



City West Water™

2020-21

Drinking Water Quality Report



Acknowledgement of Country

Greater Western Water respectfully acknowledges the Traditional Owners of the lands and waters upon which we work and operate. We pay our deepest respects to the traditional custodians past, present and future. We acknowledge the continued cultural, social and spiritual connections that First Nations people have with the lands and waters and recognise and value that the Traditional

Owner groups have cared for and protected them for thousands of generations. We will further develop our partnership with the Traditional Owner groups to ensure their contributions to the future of the water management landscape and to maintain their cultural and spiritual connection.

Introductory Note

In October 2020, the Minister for Water Lisa Neville, Chair of Western Water Andrew Cairns and Chair of City West Water David Middleton announced the integration of Western Water and City West Water to form Greater Western Water effective 1 July 2021. The formation of Greater Western Water has been identified as the best way to cater for population growth in the west while continuing to supply high quality, affordable water services.

The new trading name for the integrated entity is Greater Western Water (GWW). In accordance with the Ministerial determinations, GWW is making two annual drinking water quality reports: (1) this 2020-21 report, the last report for City West Water, and (2) a separate 2020-21 report for Western Water. Future drinking water quality reports will be made by GWW.



This document is available on our website:

gww.com.au

Contents

Message from the Managing Director	2
Becoming Greater Western Water	3
Highlights 2020-21	3
1. Introduction	4
1.1 Characterisation of the system	4
1.1.1 Source water system	4
1.1.2 City West Water system	6
2. Water treatment and quality management system	8
2.1 Water treatment	8
2.2 Issues	8
3. Emergency, incident and event management	11
4. Drinking Water Quality Monitoring	12
5. Drinking Water Quality Standards	13
5.1 <i>E. coli</i>	14
5.2 Total trihalomethanes	15
5.3 Turbidity	16
5.4 Summary performance against water quality standards	16
6. Other water quality standards (algal toxin, pathogen, chemical or substance that may pose a risk to human health)	17
7. Aesthetic characteristics	18
8. Analysis of results – trends	21
8.1 Historical compliance of standard parameters	21
8.2 Parameter trends over time and between localities	21
9. Complaints relating to water quality	23
10. Risk management plan audit results	27
11. Undertakings under Section 30 of the <i>Safe Drinking Water Act 2003</i>	28
12. Exemptions from water quality standards under Section 20 and conditions imposed under Section 21 of the <i>Safe Drinking Water Act 2003</i>	28
13. Variation to aesthetic standards under Section 19 of the Act and conditions imposed under Section 21 of the <i>Safe Drinking Water Act 2003</i>	28
14. Regulated water	28
15. Further Information	28
Appendix A. Water quality data by locality	29
Appendix B. Spatial and time-based water quality summaries	47
Appendix C. 2020 Risk Management plan regulatory audit certificate	56
Appendix D. Glossary of Terms	57

Message from the Managing Director

On behalf of Greater Western Water, I am pleased to present this final Drinking Water Quality annual report for our corporation trading under its former name of City West Water.

This report updates customers and community on details of the quality of drinking water that we supplied throughout the former City West Water service area, which encompasses the inner and western suburbs of Melbourne, including Melbourne's central business district. This report addresses the 12-month period from 1 July 2020 to 30 June 2021.

Throughout 2020-21, City West Water upheld its commitment to be an exceptional service provider that puts customers first and benefits the community. We supplied water that is clean and safe to drink and delivered our services in a reliable and affordable way that is accessible to everyone in our community.

This report describes the sources of our drinking water and how it is treated so that it is safe to consume without further treatment. It reports on the quality of water supplied to our customers against relevant standards and guideline values.

In 2020-21, we verified the quality of the drinking water supply via a comprehensive monitoring program that also allows us to identify potential water quality issues and improvements to benefit our customers and community. During the year we routinely tested more than 3,000 water samples, most of which were obtained from customer premises. I am pleased to report that this independent chemical and microbial testing showed that the quality of our drinking water supply continued to meet the standards in Victoria's *Safe Drinking Water Act 2003* and Safe Drinking Water Regulations 2015, as well as the Australian Drinking Water Guidelines 2011 (National Health and Medical Research Council of Australia).

In addition to monitoring the supplied water quality, we also rely on feedback from customers to assist in identifying local issues. This feedback is recorded as water quality related customer complaints. During 2020-21 we received 210 complaints per 100,000 customers. Most of the complaints related to discoloured water from resuspension of natural sediments in our pipe network, resulting from the unfiltered nature of much of our water supply. This discolouration does not impact on the safety of the water. Nevertheless, Greater Western Water will continue to manage this at a customer level while we finalise the design of a mains cleaning trial to drive a decrease in discoloured water complaints. The results of the trial will be used to seek feedback from our customers and assess the development of a mains cleaning program.

Our annual customer satisfaction survey for 2020-21 indicated a water quality satisfaction level among our residential and non-residential customers of 96 per cent and 92 per cent respectively. Overall, customers were more satisfied with the taste of the water when compared to last year. The feedback provided in this survey is used to drive continuous improvement initiatives.

Our drinking water quality management processes are endorsed through a consistent history of successfully retaining drinking water risk management certification and compliance of our water quality Risk Management Plan with Victoria's *Safe Drinking Water Act 2003*.

During 2020-21 drinking water from the Victorian Desalination Plant continued, for the second year, to be included as a blend in City West Water's water supply.

Regarding the coronavirus (COVID-19) pandemic, there is no evidence that drinking water was or will be affected by coronavirus or that it is transmitted by drinking water.

In October 2020, the Minister for Water Lisa Neville, Chair of Western Water Andrew Cairns and Chair of City West Water David Middleton announced the integration of Western Water and City West Water to form Greater Western Water effective 1 July 2021. The formation of Greater Western Water has been identified as the best way to cater for population growth in the west while continuing to supply high quality, affordable water services.

Greater Western Water is committed to reliably providing high quality, safe drinking water to all our customers and community across our expanded service area.

Maree Lang
Managing Director
Greater Western Water

Becoming Greater Western Water

On 1 July 2021, Greater Western Water became the new water corporation for Melbourne's CBD and north-western region. Greater Western Water was formed by bringing together the areas previously serviced by Western Water and City West Water.

Greater Western Water builds on the excellent work and rich legacies of these two organisations and provides for a secure, sustainable and prosperous future for the region, its customers and people. It draws on the history and deep knowledge of the region that Western Water and City West Water people have built over decades.

Since the formation of Greater Western Water was announced in October 2020, a three-year program of work commenced to manage the integration. This work is ensuring a smooth transition, where customers experience continuity of service and our people work together to create a new organisation with one culture. Through the integration work and beyond, our aim is to be an organisation that represents leading practice and exemplary governance.

A Joint Transition Committee oversaw the integration work, chaired by leading water sector expert, Cheryl Batagol, with members from both organisations' boards and support from the Department of Environment, Land, Water and Planning (DELWP). A Joint Steering Committee, which comprised executives from Western Water and City West Water, provided transition oversight and guidance and approved key decisions. A Joint Transition Office, a collaborative project team made up by employees from both businesses, managed the transition and delivered a detailed program of works in preparation for 1 July 2021. A Program Assurance Advisor and Integration Advisor, both external to Greater Western Water, provided support and confidence in governance and approach.

In the lead up to 1 July 2021, we aligned the information and messaging in our customer communications and created engagement opportunities to ask our community what they want from their new water corporation. We also worked together to create awareness of Greater Western Water and sought feedback on the Greater Western Water brand, proposed prices, customer charters and permanent water saving plan. We will continue to focus on aligning customer experiences and consolidating and evolving policies and plans.

Highlights 2020-21

- Safely delivered 98 billion litres of drinking water to 504,908 properties
- Increased the size of our network by 75km of drinking water pipework
- Water Quality satisfaction level of 96% for residential customers and 92% for non-residential customers
- Successfully completed Department of Health regulatory audit of our drinking water risk management plan
- Tested over 3,000 water samples to monitor compliance with the drinking water quality standards
- Developed a plan to increase the number of water quality sensors across Melbourne, improving our ability to track the quality of water across our entire system
- Fully complied with the requirements of the *Safe Drinking Water Act 2003* and *Safe Drinking Water Regulations 2015*
- Continued to provide essential water supply services to customers during the coronavirus (COVID-19) pandemic

1. Introduction

City West Water was one of three metropolitan water retailers established under Section 85(1A) of the *Water Act 1989* (Vic).

In 2020-21, City West Water provided drinking water, trade waste, recycled water, stormwater and sewerage services to approximately 505,000 residential and non-residential properties in Melbourne's inner and western suburbs and central business district.

In 2020-21, Melbourne Water provided City West Water with a bulk water supply and a wastewater treatment service. Melbourne Water manages the water catchments, dams and primary treatment, as well as a network of large water mains that interconnect with our water supply network. This interconnection means that risks associated with water supply are shared between the wholesaler, Melbourne Water, and retailer, City West Water. To manage these risks and to clearly assign the rights and obligations of both parties, we have a contractual arrangement, Bulk Water Supply Agreement, with Melbourne Water, as well as cross business contingency plans and operational arrangements.

Our management of the water supply system and drinking water quality is afforded the highest priority to reflect public health considerations and community expectations. In this regard, we closely follow the risk management principles outlined in Victoria's *Safe Drinking Water Act 2003* and associated *Safe Drinking Water Regulations 2015*. This commitment to safeguarding drinking water quality has continued to be independently recognised through our consistent retention of the internationally recognised HACCP certification.

With this publicly available report, Greater Western Water complies with Section 23 of the *Safe Drinking Water Act 2003*, which requires public disclosure of all water quality monitoring information. A copy of this report is provided to the Secretary of the Department of Health in compliance with Section 26 of the *Safe Drinking Water Act 2003*.

1.1 Characterisation of the system

1.1.1 Source water system

Our water supply originates from Melbourne's well-established water supply catchment and reservoir system, which has provided the city with a reliable, high quality water supply. This extensive system, managed by Melbourne Water, lies primarily to the east of Melbourne and extends as far as Thomson Reservoir, approximately 120 kilometres from our service area.

Drinking water is supplied to City West Water from three major storages within the system. Two of the storages, Silvan Reservoir (near Mount Dandenong) and Sugarloaf Reservoir (near Yarra Glen), are east of Melbourne. The third, Greenvale Reservoir, is north, near Somerton. The relative proportion of water supplied from the three reservoirs can vary, depending on factors such as local water demands, weather conditions, maintenance works and longer-term population changes (refer [Figure 1](#)).

Figure 1: Reservoir source of water supplied to City West Water’s service area over the last decade and during the 2020-21 financial year

Reservoir source supplied to City West Water over the last decade



● Silvan Reservoir	17%
● Greenvale Reservoir	15%
● Sugarloaf Reservoir	68%

Reservoir source supplied to City West Water over 2020-21



● Silvan Reservoir	12%
● Greenvale Reservoir	15%
● Sugarloaf Reservoir	73%

The supply from Silvan Reservoir comes from protected, natural catchments (including the Thomson and Upper Yarra catchments) where activities such as industry, farming, urbanisation and tourism (which could pollute the water supply) are highly restricted. Greenvale Reservoir, which does not have a catchment, receives its water supply from Silvan Reservoir. Long storage periods (ranging between months and years) in these pristine reservoirs enhance water quality. As a result, the only active water treatment process that is applied to this water is chlorination (chlorine gas at Silvan; sodium hypochlorite at Greenvale) and pH correction with lime.

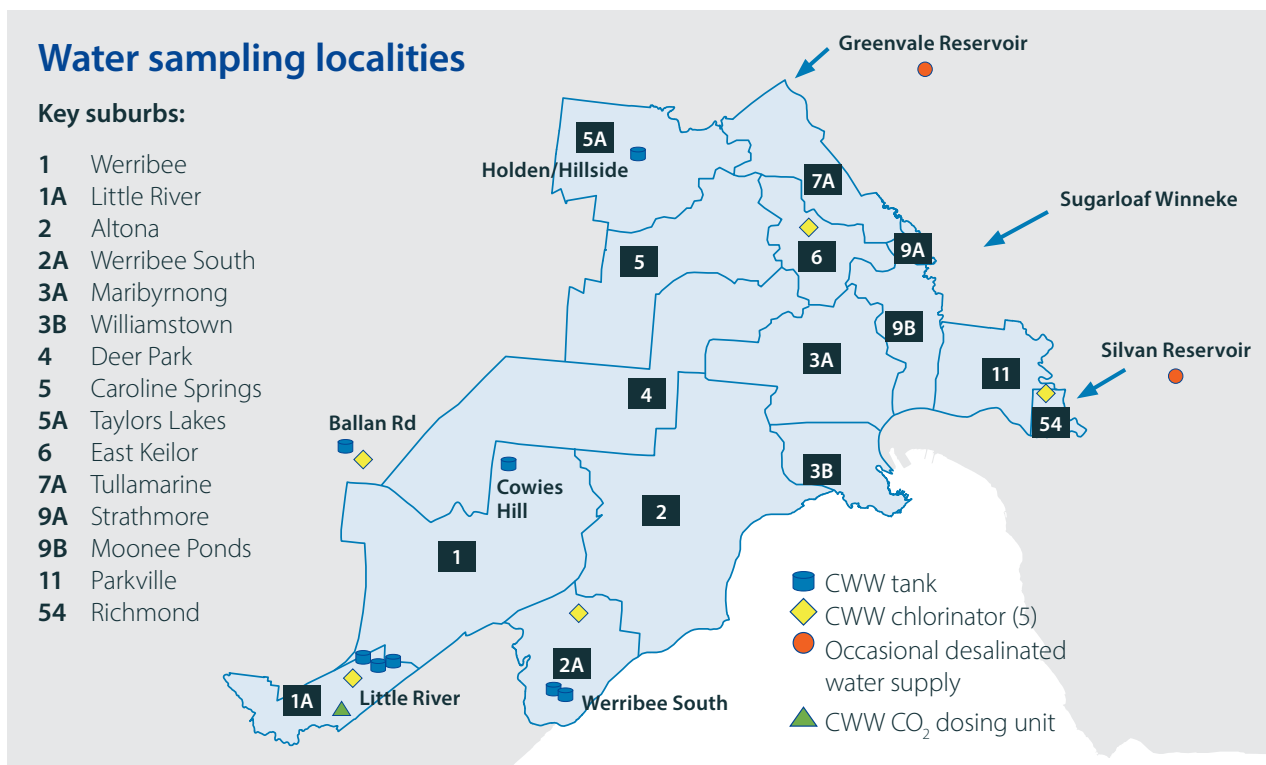
Sugarloaf Reservoir draws most of its water from the mid-point of the Yarra River where the catchment is unprotected, containing urban areas, light industry and agricultural activities. A smaller proportion also comes from Maroondah Reservoir via the Maroondah Aqueduct. On average, the source waters pumped into Sugarloaf Reservoir are stored for months before being treated (via aluminium-based coagulation and flocculation, sand filtration, sodium hypochlorite chlorination and pH correction with lime) at Melbourne Water’s Winneke water treatment plant.

Melbourne Water adds fluoride to all of City West Water’s bulk water in line with the requirements of the *Victorian Health (Fluoridation) Act 1973*. This is in the form of fluorosilicic acid at both the Silvan Reservoir supply and Winneke water treatment plant.

The quality of the bulk water supply is monitored by Melbourne Water before it enters City West Water’s distribution system. This monitoring has two components:

- Sites upstream of treatment, comprising rivers, streams, aqueducts and reservoirs. These sites are monitored at varying frequencies, largely to characterise overall long-term background water quality and to monitor for seasonal and possible longer-term changes. Parameters tested include organic chemicals, nutrients and microbes.
- Sites downstream of water treatment, where the monitoring is more intense than at upstream sites and is largely focused on verifying the quality of post-treatment product water. Frequencies of this monitoring ranged between continuous at chlorine dosing points and daily or weekly, depending on the sites and parameters measured (for example, testing for water clarity and purity, as well as microbial levels).

Figure 2: City West Water’s water service area, including 15 water sampling localities and sources of bulk water supply



Between 1 July 2020 and 30 June 2021, a blend of desalinated water from the Victorian Desalination Plant and water from Melbourne Water’s Cardinia Reservoir was pumped into Silvan Reservoir. The proportion of desalinated water in Silvan Reservoir reached a peak concentration of 20% in June 2021. In turn, the percentage of desalinated water in Greenvale Reservoir reached a peak concentration of 9% in June 2021.

1.1.2 City West Water system

In 2020-21, City West Water distributed water to more than 950,000 people and to businesses across 504,908 properties. The water was distributed through an extensive network of over 5,200km of water mains, 10 pumping stations, eight holding tanks (or service tanks) and five secondary chlorination plants. This network encompasses central and western Melbourne, including inner suburbs such as Fitzroy, Collingwood, Richmond and the central business district, to outer western suburbs as far west as Little River. The network is fully enclosed, protecting the water from possible contamination during its delivery to customers.

For the purpose of water quality monitoring, our 714 square kilometre service area was divided into 15 water sampling localities (refer Figure 2) based on sources of water supply and similar pressure. The water supply source(s) for each of our 15 water sampling localities are shown in Table 1. The bulk water transfer arrangements with Melbourne Water are routinely varied for supply purposes. In this reporting period there were no changes to water sampling locality names or boundaries from previous years.



Information on the Desalination Plant’s purpose, location and operation is available at Melbourne Water’s website:

www.melbournewater.com.au/water/water-facts-and-history/why-melbournes-water-tastes-great-tap/water-treatment/desalination

Table 1: 2020-2021 supply sources for our water sampling localities

Water sampling locality	Source water	Treatment plant	Population supplied (2016 census)
Altona	Yarra River	Winneke	117,900
	Maroondah, Silvan & Greenvale Reservoirs	Silvan	
		Greenvale	
Caroline Springs	Yarra River	Winneke	103,800
	Maroondah & Greenvale Reservoirs	Greenvale	
Deer Park	Yarra River	Winneke	58,000
	Maroondah, Silvan & Greenvale Reservoirs	Silvan	
		Greenvale	
East Keilor	Yarra River	Winneke	41,300
	Maroondah, Silvan & Greenvale Reservoirs	Silvan	
		Greenvale	
Little River	Yarra River	Winneke	670
	Maroondah, Silvan & Greenvale Reservoirs	Silvan	
		Greenvale	
Maribyrnong	Yarra River	Winneke	120,900
	Maroondah & Silvan Reservoirs	Silvan	
Moonee Ponds	Yarra River	Winneke	73,500
	Maroondah & Silvan Reservoirs	Silvan	
Parkville	Yarra River	Winneke	157,600
	Maroondah & Silvan Reservoirs	Silvan	
Richmond	Yarra River	Winneke	24,900
	Maroondah & Silvan Reservoirs	Silvan	
Strathmore	Yarra River	Winneke	8,100
	Maroondah, Silvan & Greenvale Reservoirs	Silvan	
		Greenvale	
Taylors Lakes	Yarra River	Winneke	67,800
	Maroondah & Greenvale Reservoirs	Greenvale	
Tullamarine	Yarra River	Winneke	10,500
	Maroondah & Greenvale Reservoirs	Greenvale	
Werribee	Yarra River	Winneke	136,700
	Maroondah, Silvan & Greenvale Reservoirs	Silvan	
		Greenvale	
Werribee South	Yarra River	Winneke	2,000
	Maroondah, Silvan & Greenvale Reservoirs	Silvan	
		Greenvale	
Williamstown	Yarra River	Winneke	50,000
	Maroondah & Silvan Reservoirs	Silvan	

2. Water treatment and quality management system

2.1 Water treatment

The water quality treatment processes used for City West Water's source or bulk water supply are outlined in Section 1.1.1.

Notwithstanding Melbourne Water's source or bulk water disinfection by chlorination, additional secondary chlorination (using liquid sodium hypochlorite) is undertaken within our service area by:

- Melbourne Water, with four secondary chlorination plants servicing the water sampling localities of Werribee, Deer Park, Caroline Springs and Altona
- City West Water, with a further five secondary chlorination plants servicing the water sampling localities of East Keilor, Little River, Richmond, Werribee and Werribee South.

In addition, the local water supply at Little River is dosed with gaseous carbon dioxide to assist with maintaining neutral pH levels.

Melbourne Water provides treated water as a bulk supply to City West Water to store and distribute to customers. Table 2 summarises the water treatment processes used on the bulk water source by Melbourne Water that is supplied to City West Water. Refer to Melbourne Water's annual water quality report¹ for further details.

2.2 Issues

No adverse water treatment issues originated from secondary water treatment within City West Water's service area during 2020-21.

City West Water worked closely with Melbourne Water regarding any issues relating to the treatment of the bulk water supply. For further details regarding bulk water supply treatment issues during 2020-21 refer to the Melbourne Water Annual Drinking Water Quality Report¹.

During 2021, there was one water treatment event that had the potential to impact City West Water's drinking water supply.

- Melbourne Water Disinfection Failure at Silvan Treatment Plant

On late Thursday night, 27 August 2020, a failure at Melbourne Water's (MW) Silvan Water Treatment Plant resulted in undisinfected drinking water being supplied to Yarra Valley Water (YVW) and South East Water (SEW) customers. Two Boiled Water Advisory notices were issued: one by YVW and one by SEW covering a total of 101 suburbs, impacting an estimated 500,000 households in the north and east of Melbourne.

While the incident did not directly impact our drinking water supply, we did declare an incident and the lessons learnt from our response and the responses of YVW, SEW and MW are relevant to the effectiveness of our emergency management systems.

Since the incident, we have been working with MW, SEW and YVW to:

- review and align protocols for issuing and rescinding drinking water advisories (such as boiled water and do not drink) – assisting us to issue and lift advisories as soon as possible
- develop a plan to increase the number of water quality sensors across Melbourne – improving our ability to track the quality of water across our entire system
- review and update the Melbourne Metropolitan Water Industry Response Plan – enhancing our ability to support each other during major incidents
- review our communications protocols – to ensure we provide clear and timely information to the community during major incidents.

In addition, we reviewed and updated our Emergency Management Framework and various contingency plans and implemented new cross-functional engagement sessions with key emergency management personnel.

We also developed an interim Emergency Management Arrangement for Greater Western Water, to ensure the new organisation could respond to emergencies in a coordinated manner from Day 1 (1 July 2021).

1. Melbourne Water's Annual Water Quality Report can be found on their website at www.melbournewater.com.au/about/strategies-and-reports/water-quality-annual-report.

