City West Water™

Drinking Water Quality Report

2017

Glossary of Terms

Term	Definition
ADWG 2011	Australian Drinking Water Guidelines 2011. Published by the National Health & Medical Research Council of Australia.
DHHS	Victorian Department of Health and Human Services
E. coli	*Escherichia coli*, a bacterium which is considered to indicate the presence of faecal contamination and therefore, health risk.
HACCP	Hazard Analysis and Critical Control Points certification for protecting drinking water quality
mg/L	Milligrams per litre
NTU	Nephelometric Turbidity Units
orgs/100mL	Organisms per 100 millilitres
Regulations (2015)	Safe Drinking Water Regulations (2015) Victoria
Section 22 notification	Notification under Section 22 of the *Safe Drinking Water Act 2003* of known or suspected water contamination
<	"less than" symbol.
>	"greater than" symbol

Table of Contents

From our Managing Director

Welcome to City West Water's 2017 Annual Drinking Water Quality Report. Each year we produce a report to update our customers and the community with details of the quality of drinking water that we are supplying throughout our service area. This 2017 report addresses the 12 month period between 1 July 2016 and 30 June 2017.

In 2016 City West Water launched a new corporate strategy to be an exceptional service provider that puts customers first and benefits the community. Water is a life-giving resource; its provision contributes to community health and hygiene. We strive to deliver our services in a reliable and affordable way that is accessible to everyone in our community.

Our service area is growing and encompasses the inner and western suburbs of Melbourne, including Melbourne's central business district. Drinking water is supplied to our customers via an extensive, largely underground network of over 4,800 kilometers of water mains, as well as associated valves, holding tanks, pumping stations and secondary disinfection plants. Our priority as an exceptional service provider is to manage and operate this network so that our customers continue to reliably receive the high quality, safe drinking water for which Melbourne has long been renowned.

The information presented in this report explains the sources of our drinking water, how it is treated so that it is safe to consume without further treatment, and demonstrates in detail how the quality consistently meets and surpasses drinking water quality standards and targets.

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

As part of the management processes we have a comprehensive monitoring program that allows us to verify the quality of the drinking water being supplied, as well as identify potential improvements to benefit our customers and community.

Throughout 2016-17 we routinely tested over 3,000 water samples, most of which were obtained from customers' premises. I am pleased to report that this independent chemical and microbial testing continued to demonstrate that the quality of our drinking water supply surpasses standards of the *Safe Drinking Water Act 2003* and associated *Safe Drinking Water Regulations*. Details of the testing undertaken and results obtained form a major part of this report.

Further to monitoring the supplied water quality, we also rely upon feedback from customers to advise of local issues that may arise. Such feedback is recorded as water quality related customer complaints. During 2016-17 were received 0.098 complaints per 100 customers.

City West Water is committed to reliably providing high quality and safe drinking water to all our customers and community. I am confident that you will find the information contained in this report helpful in better understanding the great quality of our drinking water supply.

David Ryan
Managing Director

1. Introduction

With this publically available report City West Water (CWW) complies with section 23 of the *Safe Drinking Water Act 2003* which requires public disclosure of all water quality monitoring information.

City West Water is one of three metropolitan water retailers established under section 85(1A) of the *Water Act 1989* (Vic). Our Board of Directors is appointed by the Victorian Government and is responsible for setting and overseeing the implementation of the policies, objectives and strategies of the business. We provide drinking water, trade waste, recycled water, stormwater and sewerage services to approximately 444,000 residential and non-residential customers in Melbourne's inner and western suburbs and central business district.

Melbourne Water provides City West Water with a bulk water supply and a waste water treatment service. Melbourne Water manages the water catchments and dams, as well as a network of large water mains that interconnect with our own 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 (the 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 given the highest priority to reflect public health considerations and community expectations. Our management of the drinking water supply closely follows the risk management principles outlined in Victoria's *Safe Drinking Water Act 2003* and associated *Safe Drinking Water Regulations*. This commitment to safeguarding drinking water quality has continued to be independently recognised through consistent retention of our internationally recognised Hazard Analysis and Critical Control Points (HACCP) certification.

1.1 Characterisation of the system

1.1.1 Source water system

The 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 for many years. This extensive system, managed by Melbourne Water, lies mainly to the east of Melbourne and extends as far as Thomson Reservoir, approximately 120 kilometres from our service area.

More specifically, 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 to the north, near Somerton. The relative proportion of water supplied to us from the three reservoirs can vary, depending on factors such as local water demands, weather conditions, maintenance works and longer term population changes. Over the last decade or so, on average about 25 per cent of our bulk supply has come from Silvan, 25 per cent from Greenvale and 50 per cent from Sugarloaf. During 2016-17 these percentages were 24, 14 and 62, respectively.

The supply from Silvan Reservoir originates 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 does not have a catchment, and 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 middle reaches 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, gas chlorination and pH correction with lime) at Melbourne Water's nearby 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 focussed on verifying the quality of post-treatment product water. Frequencies of this monitoring range between continuous at chlorine dosing points, daily and weekly, depending on the sites and parameters measured (for example, microbial testing, water clarity and purity).

The overall water supply system and water delivery arrangements during the past year have continued unchanged from preceding years.

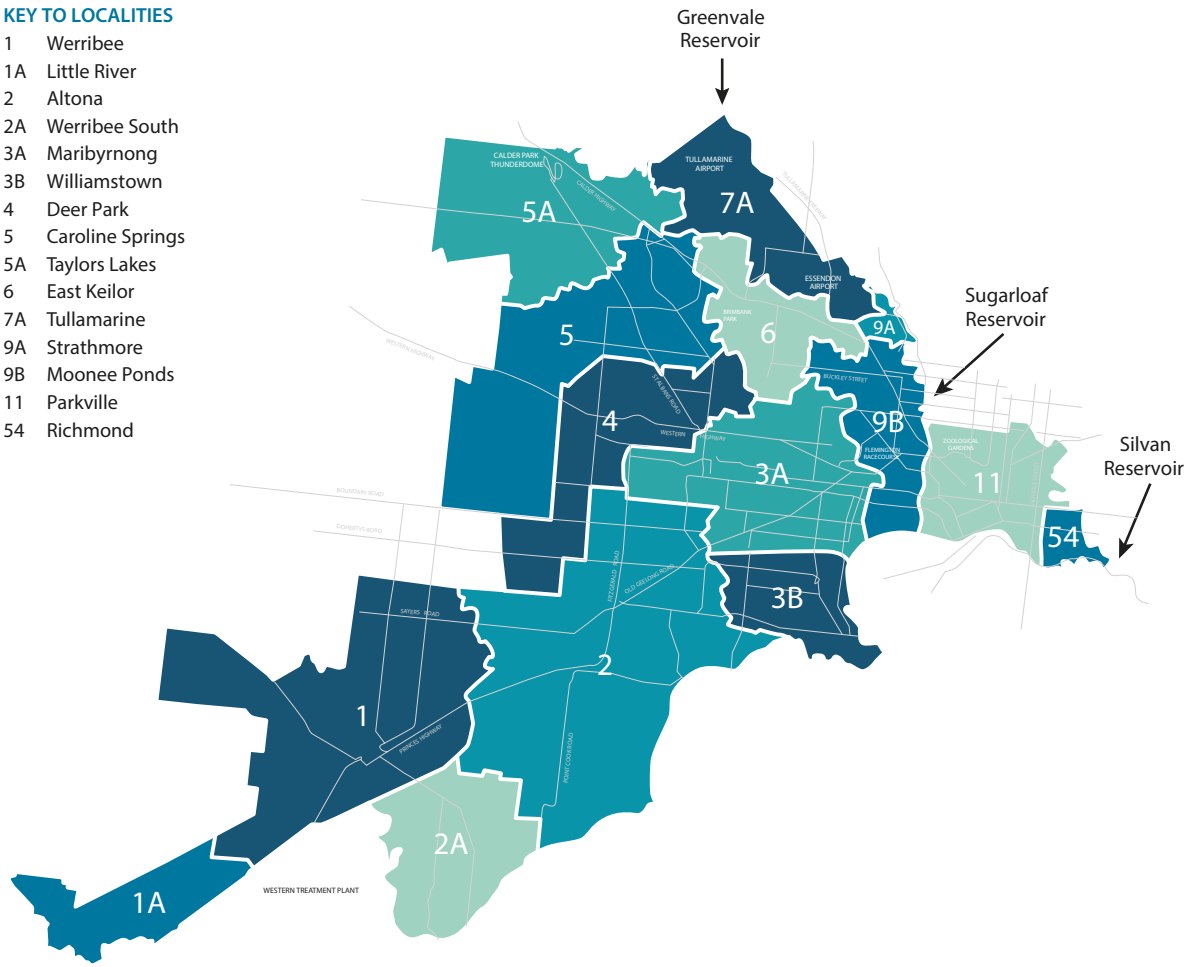
1.1.2 City West Water system

We distribute water to over 1 million people. The water is distributed through an extensive network of over 4,800 kilometres of water mains, 10 pumping stations, 8 holding tanks (or service reservoirs/tanks) and 5 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 is divided into 15 water sampling localities (refer Figure 1.1) based on sources of water supply and similar pressure.

Figure 1.1 City West Water's water service area showing its 15 water sampling localities and sources of bulk water supply.

KEY TO LOCALITIES

1	Werribee
1A	Little River
2	Altona
2A	Werribee South
3A	Maribyrnong
3B	Williamstown
4	Deer Park
5	Caroline Springs
5A	Taylors Lakes
6	East Keilor
7A	Tullamarine
9A	Strathmore
9B	Moonee Ponds
11	Parkville
54	Richmond



The water supply source(s) for each of our 15 water sampling localities are shown in Table 1.1

Table 1.1 2016-17 supply sources for our water sampling localities

Water sampling locality	Source water	Treatment plant	Population supplied (2011 census)
Altona	Yarra River; Maroondah, Silvan & Greenvale Reservoirs	Winneke Silvan Greenvale	97,611
Caroline Springs	Yarra River; Maroondah & Greenvale Reservoirs	Winneke Greenvale	87,947
Deer Park	Yarra River; Maroondah, Silvan & Greenvale Reservoirs	Winneke Silvan Greenvale	53,687
East Keilor	Yarra River; Maroondah, Silvan & Greenvale Reservoirs	Winneke Silvan Greenvale	38,063
Little River	Yarra River; Maroondah, Silvan & Greenvale Reservoirs	Winneke Silvan Greenvale	625
Maribyrnong	Yarra River; Maroondah & Silvan Reservoirs	Winneke Silvan	101,272
Moonee Ponds	Yarra River; Maroondah & Silvan Reservoirs	Winneke Silvan	68,395
Parkville	Yarra River; Maroondah & Silvan Reservoirs	Winneke Silvan	111,305
Richmond	Yarra River; Maroondah & Silvan Reservoirs	Winneke Silvan	20,646
Strathmore	Yarra River; Maroondah, Silvan & Greenvale Reservoirs	Winneke Silvan Greenvale	8,917
Taylors Lakes	Yarra River; Maroondah & Greenvale Reservoirs	Winneke Greenvale	63,394
Tullamarine	Yarra River; Maroondah & Greenvale Reservoirs	Winneke Greenvale	9,833
Werribee	Yarra River; Maroondah, Silvan & Greenvale Reservoirs	Winneke Silvan Greenvale	124,833
Werribee South	Yarra River; Maroondah, Silvan & Greenvale Reservoirs	Winneke Silvan Greenvale	807
Williamstown	Yarra River; Maroondah & Silvan Reservoirs	Winneke Silvan	35,996

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 4 secondary chlorination plants servicing the water sampling localities of Werribee, Deer Park, Caroline Springs and Altona.
- City West Water, with a further 5 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 in order to assist with maintaining neutral pH levels.

Table 2.1 summarises the water treatment processes used on the water supplied to each water sampling locality.

Table 2.1 Drinking water treatment processes

	Drinking Water Treatment Processes									
	Clarification	Filtration	Disinfection	Other		Added Substances				
Treatment plant#	Coagulation and flocculation	Sand filtration	chlorination	pH correction	fluoridation	alum	chlorine gas	chlorine liquid (sodium hypochlorite)	lime	fluorosilicic acid
Winneke	X	X	X	X	X	X	X		X	X
Greenvale			X	X			X*	X*	X	
Silvan			X	X	X		X		X	X

*chlorination at Greenvale was changed from gas to liquid in January 2017

#treatment plants applicable to individual localities are shown in Table 1.1.

2.2 Issues

No adverse water treatment issues originated within City West Water's service area during 2016-17.

3. Emergency, incident and event management

This part of the report is for reporting emergencies, incidents and events that may have led to known or suspected contamination of the drinking water supply, including those that were reported to Department of Health and Human Services (DHHS) in line with Section 22 of the *Safe Drinking Water Act 2003*. We made two such reports in 2016-17.

- On 3 January CWW detected *E.coli* of 1 organism per 100mL at Holden water supply tank (part of the supply to Taylors Lakes water sampling locality). On 4 January it was reported to DHHS and the following actions took place in line with Schedule 2 of the *Safe Drinking Water Regulations 2015*:
  - Holden tank was isolated, inspected and dosed with chlorine;
  - Melbourne Water's upstream treatment processes and water quality data was verified;
  - resampled at the tank and downstream at customers' properties.

The outcome from these actions indicated no evidence (apart from the initial *E. coli* detection) to support that the water supply had been contaminated. Therefore, in line with Schedule 2 of the *Safe Drinking Water Regulations 2015* it was concluded that the detection was a "false positive".

- In mid-November 2016, Class A recycled water was supplied for the first time in the West Wyndham dual pipe supply network, to over 4000 properties. The recycled water is provided for external watering uses and toilet flushing. Between 16 and 21 December 2016 it was found that four residential properties in the Wyndham Vale / Manor Lakes area had been incorrectly connected to the dual pipe supply system. The customers were supplied via property specific cross connections, with an approximately 50/50 mixture of Class A recycled water and drinking water into their household drinking water supply. The cause was identified as incorrect connections to the separate recycled water and drinking water mains at the supply point to each property. These cross connections were corrected at each property on the same day as they were identified. In cooperation with DHHS, City West Water has maintained communications with the affected customers.

City West Water commissioned a comprehensive health risk assessment reviewed by an independent toxicologist, and an independent review of our processes to prevent similar events in the future. The independent review by the expert toxicologist found that:

- any adverse health outcomes caused by the short term consumption of the recycled water were extremely unlikely;
- the health risk assessment was well conducted and provided a sound assessment of the risks of the short-term exposure to recycled water.

City West Water provided the toxicologist's review to DHHS which concluded satisfaction with the findings.

The independent review of our processes has led to implementation of changes to our management of dual supply systems to better safeguard the drinking water supply.

4. Drinking Water Quality Monitoring

A significant part of our water supply activities involves 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, including some 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. 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 scrutinised under the Bulk Water Supply Agreement between City West Water and Melbourne Water.

Between 1 July 2016 and 30 June 2017, we routinely collected and tested over 3,000 microbiological and 900 physical/chemical water samples from customer taps, mains and service reservoirs/tanks. This was undertaken under contract by a government approved, specialised and quality certified laboratory. The extent of this monitoring was based on requirements of *Safe Drinking Water Regulations 2015* as well as guidance from the *Australian Drinking Water Guidelines 2011* (*ADWG 2011*), including consideration of locality population numbers for bacterial monitoring.

As well as guiding the design of monitoring programs, *ADWG 2011* provides a basis for assessing the quality of drinking water. Microbiological assessment is based principally on the bacterium *Escherichia coli (E. coli)*, which is considered to definitively indicate the presence of faecal contamination and, therefore, health risk.

Physical/chemical assessment and monitoring is based on a combination of parameters that indicate physical/aesthetic characteristics, such as pH, colour and turbidity (the clarity of the water), 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 provided in *Further Information* on page 24.

Under *Safe Drinking Water Regulations 2015* sample results from reticulation sites such as water mains and service reservoirs/tanks that are both spatially and hydraulically within individual water sampling localities, are required to be 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 in Table 4.1 as follows:

Table 4.1 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	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, *Safe Drinking Water Regulations* specifies scheduled water quality standards for a number of water quality parameters. The standards currently in place are listed in table 4.2:

The tables in parts 5.1 to 5.3 report the overall 2016-17 compliance of water quality standard parameters against the water quality scheduled standards specified in Victoria's *Safe Drinking Water Regulations 2015*.

Table 5.1 Water quality parameters, standards and frequency of sampling

Water quality parameter	Standard (*Regulations 2015*)	Relevant sampling frequency for each locality
Escherichia coli (E. coli)	No *E. coli* per 100mL of drinking water, with the exception of any false positive sample	one sample per week
Trihalomethanes	Less than or equal to 0.25 mg/L of drinking water	one sample per month
Turbidity	The 95th percentile of results for samples any 12 month period must be ≤5.0 NTU	one sample per week

5.1 *Escherichia coli (E. coli)*

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

Results: 1 July 2016 to 30 June 2017

Table 5.2 *E. coli* summary results in drinking water samples obtained from reticulation system sampling sites (customer taps, water mains, service reservoirs/tanks) tested between 1 July 2016 and 30 June 2017

Water sampling locality (locality number)	Sampling frequency	Number of samples	Maximum detected (orgs/100mL)	Average	Number of detections and investigations conducted (s. 22)#	Number of samples where standard was not met (s.18)#
Altona (2)	>weekly	303	<1	<1	0	0
Caroline Springs (5)	>weekly	277	<1	<1	0	0
Deer Park (4)	>weekly	182	<1	<1	0	0
East Keilor (6)	>weekly	145	<1	<1	0	0
Little River (1A)	>weekly	119	<1	<1	0	0
Maribyrnong (3A)	>weekly	356	<1	<1	0	0
Moonee Ponds (9B)	>weekly	224	<1	<1	0	0
Parkville (11)	>weekly	368	<1	<1	0	0
Richmond (54)	>weekly	105	<1	<1	0	0
Strathmore (9A)	>weekly	78	<1	<1	0	0
Taylors Lakes (5A)	>weekly	235	1*	<1	1*	0
Tullamarine (7A)	>weekly	78	<1	<1	0	0
Werribee (1)	>weekly	444	<1	<1	0	0
Werribee South (2A)	>weekly	117	<1	<1	0	0
Williamstown (3B)	>weekly	144	<1	<1	0	0

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)*

*Refer to preceding Part 3 for further information.

