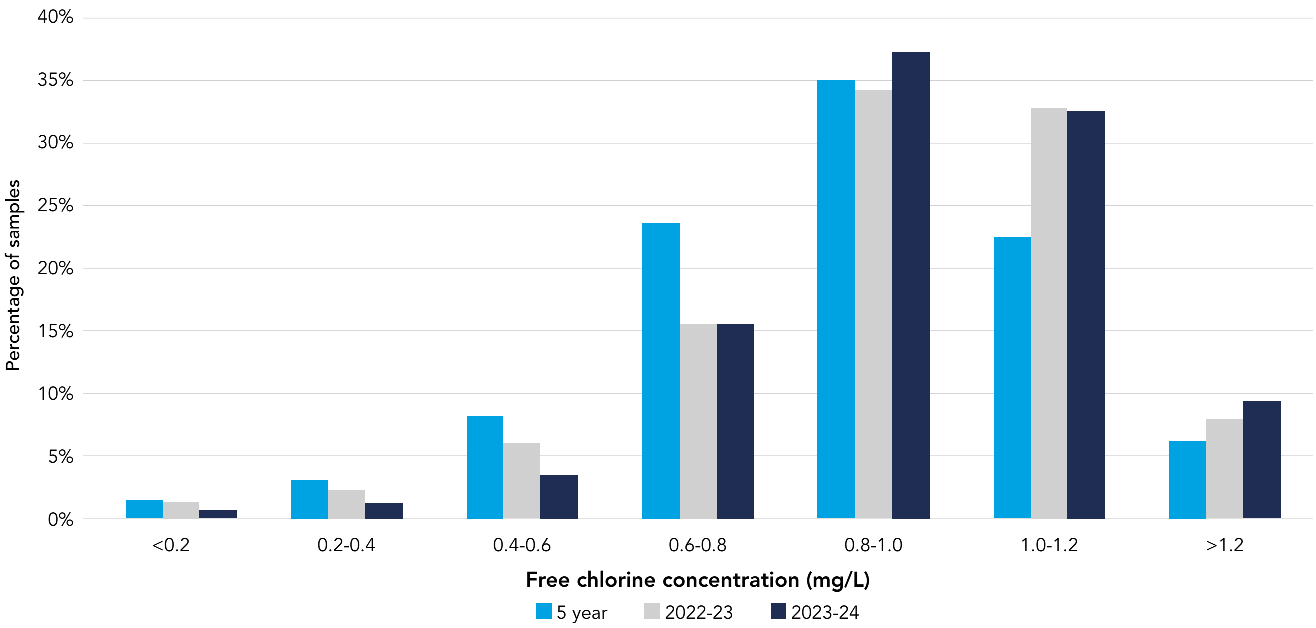
Disinfection in the distribution system

Chlorine is added to water in the final stages of treatment at Mount Stromlo and Googong WTPs. This process is detailed on page 21. Sometimes customers in one location can taste a different amount of chlorine than another location. This is because chlorine dissipates as the water travels through the distribution network and in different temperature conditions. When making decisions about the chlorine concentration leaving our water treatment plants, we factor in transit times and seasonal temperature to minimise aesthetic impacts for our customers. However, given water transit times can vary depending on how much water the community is using and seasonal factors, sometimes we need to increase the concentration at our plant or boost the concentration in an area of our network. We always prioritise protection of public health for the entire network over aesthetic considerations relating to chlorine.

Chlorine is monitored frequently so we can optimise and act on any results that indicate a depletion of disinfection residual. When chlorine levels drop we can boost those disinfection levels at service reservoirs using sodium hypochlorite. The ADWG has set a health guideline limit of 5 mg/L. In 2023–24, the average free chlorine concentration was 0.96 mg/L across the customer tap sampling program and the highest was 1.83 mg/L. See page 40 (Laboratory analysis section) for more information.

The distribution of chlorine results for customer taps across all the network is shown in Figure 10.

Figure 10. The distribution of chlorine concentration in monthly network monitoring samples



Microbial monitoring

The WTPs are designed to deactivate and remove microbial contaminants from water before distribution to customers. As the water moves through the water distribution system there remains a small potential for contamination or microbial growth.

Therefore, we conduct verification monitoring of *E. coli* (faecal indicator) at customers' connections to ensure the water is free from harmful microbiological contamination.

The ADWG suggests that *E. coli* should not be detected in a minimum 100 mL sample of drinking water. The Code requires Icon Water to notify ACT Health of any *E. coli* detections in the treated water. Our supply was 100% compliant for all E.coli tests.

Monitoring physical parameters

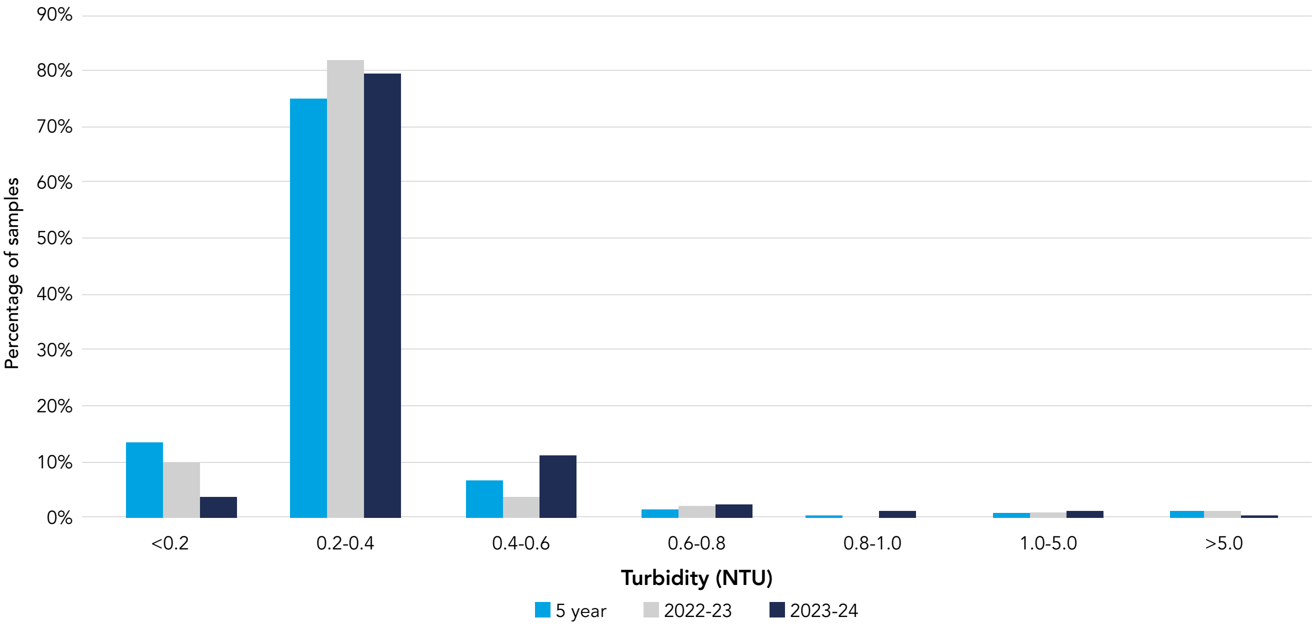
Turbidity is a physical parameter that measures the suspended and dissolved particulates in water. Turbidity can increase as water passes through the distribution system, usually because of resuspension of natural minerals that have settled over a long period of time. Elevated turbidity levels may be temporary, associated with a water main burst or when sudden demand is placed on the network.

The ADWG does not outline a turbidity health guideline, however the aesthetic guideline value is five nephelometric turbidity units (NTU) – a level that is just noticeable in a glass of water. During 2023–24 the average turbidity at participating customers' taps was 0.4 NTU.

Colour is mainly present in the raw water due to natural organic compounds, from small hydrophilic acids, proteins and amino acids to humic and fulvic acids. These compounds originate from organic matter in the catchment. The majority of natural organic matter is removed by coagulation in the water treatment plants.

The ADWG does not outline a colour 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. During 2023–24 the average true colour measured at participating customers' taps was <1 Pt-Co.

Figure 11. The distribution of turbidity values across monthly network monitoring samples



Metals

Iron

Iron in the soil of the catchment dissolves into raw water (within our dams) but can also arise in the distribution system from the corrosion of iron or steel pipes, including components of a plumbing system. Iron can contribute to the formation of mineral deposits on the inside of pipes, which may detach during high flows and appear as temporary discolouration. It can also affect the taste of the water. We undertake a planned program of works to replace sections of corroded pipe, which helps lower metal concentrations.

The ADWG does not outline a health value, however the aesthetic guideline value for iron is 0.3 mg/L, which is based on the taste threshold in water. In 2023–24 the average concentration of iron measured at participating customers' taps was <0.01 mg/L.

Manganese

Manganese is commonly present in water sources in low concentrations, and is detected in higher concentration when under anoxic conditions, like at the bottom of deep reservoirs. Like iron, manganese can also contribute to the formation of deposits on the inside of pipes, which may temporarily discolour water when flows are disturbed.

The ADWG provide both a health and an aesthetic value for manganese. The health guideline value 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. During 2023–24 the average concentration of manganese measured at participating customers' taps was 0.007 mg/L.

Copper

Copper is found naturally in raw water, generally in low concentrations. Water from customers' taps may contain higher levels of copper if the water has been in contact with copper plumbing and fixtures such as hot water systems. Copper levels increase when water stagnates in the plumbing system for long periods, for example if residents are away on holiday. Water with a high level of copper often has a blue-green appearance.

The ADWG health guideline value for copper is 2 mg/L. The ADWG aesthetic guideline value for copper is 1 mg/L which can contribute to staining on plumbing fixtures such as taps. During 2023–24 the average concentration of copper measured at participating customers' taps was 0.013 mg/L.

Lead

Lead is found in the catchments as a naturally occurring metal, and household plumbing systems are another source. Lead is used to manufacture 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 Australian Government Department of Health recommends flushing cold water taps used for drinking and cooking for about 30 seconds first thing in the morning and for at least two to three minutes after periods of absence. This draws fresh water from the network into the tap and reduces potential exposure to lead and other metals such as copper and nickel that may have stagnated within household pipes.

The ADWG sets a health limit for lead of 0.01 mg/L. During 2023–24 the average concentration of lead measured at participating customers' taps was 0.0003 mg/L.

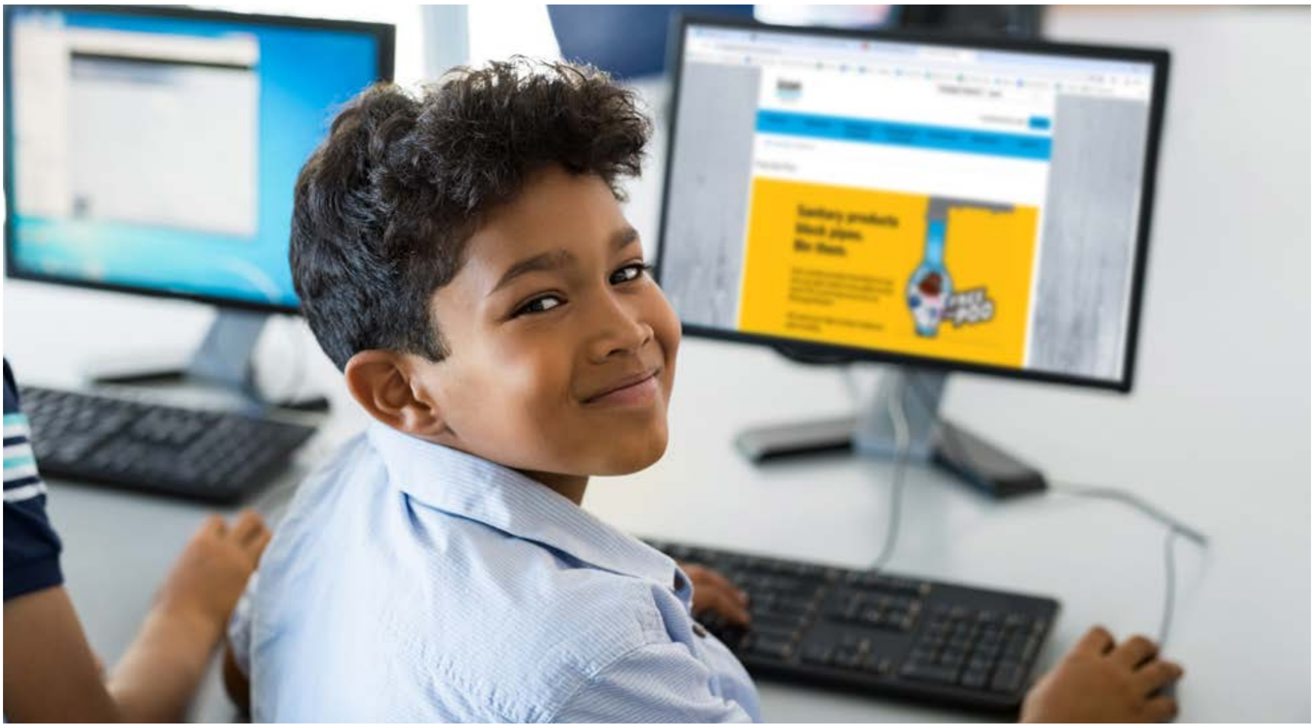
Other compounds

We monitor various other substances in the distribution system including a range of semi-volatile organic compounds (SVOCs) and disinfection by-products in line with the ADWG. Plasticisers and hydrocarbons are common sources of SVOCs. Plasticisers are used in a broad range of products including some pipework, while hydrocarbons can be used as an indicator of contamination permeating the wall of some pipe materials and fittings.

Disinfection by-products are chemicals with health values in the ADWG. Under suitable conditions these chemicals can form as a result of the water treatment process. We monitor for these compounds at the WTP and across the distribution network.