Table 2: Drinking water treatment processes provided by Melbourne Water's treatment plants

Water Sampling Locality	Treatment Plant	Treatment Process³	Added substance/s	Comments
Altona Caroline Springs Deer Park East Keilor Little River Strathmore Taylors Lakes Tullamarine Werribee Werribee South	Greenvale (transfer from treatment plant Silvan to Greenvale Reservoir)	Disinfection • Chlorination	Sodium Hypochlorite	No additional fluoridation at Greenvale as it receives fluoridated water from Silvan (refer Section 1.1.1).
Altona Deer Park East Keilor Little River Maribyrnong Moonee Ponds Parkville Richmond Werribee Werribee South Williamstown	Silvan	Disinfection • Chlorination Other • pH correction • Fluoridation	Chlorine gas ² Lime Fluorosilicic acid	
Altona Caroline Springs Deer Park East Keilor Little River Maribyrnong Moonee Ponds Parkville Richmond Strathmore Taylors Lakes Tullamarine Werribee Werribee South Williamstown	Winneke	Clarification • Coagulation & flocculation Filtration • Sand filtration Disinfection • Chlorination Other • pH correction • Fluoridation	Polymer Alum Sodium hypochlorite Lime Fluorosilicic acid	

2. Occasional use of Sodium hypochlorite when required as additional residual or when chlorine gas dosing is offline.

3. Refer to Melbourne Water's Water Quality Annual Report for further details.

Table 2: Drinking water treatment processes provided by Melbourne Water's treatment plants (continued)

Water Sampling Locality	Treatment Plant	Treatment Process³	Added substance/s	Comments	
Altona	Wonthaggi	Clarification		Between 1 July 2020 and 30 June 2021, a blend of desalinated water from the Victorian Desalination Plant and water from Melbourne Water's Cardinia Reservoir was pumped into Silvan Reservoir (refer Section 1.1.1).	
Caroline Springs	Desalination Plant via Cardinia and Silvan (including transfer from treatment plant Silvan to Greenvale Reservoir)	• Coagulation & flocculation	Ferric sulphate/Sulphuric acid/Polydamac		
Deer Park					
East Keilor		Filtration	• Drum screens, dual media pressure filters and cartridge filters		
Little River					
Maribyrnong		Reverse Osmosis	Antiscalant, Sodium hydroxide, Sodium bisulfite, Membrane cleaning chemicals (caustic, detergent, acid)		
Moonee Ponds					
Parkville					
Richmond		Remineralisation	Hydrated lime, Carbon dioxide		
Strathmore					
Taylors Lakes					
Tullamarine		Disinfection	• Chlorination		Chlorine gas
Werribee					
Werribee South					
Williamstown		Other	• pH correction		Lime
				• Fluoridation	
	Sludge Handling		Polymer		

3. Refer to Melbourne Water's Water Quality Annual Report for further details.

3. Emergency, incident and event management

This section reports on emergencies, incidents and events related to drinking water quality. Water quality information is also reported quarterly to the City West Water Board's Health, Environment and Safety subcommittee. This includes events that may have led to known or suspected contamination of the drinking water supply, including those that were reported to Department of Health (the Department) in line with Section 22 of the *Safe Drinking Water Act 2003*.

Known or suspected contamination reported under Section 22

We submitted one Section 22 report to the Department in 2020-21.

- False Positive *E. coli* sample in East Keilor water sampling locality

On Saturday 30 January 2021, City West Water reported to the Department that there had been an *E. coli* sample detection (1 organism per 100mL) in a routine sample from a sample tap located in the East Keilor water sampling locality on 29 January 2021. The sample also contained 0.29mg/L of free chlorine and was taken during a day of heavy rainfall. On 30 January 2021, in line with Schedule 2 of Safe Drinking Water Regulations 2015, the following key actions were undertaken to ascertain whether the result of the analysis was representative of water in the East Keilor water sampling locality:

- confirmed the quality of the source water
- confirmed that there were no upstream water treatment plant or water quality issues
- undertook further water quality samples
- confirmed operation of network and critical assets.

The outcome from the investigation concluded that the results of the analysis conducted in accordance with regulation 14 were not representative of the water in the East Keilor water sampling locality because the investigation established that the standard criteria (i), (ii), (iii) and (iv) had been met with no evidence, apart from the initial *E. coli* detection, to support that the East Keilor water supply had been contaminated on 29 January 2020. In line with Schedule 2 of Safe Drinking Water Regulations 2015, it was concluded that the detection of *E. coli* was a 'false positive sample'. To minimise the risk of the issue recurring, we are considering additional contractual mechanisms.

Other drinking water quality events

- Coronavirus (COVID-19) pandemic

COVID-19 pandemic has continued to impact a variety of services and activities throughout Victoria. However, our management and monitoring of drinking water quality have not been affected and continue to be undertaken to our usual, highest standards. Furthermore, there is no evidence that COVID-19 is transmitted by drinking water.

4. Drinking Water Quality Monitoring

In 2020-21, a significant part of our water supply activities involved monitoring the quality of the water being supplied to customers. We have a water monitoring program of day-to-day sampling and testing from many locations throughout the distribution network of 15 water sampling localities. This includes 450 purpose-built sampling fittings (referred to as 'customer taps') located at the point of supply, adjacent to water meters at properties across our service area. The number of customer taps sites in each water sampling locality is distributed in proportion to locality populations.

We also have a program of regular sampling and testing of water quality in each of our eight service tanks. In addition, Melbourne Water monitors the quality of bulk water supplies at points upstream of delivery points to City West Water. The results of all these tests are reviewed as part of the Bulk Water Supply Agreement between the two water agencies.

Between 1 July 2020 and 30 June 2021, we routinely collected and tested more than 3,000 microbiological and 900 physical and chemical water samples, predominantly from customer taps sites, but also from mains and service tanks. Monitoring was undertaken under contract by a government approved, specialised and quality-certified laboratory. The extent of this monitoring is based on requirements of Safe Drinking Water Regulations 2015 as well as guidance from Australian Drinking Water

Guidelines 2011, including consideration of locality population numbers for bacterial monitoring.

In addition to guiding the design of monitoring programs, Australian Drinking Water Guidelines 2011 provides a basis for assessing the quality of drinking water. Microbiological assessment is based principally on the bacterium *E. coli*, which is considered to indicate the presence of faecal contamination and, therefore, a health risk.

Physical and chemical assessment and monitoring is based on a combination of parameters that indicate physical and aesthetic characteristics, such as pH, colour and turbidity (water clarity), as well as the chemical quality of the water (i.e. levels of chlorine, iron, fluoride, dissolved salts, aluminium, copper and other heavy metals). Contact information for obtaining further details of all water quality testing outlined in this report is contained in [section 15](#).

In line with Safe Drinking Water Regulations 2015, sample results from reticulation sites such as water mains and service tanks both spatially and hydraulically within individual water sampling localities, are added to the associated customer tap data.

City West Water's sampling sites (other than customer taps), and the water sampling locality to which they are associated for water quality performance reporting purposes, are listed below in [Table 3](#).

Table 3: City West Water's sampling sites (other than customer taps) and associated water sampling localities

Sampling site	Sampling site location and water sampling locality to which water quality data are included
Little River elevated tank	Little River
Little River ground level tank no. 1	Little River
Little River ground level tank no. 2	Little River
Hillside elevated tank	Taylors Lakes
Cowies Hill elevated tank	Werribee
Ballan Road tank	Werribee
Werribee South elevated tank	Werribee South
Werribee South ground level tank	Werribee South
Werribee South main at Maltby bypass (water supply main)	Werribee South

5. Drinking Water Quality Standards

Since 1 July 2004, the management of drinking water in Victoria has been governed by the *Safe Drinking Water Act 2003*. Under this Act, the drinking water must comply with quality standards. The Safe Drinking Water Regulations 2015 specify scheduled water quality standards for several water quality parameters, as listed in [Table 4](#):

Table 4: Water quality parameters, standards and frequency of sampling

Water quality parameter	Standard (Safe Drinking Water Regulations 2015)	Relevant sampling frequency for each locality
<i>Escherichia coli</i> (<i>E. coli</i>)	All samples of drinking water collected are found to contain no <i>E. coli</i> per 100 millilitres of drinking water, with the exception of any false positive sample.	one sample per week
Total Trihalomethanes (Total THMs)	Less than or equal to 0.25 mg/L of drinking water	one sample per month
Turbidity	The 95 th percentile of results for samples any 12-month period must be ≤5.0 NTU	one sample per week

The tables in [Sections 5.1 to 5.3](#) of this report outline the 2020-21 compliance of water quality parameters against the water quality scheduled standards specified in Safe Drinking Water Regulations 2015.

5.1 *E. coli*

Standard: All samples of drinking water collected are found to contain no *E. coli* per 100 millilitres of drinking water, with the exception of any false positive sample.

Table 5: *E. coli* summary results in drinking water samples obtained from reticulation system sampling sites (customer taps, water mains, service tanks) tested between 1 July 2020 and 30 June 2021

Water sampling locality (locality number)	Sampling Frequency	Number of Samples	Maximum detected (orgs/100mL)	Average	Number of detections & investigations conducted (s.22 ^{**})	Number of samples where standard was not met (s.18 ^{***})
Altona (2)	>weekly	317	0	0	0	0
Caroline Springs (5)	>weekly	339	0	0	0	0
Deer Park (4)	>weekly	212	0	0	0	0
East Keilor (6)	>weekly	156	1*	0	1*	0
Little River (1A)	>weekly	119	0	0	0	0
Maribyrnong (3A)	>weekly	366	0	0	0	0
Moonee Ponds (9B)	>weekly	235	0	0	0	0
Parkville (11)	>weekly	405	0	0	0	0
Richmond (54)	>weekly	103	0	0	0	0
Strathmore (9A)	>weekly	78	0	0	0	0
Taylors Lakes (5A)	>weekly	251	0	0	0	0
Tullamarine (7A)	>weekly	91	0	0	0	0
Werribee (1)	>weekly	465	0	0	0	0
Werribee South (2A)	>weekly	106	0	0	0	0
Williamstown (3B)	>weekly	171	0	0	0	0

* This detection was confirmed as a false positive sample. Refer to Section 3 of this report for details.

** s.22: as per Section 22 of the *Safe Drinking Water Act 2003*.

*** s.18: as per Section 18 of the *Safe Drinking Water Act 2003*.

The reticulation system results for *E. coli* monitoring demonstrate compliance with the standard (100% of samples with no *E. coli*) in each of City West Water's 15 water sampling localities, between 1 July 2020 and 30 June 2021. False positive samples, following investigations in accordance with the Secretary's guidelines, are not considered non-compliant with the *E. coli* drinking water quality standard under Safe Drinking Water Regulations 2015.

Sampling frequencies in each locality exceeded that prescribed by Safe Drinking Water Regulations 2015 (that is, one sample per week in each locality; refer Table 4). This approach meets the more intensive surveillance of internationally recognised population-based frequencies, as advocated in Australian Drinking Water Guidelines 2011.

5.2 Total trihalomethanes

Standard: Total trihalomethanes less than or equal to 0.25 milligrams per litre of drinking water.

Table 6: Total trihalomethanes summary results in drinking water samples obtained from reticulation system sampling sites (customer taps, water mains, service tanks) tested between 1 July 2020 and 30 June 2021

Water sampling locality (locality number)	Frequency of Sampling	Number of Samples	Drinking water quality standard (mg/L)	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met (s.18*)
Altona (2)	>monthly	13	0.25	0.057	0.045	0
Caroline Springs (5)	monthly	12	0.25	0.042	0.031	0
Deer Park (4)	>monthly	13	0.25	0.046	0.032	0
East Keilor (6)	>monthly	13	0.25	0.039	0.028	0
Little River (1A)	>fortnightly	51	0.25	0.062	0.048	0
Maribyrnong (3A)	>monthly	13	0.25	0.061	0.043	0
Moonee Ponds (9B)	>monthly	13	0.25	0.068	0.053	0
Parkville (11)	>monthly	13	0.25	0.072	0.043	0
Richmond (54)	monthly	12	0.25	0.087	0.074	0
Strathmore (9A)	>monthly	13	0.25	0.080	0.063	0
Taylors Lakes (5A)	>monthly	25	0.25	0.038	0.026	0
Tullamarine (7A)	>monthly	13	0.25	0.030	0.025	0
Werribee (1)	>fortnightly	35	0.25	0.058	0.045	0
Werribee South (2A)	>fortnightly	41	0.25	0.061	0.035	0
Williamstown (3B)	>monthly	13	0.25	0.062	0.044	0

* s.18: as per Section 18 of the *Safe Drinking Water Act 2003*.

Total trihalomethanes data demonstrate compliance with the standard (0.25 mg/L) in each of City West Water's 15 water sampling localities between 1 July 2020 and 30 June 2021.

5.3 Turbidity

Standard: The 95th percentile of results for samples in any given 12-month period must be less than or equal to 5.0 Nephelometric Turbidity Units (NTU).

Table 7: Turbidity summary results in drinking water samples obtained from reticulation system sampling sites (customer taps, water mains, service tanks) tested between 1 July 2020 and 30 June 2021

Water sampling locality (locality number)	Frequency of Sampling	Number of Samples	Maximum Turbidity in a sample (NTU)	95 th percentile of turbidity results in any 12 months (NTU)	Number of 95 th percentile results in any 12 months above standard (s.18 [*])
Altona (2)	weekly	52	0.6	0.5	0
Caroline Springs (5)	weekly	52	1.0	0.7	0
Deer Park (4)	>weekly	53	1.0	0.5	0
East Keilor (6)	weekly	52	0.9	0.5	0
Little River (1A)	>weekly	93	0.5	0.4	0
Maribyrnong (3A)	weekly	52	0.8	0.6	0
Moonee Ponds (9B)	weekly	52	1.0	0.8	0
Parkville (11)	weekly	52	0.9	0.6	0
Richmond (54)	weekly	51**	1.2	1.0	0
Strathmore (9A)	weekly	52	0.9	0.8	0
Taylors Lakes (5A)	>weekly	64	1.1	0.9	0
Tullamarine (7A)	weekly	52	2.0	0.7	0
Werribee (1)	>weekly	78	0.7	0.3	0
Werribee South (2A)	>weekly	80	0.5	0.4	0
Williamstown (3B)	weekly	52	0.6	0.5	0

* s.18: as per Section 18 of the *Safe Drinking Water Act 2003*.

** The number of turbidity samples tested from 1 July 2020 until 30 June 2021 in Richmond water sampling locality is 51 because the weekly sample for the first week of the 2020-21 financial year was collected on Tuesday 30 June 2020. This is also supported by the data reported in the 2020 Drinking Water Quality Report which shows 53 turbidity samples for the water sampling locality of Richmond.

Turbidity data demonstrate compliance with the standard (95th percentile \leq 5 NTU) in each of City West Water's 15 water sampling localities between 1 July 2020 and 30 June 2021.

5.4 Summary performance against water quality standards

During 2020-21, City West Water met the monitoring and water quality requirements of Safe Drinking Water Regulations 2015 for drinking water samples obtained from reticulation system sampling sites (water mains, customer taps, service tanks).

6. Other water quality standards (algal toxin, pathogen, chemical or substance that may pose a risk to human health)

In addition to the water quality parameters designated as standards by Safe Drinking Water Regulations 2015, we also monitored a range of other chemical parameters that provide further information on the overall quality of our drinking water supply. Among such other parameters that were monitored in 2020-21, those for which there is a health-related Australian Drinking Water Guidelines 2011 value are considered as other drinking water quality

standards under regulation 12(b) of Safe Drinking Water Regulations 2015. These parameters are listed in Table 8. Furthermore, data on aesthetic and other parameters that provide an additional comprehensive characterisation of the water, as well as assisting the needs of customers (for example, industry, students and researchers) are in Section 7, Appendix A and Appendix B of this report.

Table 8: Other water quality standards (chemical or substance that may pose a risk to human health) monitored in drinking water samples obtained from reticulation system sampling sites (water mains, customer taps, service tanks) and tested between 1 July 2020 and 30 June 2021

Parameter	ADWG 2011 guideline (mg/L unless specified)		Frequency of testing*	Met the guideline Yes/No
	Health	Aesthetic		
Arsenic	0.01		annually per locality	Yes
Cadmium	0.002		annually per locality	Yes
Total Chlorine	5	0.6	>weekly per locality	Yes
Chromium	0.05		annually per locality	Yes
Copper	2	1	annually per locality	Yes
Cyanide	0.08		annually per locality	Yes
Fluoride	1.5		>fortnightly per locality	Yes
Lead	0.01		annually per locality	Yes
Manganese	0.5	0.1	>fortnightly per locality	Yes
Mercury	0.001		annually per locality	Yes
Nitrate (NO ₃)	50		annually per locality	Yes
Sulphate	^c	250	annually per locality	Yes
Zinc	^c	3	annually per locality	Yes

* sample numbers, maximum/average/minimum levels and compliance details for each sampling locality are shown in Appendix A tables.

^c Australian Drinking Water Guidelines (ADWG) 2011 note that there is insufficient data to set a health guideline value.

Since levels of all health-related parameters tested satisfied Australian Drinking Water Guidelines 2011 guideline values for samples from reticulation system sampling sites, no related remedial water quality actions were necessary.

As our water supply distribution network is completely enclosed, any monitoring for organic chemicals (including pesticides) and radioactive substances is undertaken at

locations upstream of this network. Melbourne Water tests for these substances with respect to its major storage reservoirs such as Silvan and Sugarloaf, where the potential for contamination is greater. Results of this monitoring are provided to City West Water. No significant detections (with respect to Australian Drinking Water Guidelines 2011) in the bulk water supply were reported (by Melbourne Water) during 2020-21.

7. Aesthetic characteristics

In addition to defining health-related guideline values, the Australian Drinking Water Guidelines 2011 also outline aesthetic water quality guideline values. These are associated with customers' acceptability of drinking water in terms of issues such as appearance, taste and odour. In 2020-21, City West Water monitored a range of aesthetic water quality parameters including pH, colour, hardness, alkalinity and iron. The monitoring results for these parameters are shown in Table 9.

Note that our colour tests are reported as apparent colour, which is representative of colour visible to our customers. The results are expressed as Platinum/Cobalt (Pt/Co)

units. Australian Drinking Water Guidelines 2011 has an aesthetic guideline value for true colour of 15 Hazen Units (HU). Note that Pt/Co units and HU are interchangeable and equivalent in value. True colour tests require the water sample to be filtered to remove suspended particles, while the apparent colour test is done without filtration. We therefore have analysed and reviewed our apparent colour results against a benchmark guideline value of 25Pt/Co units, as shown in Table 9.

Table 9: Detailed monitoring results for pH, apparent colour, hardness, alkalinity and iron in drinking water samples obtained from reticulation system sampling sites (water mains, customer taps, service tanks) and tested between 1 July 2020 and 30 June 2021

Water Sampling Locality (locality number)	Parameter	Frequency of Sampling	Total	Minimum*	Maximum*	Aesthetic operating range (ADWG)
Altona (2)	pH	fortnightly	26	7.2	7.8	6.5-8.5 or 6.5-9.2**
	Apparent Colour	fortnightly	26	<2	6	<25Pt/Co***
	Hardness	annually	1	22	22	<200mg/L
	Alkalinity	annually	1	13	13	NA
	Iron	fortnightly	26	<0.01	0.06	<0.3mg/L
Caroline Springs (5)	pH	>monthly	25	6.8	7.8	6.5-8.5 or 6.5-9.2**
	Apparent Colour	>monthly	25	<2	6	<25Pt/Co***
	Hardness	annually	1	15	15	<200mg/L
	Alkalinity	annually	1	14	14	NA
	Iron	>monthly	25	<0.01	0.08	<0.3mg/L
Deer Park (4)	pH	>fortnightly	27	6.9	8.0	6.5-8.5 or 6.5-9.2**
	Apparent Colour	fortnightly	26	<2	4	<25Pt/Co***
	Hardness	annually	1	20	20	<200mg/L
	Alkalinity	annually	1	13	13	NA
	Iron	fortnightly	26	<0.01	0.07	<0.3mg/L
East Keilor (6)	pH	fortnightly	26	7.2	7.7	6.5-8.5 or 6.5-9.2**
	Apparent Colour	fortnightly	26	<2	4	<25Pt/Co***
	Hardness	annually	1	15	15	<200mg/L
	Alkalinity	annually	1	16	16	NA
	Iron	fortnightly	26	<0.01	0.08	<0.3mg/L
Little River (1A)	pH	>weekly	64	6.5	7.9	6.5-8.5 or 6.5-9.2**
	Apparent Colour	>weekly	64	<2	4	<25Pt/Co***
	Hardness	annually	1	63	63	<200mg/L
	Alkalinity	annually	1	48	48	NA
	Iron	>weekly	63	0.01	0.06	<0.3mg/L

Table 9: Detailed monitoring results for pH, apparent colour, hardness, alkalinity and iron in drinking water samples obtained from reticulation system sampling sites (water mains, customer taps, service tanks) and tested between 1 July 2020 and 30 June 2021 (continued)

Water Sampling Locality (locality number)	Parameter	Frequency of Sampling	Total	Minimum*	Maximum*	Aesthetic operating range (ADWG)
Maribyrnong (3A)	pH	fortnightly	26	6.9	7.4	6.5-8.5 or 6.5-9.2**
	Apparent Colour	fortnightly	26	<2	8	<25Pt/Co***
	Hardness	annually	1	18	18	<200mg/L
	Alkalinity	annually	1	12	12	NA
	Iron	fortnightly	26	<0.01	0.08	<0.3mg/L
Moonee Ponds (9B)	pH	fortnightly	26	7.1	7.5	6.5-8.5 or 6.5-9.2**
	Apparent Colour	fortnightly	26	<2	10	<25Pt/Co***
	Hardness	annually	1	19	19	<200mg/L
	Alkalinity	annually	1	12	12	NA
	Iron	fortnightly	26	0.04	0.10	<0.3mg/L
Parkville (11)	pH	fortnightly	26	6.9	7.4	6.5-8.5 or 6.5-9.2**
	Apparent Colour	fortnightly	26	<2	8	<25Pt/Co***
	Hardness	annually	1	22	22	<200mg/L
	Alkalinity	annually	1	11	11	NA
	Iron	fortnightly	26	<0.01	0.10	<0.3mg/L
Richmond (54)	pH	>monthly	25	7.2	7.9	6.5-8.5 or 6.5-9.2**
	Apparent Colour	>monthly	25	4	10	<25Pt/Co***
	Hardness	annually	1	13	13	<200mg/L
	Alkalinity	annually	1	13	13	NA
	Iron	>monthly	25	0.06	0.14	<0.3mg/L
Strathmore (9A)	pH	fortnightly	26	7.2	7.6	6.5-8.5 or 6.5-9.2**
	Apparent Colour	fortnightly	26	<2	10	<25Pt/Co***
	Hardness	annually	1	16	16	<200mg/L
	Alkalinity	annually	1	13	13	NA
	Iron	fortnightly	26	0.02	0.11	<0.3mg/L
Taylors Lakes (5A)	pH	>fortnightly	38	7.2	8.2	6.5-8.5 or 6.5-9.2**
	Apparent Colour	>fortnightly	38	2	8	<25Pt/Co***
	Hardness	annually	1	16	16	<200mg/L
	Alkalinity	annually	1	15	15	NA
	Iron	>fortnightly	38	0.05	0.14	<0.3mg/L
Tullamarine (7A)	pH	fortnightly	26	7.1	8.6	6.5-8.5 or 6.5-9.2**
	Apparent Colour	fortnightly	26	<2	6	<25Pt/Co***
	Hardness	annually	1	18	18	<200mg/L
	Alkalinity	annually	1	15	15	NA
	Iron	fortnightly	26	<0.01	0.09	<0.3mg/L

Table 9: Detailed monitoring results for pH, apparent colour, hardness, alkalinity and iron in drinking water samples obtained from reticulation system sampling sites (water mains, customer taps, service tanks) and tested between 1 July 2020 and 30 June 2021 (continued)

Water Sampling Locality (locality number)	Parameter	Frequency of Sampling	Total	Minimum*	Maximum*	Aesthetic operating range (ADWG)
Werribee (1)	pH	>fortnightly	49	7.2	8.6	6.5-8.5 or 6.5-9.2**
	Apparent Colour	>fortnightly	48	<2	6	<25Pt/Co***
	Hardness	annually	1	24	24	<200mg/L
	Alkalinity	annually	1	14	14	NA
	Iron	>fortnightly	48	<0.01	0.10	<0.3mg/L
Werribee South (2A)	pH	>weekly	54	7.3	8.5	6.5-8.5 or 6.5-9.2**
	Apparent Colour	>weekly	54	<2	6	<25Pt/Co***
	Hardness	annually	1	19	19	<200mg/L
	Alkalinity	annually	1	14	14	NA
	Iron	>weekly	54	<0.01	0.09	<0.3mg/L
Williamstown (3B)	pH	fortnightly	26	7.2	7.7	6.5-8.5 or 6.5-9.2**
	Apparent Colour	fortnightly	26	<2	6	<25Pt/Co***
	Hardness	annually	1	19	19	<200mg/L
	Alkalinity	annually	1	13	13	NA
	Iron	fortnightly	26	0.01	0.06	<0.3mg/L

* Units: pH (units); apparent colour (platinum cobalt units); hardness (mg/L as calcium carbonate); alkalinity (mg/L as calcium carbonate); iron (mg/L).