E. coli reticulation system data demonstrate compliance with the standard (100% samples with no E. coli) in each of City West Water's 15 water sampling localities between 1 July 2016 and 30 June 2017.

Sampling frequencies in each locality exceeded that prescribed by the Safe Drinking Water Regulations 2015 (i.e. one sample per week in each locality). This was done in order to meet the more intense surveillance of internationally recognised population based frequencies, as advocated in ADWG 2011.

5.2 Total trihalomethanes

Trihalomethanes (THMs) are disinfection by-products that are the result of chlorine reacting with substances in water.

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

Results: **Total trihalomethanes** 1 July 2016 to 30 June 2017

Table 5.3 Total trihalomethanes summary results in drinking water samples obtained from reticulation system sampling sites (customer taps, water mains, service reservoirs/tanks) tested between 1 July 2016 and 30 June 2017

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	0.088	0.05	0
Caroline Springs (5)	monthly	13	0.25	0.065	0.03	0
Deer Park (4)	monthly	13	0.25	0.065	0.04	0
East Keilor (6)	monthly	13	0.25	0.062	0.04	0
Little River (1A)	>fortnightly	49	0.25	0.076	0.06	0
Maribyrnong (3A)	monthly	13	0.25	0.076	0.05	0
Moonee Ponds (9B)	monthly	13	0.25	0.074	0.06	0
Parkville (11)	monthly	13	0.25	0.074	0.05	0
Richmond (54)	monthly	13	0.25	0.094	0.09	0
Strathmore (9A)	monthly	13	0.25	0.077	0.08	0
Taylors Lakes (5A)	>monthly	25	0.25	0.063	0.03	0
Tullamarine (7A)	monthly	13	0.25	0.039	0.03	0
Werribee (1)	>fortnightly	37	0.25	0.069	0.06	0
Werribee South (2A)	>fortnightly	49	0.25	0.076	0.03	0
Williamstown (3B)	monthly	13	0.25	0.077	0.05	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 2016 and 30 June 2017.

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).

Results: **Turbidity** 1 July 2016 to 30 June 2017

Table 5.4 Turbidity summary results in drinking water samples obtained from reticulation system sampling sites (customer taps, water mains, service reservoirs/tanks) tested between 1 July 2016 and 30 June 2017

Water sampling locality (locality number)	Frequency of Sampling	Number of samples	Maximum turbidity in a sample (NTU)	95th percentile of turbidity results in any 12 months (NTU)	Number of 95th percentile results in any 12 months above standard (s.18)#
Altona (2)	weekly	52	0.7	0.5	0
Caroline Springs (5)	weekly	52	0.8	0.7	0
Deer Park (4)	weekly	52	0.9	0.6	0
East Keilor (6)	weekly	52	0.8	0.6	0
Little River (1A)	>weekly	88	0.6	0.4	0
Maribyrnong (3A)	weekly	52	0.7	0.6	0
Moonee Ponds (9B)	weekly	52	1.7	0.8	0
Parkville (11)	weekly	52	2.4	1.2	0
Richmond (54)	weekly	52	1	0.9	0
Strathmore (9A)	weekly	51	1.1	0.9	0
Taylors Lakes (5A)	>weekly	64	5.7	1.1	0
Tullamarine (7A)	weekly	51	0.9	0.8	0
Werribee (1)	weekly	>76	0.6	0.5	0
Werribee South (2A)	weekly	>88	2	0.5	0
Williamstown (3B)	weekly	52	0.7	0.3	0

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

Turbidity data demonstrate compliance with the standard (95th percentile ≤5 NTU) in each of City West Water's 15 water sampling localities between 1 July 2016 and 30 June 2017.

5.4 Summary performance against water quality standards

During 2016-17, City West Water met the monitoring and water quality requirements of 2015 *Safe Drinking Water Regulations* for drinking water samples obtained from reticulation system sampling sites (water mains, customer taps, service reservoirs/tanks). A *Section 22* notification with respect to an *E.coli* detection was made however, it was found to be a "false positive" (refer Part 3).

6. Other water quality standards

(algae toxin, pathogen, chemical or substance that may pose a risk to human health)

In addition to the water quality parameters designated as standards by the *Safe Drinking Water Regulations*, we also monitor a range of other microbiological and chemical parameters that provide further information on the overall quality of our drinking water supply. Among such other parameters that were monitored in 2016-17, those for which there is a health-related *ADWG 2011* guideline are listed in Table 6.1. In addition, data on aesthetic and other parameters that provide a more comprehensive characterisation of the water, as well as assisting the needs of customers (e.g. industry, students and researchers) are contained in Part 7 and Appendices A and B.

Table 6.1 Other water quality standards (algae toxin, pathogen, 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 reservoirs/tanks) and tested between 1 July 2016 and 30 June 2017

Parameter	ADWG 2011 health guideline	Frequency of testing	Met the guideline?
Microbiological			
Vibrio spp.			
Shigella spp.			
Yersinia spp.			
Salmonella spp.	these parameters should not be present in drinking water	3 to 4 samples per month (3 samples per locality per year)	yes (none detected)
Campylobacter spp.			
Giardia spp.			
Cryptosporidium spp.			
Enterococci			
Coliphage			
Chemical*	(mg/L)		
Arsenic	0.01	annually per locality	yes (not detected)
Cadmium	0.002	annually per locality	yes (not detected)
Chlorine	5	>weekly per locality	yes
Chromium	0.05	annually per locality	yes (not detected)
Copper	2	annually per locality	yes
Cyanide	0.08	annually per locality	yes (not detected)
Fluoride	1.5	>fortnightly per locality	yes
Lead	0.01	annually per locality	yes (not detected)
Manganese	0.1	fortnightly per locality	yes
Mercury	0.001	annually per locality	yes (not detected)
Nitrate	50	annually per locality	yes
Sulphate	250	annually per locality	yes
Zinc	3 (aesthetic only)	annually per locality	yes

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

Since levels of all health-related parameters tested satisfied *ADWG 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 radioactivity 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 *ADWG 2011* guidelines) in the bulk water supply were reported during 2016-17.

7. Aesthetic characteristics

Monitoring results for the aesthetic water quality parameters comprising pH, colour, hardness, alkalinity and iron are shown in Table 7.1. Note that our colour tests are reported as apparent colour while the *ADWG 2011* guideline of 15 platinum cobalt units (PCU) refers to true colour. Due to the omission of a filtering step in the test for apparent colour, the subsequent result values are at least equal to, but not less than, the equivalent true colour values. As a result, true colour compliance with respect to the *ADWG 2011* guideline is assured in all cases where apparent colour levels are within the guideline. Past investigations have shown that for Melbourne's water supply, an apparent colour level of 25 PCU is equivalent to a true colour level of 15 PCU.

Table 7.1 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 reservoirs/tanks) and tested between 1 July 2016 and 30 June 2017

Water Sampling Locality (locality number)	Parameter	Frequency of Sampling	Number of samples	Minimum*	Maximum*	Aesthetic operating range
Altona (2)	pH	fortnightly	26	7.1	7.8	6.5-8.5 or 6.5-9.2#
	apparent colour	fortnightly	26	<2	6	<25Pt/Co**
	hardness	annually	1	21	21	<200mg/L
	alkalinity	annually	1	13	13	NA
	iron	fortnightly	26	0.01	0.08	<0.3mg/L
Caroline Springs (5)	pH	fortnightly	26	6.9	8.4	6.5-8.5 or 6.5-9.2#
	apparent colour	fortnightly	26	<2	6	<25Pt/Co**
	hardness	annually	1	17	17	<200mg/L
	alkalinity	annually	1	16	16	NA
	iron	fortnightly	26	<0.01	0.1	<0.3mg/L
Deer Park (4)	pH	fortnightly	26	7.0	8.9	6.5-8.5 or 6.5-9.2#
	apparent colour	fortnightly	26	<2	6	<25Pt/Co**
	hardness	annually	1	16	16	<200mg/L
	alkalinity	annually	1	14	14	NA
	iron	fortnightly	26	<0.01	0.09	<0.3mg/L
East Keilor (6)	pH	fortnightly	26	6.8	8.0	6.5-8.5 or 6.5-9.2#
	apparent colour	fortnightly	26	<2	8	<25Pt/Co**
	hardness	annually	1	16	16	<200mg/L
	alkalinity	annually	1	14	14	NA
	iron	fortnightly	26	<0.01	0.1	<0.3mg/L
Little River (1A)	pH	>fortnightly	62	6.4	7.7	6.5-8.5 or 6.5-9.2#
	apparent colour	>fortnightly	62	<2	4	<25Pt/Co**
	hardness	annually	1	23	23	<200mg/L
	alkalinity	annually	1	22	22	NA
	iron	>fortnightly	62	0.01	0.1	<0.3mg/L

Water Sampling Locality (locality number)	Parameter	Frequency of Sampling	Number of samples	Minimum*	Maximum*	Aesthetic operating range
Maribyrnong (3A)	pH	fortnightly	51	6.8	7.7	6.5-8.5 or 6.5-9.2#
	apparent colour	fortnightly	51	<2	6	<25Pt/Co**
	hardness	annually	2	17	17	<200mg/L
	alkalinity	annually	2	13	13	NA
	iron	fortnightly	51	<0.01	0.07	<0.3mg/L
Moonee Ponds (9B)	pH	fortnightly	26	7.1	7.4	6.5-8.5 or 6.5-9.2#
	apparent colour	fortnightly	26	<2	8	<25Pt/Co**
	hardness	annually	1	19	19	<200mg/L
	alkalinity	annually	1	12	12	NA
	iron	fortnightly	26	0.01	0.09	<0.3mg/L
Parkville (11)	pH	fortnightly	26	6.8	7.5	6.5-8.5 or 6.5-9.2#
	apparent colour	fortnightly	26	<2	18	<25Pt/Co**
	hardness	annually	1	20	20	<200mg/L
	alkalinity	annually	1	12	12	NA
	iron	fortnightly	26	0.01	0.14	<0.3mg/L
Richmond (54)	pH	fortnightly	26	7.0	7.6	6.5-8.5 or 6.5-9.2#
	apparent colour	fortnightly	26	<2	10	<25Pt/Co**
	hardness	annually	1	14	14	<200mg/L
	alkalinity	annually	1	14	14	NA
	iron	fortnightly	26	0.07	0.09	<0.3mg/L
Strathmore (9A)	pH	fortnightly	25	7.2	7.9	6.5-8.5 or 6.5-9.2#
	apparent colour	fortnightly	25	<2	10	<25Pt/Co**
	hardness	annually	1	25	25	<200mg/L
	alkalinity	annually	1	17	17	NA
	iron	fortnightly	25	0.02	0.08	<0.3mg/L
Taylors Lakes (5A)	pH	>fortnightly	38	6.9	7.6	6.5-8.5 or 6.5-9.2#
	apparent colour	>fortnightly	38	<2	8	<25Pt/Co**
	hardness	annually	1	14	14	<200mg/L
	alkalinity	annually	1	15	15	NA
	iron	>fortnightly	38	0.03	0.18	<0.3mg/L
Tullamarine (7A)	pH	fortnightly	26	7.0	8.2	6.5-8.5 or 6.5-9.2#
	apparent colour	fortnightly	26	<2	8	<25Pt/Co**
	hardness	annually	1	14	14	<200mg/L
	alkalinity	annually	1	15	15	NA
	iron	fortnightly	26	<0.01	0.08	<0.3mg/L

Water Sampling Locality (locality number)	Parameter	Frequency of Sampling	Number of samples	Minimum*	Maximum*	Aesthetic operating range
Werribee (1)	pH	>fortnightly	50	7.1	8.4	6.5-8.5 or 6.5-9.2#
	apparent colour	>fortnightly	50	<2	4	<25Pt/Co**
	hardness	annually	1	18	18	<200mg/L
	alkalinity	annually	1	15	15	NA
	iron	>fortnightly	50	0.01	0.05	<0.3mg/L
Werribee South (2A)	pH	>fortnightly	62	7.0	8.4	6.5-8.5 or 6.5-9.2#
	apparent colour	>fortnightly	62	<2	16	<25Pt/Co**
	hardness	annually	1	18	18	<200mg/L
	alkalinity	annually	1	15	15	NA
	iron	>fortnightly	62	0.01	0.21	<0.3mg/L
Williamstown (3B)	pH	fortnightly	26	6.8	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	28	28	NA
	iron	fortnightly	26	<0.01	0.08	<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 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).

All 2016-17 water colour, hardness and iron monitoring data complied with the respective aesthetic operating ranges levels of 25 PCU, 200 mg/L and 0.3 mg/L. There is no guideline for alkalinity. Of the 497 samples tested for pH, there were 8 instances where pH readings were not within the *ADWG 2011* guideline range of 6.5 to 8.5. Two of these exceeded 8.5 (maximum 8.9) but not the tolerable upper value of 9.2, whilst another five were marginally below 6.5 (minimum 6.4). Such minor variations do not have health implications as, according to ADWG 2011, adverse health effects may occur at pH levels less than 4 or greater than 11.

8. Analysis of results – trends

This part of the report examines:

a) trends over time of water quality parameters tested that are designated as scheduled standards in *Safe Drinking Water Regulations (2015)*.

b) trends over time and between localities of parameters listed in Appendix A tables that have a corresponding Victorian standard or *ADWG 2011* guideline.

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

A comprehensive outline of our monitoring data for individual localities, together with monitoring frequencies, Victorian standards and *ADWG 2011* guidelines for both health-related and aesthetic water quality data, is contained in Appendix A tables. Contact information for obtaining further details of all water quality testing outlined in this report is provided in the *Further Information* section on page 24.

8.1 Historical compliance of standard parameters

Table 8.1 summarises trends over time (and extent of compliance) of water quality parameters that are scheduled standards in *Safe Drinking Water Regulations (2015)*.

Table 8.1 Compliance time trends of scheduled standard parameters

Parameter	Standard (2015 Regulations)	Localities compliant (% of customers supplied with compliant water)			
		2016-17	2015-16	2014-15	2013-14
E. coli	<1 per 100ml	15 / 15 (100%)	15 / 15 (100%)	15 / 15 (100%)	15 / 15 (100%)
Trihalomethanes	0.25 mg/L	15 / 15 (100%)	15 / 15 (100%)	15 / 15 (100%)	15 / 15 (100%)
Turbidity	5*	15 / 15 (100%)	15 / 15 (100%)	15 / 15 (100%)	15 / 15 (100%)

** 95th percentile not to exceed 5.0 NTU.*

8.2 Parameter trends over time and between localities

Analysis of parameter trends over time and between localities is used as a tool to better understand and possibly highlight water quality issues throughout our service area. This part of the report looks at such trends over the past three 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.

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

E. coli performance in our drinking water has consistently complied with the 2015 Victorian standards 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 *ADWG 2011* guideline of 5 mg/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 close to primary chlorination at Greenvale Reservoir, while the 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 and bulk water sources.

Aluminium (refer Figure B.3 in Appendix B)

Overall aluminium levels in the water supply are low. Apparent variations at these levels are considered to be 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, Werribee) do not exhibit markedly higher aluminium levels as compared with other localities.

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.

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)

ADWG 2011 refers to 'true colour' of water; however we have continued the historical practice of measuring the more conservative 'apparent colour', which gives higher readings. Nevertheless, our average apparent colour levels have been within the *ADWG 2011* True Colour guideline of 15 PCU. 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 *ADWG 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). *ADWG 2011* advises that its TDS guideline level of 600 mg/L can be substituted by an EC level of approximately 900 µs/cm. EC levels are quite low and relatively consistent within each water sampling locality. Slight trend of increased EC levels reflects greater supply from Sugarloaf/Winneke.

Fluoride (refer Figure B.8 in Appendix B)

Fluoride levels in the water supply are the result of fluoridation of the bulk supply (refer Section 1.1.1). Dosing is normally controlled such that levels are generally maintained between approximately 0.9 and 1.0 mg/L. Average fluoride levels in 2015-16 were lower due to a malfunction of fluoride dosing at Winneke treatment plant in March 2016, affecting most water sampling localities. These lower levels were maintained in 2016-17 due to more conservative dosing as well as periods of absence of dosing.

Hardness (refer Figure B.9 in Appendix B)

Water hardness levels are quite low and relatively consistent within each water sampling locality.

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 Silvan and Greenvale reservoirs. Nevertheless, variations occur due to changes in bulk water sources. A decline in iron levels throughout 2016-17 reflects an overall greater supply from Sugarloaf/Winneke.

Manganese (refer Figure B.11 in Appendix B)

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

Nitrate (refer Figure B.12 in Appendix B)

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

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. Note that Little River also has cement lined mains but its pH is being controlled 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.

Turbidity (refer Figure B.15 in Appendix B)

Turbidity levels in all localities continue to be less than 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, while higher turbidity localities tend to be supplied to a greater extent from Silvan and Greenvale reservoirs. Note that comparisons of 2014-15 levels with subsequent years may be inappropriate due to the changed standard.