A summary of all routine monitoring results are presented in the Laboratory analysis section on page 40.

HOW WE ENGAGE WITH OUR CUSTOMERS



COMMUNITY ENGAGEMENT AND EDUCATION

Our education program aims to enhance water and wastewater knowledge among local students (primary, secondary and tertiary levels) as well as industry professionals and community groups.

Key areas of focus include building knowledge of the ACT and Queanbeyan urban water supply including water quality, water and wastewater treatment process, catchment management, the importance of permanent water conservation measures (PWCMs) and long-term sustainable water use, and the urban water cycle.

To support a flexible learning model, we offer a hybrid education program of digital webinars and face-to-face sessions in the classroom, along with external tours across our major water and wastewater assets. Participation at STEM events and tours to water and sewage treatment plants for secondary and tertiary students and industry stakeholders proved popular this year reaching over 10,000 participants from the Canberra and Queanbeyan communities.

Our digital resources continue to be well received with over 59,000 visits to the water education section of our website this year. Due to this demand, we continue our focus on developing relevant and informative digital materials to build our online water and wastewater knowledge program. These resources include a growing series of downloadable factsheets and engaging activities to support learning for primary (K-2, 3-6) and secondary (7-12) students.

Other communication activities to build knowledge about source water protection include information stands at events, social media and key messages in community newsletters.

COMMON WATER QUALITY ENQUIRIES

At Icon Water we manage approximately 200,000 connections to the water network in the ACT.

A survey of 300 residential households and 200 businesses indicated that 95 per cent of our customers are satisfied with our services. Our drinking water continued to be highly regarded with 91 per cent of our customers satisfied with the quality.

Occasionally customers experience problems with the quality of their water supply and contact us for advice. Concerns expressed by the community may be investigated to determine the likely cause and, if required, corrective actions are taken. Following a media article, we received several customer enquiries about PFAS in drinking water. Recognising the importance of these concerns, we engaged with the community through various channels including our website to keep everyone informed about the measures we are taking.

During 2023–24 we received around 74,000 customer calls (including faults and emergencies, account inquiries, and general questions). Among these, 178 calls were concerns about water quality, and 13 were escalated for further investigation. These escalated cases were handled systematically to ensure thorough investigation, effective communication and resolution. A summary of the types of water quality complaints received are detailed below (Figure 12).

Changes to water quality are often short-term and may be associated with:

- seasonal changes to quality
- a switch between water treatment plants (each source water catchment has a different natural quality signature – for instance organic content changes in each catchment)
- water main bursts, network renewal or expansion, maintenance work or a change in usage patterns within the water supply system.

Sudden changes in network demand caused by hot weather, use of a fire hydrant, or network valve operations required for maintenance work, have the potential to reverse the direction of flow of water. This causes a shearing force on internal pipe surfaces and disturbs the natural mineral sediment that is settled at the bottom of pipes, which may result in discoloured water for a short time. Where customers are likely to be affected by planned maintenance activities, we make every effort to notify them in advance.

It is also common for customers to notice a change to the appearance or the aesthetic quality of their water due to something associated with their own internal pipework or the way they are storing water (see Figure 13). The easiest way to determine if something might be originating in Icon Water's network or within a customer's home is to check the water at the front garden tap or talk with neighbours.

Figure 12. Total number of customer enquiries about water quality

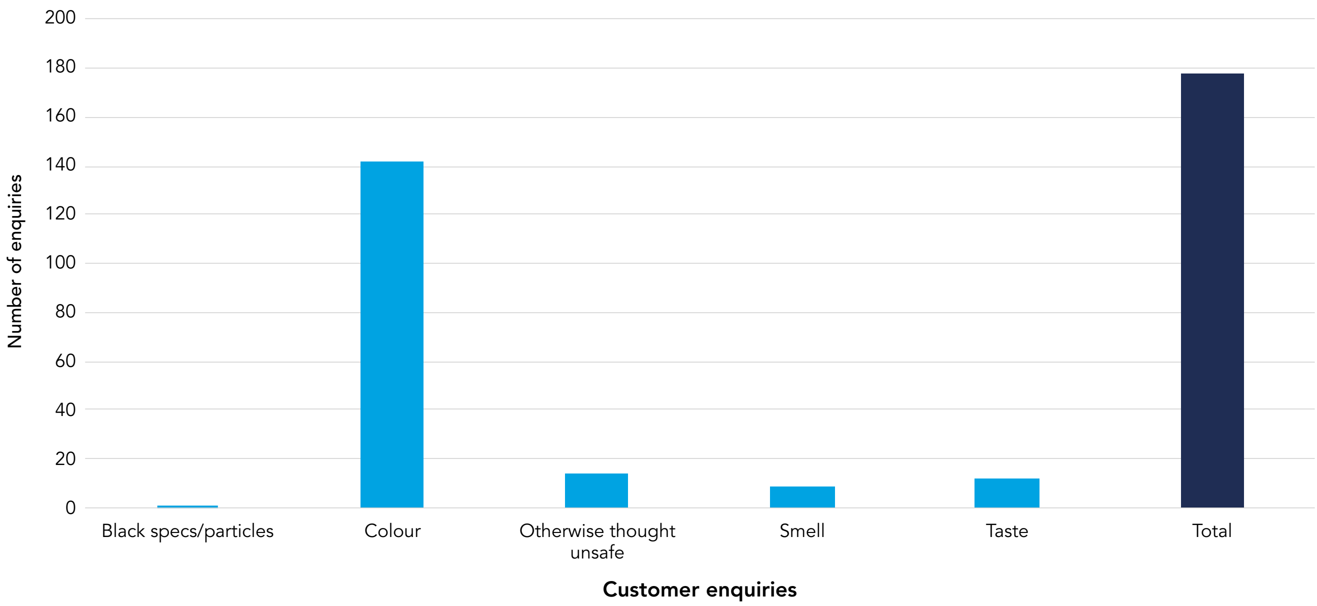


Figure 13. A summary of common enquiries received

Discoloured

Discoloured water is often associated with planned and reactive maintenance work or a change in network usage patterns, but may also be associated with internal plumbing (particularly within deteriorated pipework and hot water services).

Usually clears within a short time, after flushing or upon inspection of internal pipework.

White/cloudy

Usually presents as cloudy water resulting from air bubbles generated by flushing of the mains, hot water units or aerators on taps.

Air is harmless, and will clear from the glass (from the bottom-upwards) if left to sit.

Blue/green

Blue or green water can often be associated with the corrosion of copper pipes.

Usually addressed through changes to internal plumbing.

Staining

Deposits dislodged from domestic plumbing or from the water main can cause staining of washing.

Usually temporary or cleared through investigation of internal fittings/pipework.

Chlorine odour

Usually these enquiries relate to a change (increase) in the level of chlorine perceived by a customer.

These problems are aesthetic, usually short-term and can be reduced by:

- leaving water to stand on a bench or in a fridge for a short time, which will allow the chlorine to dissipate
- adding freshly squeezed citrus e.g. lemon juice to the water; this contains ascorbic acid which can neutralise chlorine.

Disagreeable taste

Disagreeable tastes including musty, earthy, bitter and metallic tastes. Like odour, taste can vary and is subjective.

Can sometimes be resolved by flushing water in the network, often addressed by investigating internal plumbing issues.

Other

Issues not otherwise categorised.

NOTIFICATIONS TO ACT HEALTH

Icon Water complies with the *Public Health (Drinking Water) Code of Practice (2007)* (the Code) issued by ACT Health (as referenced in Section 2 of this report).

The Code sets out operational, communication, reporting and response requirements for 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 2023–24, three notifications to ACT Health were issued; two were identified from the results of our routine monitoring program and one from a taste and odour investigation. All three notifications were regarding water in the distribution network.

The details of each of these are below in Table 3:

Table 3. Notifications to ACT Health under the Drinking Water Code of Practice

Water in the distribution system	
19/12/2023	**Trichloroacetic Acid – Upper Hackett Reservoir** Trichloroacetic Acid detection of 103 ug/L was observed at a site as part of our routine monitoring program. The formation of these byproducts coincided with the operation of the Googong Water Treatment Plant and the levels decreased when this plant was taken offline.
16/02/2024	**Manganese – Calwell** A taste and odour investigation involved collecting a water sample from a unit complex and the sample showed elevated Manganese levels (563 µg/L) above the ADWG health value. The investigation revealed that disconnecting and inspecting the water meter disturbed accumulated sediment, causing temporary discoloration in the water.
03/06/2024	**Lead – Cotter** The water quality issue occurred within a pipeline which is 110 years old and services 10 potable water connections. This water pipeline is made of cast iron and has lead joints that are prone to failure due to their age. Routine monitoring revealed elevated lead levels of 16.8 µg/L. Subsequent testing showed results below the public health limits of the ADWG.

MANAGING WATER QUALITY INTO THE FUTURE

LOOKING AHEAD

Part of ensuring we are operating in the most efficient way involves keeping abreast of the latest developments and technologies.

We do this by contributing funds, providing in kind support, collaborating on a range of research and development projects, and partnering with other 'can do' business partners.

We are a member of several water industry bodies and participate in network groups and joint collaborative research projects. This enables us to learn from a rich body of expertise across Australia and internationally, and benefit from shared knowledge, expertise, partnerships and funding.

We work in partnership with universities and industry through the Water Services Association of Australia (WSAA) and Water Research Australia (WaterRA). These relationships provide access to research organisations such as Cooperative Research Centres (CRC), the Water Environment Research Foundation (WERF), the Smart Water Fund and the Australian Research Council. We contribute to industry associations such as the Research Managers Network, WaterRA forums and W-Lab (a platform for showcasing the latest advances, innovations and international water utility technologies).

In 2023–24, we contributed to the following research, development and innovation projects:

- We are participating in a study with industry partners and health authorities to understand the potential impacts of recreational access to drinking water catchments and storages in the Australian context. This study will collate and present objective evidence to better understand the impacts of recreational development on water catchments.
- In partnership with Griffith University, government agencies and water utilities, we are participating in research to 'Determine the Ecological Impacts of Bushfire Fighting Chemicals'. The project will focus on assessing the fate, persistence, and aquatic toxicity of firefighting chemicals used to control bushfires to help protect water quality in drinking water supply catchments.

This year we continued to share our knowledge, expertise and information on various Icon Water initiatives by participating in conference presentations and panel discussions. We hosted the annual NSW 2023 conference of Water Industry Operators Association (WIOA) and won two awards for papers presented.

MANAGING ASSETS TO MEET CURRENT AND FUTURE NEEDS

Climate Change Adaption Plan

To prepare for climate change-driven impacts to source water quality and drinking water treatment, in 2023 we published our revised five-year *Climate Change Adaptation Plan – sustaining resilience*.

This second plan recognises that climate change hazards often happen consecutively, and that cascading impacts from external forces also amplify the impacts of climate change adding pressure on our adaptation planning. Implementation of the plan is routinely measured.

Water System Strategy

Our water system strategy provides high-level guidance and objectives to source, treat and distribute water, enabling decision-making for water system infrastructure and assets.

Our water system strategy has the following vision for Icon Water's water system: *We provide water with a safe, secure and smart system.*

Our water system strategy is focussed on achieving three objectives:

- Objective 1: Safe system
  A system that delivers safe drinking water in a safe way.
- Objective 2: Secure system
  A system that provides water now and into the future.
- Objective 3: Smart system
  A system that learns, adapts and grows.

Our assessment of the current conditions of our water system found a number of challenges but also potential opportunities. The main drivers identified which impact on our water system are demand, operating context, and environmental/climate change.

Our Water System Strategy incorporates an adaptive planning approach to manage future uncertainties, and provides a decision-making framework with:

- specific actions and deliverables over the short-term (next five years)
- plans over the medium-term (5-10 years) and long-term (over 10 years).

Integrated Water Management Plan

The Strategy's implementation plans for the short-term (next five years) will be delivered as part of our Integrated Water Management Plan (IWMP) program. The main actions in relation to water quality management include:

- developing Level of Service (LoS) targets for the WTPs and determining the timing of future WTP augmentations required
- reviewing the WTPs' capability to comply with the *Australian Drinking Water Guidelines 2011* (ADWG)
- updating the WTP Master Plans
- updating and implementing the Strategic Water Quality Improvement Plan.

To date we have shortlisted source water augmentation options, assessed our critical and remote sites to ensure sufficient backup energy supply arrangements are in place, and are conducting planning and design works to upgrade Googong WTP to help manage changes to source water characteristics that might arise from climate driven events in our catchments.

Strategic Water Quality Improvement Plan

We produce an annual plan for Strategic Water Quality Improvement. This plan summarises the drinking water quality improvement activities proposed or underway that address identified strategic risks associated with drinking water supply.

Most projects relate to maintenance, asset renewal, or continual improvement, many of which are longer term projects. Status updates on these projects along with any new projects are outlined in this plan. A selection of projects from the 2023–24 plan are detailed in the following sections.

