ACTEW WATER

# Annual Drinking Water Quality Report 2012–13

# Contents

# Summary

## ACTEW Water[1] is committed to providing high quality water to the Canberra community.

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

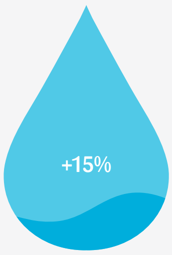
The population of Canberra and Queanbeyan is currently increasing by approximately 2.2 per cent per year. Permanent Water Conservation Measures have been in place since November 2010.

Storage reservoir volumes were lower at the end of 2012–13 with Canberra's four storage reservoirs holding 85.2 per cent of their total capacity; this compares with 99.3 per cent of capacity at the end of June 2012.

This report covers the period of 1 July 2012 to 30 June 2013.

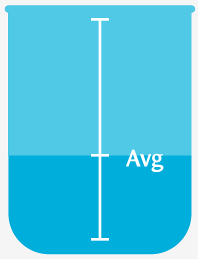
1 ACTEW Water is a business name owned by ACTEW Corporation Limited ABN 86 069 381 960

Water supplied up 15%

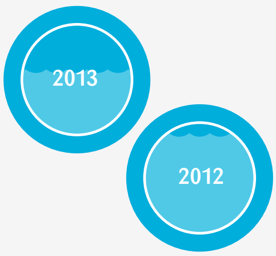



Daily consumption was 90–228 ML

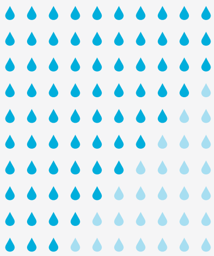

Average person consumed 312 L/day




Storage volumes down 14.2%




Rainfall 27% below average



Evaporation 5% above average

# 1. Canberra's drinking water supply system

ACTEW Water relies on four storage reservoirs in two catchment areas and the Murrumbidgee River for its drinking water supply.

The Cotter River catchment to the south-west of Canberra has an area of 480 square kilometres ($km^2$) and forms a major part of Canberra's water supply. The Cotter River contains three storage reservoirs – Corin (70.9 gigalitres (GL)), Bendora (11.5 GL) and Cotter (3.8 GL). The majority of the catchment is within the Namadgi National Park and is protected from human and domestic animal activities and faecal contamination, as well as other pollutants associated with urban development.

The Queanbeyan River catchment, with an area of 873 $km^2$, contains the Googong reservoir (121.5 GL). This catchment, located to the south-east of Canberra, contains both developed and impacted land, which includes forestry reserves, rural pasture and rural residential properties. NSW state agencies and local government councils regulate land planning and manage activities in this catchment. Parks and Conservation Services (PCS) manage the immediate area around the Googong reservoir and recreational access to the water body and foreshore.

The Murrumbidgee to Googong Water Transfer is able to transfer up to 100 ML of water per day from Angle Crossing on the Murrumbidgee River via a 12 km underground pipeline to Burra Creek in NSW which flows into the Googong reservoir.

Water from the Murrumbidgee River is blended with water from Cotter and Bendora reservoirs for treatment. The Murrumbidgee catchment area of 6,826 $km^2$ is located to the south of Canberra and includes a wide variety of agricultural land uses, as well as the towns of Cooma, Numeralla, Bredbo and the suburbs of Tuggeranong.

ACTEW Water operates two water treatment plants (WTP), Mount Stromlo WTP to the west of the city of Canberra and Googong WTP to the east. Mount Stromlo WTP receives water from the Cotter and Murrumbidgee catchments for treatment, while Googong WTP treats water from the Googong reservoir.

Treated water is delivered to customers through 47 service reservoirs, 23 pump stations and over 3,080 km of water mains. The network is operated using advanced remote monitoring and control systems.

# 2. Managing Canberra's drinking water supply

ACTEW Water applies a multiple-barrier approach throughout its operations to protect the water supply from contaminants, including pathogenic microorganisms.

The drinking water supply barriers include the following:

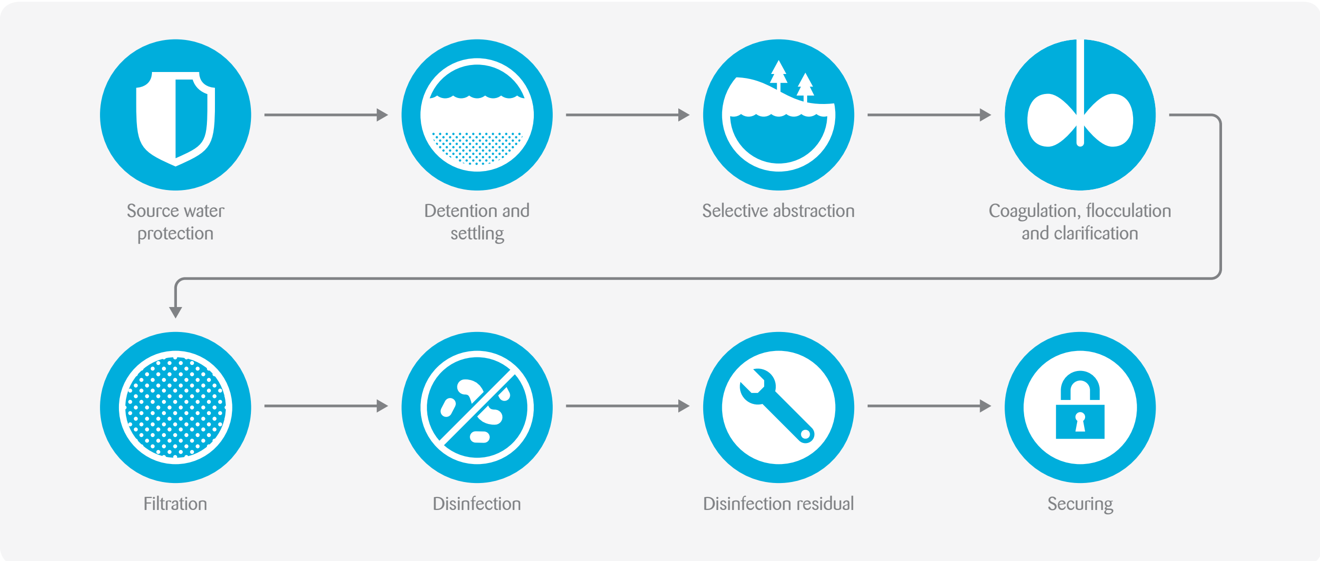
- Source water protection to reduce contamination risks to water sources.
- Detention and settling of contaminants in the storage reservoirs.
- Selective abstraction to ensure that raw water quality is appropriate for treatment.
- Coagulation, flocculation, clarification (at Googong water treatment plant only) and dissolved air flotation.
- Filtration
- Disinfection of treated water using chlorine and UV (at Mt Stromlo water treatment plant only).
- Disinfection residual in treated water throughout the distribution system.
- Securing the distribution system against possible recontamination.

ACTEW Water's drinking water quality monitoring program enables the early identification of possible points of entry of harmful microorganisms and other substances so the source can be appropriately managed and the risk eliminated.

The drinking water quality monitoring program measures physical, chemical and microbiological parameters of the water supplied to customers.

The water quality testing results are verified with the recommended levels in the Australian Drinking Water Guidelines (2011) (ADWG). The guidelines include two different types of values. A health related guideline value, which is the concentration or measure of a water quality characteristic that based on current knowledge does not result in any significant risk to the consumer over a lifetime of consumption; and, an aesthetic value, which is the concentration or measure of a water quality characteristic that is associated with acceptability of water to the consumer; for example appearance, taste and odour.

Figure 2.1 Drinking water supply barriers




# Management framework

ACTEW Corporation (under the business name ACTEW Water) holds the Drinking Water Utilities Licence issued by ACT Health under the Public Health Act 1997 and the Utilities Service Licence issued by Independent Competition and Regulatory Commission (ICRC) under the Utilities Act 2000 (ACT). These licences allow ACTEW Water to operate a drinking water distribution and supply service.

ACTEW Water operates the water supply system under a Policy and Process Document System to meet quality, environmental, regulatory and occupational health and safety requirements. This system is third-party certified and audited and complies with Australian and international standards AS/NZS ISO 9001, AS/NZS ISO 14001, AS4801 and Codex Alimentarius Alinorm 97/13a. ACTEW Water uses a preventive management approach to ensure the risks to water quality are minimised. A key component is a Hazard Analysis and Critical Control Point (HACCP) system which covers water production from the catchment to the customer's tap. The externally certified HACCP system is designed specifically to suit the water supply process and enhance the organisation's ability to meet the challenges of managing drinking water quality from the catchment to the tap. HACCP works with ACTEW Water's International Standards-based (ISO 9001) quality system to help manage the risks to drinking water quality. In 2012–13, ACTEW Water maintained the independent HACCP certification, ensuring that the management of Canberra's drinking water quality is undergoing continuous evaluation and improvement.

The Policy and Process Document System incorporates HACCP, quality, environmental and occupational health and safety requirements, and contains procedures, processes and work instructions for operating and managing the water and sewerage network assets. The Policy and Process Document System has been under continual development and refinement as part of ACTEW Water's continuous improvement program.

# 3. Canberra's source water catchments

Canberra's source water catchments consist of Corin, Bendora and Cotter storage reservoirs on the Cotter River, Murrumbidgee River and the Googong storage reservoir on the Queanbeyan River.

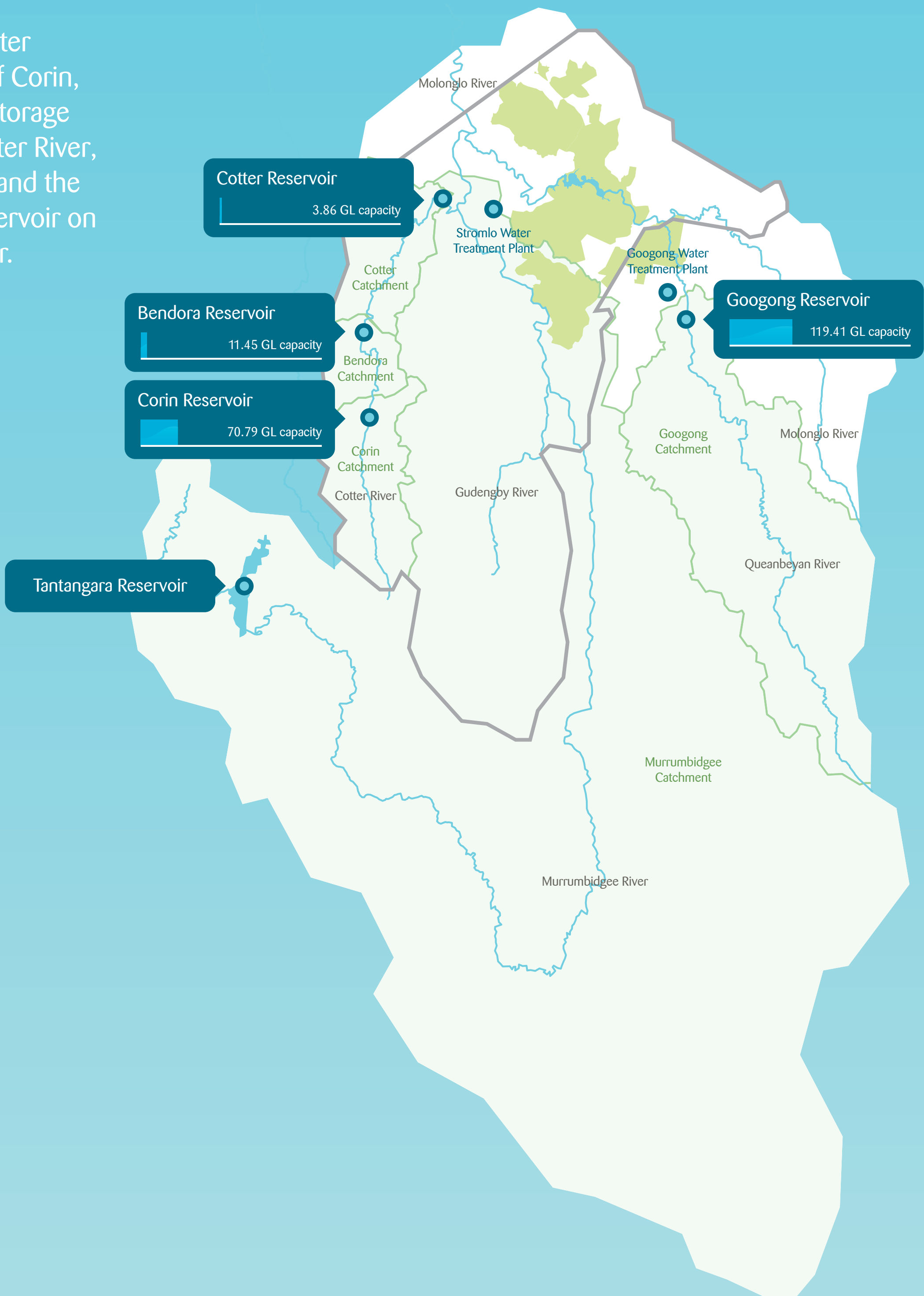


Table 3.1 Rainfall, evaporation and reservoir capacity for 2012-13

| Total Rainfall (mm) | 5 yr average rainfall (mm) | Evaporation (mm) | Total reservoir capacity (end 2013) |
|---|---|---|---|
| 470 | 644 | 1676 | 85.2% |

The Cotter River reservoirs currently have an accessible combined capacity of 86.3GL, which were 63.2 per cent full at the end of June 2013. The Enlarged Cotter Dam project progressed throughout 2012–13, and water was not abstracted from the Cotter storage reservoir during this time. The new dam will increase the capacity of the Cotter reservoir from 4 GL to 78 GL but was not included in water storage calculations at the end of June 2013.

The Googong reservoir on the Queanbeyan River is the largest of the four water supply reservoirs. At the end of June 2013 Googong Reservoir was at 100 per cent capacity.

When necessary, water may also be abstracted from the Murrumbidgee River and blended with water from the Cotter River catchment reservoirs for treatment at the Mount Stromlo WTP. During 2012–13 no water was abstracted from the Murrumbidgee River.

The Murrumbidgee to Googong water transfer was operated for maintenance purposes only during 2012–13.

ACTEW Water supplied 47,815 ML of drinking water to Canberra and Queanbeyan during 2012–13, representing an increase in supply of 14 per cent compared to the 2011–12 period. The most recent estimates put Canberra's population at 380,000 and Queanbeyan at 40,000. Annual population growth is tracking at an average of 2%. On average, daily consumption ranged from a minimum 90 ML in October to a maximum of 228 ML in January. Per capita consumption was 312 litres per person per day.

Figure 3.1 Reservoir storage levels at 30 June 2013

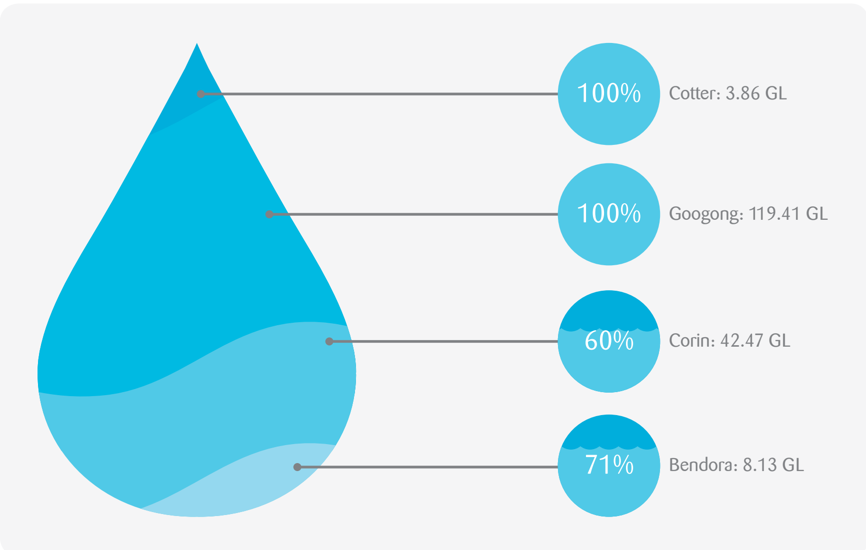



Figure 3.2 Source of drinking water supply for 2012–13

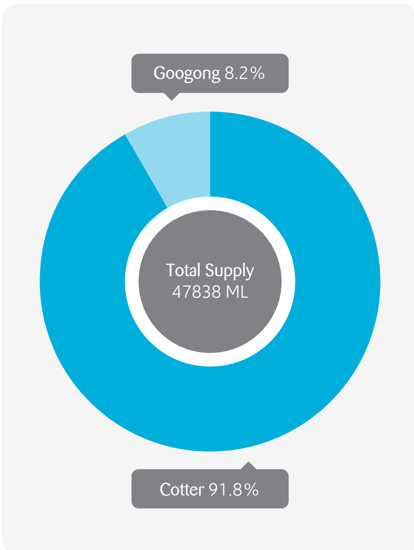
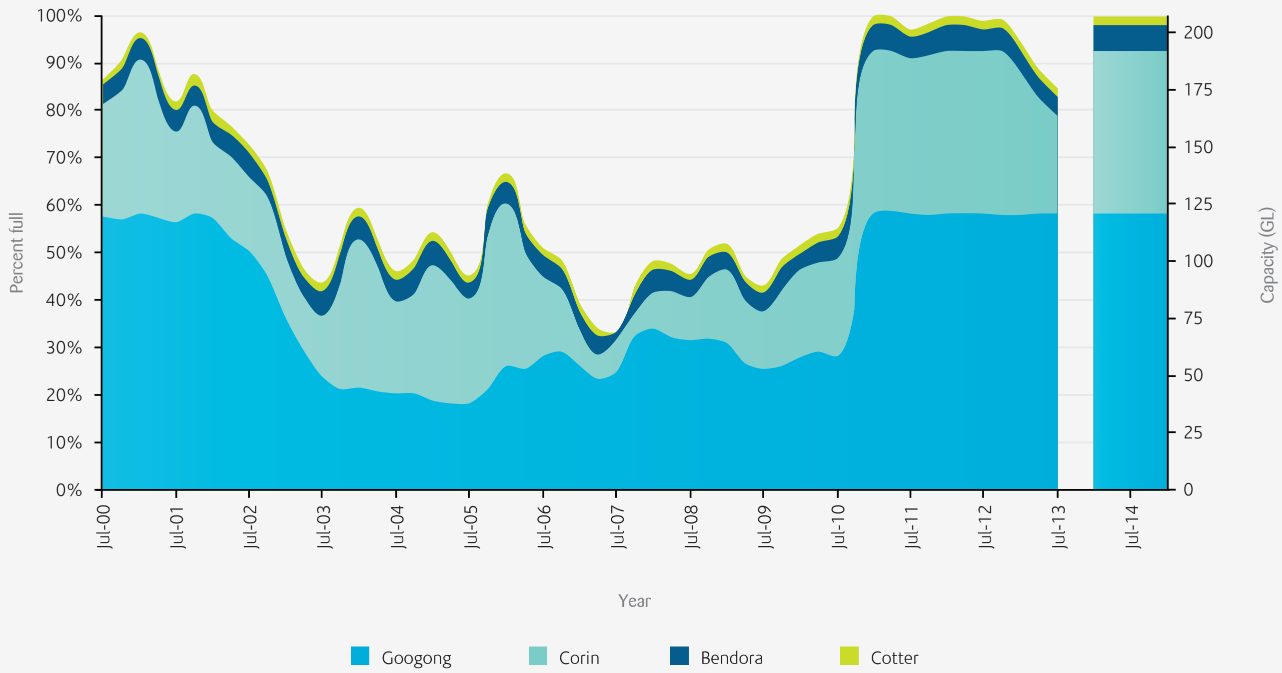


Figure 3.3 Reservoir storage as a percentage of the combined capacity of Corin, Bendora, Cotter and Googong dams from 2000–2013.



# Water security projects

ACTEW Water continued to provide high quality drinking water to the ACT and Queanbeyan, and maintained an ongoing focus on ensuring water security, as well as addressing the issues of drought and climate variability.

## Cotter Dam

The Enlarged Cotter Dam drew close to completion in the 2012/13 financial year. By June 2013 the final height of 80 metre tall dam had been reached and the old Cotter Dam submerged as the new wall began to impound water. There are several concrete pours left to be competed in the stilling basin downstream of the wall.

Demobilisation of the site began with the decommissioning of the second concrete batch plant and preparations are being progressed to rehabilitate the site post constructions works.

It is expected that commissioning and final site demobilisation will be completed by September 2013.

## The Murrumbidgee to Googong Water Transfer

The Murrumbidgee to Googong Water Transfer project concluded in August 2012. The project enables the transfer of up to a maximum of 100 megalitres of water per day from the Murrumbidgee River through a 12 kilometre underground pipeline to Burra Creek in NSW.

## Water restrictions

Permanent Water Conservation Measures have been in place since 1 November 2010. The Queanbeyan City Council implemented water restrictions and conservation measures identical to the ACT program.

# Source Water Protection program

The Source Water Protection program (SWPP) is a service delivered by ACTEW Water's Safety, Environment, Quality and Regulation Group. It is responsible for assessing and managing potential risks to the quality of source water supply through targeted work within the ACT drinking water catchments. 2012–13 marked the end of the five year proof-of-concept phase for the SWPP, which has now been fully integrated in ACTEW Water operations.

ACTEW Water has adopted the Australian Drinking Water Guideline (ADWG) recommendations to identify and mitigate potential contamination hazards within the catchments as a means to protect the quality of water sources for potable water supply. The ADWG recognises that '*catchment management and source water protection provide the first barrier for the protection of water quality*.'

## SWPP Activities 2012–13

### Hazard identification and Risk assessment

During its 2008–2013 pilot phase, the SWPP has built a knowledge base of physical condition for each catchment. Extensive desktop GIS and ground-truthing has been undertaken to identify and map hazards which pose a risk to water quality in the drinking water catchments. This information has been used to drive decision making and prioritisation of work in the catchments to lower the risk of contamination of source waters.

In 2012–13, the SWPP developed a tool which will use gathered data to generate risk ratings specific to sub-catchments within the drinking water catchments. This will guide future site prioritisation and investment. The tool incorporates data from sub-catchments and monitoring points to deliver a greater level of detail to inform understanding of risks to drinking water quality.