Sulphate (refer Figure B.16 in Appendix B)

Sulphate levels are quite low and relatively consistent within each water quality locality. Lower sulphate (as well as sodium, hardness, conductivity and chloride – as per earlier Figures) levels in Caroline Springs, Richmond and Taylors Lakes localities are a reflection of the Silvan reservoir source. At the same time, higher turbidity, iron and colour in these localities also reflects Silvan as the source of the water.

Total trihalomethanes – (refer Figure B.17 in Appendix B)

Total trihalomethanes concentrations are relatively low (in comparison with the Victorian standard) and consistent among water sampling localities. Localities with higher levels tend to be more remote from primary chlorination.

9. Complaints relating to water quality

In 2016-17, City West Water received 435 complaints related to water supply quality. The various categories of complaints were distributed as shown in Table 9.1.

Table 9.1 Water quality related customer complaints received over the last three years

Complaint category	Numbers received				
	2016-17	2015-16	2014-15	Comparison with previous reporting periods	Comments
Discoloured water	338	187	215	Increase of 151 from previous reporting period.	Complaint recording procedure was clarified. Follow up calls are now recorded separately. Also, all customers' calls from a single incident are now recorded.
Taste/odour	43 (5 chlorine)*	31 (6 chlorine)*	37 (9 chlorine)*	No significant change.	Nil.
Air in water	47	19	9	Increase of 28 from previous reporting period.	As per discoloured water.
Other (alleged illness) (blocked filter) (blue-green water) (staining)	7 (1) (3) (1) (2)	6 (0) (6) (0) (0)	1 (0) (1) (0) (0)	No significant change.	Nil.
Total	**435**	**243**	**262**	Increase of 192 from previous reporting period.	As per discoloured water.
No. of properties	445,000	429,000	414,000	-	-
Complaints per 100 properties	0.098	0.057	0.063	-	-

* Number of complaints received of chlorine taste or odour.

The water quality complaints received during 2016-17 in each water sampling locality are shown in Table 9.2.

Table 9.2 Water quality related customer complaints received during 2016-17 per water sampling locality.

Water sampling locality (Locality number)	Numbers received				
	Discoloured water	Taste/odour	Air in water	Other (alleged illness) (blocked filter) (blue-green water) (staining)	Total complaints
Altona (2)	35	3	0	1	39
Caroline Springs (5)	48	4	3	0	55
Deer Park (4)	10	1	2	0	13
East Keilor (6)	28	0	3	0	31
Little River (1A)	0	0	0	0	0
Maribyrnong (3A)	20	2	5	1	28
Moonee Ponds (9B)	6	2	18	0	26
Parkville (11)	21	7	1	1	30
Richmond (54)	18	1	1	0	20
Strathmore (9A)	0	0	1	0	1
Taylors Lakes (5A)	59	6	3	1	69
Tullamarine (7A)	6	1	2	0	9
Werribee (1)	78	12	5	3	98
Werribee South (2A)	4	2	0	0	6
Williamstown (3B)	5	2	3	0	10

Complaints and responses

We provide individual responses to water quality related complaints. These 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 to City West Water 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 referred to our Water Quality Scientist for detailed discussion, analysis and investigation. Customers may be advised to seek medical advice.

White water (air in water)

White water (water with a cloudy appearance that clarifies within a few minutes) indicates the presence of tiny, harmless air bubbles. It tends to be associated with maintenance and repair works, when air can enter water pipes. As the aerated water is used by customers, its appearance returns to normal. In the past we often responded to customers' concerns with targeted mains flushing, however with increasing emphasis on the need to conserve water, we spend more time on explaining the phenomenon and obtaining customer agreement to not flush water mains.

Blue-green water

On a seemingly random basis, customers at a small number of properties report blue-green water (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 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.

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. If customers are experiencing blue-green water or have other water quality concerns, they are asked to call us on 132 642 for further information and advice.

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 sensation. Fluctuations in chlorine levels (and hence, the perception of chlorine taste or odour) occur from time to time, largely due to changed water demands and flow rates. Our response to customers reporting chlorine taste/odour involves providing an explanation, as well as considering changes to chlorine dosing.

Other tastes/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* (SDWA), we have a documented water quality Risk Management Plan that is subject to independent audit in terms of its content and implementation. Our Plan was audited for the fifth time in March 2016, during which it was examined to determine compliance with the obligations imposed by Section 7(1) of the *Safe Drinking Water Act 2003*. In this regard, the audit:

- determined whether City West Water met all the requirements described under Section 7(1);
- determined whether the Risk Management Plan that met all the specifications in the Act (Section 9) and its Regulations in an effective manner;
- inspected all documents specified in the Regulations;
- determined whether the identified water quality control measures and control measure combinations are in place operationally and are adequate to control water safety risks.

The audit concluded that the water quality Risk Management Plan complies with the obligations imposed by Section 7(1) of the SDWA during the audit period (March 2014 to March 2016). No suggested opportunities for improvement were identified. A copy of the audit certificate is in Appendix C. The Risk Management Plan that is subject to independent audit at approximately 18 month intervals; the next audit is due in 2017-18.

Significant portions of the Risk Management Plan are based on our pre-existing HACCP plan which itself is audited internally on a quarterly basis, as well as annually by an external, independent auditor. The HACCP plan specifically addresses issues such as staff 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 and well known in the food industry for protecting the welfare and safety of consumers. It is based on the identification and management of risks (to quality) at key points within a production or product delivery process.

The HACCP certification demonstrates that we attend 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 requirements.

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

City West Water has not entered into any undertakings with the DHHS, 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*

City West Water did not have any Section 20 or Section 21 exemptions 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*

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 drinking water. We do not manage any water supplies that have been declared as 'regulated water'.

In certain cases however, we do supply water from our water distribution mains to customers with privately owned off-takes. Such supplies are 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 off-take point, albeit that we endeavour to maintain these. City West Water has embarked on a program to reduce the number of such private supplies.

15. Further Information

For further information on the details of this report or on general water quality matters can be obtained by contacting our Water Quality Scientist, Georges Ruta directly on (03) 9313 8388 or email **george.ruta@citywestwater.com.au** or our Water Quality Engineer, Carlota Rodriguez directly on (03) 9313 7726 or email **carlota.rodriguez@citywestwater.com.au**. Written enquiries can be addressed to Mr Georges Ruta or Ms Carlota Rodriguez, City West Water, Locked Bag 350, Sunshine, Victoria, 3020.

Appendix A: Water quality data by locality

(based on results of tests on drinking water samples obtained from reticulation system sampling sites (water mains, customer taps, service reservoirs/tanks) tested between 1 July 2016 and 30 June 2017)

WATER SAMPLING LOCALITY	Altona	LOCALITY No.	2
FOR PERIOD	1 July 2016 to 30 June 2017	POPULATION (2011 Census)	97,611

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37ºC)	orgs/mL	1000*	<1	<1	19	>weekly	301	301	100%
Total Coliforms	orgs/100mL	N	<1	<1	38	>weekly	303	-	-
E. coli	orgs/100mL	100%<1[#]	<1	<1	<1	>weekly	303	303	100%
Free Chlorine	mg/L	5	<0.01	0.17	0.49	>weekly	303	303	100%
Total Chlorine	mg/L	5	<0.05	0.26	0.53	>weekly	303	303	100%
Alkalinity (as $CaCO_3$)	mg/L	N	13	13	13	annually	1	-	-
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	5.6	5.6	5.6	annually	1	-	-
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	3	6	fortnightly	26	26	100%
Conductivity	µS/cm	~900	71	111	130	fortnightly	26	26	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	0.20	0.80	0.88	>fortnightly	28	28	100%
Hardness (as $CaCO_3$)	mg/L	200	21	21	21	annually	1	1	100%
Iron	mg/L	0.3	0.01	0.03	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	1.8	1.8	1.8	annually	1	-	-
Manganese	mg/L	0.1	<0.001	0.002	0.007	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	1.28	1.28	1.28	annually	1	1	100%
pH	units	6.5-8.5	7.1	7.3	7.8	fortnightly	26	26	100%
pH	units	6.5-9.2	7.1	7.3	7.8	fortnightly	26	26	100%
Potassium	mg/L	N	1.0	1.0	1.0	annually	1	-	-
Silica (SiO_2)	mg/L	80	4.6	4.6	4.6	annually	1	1	100%
Sodium	mg/L	180	7.6	7.6	7.6	annually	1	1	100%
Sulphate	mg/L	250	6.1	6.1	6.1	annually	1	1	100%
Total Organic Carbon	mg/L	N	2.4	2.4	2.4	annually	1	-	-
Total Phosphorus	mg/L	N	0.012	0.012	0.012	annually	1	-	-
Total Dissolved Solids	mg/L	600	45	45	45	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	0.5[1]	0.7	weekly	52	-	within standard
Zinc	mg/L	3	0.003	0.003	0.003	annually	1	1	100%
Dibromochloromethane	mg/L	N	<0.001	0.005	0.008	monthly	13	-	-
Dichlorobromomethane	mg/L	N	<0.001	0.014	0.019	monthly	13	-	-
Bromoform	mg/L	N	<0.001	<0.001	<0.001	monthly	13	-	-
Chloroform	mg/L	N	<0.001	0.034	0.054	monthly	13	-	-
Total Trihalomethanes	mg/L	0.25	0.044	0.053	0.068	monthly	13	13	100%
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	0.016	0.016	0.016	annually	1	1	100%

* Internal City West Water guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
1 Victorian standard: 95th percentile (shown) less than or equal to 5 NTU.

WATER SAMPLING LOCALITY	Caroline Springs	LOCALITY No.	5
FOR PERIOD	1 July 2016 to 30 June 2017	POPULATION (2011 Census)	87,947

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37ºC)	orgs/mL	1000*	<1	<1	520	>weekly	276	276	100%
Total Coliforms	orgs/100mL	N	<1	<1	1	>weekly	270	-	-
E. coli	orgs/100mL	100%<1[#]	<1	<1	<1	>weekly	277	277	100%
Free Chlorine	mg/L	5	<0.01	0.19	0.59	>weekly	277	277	100%
Total Chlorine	mg/L	5	0.03	0.28	0.69	>weekly	277	277	100%
Alkalinity (as $CaCO_3$)	mg/L	N	16	16	16	annually	1	-	-
Aluminium (acid soluble)	mg/L	0.2	<0.01	0.01	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	4.8	4.8	4.8	annually	1	-	-
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	3	6	fortnightly	26	26	100%
Conductivity	µS/cm	~900	59	93	130	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	0.03	0.80	0.97	>fortnightly	27	27	100%
Hardness (as $CaCO_3$)	mg/L	200	17	17	17	annually	1	1	100%
Iron	mg/L	0.3	<0.01	0.03	0.10	fortnightly	26	26	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	-	-
Manganese	mg/L	0.1	<0.001	0.003	0.015	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	6.5-8.5	6.9	7.4	8.4	fortnightly	26	26	100%
pH	units	6.5-9.2	6.9	7.4	8.4	fortnightly	26	26	100%
Potassium	mg/L	N	0.7	0.7	0.7	annually	1	-	-
Silica (SiO_2)	mg/L	80	3.6	3.6	3.6	annually	1	1	100%
Sodium	mg/L	180	5.4	5.4	5.4	annually	1	1	100%
Sulphate	mg/L	250	2.6	2.6	2.6	annually	1	1	100%
Total Organic Carbon	mg/L	N	0.7	0.7	0.7	annually	1	-	-
Total Phosphorus	mg/L	N	0.007	0.007	0.007	annually	1	-	-
Total Dissolved Solids	mg/L	600	36	36	36	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	0.7[1]	0.8	weekly	52	-	within standard
Zinc	mg/L	3	0.002	0.002	0.002	annually	1	1	100%
Dibromochloromethane	mg/L	N	<0.001	0.003	0.007	monthly	13	-	-
Dichlorobromomethane	mg/L	N	0.005	0.008	0.013	monthly	13	-	-
Bromoform	mg/L	N	<0.001	<0.001	<0.001	monthly	13	-	-
Chloroform	mg/L	N	0.014	0.022	0.035	monthly	13	-	-
Total Trihalomethanes	mg/L	0.25	0.028	0.034	0.045	monthly	13	13	100%
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 guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
1 Victorian standard: 95th percentile (shown) less than or equal to 5 NTU.

WATER SAMPLING LOCALITY	Deer Park	LOCALITY No.	4
FOR PERIOD	1 July 2016 to 30 June 2017	POPULATION (2011 Census)	53,687

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37ºC)	orgs/mL	1000*	<1	<1	100	>weekly	182	182	100%
Total Coliforms	orgs/100mL	N	<1	<1	1	>weekly	182	-	-
E. coli	orgs/100mL	100%<1#	<1	<1	<1	>weekly	182	182	100%
Free Chlorine	mg/L	5	<0.01	0.22	0.47	>weekly	182	182	100%
Total Chlorine	mg/L	5	0.05	0.31	0.60	>weekly	182	182	100%
Alkalinity (as $CaCO_3$)	mg/L	N	14	14	14	annually	1	-	-
Aluminium (acid soluble)	mg/L	0.2	<0.01	0.02	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	4.3	4.3	4.3	annually	1	-	-
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	3	6	fortnightly	26	26	100%
Conductivity	µS/cm	~900	63	110	140	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	0.66	0.84	0.93	>fortnightly	27	27	100%
Hardness (as $CaCO_3$)	mg/L	200	16	16	16	annually	1	1	100%
Iron	mg/L	0.3	<0.01	0.02	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	1.4	1.4	1.4	annually	1	-	-
Manganese	mg/L	0.1	<0.001	0.002	0.010	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	0.41	0.41	0.41	annually	1	1	100%
pH	units	6.5-8.5	7.0	7.5	8.9	fortnightly	26	24	92.31%
pH	units	6.5-9.2	7.0	7.5	8.9	fortnightly	26	26	100%
Potassium	mg/L	N	0.7	0.7	0.7	annually	1	-	-
Silica (SiO_2)	mg/L	80	3.6	3.6	3.6	annually	1	1	100%
Sodium	mg/L	180	5.5	5.5	5.5	annually	1	1	100%
Sulphate	mg/L	250	2.8	2.8	2.8	annually	1	1	100%
Total Organic Carbon	mg/L	N	0.8	0.8	0.8	annually	1	-	-
Total Phosphorus	mg/L	N	0.005	0.005	0.005	annually	1	-	-
Total Dissolved Solids	mg/L	600	46	46	46	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	0.6[1]	0.9	weekly	52	-	within standard
Zinc	mg/L	3	0.003	0.003	0.003	annually	1	1	100%
Dibromochloromethane	mg/L	N	0.002	0.006	0.009	monthly	13	-	-
Dichlorobromomethane	mg/L	N	0.008	0.013	0.020	monthly	13	-	-
Bromoform	mg/L	N	<0.001	0.001	0.001	monthly	13	-	-
Chloroform	mg/L	N	0.014	0.020	0.027	monthly	13	-	-
Total Trihalomethanes	mg/L	0.25	0.027	0.039	0.057	monthly	13	13	100%
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 guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
1 Victorian standard: 95th percentile (shown) less than or equal to 5 NTU.

WATER SAMPLING LOCALITY	East Keilor	LOCALITY No.	6
FOR PERIOD	1 July 2016 to 30 June 2017	POPULATION (2011 Census)	38,063

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37ºC)	orgs/mL	1000*	<1	<1	190	>weekly	145	145	100%
Total Coliforms	orgs/100mL	N	<1	<1	<1	>weekly	145	-	-
E. coli	orgs/100mL	100%<1[#]	<1	<1	<1	>weekly	145	145	100%
Free Chlorine	mg/L	5	<0.01	0.27	0.59	>weekly	145	145	100%
Total Chlorine	mg/L	5	0.03	0.37	0.71	>weekly	145	145	100%
Alkalinity (as $CaCO_3$)	mg/L	N	14	14	14	annually	1	-	-
Aluminium (acid soluble)	mg/L	0.2	<0.01	0.02	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	4.1	4.1	4.1	annually	1	-	-
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	3	8	fortnightly	26	26	100%
Conductivity	µS/cm	~900	64	106	140	fortnightly	26	26	100%
Copper	mg/L	1	0.010	0.010	0.010	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	0.84	0.94	>fortnightly	27	27	100%
Hardness (as $CaCO_3$)	mg/L	200	16	16	16	annually	1	1	100%
Iron	mg/L	0.3	<0.01	0.03	0.10	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	-	-
Manganese	mg/L	0.1	<0.001	0.002	0.012	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	0.49	0.49	0.49	annually	1	1	100%
pH	units	6.5-8.5	6.8	7.4	8.0	fortnightly	26	26	100%
pH	units	6.5-9.2	6.8	7.4	8.0	fortnightly	26	26	100%
Potassium	mg/L	N	0.7	0.7	0.7	annually	1	-	-
Silica (SiO_2)	mg/L	80	3.3	3.3	3.3	annually	1	1	100%
Sodium	mg/L	180	5.2	5.2	5.2	annually	1	1	100%
Sulphate	mg/L	250	2.6	2.6	2.6	annually	1	1	100%
Total Organic Carbon	mg/L	N	1.1	1.1	1.1	annually	1	-	-
Total Phosphorus	mg/L	N	<0.005	<0.005	<0.005	annually	1	-	-
Total Dissolved Solids	mg/L	600	36	36	36	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	0.6[1]	0.8	weekly	52	-	within standard
Zinc	mg/L	3	0.002	0.002	0.002	annually	1	1	100%
Dibromochloromethane	mg/L	N	0.001	0.005	0.009	monthly	13	-	-
Dichlorobromomethane	mg/L	N	0.006	0.011	0.017	monthly	13	-	-
Bromoform	mg/L	N	<0.001	<0.001	<0.001	monthly	13	-	-
Chloroform	mg/L	N	0.012	0.024	0.072	monthly	13	-	-
Total Trihalomethanes	mg/L	0.25	0.022	0.040	0.083	monthly	13	13	100%
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	0.006	0.006	0.006	annually	1	1	100%

* Internal City West Water guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
1 Victorian standard: 95th percentile (shown) less than or equal to 5 NTU.