** tolerable upper value of 9.2 where there are cement lined water mains.

*** Guideline set for 'True Colour' (15 HU) however 'Apparent Colour' is measured (with a benchmark guideline of 25 Pt/Co units).

All 2020-21 water colour, hardness and iron monitoring data complied with the respective aesthetic operating ranges of 25 Pt/Co units, 200 mg/L and 0.3 mg/L. There is no guideline value for alkalinity. Of the 490 samples tested for pH, there were two instances where pH readings were not within the Australian Drinking Water Guidelines 2011 guideline range of 6.5 to 8.5. One of these results was measured in Tullamarine water sampling locality, the other result was measured in Werribee water sampling locality. Occasionally we observe pH levels

above 8.5. These are caused by the presence of corrosion-preventative cement linings within metal water pipes. Australian Drinking Water Guidelines 2011 makes an allowance for such cases by having a tolerable upper limit of 9.2 for water supplied by cement-lined pipe. Adverse health effects may occur at pH levels less than 4 or greater than 11. City West Water did not have any results outside those limits. Average pH levels observed in all localities sampled are within guideline levels.

8. Analysis of results – trends

This section of the report examines:

- Trends over time (three years) of water quality parameters tested that are designated as standards in Regulations 2015 are shown in Section 8.1.
- Trends over time (five years) and between localities, of parameters listed in Appendix A tables that are drinking

water quality standards under regulation 12 or Australian Drinking Water Guidelines 2011 aesthetic guideline value described further in Section 8.2.

Data analysed in this section is based on drinking water samples obtained from reticulation system sampling sites (customer taps, water mains, service tanks).

8.1 Historical compliance of standard parameters

Trends for the previous two financial years and the current reporting period (and extent of compliance) of water quality parameters that are scheduled standards in Safe Drinking Water Regulations 2015 are summarised in Table 10. The trend shows consistent 100% compliance with the standards.

Table 10: Compliance trends over time of scheduled standard parameters at our 15 water sampling localities

Parameter	Standard (Safe Drinking Water Regulations 2015)	Localities compliant (% of customers supplied with compliant water)		
		2020-2021	2019-2020	2018-2019
Trihalomethanes	≤0.25 mg/L	15/15 (100%)	15/15 (100%)	15/15 (100%)
<i>E. coli</i>	no <i>E. coli</i> per 100mL of drinking water, with the exception of any false positive sample	15/15 (100%)	15/15 (100%)	15/15 (100%)
Turbidity	95 th percentile ≤5.0 NTU	15/15 (100%)	15/15 (100%)	15/15 (100%)

Details of our monitoring data for individual localities, together with monitoring frequencies, Safe Drinking Water Regulations 2015 and Australian Drinking Water Guidelines 2011 guidelines for both health-related and aesthetic water quality data, are contained in Appendix A tables. Contact information for obtaining further details of all water quality testing outlined in this report is contained in Section 15.

8.2 Parameter trends over time and between localities

Analysis of parameter trends over five years and between localities is used to better understand and highlight water quality issues that may occur throughout our service area. This section of the report looks at such trends over the past five years in terms of the key parameters listed in Appendix A tables. Graphical representations of trends are contained in Appendix B and briefly discussed below:

Arsenic, cadmium, chromium, cyanide, lead, mercury, zinc

These substances have been monitored on an annual basis. As shown in the Appendix A tables, test results have consistently been either well within guideline levels or below analytical detection limits.

E. coli (refer Figure B.1 in Appendix B)

E. coli performance in our drinking water has consistently complied with Safe Drinking Water Regulations 2015 in all water sampling localities.

Free chlorine (refer Figure B.2 in Appendix B)

All of our drinking water supply is disinfected with chlorine. The more active form, free chlorine, is present in all water sampling localities, with levels well within the maximum Australian Drinking Water Guidelines 2011 health guideline of 5mg/L. Nevertheless, average levels amongst individual localities can be markedly different; this being largely due to relative proximity to chlorine dosing points. For example, the Taylors Lakes and Tullamarine localities are situated near primary chlorination facilities at Greenvale Reservoir, while the Little River, East Keilor and Werribee South localities are served by secondary re-chlorination plants. Year-to-year variations within water sampling localities reflect changes to chlorine dosing rates, water age and bulk water sources.

Aluminium (refer Figure B.3 in Appendix B)

Aluminium levels in the water supply are low and within the Australian Drinking Water Guidelines 2011 aesthetic guideline of 0.2mg/L. Some variations at these levels are related to natural differences in the catchments rather than

from artificial treatment dosing. For example, aluminium is only used in water treatment at the Winneke Treatment Plant, yet the water sampling localities more likely to receive water from this source (Moonee Ponds, Parkville, Altona and Werribee) do not exhibit markedly higher aluminium levels, as compared with other localities.

Chloride (refer Figure B.4 in Appendix B)

Chloride levels are quite low, well within guideline levels and relatively consistent amongst the water sampling localities.

Colour (refer Figure B.5 in Appendix B)

The apparent colour results continue to be below the benchmark guideline. Higher colour levels in the Richmond locality are associated with its traditional bulk supply source from Silvan Reservoir. Average colour levels are generally consistent within individual sampling localities.

Copper (refer Figure B.6 in Appendix B)

Copper levels in the water supply are low and consistently well within the Australian Drinking Water Guidelines 2011 health and aesthetic guidelines.

Electrical conductivity (EC) – (refer Figure B.7 in Appendix B)

We measure EC as a surrogate for total dissolved solids (TDS). Australian Drinking Water Guidelines 2011 advise that its TDS guideline level of 600mg/L can be substituted by an EC level of approximately 900µs/cm. EC levels monitored by City West Water continued to be well below the guideline value and relatively consistent within each water sampling locality.

Fluoride (refer Figure B.8 in Appendix B)

Fluoride levels in the water supply are the result of fluoridation of the bulk water supply (refer report section 1.1.1). Dosing is normally controlled such that levels are generally maintained between approximately 0.9 and 1.0 mg/L. The results show that the fluoride levels were within the guideline value of 1.5 mg/L.

Hardness (refer Figure B.9 in Appendix B)

Water hardness levels are well below the guideline value of 200mg/L and relatively consistent within each water sampling locality. During 2020-21, one result measured in Little River presented higher levels of hardness when compared to the other water sampling localities. This was attributed to the 150mm ductile iron cement lined main.

Monitoring in this location will be increased to inform whether main replacement is warranted.

Iron (refer Figure B.10 in Appendix B)

Overall, slightly higher iron levels in the Taylors Lakes and Richmond water sampling localities are consistent with their source water comprising more of the relatively greater iron containing water from Greenvale and Silvan reservoirs. Nevertheless, variations occur due to changes in bulk water sources.

Manganese (refer Figure B.11 in Appendix B)

Manganese levels in the water supply are low and consistently well within the guideline value.

Nitrate (refer Figure B.12 in Appendix B)

Nitrate levels in the water supply are low and consistently well within the guideline value.

pH (refer Figure B.13 in Appendix B)

Average pH levels in all localities are within guideline levels. The slightly higher levels in Werribee South are consistent with the presence of cement lined mains. The minor variation in pH levels at Little River are attributable to it being managed by dosing the local water supply with carbon dioxide gas.

Sodium (refer Figure B.14 in Appendix B)

Sodium levels are quite low and relatively consistent among the water sampling localities and consistently well within the guideline value.

Sulphate (refer Figure B.15 in Appendix B)

Sulphate levels are quite low and relatively consistent within each water quality locality and consistently well within the guideline value.

Total trihalomethanes – (refer Figure B.16 in Appendix B)

Total trihalomethanes concentrations are relatively low (in comparison with the water quality standard in the Safe Drinking Water Regulations 2015) and consistent among water sampling localities. Localities with higher levels tend to be more remote from primary or secondary chlorination.

Turbidity (refer Figure B.17 in Appendix B)

Turbidity levels measured in all localities continue to be within the standard. Variations between individual water sampling localities are a reflection of their source waters. For example, localities with lower turbidity tend to be supplied more from Sugarloaf/Winneke with filtration, while higher turbidity localities tend to be supplied to a greater extent from Silvan and Greenvale reservoirs, which are unfiltered.

9. Complaints relating to water quality

During 2020-21, City West Water received a total of 1,062 complaints related to water supply quality; this compares with 745 in 2019-20, 555 in 2018-19 and 330 in 2017-18. This increasing trend in complaint numbers has been associated with an increase in the proportion of discoloured water complaints over the same period (from 64% to 83%).

Analysis completed to date has identified that increased sedimentation and changing customer usage and behaviour are likely to have contributed to this increase in complaints.

- Increased sedimentation in the system

Melbourne's water supply is not filtered. This allows naturally occurring sedimentation to build up over time. Accumulated sedimentation can be stirred up during high flow events (such as burst water mains), resulting in dirty water noticeable to customers. In addition, the unintended withdrawal of discoloured water from the lower depths of Greenvale Reservoir in 2019 is likely to have resulted in the deposit of significant sedimentation in the City West Water distribution network.

- Changing customer usage and behaviour

The way water moves around the network will impact where sedimentation build-up occurs and how often it will become resuspended due to high flow events. Usage patterns have been changing due to considerable growth within the City West Water service area, and more recently due to a significant increase in the number of people working from home. More people working from home is also likely to have changed the number of people exposed to any given water quality event.

A small increase in the number of alleged illness complaints (nine compared to two in previous years) was also noted during 2020-21. All alleged illness cases are taken seriously, and appropriate investigations completed. The investigations did not find any correlations between the complaints and no illnesses were linked to the drinking water supply.

All other complaint types were consistent with historic volumes.

We continued to focus on reducing the overall volume of complaints. In 2020-21 we developed a program of works consisting of three strategic priorities:

- further investigations into the increase in volumes to understand the root cause(s) of the increased complaints
- improving our business-as-usual performance monitoring of water quality complaints
- implementing improvement initiatives to reduce complaint volumes.

This program is already well underway. We updated our analytical process to capture more information regarding complaints and based on our existing analysis we identified mains cleaning as a potential long-term improvement initiative. Mains cleaning will remove the build-up of natural sediments in the water pipes. This work will continue into 2021-22.

Counter to the increased volume of complaints, our Annual Customer Satisfaction survey for 2020-21 indicated a high level of satisfaction with water quality among both residential and non-residential customers. Satisfaction was 96% among our residential customers and 92% among our non-residential customers, representing an increase of 3% and 8% respectively when compared to last year. The research found that customers were more satisfied with all aspects of water quality and, in particular, perceptions around the taste of the water.

The categories of overall complaints along with actions taken to minimise complaints received over the past three years are shown in [Table 11](#).

Table 11: Water quality related customer complaints received over the last three years

Type of complaints	Number of complaints			Comparison with previous reporting periods	Comments
	2020-21	2019-20	2018-19		
Discoloured water	882	593	426	Increase of 289 from previous reporting period.	Increased number due to: a) Greenvale Reservoir discoloured water event of early 2019 that deposited sediments throughout the distribution network. The continued presence of this material continues to cause discoloured water and associated complaints. b) Increase number of people working from home due to the COVID-19 pandemic while maintenance and reactive works on water mains are completed.
Taste/odour	90 (28 chlorine)*	76 (25 chlorine)*	83 (29 chlorine)*	Increase of 14 from previous reporting period.	Small variation in line with normal variations.
Air in water	63	60	27	No significant change (increase of 3).	Nil.
Other	27	16	19	Increase of 11 from previous reporting period.	Small variation in line with normal variations. The alleged illness cases were analysed and investigated. None of the complaints took place on the same day and/or suburb.
(alleged illness)	(9)	(2)	(2)		
(blocked filter)	(5)	(4)	(4)		
(blue-green water)	(4)	(5)	(6)		
(staining)	(9)	(5)	(7)		
Total	1,062	745	555	Increase of 317 from previous reporting period.	Actions taken to address and minimise water quality complaints included: • personalised contact with customers • targeted mains flushing • visits to customer properties • addressing customer concerns • continuous monitoring of complaint numbers and locations • analysis of likely causes and solutions • development of a program of works to ensure a fit for purpose approach to decrease the instances of dirty water complaints.
No. of properties	505,000	488,000	473,000	-	-
Complaints per 100 properties	0.21	0.153	0.117	-	-

* Number of complaints received of chlorine taste or odour.

The water quality complaints received during 2020-21 in each water sampling locality are shown in Table 12.

Table 12: Water quality related customer complaints received during 2020-21 per water sampling locality

Water sampling locality (Locality number)	Numbers received				Total complaints
	Discoloured water	Taste/odour	Air in water	Other (alleged illness) (blocked filter) (blue-green water) (staining)	
Altona (2)	127	8	7	2 (2 alleged illness)	144
Caroline Springs (5)	80	10	10	2 (1 blue-green water) (1 staining)	102
Deer Park (4)	51	8	4	3 (1 alleged illness) (2 staining)	66
East Keilor (6)	15	6	2	0	23
Little River (1A)	0	0	0	0	0
Maribyrnong (3A)	67	8	7	4 (1 alleged illness) (2 blocked filter) (1 blue-green water)	86
Moonee Ponds (9B)	65	8	2	0	75
Parkville (11)	122	13	7	5 (2 alleged illness) (1 blocked filter) (1 blue-green water) (1 staining)	147
Richmond (54)	27	1	0	0	28
Strathmore (9A)	4	0	0	0	4
Taylors Lakes (5A)	147	7	8	2 (1 alleged illness) (1 blocked filter)	164
Tullamarine (7A)	12	2	5	1 (1 staining)	20
Werribee (1)	81	14	9	4 (1 alleged illness) (1 blue-green water) (2 staining)	108
Werribee South (2A)	13	1	1	1 (1 alleged illness)	16
Williamstown (3B)	71	4	1	3 (1 blocked filter) (2 staining)	79

Complaints and responses

We provide individual responses to water quality related complaints. If customers are experiencing water quality concerns, they can contact Greater Western Water on 134 499 for further information and advice. Responses to complaints can range between verbal clarification of perceived issues to onsite investigations and remedial action. In terms of the major complaint categories, our responses are as follows:

Discoloured (e.g. brown) water

Discoloured water is generally caused by the suspension of accumulated natural sediments in water mains. It can be triggered by the opening or closing of valves and reinstatement of mains into service following repairs. Discoloured water can also result from older, rusting internal galvanised iron pipes. Calls received from customers are assessed by trained staff and, where the discoloured water is deemed to be originating from the water main, targeted mains flushing is generally undertaken.

Alleged illness

Complaints of water related illness are analysed and investigated. Customers may be advised to seek medical advice.

White water (air in water)

White water is water with a cloudy appearance that clarifies within a few minutes and indicates the presence of tiny, harmless air bubbles. It tends to be associated with maintenance and repair works, when air can enter water pipes when the supply mains are recharged. As the aerated water is used by customers, the appearance returns to normal.

Blue-green water

Blue-green water is water that has a cloudy to blue-green appearance, possibly containing blue-green particles, and having an unpleasant bitter taste. This is caused by accelerated corrosion of customers' internal copper water pipes and appears to be restricted to cold water pipes.

Blue-green water must not be consumed (by drinking or in the preparation of food) because it can cause nausea and vomiting. The prolonged consumption of water containing elevated copper levels can have adverse health effects.

As blue-green water originates from a property's internal copper pipes, customers can manage the problem by flushing their tap with fresh mains water. This means running their tap until the water becomes clear. A permanent solution to such blue-green water instances would involve the replacement of the property's internal copper pipes.

In certain cases, corrosion of copper pipes can lead to perforation and leakage. Neither the cause(s) of, nor solution to this international and Australia-wide copper corrosion phenomenon are well known (apart from replacement of corroding pipes).

We assist customers experiencing copper pipe corrosion by testing copper levels in their water and providing advice on how to best manage the issue of blue-green water.

Taste or odour

A change in taste or odour of tap water can occur occasionally and is generally apparent as a chlorine-like or earthy, musty taste or odour. Fluctuations in chlorine levels (and hence, the perception of chlorine taste or odour) occurs from time to time, largely due to changed water demands and flow rates. Our response to customers reporting chlorine taste and odour involves providing an explanation, as well as considering changes to chlorine dosing.

Other tastes and odours can result when water flows are slower and during flow reversals in large pipes. In such cases the cause is identified and, where appropriate, a combination of targeted flushing and/or changes to flow regimes are implemented.

10. Risk management plan audit results

Pursuant to the *Safe Drinking Water Act 2003*, we have a documented water quality 'Risk Management Plan' that is subject to independent audit (at approximately two-year intervals) in terms of its content and implementation. Our plan was audited for the seventh time in July 2020, during which it was examined to determine compliance with obligations imposed by Section 7(1) of the *Safe Drinking Water Act 2003*. In this regard, the audit determined that:

- the water quality Risk Management Plan complied with the obligations imposed by Section 7(1) of the *Safe Drinking Water Act 2003* during the audit period 17 April 2018 to 23 July 2020
- the Risk Management Plan met all the specifications in the Act (Section 9) and its Regulations in an effective manner
- the identified water quality control measures and control measure combinations are in place operationally and are adequate to control water safety risks.

Notwithstanding the plan's compliance with the Act, the audit identified two opportunities for improvement. An outline of these, together with the status of the opportunity for improvement (number 6) for 2018 can be found in [Table 13](#) and [Table 14](#) for 2020 actions respectively. The other five opportunities for improvement from the

2018 Risk Management Plan audit have previously been reported as completed. Refer to 2019-2020 report, available at the Greater Western Water website, for more information.

Significant portions of the Risk Management Plan are based on our pre-existing Hazard Analysis and Critical Control Point (HACCP) plan which is audited internally on a quarterly basis, as well as annually by an external, independent auditor. The HACCP plan specifically addresses issues such as employee training and development, calibration of equipment, and maintenance and inspections of assets. Each of these is examined during the independent annual audits. The HACCP system is highly regarded in the food industry for protecting the welfare and safety of consumers. It is based on the identification and management of risks (to drinking water quality) at key points within a production or product delivery process.

The HACCP certification demonstrates that City West Water attends to those parts of our network and operations that have an impact on water quality. Maintenance of HACCP certification requires continual vigilance and improvements to our water quality management operations. We aim to continue meeting the HACCP risk management framework requirements.

Table 13: City West Water 2018 Drinking Water Risk Management Plan audit response progress summary

No.	Opportunity for improvement	Status of opportunities for improvement 2018
6.	C-Tech are managing the chlorine dosing system. C-Tech to graph both pH and free active chlorine residual. Other parameters could also be considered to optimize water chemistry. A yearly chemistry performance review with suggestion for upgrades and Key Performance Indicators.	<p>In July 2018, City West Water explored this opportunity for improvement and determined that this was best achieved through an upgrade of the dosing system telemetry equipment.</p> <p>Due to the cost and complexity of the upgrades, the action was not closed out prior to the 2020 audit.</p> <p>We are now reviewing this opportunity as part of the integration roadmap for Greater Western Water. This will include a review of our chlorine operation and maintenance contract.</p> <p>In the meantime, we have carried out a review of our current data sources and monitoring arrangements, including raw C-Tech data and that gathered from our sampling programs and have determined that we currently have sufficient data to manage our risks</p>

Table 14: City West Water 2020 Drinking Water Risk Management Plan audit response progress summary

No.	Opportunity for improvement	Status of opportunities for improvement 2020
1.	Suggest monitoring the customer complaints regarding dirty water, develop a plan to minimise dirty water complaints in the future.	<p>As discussed in Section 9, a program of work has been developed to address the increasing volumes of water quality complaints.</p> <p>The program of work has a strong focus on improving our analytical processes including the monitoring of dirty water complaints. To date, this work has focused on improving our analytical systems and increasing the depth of investigations into each complaint.</p> <p>We are also considering long-term initiatives like implementing a system-wide cleaning program following the mains flushing trial. These works will continue into 2021-22.</p>
2.	Consider re introducing the Water Quality Awareness training for staff.	Water quality awareness training is scheduled for re-initiation for relevant staff by the end of September 2021. We will also develop a fit for purpose ongoing program of water quality awareness training for Greater Western Water as part of the integration plan.

11. Undertakings under Section 30 of the *Safe Drinking Water Act 2003*

During 2020-21, City West Water did not enter into any undertakings with the Department of Health, pursuant to Section 30 of the *Safe Drinking Water Act 2003*.

12. Exemptions from water quality standards under Section 20 and conditions imposed under Section 21 of the *Safe Drinking Water Act 2003*

During 2020-21, City West Water did not have any Section 20 exemptions or Section 21 exemptions imposed conditions in place.

13. Variation to aesthetic standards under Section 19 of the act and conditions imposed under Section 21 of the *Safe Drinking Water Act 2003*

During 2020-21, City West Water did not have any Section 19 variations.

14. Regulated water

'Regulated water' is water that is the subject of a declaration made by the Minister for Health concerning water that is not intended for drinking but could

reasonably be mistaken as drinking water. We do not manage any water supplies that have been declared as regulated water.

In certain cases, however, we supply water from our water distribution mains to customers with privately owned offtakes. Such supplies were provided under a private agreement between City West Water and the customer. The agreement does not guarantee the pressure or quality of the supply downstream of the offtake point, albeit that we endeavoured to maintain these. City West Water embarked on a program to reduce the number of such private supplies.

