



2023/24



Safe Drinking Water Act

Annual Report

Contents

1	Overview	3
1.1	Characterisation of the system	5
1.2	Source water protection	6
1.2.1	Raw water monitoring parameters	7
1.3	Water Supply Systems	9
2	Drinking water treatment processes	11
2.1	Water treatment	11
2.2	Improvements to water supply and treatment	14
2.3	Issues	15
2.3.1	Aesthetic Guideline value exceedances	15
2.3.2	Event Incidents reported to Department of Health	15
2.3.3	Fluoride Notifications	16
3	Emergency Incident and Event Management	17
3.1	Section 22 Reports	17
4	Drinking Water Quality Standards	19
4.1	Section 18 Notifications	19
4.2	Water Quality Sampling Program	20
4.3	Water Quality Monitoring results	20
4.3.1	Analysis of Water Sampling Results	21
4.3.1.1	Actions Undertaken for Schedule 2 Non-compliant Health Parameters	22
4.3.1.2	Actions undertaken for Aesthetic Parameters that were not met	22
4.4	Water Quality Data for Sampling Localities: 1 July 2023 – 30 June 2024	22
4.4.1	Treated Water results from plant exit/storage points	22
4.4.2	Treated Water results from customer tap sample points	40
5	Complaints relating to water quality	80
5.1	Complaints and responses	80
6	Risk Management Plan Audit Results	82
6.1	Outcome of the most recent audit	82
6.2	Findings and Action Plan for audit completed in March 2023	82
7	Regulated Water	84
8	Further Information	85
	Appendix A – Glossary of Terms	86
	Appendix B – List of raw water organic (fungicides/herbicides/insecticides) parameters	89
	Appendix C – List of treatment processes and added substances	90

1 Overview

This report, to the Secretary to the Department of Health (DH), has been prepared to satisfy the annual reporting requirement under Section 26 of the *Safe Drinking Water Act 2003* (the Act), for Coliban Water, as a Water Supplier, to produce an annual water quality report.

We are a major urban water corporation in Victoria. Led by our vision of *healthy water, healthy people (dheik gatjin dheik balak)*, we manage, maintain and operate 34 reservoirs and water storage basins across north central Victoria, and provide water and wastewater services to rural and urban customers across an area of 16,500 square kilometres.

Our service region includes 49 towns, extending from Cohuna and Echuca in the north, to Kyneton and Trentham in the south. The western boundary incorporates Boort, Wedderburn, Bealiba and Dunolly, and the eastern boundary includes Heathcote and Tooborac.

Raw water is sourced from eight individual water supply systems: the Coliban, Campaspe, Wimmera, Loddon, Goulburn and Murray River systems, and two groundwater sources. Coliban Water has 19 water treatment plants which provide drinking water to 42 separate water sampling localities. We also have seven regulated water supply systems. Throughout this document we'll refer to water treatment plants as 'our plant' or 'treatment plants'.



Figure 1: Coliban Water Service Region

We are committed to the provision of safe drinking water as outlined in our Drinking Water Quality Policy Statement, provided below. This is reviewed every three years.

Drinking Water Quality Policy Statement

This Policy Statement recognises that the region's Traditional Owners have been the custodians of the land and water for thousands of generations. Coliban Water acknowledges that Traditional Owners have unique knowledge and connection to this land and water. We actively seek strong partnerships with Traditional Owners so that our decisions are better informed to help deliver the goals and aspirations that they hold for their culture and country.

Coliban Water is responsible for providing safe, aesthetically pleasing drinking water which consistently meets the Safe Drinking Water Act 2003 and Safe Drinking Water Regulations (SDWR) 2015. We will work collaboratively with our staff and operational partners to:

1. Manage water quality from catchment to tap through a multiple barrier approach using our Drinking Water Quality Risk Management Plan.
2. Consult and integrate the needs and expectations of our customers into our planning processes.
3. Undertake regular monitoring of the quality of drinking water at barriers and regular reporting to promote confidence in our water supply and its management.
4. Ensure we have and maintain treatment and distribution assets that are capable of delivering safe drinking water now and into the future having regard for climate change related risks.
5. Undertake appropriate contingency planning and have adequate incident response protocols.
6. Be involved in research and development activities to understand emerging water quality issues and performance.
7. Continually improve our water systems management practices in line with the principles set out in the Australian Drinking Water Guidelines 2011.
8. Ensure that our staff and operational partners have the appropriate training to make decisions that ensure our systems are operated to produce and supply safe drinking water to our customers.

We will engage all staff and/or partners involved in the supply of drinking water to implement the policy and continually improve the drinking water quality management system.