- The Reticulation Monitoring Management Program is currently undergoing review. This program involves collecting water samples from the reticulation network to verify water quality received by customers. As the network has expanded and catchment characteristics have changed due to medium and high-density developments, the methodologies for determining sample locations, quantities, and analysis parameters now need re-validation. The purpose of this review is to ensure the representation of the reticulation monitoring program and implement any necessary changes.
- A trial of a new UV-transmissivity online analyser for operational monitoring is currently underway at the Googong WTP. The purpose is to understand and address the generation of disinfection by-products (DBP), which occur more readily when source water has higher dissolved organic carbon. The new instrumentation monitors how effective the coagulation, sedimentation, and filtration processes are at Googong WTP at removing dissolved organic carbon, aiming to reduce DBP generation through process optimisation. The instrument has been successfully installed and commissioned and is actively monitoring process changes.
- The notable downward trend in raw water quality in the Googong reservoir means the ability of the Googong WTP to meet drinking water quality requirements may be at risk in the future. Ongoing investigations are underway to determine what, if any process improvements are required, including:
  - hydrodynamic modelling of Googong reservoir
  - comprehensive pathogen removal assessment which will comprise of a Health Based Target evaluation of catchment and an assessment of the existing treatment process against the Good Practice Guide to the Operation of Drinking Water Supply Systems for the Management of Microbial Risk (WSAA 2015)
  - options definition and concept design.
- With 50 service reservoirs of varying ages within our network, we run a routine program to assess and maintain reservoir structural integrity; in particular, the roof integrity of reservoirs is an essential control to prevent contamination from entering the drinking water. Six reservoirs (Deakin, Upper Russell, Lower Red Hill Tank A and B, Aranda, and Rivett) have been identified for renewal. Work on Lower Red Hill Tank A commenced in late August 2024, and business cases are being developed for the other identified sites.
- To ensure we can maintain the required chlorine residual for safe drinking water across the network, we are evaluating the benefits of installing online chlorine monitoring at five of our service reservoirs. This project also aims to improve our understanding of the effectiveness of our current re-chlorination approach. The proposal is in the planning stage and if viable, site works will commence in late 2024.

LABORATORY ANALYSIS

LABORATORY ANALYSIS

Quality control and assurance

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 by Icon Water annually to reflect our changing need and priorities. ALS Global operates a National Association of Testing Authorities (NATA) -accredited laboratory. NATA provides specific technical evaluation combined with international recognition by its overseas counterparts, which allow for NATA-accredited laboratories to be recognised worldwide. ALS Global participates in regular audits and proficiency testing whereby results for identical samples are compared with other NATA-accredited laboratories. NATA audits were carried out in the biological area in August 2023 and in the chemistry area in April 2024. The facility complies with the criteria of NATA Policy Circular 1 – Corporate Accreditation.

How to read the result for water quality in your area

The Canberra distribution system is divided into four water quality supply zones based on population, hydraulic characteristics and geography. These zones also ensure the statistical representation of samples collected from the taps of participants in our voluntary water quality monitoring program.

A summary of the laboratory analysis completed for the customer tap water quality monitoring program is presented in the following tables. You can search by suburb and by the water quality parameter of interest. Parameters are grouped into categories to simplify navigating the tables. Each summary table includes the total number of samples analysed for each parameter, the range of those values being the minimum, maximum, mean and the 95th percentile.

Also included are the ADWG health values for a ready comparison of our results demonstrating how we are meeting public health requirements.

The following pages of test results are for samples collected of the customer tap monitoring program. These results are representative of the quality of water received by customers across the region. Approximately hundred locations are sampled each month.

In monitoring the water supplied to our customers we collected 1,205 unique samples, tested for up to 177 parameters returning a total of 37,556 test results. 100% of applicable test results were compliant with the ADWG health values.

- Table 4: Summary data for all water quality zones
- Table 5: Summary data for water quality zone 1 – North Canberra and Gungahlin
- Table 6: Summary data for water quality zone 2 – Belconnen
- Table 7: Summary data for water quality zone 3 – South Canberra, Woden and Weston Creek
- Table 8: Summary data for water quality zone 4 – Tuggeranong

Figure 14. Water quality monitoring zone map

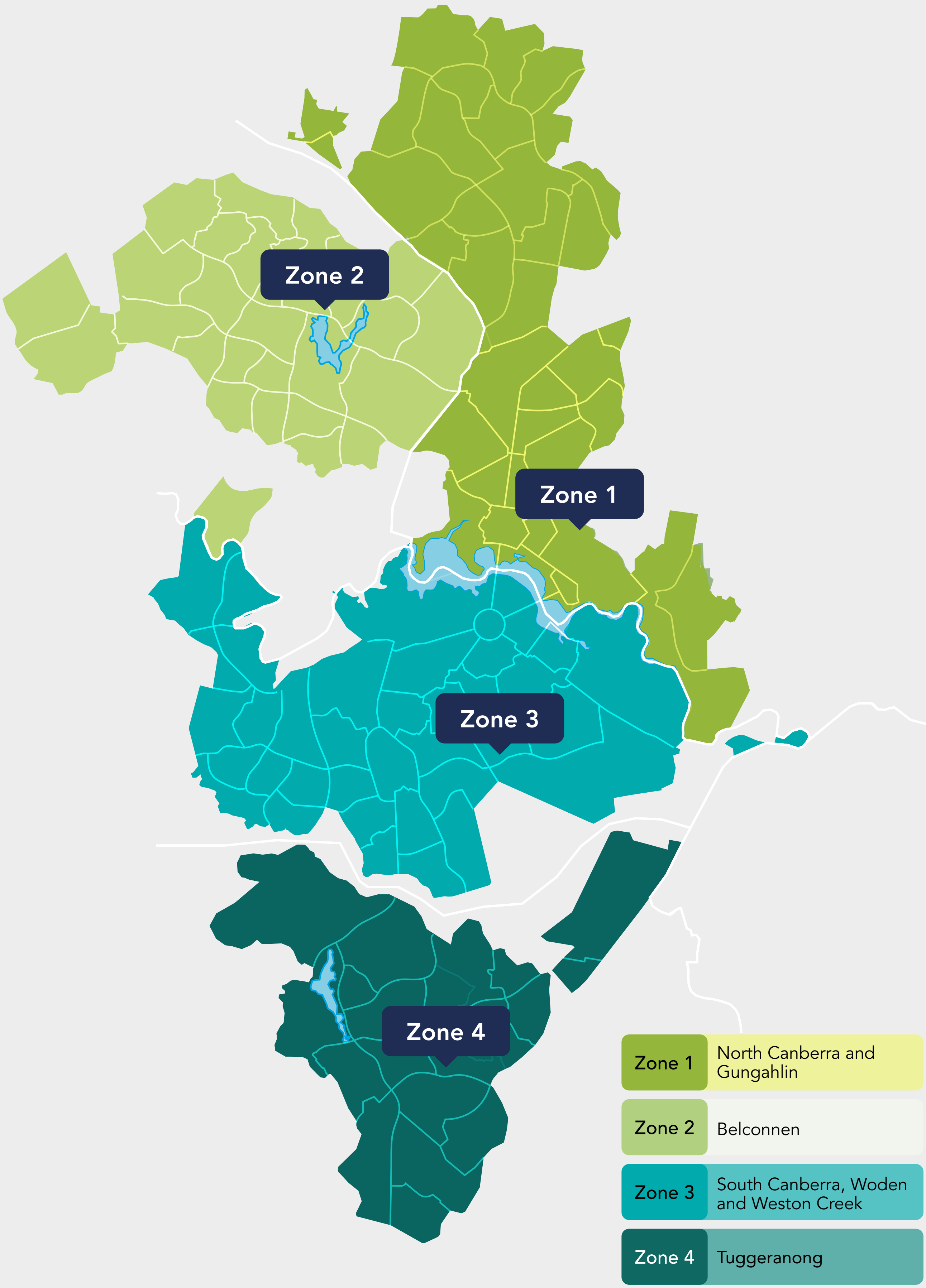


Table 4. Summary data for all water quality zones

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th Percentile
Microbiological									
E.Coli	AS 4276.21	MPN/100mL	<1	<1	1205	<1	<1	<1	<1
Total coliforms	AS 4276.21	MPN/100mL	-	<1	1205	<1	83	<1	<1
Heterotrophic plate count	APHA 9215 B	CFU/mL	-	<1	1203	<1	5900	12	7
Physical									
Conductivity	APHA 2510 B	uS/cm	-	<2	120	57	191	111	186
pH	APHA 4500-H B	pH units	-	<0.01	1205	6.01	9.75	7.63	8.09
Temperature	APHA 4500-H B	deg. C	-	<0.1	245	9.0	25.2	16.8	23.4
Total dissolved solids	APHA 2540 C	mg/L	-	<10	120	21	163	68	121
True colour	APHA 2120 B	Pt/Co	-	<1	241	<1	2	<1	2
Turbidity	APHA 2130 B	NTU	-	<0.1	245	0.1	15.1	0.4	0.7
Inorganic									
Alkalinity bicarb	APHA 2320 A/B	mg/L	-	<0.1	240	29.5	53.7	38.4	46.4
Alkalinity carb	APHA 2320 A/B	mg/L	-	<0.1	240	<0.1	0.8	<0.1	<0.1
Alkalinity hydrox	APHA 2320 A/B	mg/L	-	<0.1	240	<0.1	<0.1	<0.1	<0.1
Alkalinity total	APHA 2320 A/B	mg/L	-	<1	240	30	54	38	46
Aluminium acid soluble	USEPA 200.8	ug/L	-	<5	120	14	283	31	40
Asbestos	AS4964-2000	g/kg	-	Absent	48	Absent	Absent	Absent	Absent
Calcium dissolved	USEPA 200.7	mg/L	-	<0.05	120	9.48	101.00	13.14	19.11
Chloride	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.1	48	2.5	28.3	5.5	7.8
Chlorine combined	APHA 4500 -CL G	mg/L	-	<0.03	1205	<0.03	0.51	0.06	0.17
Chlorine free	APHA 4500 -CL G	mg/L	-	<0.03	1205	<0.03	1.83	0.96	1.29
Chlorine total	APHA 4500 -CL G	mg/L	5	<0.03	1205	<0.03	1.87	1.02	1.37
Cyanide	APHA 4500_CN	mg/L	0.08	<0.004	48	<0.004	<0.004	<0.004	<0.004
Flouride	APHA 21st Ed. 2005, Part 4110 B	mg/L	1.5	<0.05	120	0.51	0.94	0.79	0.87
Hardness total	APHA 2340 B	mg/L	-	<1	120	27	288	38	65
Iodide	VIC-CM078	mg/L	0.5	<0.01	48	<0.01	<0.01	<0.01	<0.01
Magnesium dissolved	USEPA 200.7	mg/L	-	<0.05	120	0.80	9.01	1.36	4.13
Nitrate	APHA 21st Ed. 2005, Part 4110 B	mg/L N	50	<0.1	48	<0.1	0.3	0.2	0.3
Potassium dissolved	USEPA 200.7	mg/L	-	<0.1	48	0.1	4.6	0.7	1.4
Sodium dissolved	USEPA 200.7	mg/L	-	<0.1	48	2.5	32.3	4.0	8.3
Sulphate	APHA 21st Ed. 2005, Part 4110 B	mg/L SO4	-	<0.4	48	<0.4	24.1	5.2	23.6
Total metals									
Aluminium total	USEPA 200.8	ug/L	-	<9	120	22	427	41	52
Antimony total	USEPA 200.8	ug/L	3	<3	120	<3	<3	<3	<3
Arsenic total	USEPA 200.8	ug/L	10	<1	120	<1	<1	<1	<1
Barium total	USEPA 200.8	ug/L	2000	<0.5	120	2.7	8.2	4.1	7.6
Beryllium total	USEPA 200.8	ug/L	60	<0.1	120	<0.1	<0.1	<0.1	<0.1
Boron total	USEPA 200.7	mg/L	4	<0.01	48	<0.01	<0.01	<0.01	<0.01
Cadmium total	USEPA 200.8	ug/L	2	<0.05	120	<0.05	0.11	<0.05	<0.05
Chromium total	USEPA 200.8	ug/L	-	<2	120	<2	<2	<2	<2
Cobalt total	USEPA 200.8	ug/L	-	<0.2	120	<0.2	0.6	<0.2	<0.2
Copper total	USEPA 200.8	ug/L	2000	<1	240	<1	182	13	33
Iron total	USEPA 200.7	mg/L	-	<0.01	242	<0.01	0.32	<0.01	0.03
Lead total	USEPA 200.8	ug/L	10	<0.2	240	<0.2	4.7	0.3	1.0

Table 4. Summary data for all water quality zones

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th Percentile
Manganese total	USEPA 200.7	mg/L	0.5	<0.001	240	<0.001	0.349	0.007	0.015
Mercury total	USEPA 200.8	ug/L	1	<0.1	122	<0.1	0.1	<0.1	<0.1
Molybdenium total	USEPA 200.8	ug/L	50	<1	120	<1	<1	<1	<1
Nickel total	USEPA 200.8	ug/L	20	<1	120	<1	1	<1	<1
Selenium total	USEPA 200.8	ug/L	10	<1	120	<1	<1	<1	<1
Silver total	USEPA 200.8	ug/L	100	<1	120	<1	<1	<1	<1
Zinc total	USEPA 200.8	ug/L	-	<5	120	<5	18	<5	11
Haloacetic acids									
Bromoacetic acid	ALS: Headspace GCMS	ug/L	-	<5	480	<5	<5	<5	<5
Bromochloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	480	<1	8	2	6
Bromodichloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	480	<1	12	4	11
Chloroacetic acid	ALS: Headspace GCMS	ug/L	150	<1	480	<1	8	3	5
Dibromoacetic Acid	ALS: Headspace GCMS	ug/L	-	<10	480	<10	<10	<10	<10
Dibromochloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	480	5	5	5	5
Dichloroacetic Acid	ALS: Headspace GCMS	ug/L	100	<1	480	1	70	20	41
Tribromoacetic Acid	ALS: Headspace GCMS	ug/L	-	<10	480	<10	10	<10	<10
Trichloroacetic Acid	ALS: Headspace GCMS	ug/L	100	<1	480	<1	88	29	60
Sum of Haloacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	480	1	185	57	119
Trihalomethanes									
Bromoform	VIC-CM047	mg/L	-	<0.001	480	<0.001	<0.001	<0.001	<0.001
Chloroform	VIC-CM047	mg/L	-	<0.001	480	<0.001	0.111	0.035	0.078
Dibromochloromethane	VIC-CM047	mg/L	-	<0.001	480	<0.001	0.001	<0.001	0.001
Bromodichloromethane	VIC-CM047	mg/L	-	<0.001	480	<0.001	0.014	0.004	0.011
Trihalomethanes total	VIC-CM047	mg/L	0.25	<0.001	480	<0.001	0.126	0.039	0.089
Semi volatile organic compounds (SVOC) Anilines and benzidines									
2-Nitroaniline	US EPA 3510/8270	ug/L	-	<4	120	<4	<4	<4	<4
3-Nitroaniline	US EPA 3510/8270	ug/L	-	<4	120	<4	<4	<4	<4
3,3'-Dichlorobenzidine	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
4-Chloroaniline	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
4-Nitroaniline	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Aniline	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Carbazole	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Dibenzofuran	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Chlorinated hydrocarbons									
1,2-Dichlorobenzene	ALS Headspace GCMS	ug/L	1500	<0.25	120	<0.25	<0.25	<0.25	<0.25
1,2,4-Trichlorobenzene	US EPA 3510/8270	ug/L	30	<2	120	<2	<2	<2	<2
1,3-Dichlorobenzene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
1,4-Dichlorobenzene	ALS Headspace GCMS	ug/L	40	<0.25	120	<0.25	<0.25	<0.25	<0.25
Hexachlorobenzene	US EPA 3510/8270	ug/L	-	<4	120	<4	<4	<4	<4
Hexachlorobutadiene	ALS Headspace GCMS	ug/L	0.7	<0.25	120	<0.25	<0.25	<0.25	<0.25
Hexachlorocyclopentadiene	US EPA 3510/8270	ug/L	-	<10	120	<10	<10	<10	<10
Hexachloroethane	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Hexachloropropylene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Pentachlorobenzene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Haloethers									
4-Bromophenyl phenyl ether	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
4-Chlorophenyl phenyl ether	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2