15. Further information

For further information on this report please email: contact@gww.com.au

For water quality issues please contact 13 44 99

Written enquiries can be addressed to: Greater Western Water, Locked Bag 350, Sunshine Vic 3020



This report is available on Greater Western Water's website:

gww.com.au

Appendix A. Water quality by locality

Based on results of tests on drinking water samples obtained from reticulation system sampling sites (water mains, customer taps, service tanks) tested between 1 July 2020 and 30 June 2021 (population is based on 2016 census)

Water sampling locality	Altona	Locality	No. 2
For Period	1 July 2020 to 30 June 2021	Population	117,900 (2016 Census)

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling Frequency	No. of Samples		Performance against standard/ guideline
			Min	Mean	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000*	<1	<1 ^c	150	>weekly	317	317	100%*
Total Coliforms	orgs/100mL	N	<1	<1 ^c	140	>weekly	317	N	N
<i>E. coli</i>	orgs/100mL	Zero(0)*	0	0	0	>weekly	317	317	100%
Free Chlorine	mg/L	5	<0.05	0.16	0.63	>weekly	317	317	100%
Total Chlorine	mg/L	5	<0.05	0.26	0.71	>weekly	317	317	100%
Alkalinity (as CaCO ₃)	mg/L	N	13	13	13	annually	1	N	N
Aluminium (acid soluble)	mg/L	0.2	0.02	0.02	0.03	>monthly	13	13	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	6.5	6.5	6.5	annually	1	N	N
Chloride	mg/L	250	14	14	14	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	25**	<2	2	6	fortnightly	26	26	100%
Conductivity	µs/cm	~900	86	102	120	fortnightly	26	26	100%
Copper	mg/L	1	0.011	0.011	0.011	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.61	0.83	0.94	>fortnightly	28	28	100%
Hardness (as CaCO ₃)	mg/L	200	22	22	22	annually	1	1	100%
Iron	mg/L	0.3	<0.01	0.03	0.06	fortnightly	26	26	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	1.4	1.4	1.4	annually	1	N	N
Manganese	mg/L	0.1	<0.001	0.002	0.004	fortnightly	26	26	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO ₃)	mg/L	50	1.06	1.06	1.06	annually	1	1	100%
pH	units	6.5-9.2	7.2	7.3	7.8	fortnightly	26	26	100%
Potassium	mg/L	N	1	1	1	annually	1	N	N
Silica (SiO ₂)	mg/L	80	4.3	4.3	4.3	annually	1	1	100%
Sodium	mg/L	180	7.7	7.7	7.7	annually	1	1	100%
Sulphate	mg/L	250	9.9	9.9	9.9	annually	1	1	100%

Water sampling locality	Altona
For Period	1 July 2020 to 30 June 2021

Locality	No. 2
Population	117,900 (2016 Census)

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling Frequency	No. of Samples		Performance against standard/guideline
			Min	Mean	Max		Total	Passing	
Total Organic Carbon	mg/L	N	0.7	0.7	0.7	annually	1	N	N
Total Phosphorus	mg/L	N	<0.005	<0.005	<0.005	annually	1	N	N
Total Dissolved Solids	mg/L	600	70	70	70	annually	1	1	100%
Turbidity	NTU	5 ¹	<0.1	0.5 ²	0.6	weekly	52	N	within standard
Zinc	mg/L	3	0.002	0.002	0.002	annually	1	1	100%
Disinfection Byproducts									
Total Trihalomethanes	mg/L	0.25	0.032	0.045	0.057	>monthly	13	13	100%
Chloroform	mg/L	N	0.015	0.028	0.042	>monthly	13	N	N
Dichlorobromomethane	mg/L	N	0.009	0.012	0.014	>monthly	13	N	N
Dibromochloromethane	mg/L	N	0.003	0.005	0.006	>monthly	13	N	N
Bromoform	mg/L	N	<0.001	<0.001	<0.001	>monthly	13	N	N
Chloroacetic acids									
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	0.009	0.009	0.009	annually	1	1	100%

* Internal City West Water target.

** Guideline set for "True Colour" (15 Pt/Co) however "Apparent Colour" is measured (with a benchmark guideline of 25 Pt/Co).

N No guideline/standard set for this parameter.

Victorian standard: All samples of drinking water collected are found to contain no *E. coli* per 100mL of drinking water, with the exception of any false positive sample.

⁶ Geometric means shown for bacterial parameters.

¹ Victorian standard: 95th percentile less than or equal to 5 NTU.

² 95th percentile result shown for turbidity.

Water sampling locality	Caroline Springs	Locality	No. 5
For Period	1 July 2020 to 30 June 2021	Population	103,800 (2016 Census)

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling Frequency	No. of Samples		Performance against standard/guideline
			Min	Mean	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000 [*]	<1	<1 ^c	130	>weekly	339	339	100% [*]
Total Coliforms	orgs/100mL	N	<1	<1 ^c	200	>weekly	339	N	N
<i>E. coli</i>	orgs/100mL	Zero(0) [#]	0	0	0	>weekly	339	339	100%
Free Chlorine	mg/L	5	<0.05	0.25	0.73	>weekly	339	339	100%
Total Chlorine	mg/L	5	0.05	0.36	0.88	>weekly	339	339	100%
Alkalinity (as CaCO ₃)	mg/L	N	14	14	14	annually	1	N	N
Aluminium (acid soluble)	mg/L	0.2	0.01	0.02	0.03	monthly	12	12	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	4.2	4.2	4.2	annually	1	N	N
Chloride	mg/L	250	10	10	10	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	25 ^{**}	<2	3	6	>monthly	25	25	100%
Conductivity	µs/cm	~900	62	82	120	>monthly	24	24	100%
Copper	mg/L	1	0.005	0.005	0.005	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.7	0.8	0.97	fortnightly	26	26	100%
Hardness (as CaCO ₃)	mg/L	200	15	15	15	annually	1	1	100%
Iron	mg/L	0.3	<0.01	0.05	0.08	>monthly	25	25	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	1.2	1.2	1.2	annually	1	N	N
Manganese	mg/L	0.1	<0.001	0.002	0.005	>monthly	25	25	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO ₃)	mg/L	50	0.39	0.39	0.39	annually	1	1	100%
pH	units	6.5-9.2	6.8	7.4	7.8	>monthly	25	25	100%
Potassium	mg/L	N	0.6	0.6	0.6	annually	1	N	N
Silica (SiO ₂)	mg/L	80	5.3	5.3	5.3	annually	1	1	100%
Sodium	mg/L	180	5.4	5.4	5.4	annually	1	1	100%
Sulphate	mg/L	250	1.3	1.3	1.3	annually	1	1	100%
Total Organic Carbon	mg/L	N	0.6	0.6	0.6	annually	1	N	N
Total Phosphorus	mg/L	N	<0.005	<0.005	<0.005	annually	1	N	N
Total Dissolved Solids	mg/L	600	45	45	45	annually	1	1	100%
Turbidity	NTU	5 ¹	<0.1	0.7 ²	1	weekly	52	N	within standard
Zinc	mg/L	3	0.002	0.002	0.002	annually	1	1	100%
Disinfection Byproducts									
Total Trihalomethanes	mg/L	0.25	0.021	0.031	0.042	monthly	12	12	100%
Chloroform	mg/L	N	0.014	0.021	0.031	monthly	12	N	N
Dichlorobromomethane	mg/L	N	0.005	0.008	0.013	monthly	12	N	N
Dibromochloromethane	mg/L	N	0.001	0.003	0.006	monthly	12	N	N
Bromoform	mg/L	N	<0.001	<0.001	<0.001	monthly	12	N	N
Chloroacetic acids									
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%

* Internal City West Water target.

** Guideline set for "True Colour" (15 Pt/Co) however "Apparent Colour" is measured (with a benchmark guideline of 25 Pt/Co).

N No guideline/standard set for this parameter.

Victorian standard: All samples of drinking water collected are found to contain no *E. coli* per 100mL of drinking water, with the exception of any false positive sample.

^c Geometric means shown for bacterial parameters.

¹ Victorian standard: 95th percentile less than or equal to 5 NTU.

² 95th percentile result shown for turbidity.

Water sampling locality	Deer Park	Locality	No. 4
For Period	1 July 2020 to 30 June 2021	Population	58,500 (2016 Census)

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling Frequency	No. of Samples		Performance against standard/guideline
			Min	Mean	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000*	<1	<1 ^c	660	>weekly	210	210	100% ^c
Total Coliforms	orgs/100mL	N	<1	<1 ^c	<1	>weekly	212	N	N
<i>E. coli</i>	orgs/100mL	Zero(0) [#]	0	0	0	>weekly	212	212	100%
Free Chlorine	mg/L	5	<0.05	0.33	0.61	>weekly	212	212	100%
Total Chlorine	mg/L	5	0.08	0.44	0.69	>weekly	212	212	100%
Alkalinity (as CaCO ₃)	mg/L	N	13	13	13	annually	1	N	N
Aluminium (acid soluble)	mg/L	0.2	0.01	0.02	0.03	>monthly	13	13	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	5.5	5.5	5.5	annually	1	N	N
Chloride	mg/L	250	14	14	14	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	25**	<2	<2	4	fortnightly	26	26	100%
Conductivity	µs/cm	~900	72	109	130	>fortnightly	27	27	100%
Copper	mg/L	1	0.005	0.005	0.005	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.7	0.85	0.95	>fortnightly	27	27	100%
Hardness (as CaCO ₃)	mg/L	200	20	20	20	annually	1	1	100%
Iron	mg/L	0.3	<0.01	0.02	0.07	fortnightly	26	26	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	1.4	1.4	1.4	annually	1	N	N
Manganese	mg/L	0.1	<0.001	<0.001	0.002	fortnightly	26	26	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO ₃)	mg/L	50	0.89	1.4	1.9		2	2	100%
pH	units	6.5-9.2	6.9	7.4	8	>fortnightly	27	27	100%
Potassium	mg/L	N	1	1	1	annually	1	N	N
Silica (SiO ₂)	mg/L	80	4.4	4.4	4.4	annually	1	1	100%
Sodium	mg/L	180	7.3	7.3	7.3	annually	1	1	100%
Sulphate	mg/L	250	7.6	7.6	7.6	annually	1	1	100%
Total Organic Carbon	mg/L	N	<0.5	<0.5	<0.5	annually	1	N	N
Total Phosphorus	mg/L	N	<0.005	<0.005	<0.005	annually	1	N	N
Total Dissolved Solids	mg/L	600	60	60	60	annually	1	1	100%
Turbidity	NTU	5 ¹	<0.1	0.5 ²	1	>weekly	53	N	within standard
Zinc	mg/L	3	0.001	0.001	0.001	annually	1	1	100%
Disinfection Byproducts									
Total Trihalomethanes	mg/L	0.25	0.023	0.032	0.046	>monthly	13	13	100%
Chloroform	mg/L	N	0.012	0.016	0.024	>monthly	13	N	N
Dichlorobromomethane	mg/L	N	0.006	0.011	0.015	>monthly	13	N	N
Dibromochloromethane	mg/L	N	0.002	0.005	0.007	>monthly	13	N	N
Bromoform	mg/L	N	<0.001	<0.001	<0.001	>monthly	13	N	N
Chloroacetic acids									
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%

* Internal City West Water target.

** Guideline set for "True Colour" (15 Pt/Co) however "Apparent Colour" is measured (with a benchmark guideline of 25 Pt/Co).

N No guideline/standard set for this parameter.

Victorian standard: All samples of drinking water collected are found to contain no *E. coli* per 100mL of drinking water, with the exception of any false positive sample.

^c Geometric means shown for bacterial parameters.

¹ Victorian standard: 95th percentile less than or equal to 5 NTU.

² 95th percentile result shown for turbidity.

Water sampling locality	East Keilor
For Period	1 July 2020 to 30 June 2021

Locality	No. 6
Population	41,300 (2016 Census)

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling Frequency	No. of Samples		Performance against standard/guideline
			Min	Mean	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000*	<1	<1 ^c	12	>weekly	156	156	100% ^d
Total Coliforms	orgs/100mL	N	<1	<1 ^c	1	>weekly	156	N	N
<i>E. coli</i>	orgs/100mL	Zero(0) [#]	0	0	1 ^{**}	>weekly	156	156	100%
Free Chlorine	mg/L	5	<0.05	0.35	0.81	>weekly	156	156	100%
Total Chlorine	mg/L	5	0.06	0.46	0.99	>weekly	156	156	100%
Alkalinity (as CaCO ₃)	mg/L	N	16	16	16	annually	1	N	N
Aluminium (acid soluble)	mg/L	0.2	0.02	0.02	0.03	>monthly	13	13	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	4.4	4.4	4.4	annually	1	N	N
Chloride	mg/L	250	9	9	9	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	25 ^{**}	<2	<2	4	fortnightly	26	26	100%
Conductivity	µs/cm	~900	68	113	120	fortnightly	26	26	100%
Copper	mg/L	1	0.004	0.004	0.004	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	<0.05	0.84	0.98	>fortnightly	27	27	100%
Hardness (as CaCO ₃)	mg/L	200	15	15	15	annually	1	1	100%
Iron	mg/L	0.3	<0.01	0.02	0.08	fortnightly	26	26	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	1.1	1.1	1.1	annually	1	N	N
Manganese	mg/L	0.1	<0.001	<0.001	0.004	fortnightly	26	26	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO ₃)	mg/L	50	0.39	0.39	0.39	annually	1	1	100%
pH	units	6.5-9.2	7.2	7.4	7.7	fortnightly	26	26	100%
Potassium	mg/L	N	0.8	0.8	0.8	annually	1	N	N
Silica (SiO ₂)	mg/L	80	4.9	4.9	4.9	annually	1	1	100%
Sodium	mg/L	180	5.4	5.4	5.4	annually	1	1	100%
Sulphate	mg/L	250	1.4	1.4	1.4	annually	1	1	100%
Total Organic Carbon	mg/L	N	0.7	0.7	0.7	annually	1	N	N
Total Phosphorus	mg/L	N	0.006	0.006	0.006	annually	1	N	N
Total Dissolved Solids	mg/L	600	42	42	42	annually	1	1	100%
Turbidity	NTU	5 ¹	<0.1	0.5 ²	0.9	weekly	52	N	within standard
Zinc	mg/L	3	0.002	0.002	0.002	annually	1	1	100%
Disinfection Byproducts									
Total Trihalomethanes	mg/L	0.25	0.012	0.028	0.039	>monthly	13	13	100%
Chloroform	mg/L	N	0.008	0.013	0.018	>monthly	13	N	N
Dichlorobromomethane	mg/L	N	0.003	0.009	0.014	>monthly	13	N	N
Dibromochloromethane	mg/L	N	0.001	0.005	0.007	>monthly	13	N	N
Bromoform	mg/L	N	<0.001	<0.001	<0.001	>monthly	13	N	N
Chloroacetic acids									
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%

* Internal City West Water target.

** Guideline set for "True Colour" (15 Pt/Co) however "Apparent Colour" is measured (with a benchmark guideline of 25 Pt/Co).

N No guideline/standard set for this parameter.

[#] Victorian standard: All samples of drinking water collected are found to contain no *E. coli* per 100mL of drinking water, with the exception

of any false positive sample.

^{**} Following investigation, it was concluded the positive sample was a 'false positive sample'. Refer to Section 3 for further details.

^c Geometric means shown for bacterial parameters.

¹ Victorian standard: 95th percentile less than or equal to 5 NTU.

² 95th percentile result shown for turbidity.

Water sampling locality	Little River	Locality	No. 1A
For Period	1 July 2020 to 30 June 2021	Population	670 (2016 Census)

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling Frequency	No. of Samples		Performance against standard/guideline
			Min	Mean	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000 [*]	<1	<1 ^g	2	>weekly	119	119	100% ^h
Total Coliforms	orgs/100mL	N	<1	<1 ^g	8	>weekly	119	N	N
<i>E. coli</i>	orgs/100mL	Zero(0) [#]	0	0	0	>weekly	119	119	100%
Free Chlorine	mg/L	5	<0.05	0.27	0.85	>weekly	119	119	100%
Total Chlorine	mg/L	5	0.09	0.37	0.99	>weekly	119	119	100%
Alkalinity (as CaCO ₃)	mg/L	N	48	48	48	annually	1	N	N
Aluminium (acid soluble)	mg/L	0.2	<0.01	0.02	0.04	>fortnightly	51	51	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	23	23	23	annually	1	N	N
Chloride	mg/L	250	16	16	16	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	25 ^{**}	<2	2	4	>weekly	64	64	100%
Conductivity	µs/cm	~900	87	120	180	>weekly	64	64	100%
Copper	mg/L	1	0.024	0.024	0.024	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.23	0.81	0.99	>weekly	66	66	100%
Hardness (as CaCO ₃)	mg/L	200	63	63	63	annually	1	1	100%
Iron	mg/L	0.3	0.01	0.03	0.06	>weekly	63	63	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	1.5	1.5	1.5	annually	1	N	N
Manganese	mg/L	0.1	<0.001	0.001	0.004	>weekly	63	63	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO ₃)	mg/L	50	1.37	1.37	1.37	annually	1	1	100%
pH	units	6.5-9.2	6.5	7.3	7.9	>weekly	64	64	100%
Potassium	mg/L	N	1.2	1.2	1.2	annually	1	N	N
Silica (SiO ₂)	mg/L	80	7.5	7.5	7.5	annually	1	1	100%
Sodium	mg/L	180	9.3	9.3	9.3	annually	1	1	100%
Sulphate	mg/L	250	11	11	11	annually	1	1	100%
Total Organic Carbon	mg/L	N	1.1	1.1	1.1	annually	1	N	N
Total Phosphorus	mg/L	N	<0.005	<0.005	<0.005	annually	1	N	N
Total Dissolved Solids	mg/L	600	100	100	100	annually	1	1	100%
Turbidity	NTU	5 ¹	<0.1	0.4 ²	0.5	>weekly	93	N	within standard
Zinc	mg/L	3	0.004	0.004	0.004	annually	1	1	100%
Disinfection Byproducts									
Total Trihalomethanes	mg/L	0.25	0.039	0.048	0.062	>fortnightly	51	51	100%
Chloroform	mg/L	N	0.021	0.028	0.038	>fortnightly	51	N	N
Dichlorobromomethane	mg/L	N	0.01	0.014	0.018	>fortnightly	51	N	N
Dibromochloromethane	mg/L	N	0.003	0.006	0.008	>fortnightly	51	N	N
Bromoform	mg/L	N	<0.001	<0.001	<0.001	>fortnightly	51	N	N
Chloroacetic acids									
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	0.014	0.014	0.014	annually	1	1	100%

* Internal City West Water target.

** Guideline set for "True Colour" (15 Pt/Co) however "Apparent Colour" is measured (with a benchmark guideline of 25 Pt/Co).

N No guideline/standard set for this parameter.

^h Victorian standard: All samples of drinking water collected are found to contain no *E. coli* per 100mL of drinking water, with the exception of any false positive sample.

^g Geometric means shown for bacterial parameters.

¹ Victorian standard: 95th percentile less than or equal to 5 NTU.

² 95th percentile result shown for turbidity.

Water sampling locality	Maribyrnong	Locality	No. 3A
For Period	1 July 2020 to 30 June 2021	Population	120,900 (2016 Census)

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling Frequency	No. of Samples		Performance against standard/guideline
			Min	Mean	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000 [*]	<1	<1 ^c	45	>weekly	366	366	100% [*]
Total Coliforms	orgs/100mL	N	<1	<1 ^c	18	>weekly	366	N	N
<i>E. coli</i>	orgs/100mL	Zero(0) [#]	0	0	0	>weekly	366	366	100%
Free Chlorine	mg/L	5	<0.05	0.21	0.54	>weekly	366	366	100%
Total Chlorine	mg/L	5	0.05	0.31	0.73	>weekly	366	366	100%
Alkalinity (as CaCO ₃)	mg/L	N	12	12	12	annually	1	N	N
Aluminium (acid soluble)	mg/L	0.2	0.02	0.02	0.03	>monthly	13	13	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	4.9	4.9	4.9	annually	1	N	N
Chloride	mg/L	250	11	11	11	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	25 ^{**}	<2	4	8	fortnightly	26	26	100%
Conductivity	µs/cm	~900	67	96	120	fortnightly	26	26	100%
Copper	mg/L	1	0.018	0.018	0.018	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.64	0.83	0.91	>fortnightly	29	29	100%
Hardness (as CaCO ₃)	mg/L	200	18	18	18	annually	1	1	100%
Iron	mg/L	0.3	<0.01	0.04	0.08	fortnightly	26	26	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	1.3	1.3	1.3	annually	1	N	N
Manganese	mg/L	0.1	<0.001	0.002	0.008	fortnightly	26	26	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO ₃)	mg/L	50	0.89	0.89	0.89	annually	1	1	100%
pH	units	6.5-9.2	6.9	7.2	7.4	fortnightly	26	26	100%
Potassium	mg/L	N	0.8	0.8	0.8	annually	1	N	N
Silica (SiO ₂)	mg/L	80	5	5	5	annually	1	1	100%
Sodium	mg/L	180	5.9	5.9	5.9	annually	1	1	100%
Sulphate	mg/L	250	5.8	5.8	5.8	annually	1	1	100%
Total Organic Carbon	mg/L	N	1.1	1.1	1.1	annually	1	N	N
Total Phosphorus	mg/L	N	<0.005	<0.005	<0.005	annually	1	N	N
Total Dissolved Solids	mg/L	600	55	55	55	annually	1	1	100%
Turbidity	NTU	5 ¹	<0.1	0.6 ²	0.8	weekly	52	N	within standard
Zinc	mg/L	3	0.003	0.003	0.003	annually	1	1	100%
Disinfection Byproducts									
Total Trihalomethanes	mg/L	0.25	0.032	0.043	0.061	>monthly	13	13	100%
Chloroform	mg/L	N	0.016	0.029	0.049	>monthly	13	N	N
Dichlorobromomethane	mg/L	N	0.008	0.01	0.013	>monthly	13	N	N
Dibromochloromethane	mg/L	N	0.001	0.004	0.007	>monthly	13	N	N
Bromoform	mg/L	N	<0.001	<0.001	<0.001	>monthly	13	N	N
Chloroacetic acids									
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	0.017	0.017	0.017	annually	1	1	100%

* Internal City West Water target.

** Guideline set for "True Colour" (15 Pt/Co) however "Apparent Colour" is measured (with a benchmark guideline of 25 Pt/Co).

N No guideline/standard set for this parameter.

Victorian standard: All samples of drinking water collected are found to contain no *E. coli* per 100mL of drinking water, with the exception of any false positive sample.

^c Geometric means shown for bacterial parameters.

¹ Victorian standard: 95th percentile less than or equal to 5 NTU.

² 95th percentile result shown for turbidity.

Water sampling locality	Moonee Ponds
For Period	1 July 2020 to 30 June 2021

Locality	No. 9B
Population	73,500 (2016 Census)

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling Frequency	No. of Samples		Performance against standard/guideline
			Min	Mean	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000 [*]	<1	<1 ^c	1,000	>weekly	235	235	100% [*]
Total Coliforms	orgs/100mL	N	<1	<1 ^c	3	>weekly	235	N	N
<i>E. coli</i>	orgs/100mL	Zero(0) [#]	0	0	0	>weekly	235	235	100%
Free Chlorine	mg/L	5	<0.05	0.15	0.67	>weekly	235	235	100%
Total Chlorine	mg/L	5	0.06	0.25	0.82	>weekly	235	235	100%
Alkalinity (as CaCO ₃)	mg/L	N	12	12	12	annually	1	N	N
Aluminium (acid soluble)	mg/L	0.2	0.02	0.03	0.05	>monthly	13	13	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	5.4	5.4	5.4	annually	1	N	N
Chloride	mg/L	250	12	12	12	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	25 ^{**}	<2	6	10	fortnightly	26	26	100%
Conductivity	µs/cm	~900	60	71	88	fortnightly	26	26	100%
Copper	mg/L	1	0.012	0.012	0.012	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.65	0.8	0.91	>fortnightly	27	27	100%
Hardness (as CaCO ₃)	mg/L	200	19	19	19	annually	1	1	100%
Iron	mg/L	0.3	0.04	0.07	0.1	fortnightly	26	26	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	1.3	1.3	1.3	annually	1	N	N
Manganese	mg/L	0.1	0.001	0.004	0.009	fortnightly	26	26	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO ₃)	mg/L	50	1.12	1.2	1.2	annually	1	1	100%
pH	units	6.5-9.2	7.1	7.3	7.5	fortnightly	26	26	100%
Potassium	mg/L	N	0.9	0.9	0.9	annually	1	N	N
Silica (SiO ₂)	mg/L	80	5.1	5.1	5.1	annually	1	1	100%
Sodium	mg/L	180	6.3	6.3	6.3	annually	1	1	100%
Sulphate	mg/L	250	6.4	6.4	6.4	annually	1	1	100%
Total Organic Carbon	mg/L	N	1.3	1.3	1.3	annually	1	N	N
Total Phosphorus	mg/L	N	<0.005	<0.005	<0.005	annually	1	N	N
Total Dissolved Solids	mg/L	600	58	58	58	annually	1	1	100%
Turbidity	NTU	5 ¹	<0.1	0.8 ²	1	weekly	52	N	within standard
Zinc	mg/L	3	0.002	0.002	0.002	annually	1	1	100%
Disinfection Byproducts									
Total Trihalomethanes	mg/L	0.25	0.019	0.053	0.068	>monthly	13	13	100%
Chloroform	mg/L	N	0.014	0.044	0.058	>monthly	13	N	N
Dichlorobromomethane	mg/L	N	0.004	0.008	0.01	>monthly	13	N	N
Dibromochloromethane	mg/L	N	<0.001	0.001	0.002	>monthly	13	N	N
Bromoform	mg/L	N	<0.001	<0.001	<0.001	>monthly	13	N	N
Chloroacetic acids									
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	0.012	0.012	0.012	annually	1	1	100%

* Internal City West Water target.