The risk management principles of the ADWG are:

- Multiple barriers are required to protect drinking water quality;
- The most efficient barrier is protection of source waters rather than reliance on treatment;
- Source waters should be protected to the maximum degree practicable;
- Water quality should be maintained at the highest practicable quality; and,
- Water quality should not be degraded even if it is currently of better quality than the minimum required.

The SWPP has continued to build upon a hazard notification system which allows ACTEW Water to receive regular updates from a range of stakeholders responsible for the management of potentially hazardous activities within the catchments. These include broad scale pesticide use, hazard reduction burns, development applications and agrichemical policy.

In addition to hazard notification, ACTEW Water continues to actively engage with community groups, government and landholders working within the catchments to collect information about projects which deliver a positive contribution in the catchments. These inputs and actions contribute to ACTEW Water's understanding of the overall condition of each catchment.

### Risk mitigation and control

In 2012–13, ACTEW Water continued its project with Greening Australia to deliver a program to reduce the risk of pathogen contamination to Burra Creek, within the Googong catchment. Landholders are incentivised to install fencing on creeks where stock have direct access and can defecate in the water. Planting in the fenced riparian zone can further reduce the risk as the plants intercept runoff carrying faecal matter, as well as stabilising banks and reducing the risk of erosion. Eight landholders have participated in this project. A similar project, in partnership with the Murrumbidgee Catchment Management Authority, was initiated in the Michelago area in late 2012.

Following the closure of the public thoroughfare through the Cotter River at Vanity's Crossing this year, ten dumped vehicles were removed from the Cotter River corridor below Vanity's Crossing Road. This area had been identified as a high risk for contamination of the Cotter Reservoir after completion of the new dam wall. The cars which were removed would have been below the waterline once the new reservoir filled, potentially polluting the water with hydrocarbons, heavy metals and other chemicals. This project was completed in close collaboration with the ACT Government's Parks and Conservation Service (PCS).

In conjunction with two partner organisations, the SWPP surveyed over 200 landholders in the drinking water catchments to collect information on factors which contribute to or detract from landholders undertaking natural resource management activities which contribute to water quality protection on their properties. The data collected has been used to inform the SWPP's approach to landholder engagement in the drinking water catchments.

## Knowledge and understanding

Through its grant program, the SWPP has worked with partners to deliver the following activities:

- The production and distribution of an educational film, Triple Trickle: A Journey into Canberra's 3 Drinking Water Catchments. This film has been provided for free to all ACT public schools.
- Delivery of NSW Department of Primary Industries training in best practice land management for 15 landholders in the ACT drinking water catchments.
- Education and engagement programs with schools and the community in Tuggeranong and Cooma.
- Support for the maintenance of the Southern ACT Catchment Group herbicide spray trailer. Landholders in the drinking water catchment may borrow the trailer, providing the SWPP and the catchment group with the opportunity to raise awareness of the potential of herbicides to contaminate drinking water sources and promote best practice use of these chemicals.
- The SWPP has continued its approach of writing articles for inclusion in newsletters which are distributed to its target audiences. A focus this year has been on best practice use of pesticides. SWPP staff attended local forums for landholders and other land managers to increase awareness of water quality protection among this key stakeholder group.

## Partnerships, engagement and capacity building

The SWPP works with drinking water catchment stakeholders to identify opportunities to develop collaborative projects and advocate for works that will improve and maintain water quality.

In 2012-13, ACTEW Water through the SWPP has continued to hold positions on the executive committees of the Southern ACT Catchment Group, Tuggeranong Lake Carers and Upper Murrumbidgee Catchment Coordinating Committee. The SWPP has also maintained its role as one of the key drivers behind the multi-stakeholder cross-border Actions For Clean Water plan, which addresses turbidity in the Upper Murrumbidgee.

The SWPP conducted a survey of its key stakeholders in May 2013. Responses indicate a high level of satisfaction with the SWPP's activities and relationships, with 100% of respondents selecting that they were 'satisfied' or 'very satisfied' with their relationship with the SWPP, and 100% indicating that the SWPP has made 'some contribution' or 'contributed substantially' to the natural resource management sector in the region. Respondents commented that the influence of the SWPP has been 'unifying and galvanising', and that 'SWPP has made significant contributions to regional water quality that would not have otherwise occurred.'

## Source Water Protection Program 2013-2018

The SWPP has finalised a five year strategy to guide its work over the next regulatory period. This strategy provides a framework for the program to continue to capitalise on the work carried out through its pilot phase, while also allowing flexibility to respond to emerging issues in water quality protection. Unpredictable climatic conditions, extreme weather events and regional population growth are likely to be key challenges to maintaining the high quality of the ACT's source waters in future.

Responses indicate a high level of satisfaction with the SWPP's activities and relationships, with 100% of respondents selecting that they were 'satisfied' or 'very satisfied' with their relationship with the SWPP.

# Water quality in the raw water sources

ACTEW Water undertakes an extensive sampling and analysis program, monitoring water quality in the storage reservoirs and the Murrumbidgee River. The program, which is developed in consultation with ACT Health, is continuously reviewed and managed to ensure it incorporates changes to the supply system and includes emerging issues in drinking water supply management.

The raw water storage reservoirs assist to stabilise water quality through detention and settling of contaminants, although there are times when high inflows stir-up sediments or currents mix the reservoirs. Water offtakes at regular intervals in each of the reservoirs enable the most suitable quality water to be abstracted for treatment.

## Blue-green algae in the reservoirs

Cyanobacteria or Blue-green algae occurs naturally in water bodies, however when conditions are favourable, they grow into excessive numbers termed blooms. Blue-green algae blooms of Anabaena circinalis and Microcystis aeruginosa can produce taste and odour compounds and toxins that are dangerous to humans and animals.

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

Under the Drinking Water (Public Health) Code of Practice (2007), ACT Health is consulted if elevated levels of blue-green algae are detected and the regular monitoring program is expanded. Management options available during blue-green algal blooms include selective depth abstraction of water for treatment, additional treatment (Googong WTP) and changing water sources.

In the warmer months of 2012–13 concentrations of blue-green algae in the Googong reservoir were slightly elevated. Due to storage volumes remaining high, Googong WTP was not operated during the warmer months.

## Pesticide and herbicide monitoring in drinking water supplies

Extensive monitoring for pesticides and herbicides is undertaken in all drinking water sources. During 2012-13 there were no pesticide detections above ADWG Health values in any of the 4 storage reservoirs or the Murrumbidgee River.

ACTEW Water's SWPP is working hard with landholders, PCS and spraying contractors to increase the awareness of the risks to the aquatic environment and to drinking water through pesticide spraying within source water catchments. ACTEW Water regularly consults with PCS who manage weed control within the catchments, to ensure the risks to water quality are monitored and controlled effectively.

Table 3.2 Parameters monitored in raw water sources

| Physiochemical | Chemical | Biological |
|---|---|---|
| Temperature | Total and dissolved organic carbon | Total coliforms |
| Conductivity | Nitrogen incl. oxidised N and ammonia | E.coli |
| Turbidity | Phosphorous incl. phosphate | Heterophopic bacteria |
| Alkalinity | Chlorophyll-a | Phytoplankton incl. blue-green algae |
| Colour | Total dissolved metals | Cryptosporidium and Giardia |
| UV absorbance | Herbicides and pesticides | |
| pH | Polyaromatic hydrocarbons | |
| Dissolved oxygen | Radionuclides | |
| | Taste and odour compunds | |

# 4. Water treatment operations

ACTEW Water operates two water treatment plants (WTPs) – the Mount Stromlo WTP treating water from the Cotter River catchment reservoirs and the Murrumbidgee River and the Googong WTP treating water from Googong reservoir on the Queanbeyan River.

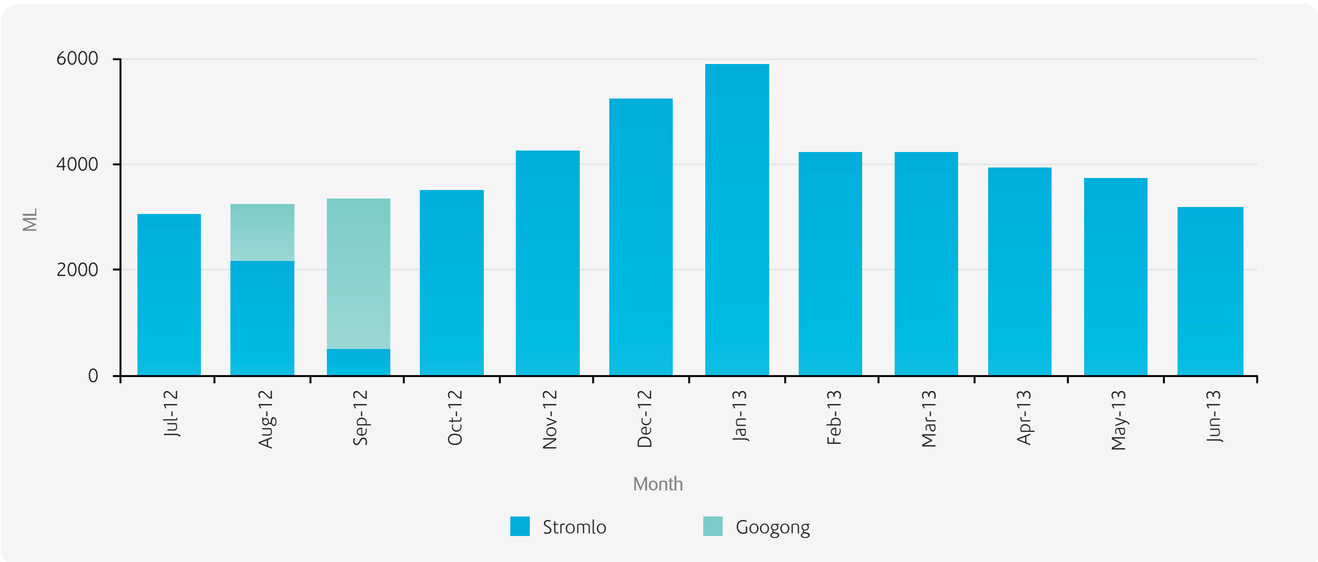
Under ACTEW Water's HACCP-based water quality management system eight Critical Control Points are applied in the supply system to ensure the ACT and Queanbeyan receive high-quality drinking water. Five of these critical control points exist in the WTP operations, highlighting the importance of the water treatment operations to the delivery of high-quality water.

In 2012–13 the Mount Stromlo WTP supplied 91.8 per cent of Canberra's water, which equates to a total of 44 GL. The Googong WTP supplied a total of 8.2 percent or 3.9 GL of water in 2012–13.

Table 4.1 WTP operations for supply of drinking water for 2012–13

| | Volume Supplied | Proportion of total |
|---|---|---|
| Mount Stromlo | 44 GL | 91.8% |
| Googong | 3.9 GL | 8.2% |

Figure 4.1 Treated water production



## Mount Stromlo WTP

Mount Stromlo WTP has a treatment capacity of 250 ML of water per day. Treatment processes are designed to remove contaminants from drinking water. The WTP can operate in two treatment process modes – direct filtration and dissolved air flotation and filtration (DAFF). The dissolved air flotation treatment step is an optional treatment step which enhances treatment capabilities when poorer raw water quality is treated. The treatment process is listed below.

- Pre-treatment for pH adjustment and stabilisation with lime and carbon dioxide.
- Coagulation by liquid alum and/or polyaluminium chloride.
- Flocculation.
- Dissolved air flotation (if enabled).
- Filtration.
- Fluoridation by sodium fluorosilicate.
- Disinfection by UV light.
- Disinfection by chlorination.
- pH adjustment and stabilisation with lime.

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

The UV system continued to reliably meet target performance standards greater than 95 per cent. In 2012–13, total proportion of water on specification was greater than 99 per cent (figure 4.3).

Figure 4.2 Process flow diagram of Mount Stromlo WTP

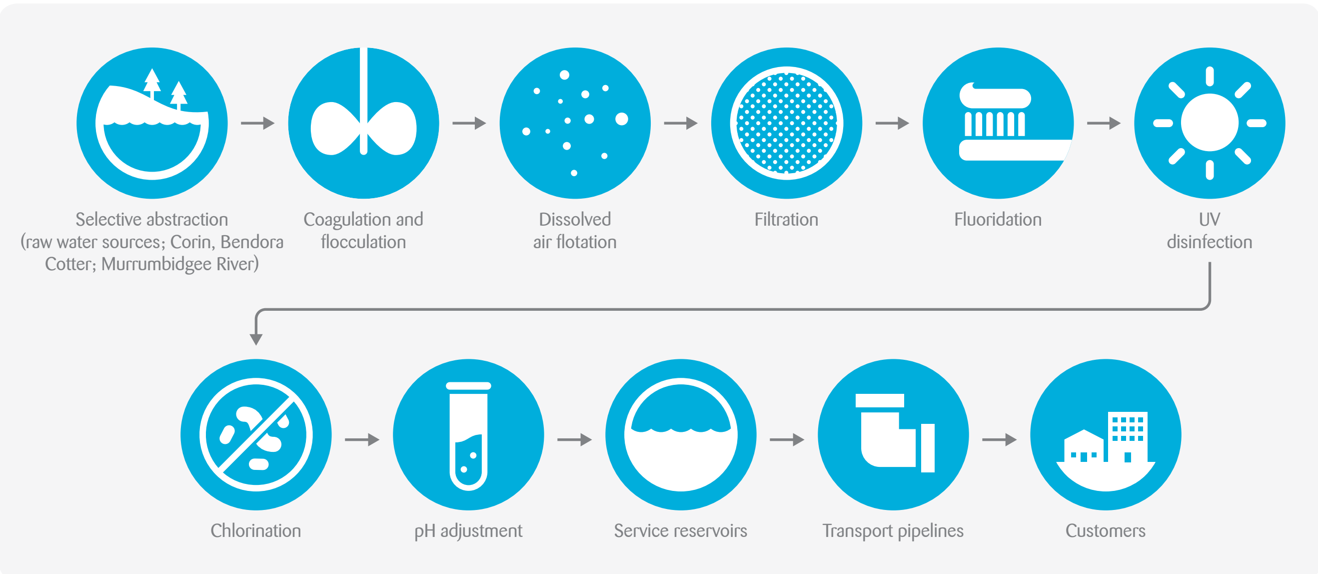
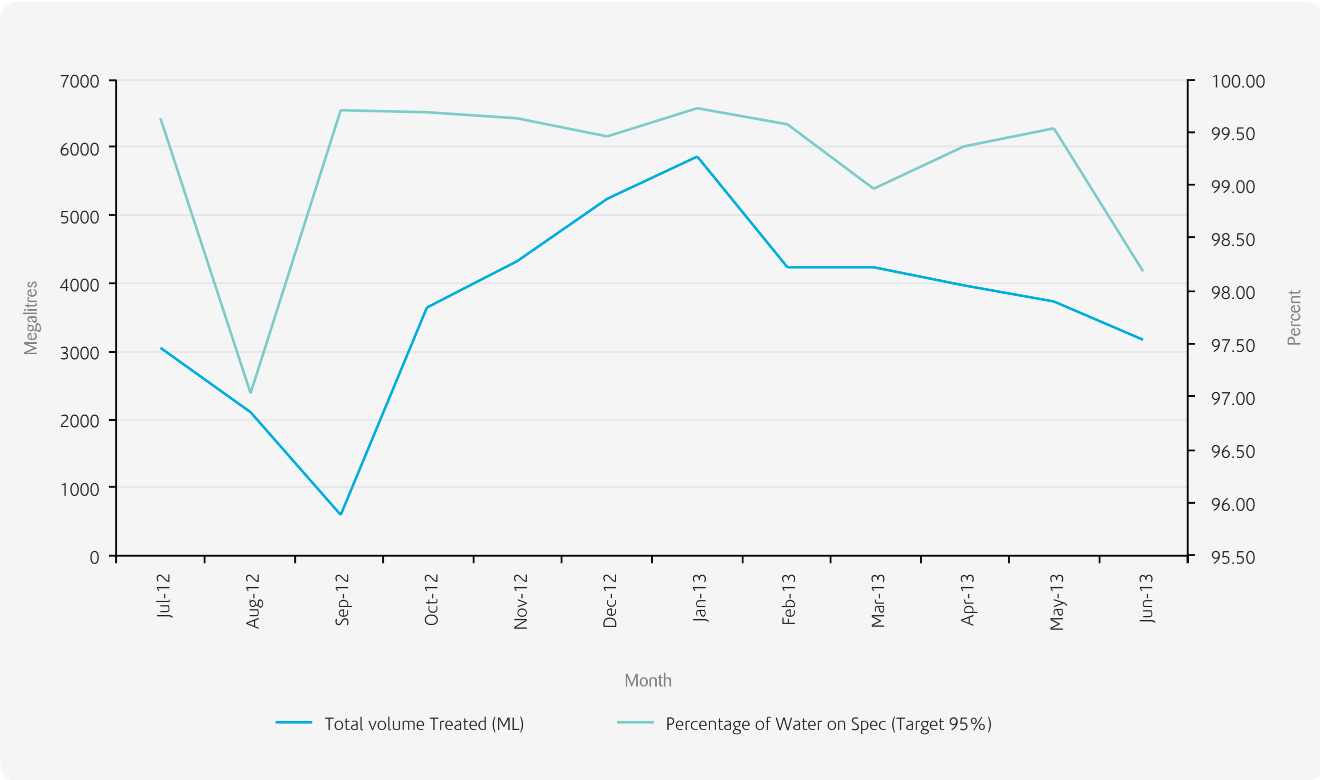
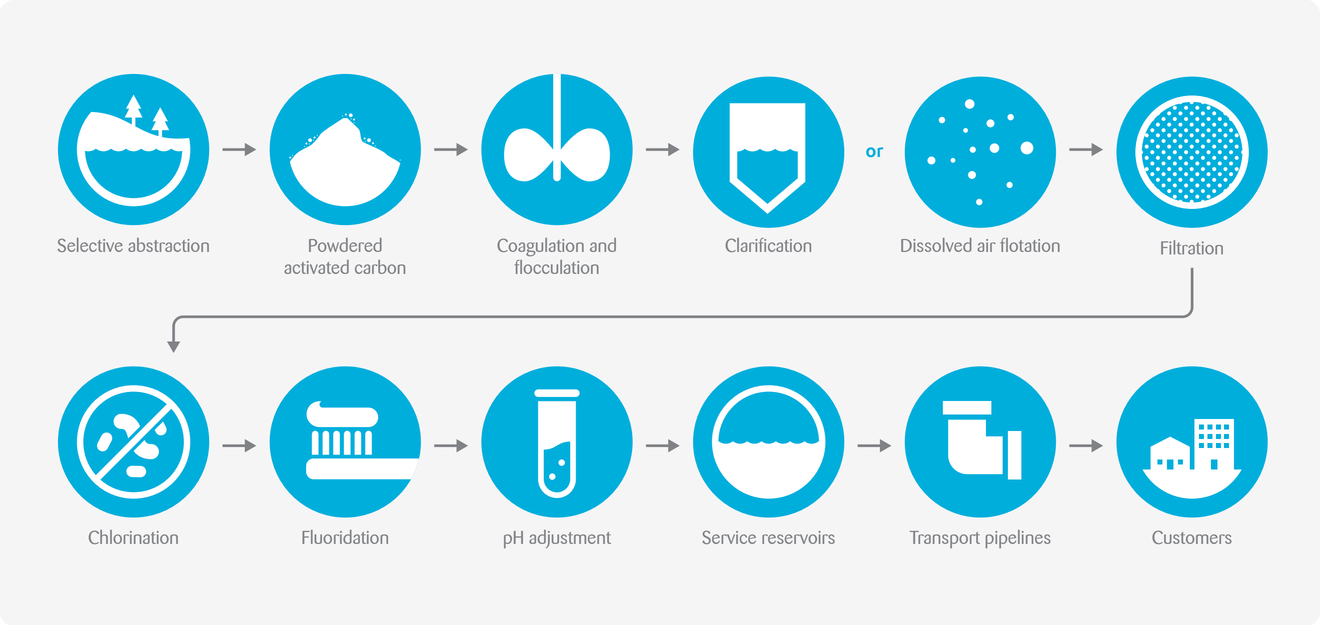


Figure 4.3 Mount Stromlo UV disinfection performance



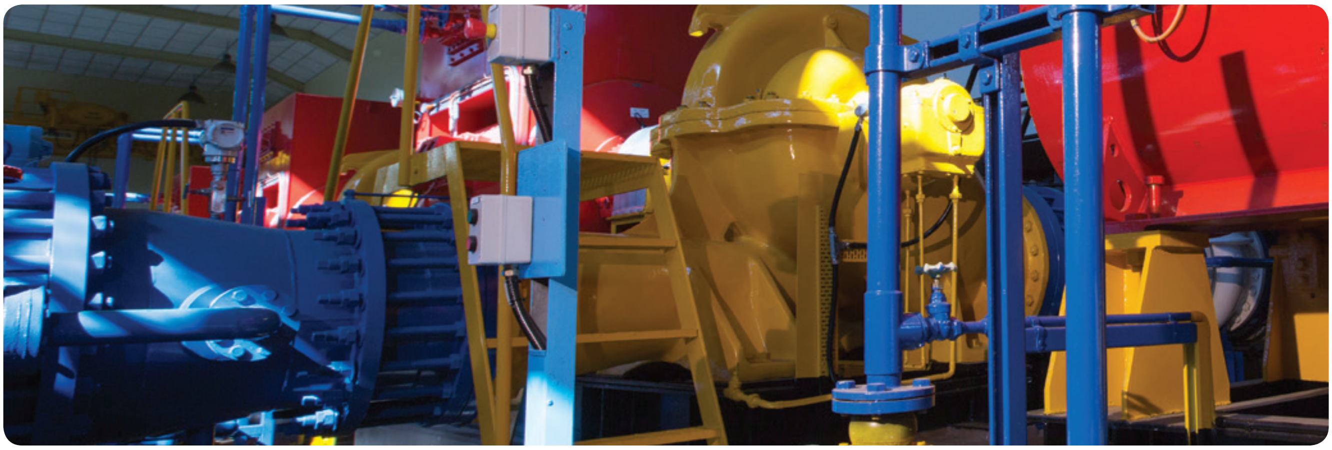
# Googong WTP

Figure 4.4 Process flow diagram of Googong WTP




Googong WTP has a treatment capacity of 270 ML of water per day. Googong WTP continues to be used in conjunction with Mount Stromlo WTP to meet summer peak demand and enable essential maintenance works to be carried out at Stromlo WTP. The treatment process is listed below.