Table 4. Summary data for all water quality zones

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th Percentile
Bis(2-chloroethoxy) methane	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Bis(2-chloroethyl) ether	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Nitroaromatics and ketones									
1-Naphthylamine	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
1,3,5-Trinitrobenzene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
2-Picoline	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
2,4-Dinitrotoluene	US EPA 3510/8270	ug/L	-	<4	120	<4	<4	<4	<4
2,6-Dinitrotoluene	US EPA 3510/8270	ug/L	-	<4	120	<4	<4	<4	<4
4-Aminobiphenyl	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
4-Nitroquinoline-N-oxide	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
5-Nitro-o-toluidine	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Acetophenone	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Azobenzene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Chlorobenzilate	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Dimethylaminoazobenzene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Isophorone	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Nitrobenzene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Pentachloronitrobenzene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Phenacetin	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Pronamide	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Nitrosamines									
Methapyrilene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
N-Nitrosodibutylamine	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
N-Nitrosodiethylamine	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
N-Nitrosodi-n-propylamine	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
N-Nitrosodiphenyl & Diphenylamine	US EPA 3510/8270	ug/L	-	<4	120	<4	<4	<4	<4
N-Nitrosomethylethylamine	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
N-Nitrosomorpholine	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
N-Nitrosopiperidine	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
N-Nitrosopyrrolidine	US EPA 3510/8270	ug/L	-	<4	120	<4	<4	<4	<4
Organochlorine pesticides									
4,4′-DDD	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
4,4′-DDE	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
4,4′-DDT	US EPA 3510/8270	ug/L	9	<4	120	<4	<4	<4	<4
Aldrin	US EPA 8081/8082	ug/L	0.3	<0.01	120	<0.01	<0.5*	<0.01	<0.01
alpha-BHC	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
alpha-Endosulfan	US EPA 3510/8270	ug/L	20	<2	120	<2	<2	<2	<2
beta-BHC	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
beta-Endosulfan	US EPA 3510/8270	ug/L	20	<2	120	<2	<2	<2	<2
delta-BHC	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Dieldrin	US EPA 8081/8082	ug/L	0.3	<0.01	120	<0.01	<0.5*	<0.01	<0.01
Endrin	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Endosulfan sulfate	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
gamma-BHC	US EPA 3510/8270	ug/L	10	<2	120	<2	<2	<2	<2
Heptachlor	US EPA 8081/8082	ug/L	0.3	<0.005	120	<0.005	<0.5*	<0.005	<0.005
Heptachlor epoxide	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2

Table 4. Summary data for all water quality zones

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th Percentile
Organophosphorous pesticides									
Chlorfenvinphos	US EPA 3510/8270	ug/L	2	<2	120	<2	<2	<2	<2
Chlorpyrifos	US EPA 3510/8270	ug/L	10	<2	120	<2	<2	<2	<2
Chlorpyrifos-methyl	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Diazinon	US EPA 3510/8270	ug/L	4	<2	120	<2	<2	<2	<2
Dichlorvos	US EPA 3510/8270	ug/L	5	<2	120	<2	<2	<2	<2
Dimethoate	US EPA 3510/8270	ug/L	7	<2	120	<2	<2	<2	<2
Ethion	US EPA 3510/8270	ug/L	4	<2	120	<2	<2	<2	<2
Fenthion	US EPA 3510/8270	ug/L	7	<2	120	<2	<2	<2	<2
Malathion	US EPA 3510/8270	ug/L	70	<2	120	<2	<2	<2	<2
Pirimiphos-ethyl	ALS LC-MSMS	ug/L	0.5	<0.01	120	<0.01	<0.01	<0.01	<0.01
Prothiofos	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Phenolic compounds									
2,3,4,6-Tetrachlorophenol	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
2,4-Dichlorophenol	US EPA 8270	ug/L	200	<0.1	120	<0.1	<0.1	<0.1	<0.1
2,4-Dimethylphenol	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
2,4,5-Trichlorophenol	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
2,4,6-Trichlorophenol	US EPA 3510/8270	ug/L	20	<2	120	<2	<2	<2	<2
2,6-Dichlorophenol	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
2-Chlorophenol	US EPA 8270	ug/L	300	<0.05	120	<0.05	<0.05	<0.05	<0.05
2-Methylphenol	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
2-Nitrophenol	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
3- & 4-Methylphenol	US EPA 3510/8270	ug/L	-	<4	120	<4	<4	<4	<4
4-Chloro-3-Methylphenol	US EPA 3510/8270	ug/L		<2	120	<2	<2	<2	<2
Pentachlorophenol	US EPA 3510/8270	ug/L	10	<4	120	<4	<4	<4	<4
Phenol	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Phthalates									
Bis(2-ethylhexyl) phthalate	US EPA 3510/8270	ug/L	10	<10	120	<10	<10	<10	<10
Bis(2-ethylhexyl) phthalate	US EPA 8270D	ug/L	10	<10	120	<10	<10	<10	<10
Butyl benzyl phthalate	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Butyl benzyl phthalate	US EPA 8270D	ug/L	-	<2	120	<2	<2	<2	<2
Diethyl phthalate	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Diethyl phthalate	US EPA 8270D	ug/L	-	<2	120	<2	<2	<2	<2
Dimethyl phthalate	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Dimethyl phthalate	US EPA 8270D	ug/L	-	<2	120	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 8270D	ug/L	-	<2	120	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 8270D	ug/L	-	<2	120	<2	<2	<2	<2
Polycyclic aromatic hydrocarbons									
2-Chloronaphthalene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
2-Methylnaphthalene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
3-Methylcholanthrene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
7,12-Dimethylbenz(a) anthracene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Acenaphthene	US EPA 3510/8270	ug/L	-	<1	120	<1	<1	<1	<1
Acenaphthene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2

Table 4. Summary data for all water quality zones

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th Percentile
Acenaphthylene	US EPA 3510/8270	ug/L	-	<1	120	<1	<1	<1	<1
Acenaphthylene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Anthracene	US EPA 3510/8270	ug/L	-	<1	120	<1	<1	<1	<1
Anthracene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Benz(a)anthracene	US EPA 3510/8270	ug/L	-	<1	120	<1	<1	<1	<1
Benz(a)anthracene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Benzo(a)pyrene	ALS GCMS-SIM	ug/L	0.01	<0.005	240	<0.005	<0.005	<0.005	<0.005
Benzo(b) fluoranthene	US EPA 3510/8270	ug/L	-	<1	120	<1	<1	<1	<1
Benzo(k) fluoranthene	US EPA 3510/8270	ug/L	-	<1	120	<1	<1	<1	<1
Benzo(b) & Benzo(k) fluoranthene	US EPA 3510/8270	ug/L	-	<4	120	<4	<4	<4	<4
Benzo(g.h.i)perylene	US EPA 3510/8270	ug/L	-	<1	120	<1	<1	<1	<1
Benzo(g.h.i)perylene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Chrysene	US EPA 3510/8270	ug/L	-	<1	120	<1	<1	<1	<1
Chrysene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Dibenz(a.h)anthracene	US EPA 3510/8270	ug/L	-	<1	120	<1	<1	<1	<1
Dibenz(a.h)anthracene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Fluoranthene	US EPA 3510/8270	ug/L	-	<1	120	<1	<1	<1	<1
Fluoranthene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Fluorene	US EPA 3510/8270	ug/L	-	<1	120	<1	<1	<1	<1
Fluorene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Indeno(1.2.3.cd)pyrene	US EPA 3510/8270	ug/L	-	<1	120	<1	<1	<1	<1
Indeno(1.2.3-cd)pyrene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
N-2-Fluorenyl Acetamide	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	ug/L	-	<1	120	<1	<1	<1	<1
Phenanthrene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
Phenanthrene	US EPA 3510/8270	ug/L	-	<1	120	<1	<1	<1	<1
Pyrene	US EPA 3510/8270	ug/L	-	<1	120	<1	<1	<1	<1
Pyrene	US EPA 3510/8270	ug/L	-	<2	120	<2	<2	<2	<2
PAHs (total)	US EPA 3510/8270	ug/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 per cent of all the water that passes through the distribution system in this 12 month period falls below.

Where the table lists two distinct data sets for the same analyte, the analyte has been measured in two different suites of screens conducted by the laboratory: semi volatile organic compounds screen and phthalates screen.

* One sample had high LORs for three analytes. These three analytes were not detected in that sample.

Table 5. Summary data for water quality zone 1: North Canberra and Gungahlin

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th Percentile
Microbiological									
E.Coli	AS 4276.21	MPN/100mL	<1	<1	349	<1	<1	<1	<1
Total coliforms	AS 4276.21	MPN/100mL	-	<1	349	<1	1	<1	<1
Heterotrophic plate count	APHA 9215 B	CFU/mL	-	<1	348	<1	2450	10	6
Physical									
Conductivity	APHA 2510 B	uS/cm	-	<2	36	76	191	113	187
pH	APHA 4500-H B	pH units	-	<0.01	349	6.01	7.99	7.54	7.82
Temperature	APHA 4500-H B	deg. C	-	<0.1	74	9.1	24.0	16.6	23.0
Total dissolved solids	APHA 2540 C	mg/L	-	<10	36	24	163	67	125
True colour	APHA 2120 B	Pt/Co	-	<1	72	<1	2	<1	2
Turbidity	APHA 2130 B	NTU	-	<0.1	74	0.1	5.4	0.4	0.6
Inorganic									
Alkalinity bicarb	APHA 2320 A/B	mg/L	-	<0.1	72	29.9	49.9	38.1	45.6
Alkalinity carb	APHA 2320 A/B	mg/L	-	<0.1	72	<0.1	<0.1	<0.1	<0.1
Alkalinity hydrox	APHA 2320 A/B	mg/L	-	<0.1	72	<0.1	<0.1	<0.1	<0.1
Alkalinity total	APHA 2320 A/B	mg/L	-	<1	72	30	50	38	46
Aluminium acid soluble	USEPA 200.8	ug/L	-	<5	36	17	44	28	41
Asbestos	AS4964-2000	g/kg	-	Absent	12	Absent	Absent	Absent	Absent
Calcium dissolved	USEPA 200.7	mg/L	-	<0.05	36	9.48	19.20	12.32	19.13
Chloride	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.1	12	2.5	7.8	4.9	6.3
Chlorine combined	APHA 4500 -CL G	mg/L	-	<0.03	349	<0.03	0.29	0.06	0.17
Chlorine free	APHA 4500 -CL G	mg/L	-	<0.03	349	0.13	1.83	1.01	1.31
Chlorine total	APHA 4500 -CL G	mg/L	5	<0.03	349	0.25	1.87	1.07	1.38
Cyanide	APHA 4500_CN	mg/L	0.08	<0.004	12	<0.004	<0.004	<0.004	<0.004
Flouride	APHA 21st Ed. 2005, Part 4110 B	mg/L	1.5	<0.05	36	0.51	0.88	0.78	0.87
Hardness total	APHA 2340 B	mg/L	-	<1	36	27	68	36	65
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	36	0.86	4.78	1.30	4.18
Nitrate	APHA 21st Ed. 2005, Part 4110 B	mg/L N	50	<0.1	12	<0.1	0.3	0.2	0.3
Potassium dissolved	USEPA 200.7	mg/L	-	<0.1	12	0.2	1.6	0.6	1.2
Sodium dissolved	USEPA 200.7	mg/L	-	<0.1	12	2.5	8.9	3.4	6.4
Sulphate	APHA 21st Ed. 2005, Part 4110 B	mg/L SO4	-	<0.4	12	<0.4	24.1	4.4	12.7
Total metals									
Aluminium total	USEPA 200.8	ug/L	-	<9	36	22	51	36	48
Antimony total	USEPA 200.8	ug/L	3	<3	36	<3	<3	<3	<3
Arsenic total	USEPA 200.8	ug/L	10	<1	36	<1	<1	<1	<1
Barium total	USEPA 200.8	ug/L	2000	<0.5	36	3.2	8.1	4.2	7.7
Beryllium total	USEPA 200.8	ug/L	60	<0.1	36	<0.1	<0.1	<0.1	<0.1
Boron total	USEPA 200.7	mg/L	4	<0.01	12	<0.01	<0.01	<0.01	<0.01
Cadmium total	USEPA 200.8	ug/L	2	<0.05	36	<0.05	0.08	<0.05	<0.05
Chromium total	USEPA 200.8	ug/L	-	<2	36	<2	<2	<2	<2
Cobalt total	USEPA 200.8	ug/L	-	<0.2	36	<0.2	<0.2	<0.2	<0.2
Copper total	USEPA 200.8	ug/L	2000	<1	72	<1	182	12	34
Iron total	USEPA 200.7	mg/L	-	<0.01	73	<0.01	0.28	<0.01	0.02
Lead total	USEPA 200.8	ug/L	10	<0.2	72	<0.2	4.7	0.4	1