** Guideline set for "True Colour" (15 Pt/Co) however "Apparent Colour" is measured (with a benchmark guideline of 25 Pt/Co).

N No guideline/standard set for this parameter.

Victorian standard: All samples of drinking water collected are found to contain no *E. coli* per 100mL of drinking water, with the exception of any false positive sample.

^c Geometric means shown for bacterial parameters.

¹ Victorian standard: 95th percentile less than or equal to 5 NTU.

² 95th percentile result shown for turbidity.

Water sampling locality	Parkville	Locality	No. 11
For Period	1 July 2020 to 30 June 2021	Population	157,600 (2016 Census)

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling Frequency	No. of Samples		Performance against standard/guideline
			Min	Mean	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000 [*]	<1	<1 ^c	110	>weekly	405	405	100% ^d
Total Coliforms	orgs/100mL	N	<1	<1 ^c	200	>weekly	405	N	N
<i>E. coli</i>	orgs/100mL	Zero(0) [#]	0	0	0	>weekly	405	405	100%
Free Chlorine	mg/L	5	<0.05	0.27	0.7	>weekly	405	405	100%
Total Chlorine	mg/L	5	0.05	0.38	0.8	>weekly	405	405	100%
Alkalinity (as CaCO ₃)	mg/L	N	11	11	11	annually	1	N	N
Aluminium (acid soluble)	mg/L	0.2	0.02	0.03	0.04	>monthly	13	13	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	6.1	6.1	6.1	annually	1	N	N
Chloride	mg/L	250	15	15	15	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	^{25**}	<2	4	8	fortnightly	26	26	100%
Conductivity	µs/cm	~900	60	97	110	fortnightly	26	26	100%
Copper	mg/L	1	0.004	0.004	0.004	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.51	0.81	0.93	>fortnightly	27	27	100%
Hardness (as CaCO ₃)	mg/L	200	22	22	22	annually	1	1	100%
Iron	mg/L	0.3	<0.01	0.04	0.1	fortnightly	26	26	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	1.6	1.6	1.6	annually	1	N	N
Manganese	mg/L	0.1	<0.001	0.002	0.006	fortnightly	26	26	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO ₃)	mg/L	50	1.11	1.11	1.11	annually	1	1	100%
pH	units	6.5-9.2	6.9	7.2	7.4	fortnightly	26	26	100%
Potassium	mg/L	N	1	1	1	annually	1	N	N
Silica (SiO ₂)	mg/L	80	4.3	4.3	4.3	annually	1	1	100%
Sodium	mg/L	180	8	8	8	annually	1	1	100%
Sulphate	mg/L	250	10	10	10	annually	1	1	100%
Total Organic Carbon	mg/L	N	0.7	0.7	0.7	annually	1	N	N
Total Phosphorus	mg/L	N	<0.005	<0.005	<0.005	annually	1	N	N
Total Dissolved Solids	mg/L	600	72	72	72	annually	1	1	100%
Turbidity	NTU	5 ¹	<0.1	0.6 ²	0.9	weekly	52	N	within standard
Zinc	mg/L	3	0.002	0.002	0.002	annually	1	1	100%
Disinfection Byproducts									
Total Trihalomethanes	mg/L	0.25	0.031	0.043	0.072	>monthly	13	13	100%
Chloroform	mg/L	N	0.016	0.028	0.062	>monthly	13	N	N
Dichlorobromomethane	mg/L	N	0.008	0.01	0.012	>monthly	13	N	N
Dibromochloromethane	mg/L	N	<0.001	0.004	0.006	>monthly	13	N	N
Bromoform	mg/L	N	<0.001	<0.001	<0.001	>monthly	13	N	N
Chloroacetic acids									
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	0.008	0.008	0.008	annually	1	1	100%

* Internal City West Water target.

** Guideline set for "True Colour" (15 Pt/Co) however "Apparent Colour" is measured (with a benchmark guideline of 25 Pt/Co).

N No guideline/standard set for this parameter.

Victorian standard: All samples of drinking water collected are found to contain no *E. coli* per 100mL of drinking water, with the exception of any false positive sample.

^c Geometric means shown for bacterial parameters.

¹ Victorian standard: 95th percentile less than or equal to 5 NTU.

² 95th percentile result shown for turbidity.

Water sampling locality	Richmond	Locality	No. 54
For Period	1 July 2020 to 30 June 2021	Population	24,900 (2016 Census)

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling Frequency	No. of Samples		Performance against standard/guideline
			Min	Mean	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000 [*]	<1	<1 ^g	8	>weekly	103	103	100% [†]
Total Coliforms	orgs/100mL	N	<1	<1 ^g	6	>weekly	103	N	N
<i>E. coli</i>	orgs/100mL	Zero(0) [#]	0	0	0	>weekly	103	103	100%
Free Chlorine	mg/L	5	<0.05	0.28	0.55	>weekly	103	103	100%
Total Chlorine	mg/L	5	<0.05	0.4	0.78	>weekly	103	103	100%
Alkalinity (as CaCO ₃)	mg/L	N	13	13	13	annually	1	N	N
Aluminium (acid soluble)	mg/L	0.2	0.03	0.04	0.05	monthly	12	12	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	3.7	3.7	3.7	annually	1	N	N
Chloride	mg/L	250	8	8	8	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	25 ^{**}	4	7	10	>monthly	25	25	100%
Conductivity	µs/cm	~900	57	64	77	>monthly	25	25	100%
Copper	mg/L	1	0.009	0.009	0.009	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.58	0.76	0.88	fortnightly	26	26	100%
Hardness (as CaCO ₃)	mg/L	200	13	13	13	annually	1	1	100%
Iron	mg/L	0.3	0.06	0.09	0.14	>monthly	25	25	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	1	1	1	annually	1	N	N
Manganese	mg/L	0.1	0.003	0.006	0.015	>monthly	25	25	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO ₃)	mg/L	50	0.66	0.66	0.66	annually	1	1	100%
pH	units	6.5-9.2	7.2	7.4	7.9	>monthly	25	25	100%
Potassium	mg/L	N	0.6	0.6	0.6	annually	1	N	N
Silica (SiO ₂)	mg/L	80	5.8	5.8	5.8	annually	1	1	100%
Sodium	mg/L	180	4.4	4.4	4.4	annually	1	1	100%
Sulphate	mg/L	250	1.1	1.1	1.1	annually	1	1	100%
Total Organic Carbon	mg/L	N	1.2	1.2	1.2	annually	1	N	N
Total Phosphorus	mg/L	N	0.006	0.006	0.006	annually	1	N	N
Total Dissolved Solids	mg/L	600	42	42	42	annually	1	1	100%
Turbidity	NTU	5 ¹	0.2	1.0 ²	1.2	weekly	51 ³	N	within standard
Zinc	mg/L	3	0.002	0.002	0.002	annually	1	1	100%
Disinfection Byproducts									
Total Trihalomethanes	mg/L	0.25	0.062	0.074	0.087	monthly	12	12	100%
Chloroform	mg/L	N	0.051	0.064	0.078	monthly	12	N	N
Dichlorobromomethane	mg/L	N	0.007	0.01	0.011	monthly	12	N	N
Dibromochloromethane	mg/L	N	<0.001	<0.001	0.001	monthly	12	N	N
Bromoform	mg/L	N	<0.001	<0.001	<0.001	monthly	12	N	N
Chloroacetic acids									
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	0.046	0.046	0.046	annually	1	1	100%

* Internal City West Water target.

** Guideline set for "True Colour" (15 Pt/Co) however "Apparent Colour" is measured (with a benchmark guideline of 25 Pt/Co).

N No guideline/standard set for this parameter.

Victorian standard: All samples of drinking water collected are found to contain no *E. coli* per 100mL of drinking water, with the exception of any false positive sample.

g Geometric means shown for bacterial parameters.

¹ Victorian standard: 95th percentile less than or equal to 5 NTU.

² 95th percentile result shown for turbidity.

³ The number of turbidity samples tested from 1 July 2020 until 30 June 2021 in Richmond water sampling locality is 51 because the weekly sample for the first week of the 2020-21 financial year was collected on Tuesday 30 June 2020. This is also supported by the data reported in the 2020 Drinking Water Quality Report which shows 53 turbidity samples for the water sampling locality of Richmond.

Water sampling locality	Strathmore	Locality	No. 9A
For Period	1 July 2020 to 30 June 2021	Population	8,100 (2016 Census)

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling Frequency	No. of Samples		Performance against standard/guideline
			Min	Mean	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000 [*]	<1	1 ^g	52	>weekly	78	78	100% [*]
Total Coliforms	orgs/100mL	N	<1	<1 ^g	15	>weekly	78	N	N
<i>E. coli</i>	orgs/100mL	Zero(0) [#]	0	0	0	>weekly	78	78	100%
Free Chlorine	mg/L	5	<0.05	0.07	0.31	>weekly	78	78	100%
Total Chlorine	mg/L	5	<0.05	0.15	0.37	>weekly	78	78	100%
Alkalinity (as CaCO ₃)	mg/L	N	13	13	13	annually	1	N	N
Aluminium (acid soluble)	mg/L	0.2	0.02	0.03	0.05	>monthly	13	13	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	4.6	4.6	4.6	annually	1	N	N
Chloride	mg/L	250	8	8	8	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	25 ^{**}	<2	7	10	fortnightly	26	26	100%
Conductivity	µs/cm	~900	59	67	100	fortnightly	26	26	100%
Copper	mg/L	1	0.005	0.005	0.005	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.63	0.79	0.87	>fortnightly	27	27	100%
Hardness (as CaCO ₃)	mg/L	200	16	16	16	annually	1	1	100%
Iron	mg/L	0.3	0.02	0.07	0.11	fortnightly	26	26	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	1.1	1.1	1.1	annually	1	N	N
Manganese	mg/L	0.1	0.002	0.005	0.009	fortnightly	26	26	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO ₃)	mg/L	50	0.89	0.89	0.89	annually	1	1	100%
pH	units	6.5-9.2	7.2	7.4	7.6	fortnightly	26	26	100%
Potassium	mg/L	N	0.7	0.7	0.7	annually	1	N	N
Silica (SiO ₂)	mg/L	80	5.8	5.8	5.8	annually	1	1	100%
Sodium	mg/L	180	4.5	4.5	4.5	annually	1	1	100%
Sulphate	mg/L	250	1.9	1.9	1.9	annually	1	1	100%
Total Organic Carbon	mg/L	N	1.4	1.4	1.4	annually	1	N	N
Total Phosphorus	mg/L	N	<0.005	<0.005	<0.005	annually	1	N	N
Total Dissolved Solids	mg/L	600	45	45	45	annually	1	1	100%
Turbidity	NTU	5 ¹	0.3	0.8 ²	0.9	weekly	52	N	within standard
Zinc	mg/L	3	0.001	0.001	0.001	annually	1	1	100%
Disinfection Byproducts									
Total Trihalomethanes	mg/L	0.25	0.039	0.063	0.08	>monthly	13	13	100%
Chloroform	mg/L	N	0.025	0.052	0.071	>monthly	13	N	N
Dichlorobromomethane	mg/L	N	0.008	0.01	0.011	>monthly	13	N	N
Dibromochloromethane	mg/L	N	<0.001	0.001	0.004	>monthly	13	N	N
Bromoform	mg/L	N	<0.001	<0.001	<0.001	>monthly	13	N	N
Chloroacetic acids									
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	0.012	0.012	0.012	annually	1	1	100%

* Internal City West Water target.

** Guideline set for "True Colour" (15 Pt/Co) however "Apparent Colour" is measured (with a benchmark guideline of 25 Pt/Co).

N No guideline/standard set for this parameter.

Victorian standard: All samples of drinking water collected are found to contain no *E. coli* per 100mL of drinking water, with the exception of any false positive sample.

^g Geometric means shown for bacterial parameters.

¹ Victorian standard: 95th percentile less than or equal to 5 NTU.

² 95th percentile result shown for turbidity.

Water sampling locality	Taylors Lakes	Locality	No. 5A
For Period	1 July 2020 to 30 June 2021	Population	70,200 (2016 Census)

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling Frequency	No. of Samples		Performance against standard/guideline
			Min	Mean	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000 [*]	<1	<1 ^c	660	>weekly	251	251	100% ^d
Total Coliforms	orgs/100mL	N	<1	<1 ^c	770	>weekly	251	N	N
<i>E. coli</i>	orgs/100mL	Zero(0) [#]	0	0	0	>weekly	251	251	100%
Free Chlorine	mg/L	5	<0.05	0.41	0.92	>weekly	251	251	100%
Total Chlorine	mg/L	5	<0.05	0.53	1	>weekly	251	251	100%
Alkalinity (as CaCO ₃)	mg/L	N	15	15	15	annually	1	N	N
Aluminium (acid soluble)	mg/L	0.2	0.01	0.02	0.03	>monthly	25	25	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	4.7	4.7	4.7	annually	1	N	N
Chloride	mg/L	250	10	10	10	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	25 ^{**}	2	5	8	>fortnightly	38	38	100%
Conductivity	µs/cm	~900	62	68	74	>fortnightly	38	38	100%
Copper	mg/L	1	0.006	0.006	0.006	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.68	0.75	0.86	>fortnightly	39	39	100%
Hardness (as CaCO ₃)	mg/L	200	16	16	16	annually	1	1	100%
Iron	mg/L	0.3	0.05	0.08	0.14	>fortnightly	38	38	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	1.1	1.1	1.1	annually	1	N	N
Manganese	mg/L	0.1	0.001	0.004	0.013	>fortnightly	38	38	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO ₃)	mg/L	50	0.44	0.44	0.44	annually	1	1	100%
pH	units	6.5-9.2	7.2	7.5	8.2	>fortnightly	38	38	100%
Potassium	mg/L	N	0.6	0.6	0.6	annually	1	N	N
Silica (SiO ₂)	mg/L	80	5	5	5	annually	1	1	100%
Sodium	mg/L	180	5.4	5.4	5.4	annually	1	1	100%
Sulphate	mg/L	250	1.9	1.9	1.9	annually	1	1	100%
Total Organic Carbon	mg/L	N	0.6	0.6	0.6	annually	1	N	N
Total Phosphorus	mg/L	N	0.005	0.005	0.005	annually	1	N	N
Total Dissolved Solids	mg/L	600	50	50	50	annually	1	1	100%
Turbidity	NTU	5 ¹	0.4	0.9 ²	1.1	>weekly	64	N	within standard
Zinc	mg/L	3	0.001	0.001	0.001	annually	1	1	100%
Disinfection Byproducts									
Total Trihalomethanes	mg/L	0.25	0.013	0.026	0.038	>monthly	25	25	100%
Chloroform	mg/L	N	0.009	0.019	0.029	>monthly	25	N	N
Dichlorobromomethane	mg/L	N	0.003	0.005	0.007	>monthly	25	N	N
Dibromochloromethane	mg/L	N	<0.001	0.001	0.002	>monthly	25	N	N
Bromoform	mg/L	N	<0.001	<0.001	<0.001	>monthly	25	N	N
Chloroacetic acids									
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	0.007	0.007	0.007	annually	1	1	100%

* Internal City West Water target.

** Guideline set for "True Colour" (15 Pt/Co) however "Apparent Colour" is measured (with a benchmark guideline of 25 Pt/Co).

N No guideline/standard set for this parameter.

Victorian standard: All samples of drinking water collected are found to contain no *E. coli* per 100mL of drinking water, with the exception of any false positive sample.

^c Geometric means shown for bacterial parameters.

¹ Victorian standard: 95th percentile less than or equal to 5 NTU.

² 95th percentile result shown for turbidity.

Water sampling locality	Tullamarine	Locality	No. 7A
For Period	1 July 2020 to 30 June 2021	Population	10,500 (2016 Census)

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling Frequency	No. of Samples		Performance against standard/guideline
			Min	Mean	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000 [*]	<1	<1 ^c	240	>weekly	91	91	100% ^d
Total Coliforms	orgs/100mL	N	<1	<1 ^c	200	>weekly	91	N	N
<i>E. coli</i>	orgs/100mL	Zero(0) [#]	0	0	0	>weekly	91	91	100%
Free Chlorine	mg/L	5	<0.05	0.4	0.77	>weekly	91	91	100%
Total Chlorine	mg/L	5	0.1	0.52	0.98	>weekly	91	91	100%
Alkalinity (as CaCO ₃)	mg/L	N	15	15	15	annually	1	N	N
Aluminium (acid soluble)	mg/L	0.2	0.01	0.03	0.14	>monthly	13	13	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	5.5	5.5	5.5	annually	1	N	N
Chloride	mg/L	250	9	9	9	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	25 ^{**}	<2	3	6	fortnightly	26	26	100%
Conductivity	µs/cm	~900	65	84	120	fortnightly	26	26	100%
Copper	mg/L	1	0.004	0.004	0.004	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.38	0.77	0.9	>fortnightly	27	27	100%
Hardness (as CaCO ₃)	mg/L	200	18	18	18	annually	1	1	100%
Iron	mg/L	0.3	<0.01	0.04	0.09	fortnightly	26	26	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	1.1	1.1	1.1	annually	1	N	N
Manganese	mg/L	0.1	<0.001	0.002	0.006	fortnightly	26	26	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO ₃)	mg/L	50	0.39	0.39	0.39	annually	1	1	100%
pH	units	6.5-9.2	7.1	7.5	8.6	fortnightly	26	26	100%
Potassium	mg/L	N	0.6	0.6	0.6	annually	1	N	N
Silica (SiO ₂)	mg/L	80	5.8	5.8	5.8	annually	1	1	100%
Sodium	mg/L	180	5.7	5.7	5.7	annually	1	1	100%
Sulphate	mg/L	250	1.5	1.5	1.5	annually	1	1	100%
Total Organic Carbon	mg/L	N	0.6	0.6	0.6	annually	1	N	N
Total Phosphorus	mg/L	N	<0.005	<0.005	<0.005	annually	1	N	N
Total Dissolved Solids	mg/L	600	50	50	50	annually	1	1	100%
Turbidity	NTU	5 ¹	<0.1	0.7 ²	2	weekly	52	N	within standard
Zinc	mg/L	3	0.002	0.002	0.002	annually	1	1	100%
Disinfection Byproducts									
Total Trihalomethanes	mg/L	0.25	0.014	0.025	0.03	>monthly	13	13	100%
Chloroform	mg/L	N	0.009	0.017	0.023	>monthly	13	N	N
Dichlorobromomethane	mg/L	N	0.003	0.006	0.009	>monthly	13	N	N
Dibromochloromethane	mg/L	N	<0.001	0.002	0.005	>monthly	13	N	N
Bromoform	mg/L	N	<0.001	<0.001	<0.001	>monthly	13	N	N
Chloroacetic acids									
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%

* Internal City West Water target.

** Guideline set for "True Colour" (15 Pt/Co) however "Apparent Colour" is measured (with a benchmark guideline of 25 Pt/Co).

N No guideline/standard set for this parameter.

Victorian standard: All samples of drinking water collected are found to contain no *E. coli* per 100mL of drinking water, with the exception of any false positive sample.

^c Geometric means shown for bacterial parameters.

¹ Victorian standard: 95th percentile less than or equal to 5 NTU.

² 95th percentile result shown for turbidity.

Water sampling locality	Werribee	Locality	No. 1
For Period	1 July 2020 to 30 June 2021	Population	136,700 (2016 Census)

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling Frequency	No. of Samples		Performance against standard/guideline
			Min	Mean	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000 [*]	<1	<1 ^c	100	>weekly	462	462	100% [*]
Total Coliforms	orgs/100mL	N	<1	<1 ^c	200	>weekly	465	N	N
<i>E. coli</i>	orgs/100mL	Zero(0) [#]	0	0	0	>weekly	465	465	100%
Free Chlorine	mg/L	5	<0.05	0.31	0.92	>weekly	465	465	100%
Total Chlorine	mg/L	5	0.06	0.42	0.95	>weekly	465	465	100%
Alkalinity (as CaCO ₃)	mg/L	N	14	14	14	annually	1	N	N
Aluminium (acid soluble)	mg/L	0.2	0.02	0.03	0.04	>fortnightly	35	35	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	7.2	7.2	7.2	annually	1	N	N
Chloride	mg/L	250	15	15	15	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	25 ^{**}	<2	<2	6	>fortnightly	48	48	100%
Conductivity	µs/cm	~900	74	109	120	>fortnightly	49	49	100%
Copper	mg/L	1	0.009	0.009	0.009	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.09	0.8	0.97	>fortnightly	50	50	100%
Hardness (as CaCO ₃)	mg/L	200	24	24	24	annually	1	1	100%
Iron	mg/L	0.3	<0.01	0.02	0.1	>fortnightly	48	48	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	1.4	1.4	1.4	annually	1	N	N
Manganese	mg/L	0.1	<0.001	0.001	0.004	>fortnightly	48	48	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO ₃)	mg/L	50	1.11	1.42	1.73		2	2	100%
pH	units	6.5-9.2	7.2	7.4	8.6	>fortnightly	49	49	100%
Potassium	mg/L	N	1	1	1	annually	1	N	N
Silica (SiO ₂)	mg/L	80	4.4	4.4	4.4	annually	1	1	100%
Sodium	mg/L	180	8.2	8.2	8.2	annually	1	1	100%
Sulphate	mg/L	250	10	10	10	annually	1	1	100%
Total Organic Carbon	mg/L	N	0.9	0.9	0.9	annually	1	N	N
Total Phosphorus	mg/L	N	<0.005	<0.005	<0.005	annually	1	N	N
Total Dissolved Solids	mg/L	600	82	82	82	annually	1	1	100%
Turbidity	NTU	5 ¹	<0.1	0.3 ²	0.7	>weekly	78	N	within standard
Zinc	mg/L	3	<0.001	<0.001	<0.001	annually	1	1	100%
Disinfection Byproducts									
Total Trihalomethanes	mg/L	0.25	0.032	0.045	0.058	>fortnightly	35	35	100%
Chloroform	mg/L	N	0.017	0.026	0.038	>fortnightly	35	N	N
Dichlorobromomethane	mg/L	N	0.009	0.013	0.017	>fortnightly	35	N	N
Dibromochloromethane	mg/L	N	0.002	0.006	0.007	>fortnightly	35	N	N
Bromoform	mg/L	N	<0.001	<0.001	<0.001	>fortnightly	35	N	N
Chloroacetic acids									
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	0.01	0.01	0.01	annually	1	1	100%

* Internal City West Water target.