- Optional powdered-activated carbonfor taste and odour compound removal, if required.
- Coagulation by liquid alum.
- Flocculation.
- Dissolved air flotation and filtration (augmented plant) or clarification and filtration (original plant), depending on operational mode.
- Disinfection by chlorination.
- pH adjustment and stabilisation with lime.
- Fluoridation by sodium fluorosilicate.



# Mount Stromlo and Googong water treatment plant performance

Extensive monitoring of process operations are required to ensure optimum performance of treatment plants. Online analysers enable continual monitoring of key water quality parameters, which means that changes in the raw or process water quality are quickly identified and addressed.

Chlorine, pH, turbidity, UV dose (at Mt Stromlo WTP) and fluoride are all monitored continuously to ensure the treatment processes are operating correctly. Regular laboratory monitoring includes analysis of Escherichia coli (E. coli), Cryptosporidium and Giardia in both untreated (raw) and treated (final) waters. The table below shows average treated water quality values for both WTPs. The ADWG health guideline is the concentration or measure of a water quality characteristic that, based on present knowledge, does not result in any significant risk to the health of the consumer over a lifetime of consumption (ADWG).

Table 4.2 Average Treated Water Quality during 2012–13

| | | ADWG Health value | Mt Stromlo WTP | Googong WTP |
|---|---|---|---|---|
| Chlorine | Free | – | 1.29 | 2.05 |
| | Total | 5mg/L | 1.32 | 2.20 |
| pH* | | 6.5-8.5 | 7.39 | 7.48 |
| Fluoride | | 1.5mg/L | 0.85 | 0.87 |
| *Giardia* | | – | ND | ND |
| *Cryptosporidium* | | – | ND | ND |
| *E.coli* | | <1MPN/100mL | <1 | <1 |

*aesthetic value only, no current ADWG health value; ND not detected

All drinking water processed by the treatment plants is disinfected using chlorine. This chemical is widely used in treatment plants throughout the world to control microbiological contaminants, such as bacteria and viruses.

## Chlorine disinfection

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

## Turbidity

Turbidity is a measurement of the suspended and dissolved particulates in water. These include suspended colloidal particles, clay and silt. Water with a high level of turbidity often has a muddy or milky appearance.

The ADWG states "Where filtration alone is used as the water treatment process to address identified risks from Cryptosporidium and Giardia, it is essential that filtration is optomised and consequently the target for the turbidity leaving individual filters should be less than 0.2NTU, and should not exceed 0.5NTU at any time".

Individual filter turbidity for Mount Stromlo WTP is shown in figure 4.5 and Googong in figure 4.6.

Figure 4.5 Stromlo WTP – individual filters turbidity

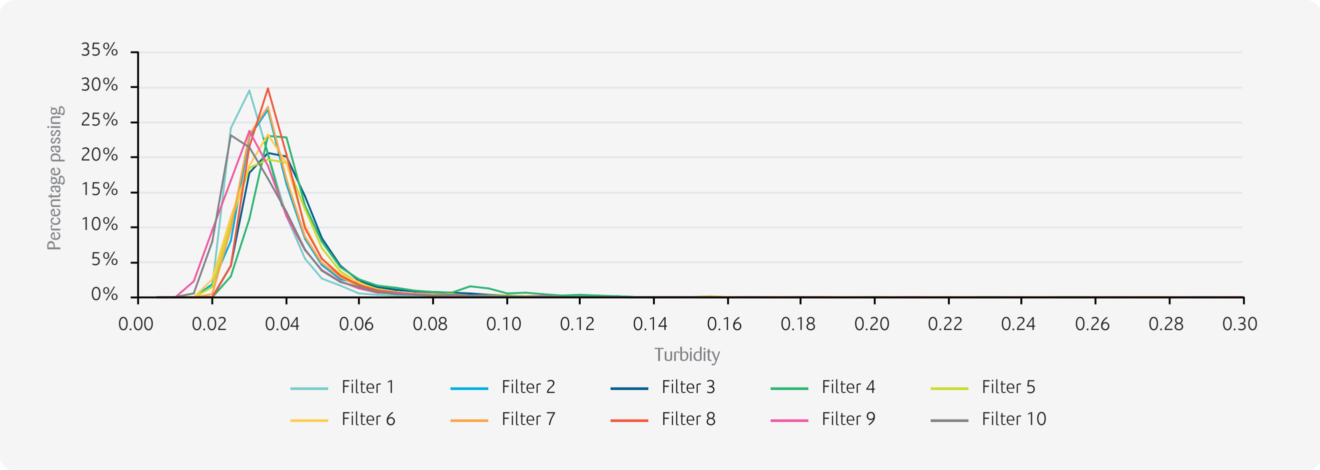
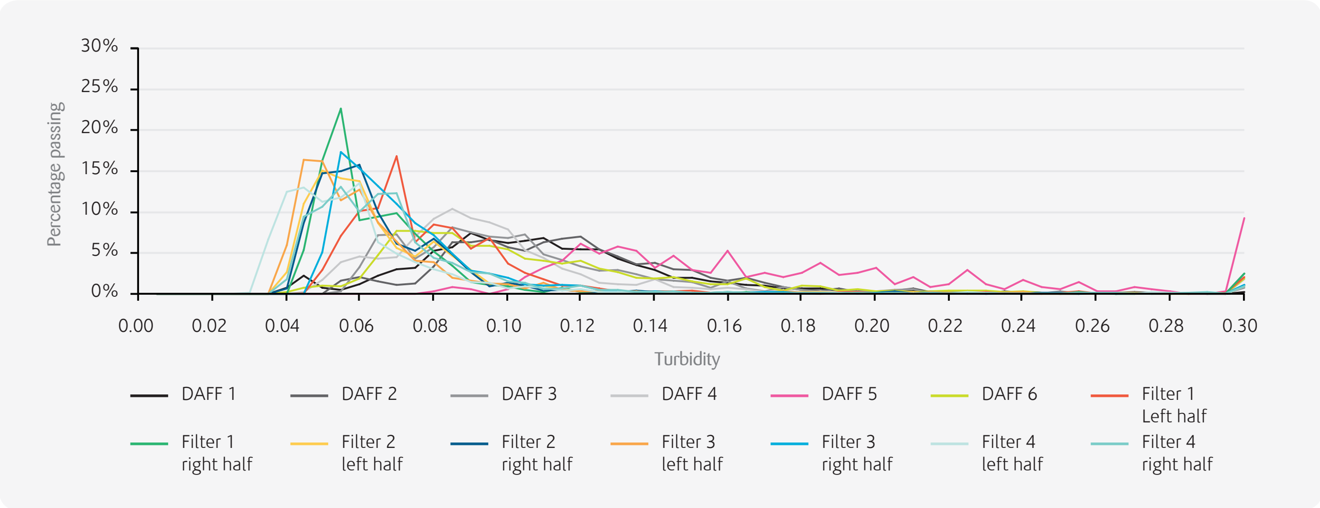



Figure 4.6 Googong individual filters turbidity



## *Cryptosporidium* and *Giardia*

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

Testing methods for Cryptosporidium and Giardia are complex and if detected, it is difficult to confirm whether they are infectious to humans. ACTEW Water undertakes a routine monitoring program for Cryptosporidium and Giardia at the water treatment plants in the raw and treated water as well as in the storage reservoirs and Murrumbidgee River. All positive detections from the raw and treated water at the water treatment plants are reported to ACT Health which determines the level of public risk and is responsible for informing the public if there is a health concern (see section 10).

As shown in the table below, in 2012-13 Cryptosporidium was detected once in the raw water at Mt Stromlo WTP and Giardia was not detected in any raw or final waters being treated at the water treatment plants.

The UV disinfection process at the Mount Stromlo WTP is specifically designed to target these microorganisms.

Table 4.3 2012-13 Mount Stromlo WTP – Cotter and Murrumbidgee catchment source

| Test | Sample point | Number of samples | Number samples positive |
|---|---|---|---|
| *Cryptosporidium* | Bendora raw water | 14 | 1 |
| | Cotter/Murrumbidgee raw water | 0 | 0 |
| | Final water | 13 | 0 |
| *Giardia* | Bendora raw water | 14 | 0 |
| | Cotter/Murrumbidgee raw water | 0 | 0 |
| | Final water | 13 | 0 |

Table 4.4 2012-13 Googong WTP – Queanbeyan River catchment source

| Test | Sample point | Number of samples | Number samples positive |
|---|---|---|---|
| *Cryptosporidium* | Raw water | 1 | 0 |
| | Final water | 1 | 0 |
| *Giardia* | Raw water | 1 | 0 |
| | Final water | 1 | 0 |

Due to the lower levels of catchment protection and little detention time associated with the Murrumbidgee River water, frequent monitoring for Cryptosporidium and Giardia is carried out at the abstraction point. Furthermore, rainfall events can instigate additional monitoring if necessary. During 2012–13, one sample taken from the Murrumbidgee River abstraction site was positive for Giardia. No samples were positive for Cryptosporidium. The UV disinfection process at the Mount Stromlo WTP is specifically designed to target these microorganisms.

Table 4.5 Murrumbidgee River water

| Test | Sample point | Number of samples | Number samples positive |
|---|---|---|---|
| *Cryptosporidium* | Murrumbidgee raw | 16 | 0 |
| *Giardia* | Murrumbidgee raw | 16 | 1 |

## Fluoride

The Drinking Water Utility Licence, issued by ACT Health, requires that fluoride is added to the ACT's drinking water network at a concentration between 0.6 and 1.1 mg/L of drinking water. "The aim of water fluoridation is the adjustment of the natural fluoride concentration in fluoride deficient water to that recommended for optimal dental health"(NHMRC 2007). In 2012–13 fluoride concentrations were maintained in the treated water at an average of 0.8 mg/L.

# 5. The distribution system

The drinking water distribution system is operated with a number of physical and disinfection barriers in place to minimise the potential for contamination of the water.

Sewerage mains are generally buried deeper than the water network, minimising the risk of contamination through groundwater. The positive pressure in the water mains is an effective barrier, preventing contaminants entering the network. Additionally, backflow prevention devices are installed at customer supply points to protect against contaminants entering the network.

ACTEW Water maintains a free residual chlorine concentration in the water distribution network to protect against microbiological contamination of the water between the WTP and the customer's tap.

The Canberra distribution system is divided into four water quality zones:

- **water quality zone 1** — north Canberra and Gungahlin
- **water quality zone 2** — Belconnen
- **water quality zone 3** — south Canberra, Woden and Weston Creek
- **water quality zone 4** — Tuggeranong

ACTEW Water supplies bulk water via two supply points to Queanbeyan. ACTEW Water supplies this water under a Service Level Agreement with Queanbeyan City Council. During 2012–13 ACTEW Water supplied 3836.6ML of bulk water to Queanbeyan.

# Distribution service reservoirs

In 2012–13, ACTEW Water operated 47 service reservoirs and 3 tanks located throughout the city. These reservoirs receive water from the WTPs via bulk supply and trunk mains and provide storage for between 450 ML and 680 ML of water depending on demand. All Canberra service reservoirs are secure structures to ensure the integrity of the supply system is maintained and to prevent contamination from birds and animals. Regular inspections are carried out to assess their external condition and the security of the site. Reservoir cleaning is also routinely undertaken every three to five years, during which the reservoir is emptied, cleaned and inspected internally.

Frequent water quality monitoring occurs at each reservoir which includes the parameters: total coliforms and E. coli, heterotrophic bacteria, temperature, and chlorine concentrations to verify that the water quality complies with ADWG and to optimise system operations.

### Table 5.1 2012-13 service reservoir monitoring

| | No. of Samples |
|---|---|
| *E.coli* | 848 |
| Total Coliforms | 848 |
| Heterotrophic Plate Count | 837 |
| Temperature | 835 |
| Free Chlorine | 837 |

# Water quality at customer's taps

Ensuring that high-quality water is delivered to customers is a priority to ACTEW Water. A comprehensive routine drinking water quality monitoring program based on the ADWG verifies water quality throughout the distribution system. Each month 84 random customer garden taps are monitored from a pool of over 350 sites throughout Canberra suburbs, representing the four water quality zones. Garden taps are used as they are easily accessible, provide static sample points in the distribution system allowing historical data acquisition, and they enable verification of the actual water received by customers.

### Table 5.2 Customer taps monitoring

| Physiochemical | Chemical | Biological |
|---|---|---|
| Temperature | Chlorine | Total coliforms |
| Conductivity | Flouride | *E.coli* |
| Turbidity | Hardness | Heterophopic bacteria |
| Alkalinity | Metals | |
| Colour | Trihalomethanes | |
| Total dissolved solids | Plasticisers | |
| pH | Polycyclic aromatic hydrocarbons | |
| | Haloacetic acids | |

# Disinfection in the distribution system

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

The concentrations of free chlorine at customers taps in 2012–13 were predominantly between 0.6 and 1.0 mg/L (see figure 5.1). The ADWG's health guideline level is well above this at 5 mg/L; however, the ADWG has an aesthetic guideline of 0.6 mg/L, which is based on an odour threshold. Some customers may be able to detect chlorine at lower concentrations. As the concentration of chlorine is relied upon to preserve water quality through the distribution system, maintenance of chlorine residual in drinking water is high priority.

Whilst chlorine protects against microbiological contamination, it also reacts with naturally occurring organic matter to form a range of undesirable organic compounds including trihalomethanes (THMs). The ADWG states that total THMs should not exceed 0.25 mg/L and although system performance should encourage a reduction in THMs, disinfection should not be compromised, as non-disinfected water poses a significantly greater public health risk. High THM concentrations may indicate the presence of other chlorination by-products. The distribution of THM results for 2012–13 are shown below. As can be seen from figure 5.2, typical THM levels in Canberra's drinking water remain well below ADWG levels.

Figure 5.1 Chlorine residual concentration at customers' taps

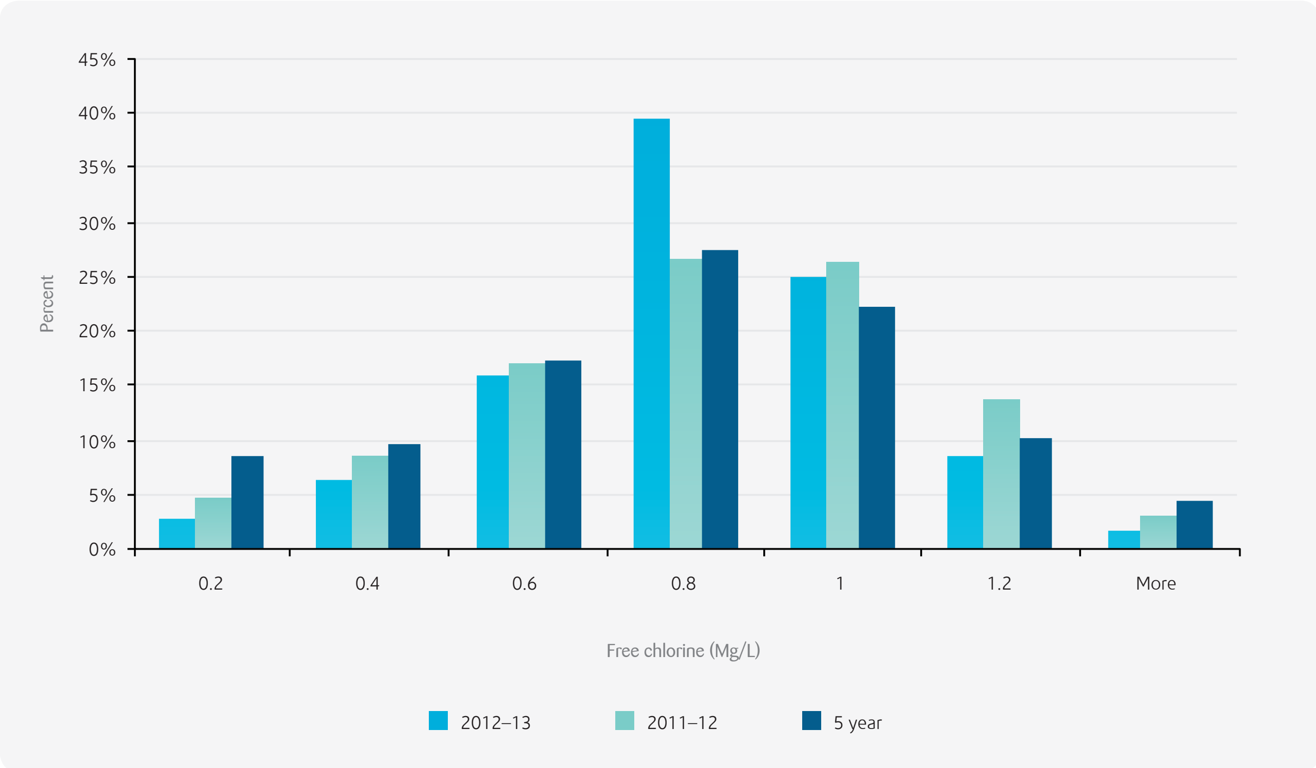
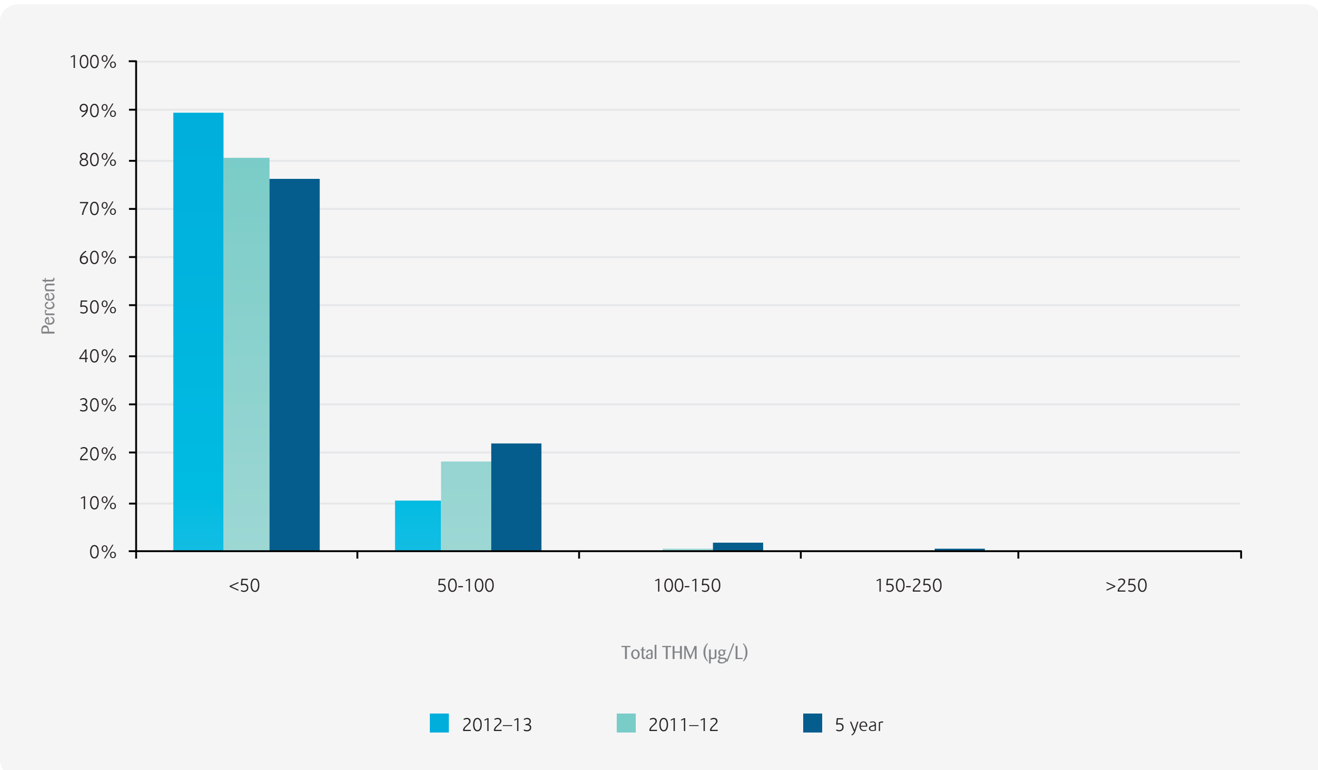



Figure 5.2 THMs at customers' taps



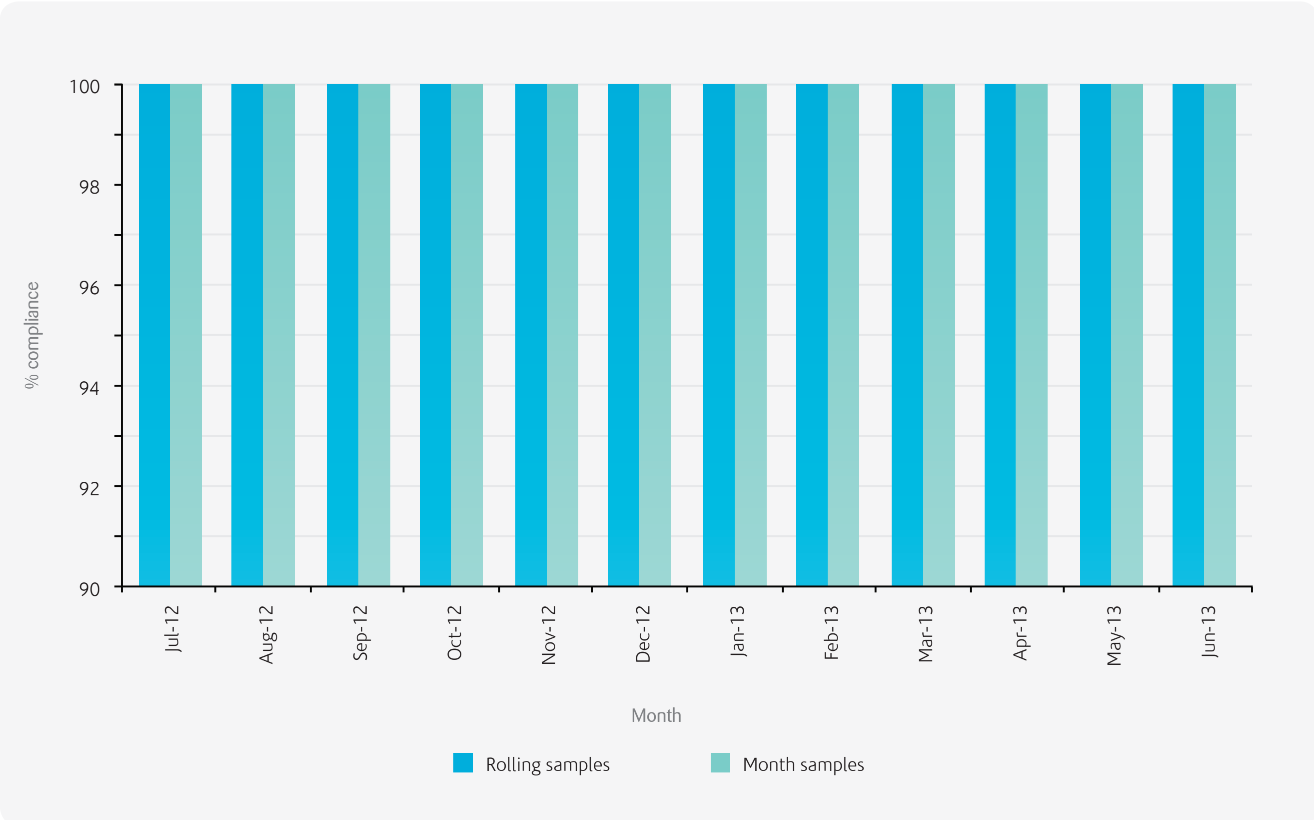
# Microbiological contamination of drinking water

The biggest risk to drinking water is microbiological contaminants.