Table 5. Summary data for water quality zone 1: North Canberra and Gungahlin

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th Percentile
Manganese total	USEPA 200.7	mg/L	0.5	<0.001	72	<0.001	0.136	0.006	0.015
Mercury total	USEPA 200.8	ug/L	1	<0.1	37	<0.1	0.1	<0.1	<0.1
Molybdenium total	USEPA 200.8	ug/L	50	<1	36	<1	<1	<1	<1
Nickel total	USEPA 200.8	ug/L	20	<1	36	<1	1	<1	<1
Selenium total	USEPA 200.8	ug/L	10	<1	36	<1	<1	<1	<1
Silver total	USEPA 200.8	ug/L	100	<1	36	<1	<1	<1	<1
Zinc total	USEPA 200.8	ug/L	-	<5	36	<5	13	<5	9
Haloacetic acids									
Bromoacetic acid	ALS: Headspace GCMS	ug/L	-	<5	140	<5	<5	<5	<5
Bromochloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	140	<1	6	2	6
Bromodichloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	140	<1	12	4	11
Chloroacetic acid	ALS: Headspace GCMS	ug/L	150	<1	140	<1	6	3	5
Dibromoacetic Acid	ALS: Headspace GCMS	ug/L	-	<10	140	<10	<10	<10	<10
Dibromochloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	140	5	5	5	5
Dichloroacetic Acid	ALS: Headspace GCMS	ug/L	100	<1	140	6	45	19	38
Tribromoacetic Acid	ALS: Headspace GCMS	ug/L	-	<10	140	<10	10	<10	<10
Trichloroacetic Acid	ALS: Headspace GCMS	ug/L	100	<1	140	8	75	28	58
Sum of Haloacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	140	17	129	55	115
Trihalomethanes									
Bromoform	VIC-CM047	mg/L	-	<0.001	140	<0.001	<0.001	<0.001	<0.001
Chloroform	VIC-CM047	mg/L	-	<0.001	140	0.003	0.094	0.034	0.076
Dibromochloromethane	VIC-CM047	mg/L	-	<0.001	140	<0.001	0.001	<0.001	0.001
Bromodichloromethane	VIC-CM047	mg/L	-	<0.001	140	<0.001	0.013	0.004	0.011
Trihalomethanes total	VIC-CM047	mg/L	0.25	<0.001	140	0.003	0.108	0.038	0.088
Semi volatile organic compounds (SVOC) Anilines and benzidines									
2-Nitroaniline	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
3-Nitroaniline	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
3,3'-Dichlorobenzidine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
4-Chloroaniline	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
4-Nitroaniline	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Aniline	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Carbazole	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Dibenzofuran	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Chlorinated hydrocarbons									
1,2-Dichlorobenzene	ALS Headspace GCMS	ug/L	1500	<0.25	36	<0.25	<0.25	<0.25	<0.25
1,2,4-Trichlorobenzene	US EPA 3510/8270	ug/L	30	<2	36	<2	<2	<2	<2
1,3-Dichlorobenzene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
1,4-Dichlorobenzene	ALS Headspace GCMS	ug/L	40	<0.25	36	<0.25	<0.25	<0.25	<0.25
Hexachlorobenzene	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
Hexachlorobutadiene	ALS Headspace GCMS	ug/L	0.7	<0.25	36	<0.25	<0.25	<0.25	<0.25
Hexachlorocyclopentadiene	US EPA 3510/8270	ug/L	-	<10	36	<10	<10	<10	<10
Hexachloroethane	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Hexachloropropylene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Pentachlorobenzene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Haloethers									
4-Bromophenyl phenyl ether	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
4-Chlorophenyl phenyl ether	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2

Table 5. Summary data for water quality zone 1: North Canberra and Gungahlin

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th Percentile
Bis(2-chloroethoxy) methane	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Bis(2-chloroethyl) ether	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Nitroaromatics and ketones									
1-Naphthylamine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
1,3,5-Trinitrobenzene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2-Picoline	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2,4-Dinitrotoluene	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
2,6-Dinitrotoluene	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
4-Aminobiphenyl	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
4-Nitroquinoline-N-oxide	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
5-Nitro-o-toluidine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Acetophenone	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Azobenzene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Chlorobenzilate	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Dimethylaminoazobenzene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Isophorone	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Nitrobenzene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Pentachloronitrobenzene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Phenacetin	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Pronamide	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Nitrosamines									
Methapyrilene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-Nitrosodibutylamine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-Nitrosodiethylamine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-Nitrosodi-n-propylamine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-Nitrosodiphenyl & Diphenylamine	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
N-Nitrosomethylethylamine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-Nitrosomorpholine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-Nitrosopiperidine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-Nitrosopyrrolidine	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
Organochlorine pesticides									
4,4′-DDD	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
4,4′-DDE	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
4,4′-DDT	US EPA 3510/8270	ug/L	9	<4	36	<4	<4	<4	<4
Aldrin	US EPA 8081/8082	ug/L	0.3	<0.01	36	<0.01	<0.01	<0.01	<0.01
alpha-BHC	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
alpha-Endosulfan	US EPA 3510/8270	ug/L	20	<2	36	<2	<2	<2	<2
beta-BHC	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
beta-Endosulfan	US EPA 3510/8270	ug/L	20	<2	36	<2	<2	<2	<2
delta-BHC	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Dieldrin	US EPA 8081/8082	ug/L	0.3	<0.01	36	<0.01	<0.01	<0.01	<0.01
Endrin	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Endosulfan sulfate	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
gamma-BHC	US EPA 3510/8270	ug/L	10	<2	36	<2	<2	<2	<2
Heptachlor	US EPA 8081/8082	ug/L	0.3	<0.005	36	<0.005	<0.005	<0.005	<0.005
Heptachlor epoxide	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2

Table 5. Summary data for water quality zone 1: North Canberra and Gungahlin

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th Percentile
Organophosphorous pesticides									
Chlorfenvinphos	US EPA 3510/8270	ug/L	2	<2	36	<2	<2	<2	<2
Chlorpyrifos	US EPA 3510/8270	ug/L	10	<2	36	<2	<2	<2	<2
Chlorpyrifos-methyl	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Diazinon	US EPA 3510/8270	ug/L	4	<2	36	<2	<2	<2	<2
Dichlorvos	US EPA 3510/8270	ug/L	5	<2	36	<2	<2	<2	<2
Dimethoate	US EPA 3510/8270	ug/L	7	<2	36	<2	<2	<2	<2
Ethion	US EPA 3510/8270	ug/L	4	<2	36	<2	<2	<2	<2
Fenthion	US EPA 3510/8270	ug/L	7	<2	36	<2	<2	<2	<2
Malathion	US EPA 3510/8270	ug/L	70	<2	36	<2	<2	<2	<2
Pirimiphos-ethyl	ALS LC-MSMS	ug/L	0.5	<0.01	36	<0.01	<0.01	<0.01	<0.01
Prothiofos	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Phenolic compounds									
2,3,4,6-Tetrachlorophenol	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2,4-Dichlorophenol	US EPA 8270	ug/L	200	<0.1	36	<0.1	<0.1	<0.1	<0.1
2,4-Dimethylphenol	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2,4,5-Trichlorophenol	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2,4,6-Trichlorophenol	US EPA 3510/8270	ug/L	20	<2	36	<2	<2	<2	<2
2,6-Dichlorophenol	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2-Chlorophenol	US EPA 8270	ug/L	300	<0.05	36	<0.05	<0.05	<0.05	<0.05
2-Methylphenol	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2-Nitrophenol	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
3- & 4-Methylphenol	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
4-Chloro-3-Methylphenol	US EPA 3510/8270	ug/L		<2	36	<2	<2	<2	<2
Pentachlorophenol	US EPA 3510/8270	ug/L	10	<4	36	<4	<4	<4	<4
Phenol	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Phthalates									
Bis(2-ethylhexyl) phthalate	US EPA 3510/8270	ug/L	10	<10	36	<10	<10	<10	<10
Bis(2-ethylhexyl) phthalate	US EPA 8270D	ug/L	10	<10	36	<10	<10	<10	<10
Butyl benzyl phthalate	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Butyl benzyl phthalate	US EPA 8270D	ug/L	-	<2	36	<2	<2	<2	<2
Diethyl phthalate	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Diethyl phthalate	US EPA 8270D	ug/L	-	<2	36	<2	<2	<2	<2
Dimethyl phthalate	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Dimethyl phthalate	US EPA 8270D	ug/L	-	<2	36	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 8270D	ug/L	-	<2	36	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 8270D	ug/L	-	<2	36	<2	<2	<2	<2
Polycyclic aromatic hydrocarbons									
2-Chloronaphthalene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2-Methylnaphthalene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
3-Methylcholanthrene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
7,12-Dimethylbenz(a) anthracene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Acenaphthene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Acenaphthene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2

Table 5. Summary data for water quality zone 1: North Canberra and Gungahlin

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th Percentile
Acenaphthylene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Acenaphthylene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Anthracene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Anthracene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Benz(a)anthracene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Benz(a)anthracene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Benzo(a)pyrene	ALS GCMS-SIM	ug/L	0.01	<0.005	72	<0.005	<0.005	<0.005	<0.005
Benzo(b) fluoranthene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Benzo(k) fluoranthene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Benzo(b) & Benzo(k) fluoranthene	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
Benzo(g.h.i)perylene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Benzo(g.h.i)perylene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Chrysene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Chrysene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Dibenz(a.h)anthracene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Dibenz(a.h)anthracene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Fluoranthene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Fluoranthene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Fluorene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Fluorene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Indeno(1.2.3.cd)pyrene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Indeno(1.2.3-cd)pyrene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-2-Fluorenyl Acetamide	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Phenanthrene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Phenanthrene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Pyrene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Pyrene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
PAHs (total)	US EPA 3510/8270	ug/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 per cent of all the water that passes through the distribution system in this 12 month period falls below.

Where the table lists two distinct data sets for the same analyte, the analyte has been measured in two different suites of screens conducted by the laboratory: semi volatile organic compounds screen and phthalates screen.

Table 6. Summary data for water quality zone 2: Belconnen

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th Percentile
Microbiological									
E.Coli	AS 4276.21	MPN/100mL	<1	<1	325	<1	<1	<1	<1
Total coliforms	AS 4276.21	MPN/100mL	-	<1	325	<1	<1	<1	<1
Heterotrophic plate count	APHA 9215 B	CFU/mL	-	<1	325	<1	118	2	5
Physical									
Conductivity	APHA 2510 B	uS/cm	-	<2	36	57	189	113	173
pH	APHA 4500-H B	pH units	-	<0.01	325	7.03	8.45	7.64	7.99
Temperature	APHA 4500-H B	deg. C	-	<0.1	72	9.5	24.9	17.1	23.8
Total dissolved solids	APHA 2540 C	mg/L	-	<10	36	21	147	71	118
True colour	APHA 2120 B	Pt/Co	-	<1	72	<1	2	<1	2
Turbidity	APHA 2130 B	NTU	-	<0.1	73	0.1	1.9	0.4	0.8
Inorganic									
Alkalinity bicarb	APHA 2320 A/B	mg/L	-	<0.1	72	29.5	47.8	38.3	46.1
Alkalinity carb	APHA 2320 A/B	mg/L	-	<0.1	72	<0.1	<0.1	<0.1	<0.1
Alkalinity hydrox	APHA 2320 A/B	mg/L	-	<0.1	72	<0.1	<0.1	<0.1	<0.1
Alkalinity total	APHA 2320 A/B	mg/L	-	<1	72	30	48	38	46
Aluminium acid soluble	USEPA 200.8	ug/L	-	<5	36	14	40	29	39
Asbestos	AS4964-2000	g/kg	-	Absent	12	Absent	Absent	Absent	Absent
Calcium dissolved	USEPA 200.7	mg/L	-	<0.05	36	9.92	20.70	12.70	19.00
Chloride	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.1	12	2.5	7.8	5.1	7.0
Chlorine combined	APHA 4500 -CL G	mg/L	-	<0.03	325	<0.03	0.33	0.06	0.17
Chlorine free	APHA 4500 -CL G	mg/L	-	<0.03	325	0.04	1.77	0.93	1.21
Chlorine total	APHA 4500 -CL G	mg/L	5	<0.03	325	0.19	1.80	0.99	1.28
Cyanide	APHA 4500_CN	mg/L	0.08	<0.004	12	<0.004	<0.004	<0.004	<0.004
Flouride	APHA 21st Ed. 2005, Part 4110 B	mg/L	1.5	<0.05	36	0.66	0.86	0.78	0.85
Hardness total	APHA 2340 B	mg/L	-	<1	36	28	67	37	61
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	36	0.83	4.06	1.33	3.44
Nitrate	APHA 21st Ed. 2005, Part 4110 B	mg/L N	50	<0.1	12	<0.1	0.3	0.2	0.3
Potassium dissolved	USEPA 200.7	mg/L	-	<0.1	12	0.1	1.4	0.6	1.0
Sodium dissolved	USEPA 200.7	mg/L	-	<0.1	12	2.7	8.4	3.6	6.7
Sulphate	APHA 21st Ed. 2005, Part 4110 B	mg/L SO4	-	<0.4	12	<0.4	23.6	5.5	18.3
Total metals									
Aluminium total	USEPA 200.8	ug/L	-	<9	36	22	100	40	63
Antimony total	USEPA 200.8	ug/L	3	<3	36	<3	<3	<3	<3
Arsenic total	USEPA 200.8	ug/L	10	<1	36	<1	<1	<1	<1
Barium total	USEPA 200.8	ug/L	2000	<0.5	36	2.8	8.2	4.2	7.1
Beryllium total	USEPA 200.8	ug/L	60	<0.1	36	<0.1	<0.1	<0.1	<0.1
Boron total	USEPA 200.7	mg/L	4	<0.01	12	<0.01	<0.01	<0.01	<0.01
Cadmium total	USEPA 200.8	ug/L	2	<0.05	36	<0.05	0.06	<0.05	<0.05
Chromium total	USEPA 200.8	ug/L	-	<2	36	<2	<2	<2	<2
Cobalt total	USEPA 200.8	ug/L	-	<0.2	36	<0.2	<0.2	<0.2	<0.2
Copper total	USEPA 200.8	ug/L	2000	<1	72	1	75	13	31
Iron total	USEPA 200.7	mg/L	-	<0.01	72	<0.01	0.04	<0.01	0.02
Lead total	USEPA 200.8	ug/L	10	<0.2	72	<0.2	1.8	0.3	0.9