Bob Cameron
Board Chairperson



Damian Wells
Managing Director

Effective date: 12 January 2023

1.1 Characterisation of the system

We manage and operate various water supply systems. Bendigo, Castlemaine and Kyneton are supplied with water harvested from our three main reservoirs on the Coliban River (Upper Coliban, Lauriston and Malmsbury).

Water is transported to Bendigo and Castlemaine by open channel and stored in the Sandhurst and McCay reservoirs, both of which are off-stream storages managed by Coliban Water. Kyneton is supplied via a pipeline directly from Lauriston Reservoir. Of our 19 water treatment plants, three are owned and operated by Bendigo Water Services Pty Ltd (Veolia Water), and treated water is supplied to us under a 25-year contract. This commenced in 2001, and these three plants service Bendigo, Castlemaine and Kyneton.

Supply to Bendigo is supplemented by water from both Lake Eppalock (a major reservoir on the Campaspe River, managed by Goulburn-Murray Water) and the Waranga Western Channel (Goulburn System, also managed by Goulburn-Murray Water).

Our remaining 16 treatment plants are owned by Coliban Water. These are operated by Service Stream under an operations and maintenance service contract, which started 1 July 2013.

Two of these plants rely on groundwater supplies, and the others receive raw water by diversions from either waterway, irrigation channels or pipelines. These are directly managed by us, or managed by Grampians Wimmera Mallee Water (GWMW) or Goulburn-Murray Water (GMW), as bulk water suppliers to Coliban Water.

For the purposes of the Act, both GWMW and GMW are water storage managers for Coliban Water. These water storage managers work closely with us, communicating raw water data regularly, with direct contact when issues are identified. This enables our plant operators to better prepare for any raw water changes.

All raw water supplied to our treatment plants is sourced from open catchments. All identified catchment risks are included in a risk register that forms part of our Drinking Water Quality Risk Management Plan (DWQRMP), and managed as required.

The SDWR requires water suppliers to detail the methodology used to quantify microbial hazards in source waters. Since the introduction of this regulatory requirement, we have applied the Microbial Health-Based Targets manual, developed by Water Services Association of Australia (WSAA). This work required all catchments supplying water for treatment to be assessed, together with analysis of raw water data, to identify the appropriate source water category. Each category has an associated level of potential pathogen risk that our plants need to manage. Processes at each plant are then aligned with the source water category, to identify the level of pathogen risk post treatment.

In September 2022, the National Health and Medical Research Council released an updated version of the Australian Drinking Water Guidelines (ADWG), which included a revision of Chapter 5, specific to assessing microbial risk. These revisions will be applied during the next microbial review for each of our plants.

Information collected from our catchments, source water and plants enable us to identify which plants and treatment processes may require enhancement to manage the potential pathogen risks in the source water. Where a risk has been identified, options to reduce the risk are assessed, which can result in a treatment plant upgrade, or asset modification. All of our plants have critical control points throughout the process, which will alert operators if the plant is operating outside the required range. It will then stop the process when pre-defined critical limits are reached.

We also supply seven townships with water that is classified as regulated water, as detailed in Section 6 of the Act (see part 7 of this report for more details). Regulated water is water that is not intended for drinking, but could be reasonably mistaken as drinking water.

1.2 Source water protection

We work in partnership with the North Central Catchment Management Authority (NCCMA), local government, GMW, GWMW and landcare groups to address issues affecting water quality in our catchments from where drinking water is sourced. This includes the Coliban, Campaspe, Loddon, Wimmera and Murray River catchments.

Our catchments and operational areas are closely managed to ensure we monitor our land for fire and tree hazards, manage our pest plant obligations, whilst also protecting water quality in our storages. We also work to enhance river health and support biodiversity across our lands and catchment.

As part of our fire hazard management, we take a proactive approach to reducing fuel loads. This minimises risk to adjacent landowners, high value assets, and public areas. We also work collaboratively with other agencies through regional forums to prepare for upcoming fire seasons.

We engage with Traditional Owner enterprises such as DJAARA (the Dja Dja Wurrung Clans Aboriginal Corporation) to deliver land and natural resource management outcomes on Country. This includes sensitively managing access to areas around the storages and across sites that contain cultural heritage.

Since the release in February 2015 of our Drinking Water Storages and Land Management Plan, numerous Catchment Works Agreements have been entered into with adjoining landowners. This has been around Malmsbury and Upper Coliban reservoirs to reduce stock access to raw water supplies. Negotiations with landowners about fencing at Lauriston Reservoir are ongoing.