WATER SAMPLING LOCALITY	Little River	LOCALITY No.	1A
FOR PERIOD	1 July 2016 to 30 June 2017	POPULATION (2011 Census)	625

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37ºC)	orgs/mL	1000*	<1	<1	23	>weekly	119	119	100%
Total Coliforms	orgs/100mL	N	<1	<1	53	>weekly	119	-	-
E. coli	orgs/100mL	100%<1[#]	<1	<1	<1	>weekly	119	119	100%
Free Chlorine	mg/L	5	<0.01	0.21	0.58	>weekly	119	119	100%
Total Chlorine	mg/L	5	0.03	0.30	0.66	>weekly	119	119	100%
Alkalinity (as $CaCO_3$)	mg/L	N	22	22	22	annually	1	-	-
Aluminium (acid soluble)	mg/L	0.2	<0.01	0.02	0.04	>fortnightly	49	49	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	7.6	7.6	7.6	annually	1	-	-
Chloride	mg/L	250	13	13	13	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	4	>fortnightly	62	62	100%
Conductivity	µS/cm	~900	83	124	160	>fortnightly	62	62	100%
Copper	mg/L	1	0.023	0.023	0.023	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.40	0.81	0.99	>fortnightly	64	64	100%
Hardness (as $CaCO_3$)	mg/L	200	23	23	23	annually	1	1	100%
Iron	mg/L	0.3	0.01	0.03	0.10	>fortnightly	62	62	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	1.0	1.0	1.0	annually	1	-	-
Manganese	mg/L	0.1	<0.001	0.002	0.006	>fortnightly	62	62	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	6.5-8.5	6.4	7.0	7.7	>fortnightly	62	57	91.94%
pH	units	6.5-9.2	6.4	7.0	7.7	>fortnightly	62	57	91.94%
Potassium	mg/L	N	0.8	0.8	0.8	annually	1	-	-
Silica (SiO_2)	mg/L	80	4.9	4.9	4.9	annually	1	1	100%
Sodium	mg/L	180	6.4	6.4	6.4	annually	1	1	100%
Sulphate	mg/L	250	3.2	3.2	3.2	annually	1	1	100%
Total Organic Carbon	mg/L	N	1.0	1.0	1.0	annually	1	-	-
Total Phosphorus	mg/L	N	<0.005	<0.005	<0.005	annually	1	-	-
Total Dissolved Solids	mg/L	600	44	44	44	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	0.4[1]	0.6	>weekly	88	-	within standard
Zinc	mg/L	3	0.011	0.011	0.011	annually	1	1	100%
Dibromochloromethane	mg/L	N	0.003	0.007	0.011	>fortnightly	49	-	-
Dichlorobromomethane	mg/L	N	0.011	0.018	0.023	>fortnightly	49	-	-
Bromoform	mg/L	N	<0.001	0.001	0.001	>fortnightly	49	-	-
Chloroform	mg/L	N	0.025	0.037	0.056	>fortnightly	49	-	-
Total Trihalomethanes	mg/L	0.25	0.048	0.063	0.081	>fortnightly	49	49	100%
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	0.018	0.018	0.018	annually	1	1	100%

* Internal City West Water guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
1 Victorian standard: 95th percentile (shown) less than or equal to 5 NTU.

WATER SAMPLING LOCALITY	Maribyrnong	LOCALITY No.	3A
FOR PERIOD	1 July 2016 to 30 June 2017	POPULATION (2011 Census)	101,272

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37ºC)	orgs/mL	1000*	<1	<1	44	>weekly	356	356	100%
Total Coliforms	orgs/100mL	N	<1	<1	19	>weekly	356	-	-
E. coli	orgs/100mL	100%<1[#]	<1	<1	<1	>weekly	356	356	100%
Free Chlorine	mg/L	5	<0.01	0.24	0.59	>weekly	356	356	100%
Total Chlorine	mg/L	5	0.06	0.33	0.64	>weekly	356	356	100%
Alkalinity (as $CaCO_3$)	mg/L	N	13	13	13	annually	1	-	-
Aluminium (acid soluble)	mg/L	0.2	0.02	0.03	0.06	fortnightly	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	-	-
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	3	6	fortnightly	26	26	100%
Conductivity	µS/cm	~900	66	106	130	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	0.48	0.82	0.94	>fortnightly	28	28	100%
Hardness (as $CaCO_3$)	mg/L	200	17	17	17	annually	1	1	100%
Iron	mg/L	0.3	<0.01	0.03	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	1.5	1.5	1.5	annually	1	-	-
Manganese	mg/L	0.1	<0.001	0.003	0.018	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	0.84	0.84	0.84	annually	1	1	100%
pH	units	6.5-8.5	6.8	7.2	7.5	fortnightly	26	19	73.08%
pH	units	6.5-9.2	6.8	7.2	7.5	fortnightly	26	21	80.77%
Potassium	mg/L	N	0.8	0.8	0.8	annually	1	-	-
Silica (SiO_2)	mg/L	80	4.6	4.6	4.6	annually	1	1	100%
Sodium	mg/L	180	5.9	5.9	5.9	annually	1	1	100%
Sulphate	mg/L	250	3.6	3.6	3.6	annually	1	1	100%
Total Organic Carbon	mg/L	N	2.8	2.8	2.8	annually	1	-	-
Total Phosphorus	mg/L	N	<0.005	<0.005	<0.005	annually	1	-	-
Total Dissolved Solids	mg/L	600	38	38	38	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	0.6[1]	0.7	weekly	52	-	within standard
Zinc	mg/L	3	0.003	0.003	0.003	annually	1	1	100%
Dibromochloromethane	mg/L	N	0.001	0.005	0.007	monthly	13	-	-
Dichlorobromomethane	mg/L	N	0.010	0.012	0.015	monthly	13	-	-
Bromoform	mg/L	N	<0.001	<0.001	<0.001	monthly	13	-	-
Chloroform	mg/L	N	0.016	0.036	0.052	monthly	13	-	-
Total Trihalomethanes	mg/L	0.25	0.035	0.053	0.068	monthly	13	13	100%
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	0.019	0.019	0.019	annually	1	1	100%

* Internal City West Water guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
1 Victorian standard: 95th percentile (shown) less than or equal to 5 NTU.

WATER SAMPLING LOCALITY	Moonee Ponds	LOCALITY No.	9B
FOR PERIOD	1 July 2016 to 30 June 2017	POPULATION (2011 Census)	68,395

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37ºC)	orgs/mL	1000*	<1	<1	45	>weekly	224	224	100%
Total Coliforms	orgs/100mL	N	<1	<1	<1	>weekly	224	-	-
E. coli	orgs/100mL	100%<1[#]	<1	<1	<1	>weekly	224	224	100%
Free Chlorine	mg/L	5	<0.01	0.14	0.68	>weekly	224	224	100%
Total Chlorine	mg/L	5	0.03	0.22	0.80	>weekly	224	224	100%
Alkalinity (as $CaCO_3$)	mg/L	N	12	12	12	annually	1	-	-
Aluminium (acid soluble)	mg/L	0.2	0.02	0.04	0.05	fortnightly	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	4.8	4.8	4.8	annually	1	-	-
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	5	8	fortnightly	26	26	100%
Conductivity	µS/cm	~900	59	86	120	fortnightly	26	26	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	0.13	0.79	0.90	>fortnightly	28	28	100%
Hardness (as $CaCO_3$)	mg/L	200	19	19	19	annually	1	1	100%
Iron	mg/L	0.3	0.01	0.05	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	1.6	1.6	1.6	annually	1	-	-
Manganese	mg/L	0.1	<0.001	0.004	0.011	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	1.28	1.28	1.28	annually	1	1	100%
pH	units	6.5-8.5	7.1	7.2	7.4	fortnightly	26	26	100%
pH	units	6.5-9.2	7.1	7.2	7.4	fortnightly	26	26	100%
Potassium	mg/L	N	0.9	0.9	0.9	annually	1	-	-
Silica (SiO_2)	mg/L	80	4.6	4.6	4.6	annually	1	1	100%
Sodium	mg/L	180	6.3	6.3	6.3	annually	1	1	100%
Sulphate	mg/L	250	5.6	5.6	5.6	annually	1	1	100%
Total Organic Carbon	mg/L	N	1.1	1.1	1.1	annually	1	-	-
Total Phosphorus	mg/L	N	<0.005	<0.005	<0.005	annually	1	-	-
Total Dissolved Solids	mg/L	600	46	46	46	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	0.8[1]	1.7	weekly	52	-	within standard
Zinc	mg/L	3	0.002	0.002	0.002	annually	1	1	100%
Dibromochloromethane	mg/L	N	0.001	0.003	0.005	monthly	13	-	-
Dichlorobromomethane	mg/L	N	0.009	0.011	0.014	monthly	13	-	-
Bromoform	mg/L	N	<0.001	<0.001	<0.001	monthly	13	-	-
Chloroform	mg/L	N	0.039	0.050	0.072	monthly	13	-	-
Total Trihalomethanes	mg/L	0.25	0.055	0.064	0.085	monthly	13	13	100%
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 guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
1 Victorian standard: 95th percentile (shown) less than or equal to 5 NTU.

WATER SAMPLING LOCALITY	Parkville	LOCALITY No.	11
FOR PERIOD	1 July 2016 to 30 June 2017	POPULATION (2011 Census)	111,305

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37ºC)	orgs/mL	1000*	<1	<1	650	>weekly	368	368	100%
Total Coliforms	orgs/100mL	N	<1	<1	200	>weekly	368	-	-
E. coli	orgs/100mL	100%<1[#]	<1	<1	<1	>weekly	368	368	100%
Free Chlorine	mg/L	5	<0.01	0.22	0.53	>weekly	368	368	100%
Total Chlorine	mg/L	5	0.03	0.31	0.63	>weekly	368	368	100%
Alkalinity (as $CaCO_3$)	mg/L	N	12	12	12	annually	1	-	-
Aluminium (acid soluble)	mg/L	0.2	0.02	0.04	0.11	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	5.1	5.1	5.1	annually	1	-	-
Chloride	mg/L	250	17	17	17	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	18	fortnightly	26	26	100%
Conductivity	µS/cm	~900	53	104	130	fortnightly	26	26	100%
Copper	mg/L	1	0.007	0.007	0.007	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.30	0.82	0.92	>fortnightly	28	28	100%
Hardness (as $CaCO_3$)	mg/L	200	20	20	20	annually	1	1	100%
Iron	mg/L	0.3	0.01	0.04	0.14	fortnightly	26	26	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	1.8	1.8	1.8	annually	1	-	-
Manganese	mg/L	0.1	<0.001	0.003	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	1.51	1.51	1.51	annually	1	1	100%
pH	units	6.5-8.5	6.8	7.2	7.5	fortnightly	26	26	100%
pH	units	6.5-9.2	6.8	7.2	7.5	fortnightly	26	26	100%
Potassium	mg/L	N	1.0	1.0	1.0	annually	1	-	-
Silica (SiO_2)	mg/L	80	4.1	4.1	4.1	annually	1	1	100%
Sodium	mg/L	180	7.4	7.4	7.4	annually	1	1	100%
Sulphate	mg/L	250	8.1	8.1	8.1	annually	1	1	100%
Total Organic Carbon	mg/L	N	1.0	1.0	1.0	annually	1	-	-
Total Phosphorus	mg/L	N	<0.005	<0.005	<0.005	annually	1	-	-
Total Dissolved Solids	mg/L	600	65	65	65	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	1.2[1]	2.4	weekly	52	-	within standard
Zinc	mg/L	3	0.002	0.002	0.002	annually	1	1	100%
Dibromochloromethane	mg/L	N	<0.001	0.004	0.007	monthly	13	-	-
Dichlorobromomethane	mg/L	N	0.007	0.012	0.016	monthly	13	-	-
Bromoform	mg/L	N	<0.001	<0.001	0.001	monthly	13	-	-
Chloroform	mg/L	N	0.017	0.036	0.072	monthly	13	-	-
Total Trihalomethanes	mg/L	0.25	0.037	0.052	0.080	monthly	13	13	100%
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 guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
1 Victorian standard: 95th percentile (shown) less than or equal to 5 NTU.

WATER SAMPLING LOCALITY	Richmond	LOCALITY No.	54
FOR PERIOD	1 July 2016 to 30 June 2017	POPULATION (2011 Census)	20,646

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37ºC)	orgs/mL	1000*	<1	<1	5	>weekly	105	105	100%
Total Coliforms	orgs/100mL	N	<1	<1	<1	>weekly	105	-	-
E. coli	orgs/100mL	100%<1[#]	<1	<1	<1	>weekly	105	105	100%
Free Chlorine	mg/L	5	0.03	0.19	0.58	>weekly	105	105	100%
Total Chlorine	mg/L	5	0.03	0.28	0.69	>weekly	105	105	100%
Alkalinity (as $CaCO_3$)	mg/L	N	14	14	14	annually	1	-	-
Aluminium (acid soluble)	mg/L	0.2	0.02	0.04	0.06	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	3.6	3.6	3.6	annually	1	-	-
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	6	10	fortnightly	26	26	100%
Conductivity	µS/cm	~900	53	62	130	fortnightly	26	26	100%
Copper	mg/L	1	0.047	0.047	0.047	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.70	0.80	0.85	>fortnightly	28	28	100%
Hardness (as $CaCO_3$)	mg/L	200	14	14	14	annually	1	1	100%
Iron	mg/L	0.3	0.07	0.08	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	1.2	1.2	1.2	annually	1	-	-
Manganese	mg/L	0.1	0.003	0.005	0.010	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	0.75	0.75	0.75	annually	1	1	100%
pH	units	6.5-8.5	7.0	7.3	7.6	fortnightly	26	26	100%
pH	units	6.5-9.2	7.0	7.3	7.6	fortnightly	26	26	100%
Potassium	mg/L	N	0.6	0.6	0.6	annually	1	-	-
Silica (SiO_2)	mg/L	80	6.3	6.3	6.3	annually	1	1	100%
Sodium	mg/L	180	3.9	3.9	3.9	annually	1	1	100%
Sulphate	mg/L	250	1.6	1.6	1.6	annually	1	1	100%
Total Organic Carbon	mg/L	N	1.0	1.0	1.0	annually	1	-	-
Total Phosphorus	mg/L	N	<0.005	<0.005	<0.005	annually	1	-	-
Total Dissolved Solids	mg/L	600	31	31	31	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	0.9[1]	1.0	weekly	52	-	within standard
Zinc	mg/L	3	0.009	0.009	0.009	annually	1	1	100%
Dibromochloromethane	mg/L	N	<0.001	0.001	0.001	monthly	13	-	-
Dichlorobromomethane	mg/L	N	0.008	0.010	0.013	monthly	13	-	-
Bromoform	mg/L	N	<0.001	<0.001	<0.001	monthly	13	-	-
Chloroform	mg/L	N	0.058	0.081	0.110	monthly	13	-	-
Total Trihalomethanes	mg/L	0.25	0.070	0.093	0.121	monthly	13	13	100%
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	annually	1	1	100%
Dichloroacetic acid	mg/L	0.1	0.006	0.006	0.006	annually	1	1	100%
Trichloroacetic acid	mg/L	0.1	0.047	0.047	0.047	annually	1	1	

* Internal City West Water guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
1 Victorian standard: 95th percentile (shown) less than or equal to 5 NTU.

WATER SAMPLING LOCALITY	Strathmore	LOCALITY No.	9A
FOR PERIOD	1 July 2016 to 30 June 2017	POPULATION (2011 Census)	8,917

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37ºC)	orgs/mL	1000*	<1	<1	10	>weekly	78	78	100%
Total Coliforms	orgs/100mL	N	<1	<1	18	>weekly	78	-	-
E. coli	orgs/100mL	100%<1[#]	<1	<1	<1	>weekly	78	78	100%
Free Chlorine	mg/L	5	<0.01	0.06	0.26	>weekly	78	78	100%
Total Chlorine	mg/L	5	0.03	0.13	0.36	>weekly	78	78	100%
Alkalinity (as $CaCO_3$)	mg/L	N	17	17	17	annually	1	-	-
Aluminium (acid soluble)	mg/L	0.2	0.02	0.04	0.06	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	7.1	7.1	7.1	annually	1	-	-
Chloride	mg/L	250	21	21	21	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	25	25	100%
Conductivity	µS/cm	~900	56	74	140	fortnightly	25	25	100%
Copper	mg/L	1	0.002	0.002	0.002	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	0.81	0.91	>fortnightly	27	27	100%
Hardness (as $CaCO_3$)	mg/L	200	25	25	25	annually	1	1	100%
Iron	mg/L	0.3	0.02	0.06	0.08	fortnightly	25	25	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	annually	1	1	100%
Magnesium	mg/L	N	1.9	1.9	1.9	annually	1	-	-
Manganese	mg/L	0.1	<0.001	0.004	0.006	fortnightly	25	25	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO_3)	mg/L	50	1.64	1.64	1.64	annually	1	1	100%
pH	units	6.5-8.5	7.2	7.4	7.9	fortnightly	25	25	100%
pH	units	6.5-9.2	7.2	7.4	7.9	fortnightly	25	25	100%
Potassium	mg/L	N	1.1	1.1	1.1	annually	1	-	-
Silica (SiO_2)	mg/L	80	3.8	3.8	3.8	annually	1	1	100%
Sodium	mg/L	180	8.7	8.7	8.7	annually	1	1	100%
Sulphate	mg/L	250	9.1	9.1	9.1	annually	1	1	100%
Total Organic Carbon	mg/L	N	0.6	0.6	0.6	annually	1	-	-
Total Phosphorus	mg/L	N	0.006	0.006	0.006	annually	1	-	-
Total Dissolved Solids	mg/L	600	54	54	54	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	0.9[1]	1.1	weekly	51	-	within standard
Zinc	mg/L	3	0.001	0.001	0.001	annually	1	1	100%
Dibromochloromethane	mg/L	N	<0.001	0.002	0.006	monthly	13	-	-
Dichlorobromomethane	mg/L	N	0.008	0.010	0.016	monthly	13	-	-
Bromoform	mg/L	N	<0.001	<0.001	<0.001	monthly	13	-	-
Chloroform	mg/L	N	0.039	0.064	0.088	monthly	13	-	-
Total Trihalomethanes	mg/L	0.25	0.056	0.077	0.097	monthly	13	13	100%
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 guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
1 Victorian standard: 95th percentile (shown) less than or equal to 5 NTU.