Table 6. Summary data for water quality zone 2: Belconnen

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th Percentile
Manganese total	USEPA 200.7	mg/L	0.5	<0.001	72	<0.001	0.04	0.005	0.017
Mercury total	USEPA 200.8	ug/L	1	<0.1	36	<0.1	0.1	<0.1	<0.1
Molybdenium total	USEPA 200.8	ug/L	50	<1	36	<1	<1	<1	<1
Nickel total	USEPA 200.8	ug/L	20	<1	36	<1	<1	<1	<1
Selenium total	USEPA 200.8	ug/L	10	<1	36	<1	<1	<1	<1
Silver total	USEPA 200.8	ug/L	100	<1	36	<1	<1	<1	<1
Zinc total	USEPA 200.8	ug/L	-	<5	36	<5	17	<5	10
Haloacetic acids									
Bromoacetic acid	ALS: Headspace GCMS	ug/L	-	<5	132	<5	<5	<5	<5
Bromochloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	132	<1	8	2	6
Bromodichloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	132	<1	12	4	11
Chloroacetic acid	ALS: Headspace GCMS	ug/L	150	<1	132	<1	6	3	5
Dibromoacetic Acid	ALS: Headspace GCMS	ug/L	-	<10	132	<10	<10	<10	<10
Dibromochloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	132	5	5	5	5
Dichloroacetic Acid	ALS: Headspace GCMS	ug/L	100	<1	132	7	49	19	43
Tribromoacetic Acid	ALS: Headspace GCMS	ug/L	-	<10	132	<10	<10	<10	<10
Trichloroacetic Acid	ALS: Headspace GCMS	ug/L	100	<1	132	7	71	29	61
Sum of Haloacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	132	16	139	56	123
Trihalomethanes									
Bromoform	VIC-CM047	mg/L	-	<0.001	132	<0.001	<0.001	<0.001	<0.001
Chloroform	VIC-CM047	mg/L	-	<0.001	132	0.012	0.111	0.033	0.076
Dibromochloromethane	VIC-CM047	mg/L	-	<0.001	132	<0.001	0.001	<0.001	0.001
Bromodichloromethane	VIC-CM047	mg/L	-	<0.001	132	<0.001	0.014	0.004	0.010
Trihalomethanes total	VIC-CM047	mg/L	0.25	<0.001	132	0.012	0.126	0.037	0.087
Semi volatile organic compounds (SVOC) Anilines and benzidines									
2-Nitroaniline	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
3-Nitroaniline	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
3,3′-Dichlorobenzidine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
4-Chloroaniline	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
4-Nitroaniline	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Aniline	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Carbazole	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Dibenzofuran	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Chlorinated hydrocarbons									
1,2-Dichlorobenzene	ALS Headspace GCMS	ug/L	1500	<0.25	36	<0.25	<0.25	<0.25	<0.25
1,2,4-Trichlorobenzene	US EPA 3510/8270	ug/L	30	<2	36	<2	<2	<2	<2
1,3-Dichlorobenzene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
1,4-Dichlorobenzene	ALS Headspace GCMS	ug/L	40	<0.25	36	<0.25	<0.25	<0.25	<0.25
Hexachlorobenzene	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
Hexachlorobutadiene	ALS Headspace GCMS	ug/L	0.7	<0.25	36	<0.25	<0.25	<0.25	<0.25
Hexachlorocyclopentadiene	US EPA 3510/8270	ug/L	-	<10	36	<10	<10	<10	<10
Hexachloroethane	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Hexachloropropylene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Pentachlorobenzene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Haloethers									
4-Bromophenyl phenyl ether	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
4-Chlorophenyl phenyl ether	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2

Table 6. Summary data for water quality zone 2: Belconnen

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th Percentile
Bis(2-chloroethoxy) methane	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Bis(2-chloroethyl) ether	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Nitroaromatics and ketones									
1-Naphthylamine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
1,3,5-Trinitrobenzene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2-Picoline	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2,4-Dinitrotoluene	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
2,6-Dinitrotoluene	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
4-Aminobiphenyl	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
4-Nitroquinoline-N-oxide	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
5-Nitro-o-toluidine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Acetophenone	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Azobenzene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Chlorobenzilate	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Dimethylaminoazobenzene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Isophorone	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Nitrobenzene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Pentachloronitrobenzene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Phenacetin	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Pronamide	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Nitrosamines									
Methapyrilene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-Nitrosodibutylamine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-Nitrosodiethylamine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-Nitrosodi-n-propylamine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-Nitrosodiphenyl & Diphenylamine	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
N-Nitrosomethylethylamine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-Nitrosomorpholine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-Nitrosopiperidine	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-Nitrosopyrrolidine	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
Organochlorine pesticides									
4,4′-DDD	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
4,4′-DDE	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
4,4′-DDT	US EPA 3510/8270	ug/L	9	<4	36	<4	<4	<4	<4
Aldrin	US EPA 8081/8082	ug/L	0.3	<0.01	36	<0.01	<0.5*	<0.01	<0.01
alpha-BHC	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
alpha-Endosulfan	US EPA 3510/8270	ug/L	20	<2	36	<2	<2	<2	<2
beta-BHC	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
beta-Endosulfan	US EPA 3510/8270	ug/L	20	<2	36	<2	<2	<2	<2
delta-BHC	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Dieldrin	US EPA 8081/8082	ug/L	0.3	<0.01	36	<0.01	<0.5*	<0.01	<0.01
Endrin	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Endosulfan sulfate	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
gamma-BHC	US EPA 3510/8270	ug/L	10	<2	36	<2	<2	<2	<2
Heptachlor	US EPA 8081/8082	ug/L	0.3	<0.005	36	<0.005	<0.5*	<0.005	<0.005
Heptachlor epoxide	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2

Table 6. Summary data for water quality zone 2: Belconnen

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th Percentile
Organophosphorous pesticides									
Chlorfenvinphos	US EPA 3510/8270	ug/L	2	<2	36	<2	<2	<2	<2
Chlorpyrifos	US EPA 3510/8270	ug/L	10	<2	36	<2	<2	<2	<2
Chlorpyrifos-methyl	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Diazinon	US EPA 3510/8270	ug/L	4	<2	36	<2	<2	<2	<2
Dichlorvos	US EPA 3510/8270	ug/L	5	<2	36	<2	<2	<2	<2
Dimethoate	US EPA 3510/8270	ug/L	7	<2	36	<2	<2	<2	<2
Ethion	US EPA 3510/8270	ug/L	4	<2	36	<2	<2	<2	<2
Fenthion	US EPA 3510/8270	ug/L	7	<2	36	<2	<2	<2	<2
Malathion	US EPA 3510/8270	ug/L	70	<2	36	<2	<2	<2	<2
Pirimiphos-ethyl	ALS LC-MSMS	ug/L	0.5	<0.01	36	<0.01	<0.01	<0.01	<0.01
Prothiofos	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Phenolic compounds									
2,3,4,6-Tetrachlorophenol	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2,4-Dichlorophenol	US EPA 8270	ug/L	200	<0.1	36	<0.1	<0.1	<0.1	<0.1
2,4-Dimethylphenol	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2,4,5-Trichlorophenol	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2,4,6-Trichlorophenol	US EPA 3510/8270	ug/L	20	<2	36	<2	<2	<2	<2
2,6-Dichlorophenol	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2-Chlorophenol	US EPA 8270	ug/L	300	<0.05	36	<0.05	<0.05	<0.05	<0.05
2-Methylphenol	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2-Nitrophenol	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
3- & 4-Methylphenol	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
4-Chloro-3-Methylphenol	US EPA 3510/8270	ug/L		<2	36	<2	<2	<2	<2
Pentachlorophenol	US EPA 3510/8270	ug/L	10	<4	36	<4	<4	<4	<4
Phenol	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Phthalates									
Bis(2-ethylhexyl) phthalate	US EPA 3510/8270	ug/L	10	<10	36	<10	<10	<10	<10
Bis(2-ethylhexyl) phthalate	US EPA 8270D	ug/L	10	<10	36	<10	<10	<10	<10
Butyl benzyl phthalate	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Butyl benzyl phthalate	US EPA 8270D	ug/L	-	<2	36	<2	<2	<2	<2
Diethyl phthalate	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Diethyl phthalate	US EPA 8270D	ug/L	-	<2	36	<2	<2	<2	<2
Dimethyl phthalate	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Dimethyl phthalate	US EPA 8270D	ug/L	-	<2	36	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 8270D	ug/L	-	<2	36	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 8270D	ug/L	-	<2	36	<2	<2	<2	<2
Polycyclic aromatic hydrocarbons									
2-Chloronaphthalene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
2-Methylnaphthalene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
3-Methylcholanthrene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
7,12-Dimethylbenz(a) anthracene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Acenaphthene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Acenaphthene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2

Table 6. Summary data for water quality zone 2: Belconnen

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th Percentile
Acenaphthylene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Acenaphthylene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Anthracene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Anthracene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Benz(a)anthracene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Benz(a)anthracene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Benzo(a)pyrene	ALS GCMS-SIM	ug/L	0.01	<0.005	72	<0.005	<0.005	<0.005	<0.005
Benzo(b) fluoranthene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Benzo(k) fluoranthene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Benzo(b) & Benzo(k) fluoranthene	US EPA 3510/8270	ug/L	-	<4	36	<4	<4	<4	<4
Benzo(g.h.i)perylene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Benzo(g.h.i)perylene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Chrysene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Chrysene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Dibenz(a.h)anthracene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Dibenz(a.h)anthracene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Fluoranthene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Fluoranthene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Fluorene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Fluorene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Indeno(1.2.3.cd)pyrene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Indeno(1.2.3-cd)pyrene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
N-2-Fluorenyl Acetamide	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Phenanthrene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
Phenanthrene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Pyrene	US EPA 3510/8270	ug/L	-	<1	36	<1	<1	<1	<1
Pyrene	US EPA 3510/8270	ug/L	-	<2	36	<2	<2	<2	<2
PAHs (total)	US EPA 3510/8270	ug/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 per cent of all the water that passes through the distribution system in this 12 month period falls below.

Where the table lists two distinct data sets for the same analyte, the analyte has been measured in two different suites of screens conducted by the laboratory: semi volatile organic compounds screen and phthalates screen.

*One sample had high LORs for three analytes. These three analytes were not detected in that sample.

Table 7. Summary data for water quality zone 3: South Canberra, Woden and Weston Creek