** Guideline set for "True Colour" (15 Pt/Co) however "Apparent Colour" is measured (with a benchmark guideline of 25 Pt/Co).

N No guideline/standard set for this parameter.

Victorian standard: All samples of drinking water collected are found to contain no *E. coli* per 100mL of drinking water, with the exception of any false positive sample.

^c Geometric means shown for bacterial parameters.

¹ Victorian standard: 95th percentile less than or equal to 5 NTU.

² 95th percentile result shown for turbidity.

Water sampling locality	Werribee South	Locality	No. 2A
For Period	1 July 2020 to 30 June 2021	Population	2,000 (2016 Census)

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling Frequency	No. of Samples		Performance against standard/guideline
			Min	Mean	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000 [*]	<1	<1 ^c	5,000	>weekly	106	102	96.22% ³
Total Coliforms	orgs/100mL	N	<1	<1 ^c	75	>weekly	106	N	N
<i>E. coli</i>	orgs/100mL	Zero(0) [#]	0	0	0	>weekly	106	106	100%
Free Chlorine	mg/L	5	<0.05	0.32	0.8	>weekly	106	106	100%
Total Chlorine	mg/L	5	<0.05	0.43	0.88	>weekly	106	106	100%
Alkalinity (as CaCO ₃)	mg/L	N	14	14	14	annually	1	N	N
Aluminium (acid soluble)	mg/L	0.2	<0.01	0.02	0.04	>fortnightly	41	41	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	5.5	5.5	5.5	annually	1	N	N
Chloride	mg/L	250	15	15	15	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	25 ^{**}	<2	2	6	>weekly	54	54	100%
Conductivity	µs/cm	~900	72	116	140	>weekly	54	54	100%
Copper	mg/L	1	0.011	0.011	0.011	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.11	0.82	0.97	>weekly	57	57	100%
Hardness (as CaCO ₃)	mg/L	200	19	19	19	annually	1	1	100%
Iron	mg/L	0.3	<0.01	0.04	0.09	>weekly	54	54	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	1.3	1.3	1.3	annually	1	N	N
Manganese	mg/L	0.1	<0.001	0.002	0.008	>weekly	54	54	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO ₃)	mg/L	50	1.46	1.46	1.46	annually	1	1	100%
pH	units	6.5-9.2	7.3	7.6	8.5	>weekly	54	54	100%
Potassium	mg/L	N	0.8	0.8	0.8	annually	1	N	N
Silica (SiO ₂)	mg/L	80	4.6	4.6	4.6	annually	1	1	100%
Sodium	mg/L	180	6.7	6.7	6.7	annually	1	1	100%
Sulphate	mg/L	250	10	10	10	annually	1	1	100%
Total Organic Carbon	mg/L	N	1.1	1.1	1.1	annually	1	N	N
Total Phosphorus	mg/L	N	<0.005	<0.005	<0.005	annually	1	N	N
Total Dissolved Solids	mg/L	600	65	65	65	annually	1	1	100%
Turbidity	NTU	5 ¹	<0.1	0.4 ²	0.5	>weekly	80	N	within standard
Zinc	mg/L	3	<0.001	<0.001	<0.001	annually	1	1	100%

Disinfection Byproducts

Total Trihalomethanes	mg/L	0.25	<0.001	0.035	0.061	>fortnightly	41	41	100%
Chloroform	mg/L	N	<0.001	0.021	0.04	>fortnightly	41	N	N
Dichlorobromomethane	mg/L	N	<0.001	0.01	0.017	>fortnightly	41	N	N
Dibromochloromethane	mg/L	N	<0.001	0.004	0.008	>fortnightly	41	N	N
Bromoform	mg/L	N	<0.001	<0.001	<0.001	>fortnightly	41	N	N
Chloroacetic acids									
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	0.011	0.011	0.011	annually	1	1	100%

* Internal City West Water target.

** Guideline set for "True Colour" (15 Pt/Co) however "Apparent Colour" is measured (with a benchmark guideline of 25 Pt/Co).

N No guideline/standard set for this parameter.

Victorian standard: All samples of drinking water collected are found to contain no *E. coli* per 100mL of drinking water, with the exception of any false positive sample.

^c Geometric means shown for bacterial parameters.

¹ Victorian standard: 95th percentile less than or equal to 5 NTU.

² 95th percentile result shown for turbidity.

³ All total plate count exceedances were investigated and resulted in corrective actions. These actions included isolation of one drinking water tank site and some minor rectification works.

Water sampling locality	Williamstown	Locality	No. 3B
For Period	1 July 2020 to 30 June 2021	Population	50,000 (2016 Census)

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling Frequency	No. of Samples		Performance against standard/guideline
			Min	Mean	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000 [*]	<1	<1 ^c	10	>weekly	171	171	100% [*]
Total Coliforms	orgs/100mL	N	<1	<1 ^c	200	>weekly	171	N	N
<i>E. coli</i>	orgs/100mL	Zero(0) [#]	0	0	0	>weekly	171	171	100%
Free Chlorine	mg/L	5	<0.05	0.19	0.53	>weekly	171	171	100%
Total Chlorine	mg/L	5	0.05	0.29	0.69	>weekly	171	171	100%
Alkalinity (as CaCO ₃)	mg/L	N	13	13	13	annually	1	N	N
Aluminium (acid soluble)	mg/L	0.2	0.02	0.02	0.03	>monthly	13	13	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	annually	1	1	100%
Calcium	mg/L	N	5.3	5.3	5.3	annually	1	N	N
Chloride	mg/L	250	14	14	14	annually	1	1	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	annually	1	1	100%
Colour	Pt/Co	25 ^{**}	<2	3	6	fortnightly	26	26	100%
Conductivity	µs/cm	~900	82	102	110	fortnightly	26	26	100%
Copper	mg/L	1	0.005	0.005	0.005	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.68	0.83	0.98	>fortnightly	27	27	100%
Hardness (as CaCO ₃)	mg/L	200	19	19	19	annually	1	1	100%
Iron	mg/L	0.3	0.01	0.03	0.06	fortnightly	26	26	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	1.4	1.4	1.4	annually	1	N	N
Manganese	mg/L	0.1	<0.001	0.002	0.003	fortnightly	26	26	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO ₃)	mg/L	50	1.33	1.33	1.33	annually	1	1	100%
pH	units	6.5-9.2	7.2	7.3	7.7	fortnightly	26	26	100%
Potassium	mg/L	N	0.8	0.8	0.8	annually	1	N	N
Silica (SiO ₂)	mg/L	80	4.9	4.9	4.9	annually	1	1	100%
Sodium	mg/L	180	6.6	6.6	6.6	annually	1	1	100%
Sulphate	mg/L	250	8.7	8.7	8.7	annually	1	1	100%
Total Organic Carbon	mg/L	N	1.2	1.2	1.2	annually	1	N	N
Total Phosphorus	mg/L	N	<0.005	<0.005	<0.005	annually	1	N	N
Total Dissolved Solids	mg/L	600	60	60	60	annually	1	1	100%
Turbidity	NTU	5 ¹	<0.1	0.5 ²	0.6	weekly	52	N	within standard
Zinc	mg/L	3	0.002	0.002	0.002	annually	1	1	100%
Disinfection Byproducts									
Total Trihalomethanes	mg/L	0.25	0.037	0.044	0.062	>monthly	13	13	100%
Chloroform	mg/L	N	0.02	0.029	0.047	>monthly	13	N	N
Dichlorobromomethane	mg/L	N	0.009	0.011	0.013	>monthly	13	N	N
Dibromochloromethane	mg/L	N	0.003	0.004	0.006	>monthly	13	N	N
Bromoform	mg/L	N	<0.001	<0.001	<0.001	>monthly	13	N	N
Chloroacetic acids									
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	0.012	0.012	0.012	annually	1	1	100%

* Internal City West Water target.

** Guideline set for "True Colour" (15 Pt/Co) however "Apparent Colour" is measured (with a benchmark guideline of 25 Pt/Co).

N No guideline/standard set for this parameter.

Victorian standard: All samples of drinking water collected are found to contain no *E. coli* per 100mL of drinking water, with the exception of any false positive sample.

^c Geometric means shown for bacterial parameters.

¹ Victorian standard: 95th percentile less than or equal to 5 NTU.

² 95th percentile result shown for turbidity.

All water sampling localities									
For Period	1 July 2020 to 30 June 2021			Population	976,570 (2016 Census)				
Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling Frequency	No. of Samples		Performance against standard/guideline
			Min	Mean	Max		Total	Passing	
Total Plate Count (37°C)	orgs/mL	1000 [*]	<1	<1 ^c	5,000	>weekly	3409	3,405	99.88% ³
Total Coliforms	orgs/100mL	N	<1	<1 ^c	770	>weekly	3414	N	N
<i>E. coli</i>	orgs/100mL	Zero(0) [#]	0	0	1 [#]	>weekly	3413	3,413	100%
Free Chlorine	mg/L	5	<0.05	0.26	0.92	>weekly	3414	3,414	100%
Total Chlorine	mg/L	5	<0.05	0.37	1	>weekly	3414	3,414	100%
Alkalinity (as CaCO ₃)	mg/L	N	11	16	48	>monthly	15	N	N
Aluminium (acid soluble)	mg/L	0.2	<0.01	0.02	0.14	>weekly	293	293	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	>monthly	15	15	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	>monthly	15	15	100%
Calcium	mg/L	N	3.7	6.4	23	>monthly	15	N	N
Chloride	mg/L	250	8	12	16	>monthly	15	15	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	>monthly	15	15	100%
Colour	Pt/Co	25 ^{**}	<2	3	10	>weekly	488	488	100%
Conductivity	µs/cm	~900	57	97	180	>weekly	489	489	100%
Copper	mg/L	1	0.004	0.009	0.024	>monthly	15	15	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	>monthly	15	15	100%
Dissolved Oxygen	mg/L	N	7.5	9.9	13.4	>monthly	25	N	N
Fluoride	mg/L	1.5	<0.05	0.81	0.99	>weekly	510	510	100%
Hardness (as CaCO ₃)	mg/L	200	13	21	63	>monthly	15	15	100%
Iron	mg/L	0.3	<0.01	0.04	0.14	>weekly	487	487	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	>monthly	15	15	100%
Magnesium	mg/L	N	1	1.3	1.6	>monthly	15	N	N
Manganese	mg/L	0.1	<0.001	0.002	0.015	>weekly	487	487	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	>monthly	15	15	100%
Nitrate (NO ₃)	mg/L	50	0.39	1.01	1.9	>monthly	17	17	100%
pH	units	6.5-9.2	6.5	7.4	8.6	>weekly	490	490	100%
Potassium	mg/L	N	0.6	0.8	1.2	>monthly	15	N	N
Silica (SiO ₂)	mg/L	80	4.3	5.1	7.5	>monthly	15	15	100%
Sodium	mg/L	180	4.4	6.5	9.3	>monthly	15	15	100%
Sulphate	mg/L	250	1.1	5.9	11	>monthly	15	15	100%

All water sampling localities

For Period 1 July 2020 to 30 June 2021 **Population** 976,570 (2016 Census)

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling Frequency	No. of Samples		Performance against standard/guideline
			Min	Mean	Max		Total	Passing	
Temperature	°C	N	10.7	16.9	26.3	>monthly	25	N	N
Total Organic Carbon	mg/L	N	<0.5	0.9	1.4	>monthly	15	N	N
Total Phosphorus	mg/L	N	<0.005	<0.005	0.006	>monthly	15	N	N
Total Dissolved Solids	mg/L	600	42	60	100	>monthly	15	15	100%
Turbidity	NTU	5 ¹	<0.1	0.8 ²	2	>weekly	887	N	within standard
Zinc	mg/L	3	<0.001	0.002	0.004	>monthly	15	15	100%
Disinfection Byproducts									
Total Trihalomethanes	mg/L	0.25	<0.001	0.042	0.087	>weekly	293	293	100%
Chloroform	mg/L	N	<0.001	0.027	0.078	>weekly	293	N	N
Dichlorobromomethane	mg/L	N	<0.001	0.011	0.018	>weekly	293	N	N
Dibromochloromethane	mg/L	N	<0.001	0.004	0.008	>weekly	293	N	N
Bromoform	mg/L	N	<0.001	<0.001	<0.001	>weekly	293	N	N
Chloroacetic acids									
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	>monthly	15	15	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	<0.005	>monthly	15	15	100%
Trichloroacetic acid	mg/L	0.1	<0.005	0.011	0.046	>monthly	15	15	100%

* Internal City West Water target.

** Guideline set for "True Colour" (15 Pt/Co) however "Apparent Colour" is measured (with a benchmark guideline of 25 Pt/Co).

N No guideline/standard set for this parameter.

Victorian standard: All samples of drinking water collected are found to contain no *E. coli* per 100mL of drinking water, with the exception of any false positive sample.

** Following investigation, it was concluded the positive sample was a 'false positive'. Refer to Section 3 for further details.

⁶ Geometric means shown for bacterial parameters.

¹ Victorian standard: 95th percentile less than or equal to 5 NTU.

² 95th percentile result shown for turbidity.

³ All total plate count exceedances were investigated and resulted in corrective actions. These actions included isolation of one drinking water tank site and some minor rectification works.

Appendix B. Spatial and time-based water quality summaries

A comparison of water quality results from the reticulation system sampling sites (water mains, customer taps, service tanks) obtained from the previous four financial years and the reporting period (2020-2021)

Figure B.1: *E. coli* performance in water sampling localities (between 2016-17 and 2020-2021, from left to right within each locality)

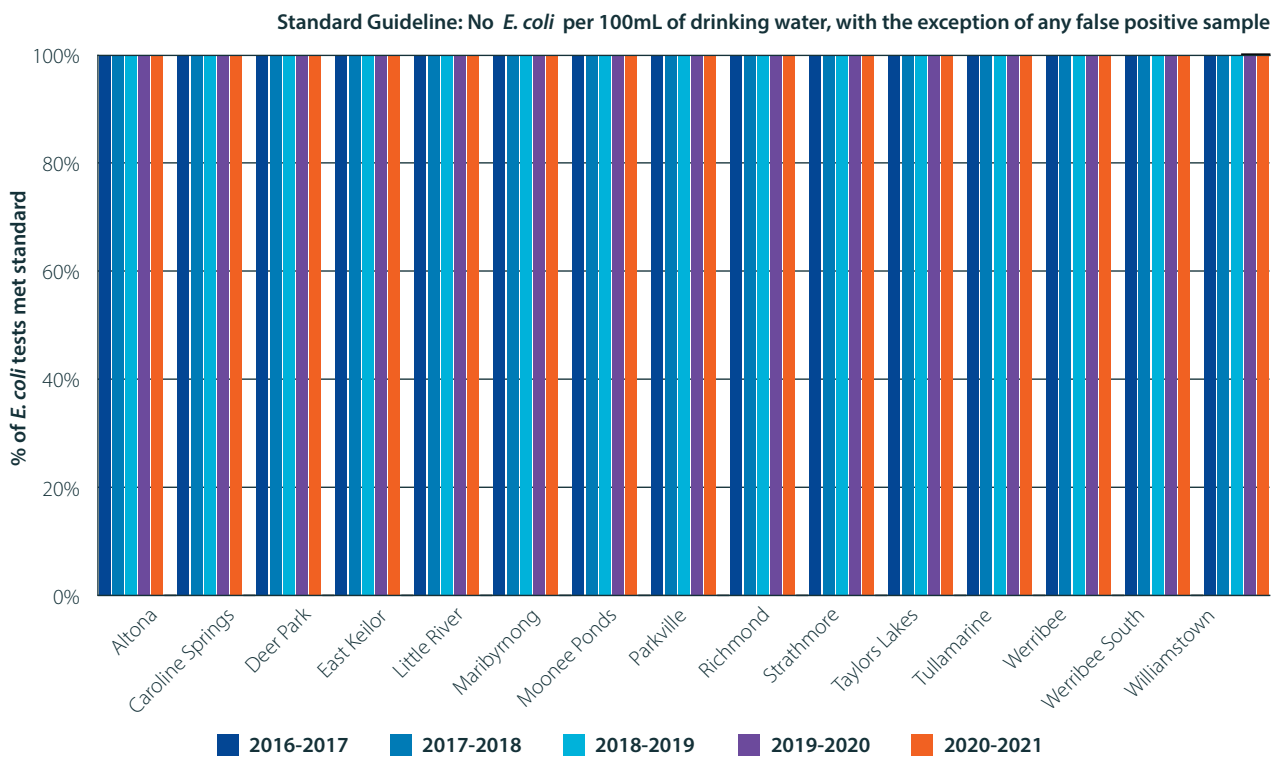


Figure B.2: Annual average free chlorine concentrations in water sampling localities (between 2016-2017 and 2020-2021 from left to right within each locality)

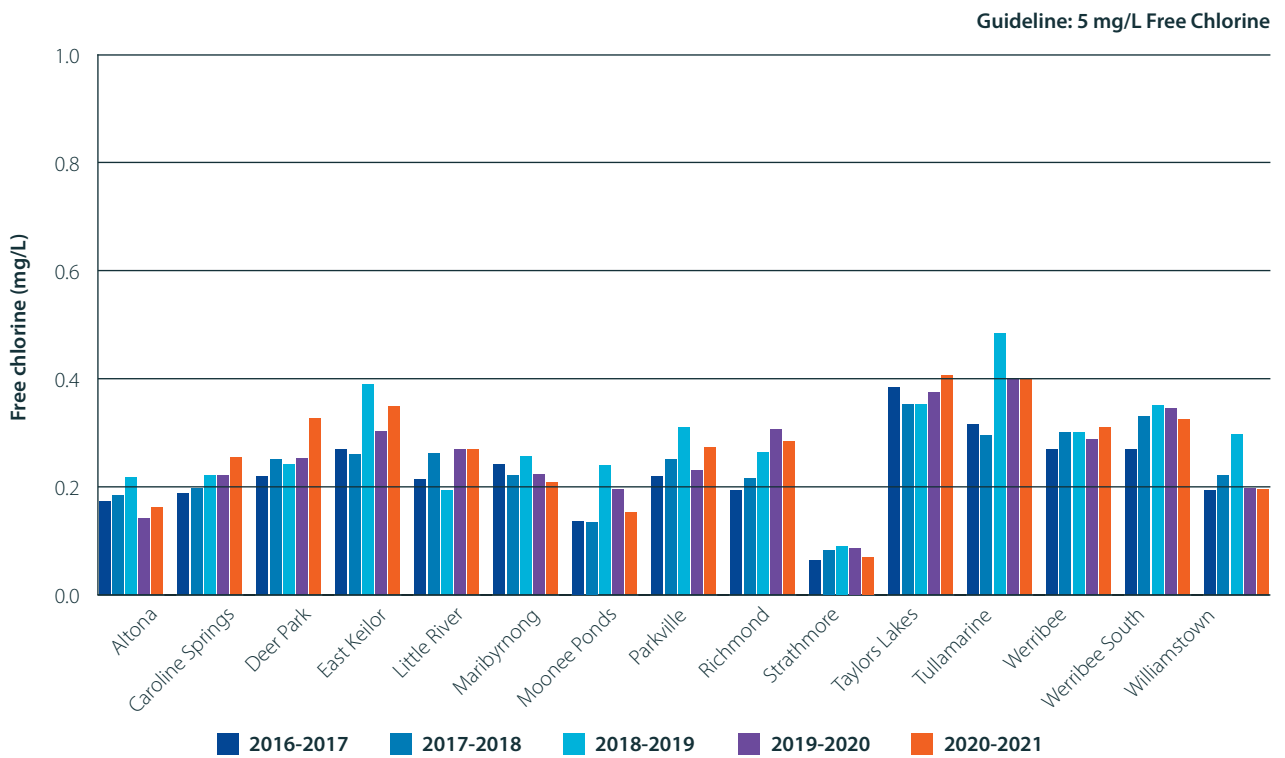


Figure B.3: Aluminium concentrations in water sampling localities (between 2016-2017 and 2020-2021 from left to right within each locality)

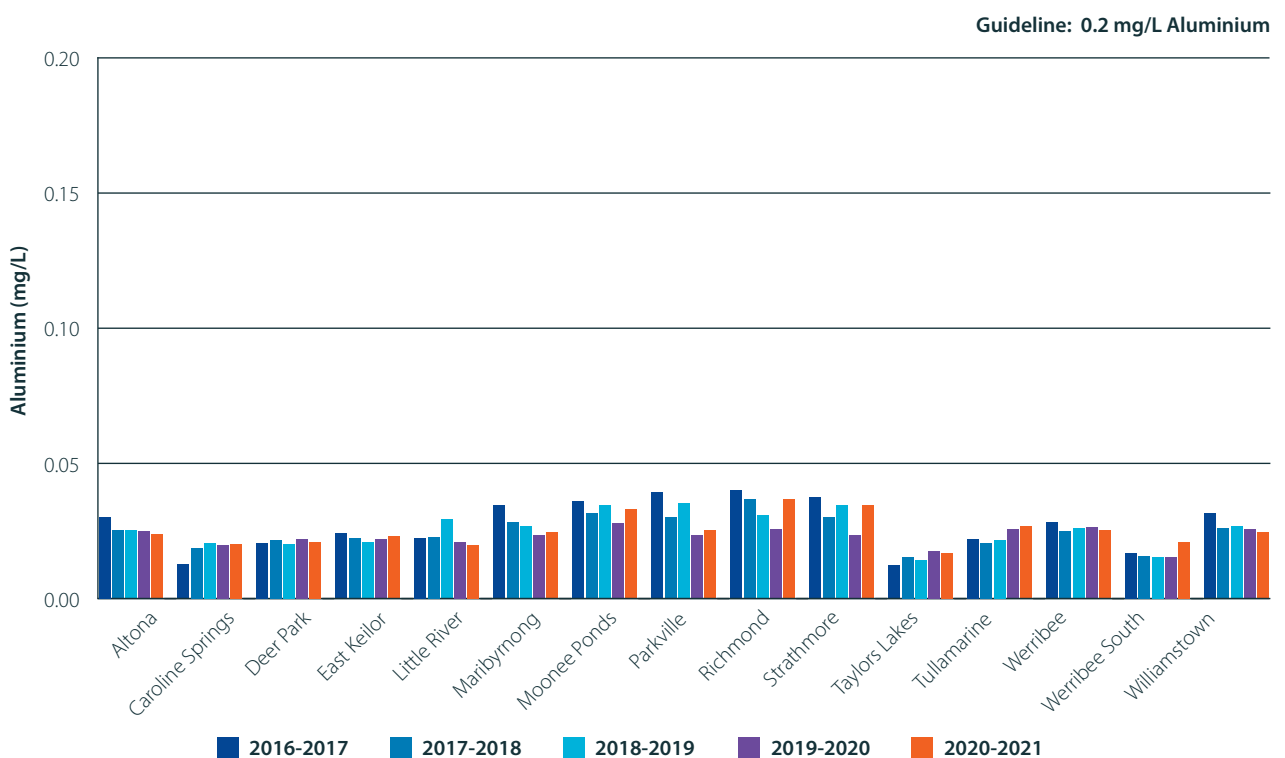


Figure B.4: Chloride concentrations in water sampling localities (between 2016-2017 and 2020-2021 from left to right within each locality)