WATER SAMPLING LOCALITY	Taylor Lakes	LOCALITY No.	5A
FOR PERIOD	1 July 2016 to 30 June 2017	POPULATION (2011 Census)	63,394

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37ºC)	orgs/mL	1000*	<1	<1	4,500	>weekly	234	233	99.57%
Total Coliforms	orgs/100mL	N	<1	<1	190	>weekly	235	-	-
E. coli	orgs/100mL	100%<1[#]	<1	<1	<1	>weekly	235	235	100%
Free Chlorine	mg/L	5	<0.01	0.38	0.76	>weekly	235	235	100%
Total Chlorine	mg/L	5	0.03	0.49	0.90	>weekly	235	235	100%
Alkalinity (as $CaCO_3$)	mg/L	N	15	15	15	annually	1	-	-
Aluminium (acid soluble)	mg/L	0.2	<0.01	0.01	0.03	fortnightly	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	3.7	3.7	3.7	annually	1	-	-
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	5	8	>fortnightly	38	38	100%
Conductivity	µS/cm	~900	57	64	70	>fortnightly	38	38	100%
Copper	mg/L	1	0.003	0.003	0.003	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.80	0.85	0.94	>fortnightly	39	39	100%
Hardness (as $CaCO_3$)	mg/L	200	14	14	14	annually	1	1	100%
Iron	mg/L	0.3	0.03	0.07	0.18	>fortnightly	38	38	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	-	-
Manganese	mg/L	0.1	0.002	0.010	0.065	>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	0.20	0.20	0.20	annually	1	1	100%
pH	units	6.5-8.5	6.9	7.2	7.6	>fortnightly	38	38	100%
pH	units	6.5-9.2	6.9	7.2	7.6	>fortnightly	38	38	100%
Potassium	mg/L	N	0.6	0.6	0.6	annually	1	-	-
Silica (SiO_2)	mg/L	80	3.5	3.5	3.5	annually	1	1	100%
Sodium	mg/L	180	4.5	4.5	4.5	annually	1	1	100%
Sulphate	mg/L	250	1.5	1.5	1.5	annually	1	1	100%
Total Organic Carbon	mg/L	N	1.1	1.1	1.1	annually	1	-	-
Total Phosphorus	mg/L	N	<0.005	<0.005	<0.005	annually	1	-	-
Total Dissolved Solids	mg/L	600	38	38	38	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	1.1[1]	5.7	>weekly	64	-	within standard
Zinc	mg/L	3	0.001	0.001	0.001	annually	1	1	100%
Dibromochloromethane	mg/L	N	<0.001	0.001	0.002	>monthly	25	-	-
Dichlorobromomethane	mg/L	N	0.003	0.005	0.008	>monthly	25	-	-
Bromoform	mg/L	N	<0.001	<0.001	<0.001	>monthly	25	-	-
Chloroform	mg/L	N	0.011	0.020	0.031	>monthly	25	-	-
Total Trihalomethanes	mg/L	0.25	0.015	0.027	0.042	>monthly	25	25	100%
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	0.006	0.006	0.006	annually	1	1	100%

* Internal City West Water guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
1 Victorian standard: 95th percentile (shown) less than or equal to 5 NTU.

WATER SAMPLING LOCALITY	Tullamarine	LOCALITY No.	7A
FOR PERIOD	1 July 2016 to 30 June 2017	POPULATION (2011 Census)	9,833

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37ºC)	orgs/mL	1000*	<1	<1	790	>weekly	78	78	100%
Total Coliforms	orgs/100mL	N	<1	<1	9	>weekly	78	-	-
E. coli	orgs/100mL	100%<1[#]	<1	<1	<1	>weekly	78	78	100%
Free Chlorine	mg/L	5	<0.01	0.31	0.67	>weekly	78	78	100%
Total Chlorine	mg/L	5	0.05	0.43	1.10	>weekly	78	78	100%
Alkalinity (as $CaCO_3$)	mg/L	N	14	14	14	annually	1	-	-
Aluminium (acid soluble)	mg/L	0.2	<0.01	0.02	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	3.5	3.5	3.5	annually	1	-	-
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	8	fortnightly	26	26	100%
Conductivity	µS/cm	~900	58	97	140	fortnightly	26	26	100%
Copper	mg/L	1	<0.001	0.001	0.001	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.03	0.81	0.93	>fortnightly	28	28	100%
Hardness (as $CaCO_3$)	mg/L	200	14	14	14	annually	1	1	100%
Iron	mg/L	0.3	<0.01	0.03	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	-	-
Manganese	mg/L	0.1	<0.001	0.003	0.012	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	0.19	0.19	0.19	annually	1	1	100%
pH	units	6.5-8.5	7.0	7.4	8.2	fortnightly	26	26	100%
pH	units	6.5-9.2	7.0	7.4	8.2	fortnightly	26	26	100%
Potassium	mg/L	N	0.6	0.6	0.6	annually	1	-	-
Silica (SiO_2)	mg/L	80	3.4	3.4	3.4	annually	1	1	100%
Sodium	mg/L	180	4.4	4.4	4.4	annually	1	1	100%
Sulphate	mg/L	250	1.5	1.5	1.5	annually	1	1	100%
Total Organic Carbon	mg/L	N	1.1	1.1	1.1	annually	1	-	-
Total Phosphorus	mg/L	N	<0.005	<0.005	<0.005	annually	1	-	-
Total Dissolved Solids	mg/L	600	35	35	35	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	0.8[1]	0.9	weekly	51	-	within standard
Zinc	mg/L	3	0.003	0.003	0.003	annually	1	1	100%
Dibromochloromethane	mg/L	N	<0.001	0.004	0.010	monthly	13	-	-
Dichlorobromomethane	mg/L	N	0.004	0.009	0.017	monthly	13	-	-
Bromoform	mg/L	N	<0.001	<0.001	0.001	monthly	13	-	-
Chloroform	mg/L	N	0.010	0.019	0.035	monthly	13	-	-
Total Trihalomethanes	mg/L	0.25	0.018	0.031	0.047	monthly	13	13	100%
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 guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
1 Victorian standard: 95th percentile (shown) less than or equal to 5 NTU.

WATER SAMPLING LOCALITY	Werribee	LOCALITY No.	1
FOR PERIOD	1 July 2016 to 30 June 2017	POPULATION (2011 Census)	124,833

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37ºC)	orgs/mL	1000*	<1	<1	54	>weekly	444	444	100%
Total Coliforms	orgs/100mL	N	<1	<1	170	>weekly	444	-	-
E. coli	orgs/100mL	100%<1#	<1	<1	<1	>weekly	444	444	100%
Free Chlorine	mg/L	5	<0.01	0.27	0.67	>weekly	444	444	100%
Total Chlorine	mg/L	5	0.03	0.36	0.77	>weekly	444	444	100%
Alkalinity (as $CaCO_3$)	mg/L	N	15	15	15	annually	1	-	-
Aluminium (acid soluble)	mg/L	0.2	0.01	0.03	0.05	>fortnightly	37	37	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	5.1	5.1	5.1	annually	1	-	-
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	3	4	>fortnightly	50	50	100%
Conductivity	µS/cm	~900	86	114	140	>fortnightly	50	50	100%
Copper	mg/L	1	0.003	0.003	0.003	annually	1	1	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	annually	1	1	100%
Fluoride	mg/L	1.5	0.39	0.80	0.89	>fortnightly	52	52	100%
Hardness (as $CaCO_3$)	mg/L	200	18	18	18	annually	1	1	100%
Iron	mg/L	0.3	0.01	0.03	0.05	>fortnightly	50	50	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	-	-
Manganese	mg/L	0.1	<0.001	0.002	0.006	>fortnightly	50	50	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO_3)	mg/L	50	0.62	0.62	0.62	annually	1	1	100%
pH	units	6.5-8.5	7.1	7.4	8.4	>fortnightly	50	50	100%
pH	units	6.5-9.2	7.1	7.4	8.4	>fortnightly	50	50	100%
Potassium	mg/L	N	0.7	0.7	0.7	annually	1	-	-
Silica (SiO_2)	mg/L	80	4.2	4.2	4.2	annually	1	1	100%
Sodium	mg/L	180	6.0	6.0	6.0	annually	1	1	100%
Sulphate	mg/L	250	3.5	3.5	3.5	annually	1	1	100%
Total Organic Carbon	mg/L	N	0.8	0.8	0.8	annually	1	-	-
Total Phosphorus	mg/L	N	0.006	0.006	0.006	annually	1	-	-
Total Dissolved Solids	mg/L	600	49	49	49	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	0.5[1]	0.6	>weekly	76	-	within standard
Zinc	mg/L	3	0.001	0.001	0.001	annually	1	1	100%
Dibromochloromethane	mg/L	N	0.003	0.007	0.011	>fortnightly	37	-	-
Dichlorobromomethane	mg/L	N	0.010	0.016	0.024	>fortnightly	37	-	-
Bromoform	mg/L	N	<0.001	<0.001	0.001	>fortnightly	37	-	-
Chloroform	mg/L	N	0.021	0.034	0.047	>fortnightly	37	-	-
Total Trihalomethanes	mg/L	0.25	0.040	0.057	0.078	>fortnightly	37	37	100%
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 guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
1 Victorian standard: 95th percentile (shown) less than or equal to 5 NTU.

WATER SAMPLING LOCALITY	Werribee South	LOCALITY No.	2A
FOR PERIOD	1 July 2016 to 30 June 2017	POPULATION (2011 Census)	807

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37ºC)	orgs/mL	1000*	<1	<1	10	>weekly	117	117	100%
Total Coliforms	orgs/100mL	N	<1	<1	200	>weekly	117	-	-
E. coli	orgs/100mL	100%<1[#]	<1	<1	<1	>weekly	117	117	100%
Free Chlorine	mg/L	5	<0.01	0.27	0.93	>weekly	117	117	100%
Total Chlorine	mg/L	5	<0.01	0.34	1.00	>weekly	117	117	100%
Alkalinity (as $CaCO_3$)	mg/L	N	15	15	15	annually	1	-	-
Aluminium (acid soluble)	mg/L	0.2	<0.01	0.02	0.04	>fortnightly	49	49	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	5.0	5.0	5.0	annually	1	-	-
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	3	16	>fortnightly	62	62	100%
Conductivity	µS/cm	~900	86	111	140	>fortnightly	62	62	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	0.40	0.83	0.93	>fortnightly	64	64	100%
Hardness (as $CaCO_3$)	mg/L	200	18	18	18	annually	1	1	100%
Iron	mg/L	0.3	0.01	0.07	0.21	>fortnightly	62	62	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	-	-
Manganese	mg/L	0.1	<0.001	0.002	0.026	>fortnightly	62	62	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	annually	1	1	100%
Nitrate (NO_3)	mg/L	50	0.62	0.62	0.62	annually	1	1	100%
pH	units	6.5-8.5	7.0	7.6	8.4	>fortnightly	62	62	100%
pH	units	6.5-9.2	7.0	7.6	8.4	>fortnightly	62	62	100%
Potassium	mg/L	N	0.8	0.8	0.8	annually	1	-	-
Silica (SiO_2)	mg/L	80	4.1	4.1	4.1	annually	1	1	100%
Sodium	mg/L	180	6.1	6.1	6.1	annually	1	1	100%
Sulphate	mg/L	250	3.3	3.3	3.3	annually	1	1	100%
Total Organic Carbon	mg/L	N	0.8	0.8	0.8	annually	1	-	-
Total Phosphorus	mg/L	N	0.005	0.005	0.005	annually	1	-	-
Total Dissolved Solids	mg/L	600	44	44	44	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	0.5[1]	2.0	>weekly	88	-	within standard
Zinc	mg/L	3	0.002	0.002	0.002	annually	1	1	100%
Dibromochloromethane	mg/L	N	<0.001	0.003	0.008	>fortnightly	49	-	-
Dichlorobromomethane	mg/L	N	<0.001	0.008	0.020	>fortnightly	49	-	-
Bromoform	mg/L	N	<0.001	<0.001	0.001	>fortnightly	49	-	-
Chloroform	mg/L	N	<0.001	0.018	0.051	>fortnightly	49	-	-
Total Trihalomethanes	mg/L	0.25	0.002	0.030	0.069	>fortnightly	49	49	100%
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 guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
1 Victorian standard: 95th percentile (shown) less than or equal to 5 NTU.

WATER SAMPLING LOCALITY	Williamstown	LOCALITY No.	3B
FOR PERIOD	1 July 2016 to 30 June 2017	POPULATION (2011 Census)	35,996

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			Sampling frequency	No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max		Total	Passing	
Total Plate Count (37ºC)	orgs/mL	1000*	<1	<1	19	>weekly	144	144	100%
Total Coliforms	orgs/100mL	N	<1	<1	130	>weekly	144	-	-
E. coli	orgs/100mL	100%<1[#]	<1	<1	<1	>weekly	144	144	100%
Free Chlorine	mg/L	5	<0.01	0.19	0.47	>weekly	144	144	100%
Total Chlorine	mg/L	5	0.03	0.29	0.82	>weekly	144	144	100%
Alkalinity (as $CaCO_3$)	mg/L	N	28	28	28	annually	1	-	-
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	5.8	5.8	5.8	annually	1	-	-
Chloride	mg/L	250	29	29	29	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	70	113	130	fortnightly	26	26	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	0.11	0.79	0.90	>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	0.02	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	1.9	1.9	1.9	annually	1	-	-
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	1.37	1.37	1.37	annually	1	1	100%
pH	units	6.5-8.5	6.8	7.3	7.8	fortnightly	26	26	100%
pH	units	6.5-9.2	6.8	7.3	7.8	fortnightly	26	26	100%
Potassium	mg/L	N	1.1	1.1	1.1	annually	1	-	-
Silica (SiO_2)	mg/L	80	4.5	4.5	4.5	annually	1	1	100%
Sodium	mg/L	180	8.2	8.2	8.2	annually	1	1	100%
Sulphate	mg/L	250	6.9	6.9	6.9	annually	1	1	100%
Total Organic Carbon	mg/L	N	8.5	8.5	8.5	annually	1	-	-
Total Phosphorus	mg/L	N	<0.005	<0.005	<0.005	annually	1	-	-
Total Dissolved Solids	mg/L	600	55	55	55	annually	1	1	100%
Turbidity	NTU	5[1]	<0.1	0.3[1]	0.7	weekly	52	-	within standard
Zinc	mg/L	3	0.002	0.002	0.002	annually	1	1	100%
Dibromochloromethane	mg/L	N	0.002	0.006	0.007	monthly	13	-	-
Dichlorobromomethane	mg/L	N	0.011	0.013	0.017	monthly	13	-	-
Bromoform	mg/L	N	<0.001	<0.001	<0.001	monthly	13	-	-
Chloroform	mg/L	N	0.020	0.031	0.055	monthly	13	-	-
Total Trihalomethanes	mg/L	0.25	0.041	0.051	0.074	monthly	13	13	100%
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 guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
1 Victorian standard: 95th percentile (shown) less than or equal to 5 NTU.