We are responsible for providing statutory and strategic land use planning engagement with municipalities where sewerage is not connected, and we are a determining referral authority under section 55 of the *Planning and Environment Act 1987*. As part of our role in special water supply catchments, declared under the *Catchment and Land Protection Act 1994*, we provided responses to planning permit applications referred to us by local government under clause 66.02-5 – ‘Special Water Supply Catchment’ of the Victorian Planning Provisions and relevant municipal planning schemes.

Our responses provide support to local government by recommending conditions to applications for the use and development of privately-owned land in open water supply catchments, to ensure minimal impact on the quality and quantity of water available to the environment, and for townships that we supply. On occasion, we have objected to the issuing of a planning permit, where we identify potential for adverse impacts.

In September 2017, the Department of Energy, Environment and Climate Action (DEECA), released a Statewide Framework for Catchment Partnership Agreements. The purpose of this is to strengthen coordination, collaboration and accountability; while reducing duplication. It provides clarity on roles and responsibilities between key catchment management partners. We are a partner organisation, under the agreement, along with NCCMA.

This allowed us to participate in the regional Catchment Partnership Forum and provided us representation on the Steering Committee managed by NCCMA for the renewal of the North Central Regional Catchment Strategy (RCS).

In 2024, we renewed a Memorandum of Understanding (MOU) with NCCMA which included a three-year action plan. Signed by the executive teams of both organisations, this linked to both the RCS and our strategy, *dheik gatjin dheik balak*. These actions are due to begin in the 2024/25 financial year. The MoU enables the protection and enhancement of our catchment areas and the environment, with a focus on risks to water security from climate change and land-use change. A key action outlined in the action plan was the continued development and implementation of the Upper Coliban Catchment Integrated Catchment Management Plan (ICMP).

In addition to the MoU, NCCMA has continued work to monitor and maintain the Kyneton Environmental Offsets Project. This includes pest plant management of revegetated sites and replanting of revegetation to ensure an 80% survival rate. These works are re-establishing riparian zones which will minimise nutrients and pathogens from entering the waterway. The October 2022 floods had a negative impact on the environmental offset work we were carrying out along the Campaspe River. This included loss of plantings and fencing. However, flood recovery funds have assisted us to engage NCCMA to replace damaged fences and replant vegetation. This work was completed in early 2024.

The ICMP was developed in response to various threats facing the Upper Coliban catchment in 2015/16. Through active participation by a range of stakeholders, including Djaara, landholders, landcare groups, local and Victorian government agencies, and GMW, the ICMP is a comprehensive analysis of the benefits and costs of protecting and enhancing the catchment. The ICMP is a key step in the delivery of safe drinking water supply and a key principle of ‘Catchment to Tap’ multi-barrier approach for the production of safe drinking water.

The ICMP enables the provision of a safe and secure water supply for communities in central and northern Victoria, along with enhanced river, biodiversity and catchment health outcomes. With a 20-year horizon, the ICMP has been

developed around three specific goals with a focus on future development pressures, waterway protection and habitat connectivity.

Delivery and implementation of the ICMP is through a Coliban Water, NCCMA and DJARRA partnership program, now entering its sixth year of operation, called 'A Healthy Coliban Catchment' (AHCC). We're now in the second year of our pricing period (2023 to 2028), which includes funding for this program. It involves a range of on-ground actions (stock exclusion from waterways, riparian regeneration and willow removal), as well as strategic planning through municipal planning scheme amendments. This includes the development of Environmental Significance Overlay controls, designed to protect and enhance source water supplies.

In 2023/24, a high rate of on-ground works were completed due to flood-delayed works finally taking place. The NCCMA successfully worked through a backlog of landholders who wish to participate in the program, and they also continued to attract new interest. Community engagement is also being achieved through a partner program, Healthy Landscapes. This is designed to assist large and small landholders to improve soil health, enhance biodiversity, reduce exposure to climate risk and increase on-farm productivity and resilience.

The table below shows both the 2023/24 outputs, and the five-year outputs for AHCC program.

Table 1: 2023/24 and overall outputs for the AHCC program

Activity	Units	2023/24 outputs	Total outputs
Fence installed	km	14.02	51.37
Weed control	ha	116	412.2
Native vegetation established	ha	58	134.36
Off-stream watering	OSWP	6	84
Workshops	No. participants	119	250
Field days	No. participants	160	368
Training events	No. participants	22	130

1.2.1 Raw water monitoring parameters

The following table details the parameters for which monitoring is carried out in all the raw water sources from which water is extracted, treated, and then supplied as drinking water. The program is reviewed every year (or more frequently, depending on seasonal conditions). All monitoring is performed by an independent National Association of Testing Authorities, Australia (NATA)-accredited laboratory.