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th Percentile
Microbiological									
E.Coli	AS 4276.21	MPN/100mL	<1	<1	266	<1	<1	<1	<1
Total coliforms	AS 4276.21	MPN/100mL	-	<1	266	<1	83	<1	<1
Heterotrophic plate count	APHA 9215 B	CFU/mL	-	<1	266	<1	5900	35	8
Physical									
Conductivity	APHA 2510 B	uS/cm	-	<2	24	78	188	109	177
pH	APHA 4500-H B	pH units	-	<0.01	266	6.59	9.75	7.58	7.87
Temperature	APHA 4500-H B	deg. C	-	<0.1	49	9.0	24.2	16.5	22.6
Total dissolved solids	APHA 2540 C	mg/L	-	<10	24	29	118	66	109
True colour	APHA 2120 B	Pt/Co	-	<1	48	<1	2	<1	2
Turbidity	APHA 2130 B	NTU	-	<0.1	49	0.1	15.1	0.7	1.2
Inorganic									
Alkalinity bicarb	APHA 2320 A/B	mg/L	-	<0.1	48	31.0	53.7	38.3	46.8
Alkalinity carb	APHA 2320 A/B	mg/L	-	<0.1	48	<0.1	<0.1	<0.1	<0.1
Alkalinity hydrox	APHA 2320 A/B	mg/L	-	<0.1	48	<0.1	<0.1	<0.1	<0.1
Alkalinity total	APHA 2320 A/B	mg/L	-	<1	48	31	54	38	47
Aluminium acid soluble	USEPA 200.8	ug/L	-	<5	24	19	283	39	41
Asbestos	AS4964-2000	g/kg	-	Absent	12	Absent	Absent	Absent	Absent
Calcium dissolved	USEPA 200.7	mg/L	-	<0.05	24	10.00	18.60	12.17	17.93
Chloride	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.1	12	4.6	7.8	5.2	6.8
Chlorine combined	APHA 4500 -CL G	mg/L	-	<0.03	266	<0.03	0.51	0.06	0.19
Chlorine free	APHA 4500 -CL G	mg/L	-	<0.03	266	<0.03	1.70	0.99	1.40
Chlorine total	APHA 4500 -CL G	mg/L	5	<0.03	266	<0.03	1.79	1.05	1.50
Cyanide	APHA 4500_CN	mg/L	0.08	<0.004	12	<0.004	<0.004	<0.004	<0.004
Flouride	APHA 21st Ed. 2005, Part 4110 B	mg/L	1.5	<0.05	24	0.69	0.93	0.80	0.89
Hardness total	APHA 2340 B	mg/L	-	<1	24	29	65	36	62
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	0.87	4.53	1.42	4.22
Nitrate	APHA 21st Ed. 2005, Part 4110 B	mg/L N	50	<0.1	12	0.2	0.3	0.3	0.3
Potassium dissolved	USEPA 200.7	mg/L	-	<0.1	12	0.5	1.3	0.6	1.2
Sodium dissolved	USEPA 200.7	mg/L	-	<0.1	12	2.6	8.0	3.5	6.5
Sulphate	APHA 21st Ed. 2005, Part 4110 B	mg/L SO4	-	<0.4	12	3.1	24.0	5.5	16.8
Total metals									
Aluminium total	USEPA 200.8	ug/L	-	<9	24	24	427	53	55
Antimony total	USEPA 200.8	ug/L	3	<3	24	<3	<3	<3	<3
Arsenic total	USEPA 200.8	ug/L	10	<1	24	<1	<1	<1	<1
Barium total	USEPA 200.8	ug/L	2000	<0.5	24	2.8	7.6	4.1	7.1
Beryllium total	USEPA 200.8	ug/L	60	<0.1	24	<0.1	<0.1	<0.1	<0.1
Boron total	USEPA 200.7	mg/L	4	<0.01	12	<0.01	<0.01	<0.01	<0.01
Cadmium total	USEPA 200.8	ug/L	2	<0.05	24	<0.05	0.11	<0.05	0.05
Chromium total	USEPA 200.8	ug/L	-	<2	24	<2	<2	<2	<2
Cobalt total	USEPA 200.8	ug/L	-	<0.2	24	<0.2	0.6	<0.2	<0.2
Copper total	USEPA 200.8	ug/L	2000	<1	48	3	37	13	30
Iron total	USEPA 200.7	mg/L	-	<0.01	48	<0.01	0.32	<0.01	0.03
Lead total	USEPA 200.8	ug/L	10	<0.2	48	<0.2	1.6	0.4	1.0

Table 7. Summary data for water quality zone 3: South Canberra, Woden and Weston Creek

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th Percentile
Manganese total	USEPA 200.7	mg/L	0.5	<0.001	48	<0.001	0.349	0.012	0.015
Mercury total	USEPA 200.8	ug/L	1	<0.1	24	<0.1	0.1	<0.1	<0.1
Molybdenium total	USEPA 200.8	ug/L	50	<1	24	<1	<1	<1	<1
Nickel total	USEPA 200.8	ug/L	20	<1	24	<1	1	<1	<1
Selenium total	USEPA 200.8	ug/L	10	<1	24	<1	<1	<1	<1
Silver total	USEPA 200.8	ug/L	100	<1	24	<1	<1	<1	<1
Zinc total	USEPA 200.8	ug/L	-	<5	24	<5	18	5	13
Haloacetic acids									
Bromoacetic acid	ALS: Headspace GCMS	ug/L	-	<5	104	<5	<5	<5	<5
Bromochloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	104	<1	6	2	5
Bromodichloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	104	<1	12	4	10
Chloroacetic acid	ALS: Headspace GCMS	ug/L	150	<1	104	<1	6	3	5
Dibromoacetic Acid	ALS: Headspace GCMS	ug/L	-	<10	104	<10	<10	<10	<10
Dibromochloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	104	5	5	5	5
Dichloroacetic Acid	ALS: Headspace GCMS	ug/L	100	<1	104	1	44	19	38
Tribromoacetic Acid	ALS: Headspace GCMS	ug/L	-	<10	104	<10	<10	<10	<10
Trichloroacetic Acid	ALS: Headspace GCMS	ug/L	100	<1	104	<1	70	27	54
Sum of Haloacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	104	1	134	55	111
Trihalomethanes									
Bromoform	VIC-CM047	mg/L	-	<0.001	104	<0.001	<0.001	<0.001	<0.001
Chloroform	VIC-CM047	mg/L	-	<0.001	104	0.001	0.096	0.034	0.078
Dibromochloromethane	VIC-CM047	mg/L	-	<0.001	104	<0.001	0.001	<0.001	0.001
Bromodichloromethane	VIC-CM047	mg/L	-	<0.001	104	<0.001	0.012	0.004	0.011
Trihalomethanes total	VIC-CM047	mg/L	0.25	<0.001	104	0.001	0.109	0.038	0.088
Semi volatile organic compounds (SVOC) Anilines and benzidines									
2-Nitroaniline	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
3-Nitroaniline	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
3,3'-Dichlorobenzidine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
4-Chloroaniline	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
4-Nitroaniline	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Aniline	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Carbazole	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Dibenzofuran	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Chlorinated hydrocarbons									
1,2-Dichlorobenzene	ALS Headspace GCMS	ug/L	1500	<0.25	24	<0.25	<0.25	<0.25	<0.25
1,2,4-Trichlorobenzene	US EPA 3510/8270	ug/L	30	<2	24	<2	<2	<2	<2
1,3-Dichlorobenzene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
1,4-Dichlorobenzene	ALS Headspace GCMS	ug/L	40	<0.25	24	<0.25	<0.25	<0.25	<0.25
Hexachlorobenzene	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
Hexachlorobutadiene	ALS Headspace GCMS	ug/L	0.7	<0.25	24	<0.25	<0.25	<0.25	<0.25
Hexachlorocyclopentadiene	US EPA 3510/8270	ug/L	-	<10	24	<10	<10	<10	<10
Hexachloroethane	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Hexachloropropylene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Pentachlorobenzene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Haloethers									
4-Bromophenyl phenyl ether	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
4-Chlorophenyl phenyl ether	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2

Table 7. Summary data for water quality zone 3: South Canberra, Woden and Weston Creek

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th Percentile
Bis(2-chloroethoxy) methane	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Bis(2-chloroethyl) ether	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Nitroaromatics and ketones									
1-Naphthylamine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
1,3,5-Trinitrobenzene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2-Picoline	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2,4-Dinitrotoluene	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
2,6-Dinitrotoluene	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
4-Aminobiphenyl	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
4-Nitroquinoline-N-oxide	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
5-Nitro-o-toluidine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Acetophenone	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Azobenzene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Chlorobenzilate	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Dimethylaminoazobenzene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Isophorone	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Nitrobenzene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Pentachloronitrobenzene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Phenacetin	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Pronamide	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Nitrosamines									
Methapyrilene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-Nitrosodibutylamine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-Nitrosodiethylamine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-Nitrosodi-n-propylamine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-Nitrosodiphenyl & Diphenylamine	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
N-Nitrosomethylethylamine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-Nitrosomorpholine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-Nitrosopiperidine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-Nitrosopyrrolidine	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
Organochlorine pesticides									
4,4'-DDD	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
4,4'-DDE	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
4,4'-DDT	US EPA 3510/8270	ug/L	9	<4	24	<4	<4	<4	<4
Aldrin	US EPA 8081/8082	ug/L	0.3	<0.01	24	<0.01	<0.01	<0.01	<0.01
alpha-BHC	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
alpha-Endosulfan	US EPA 3510/8270	ug/L	20	<2	24	<2	<2	<2	<2
beta-BHC	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
beta-Endosulfan	US EPA 3510/8270	ug/L	20	<2	24	<2	<2	<2	<2
delta-BHC	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Dieldrin	US EPA 8081/8082	ug/L	0.3	<0.01	24	<0.01	<0.01	<0.01	<0.01
Endrin	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Endosulfan sulfate	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
gamma-BHC	US EPA 3510/8270	ug/L	10	<2	24	<2	<2	<2	<2
Heptachlor	US EPA 8081/8082	ug/L	0.3	<0.005	24	<0.005	<0.005	<0.005	<0.005
Heptachlor epoxide	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2

Table 7. Summary data for water quality zone 3: South Canberra, Woden and Weston Creek

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th Percentile
Organophosphorous pesticides									
Chlorfenvinphos	US EPA 3510/8270	ug/L	2	<2	24	<2	<2	<2	<2
Chlorpyrifos	US EPA 3510/8270	ug/L	10	<2	24	<2	<2	<2	<2
Chlorpyrifos-methyl	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Diazinon	US EPA 3510/8270	ug/L	4	<2	24	<2	<2	<2	<2
Dichlorvos	US EPA 3510/8270	ug/L	5	<2	24	<2	<2	<2	<2
Dimethoate	US EPA 3510/8270	ug/L	7	<2	24	<2	<2	<2	<2
Ethion	US EPA 3510/8270	ug/L	4	<2	24	<2	<2	<2	<2
Fenthion	US EPA 3510/8270	ug/L	7	<2	24	<2	<2	<2	<2
Malathion	US EPA 3510/8270	ug/L	70	<2	24	<2	<2	<2	<2
Pirimiphos-ethyl	ALS LC-MSMS	ug/L	0.5	<0.01	24	<0.01	<0.01	<0.01	<0.01
Prothiofos	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Phenolic compounds									
2,3,4,6-Tetrachlorophenol	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2,4-Dichlorophenol	US EPA 8270	ug/L	200	<0.1	24	<0.1	<0.1	<0.1	<0.1
2,4-Dimethylphenol	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2,4,5-Trichlorophenol	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2,4,6-Trichlorophenol	US EPA 3510/8270	ug/L	20	<2	24	<2	<2	<2	<2
2,6-Dichlorophenol	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2-Chlorophenol	US EPA 8270	ug/L	300	<0.05	24	<0.05	<0.05	<0.05	<0.05
2-Methylphenol	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2-Nitrophenol	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
3- & 4-Methylphenol	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
4-Chloro-3-Methylphenol	US EPA 3510/8270	ug/L		<2	24	<2	<2	<2	<2
Pentachlorophenol	US EPA 3510/8270	ug/L	10	<4	24	<4	<4	<4	<4
Phenol	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Phthalates									
Bis(2-ethylhexyl) phthalate	US EPA 3510/8270	ug/L	10	<10	24	<10	<10	<10	<10
Bis(2-ethylhexyl) phthalate	US EPA 8270D	ug/L	10	<10	24	<10	<10	<10	<10
Butyl benzyl phthalate	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Butyl benzyl phthalate	US EPA 8270D	ug/L	-	<2	24	<2	<2	<2	<2
Diethyl phthalate	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Diethyl phthalate	US EPA 8270D	ug/L	-	<2	24	<2	<2	<2	<2
Dimethyl phthalate	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Dimethyl phthalate	US EPA 8270D	ug/L	-	<2	24	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 8270D	ug/L	-	<2	24	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 8270D	ug/L	-	<2	24	<2	<2	<2	<2
Polycyclic aromatic hydrocarbons									
2-Chloronaphthalene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2-Methylnaphthalene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
3-Methylcholanthrene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
7,12-Dimethylbenz(a) anthracene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Acenaphthene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Acenaphthene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2

Table 7. Summary data for water quality zone 3: South Canberra, Woden and Weston Creek

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th Percentile
Acenaphthylene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Acenaphthylene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Anthracene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Anthracene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Benz(a)anthracene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Benz(a)anthracene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Benzo(a)pyrene	ALS GCMS-SIM	ug/L	0.01	<0.005	48	<0.005	<0.005	<0.005	<0.005
Benzo(b) fluoranthene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Benzo(k) fluoranthene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Benzo(b) & Benzo(k) fluoranthene	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
Benzo(g.h.i)perylene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Benzo(g.h.i)perylene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Chrysene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Chrysene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Dibenz(a.h)anthracene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Dibenz(a.h)anthracene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Fluoranthene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Fluoranthene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Fluorene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Fluorene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Indeno(1.2.3.cd)pyrene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Indeno(1.2.3-cd)pyrene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-2-Fluorenyl Acetamide	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Phenanthrene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Phenanthrene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Pyrene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Pyrene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
PAHs (total)	US EPA 3510/8270	ug/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 per cent of all the water that passes through the distribution system in this 12 month period falls below.

Where the table lists two distinct data sets for the same analyte, the analyte has been measured in two different suites of screens conducted by the laboratory: semi volatile organic compounds screen and phthalates screen.