The treatment process is designed to remove the microbiological contaminants that may be present in raw water sources. The faecal indicator bacteria E. coli is used to determine whether potential faecal contamination has occurred. If E. coli is present in drinking water, it may suggest that enteric pathogenic microorganisms are present.

The ADWG suggest that E.coli should not be detected in a minimum 100mL sample of drinking water. During 2012–13, 100 per cent of samples returned no detections of E. coli. This equates to no sample containing E.coli out of a total of 1008 samples.

Figure 5.3 E. coli compliance results at customers' taps




During 2012–13, 100 per cent of samples returned no detections of E. coli. This equates to no sample containing E.coli out of a total of 1008 samples.

# Physical and chemical properties

## The pH of drinking water

A pH value in the range of 6.5 to 8.5 is optimal for water supply systems. In 2012–13, 99 per cent of pH values measured at customer taps were within this range.

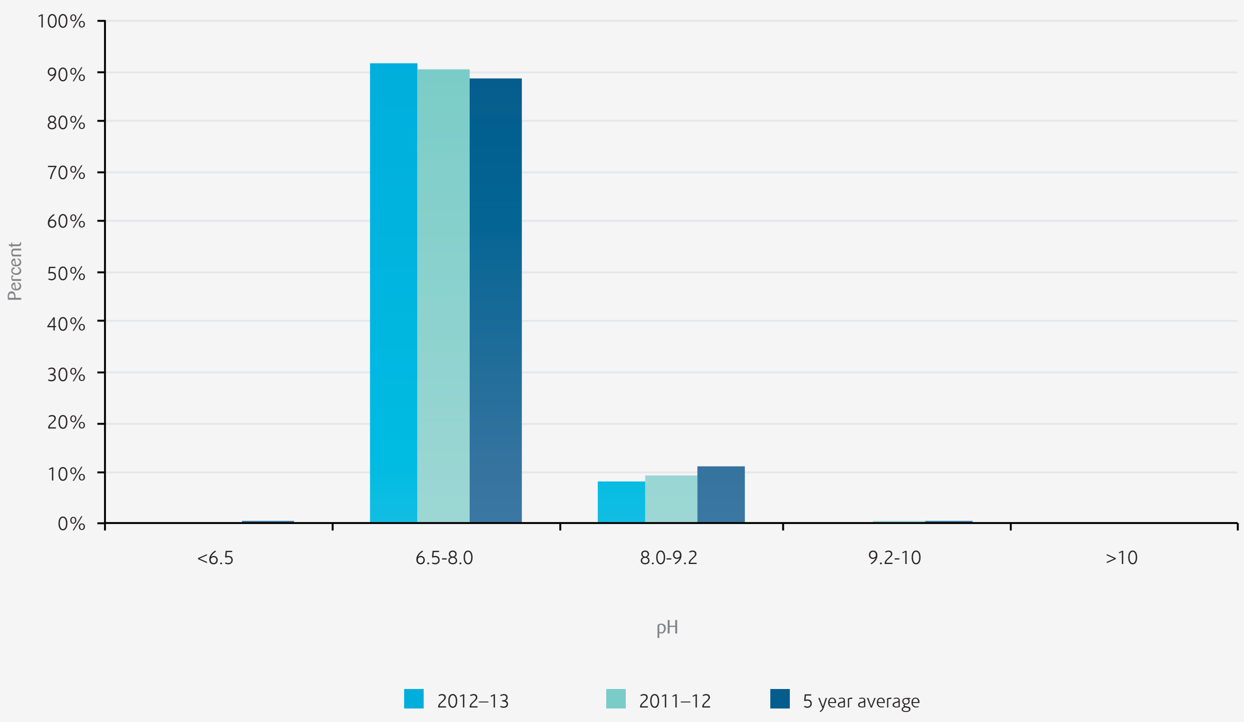
pH increases through the distribution system due to leaching of lime from cement lined pipes and concrete service reservoirs. This increase is generally proportional to the detention time of the water within the distribution network.

The control of pH within the distribution system has been enhanced by optimisation of processes at the WTPs. In particular, the improved buffering capacity of water from the upgraded Mount Stromlo WTP has continued to provide a positive impact on management of pH. The ADWG upper limit of 8.5 is set to minimise the potential for taste problems or scaling of water pipelines, however this is not of particular concern in Canberra due to the low mineral content of the drinking water.

Chlorine disinfection is also affected by pH. As pH increases the disinfection potential of chlorine decreases. However, as pH decreases the corrosion potential of the water increases, which may lead to increased levels of contaminants, for example, heavy metals, in the water and damage to assets. It is therefore necessary to balance pH in the network to minimise corrosion while ensuring effective disinfection is maintained. The ADWG advises that "Chlorine disinfection efficiency is impaired above pH 8.0…". When high pH is detected in the customer tap sampling program the chlorine and microbiological results are reviewed to identify the appropriate corrective action to be taken. Generally the initial response is to review the supply path and if practical alter the operating level of the reservoir to reduce the detention time of the water in the network.

The distribution of pH results from monitoring at customers' taps is shown below.

Figure 5.4 pH levels recorded at customers' taps



## Colour

Colour is mainly present in the water because of a range of natural organic compounds – from small hydrophilic acids, proteins and amino acids to larger humic and fulvic acids. These substances originate from organic matter through, or over which, the water has passed. The ADWG does not outline a health value, however the aesthetic guideline for true colour is based on what is just noticeable in a glass of water. Results are reported in platinum-cobalt units (Pt-Co), and the aesthetic guideline is 15 Pt-Co.

True colour results at customer taps for 2012–13 ranged from below analytical reporting limits (<1 Pt-Co units) to 13 Pt-Co units, with an average result of <1.0 Pt-Co units.

## Turbidity

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

The distribution of turbidity results for customer taps is shown in figure 5.5 Results for the period of 2012–13 for turbidity at customer taps ranged from 0.1 to 9.4 NTU with an average result of 0.36 NTU.

## Iron

The ADWG aesthetic guideline value for iron is 0.3 mg/L, which is based on the taste threshold in water. The ADWG states that "Insufficient data are available to determine a health-based guideline value for iron in drinking water". Iron is typically present in the water supply from the corrosion of iron or steel pipes or other components of the plumbing system.

Results for the period 2012–13 for iron concentrations at customer taps ranged from below analytical reporting limits (<0.02 mg/L) to 0.4mg/L with an average result of <0.02 mg/L. The majority of iron measurements in the distribution network were below the limit of reporting.

## Manganese

Water percolating through soil and rocks can dissolve minerals that contain manganese. The ADWG health guideline value for manganese is 0.5 mg/L. Levels above the ADWG aesthetic guideline level of 0.1 mg/L, can cause undesirable taste and staining of clothes during washing. At concentrations above 0.1 mg/L manganese can also contribute to the formation of biofilms on the insides of pipes, which may detach during high flows and appear as black particles.

Results in 2012–13 for manganese monitoring at customer taps ranged from <0.001 to 0.12 mg/L with the average result being 0.004 mg/L.

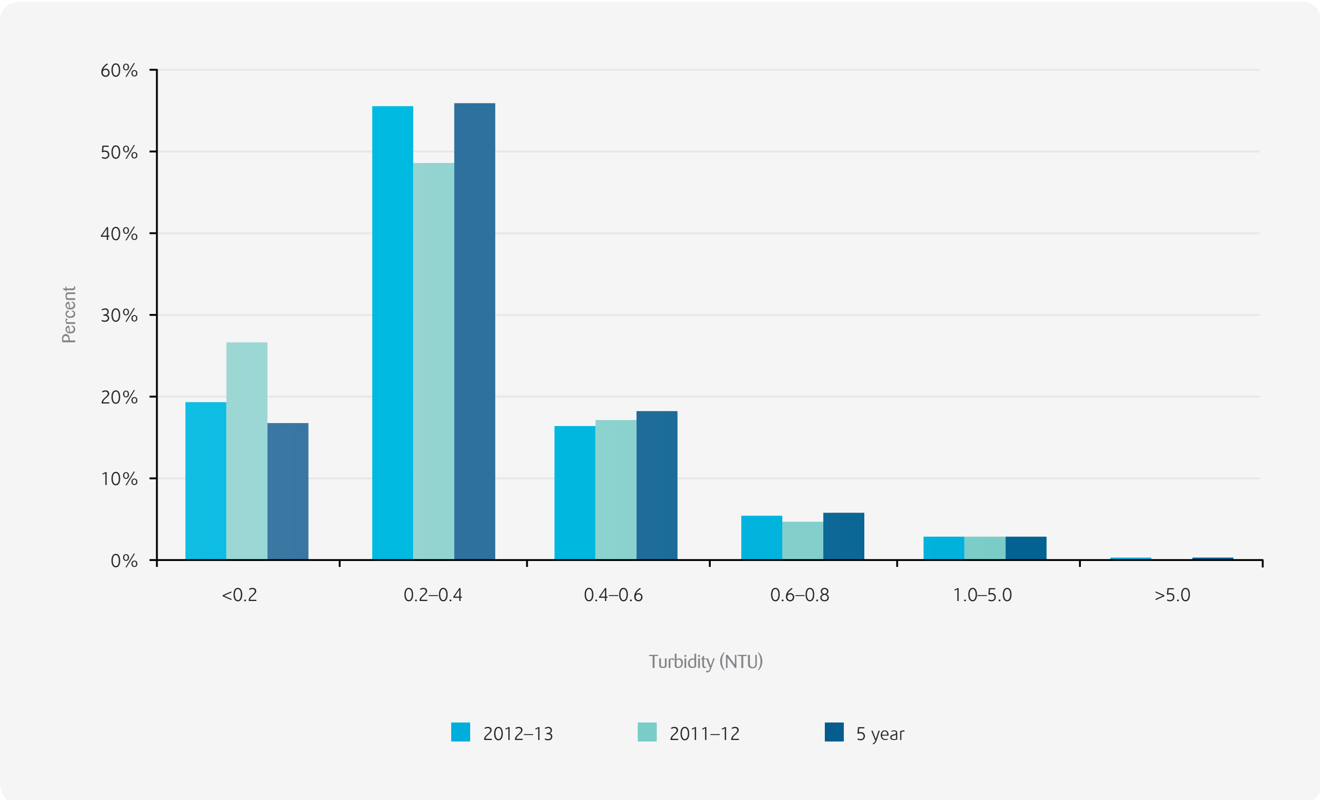
## Copper

Copper is found naturally in water, generally in low concentrations. Drinking water from customers' taps may contain higher levels of copper if the water has been in contact with copper plumbing and fixtures containing copper. Sometimes copper levels may increase if water remains stagnant in the plumbing system for long periods, like overnight or while residents are away from home for an extended time. Water which contains a high level of copper often has a blue/green appearance.

The ADWG sets an aesthetic limit of 1 mg/L for copper based on the potential for staining. The average copper value should not exceed 2 mg/L for health considerations. The guidelines state that "Water that has been in stagnant contact (six hours or more) with copper pipes and fittings should not be used in the preparation of food and drink."

Results in 2012–13 for copper monitoring at customer taps ranged from <0.001mg/L to 1.1mg/L with an average concentration of 0.02 mg/L.


Figure 5.5 Turbidity levels recorded at customer taps



# 6. Common water quality problems

ACTEW Water supplies water to 158,358 households in the ACT. Occasionally customers experience problems with the quality of their water supply and contact ACTEW Water for advice. Each enquiry or complaint received by ACTEW Water is investigated to determine the likely cause and, if required, corrective actions are taken. Enquiries and complaints are recorded along with the actions taken to rectify any problem.

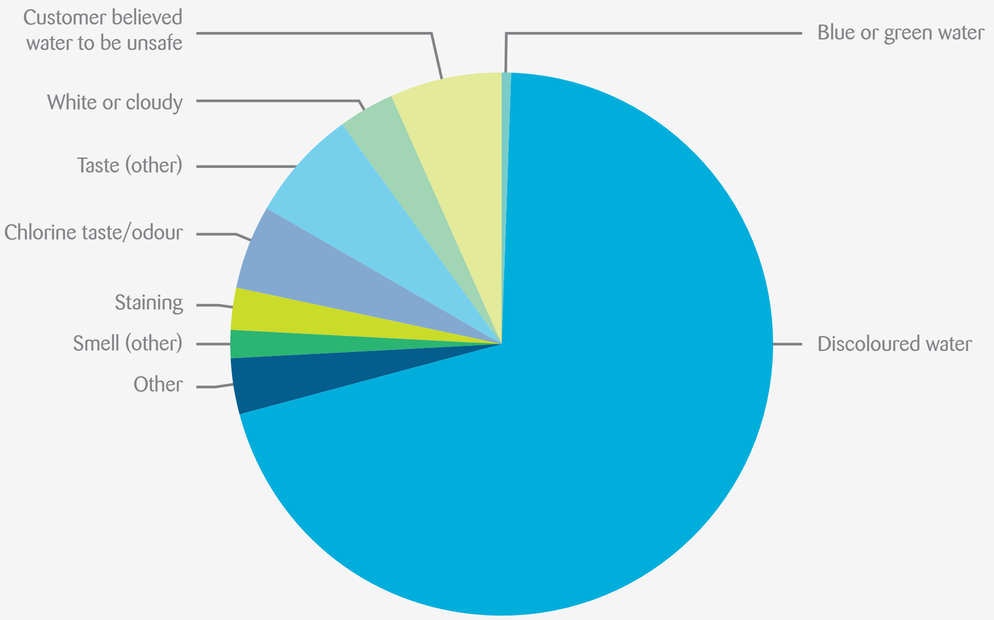
Often issues related to water quality are short-term and may be associated with water main bursts or maintenance work being carried out on the water supply network. Valve operations required for maintenance work may reverse the direction of flow of water, causing shearing of pipe surfaces, which may result in discoloured water. Where customers are likely to be affected from maintenance activities, ACTEW Water will endeavour to notify customers.

Customers are urged to contact ACTEW Water if they have any questions relating to water quality. During 2012–13 a total of 121 water quality complaints were recorded across several categories as shown in table below. This represents an 8 percent decrease in the number of water quality problems registered compared to 2011–12.

Table 6.1 Water quality Issues

| Issue | Freq. | Comments |
|---|---|---|
| Blue or green water | 1 | Blue or green water is associated with the corrosion of copper pipes (see blue water). |
| Discoloured water | 85 | Discoloured water is most often associated with maintenance work or equipment failure in the system. ACTEW Waters initial response is to flush the mains. |
| Other | 4 | Issues not otherwise categorised. |
| Smell (other) | 2 | Miscellaneous smell enquires are investigated individually. These problems are usually short term but may require investigation. |
| Staining | 3 | Deposits dislodged from domestic plumbing or from the water main can cause staining of washing or bathroom fittings. ACTEW Waters initial response is to flush the mains. |
| Chlorine taste or odour | 6 | Chlorination is necessary for the disinfection of the water supply. Usually these enquiries relate to a change (increase or decrease) in the level of chlorine that a customer is receiving. These problems are usually aesthetic and short-term. |
| Taste (other) | 8 | Miscellaneous taste enquiries are investigated individually. This also includes bitter and metallic tastes experienced by customers. These problems are usually short-term but may require further investigation. |
| White or cloudy | 4 | This usually presents as cloudy water resulting from air bubbles generated by flushing of the mains, hot water units or aerators on taps. If this does not clear over a short period of time the customer is invited to contact ACTEW Waters for further advice. |
| Customer believed water to be unsafe | 8 | Customer may raise concern that the water is unsafe to drink. In most cases water is tested by an independent laboratory to ensure compliance with the Australian Drinking Water Guidelines. |
| TOTAL | 121 | |


Figure 6.1 Water quality issues

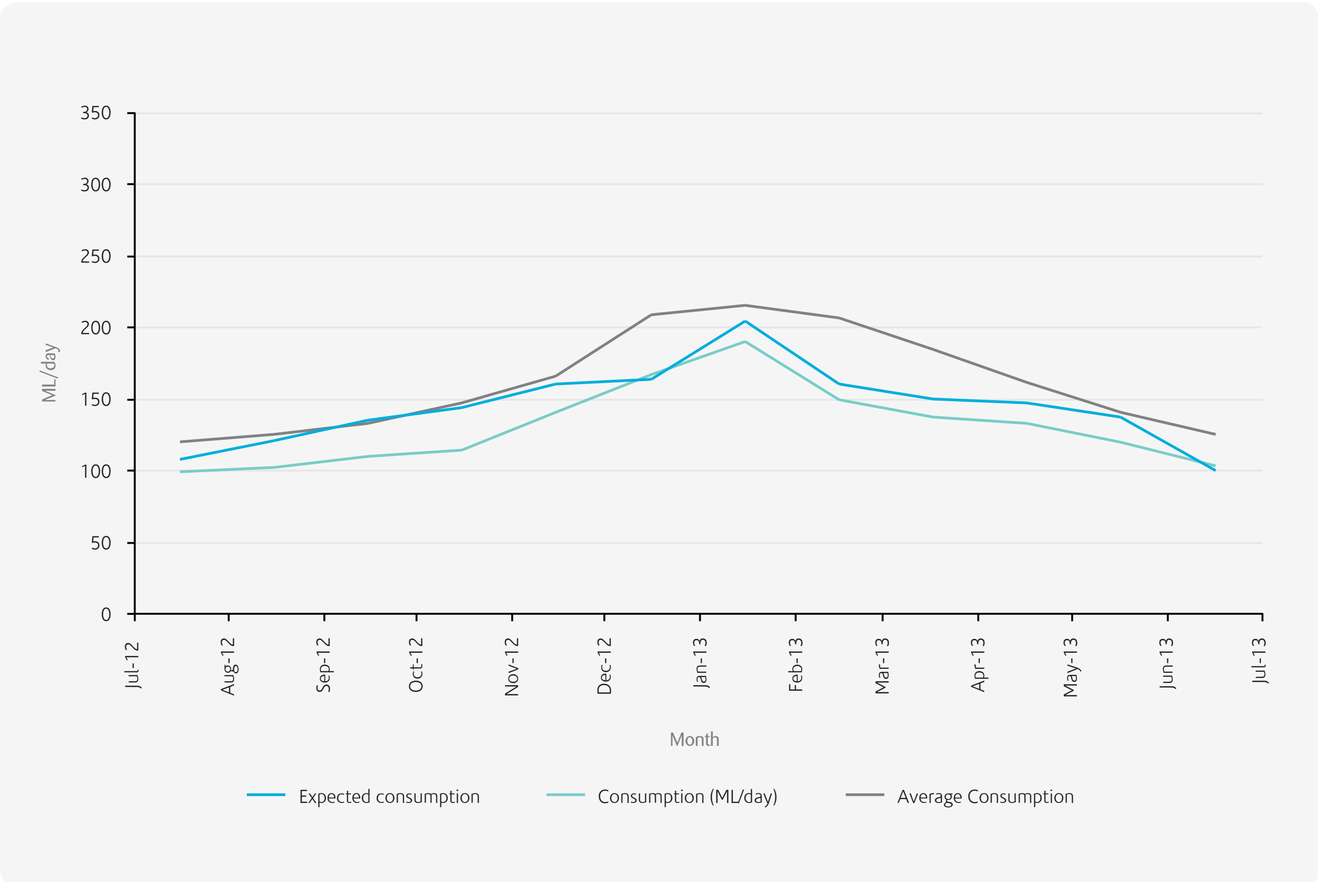


# 7. Managing Canberra's water quality into the future

The water quality monitoring data that ACTEW Water collects through the water supply system is evaluated against a range of seasonal factors, including rainfall, evaporation, treated water consumption and production rates. All these factors have the potential to affect the quality of the water supplied to customers.

Under the Permanent Water Conservation Measures, a decrease in water consumption can be attributed to a reduction in water used for watering lawns and gardens, which is closely associated with rainfall and evaporation. Unanticipated or unseasonal changes can necessitate adjustments to operational requirements in order to maintain the quality and quantity of water. These changes include reservoir and offtake selection, chlorine dosing rates and service reservoir filling rates and times.

Figure 7.1 Monthly water consumption for Canberra and Queanbeyan



# Water quality management and improvement projects

ACTEW Water is committed to the continuous improvement of water quality management practices. The Strategic Water Quality Improvement Plan outlines drinking water quality improvement projects which are proposed and underway in the ACT Drinking water supply system. Many of these are longer term projects and updates of the status of these projects along with any new projects are outlined in this plan.