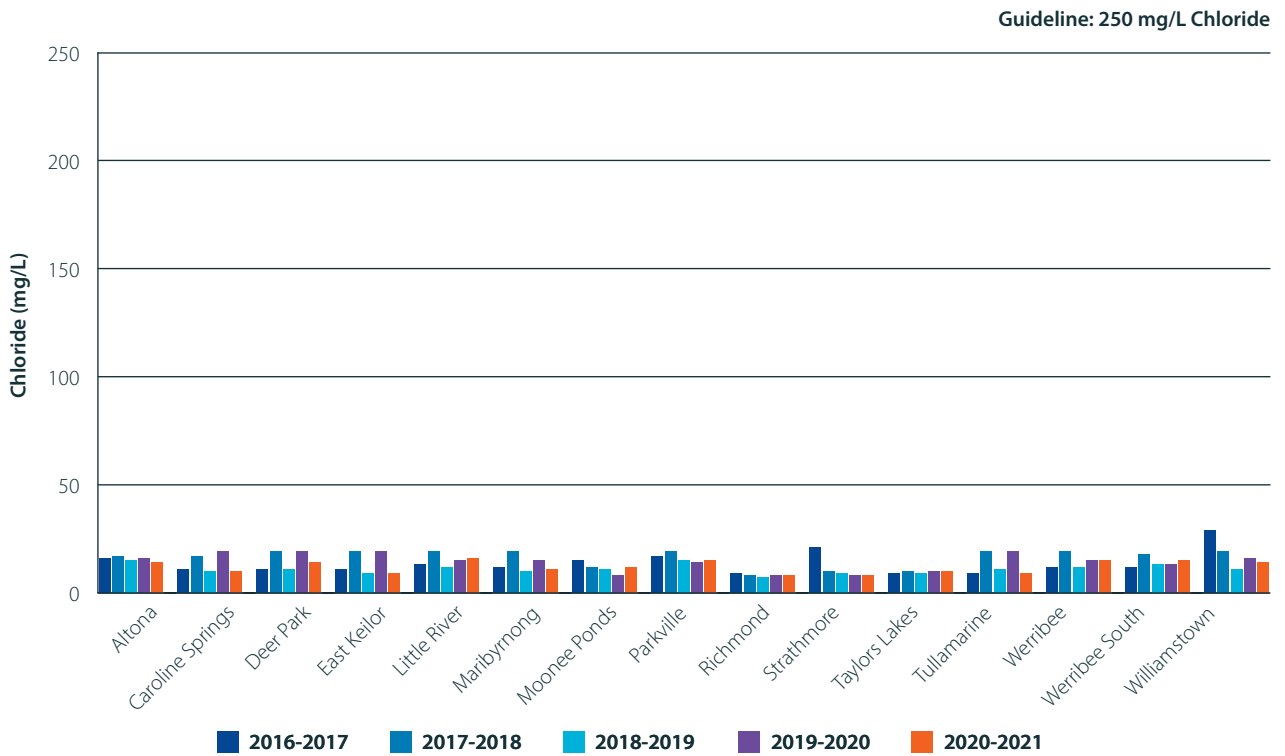


Figure B.5: Average apparent colour levels in water sampling localities (between 2016-2017 and 2020-2021 from left to right within each locality)

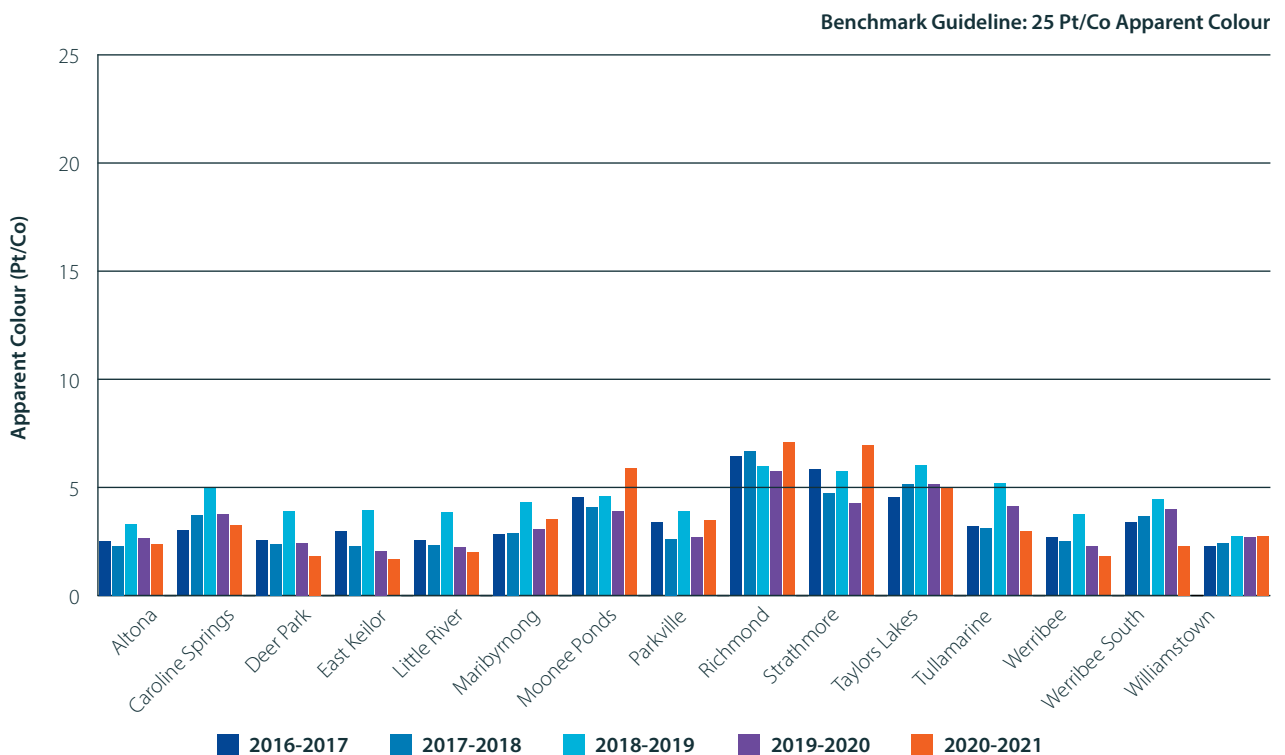


Figure B.6: Copper concentrations in water sampling localities (between 2016-2017 and 2020-2021 from left to right within each locality)

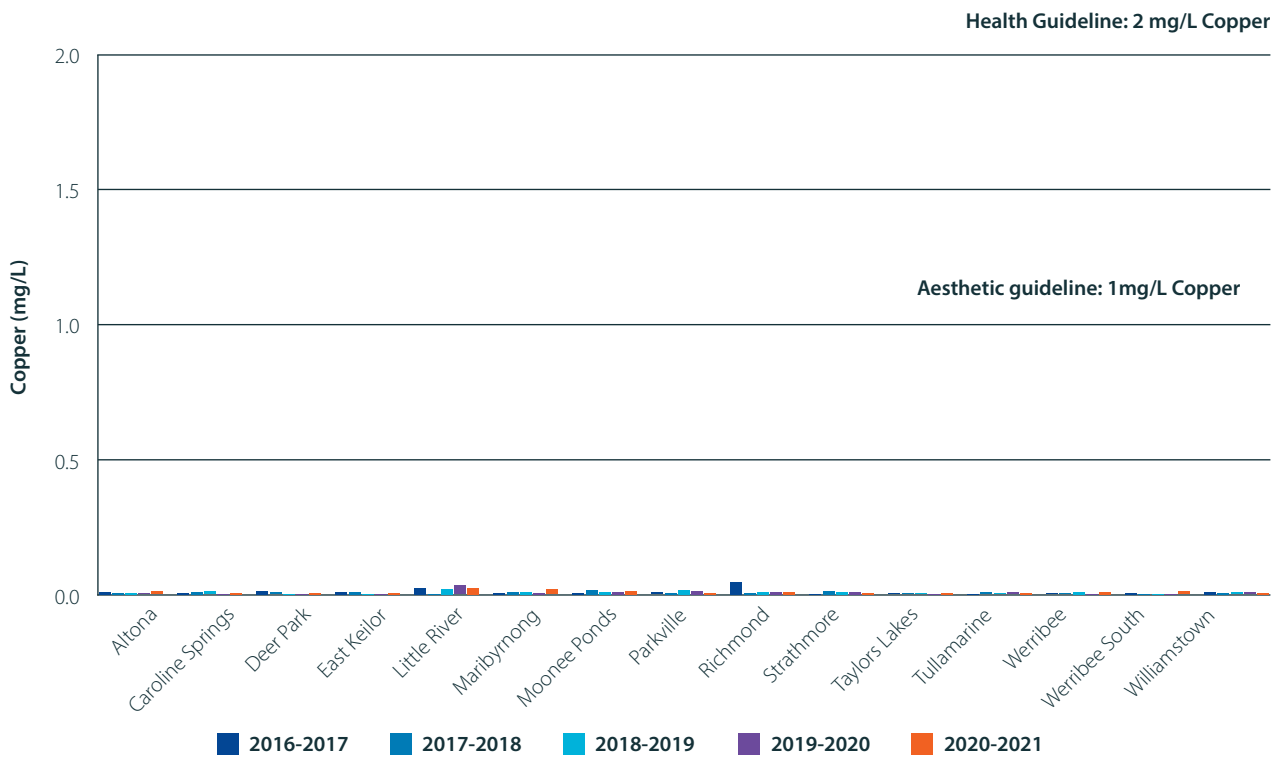


Figure B.7: Average electrical conductivity levels in water sampling localities (between 2016-2017 and 2020-2021 from left to right within each locality)

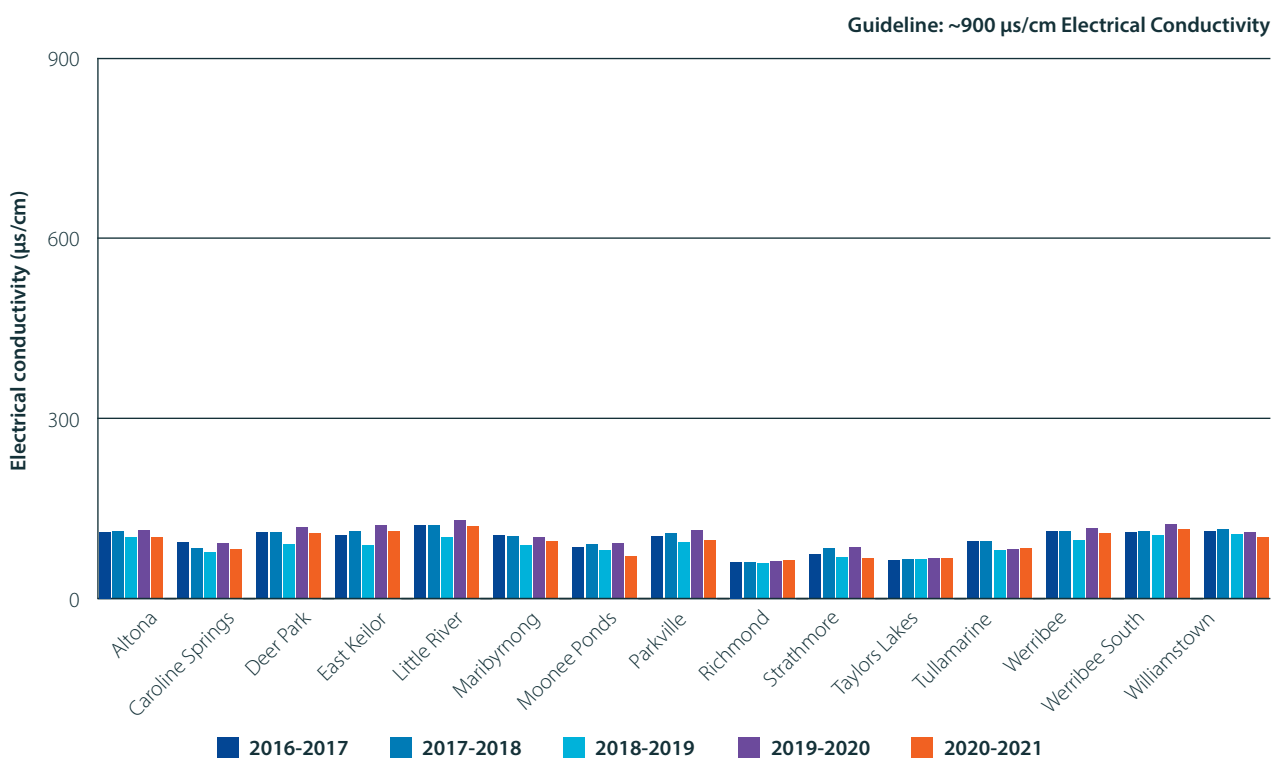


Figure B.8: Average fluoride concentrations in water sampling localities (between 2016-2017 and 2020-2021 from left to right within each locality)

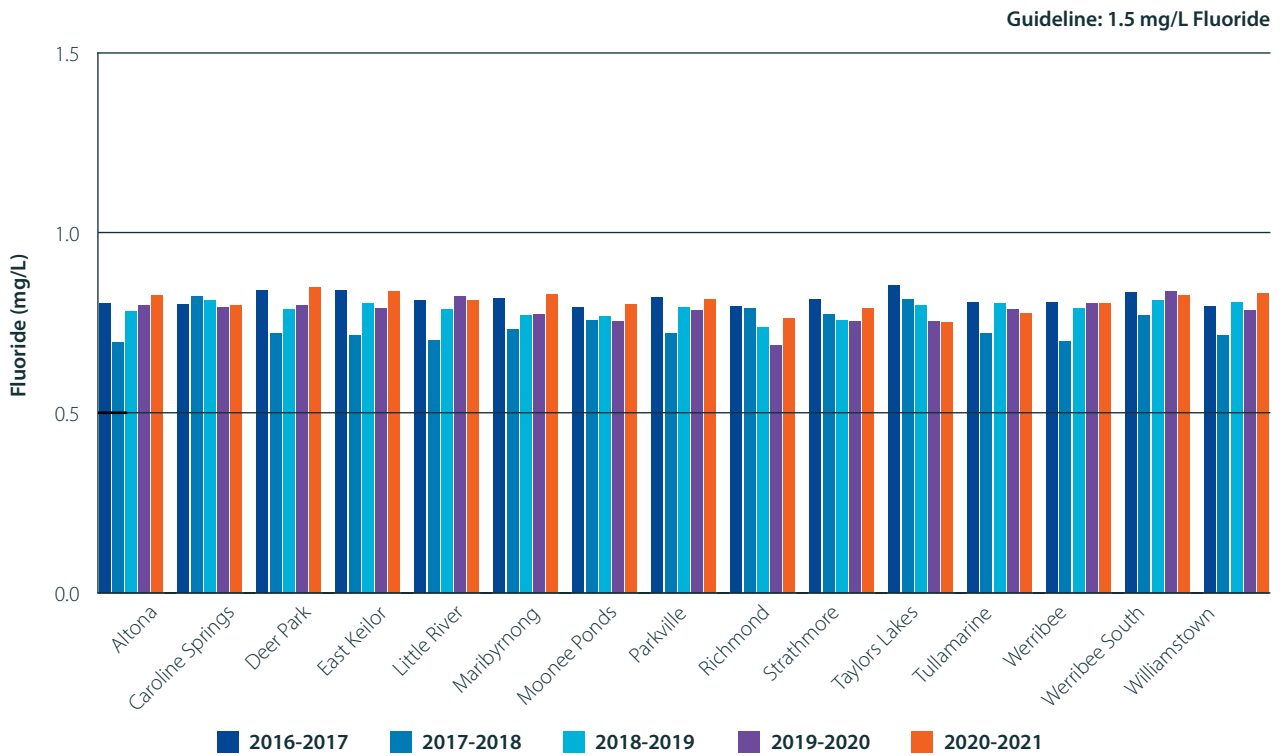


Figure B.9: Hardness concentrations in water sampling localities (between 2016-2017 and 2020-2021 from left to right within each locality)

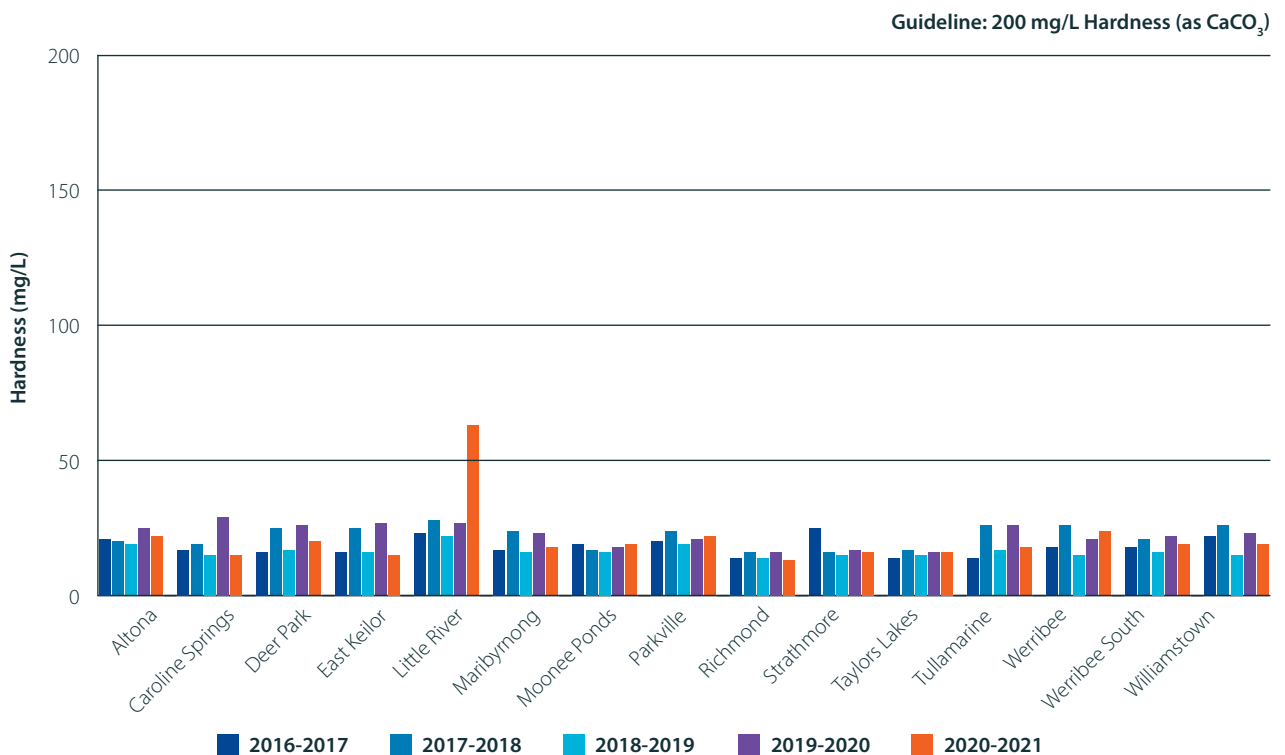


Figure B.10: Average iron concentrations in water sampling localities (between 2016-2017 and 2020-2021 from left to right within each locality)

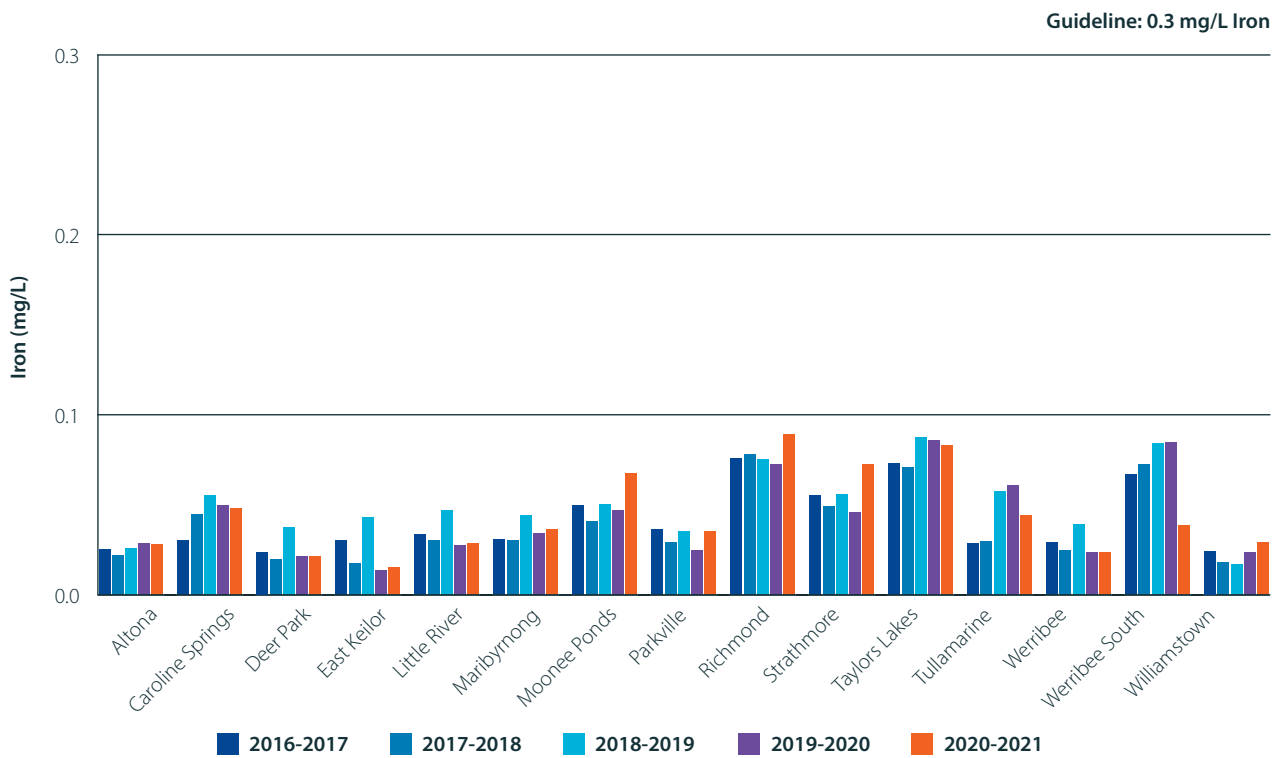


Figure B.11: Average manganese concentrations in water sampling localities (between 2016-2017 and 2020-2021 from left to right within each locality)