ALL WATER SAMPLING LOCALITIES			
FOR PERIOD	**1 July 2016 to 30 June 2017**	**POPULATION (2011 Census)**	**823,331**

Parameter	Unit	Guideline Value (ADWG 2011)	Concentration or value (all samples)			No. of Samples		Performance against standard / guideline
			Min	Mean[G]	Max	Total	Passing	
Total Plate Count (37ºC)	orgs/mL	1000*	<1	<1	4,500	3171	3170	99.97%
Total Coliforms	orgs/100mL	N	<1	<1	200	3173	-	-
E. coli	orgs/100mL	100%<1[#]	<1	<1	1	3174	3173	99.97%
Free Chlorine	mg/L	5	<0.01	0.23	0.93	3174	3174	100%
Total Chlorine	mg/L	5	<0.01	0.32	1.10	3174	3174	100%
Alkalinity (as $CaCO_3$)	mg/L	N	12	16	28	15	-	-
Aluminium (acid soluble)	mg/L	0.2	<0.01	0.02	0.11	303	303	100%
Arsenic	mg/L	0.01	<0.001	<0.001	<0.001	15	15	100%
Cadmium	mg/L	0.002	<0.0002	<0.0002	<0.0002	15	15	100%
Calcium	mg/L	N	3.5	5.0	7.6	15	-	-
Chloride	mg/L	250	9	14	29	15	15	100%
Chromium	mg/L	0.05	<0.001	<0.001	<0.001	15	15	100%
Colour	Pt/Co	25**	<2	3	18	497	497	100%
Conductivity	µS/cm	~900	53	101	160	497	497	100%
Copper	mg/L	1	<0.001	0.010	0.047	15	15	100%
Cyanide	mg/L	0.08	<0.005	<0.005	<0.005	15	15	100%
Dissolved Oxygen	mg/L	N	8.5	9.8	11.6	26	-	-
Fluoride	mg/L	1.5	0.03	0.82	0.99	523	523	100%
Hardness (as $CaCO_3$)	mg/L	200	14	18	25	15	15	100%
Iron	mg/L	0.3	<0.01	0.04	0.21	497	497	100%
Lead	mg/L	0.01	<0.001	<0.001	<0.001	15	15	100%
Magnesium	mg/L	N	1.0	1.5	1.9	15	-	-
Manganese	mg/L	0.1	<0.001	0.003	0.065	497	497	100%
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	15	15	100%
Nitrate (NO_3)	mg/L	50	0.19	0.82	1.64	15	15	100%
pH	units	6.5-8.5	6.4	7.3	8.9	497	490	98.59%
pH	units	6.5-9.2	6.4	7.3	8.9	497	492	98.99%
Potassium	mg/L	N	0.6	0.8	1.1	15	-	-
Silica (SiO_2)	mg/L	80	3.3	4.2	6.3	15	15	100%
Sodium	mg/L	180	3.9	6.1	8.7	15	15	100%
Sulphate	mg/L	250	1.5	4.1	9.1	15	15	100%
Temperature	oC	N	10.7	16.9	22.7	26	-	-
Total Organic Carbon	mg/L	N	0.6	1.7	8.5	15	-	-
Total Phosphorus	mg/L	N	<0.005	<0.005	0.012	15	-	-
Total Dissolved Solids	mg/L	600	31	44	65	15	15	100%
Turbidity	NTU	5[1]	<0.1	0.8[1]	5.7	886	-	within standard
Zinc	mg/L	3	0.001	0.003	0.011	15	15	100%
Dibromochloromethane	mg/L	N	<0.001	0.004	0.011	303	-	-
Dichlorobromomethane	mg/L	N	<0.001	0.012	0.024	303	-	-
Bromoform	mg/L	N	<0.001	<0.001	0.001	303	-	-
Chloroform	mg/L	N	<0.001	0.033	0.110	303	-	-
Total Trihalomethanes	mg/L	0.25	0.002	0.049	0.121	303	303	100%
Chloroacetic acid	mg/L	0.15	<0.005	<0.005	<0.005	15	15	100%
Dichloroacetic acid	mg/L	0.1	<0.005	<0.005	0.006	15	15	100%
Trichloroacetic acid	mg/L	0.1	<0.005	0.014	0.047	15	15	100%

* Internal City West Water guideline.
** Guideline set for "True Colour" (15 PCU) however "Apparent Colour" is measured (with a benchmark guideline of 25 PCU).
N No guideline/standard set for this parameter.
Victorian standard: 100% of samples must not contain any *E.coli*/100mL.
G Geometric means shown for bacterial parameters.
1 Victorian standard: 95th percentile (shown) less than or equal to 5 NTU.

Appendix B
Spatial and time-based water quality summaries

(based on results of tests on drinking water samples obtained from reticulation system sampling sites (water mains, customer taps, service reservoirs/tanks) tested between 1 July 2016 and 30 June 2017)

Figure B.1 *E. coli* performance in water sampling localities (between 2014-15 and 2016-17, from left to right within each locality)

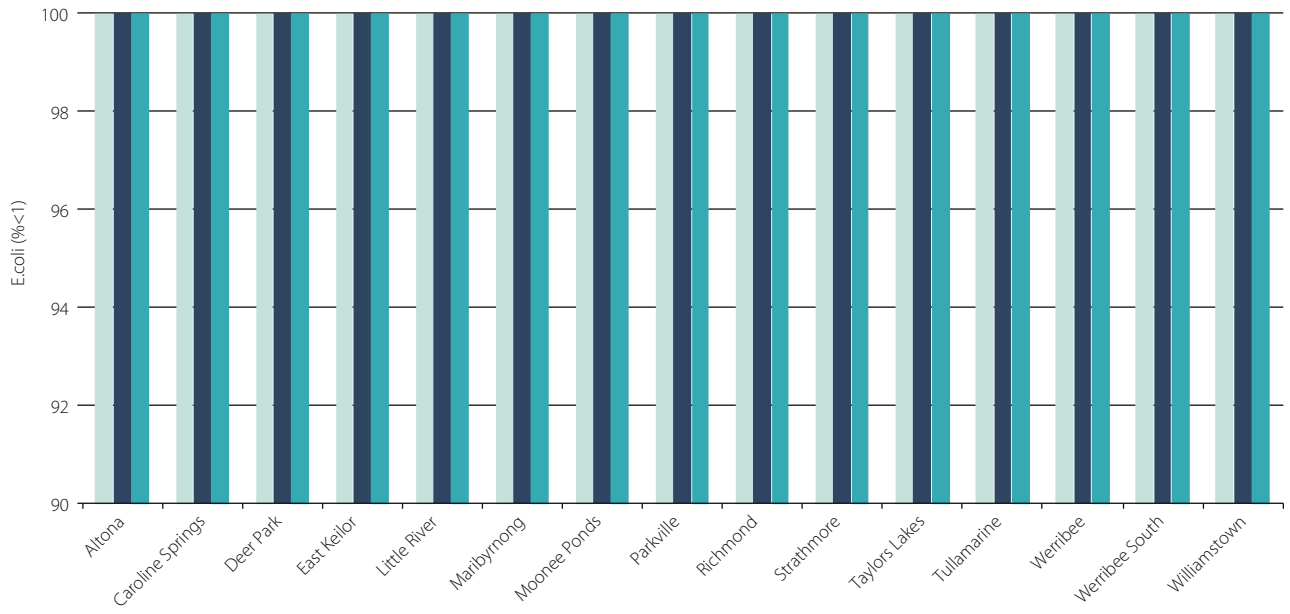


Figure B.2 Annual average free chlorine concentrations in water sampling localities (between 2014-15 and 2016-17, from left to right within each locality)

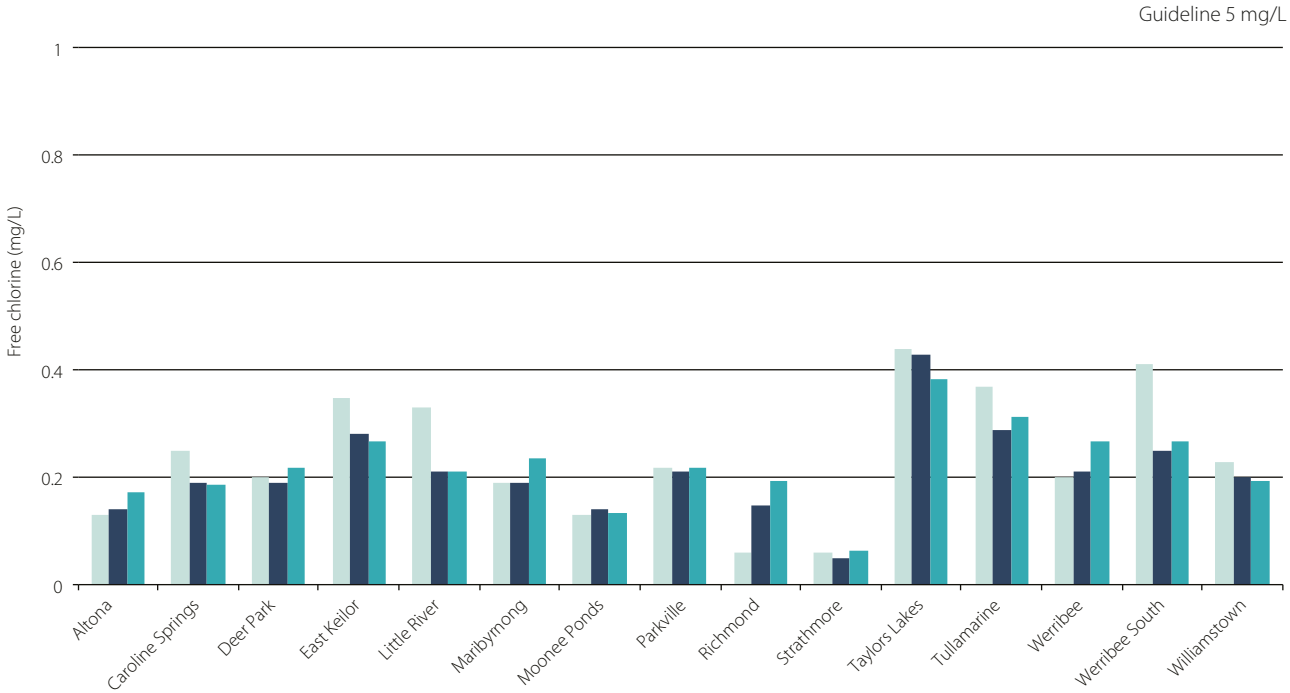


Figure B.3 Average aluminium concentrations in water sampling localities (between 2014-15 and 2016-17, from left to right within each locality)

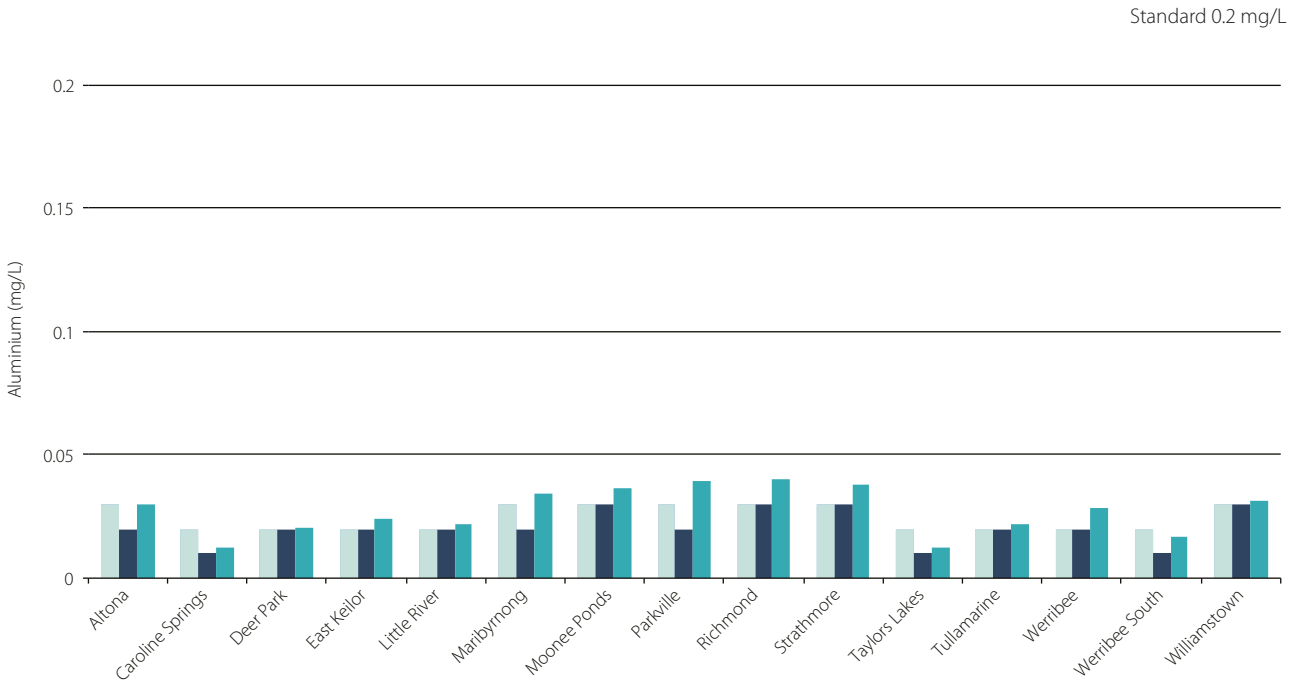


Figure B.4 Chloride concentrations in water sampling localities (between 2014-15 and 2016-17, from left to right within each locality)

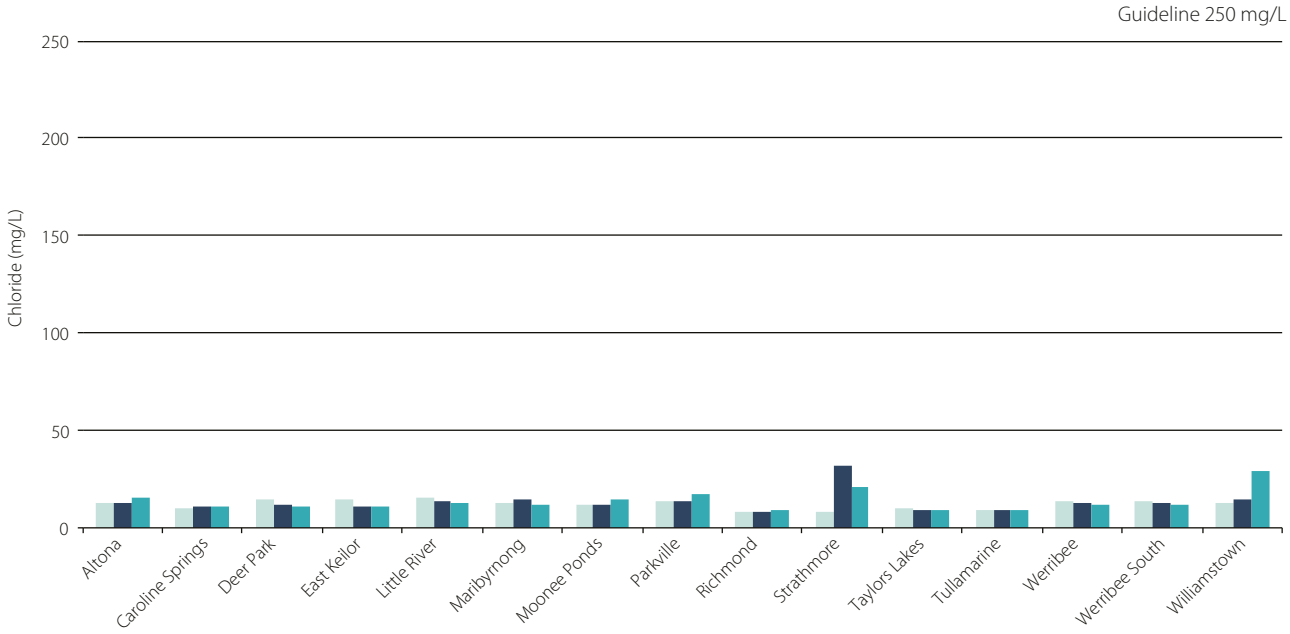


Figure B.5 Average apparent colour levels in water sampling localities (between 2014-15 and 2016-17, from left to right within each locality)

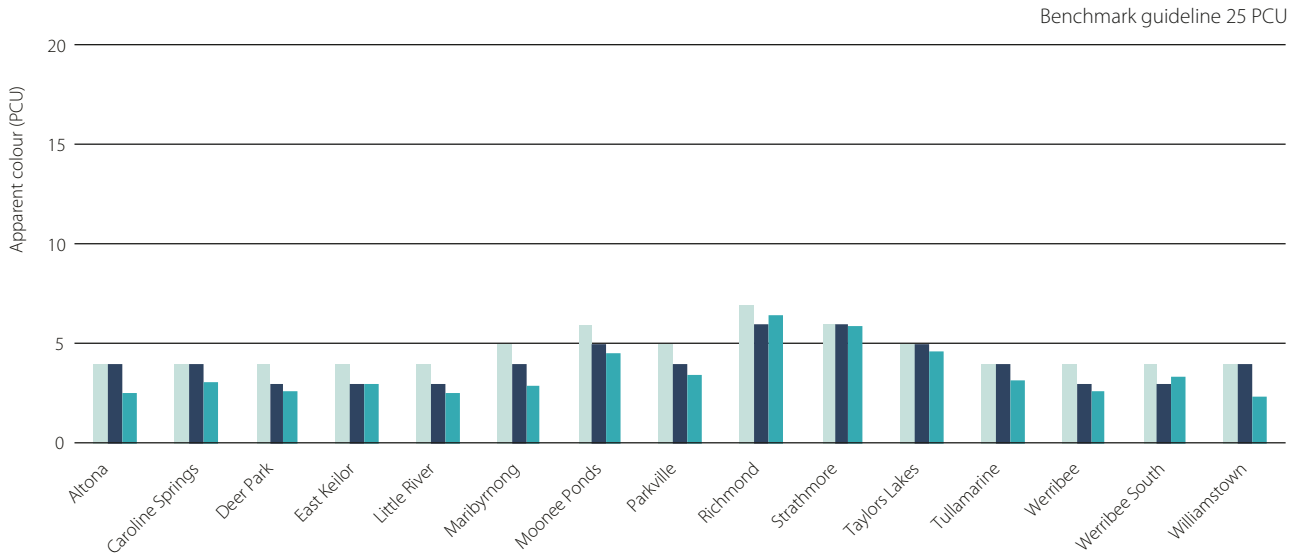


Figure B.6 Copper concentrations in water sampling localities (between 2014-15 and 2016-17, from left to right within each locality)