Projects from 2011–12 and those planned for 2012–13 include the following:

- **'Aquality' gap analysis and assessment**. To assist water utilities to identify gaps in their implementation of the Australian Drinking Water Guidelines, Framework for Management of Drinking Water Quality, the Water Services Association of Australia (WSAA) provide Aquality, a continuous improvement assessment tool. Aquality measures a utility's capability and execution of processes that form part of its water quality management system and that are set within the 12 Elements, 32 Components and 76 Actions of the Framework. Aquality will assist ACTEW Water to identify gaps and opportunities for improvement in its water quality risk management system.
- **ACT Regional Source Water Protection Program**. Review and document the learnings from the 'pilot' program and use this information to refine objectives and set new goals. Outputs from the review will inform the development of the 2013-2018 strategic plan. Complimentary work to support the strategic plan will be the development of new decision making tools, which will underpin the financial decisions on future projects. The new strategic plan will establish short, medium and long-term goals.
- **Grants and incentive program**. Funding is made available to projects which improve catchment condition, improve water quality, promote or demonstrate best land management practice, and prevent or mitigate contamination of waterways within the drinking water catchments. The program seeks to leverage existing programs and funding.

  For the 2012-13 period the following grants have been approved;

  - Fund a WaterWatch facilitator in the Upper Murrumbidgee/Cooma region 3 days/week.
  - Run a LandScan® training program, an accredited NSW Department of Primary Industries program, for landholders. The program consists of 6 workshops to promote land capability assessment, sustainable land management and awareness of impacts to water quality from land management.
  - Partnering with a catchment group to run a ChemCert equivalent pesticide awareness program in the Burra area, complimented with alternative weed management practises.
  - Fund the production of a DVD called 'Triple Trickle: a journey into Canberra's three drinking water catchments'. The DVD will be aired on the ABC and distributed to schools in the ACT to be used as an awareness raising tool.
- **Land Management Improvement Program**. The rural incentive program is only available to lands within the drinking water catchments. It aims to improve current rural land management practices through education and by equipping landholders with tools to implement changes. Land uses posing a higher likelihood of generating pathogens, nutrient, erosion, sedimentation and chemical contaminants have been targeted.

  Across 2012- 2013 and holders in prioritised sub-catchments of Googong and the Upper Murrumbidgee from the Burra and Bredbo areas received incentive funding to control livestock access to watercourses, and protection of ground cover in riparian zones.

  Training and education for sustainable land management was provided to landholders in the Upper Tinderry, Burra and Urila areas in 2012.
- **Water Quality Protection in Fire Management Planning**. ACTEW Water continues to provide advice on potential water quality issues for

proposals within the ACTs annual bushfire operational plans. The focus taken by SWPP is on minimising the impacts of the prescribed burns on the water supply. SWPP conduct site visits post burn for two purposes, the first to assess if the risk had been realised and secondly the response of the site to erosion and regeneration.

SWPP is closely monitoring the planning and implementation of a 6,000 ha prescribed burn on the eastern foreshores of Corin reservoir. They are working with ACT Government's conservation and planning section to ensure monitoring the impact of the burn is comprehensive.

- **Development and Testing of Real Time Water Quality Monitoring Instrumentation and Program for the Googong and Cotter Reservoirs**. The current source water quality monitoring program is largely based on manual grab samples done at time intervals and locations that are largely determined by historical precedent. There have been a number of technological developments in analytical instruments, data collection, handling and visualisation and numerical modelling over the past 10 years.

  New sensor and calibration technology has been deployed in the Googong Reservoir in order to assess its accuracy and reliability. The data collected will also be utilised to enhance the spatial and temporal resolution of a hydrodynamic model of the Googong Reservoir. Once validated, similar equipment will be installed in the enlarged Cotter reservoir to assist with research into how water quality will change with the inundation of unremoved vegetation.

- **Development of an Autonomous Boat for event based and specialised water quality assessments**. A semi-autonomous water craft will provide reference sensor calibration to ensure the fixed platform and buoy sensors installed remain in accurate calibration. This will be achieved by adjusting measured sensors data from profiling and fixed WQ systems to references. Due to the type of water craft proposed, a variety of payloads can be integrated including the following:

  - Bathymetric survey equipment – advanced echo-sounder with structure scanning module.
  - Sampling equipment – low and high volume sampler. It is anticipated that up to 200l water sample can be obtained during a mission.
  - Radio tagged fish receiver – integrated into communications module as another sensor.
  - Underwater camera (connected to profiling WQ reference sensor system)
  - AWS sensors for ambient condition monitoring

    With careful selection of an adequate water craft size most, if not all, payloads can be added to the vessel on a permanent basis. Efficiency and reliability of water assets will be improved by storage managers being able to make decisions based on advanced real time bathymetric, physical and environmental water quality data.

- **Mount Stromlo WTP filter to waste**. The Mount Stromlo WTP was designed to treat low turbidity water from Bendora Reservoir and the low potential for handling higher turbidity water was not considered to warrant a filter to waste facility. The WTP is now treating differing water quality from the Cotter Dam and Murrumbidgee River. Currently the plant is running to strict turbidity limits. The filter to waste facility allows for disposal of turbid water, rather than the current option of blending the water back into the filtered water stream. The filter to waste method is current industry "good practice" for higher turbidity waters.

- **Mount Stromlo WTP Enhanced Coagulation Control**. The Mt Stromlo WTP development strategy recommended that feed forward coagulation control be adopted at the plant to improve the ability of the plant to handle varying source water quality. The current approach relies on feedback control, in which the coagulant doses are adjusted manually by operators when water quality changes are detected in the inlet channel or filters.

  Under this project an online analyser is being installed on the blended raw waters upstream of the coagulant dose point. The analyser will predict a suitable chemical coagulant dose rate, enabling the coagulation process to adjust to match changing raw water quality. This will eliminate the current reactive process in which the dose is changed if water quality downstream deteriorates.

- **Googong WTP fluoride system upgrade**. The Googong fluoride system's capabilities and vulnerabilities have been reviewed and assessed against the NSW Code of practice for the fluoridation of public water supplies. ACTEW Water uses the NSW Code as a best practice benchmark. This project will bring the fluoride system up to the standards recommended in the NSW Code.

  The project will also establish a system which is in line with current work safety standards, in particular, manual handling and dust control.

A semi-autonomous water craft will provide reference sensor calibration to ensure the fixed platform and buoy sensors installed remain in accurate calibration.


This project has been identified as high priority in the Googong WTP Development Plan discussed above. Design of a new fluoride system which meets the Code is underway, and assessment of the best location was part of the Googong WTP Constructability Review discussed above.

The location of the new Fluoride Building has been determined and detailed design has commenced.

- **Installation of Permanent Reticulation sampling points**. Under the Australian Drinking Water Guidelines reticulated water is required to be monitored within the distribution system to verify the quality of treated water as supplied to the consumer.

  Currently this program is carried out using a pool of approximately 330 front garden taps. 84 samples are collected per month on a random basis from the pool, for the routine reticulated monitoring program. The program requires all tap fittings to be removed (to avoid contamination of samples), the tap flushed for approximately 3 minutes and a variety of bottles filled and returned to the laboratory for analysis.

  Problems are beginning to arise using front garden taps as sampling points. Removing some tap fittings is proving to be difficult, rendering the tap unsuitable as a sampling site, as is seeking permission to use the tap from the home owner. Problems are also arising from new building code revisions that require new or significantly renovated properties to have rain water tanks servicing their front garden taps. This has reduced the number of potentially available sampling points, particularly in the newer suburbs.

  A permanent sampling tap prototype has been developed for installation within the reticulation network to reduce the issues noted above. The first three trial locations have been identified and approved for installation.

# 8. Cooperation between ACT Health and ACTEW Water

In February 2007 the revised *Drinking Water Code of Practice* (DWCoP)was issued by ACT Health. This document replaced the *Drinking Water Quality Code of Practice (2000)* and takes into account updates of the ADWG.

DWCoP sets out operational, communication, reporting and response requirements for both organisations to ensure that optimal drinking water quality is supplied to Canberra and Queanbeyan.

Copies of DWCoP are available from the ACT Health website at www.health.act.gov.au

## Water quality notifications to ACT Health

During the year, a number of notifications to ACT Health were issued. These notifiable incidents are captured in the table below.

Table 8.1 Summary of the notifications and the action taken by ACTEW Water.

| Criteria | Date | Source | Incident |
|---|---|---|---|
| Cryptosporidium and Giardia, any detection. | 12/10/12 | Mt Stromlo Raw Water | One Cryptosporidium oocyst was detected in the Mt Stromlo raw water sample. No Cryptosporidium or Giardia were detected in the final water sample collected at the same time. The WTP was meeting turbidity and UV performance targets at the time of the detection. |
| High risk Cyanobacteria >2000cells/mL or a total biovolume 0.5$mm^3$/L | 08/03/13 | Googong Reservoir | Low concentrations of blue-green algae were present for many weeks prior to this detection. No other high risk blue green algae were detected. Googong WTP was not operating at the time of this detection. |
| Potential imminent public health risk | 08/05/13 | Service Reservoir | During routine inspection of a service reservoir, it was discovered that a roofing sheet had been bent, leaving the reservoir open to the atmosphere. The service reservoir was isolated. Sampling was conducted at the reservoir and throughout the reservoir supply area. No contaminants of concern were detected. |

# 9. Laboratory analysis

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

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

As part of its NATA accrediation, ALS Laboratory Group participates in regular audits and proficiency testing whereby results for identical samples are compared with other NATA accredited laboratories. The most recent NATA audits carried out in the chemistry area in September 2012 and in the biological area in July 2013 identified no accreditation non-compliance. All results for NATA proficiency testing in the past 12 months were within the "acceptable" statistical range.

The Canberra distribution network is divided into four water quality zones based on population, hydraulic characteristics and geography. These zones are used in ACTEW Water operations to assess the quality of drinking water supplied to the customer's tap. All data for combined zones is shown in table 10.1, along with the following.

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

Table 9.1 Summary data for all ACTEW Water's water quality zones

| Analyte | Method ID | Units | ADWG | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| E.Coli | APHA 9223 B | MPN/100mL | <1 | <1 | 1008 | <1 | <1 | <1 | <1 |
| Total Coliforms | APHA 9223 B | MPN/100mL | - | <1 | 1008 | <1 | 1 | <1 | <1 |
| Heterotrophic Plate Count | APHA 9215 B | CFU/mL | - | <1 | 1008 | <1 | 5000 | 10.05 | 19.65 |
| Alkalinity bicarb | APHA 2320 A/B | mg/L | - | <0.1 | 240 | 28.4 | 49.2 | 37.79 | 42.31 |
| Alkalinity carb | APHA 2320 A/B | mg/L | - | <0.1 | 240 | <0.1 | 3.1 | <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 | 28 | 49 | 37.81 | 42.05 |
| Asbestos | AS 4964-2000 | Presents/ Absence | - | | 120 | Not Detected | Detected | - | - |
| Chloride | APHA 21st Ed. 2005, Part 4110 B | mg/L | - | <0.1 | 48 | 2 | 9 | 3.38 | 8.10 |
| Fluoride | APHA 4500-F C | mg/L | 1.5 | <0.1 | 120 | 0.58 | 0.97 | 0.84 | 0.92 |
| Iodide | ASTM D19 | mg/L | 0.5 | <0.05 | 48 | <0.05 | <0.05 | <0.05 | <0.05 |

| Analyte | Method ID | Units | ADWG | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Nitrate | APHA 21st Ed. 2005, Part 4110 B | mg/L | 50 | <0.1 | 48 | <0.1 | 0.2 | 0.18 | 0.2 |
| Sulphate | APHA 21st Ed. 2005, Part 4110 B | mg/L | 500 | | 48 | 0.5 | 32 | 6.09 | 25.8 |
| Chlorine Combined | APHA 4500-CL G | mg/L | - | <0.03 | 1008 | <0.03 | 0.72 | 0.05 | 0.14 |
| Chlorine Free | APHA 4500-CL G | mg/L | 5 | <0.03 | 1008 | 0.03 | 1.98 | 0.73 | 1.1 |
| Chlorine Total | APHA 4500-CL G | mg/L | 5 | <0.03 | 1008 | 0.03 | 2.05 | 0.78 | 1.14 |
| True colour | Lachat QuikChem method, Color in Waters 10-308-00-1-A | Pt.Co | - | <1 | 480 | <1 | 13 | <1 | 2 |
| Conductivity | APHA 2510 B | μS/cm | - | <2 | 120 | 86 | 180 | 103.28 | 170 |
| 1,2,4 Trichlorobenzene | US EPA 8270/8260 | μg/L | 30 | <20 | 120 | <20 | <20 | <20 | <20 |
| 1,2,Dichlorobenzene | US EPA 8270/8260 | μg/L | 1500 | <20 | 120 | <20 | <20 | <20 | <20 |
| 1,3 Dichlorobenzene | US EPA 8270/8260 | μg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| 1,4 Dichlorobenzene | US EPA 8270/8260 | μg/L | 40 | <20 | 120 | <20 | <20 | <20 | <20 |
| 2,3,4,6 Tetrachlorophenol | US EPA 8270/8260 | μg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| 2,4,5 Trichlorophenol | US EPA 8270/8260 | μg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| 2,4,6 Trichlorophenol | US EPA 8270/8260 | μg/L | 20 | <20 | 120 | <20 | <20 | <20 | <20 |
| 2,4 Dichlorophenol | US EPA 8270/8260 | μg/L | 200 | <10 | 120 | <10 | <10 | <10 | <10 |
| 2,4 Dimethylphenol | US EPA 8270/8260 | μg/L | - | <10 | 120 | <10 | <10 | <10 | <10 |
| 2,4 Dinitrotoluene | US EPA 8270/8260 | μg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| 2,6 Dichlorophenol | US EPA 8270/8260 | μg/L | - | <10 | 120 | <10 | <10 | <10 | <10 |
| 2,6 Dinitrotoluene | US EPA 8270/8260 | μg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| 2 Chloronaphthalene | US EPA 8270/8260 | μg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| 2 Chlorophenol | US EPA 8270/8260 | μg/L | 300 | <10 | 120 | <10 | <10 | <10 | <10 |
| 2 Methylnaphthalene | US EPA 8270/8260 | μg/L | - | <10 | 120 | <10 | <10 | <10 | <10 |
| 2 Methylphenol | US EPA 8270/8260 | μg/L | - | <10 | 120 | <10 | <10 | <10 | <10 |
| 2 Nitroaniline | US EPA 8270/8260 | μg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| 2 Nitrophenol | US EPA 8270/8260 | μg/L | - | <10 | 120 | <10 | <10 | <10 | <10 |
| 3,4 Methylphenol | US EPA 8270/8260 | μg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| 3 Nitroaniline | US EPA 8270/8260 | μg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| 4,4. DDD | US EPA 8270/8260 | μg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| 4,4 DDE | US EPA 8270/8260 | μg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| 4,4 DDT | US EPA 8270/8260 | μg/L | 9 | <20 | 120 | <20 | <20 | <20 | <20 |
| 4 Bromophenylether | US EPA 8270/8260 | μg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| 4 Chloro 3 methylphenol | US EPA 8270/8260 | μg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| 4 Chloroaniline | US EPA 8270/8260 | μg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |

| Analyte | Method ID | Units | ADWG | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| 4 Chlorophenylether | US EPA 8270/8260 | µg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| 4 Nitroaniline | US EPA 8270/8260 | µg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| a BHC | US EPA 8270/8260 | µg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| Acenaphthene | US EPA 8270/8260 | µg/L | - | <10 | 120 | <10 | <10 | <10 | <10 |
| Acenaphthylene | US EPA 8270/8260 | µg/L | - | <10 | 120 | <10 | <10 | <10 | <10 |
| Aldrin | US EPA 8270/8260 | µg/L | 0.3 | <20 | 120 | <20 | <20 | <20 | <20 |
| Aniline | US EPA 8270/8260 | µg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| Anthracene | US EPA 8270/8260 | µg/L | - | <10 | 120 | <10 | <10 | <10 | <10 |
| Azobenzene | US EPA 8270/8260 | µg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| b BHC | US EPA 8270/8260 | µg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| Benz(a)anthracene | US EPA 8270/8260 | µg/L | - | <10 | 120 | <10 | <10 | <10 | <10 |
| Benzo(a)pyrene | US EPA 8270/8260 | µg/L | 0.01 | <10 | 120 | <10 | <10 | <10 | <10 |
| Benzo (b,k) fluoranthene | US EPA 8270/8260 | µg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| Benzo( g,h,I) perylene | US EPA 8270/8260 | µg/L | - | <10 | 120 | <10 | <10 | <10 | <10 |
| Benzyl alcohol | US EPA 8270/8260 | µg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| Bis (2 chloroethoxy) methane | US EPA 8270/8260 | µg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| Bis (2 chloroethyl) ether | US EPA 8270/8260 | µg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| Bis (2 chloroisopropyl) ether | US EPA 8270/8260 | µg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| Bis(2-ethylhexyl) phthalate | US EPA 8270/8260 | µg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| Butyl benzyl phthalate | US EPA 8270/8260 | µg/L | - | <10 | 120 | <10 | <10 | <10 | <10 |
| Carbazole | US EPA 8270/8260 | µg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| Chlorpyifos | US EPA 8270/8260 | µg/L | 10 | <20 | 120 | <20 | <20 | <20 | <20 |
| Chrysene | US EPA 8270/8260 | µg/L | - | <10 | 120 | <10 | <10 | <10 | <10 |
| d BHC | US EPA 8270/8260 | µg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| Diazinon | US EPA 8270/8260 | µg/L | 4 | <20 | 120 | <20 | <20 | <20 | <20 |
| Dibenz(a,h)anthracene | US EPA 8270/8260 | µg/L | - | <10 | 120 | <10 | <10 | <10 | <10 |
| Dibenzofuran | US EPA 8270/8260 | µg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| Dichlorobenzidine | US EPA 8270/8260 | µg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| Dieldrin | US EPA 8270/8260 | µg/L | 3 | <20 | 120 | <20 | <20 | <20 | <20 |
| Diethyl phthalate | US EPA 8270/8260 | µg/L | - | <10 | 120 | <10 | <10 | <10 | <10 |
| Dimethoate | US EPA 8270/8260 | µg/L | 7 | <20 | 120 | <20 | <20 | <20 | <20 |
| Dimethyl phthalate | US EPA 8270/8260 | µg/L | - | <10 | 120 | <10 | <10 | <10 | <10 |
| Di-n-butyl phthalate | US EPA 8270/8260 | µg/L | - | <10 | 120 | <10 | <10 | <10 | <10 |
| Di-n-octyl phthalate | US EPA 8270/8260 | µg/L | - | <10 | 120 | <10 | <10 | <10 | <10 |
| Endosulfan sulphate | US EPA 8270/8260 | µg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |

| Analyte | Method ID | Units | ADWG | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Endosulphan 1 | US EPA 8270/8260 | µg/L | 20 | <20 | 120 | <20 | <20 | <20 | <20 |
| Endosulphan 11 | US EPA 8270/8260 | µg/L | 20 | <20 | 120 | <20 | <20 | <20 | <20 |
| Endrin | US EPA 8270/8260 | µg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| Endrin Aldehyde | US EPA 8270/8260 | µg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| Ethion | US EPA 8270/8260 | µg/L | 4 | <20 | 120 | <20 | <20 | <20 | <20 |
| Fenitrothion | US EPA 8270/8260 | µg/L | 7 | <20 | 120 | <20 | <20 | <20 | <20 |
| Fluoranthene | US EPA 8270/8260 | µg/L | - | <10 | 120 | <10 | <10 | <10 | <10 |
| Fluorene | US EPA 8270/8260 | µg/L | - | <10 | 120 | <10 | <10 | <10 | <10 |
| g BHC (Lindane) | US EPA 8270/8260 | µg/L | 10 | <20 | 120 | <20 | <20 | <20 | <20 |
| Heptachlor | US EPA 8270/8260 | µg/L | 0.3 | <20 | 120 | <20 | <20 | <20 | <20 |
| Heptachlorepoxide | US EPA 8270/8260 | µg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| Hexachloro 1,3 butadiene | US EPA 8270/8260 | µg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| Hexachlorobenzene | US EPA 8270/8260 | µg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| Hexachlorocyclopentadiene | US EPA 8270/8260 | µg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| Hexachloroethane | US EPA 8270/8260 | µg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| Indeno(1,2,3 cd)pyrene | US EPA 8270/8260 | µg/L | - | <10 | 120 | <10 | <10 | <10 | <10 |
| Isophorone | US EPA 8270/8260 | µg/L | 100 | <20 | 120 | <20 | <20 | <20 | <20 |
| Malathion | US EPA 8270/8260 | µg/L | 70 | <20 | 120 | <20 | <20 | <20 | <20 |
| Naphthalene | US EPA 8270/8260 | µg/L | - | <10 | 120 | <10 | <10 | <10 | <10 |
| Nitrobenzene | US EPA 8270/8260 | µg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| N Nitrosodimethylamine | US EPA 8270/8260 | µg/L | 0.1 | <20 | 120 | <20 | <20 | <20 | <20 |
| N Nitrosodi n propylamine | US EPA 8270/8260 | µg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| N Nitrosodiphenylamine | US EPA 8270/8260 | µg/L | - | <20 | 120 | <20 | <20 | <20 | <20 |
| Pentachlorophenol | US EPA 8270/8260 | µg/L | 10 | <20 | 120 | <20 | <20 | <20 | <20 |
| Phenanthrene | US EPA 8270/8260 | µg/L | - | <10 | 120 | <10 | <10 | <10 | <10 |
| Phenol | US EPA 8270/8260 | µg/L | - | <10 | 120 | <10 | <10 | <10 | <10 |
| Pyrene | US EPA 8270/8260 | µg/L | - | <10 | 120 | <10 | <10 | <10 | <10 |
| Bromoacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <5 | 240 | <5 | <5 | <5 | <5 |
| Bromochloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <1 | 240 | <1 | 7 | 1.29 | 5 |
| Bromodichloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <1 | 240 | <1 | 6 | 1.5 | 6 |
| Dibromoacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <1 | 240 | <1 | 1 | <1 | <1 |
| Dibromochloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <10 | 240 | <10 | <10 | <10 | <10 |