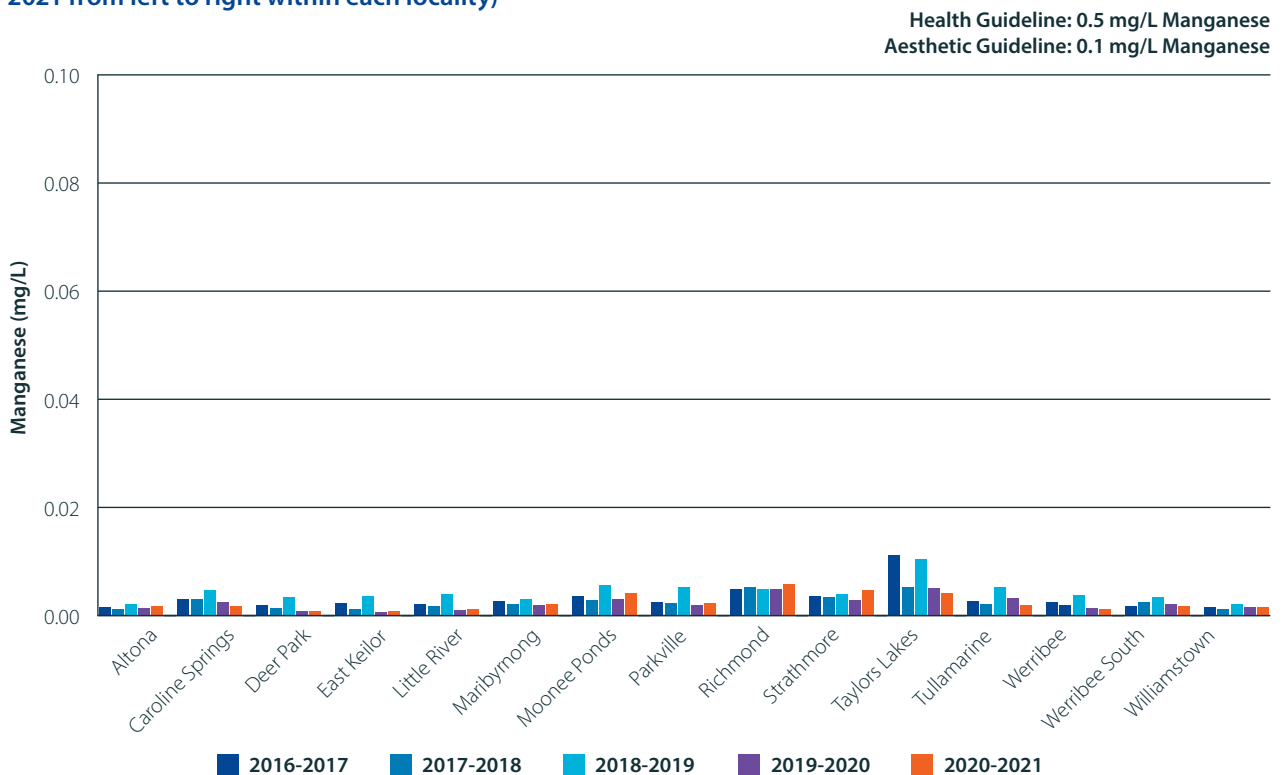


Figure B.12: Nitrate concentrations in water sampling localities (between 2016-2017 and 2020-2021 from left to right within each locality)

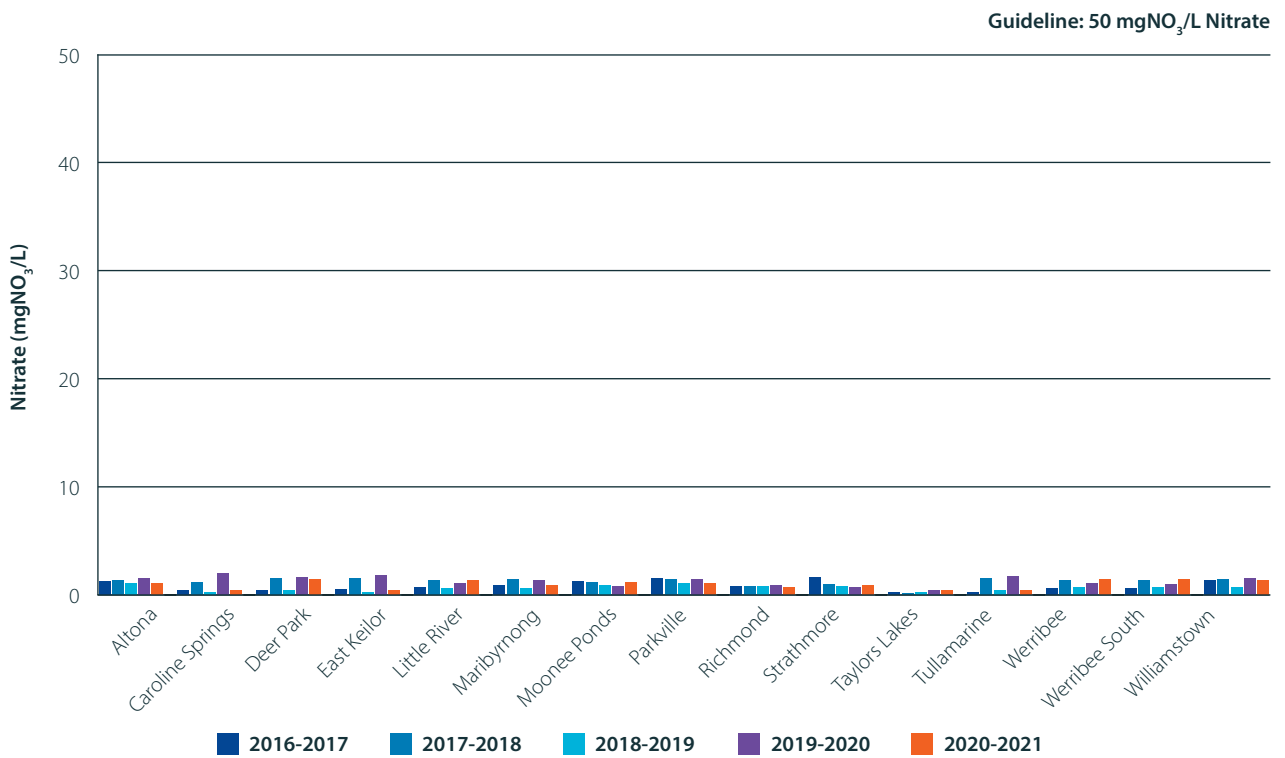


Figure B.13: Average pH values in water sampling localities (between 2016-2017 and 2020-2021 from left to right within each locality)

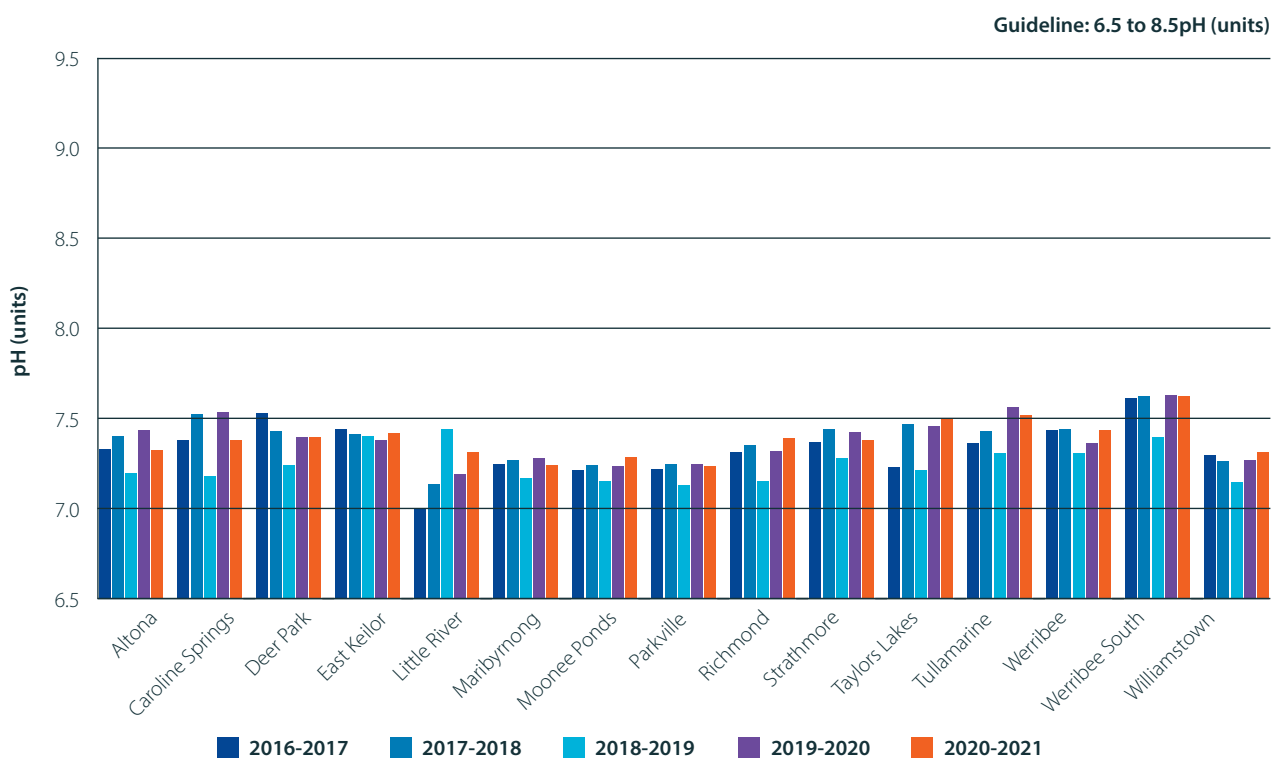


Figure B.14: Sodium concentrations in water sampling localities (between 2016-2017 and 2020-2021 from left to right within each locality)

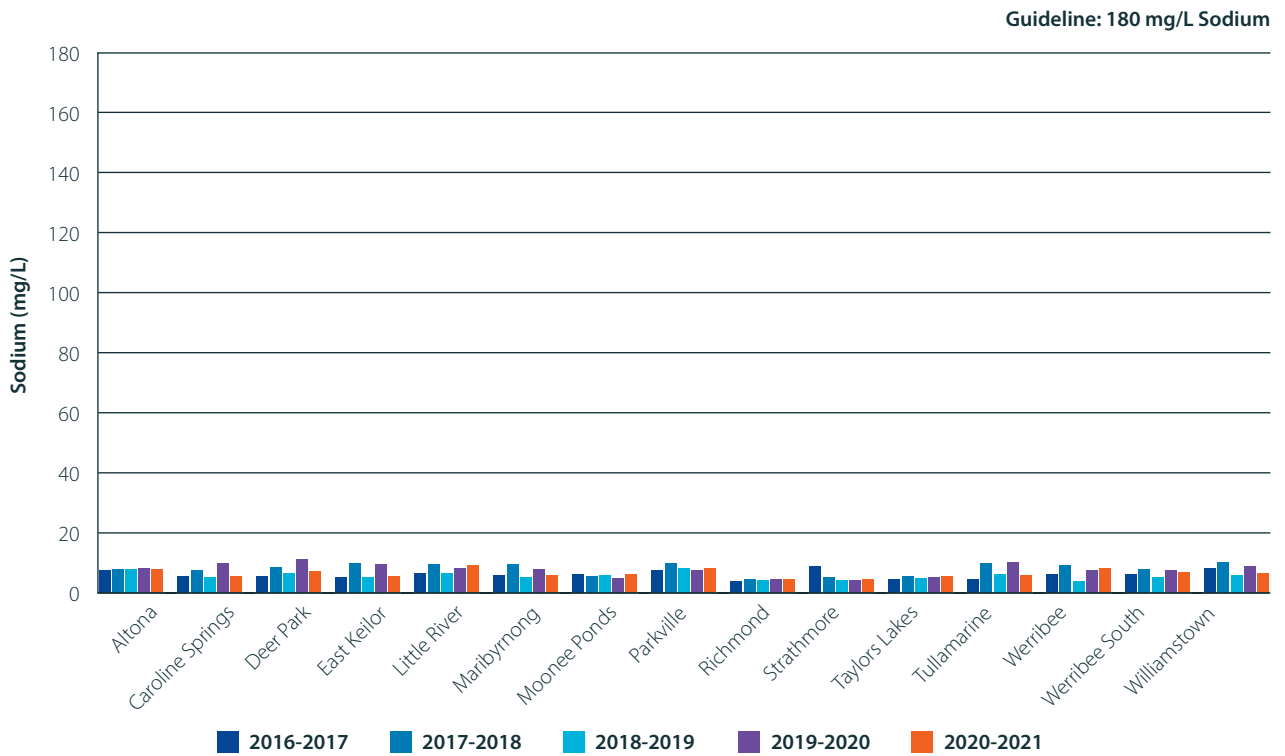


Figure B.15: Sulphate concentrations in water sampling localities (between 2016-2017 and 2020-2021 from left to right within each locality)

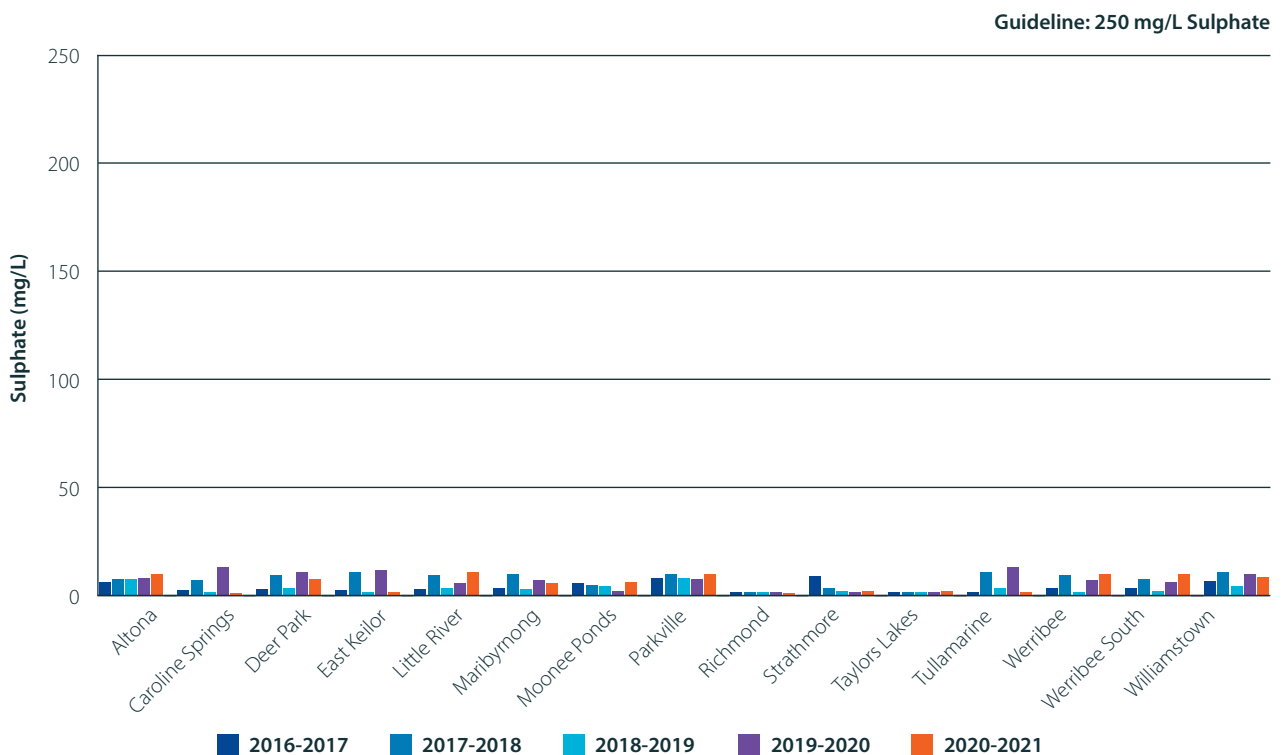


Figure B.16: Average total trihalomethane concentrations in water sampling localities (between 2016-2017 and 2020-2021 from left to right within each locality)

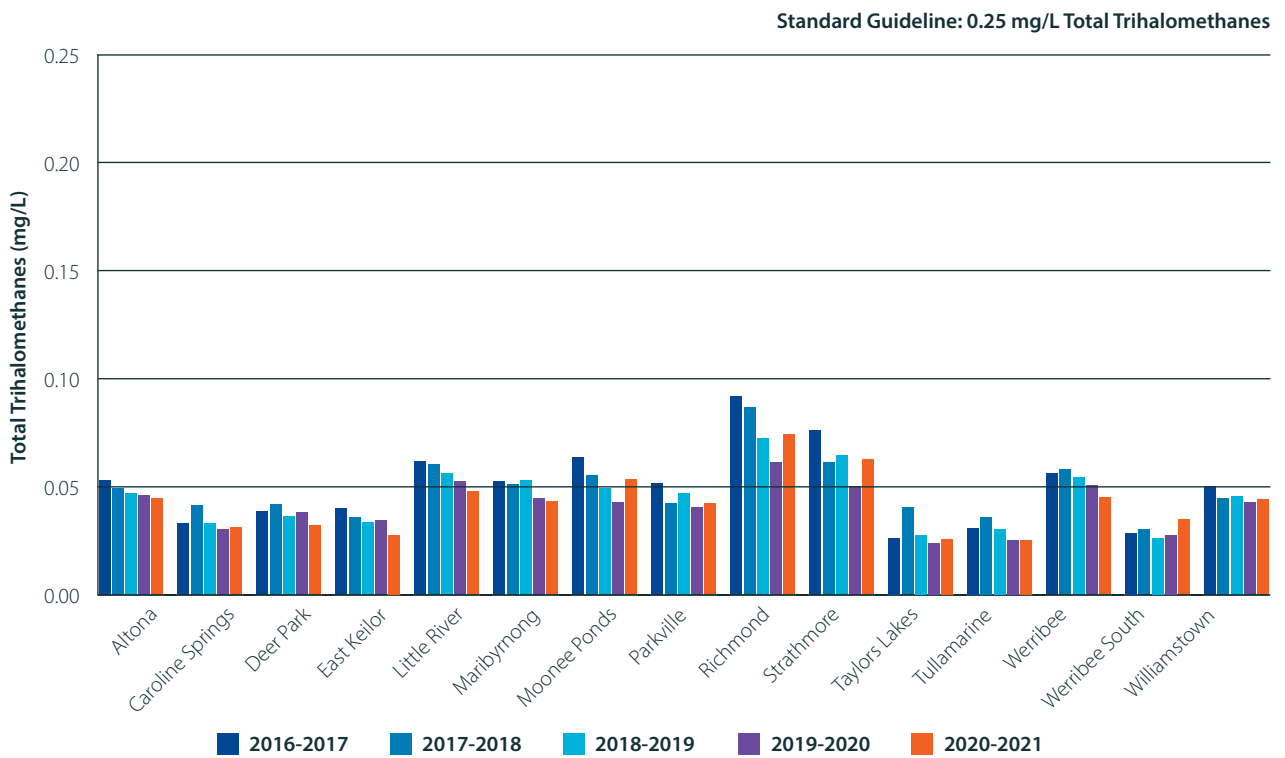
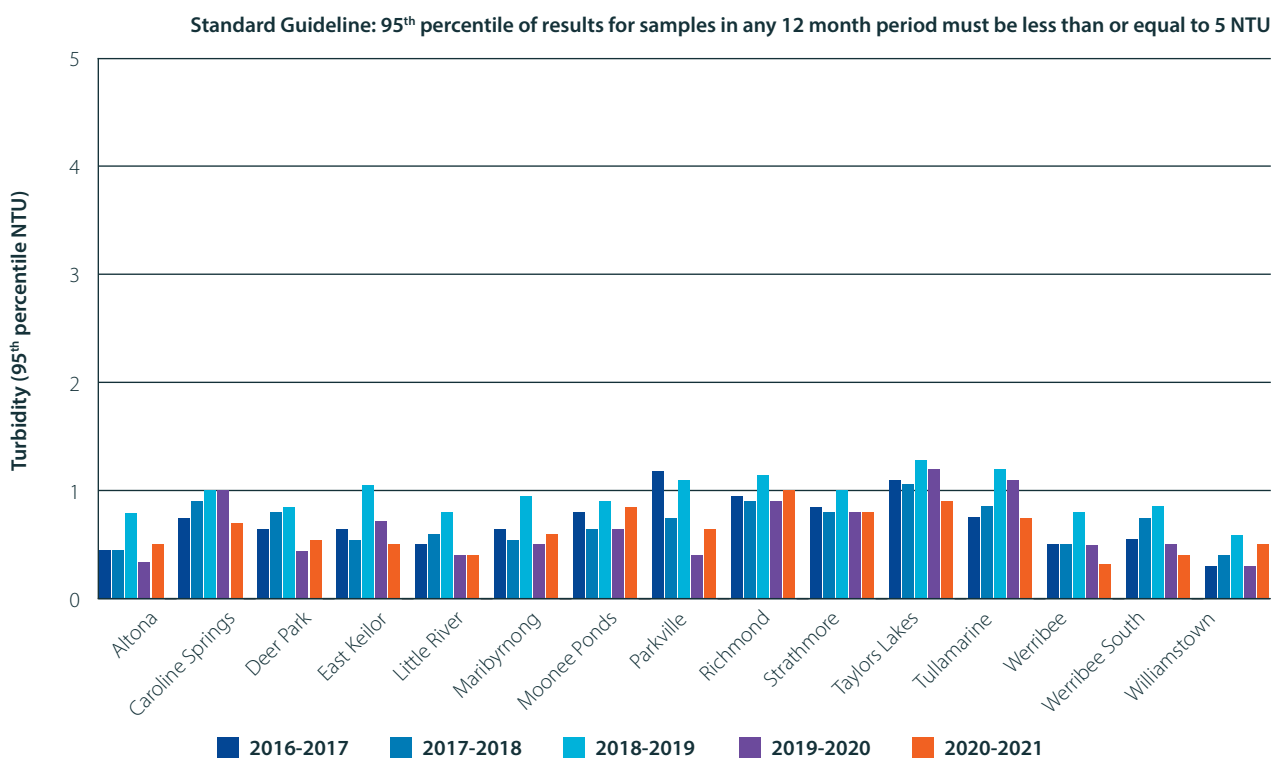


Figure B.17: Turbidity levels in water sampling localities (between 2016-2017 and 2020-2021 from left to right within each locality)



Appendix C. 2020 Risk Management plan regulatory audit certificate



Regulation 10

Schedule 1 - Risk Management Plan Audit Certificate

Safe Drinking Water Regulations 2015

Certificate Number: 22

Audit Period: 17th April 2018 to 23rd July 2020

To: Ms Maree Lang
Managing Director
City West Water Corporation
Locked Bag 350
Sunshine Vic 3020

Australian Business Number (ABN): 70 066 902 467

I, Sophia Dellis, after conducting a risk management plan audit of the water supplied by City West Water Corporation, am of the opinion that:

City West Water Corporation has complied with obligations imposed by Section 7 (1) of the **Safe Drinking Water Act 2003** during the audit period.

Date: 04th August 2020

Signature of Approved Auditor

A handwritten signature in black ink, appearing to read 'Sophia Dellis', is written over a horizontal line.

Sophia Dellis

250 Victoria Square/Tarntanyangga ADELAIDE SA 5000

Mobile: 0472 868 110

Email: sophia.dellis@awqc.com.au

Appendix D. Glossary of Terms

Glossary of Terms

ADWG 2011	Australian Drinking Water Guidelines 6, 2011. Published by the National Health & Medical Research Council of Australia, version 3.6, March 2021.
the Department	Department of Health.
<i>E. coli</i>	<i>Escherichia coli</i> , a bacterium which is considered to indicate the presence of faecal contamination and therefore, is a health risk.
'False Positive' sample <i>E. coli</i> result	<i>E. coli</i> detection in a routine water quality sample considered non representative of the water supplied to customers, following an investigation conducted in accordance with the guidelines issued by the Department of Health's Secretary. A 'false positive sample' result is considered to have met the <i>E. coli</i> drinking water quality standards in Schedule 2 of the Safe Drinking Water Regulations 2015.
HACCP	Hazard Analysis and Critical Control Point, a risk based management certification for food, also applied to protect drinking water quality.
HU	Hazen Units.
mg/L	Unit of measure milligrams per litre.
NTU	Unit of measure Nephelometric Turbidity Units.
orgs/100mL	Unit of measure organisms per 100 millilitres.
<	"less than" mathematical symbol.
>	"greater than" mathematical symbol.



City West Water™

Greater Western Water

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