The raw water monitoring is conducted for the purposes of managing risks to the water treatment process. The sampling frequency for each parameter can vary depending on the identified risk for the different raw water, for example, *E. coli* is sampled weekly at some locations and monthly at others. The data from the raw water monitoring program does not represent the quality of drinking water supplied to customers.

Table 2: Raw water monitoring parameters and frequency

Group	Parameter	Sampling frequency ¹
Bacteria	Coliforms	weekly September to April and monthly remainder of year or monthly or quarterly
	<i>E. coli</i>	weekly, September to April and, monthly remainder of year, fortnightly, monthly or quarterly
	Enterococci	weekly, fortnightly or monthly
Protozoa	<i>Cryptosporidium</i>	weekly, fortnightly or monthly in selected supply systems
	<i>Giardia</i>	
Physical and chemical	pH	weekly September to April and, monthly remainder of year or monthly or quarterly
	Turbidity	
	Colour	
	Electrical conductivity	
	Alkalinity	quarterly
	Hardness	
Inorganic	Arsenic	quarterly
	Cadmium	
	Chromium	
	Cyanide	
	Mercury	
	Nitrate	
	Selenium	
	Sodium	
	Sulphate	
	Chloride	
	Antimony	
	Barium	
	Boron	
	Beryllium	
Organic	MIB	weekly or fortnightly September to April and monthly remainder of year or monthly September to April, or monthly or fortnightly
	Geosmin	
	TOC (Total Organic Carbon)	monthly or quarterly
Corrosion Products	Iron	fortnightly or monthly or quarterly
	Manganese	
	Copper	quarterly
	Lead	
	Zinc	
	Nickel	
Cyanobacteria (Blue Green Algae)	BGA count	weekly - September to April, monthly remainder of the year or fortnightly - September to April, monthly remainder of the year
	BGA ID	
	Biovolume	
Green Algae	Green Algae	weekly September to April and monthly remainder of year
Bromide	Bromide	monthly
Fluoride	Fluoride	quarterly
Nutrients	Total phosphorus	weekly September to April and monthly remainder of year
	Total nitrogen	
Organic (Fungicides/Herbicides/Insecticides)	Numerous (refer Appendix B)	six monthly or annual

Note:

¹ Water sampling localities are assessed individually and the sampling frequencies for each parameter are allocated depending on the risk.

1.3 Water Supply Systems

A summary of general water supply system information is presented in Table 3.

Table 3: Water Sampling Locality, Population, Source Water, Storage & Water Treatment Plant information for 2023/24

Water sampling locality	Population supplied ¹	Source water	Raw water storage	Water treatment plant
Axedale	420	Upper Coliban Reservoir Lauriston Reservoir Malmsbury Reservoir Lake Eppalock Waranga Western Channel	Sandhurst Reservoir	Bendigo
Bendigo Northern	35470			
Bendigo Southern	40370			
Bendigo Spring Gully	12680			
Bendigo Raywood	200			
Bendigo Sebastian	180			
Big Hill	900			
Epsom - Huntly	10590			
Junortoun	3400			
Maiden Gully - Marong	7270			
Strathfieldsaye	7150			
Boort	830	Waranga Western Channel	Boort Basin	Boort
Bridgewater- Inglewood	1370	South West Loddon Pipeline Loddon River	Bridgewater Basins	Bridgewater
Castlemaine	11460	Upper Coliban Reservoir Lauriston Reservoir Malmsbury Reservoir	McCay Reservoir	Castlemaine
Fryerstown	170			
Guildford	270			
Harcourt	1100			
Maldon	1740			
Newstead	820			
Taradale - Elphinstone	500			
Cohuna	2470	Gunbower Creek	Nil	Cohuna
Echuca	15050	Murray River	Nil	Echuca
Elmore	840	Groundwater Bore No.3 Groundwater Bore No.4	Nil	Elmore
Goornong	430	Campaspe River	Goornong Basin	Goornong
Gunbower	340	Taylors Creek	Nil	Gunbower
Heathcote	2220	Caledonia Reservoir Lake Eppalock Waranga Western Channel Upper Coliban Reservoir Lauriston Reservoir Malmsbury Reservoir	Caledonia Reservoir	Heathcote
Tooborac	110			
Korong Vale	210	Grampian Wimmera Mallee Pipeline South West Loddon Pipeline	Korong Vale Basins	Korong Vale
Wedderburn	880			
Kyneton	6650	Lauriston Reservoir	Lauriston Reservoir	Kyneton
Malmsbury	760	Upper Coliban Reservoir		
Tylden	320	Reservoir		