| Analyte | Method ID | Units | ADWG | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Dichloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | 100 | <1 | 240 | 4 | 81 | 16.46 | 52 |
| Monochloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <1 | 239 | <1 | 6 | 1.07 | 4 |
| Tribromoacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <10 | 240 | <10 | <10 | <10 | <10 |
| Trichloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | 100 | <1 | 240 | 6 | 98 | 23.18 | 76 |
| Hardness Total | APHA 2340 B | mg/L | - | <0.1 | 119 | 31 | 67 | 40.3 | 56.4 |
| Calcium Dissolved | US EPA 200.7 | mg/L | - | <0.05 | 120 | 11 | 21 | 14.33 | 18.05 |
| Potassium Dissolved | US EPA 200.7 | mg/L | - | <0.1 | 48 | 0.4 | 2.1 | 0.65 | 1.66 |
| Magnesium Dissolved | US EPA 200.7 | mg/L | - | <0.05 | 120 | 0.6 | 3.6 | 1.1 | 3.1 |
| Sodium Dissolved | US EPA 200.7 | mg/L | - | <0.1 | 48 | 2.7 | 7.3 | 3.4 | 6.01 |
| Aluminium Total | US EPA 200.7 | mg/L | - | <0.02 | 120 | 0.02 | 0.19 | 0.05 | 0.12 |
| Iron Total | US EPA 200.7 | mg/L | - | <0.02 | 240 | <0.02 | 0.4 | <0.02 | 0.02 |
| Manganese Total | US EPA 200.8 | mg/L | 0.5 | <0.001 | 481 | <0.001 | 0.29 | 0.01 | 0.01 |
| Aluminium Acid Soluble | US EPA 200.8 | µg/L | - | <5 | 120 | 11 | 170 | 42.76 | 95.1 |
| Copper Total | US EPA 200.7 | µg/L | 2000 | <1 | 361 | 1 | 1100 | 22.85 | 66 |
| Lead Total | US EPA 200.8 | µg/L | 10 | <0.2 | 120 | <0.2 | 2.7 | 0.29 | 0.9 |
| Aluminium Total | US EPA 200.8 | µg/L | - | <9 | 120 | 16 | 210 | 50.21 | 120.5 |
| Antimony Total | US EPA 200.8 | µg/L | 3 | <3 | 120 | <3 | <3 | <3 | <3 |
| Arsenic Total | US EPA 200.8 | µg/L | 10 | <1 | 120 | <1 | <1 | <1 | <1 |
| Barium Total | US EPA 200.8 | µg/L | 2000 |  | 120 | 2.9 | 10 | 3.92 | 5.71 |
| Beryllium Total | US EPA 200.8 | µg/L | 60 | <0.1 | 120 | <0.1 | <0.1 | <0.1 | <0.1 |
| Cadmium Total | US EPA 200.8 | µg/L | 2 | <0.05 | 120 | <0.05 | 0.5 | <0.05 | 0.12 |
| Chromium Total | US EPA 200.8 | µg/L | 50 | <2 | 120 | <2 | <2 | <2 | <2 |
| Cobalt Total | US EPA 200.8 | µg/L | - | <0.2 | 120 | <0.2 | 0.4 | <0.2 | <0.2 |
| Copper Total | US EPA 200.8 | µg/L | 2000 | <1 | 120 | <1 | 87 | 16.24 | 55.1 |
| Lead Total | US EPA 200.8 | µg/L | 10 | <0.2 | 120 | <0.2 | 0.7 | <0.2 | 0.4 |
| Manganese Total | US EPA 200.8 | µg/L | 500 | <0.5 | 120 | <0.5 | 61 | 4.63 | 12 |
| Molybdenum Total | US EPA 200.8 | µg/L | 50 | <1 | 120 | <1 | 2 | <1 | <1 |
| Nickel Total | US EPA 200.8 | µg/L | 20 | <1 | 120 | <1 | 2 | <1 | 1 |
| Selenium Total | US EPA 200.8 | µg/L | 10 | <2 | 120 | <2 | <2 | <2 | <2 |
| Silver Total | US EPA 200.8 | µg/L | 100 | <1 | 120 | <1 | <1 | <1 | <1 |
| Zinc Total | US EPA 200.8 | µg/L | - | <5 | 120 | <5 | 110 | 6.15 | 22.1 |
| Acenaphthene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |
| Acenaphthylene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |

| Analyte | Method ID | Units | ADWG | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Anthracene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |
| Benz(a)anthracene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |
| Benzo(a)pyrene | US EPA 3510/8270 | µg/L | 0.01 | <0.5 | 120 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(b) fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |
| Benzo(g,h,i)perylene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |
| Benzo(k) fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |
| Chrysene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |
| Dibenz(a,h)anthracene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |
| Fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |
| Fluorene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |
| Indeno(1,2,3-cd)pyrene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |
| Naphthalene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |
| Polyaromatic Hydrocarbons Total | US EPA 3510/8270 | µg/L | - | <0.5 | 120 | <0.5 | <0.5 | <0.5 | <0.5 |
| Phenanthrene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |
| Pyrene | US EPA 3510/8270 | µg/L | - | <1 | 120 | <1 | <1 | <1 | <1 |
| pH | APHA 4500-H B | pH Units | - | <0.1 | 1008 | 7.3 | 9 | 7.72 | 8.2 |
| TDS | APHA 2540 C | mg/L | - | <20 | 120 | 46 | 120 | 67.53 | 110.5 |
| Temperature | APHA 2550 B | deg C | - | <0.1 | 481 | 7.2 | 26 | 16.7 | 23.5 |
| THM-CHBr2Cl | HP 228-135 | µg/L | - | <1 | 240 | <1 | <1 | <1 | <1 |
| THM-CHBr3 | HP 228-135 | µg/L | - | <1 | 240 | <1 | 9.4 | <1 | <1 |
| THM-CHBrCl2 | HP 228-135 | µg/L | - | <1 | 240 | <1 | 9.4 | 1.62 | 6.1 |
| THM-CHCl3 | HP 228-135 | µg/L | - | <1 | 240 | 11 | 98 | 25.98 | 69.05 |
| Total THM | HP 228-135 | µg/L | 250 | <1 | 240 | 11 | 100 | 27.42 | 74.1 |
| Turbidity | APHA 2130 B | NTU | - | <0.1 | 481 | 0.1 | 9.4 | 0.36 | 0.69 |

* aesthetic guideline
\# one sample returned positive. Resample was negative.

Notes:

| | |
|---|---|
| APHA | American Public Health Association. 2005. Standard Methods for the Examination of Water and Wastewater, 21st Edition. APHA. |
| IC | Ion Chromatography |
| GC | Gas Chromatography |
| ICP-AES | Inductively Coupled Plasma/Atomic Emission Spectrometry |
| ICP-MS | Inductively Coupled Plasma/Mass Spectrometry |
| ISE | Ion Selective Electrode |
| MPN | Most Probable Number |
| USEPA | United States Environment Protection Authority |

The 95th percentile is a statistical calculation based on 'normal' distribution. In the context of this report, 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.

Table 9.2 Summary data for water quality zone 1 – North Canberra and Gungahlin

| Analyte | Method ID | Units | ADWG | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| E.Coli | APHA 9223 B | MPN/100mL | <1 | <1 | 252 | <1 | <1 | <1 | <1 |
| Total Coliforms | APHA 9223 B | MPN/100mL | - | <1 | 252 | <1 | 1 | <1 | <1 |
| Heterotrophic Plate Count | APHA 9215 B | CFU/mL | - | <1 | 252 | <1 | 240 | 3.35 | 5 |
| Alkalinity bicarb | APHA 2320 A/B | mg/L | - | <0.1 | 60 | 28.4 | 42.6 | 37.09 | 40.41 |
| Alkalinity carb | APHA 2320 A/B | mg/L | - | <0.1 | 60 | <0.1 | <0.1 | <0.1 | <0.1 |
| Alkalinity hydrox | APHA 2320 A/B | mg/L | - | <0.1 | 60 | <0.1 | <0.1 | <0.1 | <0.1 |
| Alkalinity total | APHA 2320 A/B | mg/L | - | <1 | 60 | 28 | 43 | 37.1 | 40.05 |
| Asbestos | AS 4964-2000 | Presents/ Absence | - | | 24 | Absent | Absent | - | - |
| Chloride | APHA 21st Ed. 2005, Part 4110 B | mg/L | - | <0.1 | 12 | 2 | 5.7 | 3.14 | 5.04 |
| Fluoride | APHA 4500-F C | mg/L | 1.5 | <0.1 | 24 | 0.72 | 0.9 | 0.83 | 0.89 |
| Iodide | ASTM D19 | mg/L | 0.5 | <0.05 | 12 | <0.05 | <0.05 | <0.05 | <0.05 |
| Nitrate | APHA 21st Ed. 2005, Part 4110 B | mg/L | 50 | <0.1 | 12 | <0.1 | <0.1 | <0.1 | <0.1 |
| Sulphate | APHA 21st Ed. 2005, Part 4110 B | mg/L | 500 | | 12 | 0.5 | 12 | 4.61 | 9.25 |
| Chlorine Combined | APHA 4500-CL G | mg/L | - | <0.03 | 252 | <0.03 | 0.35 | 0.04 | 0.12 |
| Chlorine Free | APHA 4500-CL G | mg/L | 5 | <0.03 | 252 | 0.08 | 1.38 | 0.75 | 1.09 |
| Chlorine Total | APHA 4500-CL G | mg/L | 5 | <0.03 | 252 | 0.17 | 1.41 | 0.8 | 1.16 |
| True colour | Lachat QuikChem method, Color in Waters 10-308-00-1-A | Pt.Co | - | <1 | 120 | <1 | 13 | 1.02 | 2.05 |
| Conductivity | APHA 2510 B | µS/cm | - | <2 | 24 | 87 | 170 | 100.92 | 128.5 |
| 1,2,4 Trichlorobenzene | US EPA 8270/8260 | µg/L | 30 | <20 | 24 | <20 | <20 | <20 | <20 |
| 1,2,Dichlorobenzene | US EPA 8270/8260 | µg/L | 1500 | <20 | 24 | <20 | <20 | <20 | <20 |
| 1,3 Dichlorobenzene | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| 1,4 Dichlorobenzene | US EPA 8270/8260 | µg/L | 40 | <20 | 24 | <20 | <20 | <20 | <20 |
| 2,3,4,6 Tetrachlorophenol | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| 2,4,5 Trichlorophenol | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| 2,4,6 Trichlorophenol | US EPA 8270/8260 | µg/L | 20 | <20 | 24 | <20 | <20 | <20 | <20 |
| 2,4 Dichlorophenol | US EPA 8270/8260 | µg/L | 200 | <10 | 24 | <10 | <10 | <10 | <10 |
| 2,4 Dimethylphenol | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| 2,4 Dinitrotoluene | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| 2,6 Dichlorophenol | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| 2,6 Dinitrotoluene | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |

| Analyte | Method ID | Units | ADWG | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| 2 Chloronaphthalene | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| 2 Chlorophenol | US EPA 8270/8260 | µg/L | 300 | <10 | 24 | <10 | <10 | <10 | <10 |
| 2 Methylnaphthalene | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| 2 Methylphenol | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| 2 Nitroaniline | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| 2 Nitrophenol | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| 3,4 Methylphenol | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| 3 Nitroaniline | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| 4,4. DDD | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| 4,4 DDE | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| 4,4 DDT | US EPA 8270/8260 | µg/L | 9 | <20 | 24 | <20 | <20 | <20 | <20 |
| 4 Bromophenylether | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| 4 Chloro 3 methylphenol | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| 4 Chloroaniline | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| 4 Chlorophenylether | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| 4 Nitroaniline | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| a BHC | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Acenaphthene | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Acenaphthylene | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Aldrin | US EPA 8270/8260 | µg/L | 0.3 | <20 | 24 | <20 | <20 | <20 | <20 |
| Aniline | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Anthracene | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Azobenzene | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| b BHC | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Benz(a)anthracene | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Benzo(a)pyrene | US EPA 8270/8260 | µg/L | 0.01 | <10 | 24 | <10 | <10 | <10 | <10 |
| Benzo (b,k) fluoranthene | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Benzo( g,h,I) perylene | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Benzyl alcohol | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Bis (2 chloroethoxy) methane | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Bis (2 chloroethyl) ether | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Bis (2 chloroisopropyl) ether | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Bis(2-ethylhexyl) phthalate | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Butyl benzyl phthalate | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Carbazole | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Chlorpyifos | US EPA 8270/8260 | µg/L | 10 | <20 | 24 | <20 | <20 | <20 | <20 |

| Analyte | Method ID | Units | ADWG | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Chrysene | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| d BHC | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Diazinon | US EPA 8270/8260 | µg/L | 4 | <20 | 24 | <20 | <20 | <20 | <20 |
| Dibenz(a,h)anthracene | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Dibenzofuran | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Dichlorobenzidine | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Dieldrin | US EPA 8270/8260 | µg/L | 3 | <20 | 24 | <20 | <20 | <20 | <20 |
| Diethyl phthalate | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Dimethoate | US EPA 8270/8260 | µg/L | 7 | <20 | 24 | <20 | <20 | <20 | <20 |
| Dimethyl phthalate | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Di-n-butyl phthalate | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Di-n-octyl phthalate | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Endosulfan sulphate | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Endosulphan 1 | US EPA 8270/8260 | µg/L | 20 | <20 | 24 | <20 | <20 | <20 | <20 |
| Endosulphan 11 | US EPA 8270/8260 | µg/L | 20 | <20 | 24 | <20 | <20 | <20 | <20 |
| Endrin | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Endrin Aldehyde | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Ethion | US EPA 8270/8260 | µg/L | 4 | <20 | 24 | <20 | <20 | <20 | <20 |
| Fenitrothion | US EPA 8270/8260 | µg/L | 7 | <20 | 24 | <20 | <20 | <20 | <20 |
| Fluoranthene | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Fluorene | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| g BHC (Lindane) | US EPA 8270/8260 | µg/L | 10 | <20 | 24 | <20 | <20 | <20 | <20 |
| Heptachlor | US EPA 8270/8260 | µg/L | 0.3 | <20 | 24 | <20 | <20 | <20 | <20 |
| Heptachlorepoxide | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Hexachloro 1,3 butadiene | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Hexachlorobenzene | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Hexachlorocyclopentadiene | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Hexachloroethane | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Indeno(1,2,3 cd)pyrene | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Isophorone | US EPA 8270/8260 | µg/L | 100 | <20 | 24 | <20 | <20 | <20 | <20 |
| Malathion | US EPA 8270/8260 | µg/L | 70 | <20 | 24 | <20 | <20 | <20 | <20 |
| Naphthalene | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Nitrobenzene | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| N Nitrosodimethylamine | US EPA 8270/8260 | µg/L | 0.1 | <20 | 24 | <20 | <20 | <20 | <20 |
| N Nitrosodi n propylamine | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| N Nitrosodiphenylamine | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |

| Analyte | Method ID | Units | ADWG | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Pentachlorophenol | US EPA 8270/8260 | µg/L | 10 | <20 | 24 | <20 | <20 | <20 | <20 |
| Phenanthrene | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Phenol | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Pyrene | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Bromoacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <5 | 60 | <5 | <5 | <5 | <5 |
| Bromochloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <1 | 60 | <1 | 6 | 1.23 | 5 |
| Bromodichloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <1 | 60 | <1 | 6 | 1.51 | 6 |
| Dibromoacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <1 | 60 | <1 | 1 | <1 | <1 |
| Dibromochloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <10 | 60 | <10 | <10 | <10 | <10 |
| Dichloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | 100 | <1 | 60 | 4 | 59 | 16.17 | 46.3 |
| Monochloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <1 | 60 | <1 | 6 | 1.12 | 3.05 |
| Tribromoacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <10 | 60 | <10 | <10 | <10 | <10 |
| Trichloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | 100 | <1 | 60 | 8 | 82 | 23.33 | 73.3 |
| Hardness Total | APHA 2340 B | mg/L | - | <0.1 | 24 | 33 | 67 | 39.79 | 48.25 |
| Calcium Dissolved | US EPA 200.7 | mg/L | - | <0.05 | 24 | 12 | 21 | 14.29 | 16.85 |
| Potassium Dissolved | US EPA 200.7 | mg/L | - | <0.1 | 12 | 0.5 | 0.9 | 0.57 | 0.79 |
| Magnesium Dissolved | US EPA 200.7 | mg/L | - | <0.05 | 24 | 0.6 | 3.4 | 1.03 | 1.74 |
| Sodium Dissolved | US EPA 200.7 | mg/L | - | <0.1 | 12 | 2.9 | 4.1 | 3.23 | 3.88 |
| Aluminium Total | US EPA 200.7 | mg/L | - | <0.02 | 24 | 0.02 | 0.18 | 0.06 | 0.15 |
| Iron Total | US EPA 200.7 | mg/L | - | <0.02 | 60 | <0.02 | 0.4 | <0.02 | 0.03 |
| Manganese Total | US EPA 200.8 | mg/L | 0.5 | <0.001 | 120 | 0.001 | 0.29 | 0.01 | 0.02 |
| Aluminium Acid Soluble | US EPA 200.8 | µg/L | - | <5 | 24 | 16 | 130 | 45.29 | 116.25 |
| Copper Total | US EPA 200.7 | µg/L | 2000 | <1 | 96 | 3 | 100 | 18.6 | 65.25 |
| Lead Total | US EPA 200.8 | µg/L | 10 | <0.2 | 36 | <0.2 | 2.2 | 0.36 | 0.9 |
| Aluminium Total | US EPA 200.8 | µg/L | - | <9 | 24 | 16 | 170 | 56.88 | 150 |
| Antimony Total | US EPA 200.8 | µg/L | 3 | <3 | 24 | <3 | <3 | <3 | <3 |
| Arsenic Total | US EPA 200.8 | µg/L | 10 | <1 | 24 | <1 | <1 | <1 | <1 |
| Barium Total | US EPA 200.8 | µg/L | 2000 | | 24 | 3 | 10 | 4.09 | 6.71 |
| Beryllium Total | US EPA 200.8 | µg/L | 60 | <0.1 | 24 | <0.1 | <0.1 | <0.1 | <0.1 |
| Cadmium Total | US EPA 200.8 | µg/L | 2 | <0.05 | 24 | <0.05 | <0.05 | <0.05 | <0.05 |
| Chromium Total | US EPA 200.8 | µg/L | 50 | <2 | 24 | <2 | <2 | <2 | <2 |

| Analyte | Method ID | Units | ADWG | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Cobalt Total | US EPA 200.8 | µg/L | - | <0.2 | 24 | <0.2 | <0.2 | <0.2 | <0.2 |
| Copper Total | US EPA 200.8 | µg/L | 2000 | <1 | 24 | <1 | 87 | 21.85 | 76.55 |
| Lead Total | US EPA 200.8 | µg/L | 10 | <0.2 | 24 | <0.2 | 0.7 | 0.21 | 0.4 |
| Manganese Total | US EPA 200.8 | µg/L | 500 | <0.5 | 24 | <0.5 | 61 | 6.95 | 18.1 |
| Molybdenum Total | US EPA 200.8 | µg/L | 50 | <1 | 24 | <1 | 2 | <1 | <1 |
| Nickel Total | US EPA 200.8 | µg/L | 20 | <1 | 24 | <1 | 1 | <1 | 1 |
| Selenium Total | US EPA 200.8 | µg/L | 10 | <2 | 24 | <2 | <2 | <2 | <2 |
| Silver Total | US EPA 200.8 | µg/L | 100 | <1 | 24 | <1 | <1 | <1 | <1 |
| Zinc Total | US EPA 200.8 | µg/L | - | <5 | 24 | <5 | 18 | <5 | 9.7 |
| Acenaphthene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Acenaphthylene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Anthracene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Benz(a)anthracene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Benzo(a)pyrene | US EPA 3510/8270 | µg/L | 0.01 | <0.5 | 24 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(b) fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Benzo(g,h,i)perylene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Benzo(k) fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Chrysene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Dibenz(a,h)anthracene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Fluorene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Indeno(1,2,3-cd)pyrene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Naphthalene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Polyaromatic Hydrocarbons Total | US EPA 3510/8270 | µg/L | - | <0.5 | 24 | <0.5 | <0.5 | <0.5 | <0.5 |
| Phenanthrene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Pyrene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| pH | APHA 4500-H B | pH Units | - | <0.1 | 252 | 7.3 | 9 | 7.64 | 7.9 |
| TDS | APHA 2540 C | mg/L | - | <20 | 24 | 49 | 120 | 65.17 | 88.05 |
| Temperature | APHA 2550 B | deg C | - | <0.1 | 120 | 8.5 | 26 | 16.81 | 23.11 |
| THM-CHBr2Cl | HP 228-135 | µg/L | - | <1 | 60 | <1 | <1 | <1 | <1 |
| THM-CHBr3 | HP 228-135 | µg/L | - | <1 | 60 | <1 | 9.4 | <1 | <1 |
| THM-CHBrCl2 | HP 228-135 | µg/L | - | <1 | 60 | <1 | 9.4 | 1.68 | 6.14 |
| THM-CHCl3 | HP 228-135 | µg/L | - | <1 | 60 | 13 | 95 | 26.45 | 66.15 |
| Total THM | HP 228-135 | µg/L | 250 | <1 | 60 | 13 | 100 | 27.97 | 70.2 |
| Turbidity | APHA 2130 B | NTU | - | <0.1 | 120 | 0.1 | 9.4 | 0.40 | 0.73 |