Table 8. Summary data for water quality zone 4: Tuggeranong

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th Percentile
Microbiological									
E.Coli	AS 4276.21	MPN/100mL	<1	<1	265	<1	<1	<1	<1
Total coliforms	AS 4276.21	MPN/100mL	-	<1	265	<1	1	<1	<1
Heterotrophic plate count	APHA 9215 B	CFU/mL	-	<1	264	<1	89	3	9
Physical									
Conductivity	APHA 2510 B	uS/cm	-	<2	24	62	191	108	178
pH	APHA 4500-H B	pH units	-	<0.01	265	6.73	8.83	7.80	8.46
Temperature	APHA 4500-H B	deg. C	-	<0.1	50	9.2	25.2	16.9	23.4
Total dissolved solids	APHA 2540 C	mg/L	-	<10	24	36	128	66	119
True colour	APHA 2120 B	Pt/Co	-	<1	49	<1	2	<1	2
Turbidity	APHA 2130 B	NTU	-	<0.1	49	0.1	0.7	0.3	0.6
Inorganic									
Alkalinity bicarb	APHA 2320 A/B	mg/L	-	<0.1	48	32.8	48.7	39.0	46.1
Alkalinity carb	APHA 2320 A/B	mg/L	-	<0.1	48	<0.1	0.8	<0.1	<0.1
Alkalinity hydrox	APHA 2320 A/B	mg/L	-	<0.1	48	<0.1	<0.1	<0.1	<0.1
Alkalinity total	APHA 2320 A/B	mg/L	-	<1	48	33	49	39	46
Aluminium acid soluble	USEPA 200.8	ug/L	-	<5	24	17	68	30	38
Asbestos	AS4964-2000	g/kg	-	Absent	12	Absent	Absent	Absent	Absent
Calcium dissolved	USEPA 200.7	mg/L	-	<0.05	24	10.70	101.00	16.00	18.65
Chloride	APHA 21st Ed. 2005, Part 4110 B	mg/L	-	<0.1	12	2.5	28.3	6.9	17.0
Chlorine combined	APHA 4500 -CL G	mg/L	-	<0.03	265	<0.03	0.26	0.06	0.19
Chlorine free	APHA 4500 -CL G	mg/L	-	<0.03	265	0.04	1.59	0.89	1.23
Chlorine total	APHA 4500 -CL G	mg/L	5	<0.03	265	0.11	1.68	0.95	1.30
Cyanide	APHA 4500_CN	mg/L	0.08	<0.004	12	<0.004	<0.004	<0.004	<0.004
Flouride	APHA 21st Ed. 2005, Part 4110 B	mg/L	1.5	<0.05	24	0.70	0.94	0.80	0.92
Hardness total	APHA 2340 B	mg/L	-	<1	24	31	288	46	63
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	0.80	9.01	1.46	3.92
Nitrate	APHA 21st Ed. 2005, Part 4110 B	mg/L N	50	<0.1	12	<0.1	0.3	0.2	0.3
Potassium dissolved	USEPA 200.7	mg/L	-	<0.1	12	0.4	4.6	0.9	2.5
Sodium dissolved	USEPA 200.7	mg/L	-	<0.1	12	2.6	32.3	5.4	16.5
Sulphate	APHA 21st Ed. 2005, Part 4110 B	mg/L SO4	-	<0.4	12	3.1	23.5	5.2	14.2
Total metals									
Aluminium total	USEPA 200.8	ug/L	-	<9	24	23	67	37	51
Antimony total	USEPA 200.8	ug/L	3	<3	24	<3	<3	<3	<3
Arsenic total	USEPA 200.8	ug/L	10	<1	24	<1	<1	<1	<1
Barium total	USEPA 200.8	ug/L	2000	<0.5	24	2.7	7.9	4.0	7.1
Beryllium total	USEPA 200.8	ug/L	60	<0.1	24	<0.1	<0.1	<0.1	<0.1
Boron total	USEPA 200.7	mg/L	4	<0.01	12	<0.01	<0.01	<0.01	<0.01
Cadmium total	USEPA 200.8	ug/L	2	<0.05	24	<0.05	<0.05	<0.05	<0.05
Chromium total	USEPA 200.8	ug/L	-	<2	24	<2	<2	<2	<2
Cobalt total	USEPA 200.8	ug/L	-	<0.2	24	<0.2	<0.2	<0.2	<0.2
Copper total	USEPA 200.8	ug/L	2000	<1	48	1	120	14	30
Iron total	USEPA 200.7	mg/L	-	<0.01	49	<0.01	0.04	<0.01	0.02
Lead total	USEPA 200.8	ug/L	10	<0.2	48	<0.2	1.1	<0.2	0.5

Table 8. Summary data for water quality zone 4: Tuggeranong

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th Percentile
Manganese total	USEPA 200.7	mg/L	0.5	<0.001	48	<0.001	0.022	0.004	0.012
Mercury total	USEPA 200.8	ug/L	1	<0.1	25	<0.1	0.1	<0.1	<0.1
Molybdenium total	USEPA 200.8	ug/L	50	<1	24	<1	<1	<1	<1
Nickel total	USEPA 200.8	ug/L	20	<1	24	<1	<1	<1	<1
Selenium total	USEPA 200.8	ug/L	10	<1	24	<1	<1	<1	<1
Silver total	USEPA 200.8	ug/L	100	<1	24	<1	<1	<1	<1
Zinc total	USEPA 200.8	ug/L	-	<5	24	<5	8	<5	5
Haloacetic acids									
Bromoacetic acid	ALS: Headspace GCMS	ug/L	-	<5	104	<5	<5	<5	<5
Bromochloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	104	<1	8	2	6
Bromodichloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	104	<1	12	4	10
Chloroacetic acid	ALS: Headspace GCMS	ug/L	150	<1	104	<1	8	3	6
Dibromoacetic Acid	ALS: Headspace GCMS	ug/L	-	<10	104	<10	<10	<10	<10
Dibromochloroacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	104	5	5	5	5
Dichloroacetic Acid	ALS: Headspace GCMS	ug/L	100	<1	104	7	70	22	45
Tribromoacetic Acid	ALS: Headspace GCMS	ug/L	-	<10	104	<10	<10	<10	<10
Trichloroacetic Acid	ALS: Headspace GCMS	ug/L	100	<1	104	10	88	32	60
Sum of Haloacetic Acid	ALS: Headspace GCMS	ug/L	-	<1	104	19	185	62	125
Trihalomethanes									
Bromoform	VIC-CM047	mg/L	-	<0.001	104	<0.001	<0.001	<0.001	<0.001
Chloroform	VIC-CM047	mg/L	-	<0.001	104	<0.001	0.100	0.040	0.087
Dibromochloromethane	VIC-CM047	mg/L	-	<0.001	104	<0.001	0.001	<0.001	0.001
Bromodichloromethane	VIC-CM047	mg/L	-	<0.001	104	<0.001	0.014	0.004	0.012
Trihalomethanes total	VIC-CM047	mg/L	0.25	<0.001	104	<0.001	0.115	0.045	0.099
Semi volatile organic compounds (SVOC) Anilines and benzidines									
2-Nitroaniline	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
3-Nitroaniline	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
3,3′-Dichlorobenzidine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
4-Chloroaniline	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
4-Nitroaniline	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Aniline	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Carbazole	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Dibenzofuran	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Chlorinated hydrocarbons									
1,2-Dichlorobenzene	ALS Headspace GCMS	ug/L	1500	<0.25	24	<0.25	<0.25	<0.25	<0.25
1,2,4-Trichlorobenzene	US EPA 3510/8270	ug/L	30	<2	24	<2	<2	<2	<2
1,3-Dichlorobenzene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
1,4-Dichlorobenzene	ALS Headspace GCMS	ug/L	40	<0.25	24	<0.25	<0.25	<0.25	<0.25
Hexachlorobenzene	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
Hexachlorobutadiene	ALS Headspace GCMS	ug/L	0.7	<0.25	24	<0.25	<0.25	<0.25	<0.25
Hexachlorocyclopentadiene	US EPA 3510/8270	ug/L	-	<10	24	<10	<10	<10	<10
Hexachloroethane	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Hexachloropropylene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Pentachlorobenzene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Haloethers									
4-Bromophenyl phenyl ether	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
4-Chlorophenyl phenyl ether	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2

Table 8. Summary data for water quality zone 4: Tuggeranong

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th Percentile
Bis(2-chloroethoxy) methane	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Bis(2-chloroethyl) ether	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Nitroaromatics and ketones									
1-Naphthylamine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
1,3,5-Trinitrobenzene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2-Picoline	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2,4-Dinitrotoluene	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
2,6-Dinitrotoluene	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
4-Aminobiphenyl	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
4-Nitroquinoline-N-oxide	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
5-Nitro-o-toluidine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Acetophenone	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Azobenzene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Chlorobenzilate	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Dimethylaminoazobenzene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Isophorone	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Nitrobenzene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Pentachloronitrobenzene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Phenacetin	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Pronamide	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Nitrosamines									
Methapyrilene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-Nitrosodibutylamine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-Nitrosodiethylamine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-Nitrosodi-n-propylamine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-Nitrosodiphenyl & Diphenylamine	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
N-Nitrosomethylethylamine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-Nitrosomorpholine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-Nitrosopiperidine	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-Nitrosopyrrolidine	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
Organochlorine pesticides									
4,4′-DDD	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
4,4′-DDE	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
4,4′-DDT	US EPA 3510/8270	ug/L	9	<4	24	<4	<4	<4	<4
Aldrin	US EPA 8081/8082	ug/L	0.3	<0.01	24	<0.01	<0.01	<0.01	<0.01
alpha-BHC	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
alpha-Endosulfan	US EPA 3510/8270	ug/L	20	<2	24	<2	<2	<2	<2
beta-BHC	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
beta-Endosulfan	US EPA 3510/8270	ug/L	20	<2	24	<2	<2	<2	<2
delta-BHC	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Dieldrin	US EPA 8081/8082	ug/L	0.3	<0.01	24	<0.01	<0.01	<0.01	<0.01
Endrin	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Endosulfan sulfate	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
gamma-BHC	US EPA 3510/8270	ug/L	10	<2	24	<2	<2	<2	<2
Heptachlor	US EPA 8081/8082	ug/L	0.3	<0.005	24	<0.005	<0.005	<0.005	<0.005
Heptachlor epoxide	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2

Table 8. Summary data for water quality zone 4: Tuggeranong

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th Percentile
Organophosphorous pesticides									
Chlorfenvinphos	US EPA 3510/8270	ug/L	2	<2	24	<2	<2	<2	<2
Chlorpyrifos	US EPA 3510/8270	ug/L	10	<2	24	<2	<2	<2	<2
Chlorpyrifos-methyl	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Diazinon	US EPA 3510/8270	ug/L	4	<2	24	<2	<2	<2	<2
Dichlorvos	US EPA 3510/8270	ug/L	5	<2	24	<2	<2	<2	<2
Dimethoate	US EPA 3510/8270	ug/L	7	<2	24	<2	<2	<2	<2
Ethion	US EPA 3510/8270	ug/L	4	<2	24	<2	<2	<2	<2
Fenthion	US EPA 3510/8270	ug/L	7	<2	24	<2	<2	<2	<2
Malathion	US EPA 3510/8270	ug/L	70	<2	24	<2	<2	<2	<2
Pirimiphos-ethyl	ALS LC-MSMS	ug/L	0.5	<0.01	24	<0.01	<0.01	<0.01	<0.01
Prothiofos	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Phenolic compounds									
2,3,4,6-Tetrachlorophenol	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2,4-Dichlorophenol	US EPA 8270	ug/L	200	<0.1	24	<0.1	<0.1	<0.1	<0.1
2,4-Dimethylphenol	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2,4,5-Trichlorophenol	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2,4,6-Trichlorophenol	US EPA 3510/8270	ug/L	20	<2	24	<2	<2	<2	<2
2,6-Dichlorophenol	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2-Chlorophenol	US EPA 8270	ug/L	300	<0.05	24	<0.05	<0.05	<0.05	<0.05
2-Methylphenol	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2-Nitrophenol	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
3- & 4-Methylphenol	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
4-Chloro-3-Methylphenol	US EPA 3510/8270	ug/L		<2	24	<2	<2	<2	<2
Pentachlorophenol	US EPA 3510/8270	ug/L	10	<4	24	<4	<4	<4	<4
Phenol	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Phthalates									
Bis(2-ethylhexyl) phthalate	US EPA 3510/8270	ug/L	10	<10	24	<10	<10	<10	<10
Bis(2-ethylhexyl) phthalate	US EPA 8270D	ug/L	10	<10	24	<10	<10	<10	<10
Butyl benzyl phthalate	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Butyl benzyl phthalate	US EPA 8270D	ug/L	-	<2	24	<2	<2	<2	<2
Diethyl phthalate	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Diethyl phthalate	US EPA 8270D	ug/L	-	<2	24	<2	<2	<2	<2
Dimethyl phthalate	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Dimethyl phthalate	US EPA 8270D	ug/L	-	<2	24	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Di-n-butyl phthalate	US EPA 8270D	ug/L	-	<2	24	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Di-n-octylphthalate	US EPA 8270D	ug/L	-	<2	24	<2	<2	<2	<2
Polycyclic aromatic hydrocarbons									
2-Chloronaphthalene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
2-Methylnaphthalene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
3-Methylcholanthrene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
7,12-Dimethylbenz(a) anthracene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Acenaphthene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Acenaphthene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2

Table 8. Summary data for water quality zone 4: Tuggeranong

Analyte	Method ID	Units	ADWG (Health)	Limit of Reporting	No. of Samples	Min.	Max.	Mean	95th Percentile
Acenaphthylene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Acenaphthylene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Anthracene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Anthracene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Benz(a)anthracene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Benz(a)anthracene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Benzo(a)pyrene	ALS GCMS-SIM	ug/L	0.01	<0.005	48	<0.005	<0.005	<0.005	<0.005
Benzo(b) fluoranthene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Benzo(k) fluoranthene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Benzo(b) & Benzo(k) fluoranthene	US EPA 3510/8270	ug/L	-	<4	24	<4	<4	<4	<4
Benzo(g.h.i)perylene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Benzo(g.h.i)perylene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Chrysene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Chrysene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Dibenz(a.h)anthracene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Dibenz(a.h)anthracene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Fluoranthene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Fluoranthene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Fluorene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Fluorene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Indeno(1.2.3.cd)pyrene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Indeno(1.2.3-cd)pyrene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
N-2-Fluorenyl Acetamide	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Naphthalene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Phenanthrene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
Phenanthrene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Pyrene	US EPA 3510/8270	ug/L	-	<1	24	<1	<1	<1	<1
Pyrene	US EPA 3510/8270	ug/L	-	<2	24	<2	<2	<2	<2
PAHs (total)	US EPA 3510/8270	ug/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 per cent of all the water that passes through the distribution system in this 12 month period falls below.

Where the table lists two distinct data sets for the same analyte, the analyte has been measured in two different suites of screens conducted by the laboratory: semi volatile organic compounds screen and phthalates screen.

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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
MIB	2-methylisoborneol
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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