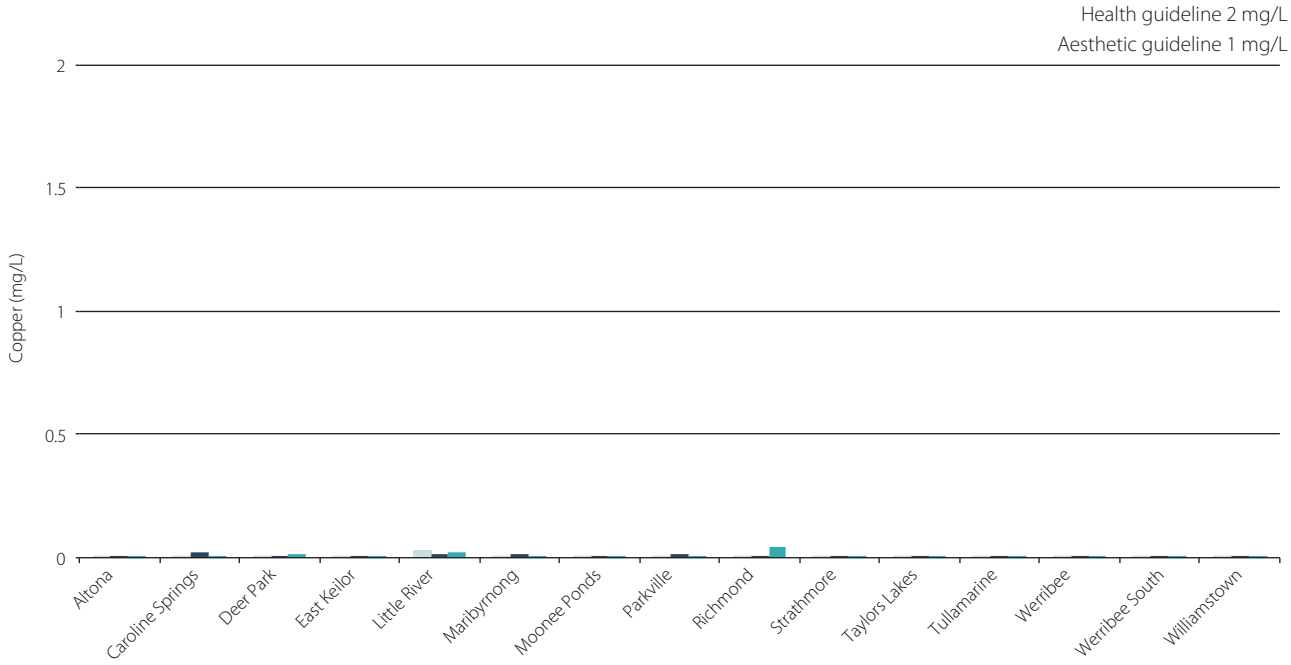


Figure B.7 Average electrical conductivity levels in water sampling localities (between 2014-15 and 2016-17, from left to right within each locality)

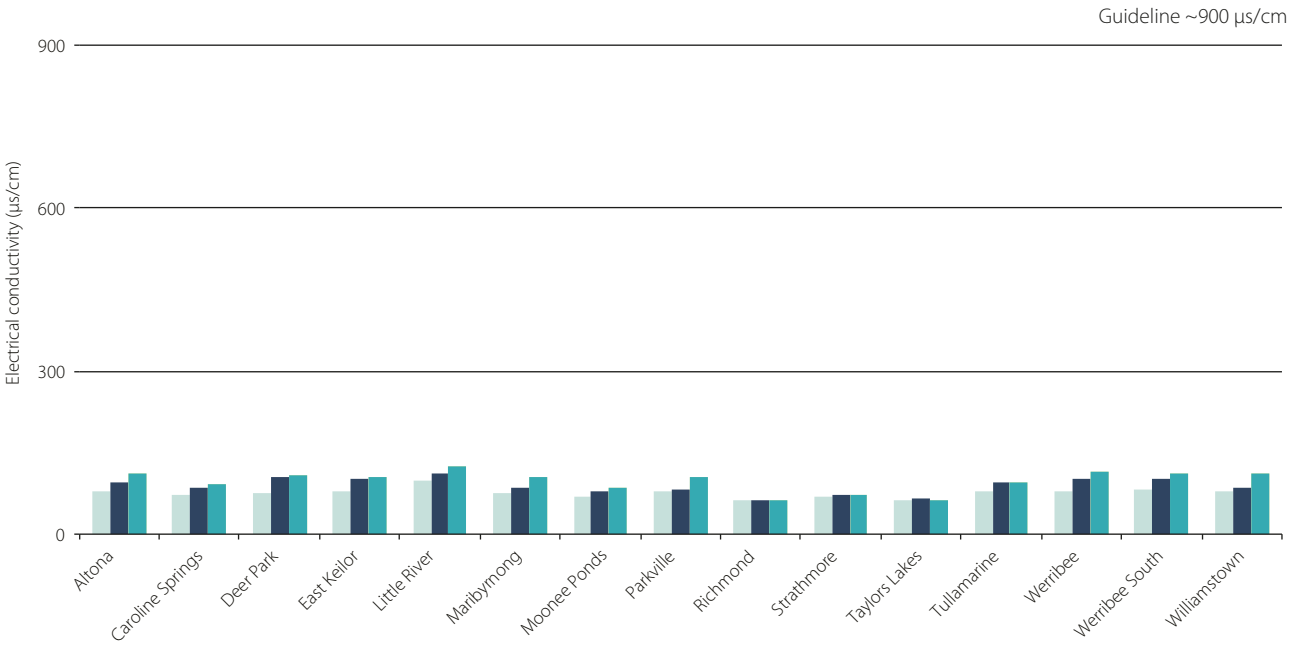


Figure B.8 Average fluoride concentrations in water sampling localities (between 2014-15 and 2016-17, from left to right within each locality)

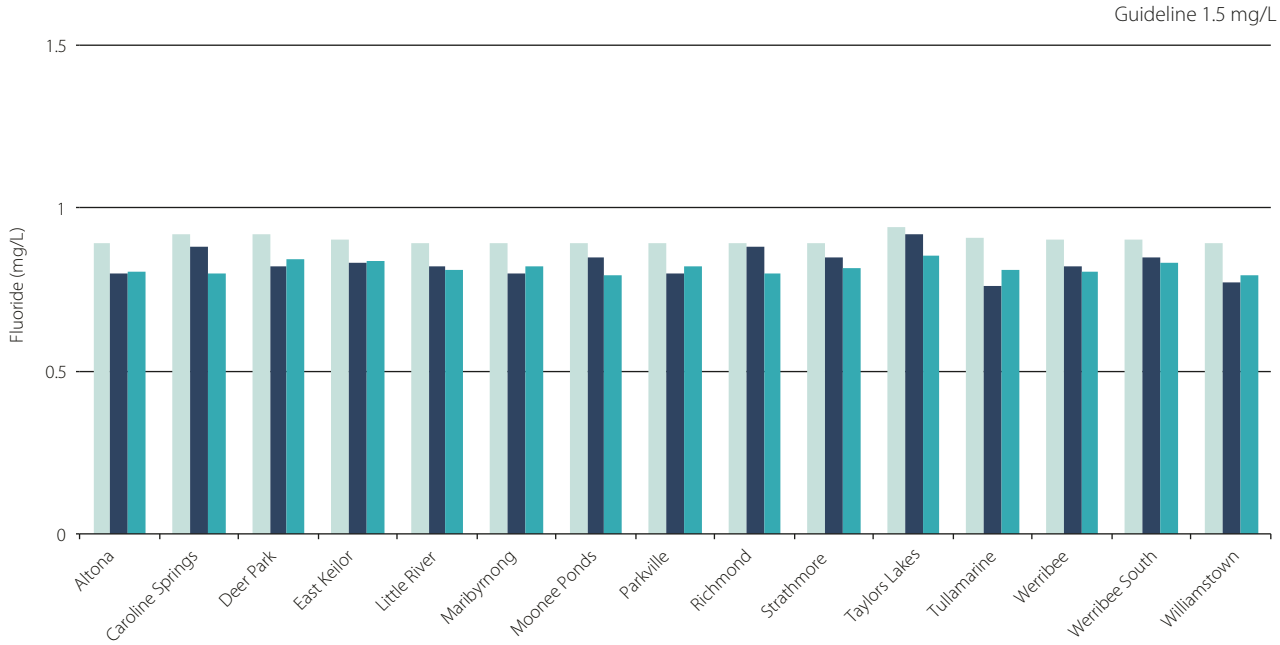


Figure B.9 Hardness concentrations in water sampling localities (between 2014-15 and 2016-17, from left to right within each locality)

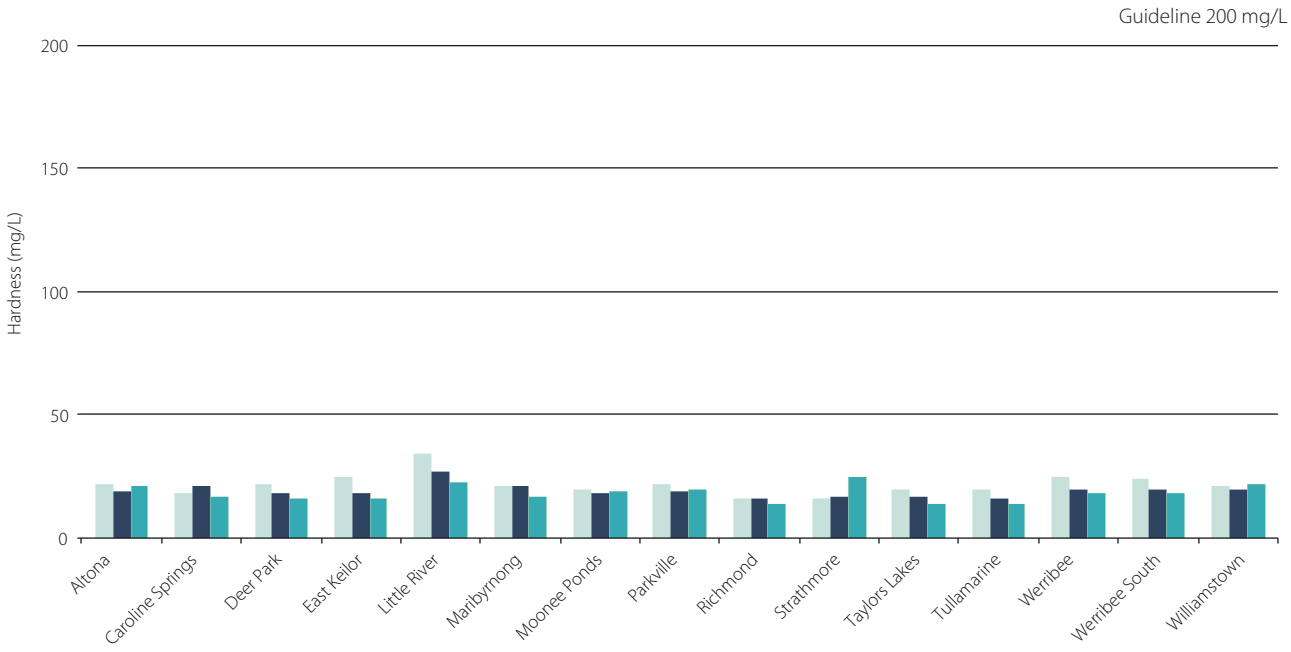


Figure B.10 Average iron concentrations in water sampling localities (between 2014-15 and 2016-17, from left to right within each locality)

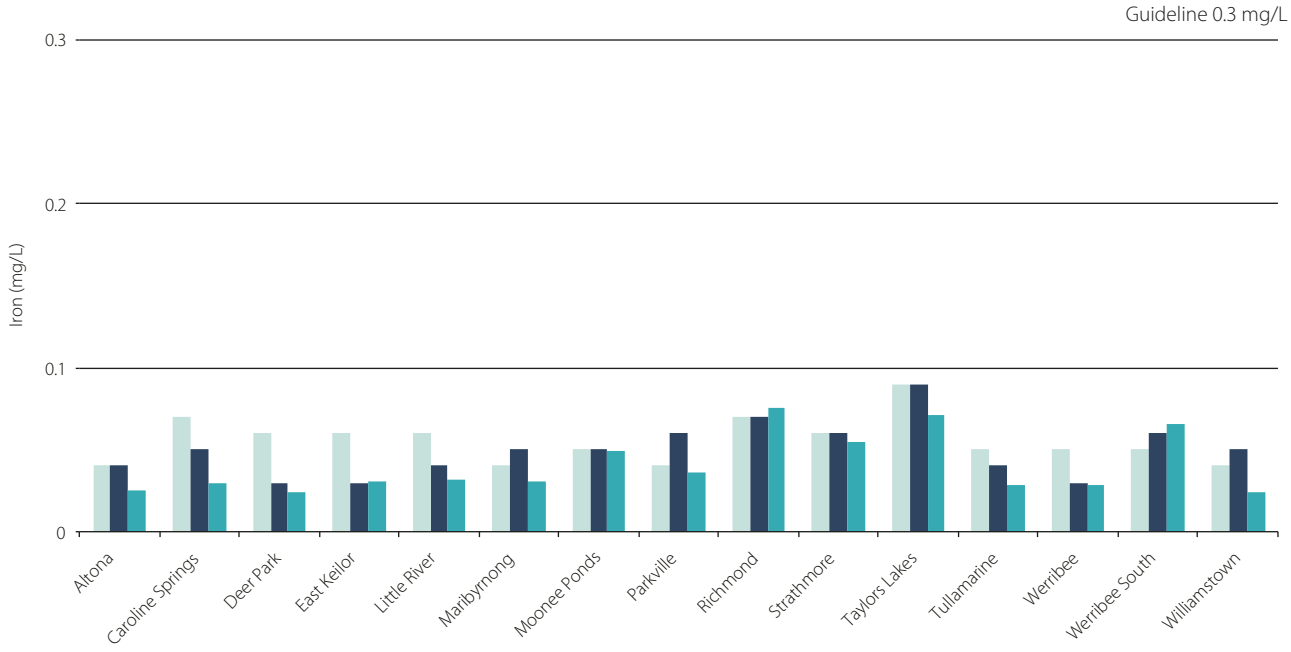


Figure B.11 Average manganese concentrations in water sampling localities (between 2014-15 and 2016-17, from left to right within each locality)

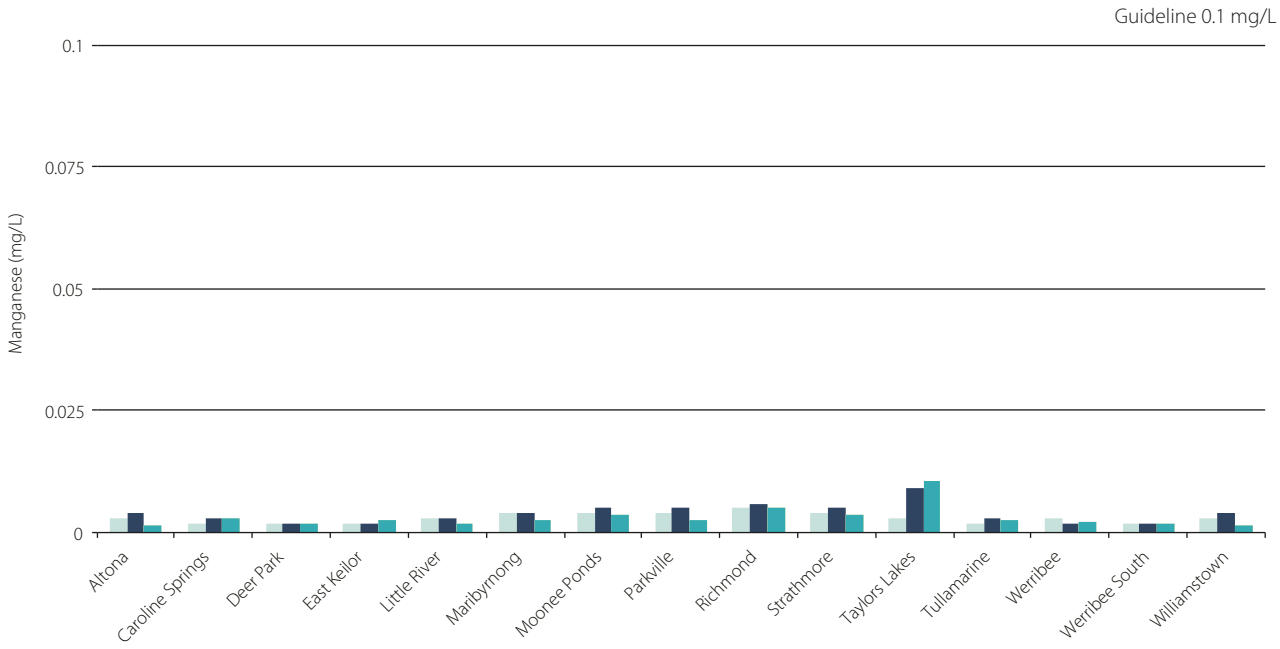


Figure B.12 Nitrate concentrations in water sampling localities (between 2014-15 and 2016-17, from left to right within each locality)