## Table 9.3 Summary data for water quality zone 2 – Belconnen

| Analyte | Method ID | Units | ADWG | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| E.Coli | APHA 9223 B | MPN/100mL | <1 | <1 | 257 | <1 | <1 | <1 | <1 |
| Total Coliforms | APHA 9223 B | MPN/100mL | - | <1 | 257 | <1 | <1 | <1 | <1 |
| Heterotrophic Plate Count | APHA 9215 B | CFU/mL | - | <1 | 257 | <1 | 150 | 4.75 | 26 |
| Alkalinity bicarb | APHA 2320 A/B | mg/L | - | <0.1 | 61 | 32.9 | 49.2 | 37.95 | 43.2 |
| Alkalinity carb | APHA 2320 A/B | mg/L | - | <0.1 | 61 | <0.1 | <0.1 | <0.1 | <0.1 |
| Alkalinity hydrox | APHA 2320 A/B | mg/L | - | <0.1 | 61 | <0.1 | <0.1 | <0.1 | <0.1 |
| Alkalinity total | APHA 2320 A/B | mg/L | - | <1 | 61 | 33 | 49 | 37.9 | 43 |
| Asbestos | AS 4964-2000 | Presents/ Absence | - | | 36 | Present | Absent | - | - |
| Chloride | APHA 21st Ed. 2005, Part 4110 B | mg/L | - | <0.1 | 12 | 2.2 | 8.9 | 3.61 | 6.92 |
| Fluoride | APHA 4500-F C | mg/L | 1.5 | <0.1 | 36 | 0.58 | 0.92 | 0.84 | 0.89 |
| Iodide | ASTM D19 | mg/L | 0.5 | <0.05 | 12 | <0.05 | <0.05 | <0.05 | <0.05 |
| Nitrate | APHA 21st Ed. 2005, Part 4110 B | mg/L | 50 | <0.1 | 12 | <0.1 | <0.1 | <0.1 | <0.1 |
| Sulphate | APHA 21st Ed. 2005, Part 4110 B | mg/L | 500 | | 12 | 0.6 | 31 | 6.49 | 18.35 |
| Chlorine Combined | APHA 4500-CL G | mg/L | - | <0.03 | 257 | 0.015 | 0.5 | 0.05 | 0.15 |
| Chlorine Free | APHA 4500-CL G | mg/L | 5 | <0.03 | 257 | 0.08 | 1.39 | 0.71 | 1.08 |
| Chlorine Total | APHA 4500-CL G | mg/L | 5 | <0.03 | 257 | 0.14 | 1.43 | 0.76 | 1.12 |
| True colour | Lachat QuikChem method, Color in Waters 10-308-00-1-A | Pt.Co | - | <1 | 123 | <1 | 3 | <1 | 2 |
| Conductivity | APHA 2510 B | µS/cm | - | <2 | 36 | 88 | 180 | 104.97 | 172.5 |
| 1,2,4 Trichlorobenzene | US EPA 8270/8260 | µg/L | 30 | <20 | 36 | <20 | <20 | <20 | <20 |
| 1,2,Dichlorobenzene | US EPA 8270/8260 | µg/L | 1500 | <20 | 36 | <20 | <20 | <20 | <20 |
| 1,3 Dichlorobenzene | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| 1,4 Dichlorobenzene | US EPA 8270/8260 | µg/L | 40 | <20 | 36 | <20 | <20 | <20 | <20 |
| 2,3,4,6 Tetrachlorophenol | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| 2,4,5 Trichlorophenol | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| 2,4,6 Trichlorophenol | US EPA 8270/8260 | µg/L | 20 | <20 | 36 | <20 | <20 | <20 | <20 |
| 2,4 Dichlorophenol | US EPA 8270/8260 | µg/L | 200 | <10 | 36 | <10 | <10 | <10 | <10 |
| 2,4 Dimethylphenol | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| 2,4 Dinitrotoluene | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| 2,6 Dichlorophenol | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| 2,6 Dinitrotoluene | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| 2 Chloronaphthalene | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |

| Analyte | Method ID | Units | ADWG | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| 2 Chlorophenol | US EPA 8270/8260 | µg/L | 300 | <10 | 36 | <10 | <10 | <10 | <10 |
| 2 Methylnaphthalene | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| 2 Methylphenol | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| 2 Nitroaniline | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| 2 Nitrophenol | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| 3,4 Methylphenol | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| 3 Nitroaniline | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| 4,4. DDD | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| 4,4 DDE | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| 4,4 DDT | US EPA 8270/8260 | µg/L | 9 | <20 | 36 | <20 | <20 | <20 | <20 |
| 4 Bromophenylether | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| 4 Chloro 3 methylphenol | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| 4 Chloroaniline | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| 4 Chlorophenylether | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| 4 Nitroaniline | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| a BHC | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Acenaphthene | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Acenaphthylene | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Aldrin | US EPA 8270/8260 | µg/L | 0.3 | <20 | 36 | <20 | <20 | <20 | <20 |
| Aniline | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Anthracene | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Azobenzene | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| b BHC | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Benz(a)anthracene | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Benzo(a)pyrene | US EPA 8270/8260 | µg/L | 0.01 | <10 | 36 | <10 | <10 | <10 | <10 |
| Benzo (b,k) fluoranthene | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Benzo( g,h,I) perylene | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Benzyl alcohol | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Bis (2 chloroethoxy) methane | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Bis (2 chloroethyl) ether | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Bis (2 chloroisopropyl) ether | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Bis(2-ethylhexyl) phthalate | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Butyl benzyl phthalate | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Carbazole | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Chlorpyifos | US EPA 8270/8260 | µg/L | 10 | <20 | 36 | <20 | <20 | <20 | <20 |

| Analyte | Method ID | Units | ADWG | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Chrysene | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| d BHC | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Diazinon | US EPA 8270/8260 | µg/L | 4 | <20 | 36 | <20 | <20 | <20 | <20 |
| Dibenz(a,h)anthracene | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Dibenzofuran | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Dichlorobenzidine | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Dieldrin | US EPA 8270/8260 | µg/L | 3 | <20 | 36 | <20 | <20 | <20 | <20 |
| Diethyl phthalate | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Dimethoate | US EPA 8270/8260 | µg/L | 7 | <20 | 36 | <20 | <20 | <20 | <20 |
| Dimethyl phthalate | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Di-n-butyl phthalate | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Di-n-octyl phthalate | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Endosulfan sulphate | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Endosulphan 1 | US EPA 8270/8260 | µg/L | 20 | <20 | 36 | <20 | <20 | <20 | <20 |
| Endosulphan 11 | US EPA 8270/8260 | µg/L | 20 | <20 | 36 | <20 | <20 | <20 | <20 |
| Endrin | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Endrin Aldehyde | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Ethion | US EPA 8270/8260 | µg/L | 4 | <20 | 36 | <20 | <20 | <20 | <20 |
| Fenitrothion | US EPA 8270/8260 | µg/L | 7 | <20 | 36 | <20 | <20 | <20 | <20 |
| Fluoranthene | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Fluorene | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| g BHC (Lindane) | US EPA 8270/8260 | µg/L | 10 | <20 | 36 | <20 | <20 | <20 | <20 |
| Heptachlor | US EPA 8270/8260 | µg/L | 0.3 | <20 | 36 | <20 | <20 | <20 | <20 |
| Heptachlorepoxide | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Hexachloro 1,3 butadiene | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Hexachlorobenzene | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Hexachlorocyclopentadiene | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Hexachloroethane | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Indeno(1,2,3 cd)pyrene | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Isophorone | US EPA 8270/8260 | µg/L | 100 | <20 | 36 | <20 | <20 | <20 | <20 |
| Malathion | US EPA 8270/8260 | µg/L | 70 | <20 | 36 | <20 | <20 | <20 | <20 |
| Naphthalene | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Nitrobenzene | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| N Nitrosodimethylamine | US EPA 8270/8260 | µg/L | 0.1 | <20 | 36 | <20 | <20 | <20 | <20 |
| N Nitrosodi n propylamine | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| N Nitrosodiphenylamine | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |

| Analyte | Method ID | Units | ADWG | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Pentachlorophenol | US EPA 8270/8260 | µg/L | 10 | <20 | 36 | <20 | <20 | <20 | <20 |
| Phenanthrene | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Phenol | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Pyrene | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Bromoacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <5 | 61 | <5 | <5 | <5 | <5 |
| Bromochloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <1 | 61 | <1 | 6 | 1.32 | 5 |
| Bromodichloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <1 | 61 | <1 | 6 | 1.58 | 6 |
| Dibromoacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <1 | 61 | <1 | <1 | <1 | <1 |
| Dibromochloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <10 | 61 | <10 | <10 | <10 | <10 |
| Dichloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | 100 | <1 | 61 | 5 | 62 | 16.75 | 51 |
| Monochloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <1 | 61 | <1 | 4 | 1.11 | 4 |
| Tribromoacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <10 | 61 | <10 | <10 | <10 | <10 |
| Trichloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | 100 | <1 | 61 | 7 | 84 | 23.38 | 76 |
| Hardness Total | APHA 2340 B | mg/L | - | <0.1 | 36 | 32 | 63 | 41.03 | 61.25 |
| Calcium Dissolved | US EPA 200.7 | mg/L | - | <0.05 | 36 | 11 | 20 | 14.56 | 19.25 |
| Potassium Dissolved | US EPA 200.7 | mg/L | - | <0.1 | 12 | 0.4 | 1.9 | 0.66 | 1.3 |
| Magnesium Dissolved | US EPA 200.7 | mg/L | - | <0.05 | 36 | 0.79 | 3.2 | 1.15 | 3.1 |
| Sodium Dissolved | US EPA 200.7 | mg/L | - | <0.1 | 12 | 2.7 | 7.3 | 3.42 | 5.21 |
| Aluminium Total | US EPA 200.7 | mg/L | - | <0.02 | 36 | 0.02 | 0.19 | 0.05 | 0.09 |
| Iron Total | US EPA 200.7 | mg/L | - | <0.02 | 61 | <0.02 | 0.03 | <0.02 | <0.02 |
| Manganese Total | US EPA 200.8 | mg/L | 0.5 | <0.001 | 123 | 0.001 | 0.04 | 0.005 | 0.01 |
| Aluminium Acid Soluble | US EPA 200.8 | µg/L | - | <5 | 36 | 11 | 170 | 42.22 | 96.25 |
| Copper Total | US EPA 200.7 | µg/L | 2000 | <1 | 87 | 1 | 74 | 17.67 | 59.3 |
| Lead Total | US EPA 200.8 | µg/L | 10 | <0.2 | 25 | <0.2 | 0.7 | 0.22 | 0.48 |
| Aluminium Total | US EPA 200.8 | µg/L | - | <9 | 36 | 16 | 210 | 49.14 | 105 |
| Antimony Total | US EPA 200.8 | µg/L | 3 | <3 | 36 | <3 | <3 | <3 | <3 |
| Arsenic Total | US EPA 200.8 | µg/L | 10 | <1 | 36 | <1 | <1 | <1 | <1 |
| Barium Total | US EPA 200.8 | µg/L | 2000 | | 36 | 3 | 6.5 | 3.98 | 5.75 |
| Beryllium Total | US EPA 200.8 | µg/L | 60 | <0.1 | 36 | <0.1 | <0.1 | <0.1 | <0.1 |
| Cadmium Total | US EPA 200.8 | µg/L | 2 | <0.05 | 36 | <0.05 | 0.5 | <0.05 | 0.13 |
| Chromium Total | US EPA 200.8 | µg/L | 50 | <2 | 36 | <2 | <2 | <2 | <2 |

| Analyte | Method ID | Units | ADWG | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Cobalt Total | US EPA 200.8 | µg/L | - | <0.2 | 36 | <0.2 | 0.4 | <0.2 | <0.2 |
| Copper Total | US EPA 200.8 | µg/L | 2000 | <1 | 36 | 2 | 74 | 14.42 | 33 |
| Lead Total | US EPA 200.8 | µg/L | 10 | <0.2 | 36 | <0.2 | 0.7 | <0.2 | 0.33 |
| Manganese Total | US EPA 200.8 | µg/L | 500 | <0.5 | 36 | <0.5 | 14 | 4.27 | 12 |
| Molybdenum Total | US EPA 200.8 | µg/L | 50 | <1 | 36 | <1 | <1 | <1 | <1 |
| Nickel Total | US EPA 200.8 | µg/L | 20 | <1 | 36 | <1 | 2 | <1 | 1 |
| Selenium Total | US EPA 200.8 | µg/L | 10 | <2 | 36 | <2 | <2 | <2 | <2 |
| Silver Total | US EPA 200.8 | µg/L | 100 | <1 | 36 | <1 | <1 | <1 | <1 |
| Zinc Total | US EPA 200.8 | µg/L | - | <5 | 36 | <5 | 110 | 9.5 | 30.25 |
| Acenaphthene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Acenaphthylene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Anthracene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Benz(a)anthracene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Benzo(a)pyrene | US EPA 3510/8270 | µg/L | 0.01 | <0.5 | 36 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(b) fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Benzo(g,h,i)perylene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Benzo(k) fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Chrysene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Dibenz(a,h)anthracene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Fluorene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Indeno(1,2,3-cd)pyrene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Naphthalene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Polyaromatic Hydrocarbons Total | US EPA 3510/8270 | µg/L | - | <0.5 | 36 | <0.5 | <0.5 | <0.5 | <0.5 |
| Phenanthrene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Pyrene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| pH | APHA 4500-H B | pH Units | - | <0.1 | 257 | 7.3 | 8.8 | 7.72 | 8.1 |
| TDS | APHA 2540 C | mg/L | - | <20 | 36 | 48 | 120 | 67.75 | 112.5 |
| Temperature | APHA 2550 B | deg C | - | <0.1 | 123 | 9 | 24.2 | 16.49 | 23.1 |
| THM-CHBr2Cl | HP 228-135 | µg/L | - | <1 | 61 | <1 | <1 | <1 | <1 |
| THM-CHBr3 | HP 228-135 | µg/L | - | <1 | 61 | <1 | <1 | <1 | <1 |
| THM-CHBrCl2 | HP 228-135 | µg/L | - | <1 | 61 | <1 | 8.9 | 1.6 | 5.6 |
| THM-CHCl3 | HP 228-135 | µg/L | - | <1 | 61 | 11 | 84 | 26.46 | 70 |
| Total THM | HP 228-135 | µg/L | 250 | <1 | 61 | 11 | 90 | 27.8 | 76 |
| Turbidity | APHA 2130 B | NTU | - | <0.1 | 123 | 0.1 | 0.71 | 0.31 | 0.56 |

Table 9.4 Summary data for water quality zone 3 – South Canberra, Woden and Weston Creek

| Analyte | Method ID | Units | ADWG | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| E.Coli | APHA 9223 B | MPN/100mL | <1 | <1 | 252 | <1 | <1 | <1 | <1 |
| Total Coliforms | APHA 9223 B | MPN/100mL | - | <1 | 252 | <1 | 1 | <1 | <1 |
| Heterotrophic Plate Count | APHA 9215 B | CFU/mL | - | <1 | 252 | <1 | 5000 | 24.91 | 22 |
| Alkalinity bicarb | APHA 2320 A/B | mg/L | - | <0.1 | 60 | 32.5 | 42.4 | 37.56 | 40.81 |
| Alkalinity carb | APHA 2320 A/B | mg/L | - | <0.1 | 60 | <0.1 | <0.1 | <0.1 | <0.1 |
| Alkalinity hydrox | APHA 2320 A/B | mg/L | - | <0.1 | 60 | <0.1 | <0.1 | <0.1 | <0.1 |
| Alkalinity total | APHA 2320 A/B | mg/L | - | <1 | 60 | 32 | 42 | 37.6 | 41 |
| Asbestos | AS 4964-2000 | Presents/ Absence | - | | 36 | Absent | Absent | - | - |
| Chloride | APHA 21st Ed. 2005, Part 4110 B | mg/L | - | <0.1 | 12 | 2.1 | 8.7 | 3.19 | 6.01 |
| Fluoride | APHA 4500-F C | mg/L | 1.5 | <0.1 | 36 | 0.61 | 0.96 | 0.84 | 0.92 |
| Iodide | ASTM D19 | mg/L | 0.5 | <0.05 | 12 | <0.05 | <0.05 | <0.05 | <0.05 |
| Nitrate | APHA 21st Ed. 2005, Part 4110 B | mg/L | 50 | <0.1 | 12 | <0.1 | 0.2 | <0.1 | <0.1 |
| Sulphate | APHA 21st Ed. 2005, Part 4110 B | mg/L | 500 | | 12 | 0.6 | 32 | 6.22 | 17.1 |
| Chlorine Combined | APHA 4500-CL G | mg/L | - | <0.03 | 252 | <0.03 | 0.72 | 0.05 | 0.14 |
| Chlorine Free | APHA 4500-CL G | mg/L | 5 | <0.03 | 252 | 0.03 | 1.36 | 0.75 | 1.11 |
| Chlorine Total | APHA 4500-CL G | mg/L | 5 | <0.03 | 252 | 0.03 | 1.39 | 0.79 | 1.16 |
| True colour | Lachat QuikChem method, Color in Waters 10-308-00-1-A | Pt.Co | - | <1 | 120 | <1 | 5 | <1 | 2 |
| Conductivity | APHA 2510 B | µS/cm | - | <2 | 36 | 86 | 170 | 100.53 | 147.5 |
| 1,2,4 Trichlorobenzene | US EPA 8270/8260 | µg/L | 30 | <20 | 36 | <20 | <20 | <20 | <20 |
| 1,2,Dichlorobenzene | US EPA 8270/8260 | µg/L | 1500 | <20 | 36 | <20 | <20 | <20 | <20 |
| 1,3 Dichlorobenzene | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| 1,4 Dichlorobenzene | US EPA 8270/8260 | µg/L | 40 | <20 | 36 | <20 | <20 | <20 | <20 |
| 2,3,4,6 Tetrachlorophenol | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| 2,4,5 Trichlorophenol | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| 2,4,6 Trichlorophenol | US EPA 8270/8260 | µg/L | 20 | <20 | 36 | <20 | <20 | <20 | <20 |
| 2,4 Dichlorophenol | US EPA 8270/8260 | µg/L | 200 | <10 | 36 | <10 | <10 | <10 | <10 |
| 2,4 Dimethylphenol | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| 2,4 Dinitrotoluene | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| 2,6 Dichlorophenol | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| 2,6 Dinitrotoluene | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |

| Analyte | Method ID | Units | ADWG | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| 2 Chloronaphthalene | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| 2 Chlorophenol | US EPA 8270/8260 | µg/L | 300 | <10 | 36 | <10 | <10 | <10 | <10 |
| 2 Methylnaphthalene | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| 2 Methylphenol | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| 2 Nitroaniline | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| 2 Nitrophenol | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| 3,4 Methylphenol | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| 3 Nitroaniline | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| 4,4. DDD | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| 4,4 DDE | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| 4,4 DDT | US EPA 8270/8260 | µg/L | 9 | <20 | 36 | <20 | <20 | <20 | <20 |
| 4 Bromophenylether | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| 4 Chloro 3 methylphenol | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| 4 Chloroaniline | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| 4 Chlorophenylether | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| 4 Nitroaniline | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| a BHC | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Acenaphthene | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Acenaphthylene | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Aldrin | US EPA 8270/8260 | µg/L | 0.3 | <20 | 36 | <20 | <20 | <20 | <20 |
| Aniline | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Anthracene | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Azobenzene | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| b BHC | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Benz(a)anthracene | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Benzo(a)pyrene | US EPA 8270/8260 | µg/L | 0.01 | <10 | 36 | <10 | <10 | <10 | <10 |
| Benzo (b,k) fluoranthene | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Benzo( g,h,I) perylene | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Benzyl alcohol | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Bis (2 chloroethoxy) methane | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Bis (2 chloroethyl) ether | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Bis (2 chloroisopropyl) ether | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Bis(2-ethylhexyl) phthalate | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Butyl benzyl phthalate | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Carbazole | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Chlorpyifos | US EPA 8270/8260 | µg/L | 10 | <20 | 36 | <20 | <20 | <20 | <20 |

| Analyte | Method ID | Units | ADWG | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Chrysene | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| d BHC | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Diazinon | US EPA 8270/8260 | µg/L | 4 | <20 | 36 | <20 | <20 | <20 | <20 |
| Dibenz(a,h)anthracene | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Dibenzofuran | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Dichlorobenzidine | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Dieldrin | US EPA 8270/8260 | µg/L | 3 | <20 | 36 | <20 | <20 | <20 | <20 |
| Diethyl phthalate | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Dimethoate | US EPA 8270/8260 | µg/L | 7 | <20 | 36 | <20 | <20 | <20 | <20 |
| Dimethyl phthalate | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Di-n-butyl phthalate | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Di-n-octyl phthalate | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Endosulfan sulphate | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Endosulphan 1 | US EPA 8270/8260 | µg/L | 20 | <20 | 36 | <20 | <20 | <20 | <20 |
| Endosulphan 11 | US EPA 8270/8260 | µg/L | 20 | <20 | 36 | <20 | <20 | <20 | <20 |
| Endrin | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Endrin Aldehyde | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Ethion | US EPA 8270/8260 | µg/L | 4 | <20 | 36 | <20 | <20 | <20 | <20 |
| Fenitrothion | US EPA 8270/8260 | µg/L | 7 | <20 | 36 | <20 | <20 | <20 | <20 |
| Fluoranthene | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Fluorene | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| g BHC (Lindane) | US EPA 8270/8260 | µg/L | 10 | <20 | 36 | <20 | <20 | <20 | <20 |
| Heptachlor | US EPA 8270/8260 | µg/L | 0.3 | <20 | 36 | <20 | <20 | <20 | <20 |
| Heptachlorepoxide | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Hexachloro 1,3 butadiene | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Hexachlorobenzene | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Hexachlorocyclopentadiene | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Hexachloroethane | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| Indeno(1,2,3 cd)pyrene | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Isophorone | US EPA 8270/8260 | µg/L | 100 | <20 | 36 | <20 | <20 | <20 | <20 |
| Malathion | US EPA 8270/8260 | µg/L | 70 | <20 | 36 | <20 | <20 | <20 | <20 |
| Naphthalene | US EPA 8270/8260 | µg/L | - | <10 | 36 | <20 | <20 | <20 | <20 |
| Nitrobenzene | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| N Nitrosodimethylamine | US EPA 8270/8260 | µg/L | 0.1 | <20 | 36 | <20 | <20 | <20 | <20 |
| N Nitrosodi n propylamine | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |
| N Nitrosodiphenylamine | US EPA 8270/8260 | µg/L | - | <20 | 36 | <20 | <20 | <20 | <20 |

| Analyte | Method ID | Units | ADWG | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Pentachlorophenol | US EPA 8270/8260 | µg/L | 10 | <20 | 36 | <20 | <20 | <20 | <20 |
| Phenanthrene | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Phenol | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Pyrene | US EPA 8270/8260 | µg/L | - | <10 | 36 | <10 | <10 | <10 | <10 |
| Bromoacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <5 | 60 | <5 | <5 | <5 | <5 |
| Bromochloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <1 | 60 | <1 | 7 | 1.21 | 4.05 |
| Bromodichloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <1 | 60 | <1 | 6 | 1.32 | 5 |
| Dibromoacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <1 | 60 | <1 | 1 | <1 | 0.5 |
| Dibromochloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <10 | 60 | <10 | <10 | <10 | <10 |
| Dichloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | 100 | <1 | 60 | 5 | 57 | 14.2 | 34.65 |
| Monochloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <1 | 59 | <1 | 4 | <1 | 2.1 |
| Tribromoacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <10 | 60 | <10 | <10 | <10 | <10 |
| Trichloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | 100 | <1 | 60 | 6 | 73 | 20 | 61.25 |
| Hardness Total | APHA 2340 B | mg/L | - | <0.1 | 35 | 31 | 60 | 39.06 | 54 |
| Calcium Dissolved | US EPA 200.7 | mg/L | - | <0.05 | 36 | 11 | 19 | 13.83 | 16.5 |
| Potassium Dissolved | US EPA 200.7 | mg/L | - | <0.1 | 12 | 0.4 | 2.1 | 0.66 | 1.28 |
| Magnesium Dissolved | US EPA 200.7 | mg/L | - | <0.05 | 36 | 0.82 | 3.6 | 1.09 | 2.28 |
| Sodium Dissolved | US EPA 200.7 | mg/L | - | <0.1 | 12 | 2.8 | 6.5 | 3.37 | 4.96 |
| Aluminium Total | US EPA 200.7 | mg/L | - | <0.02 | 36 | 0.02 | 0.13 | 0.05 | 0.09 |
| Iron Total | US EPA 200.7 | mg/L | - | <0.02 | 60 | <0.02 | 0.18 | <0.02 | 0.04 |
| Manganese Total | US EPA 200.8 | mg/L | 0.5 | <0.001 | 120 | 0.001 | 0.027 | 0.005 | 0.01 |
| Aluminium Acid Soluble | US EPA 200.8 | µg/L | - | <5 | 36 | 13 | 130 | 43.25 | 89.5 |
| Copper Total | US EPA 200.7 | µg/L | 2000 | <1 | 84 | 2 | 320 | 22.3 | 66.65 |
| Lead Total | US EPA 200.8 | µg/L | 10 | <0.2 | 24 | <0.2 | 2.7 | 0.42 | 1.44 |
| Aluminium Total | US EPA 200.8 | µg/L | - | <9 | 36 | 18 | 140 | 49.69 | 102.5 |
| Antimony Total | US EPA 200.8 | µg/L | 3 | <3 | 36 | <3 | <3 | <3 | <3 |
| Arsenic Total | US EPA 200.8 | µg/L | 10 | <1 | 36 | <1 | <1 | <1 | <1 |
| Barium Total | US EPA 200.8 | µg/L | 2000 | | 36 | 2.9 | 8.1 | 3.74 | 5 |
| Beryllium Total | US EPA 200.8 | µg/L | 60 | <0.1 | 36 | <0.1 | <0.1 | <0.1 | <0.1 |
| Cadmium Total | US EPA 200.8 | µg/L | 2 | <0.05 | 36 | <0.05 | 0.15 | <0.05 | <0.05 |
| Chromium Total | US EPA 200.8 | µg/L | 50 | <2 | 36 | <2 | <2 | <2 | <2 |

| Analyte | Method ID | Units | ADWG | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Cobalt Total | US EPA 200.8 | µg/L | - | <0.2 | 36 | <0.2 | <0.2 | <0.2 | <0.2 |
| Copper Total | US EPA 200.8 | µg/L | 2000 | <1 | 36 | 1 | 69 | 17.72 | 56.75 |
| Lead Total | US EPA 200.8 | µg/L | 10 | <0.2 | 36 | <0.2 | 0.4 | 0.19 | 0.4 |
| Manganese Total | US EPA 200.8 | µg/L | 500 | <0.5 | 36 | <0.5 | 12 | 3.78 | 9.73 |
| Molybdenum Total | US EPA 200.8 | µg/L | 50 | <1 | 36 | <1 | <1 | <1 | <1 |
| Nickel Total | US EPA 200.8 | µg/L | 20 | <1 | 36 | <1 | 1 | <1 | <1 |
| Selenium Total | US EPA 200.8 | µg/L | 10 | <2 | 36 | <2 | <2 | <2 | <2 |
| Silver Total | US EPA 200.8 | µg/L | 100 | <1 | 36 | <1 | <1 | <1 | <1 |
| Zinc Total | US EPA 200.8 | µg/L | - | <5 | 36 | <5 | 15 | <5 | 9.25 |
| Acenaphthene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Acenaphthylene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Anthracene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Benz(a)anthracene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Benzo(a)pyrene | US EPA 3510/8270 | µg/L | 0.01 | <0.5 | 36 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(b) fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Benzo(g,h,i)perylene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Benzo(k) fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Chrysene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Dibenz(a,h)anthracene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Fluorene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Indeno(1,2,3-cd)pyrene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Naphthalene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Polyaromatic Hydrocarbons Total | US EPA 3510/8270 | µg/L | - | <0.5 | 36 | <0.5 | <0.5 | <0.5 | <0.5 |
| Phenanthrene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| Pyrene | US EPA 3510/8270 | µg/L | - | <1 | 36 | <1 | <1 | <1 | <1 |
| pH | APHA 4500-H B | pH Units | - | <0.1 | 252 | 7.3 | 8.5 | 7.66 | 7.9 |
| TDS | APHA 2540 C | mg/L | - | <20 | 36 | 46 | 120 | 67.08 | 93.25 |
| Temperature | APHA 2550 B | deg C | - | <0.1 | 120 | 7.2 | 25.6 | 16.36 | 23.5 |
| THM-CHBr2Cl | HP 228-135 | µg/L | - | <1 | 60 | <1 | <1 | <1 | <1 |
| THM-CHBr3 | HP 228-135 | µg/L | - | <1 | 60 | <1 | 9.4 | <1 | <1 |
| THM-CHBrCl2 | HP 228-135 | µg/L | - | <1 | 60 | <1 | 7.4 | 1.37 | 6.01 |
| THM-CHCl3 | HP 228-135 | µg/L | - | <1 | 60 | 12 | 74 | 22.8 | 51.1 |
| Total THM | HP 228-135 | µg/L | 250 | <1 | 60 | 12 | 80 | 24.17 | 57.1 |
| Turbidity | APHA 2130 B | NTU | - | <0.1 | 120 | 0.11 | 2.1 | 0.37 | 0.76 |

Table 9.5 Summary data for water quality zone 4 – Tuggeranong

| Analyte | Method ID | Units | ADWG | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| E.Coli | APHA 9223 B | MPN/100mL | <1 | <1 | 247 | <1 | <1 | <1 | <1 |
| Total Coliforms | APHA 9223 B | MPN/100mL | - | <1 | 247 | <1 | <1 | <1 | <1 |
| Heterotrophic Plate Count | APHA 9215 B | CFU/mL | - | <1 | 247 | <1 | 850 | 7.24 | 13.5 |
| Alkalinity bicarb | APHA 2320 A/B | mg/L | - | <0.1 | 59 | 33.2 | 44.1 | 38.59 | 42.75 |
| Alkalinity carb | APHA 2320 A/B | mg/L | - | <0.1 | 59 | <0.1 | 3.1 | 0.12 | <0.1 |
| Alkalinity hydrox | APHA 2320 A/B | mg/L | - | <0.1 | 59 | <0.1 | <0.1 | <0.1 | <0.1 |
| Alkalinity total | APHA 2320 A/B | mg/L | - | <1 | 59 | 33 | 44 | 38.64 | 43 |
| Asbestos | AS 4964-2000 | Presents/ Absence | - | | 24 | Absent | Absent | - | - |
| Chloride | APHA 21st Ed. 2005, Part 4110 B | mg/L | - | <0.1 | 12 | 2.1 | 9 | 3.56 | 7.9 |
| Fluoride | APHA 4500-F C | mg/L | 1.5 | <0.1 | 24 | 0.71 | 0.97 | 0.85 | 0.97 |
| Iodide | ASTM D19 | mg/L | 0.5 | <0.05 | 12 | <0.05 | <0.05 | <0.05 | <0.05 |
| Nitrate | APHA 21st Ed. 2005, Part 4110 B | mg/L | 50 | <0.1 | 12 | <0.1 | <0.1 | <0.1 | <0.1 |
| Sulphate | APHA 21st Ed. 2005, Part 4110 B | mg/L | 500 | | 12 | 0.6 | 30 | 7.03 | 23.4 |
| Chlorine Combined | APHA 4500-CL G | mg/L | - | <0.03 | 247 | <0.03 | 0.56 | 0.05 | 0.14 |
| Chlorine Free | APHA 4500-CL G | mg/L | 5 | <0.03 | 247 | 0.04 | 1.98 | 0.72 | 1.07 |
| Chlorine Total | APHA 4500-CL G | mg/L | 5 | <0.03 | 247 | 0.1 | 2.05 | 0.77 | 1.1 |
| True colour | Lachat QuikChem method, Color in Waters 10-308-00-1-A | Pt.Co | - | <1 | 117 | <1 | 3 | <1 | 3 |
| Conductivity | APHA 2510 B | µS/cm | - | <2 | 24 | 89 | 180 | 107.21 | 167 |
| 1,2,4 Trichlorobenzene | US EPA 8270/8260 | µg/L | 30 | <20 | 24 | <20 | <20 | <20 | <20 |
| 1,2,Dichlorobenzene | US EPA 8270/8260 | µg/L | 1500 | <20 | 24 | <20 | <20 | <20 | <20 |
| 1,3 Dichlorobenzene | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| 1,4 Dichlorobenzene | US EPA 8270/8260 | µg/L | 40 | <20 | 24 | <20 | <20 | <20 | <20 |
| 2,3,4,6 Tetrachlorophenol | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| 2,4,5 Trichlorophenol | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| 2,4,6 Trichlorophenol | US EPA 8270/8260 | µg/L | 20 | <20 | 24 | <20 | <20 | <20 | <20 |
| 2,4 Dichlorophenol | US EPA 8270/8260 | µg/L | 200 | <10 | 24 | <10 | <10 | <10 | <10 |
| 2,4 Dimethylphenol | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| 2,4 Dinitrotoluene | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| 2,6 Dichlorophenol | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| 2,6 Dinitrotoluene | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| 2 Chloronaphthalene | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |

| Analyte | Method ID | Units | ADWG | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| 2 Chlorophenol | US EPA 8270/8260 | µg/L | 300 | <10 | 24 | <10 | <10 | <10 | <10 |
| 2 Methylnaphthalene | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| 2 Methylphenol | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| 2 Nitroaniline | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| 2 Nitrophenol | US EPA 8270/8260 | µg/L | - | <10 | <10 | <10 | <10 | <10 | <10 |
| 3,4 Methylphenol | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| 3 Nitroaniline | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| 4,4. DDD | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| 4,4 DDE | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| 4,4 DDT | US EPA 8270/8260 | µg/L | 9 | <20 | 24 | <20 | <20 | <20 | <20 |
| 4 Bromophenylether | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| 4 Chloro 3 methylphenol | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| 4 Chloroaniline | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| 4 Chlorophenylether | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| 4 Nitroaniline | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| a BHC | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Acenaphthene | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Acenaphthylene | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Aldrin | US EPA 8270/8260 | µg/L | 0.3 | <20 | 24 | <20 | <20 | <20 | <20 |
| Aniline | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Anthracene | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Azobenzene | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| b BHC | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Benz(a)anthracene | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Benzo(a)pyrene | US EPA 8270/8260 | µg/L | 0.01 | <10 | 24 | <10 | <10 | <10 | <10 |
| Benzo (b,k) fluoranthene | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Benzo( g,h,I) perylene | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Benzyl alcohol | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Bis (2 chloroethoxy) methane | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Bis (2 chloroethyl) ether | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Bis (2 chloroisopropyl) ether | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Bis(2-ethylhexyl) phthalate | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Butyl benzyl phthalate | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Carbazole | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Chlorpyifos | US EPA 8270/8260 | µg/L | 10 | <20 | 24 | <20 | <20 | <20 | <20 |

| Analyte | Method ID | Units | ADWG | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Chrysene | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| d BHC | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Diazinon | US EPA 8270/8260 | µg/L | 4 | <20 | 24 | <20 | <20 | <20 | <20 |
| Dibenz(a,h)anthracene | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Dibenzofuran | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Dichlorobenzidine | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Dieldrin | US EPA 8270/8260 | µg/L | 3 | <20 | 24 | <20 | <20 | <20 | <20 |
| Diethyl phthalate | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Dimethoate | US EPA 8270/8260 | µg/L | 7 | <20 | 24 | <20 | <20 | <20 | <20 |
| Dimethyl phthalate | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Di-n-butyl phthalate | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Di-n-octyl phthalate | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <20 | <10 | <10 |
| Endosulfan sulphate | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Endosulphan 1 | US EPA 8270/8260 | µg/L | 20 | <20 | 24 | <20 | <20 | <20 | <20 |
| Endosulphan 11 | US EPA 8270/8260 | µg/L | 20 | <20 | 24 | <20 | <20 | <20 | <20 |
| Endrin | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Endrin Aldehyde | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Ethion | US EPA 8270/8260 | µg/L | 4 | <20 | 24 | <20 | <20 | <20 | <20 |
| Fenitrothion | US EPA 8270/8260 | µg/L | 7 | <20 | 24 | <20 | <20 | <20 | <20 |
| Fluoranthene | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Fluorene | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| g BHC (Lindane) | US EPA 8270/8260 | µg/L | 10 | <20 | 24 | <20 | <20 | <20 | <20 |
| Heptachlor | US EPA 8270/8260 | µg/L | 0.3 | <20 | 24 | <20 | <20 | <20 | <20 |
| Heptachlorepoxide | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Hexachloro 1,3 butadiene | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Hexachlorobenzene | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Hexachlorocyclopentadiene | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Hexachloroethane | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| Indeno(1,2,3 cd)pyrene | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Isophorone | US EPA 8270/8260 | µg/L | 100 | <20 | 24 | <20 | <20 | <20 | <20 |
| Malathion | US EPA 8270/8260 | µg/L | 70 | <20 | 24 | <20 | <20 | <20 | <20 |
| Naphthalene | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Nitrobenzene | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| N Nitrosodimethylamine | US EPA 8270/8260 | µg/L | 0.1 | <20 | 24 | <20 | <20 | <20 | <20 |
| N Nitrosodi n propylamine | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |
| N Nitrosodiphenylamine | US EPA 8270/8260 | µg/L | - | <20 | 24 | <20 | <20 | <20 | <20 |

| Analyte | Method ID | Units | ADWG | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | 95th Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Pentachlorophenol | US EPA 8270/8260 | µg/L | 10 | <20 | 24 | <20 | <20 | <20 | <20 |
| Phenanthrene | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Phenol | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Pyrene | US EPA 8270/8260 | µg/L | - | <10 | 24 | <10 | <10 | <10 | <10 |
| Bromoacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <5 | 59 | <5 | <5 | <5 | <5 |
| Bromochloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <1 | 59 | <1 | 6 | 1.42 | 5.1 |
| Bromodichloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <1 | 60 | <1 | 6 | 1.56 | 5.05 |
| Dibromoacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <1 | 59 | <1 | 1 | <1 | <1 |
| Dibromochloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <10 | 59 | <10 | <10 | <10 | <10 |
| Dichloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | 100 | <1 | 59 | 4 | 81 | 18.75 | 55.4 |
| Monochloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <1 | 59 | <1 | 6 | 1.22 | 4 |
| Tribromoacetic Acid | US EPA SW 846 Method 8260 B | µg/L | - | <10 | 59 | <10 | <10 | <10 | <10 |
| Trichloroacetic Acid | US EPA SW 846 Method 8260 B | µg/L | 100 | <1 | 59 | 9 | 98 | 26.03 | 79.6 |
| Hardness Total | APHA 2340 B | mg/L | - | <0.1 | 24 | 34 | 65 | 41.54 | 55.85 |
| Calcium Dissolved | US EPA 200.7 | mg/L | - | <0.05 | 24 | 12 | 20 | 14.75 | 18 |
| Potassium Dissolved | US EPA 200.7 | mg/L | - | <0.1 | 12 | 0.5 | 1.8 | 0.72 | 1.58 |
| Magnesium Dissolved | US EPA 200.7 | mg/L | - | <0.05 | 24 | 0.77 | 3.4 | 1.1 | 2.37 |
| Sodium Dissolved | US EPA 200.7 | mg/L | - | <0.1 | 12 | 2.8 | 7 | 3.58 | 6.0 |
| Aluminium Total | US EPA 200.7 | mg/L | - | <0.02 | 24 | 0.02 | 0.12 | 0.05 | 0.1 |
| Iron Total | US EPA 200.7 | mg/L | - | <0.02 | 59 | <0.02 | 0.09 | <0.02 | <0.02 |
| Manganese Total | US EPA 200.8 | mg/L | 0.5 | <0.001 | 118 | <0.001 | 0.038 | 0.004 | 0.01 |
| Aluminium Acid Soluble | US EPA 200.8 | µg/L | - | <5 | 24 | 17 | 83 | 40.29 | 75.7 |
| Copper Total | US EPA 200.7 | µg/L | 2000 | <1 | 94 | 2 | 1100 | 32.49 | 69.9 |
| Lead Total | US EPA 200.8 | µg/L | 10 | <0.2 | 35 | <0.2 | 0.9 | <0.2 | 0.46 |
| Aluminium Total | US EPA 200.8 | µg/L | - | <9 | 24 | 18 | 100 | 45.92 | 94.15 |
| Antimony Total | US EPA 200.8 | µg/L | 3 | <3 | 24 | <3 | <3 | <3 | <3 |
| Arsenic Total | US EPA 200.8 | µg/L | 10 | <1 | 24 | <1 | <1 | <1 | <1 |
| Barium Total | US EPA 200.8 | µg/L | 2000 | | 24 | 3 | 6.9 | 3.91 | 5.64 |
| Beryllium Total | US EPA 200.8 | µg/L | 60 | <0.1 | 24 | <0.1 | <0.1 | <0.1 | <0.1 |
| Cadmium Total | US EPA 200.8 | µg/L | 2 | <0.05 | 24 | <0.05 | 0.32 | <0.05 | 0.17 |
| Chromium Total | US EPA 200.8 | µg/L | 50 | <2 | 24 | <2 | <2 | <2 | <2 |

| Analyte | Method ID | Units | ADWG | Limit of Reporting | Number of Samples | Minimum | Maximum | Mean | $95^{th}$ Percentile |
|---|---|---|---|---|---|---|---|---|---|
| Cobalt Total | US EPA 200.8 | µg/L | - | <0.2 | 24 | <2 | <2 | <2 | <2 |
| Copper Total | US EPA 200.8 | µg/L | 2000 | <1 | 24 | 2 | 35 | 11.13 | 21.85 |
| Lead Total | US EPA 200.8 | µg/L | 10 | <0.2 | 24 | <0.2 | 0.3 | <0.2 | 0.29 |
| Manganese Total | US EPA 200.8 | µg/L | 500 | <0.5 | 24 | <0.5 | 31 | 4.11 | 8.78 |
| Molybdenum Total | US EPA 200.8 | µg/L | 50 | <1 | 24 | <1 | <1 | <1 | <1 |
| Nickel Total | US EPA 200.8 | µg/L | 20 | <1 | 24 | <1 | 1 | <1 | <1 |
| Selenium Total | US EPA 200.8 | µg/L | 10 | <2 | 24 | <2 | <2 | <2 | <2 |
| Silver Total | US EPA 200.8 | µg/L | 100 | <1 | 24 | <1 | <1 | <1 | <1 |
| Zinc Total | US EPA 200.8 | µg/L | - | <5 | 24 | <5 | 37 | 6.29 | 24.5 |
| Acenaphthene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Acenaphthylene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Anthracene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Benz(a)anthracene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Benzo(a)pyrene | US EPA 3510/8270 | µg/L | 0.01 | <0.5 | 24 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(b) fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Benzo(g,h,i)perylene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Benzo(k) fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Chrysene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Dibenz(a,h)anthracene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Fluoranthene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Fluorene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Indeno(1,2,3-cd)pyrene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Naphthalene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Polyaromatic Hydrocarbons Total | US EPA 3510/8270µg/L | - | <0.5 | 24 | <0.5 | <0.5 | <0.5 | <0.5 | |
| Phenanthrene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| Pyrene | US EPA 3510/8270 | µg/L | - | <1 | 24 | <1 | <1 | <1 | <1 |
| pH | APHA 4500-H B | pH Units | - | <0.1 | 247 | 7.3 | 8.7 | 7.85 | 8.4 |
| TDS | APHA 2540 C | mg/L | - | <20 | 24 | 54 | 120 | 70.21 | 116.25 |
| Temperature | APHA 2550 B | deg C | - | <0.1 | 118 | 9 | 26 | 17.16 | 23.82 |
| THM-CHBr2Cl | HP 228-135 | µg/L | - | <1 | 59 | <1 | <1 | <1 | <1 |
| THM-CHBr3 | HP 228-135 | µg/L | - | <1 | 59 | <1 | <1 | <1 | <1 |
| THM-CHBrCl2 | HP 228-135 | µg/L | - | <1 | 59 | <1 | 7.8 | 1.86 | 6.93 |
| THM-CHCl3 | HP 228-135 | µg/L | - | <1 | 59 | 13 | 98 | 28.22 | 74.6 |
| Total THM | HP 228-135 | µg/L | 250 | <1 | 59 | 13 | 100 | 29.76 | 81.6 |
| Turbidity | APHA 2130 B | NTU | - | <0.1 | 118 | 0.11 | 2.9 | 0.36 | 0.81 |

# References

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# Abbreviations

| ACTEW | ACTEW Water (a business name used by ACTEW Corporation Ltd) |
|---|---|
| ACT | Australian Capital Territory |
| ADWG | Australian Drinking Water Guidelines (2004) also referred to as “the guidelines” |
| AS/NZS | Australian Standards/New Zealand Standards |
| CFU | colony forming units |
| DWCoP | Drinking Water Code of Practice (2007) |
| GL | gigalitre |
| HACCP | Hazard Analysis and Critical Control Point |
| ISO | International Standards Organisation |
| km | kilometre |
| L | litre |
| ML | megalitre |
| µg | micrograms |
| mg | milligram |
| mL | millilitre |
| mm | millimetre |
| MPN | most probable number |
| NATA | National Association of Testing Authorities |
| NTU | nephelometric turbidity units |
| NSW | New South Wales |
| % | per cent |
| PAC | Powdered Activated Carbon |
| PCS | Parks and Conservation Services |
| Pt-Co | platinum-cobalt units |
| SWPP | Source Water Protection Program |
| TAMS | Territory and Municipal Services |
| THMs | trihalomethanes |
| UV | ultraviolet light |
| WSAA | Water Services Association of Australia |
| WTP | water treatment plant |

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