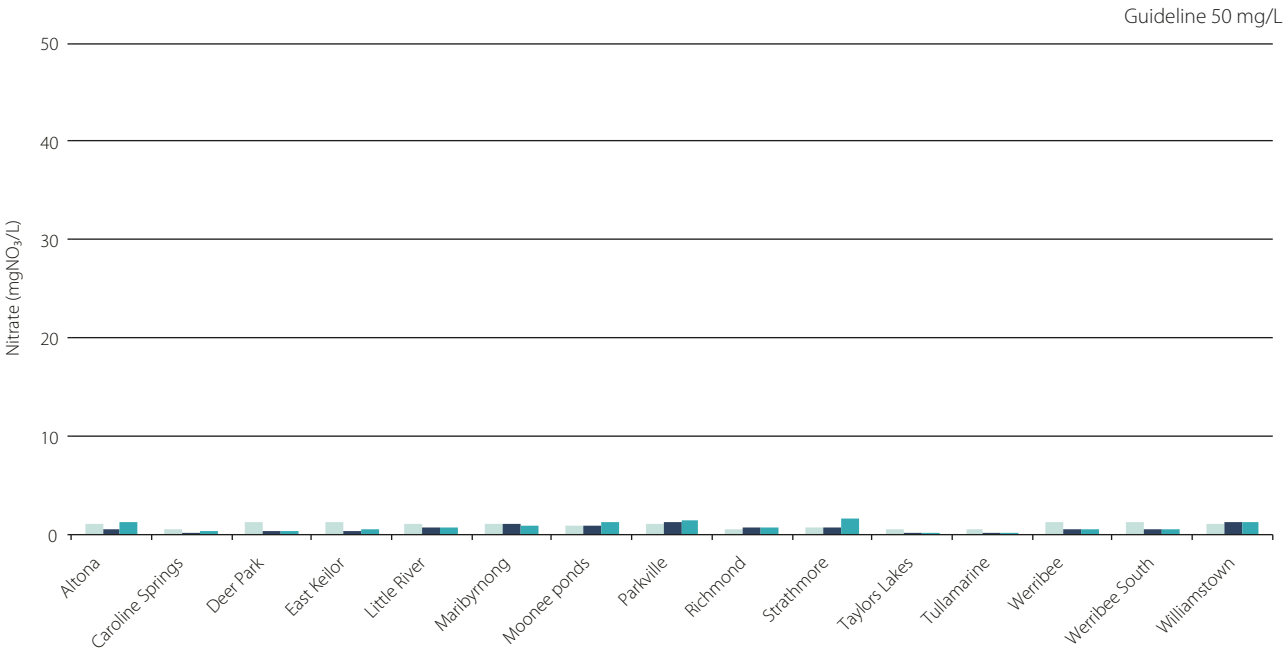


Figure B.13 Average pH values in water sampling localities
(between 2014-15 and 2016-17, from left to right within each locality)

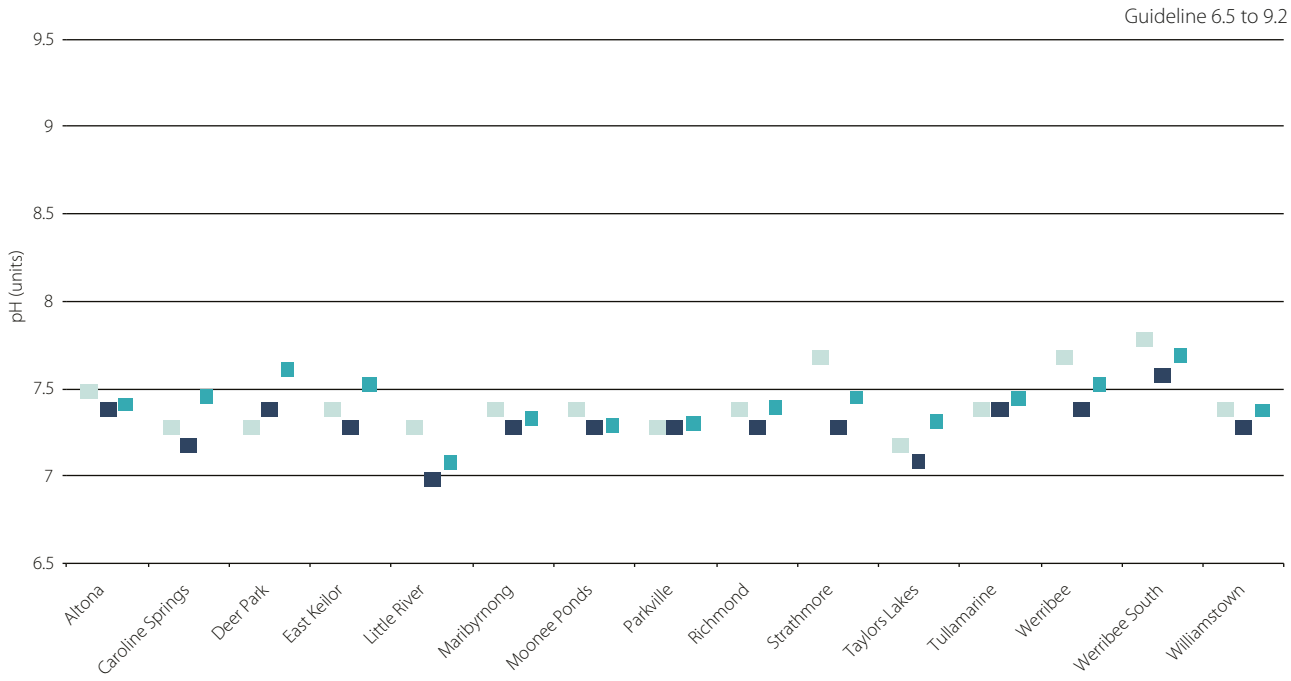


Figure B.14 Sodium concentrations in water sampling localities
(between 2014-15 and 2016-17, from left to right within each locality)

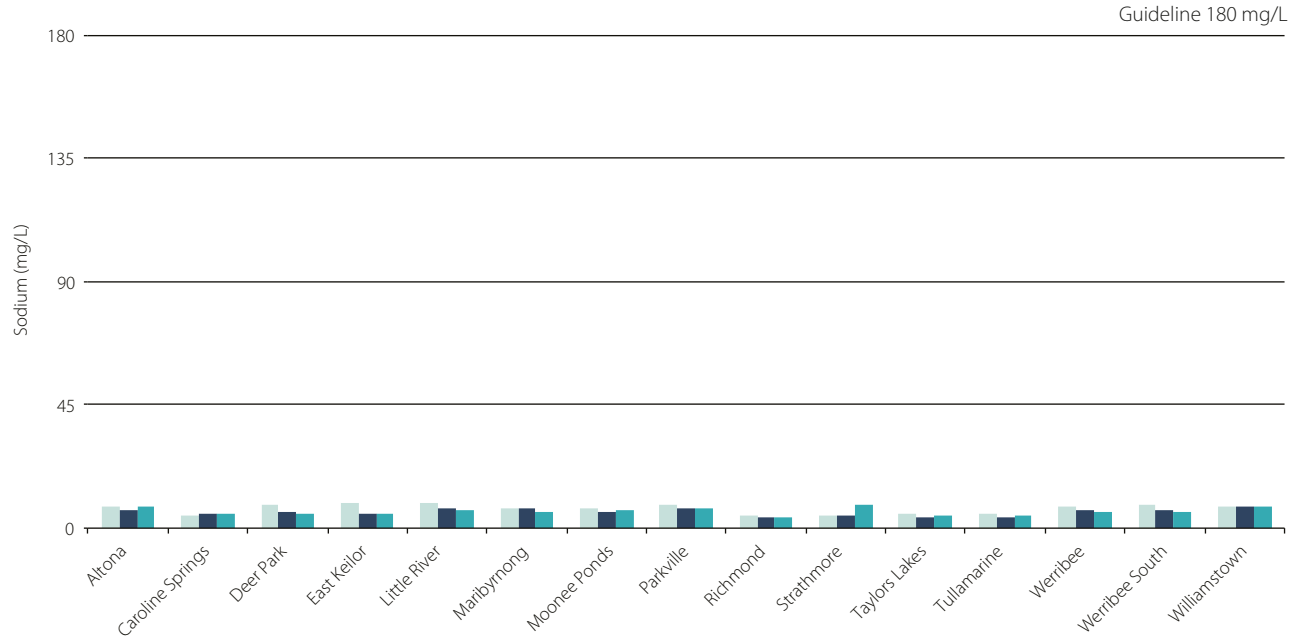


Figure B.15 Summary turbidity levels in water sampling zones
(between 2014-15 and 2016-17, from left to right within each locality)

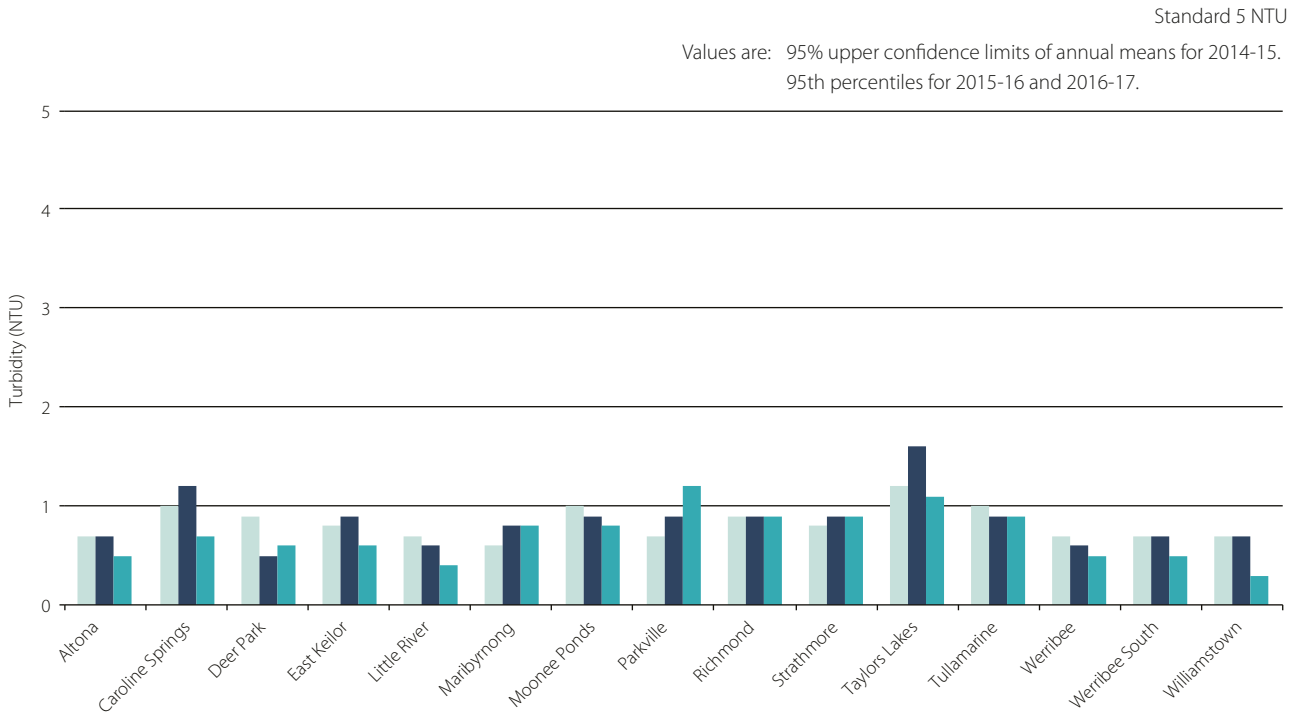


Figure B.16 Sulphate concentrations in water sampling localities
(between 2014-15 and 2016-17, from left to right within each locality)

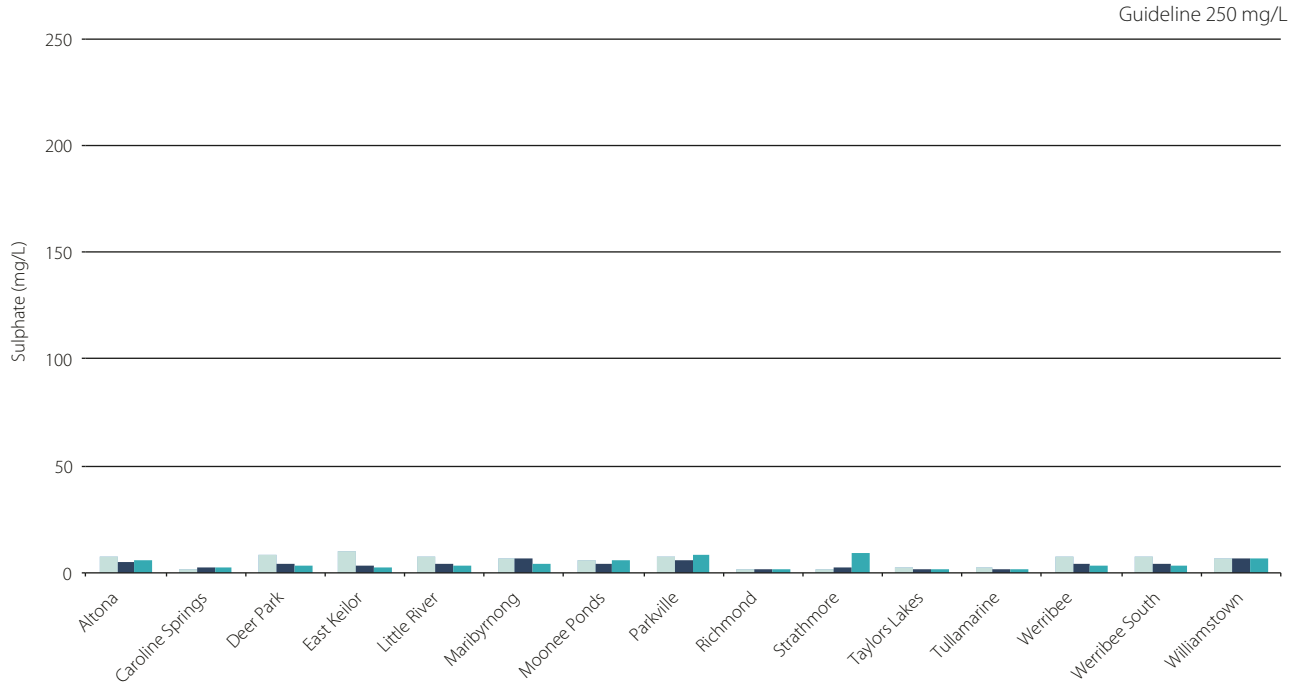
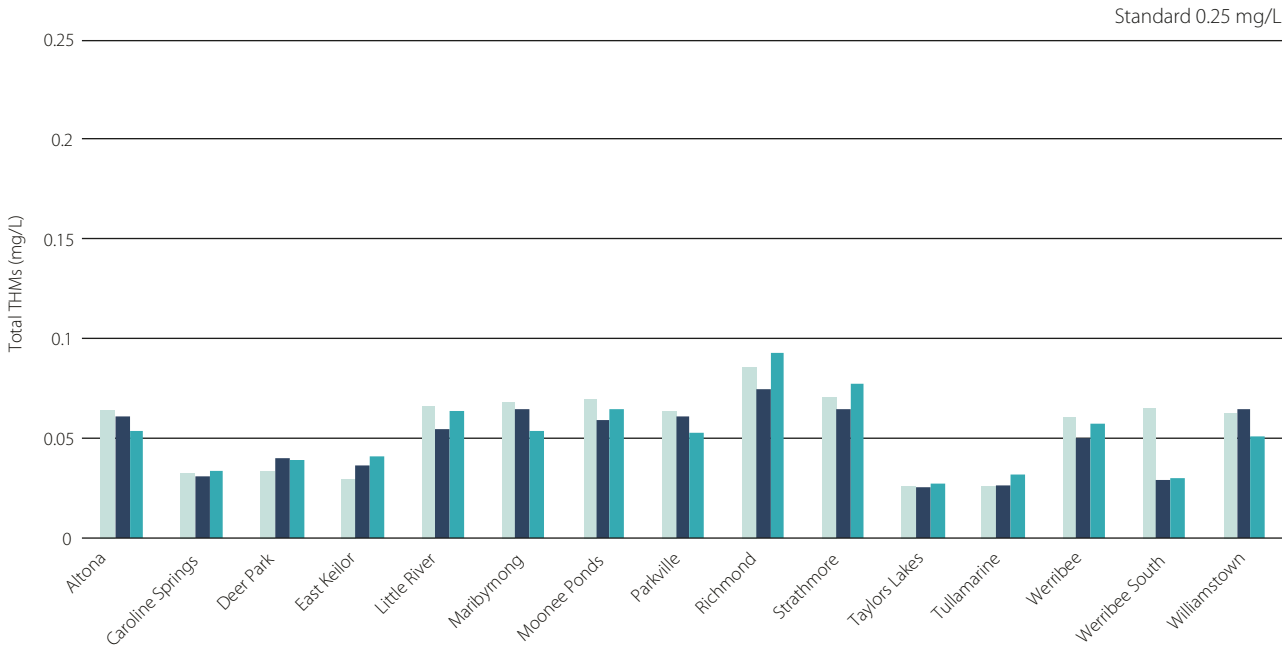


Figure B.17 Average total trihalomethane concentrations in water sampling localities (between 2014-15 and 2016-17, from left to right within each locality)



Appendix C
2016 Risk Management Plan regulatory audit certificate

ABN 46 122 146 767

Schedule 1

RISK MANAGEMENT PLAN AUDIT CERTIFICATE

Safe Drinking Water Regulations 2015 – Regulation 10

Certificate Number: 108

Audit Period: 15th March 2014 to 15th March 2016

To: Ms Anne Barker
Managing Director
City West Water Limited
Locked Bag 350
Sunshine VIC 3020

Australian Business Number (ABN): 70 066 902 467

I, Tom Teunissen, after conducting a risk management plan audit of the water supplied by City West Water Limited, am of the opinion that:

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

Signature of approved auditor:

Tom Teunissen

Date: 22nd June 2016

RMP Systems, Suite 3, Ground Floor, 24 Albert Road, South Melbourne, 3205.
Mobile: 0410 624 604 Tel: 03 9694 3231 Fax: 03 864 00 581
Email: tom@rmpsystems.com

City West Water
ABN 70 066 902 467
1 McNab Avenue, Footscray Vic 3011
Locked Bag 350, Sunshine Vic 3020

ABN 70 066 902 467

Account and general enquiries 131 691
Faults and emergencies 132 642
Interpreter service 131 450
Internet citywestwater.com.au
Email enquiries@citywestwater.com.au