Water sampling locality	Population supplied ¹	Source water	Raw water storage	Water treatment plant
Bealiba	150	Loddon River	Nil	Laanecoorie
Dunolly	770			
Laanecoorie	70			
Tarnagulla	190			
Leitchville	380	Gunbower Creek Cohuna Channel	Nil	Leitchville
Lockington	490	Waranga Western Channel	Lockington Basins	Lockington
Pyramid Hill	580	Pyramid Hill Channel	Pyramid Hill Basin	Pyramid Hill
Rochester	2960	Waranga Western Channel Campaspe River	Nil	Rochester
Serpentine	150	East Loddon stock and domestic pipeline	Serpentine Raw Water Tank	Serpentine
Trentham	1530	Groundwater Reservoir 1 and 2	Trentham Reservoir 1 and 2	Trentham
Total Population supplied	174,440			

Note:

- 1 Population is calculated using property connection numbers multiplied by mean household size from the 2021 census.

2 Drinking water treatment processes

2.1 Water treatment

The following table provides a summary of the water treatment processes used to produce drinking water for each water sampling locality¹ and the chemicals that are added during the various water treatment processes. There were no changes to the water sampling localities during 2023/24.

Appendix C contains a more detailed version of the table below.

Table 4: Water treatment processes

Water sampling locality	Treatment plant	Treatment process	Added substances	Comments
Axedale Bendigo Northern Bendigo Southern Bendigo Spring Gully Bendigo Raywood Bendigo Sebastian Big Hill Epsom - Huntly Junortoun Maiden Gully - Marong Strathfieldsaye	Bendigo	Oxidation Coagulation/flocculation Microfiltration Ozonation BAC filtration Fluoridation pH correction Chloramination	Potassium permanganate Carbon dioxide Aluminium chlorohydrate (ACH) Ozone Hydrofluorosilicic acid Lime Chlorine gas Ammonia	Water mains cleaning was undertaken by changing the chlorine disinfection method from chloramination to chlorination. This program commenced in mid-January 2023, and was completed in October 2023.
Boort	Boort	Coagulation/flocculation Clarification Dual-media filtration pH correction Chlorination	Powdered Activated Carbon ² (PAC) Aluminium sulphate Polyelectrolyte Caustic soda Chlorine gas	
Bridgewater- Inglewood	Bridgewater	Coagulation/flocculation Clarification Dual-media filtration GAC filtration UV irradiation pH correction Chlorination/ Chloramination ³	Sulphuric acid PAC Ultrion Caustic soda Chlorine gas Ammonia	
Castlemaine Fryerstown Guildford Harcourt Maldon Newstead Taradale - Elphinstone	Castlemaine	Coagulation/flocculation Microfiltration Ozonation BAC filtration Fluoridation pH correction Chlorination	Carbon dioxide ACH Ozone Hydrofluorosilicic acid Lime Chlorine gas	

Water sampling locality	Treatment plant	Treatment process	Added substances	Comments
Cohuna	Cohuna	Coagulation/flocculation Clarification Oxidation Dual-media filtration pH correction Chlorination	PAC Caustic soda Aluminium sulphate Polyelectrolyte Chlorine gas Sodium hypochlorite Sodium Fluoride	
Echuca	Echuca	Coagulation/flocculation Clarification Oxidation Dual-media filtration Fluoridation – off-line UV irradiation pH correction Chlorination	PAC Caustic soda Aluminium sulphate Polyelectrolyte Hydrofluorosilicic acid Chlorine gas Sodium hypochlorite	The fluoridation system was shut down in September 2023 due to a range of Safety, Operability and Environmental concerns. UV irradiation system and Chlorine contact tank added to treatment process.
Elmore	Elmore	pH correction UV irradiation	Caustic soda	
Goornong	Goornong	Coagulation/flocculation Clarification Sand filtration pH correction Chlorination	PAC Aluminium sulphate Soda ash Sodium hypochlorite	
Gunbower	Gunbower	Ion Exchange Coagulation/flocculation Clarification Microfiltration GAC filtration UV irradiation Chlorination	PAC MIEX resin ACH Caustic soda Calcium Hypochlorite	
Heathcote Tooborac	Heathcote	Coagulation/flocculation Clarification Oxidation Dual-media filtration UV irradiation pH correction Chlorination/ Chloramination ³	PAC Caustic soda Aluminium sulphate Sodium hypochlorite Polyelectrolyte Chlorine gas Ammonia	
Korong Vale Wedderburn	Korong Vale	Coagulation/flocculation Clarification Dual-media filtration UV irradiation pH correction Chloramination	PAC Caustic soda Aluminium sulphate Polyelectrolyte Chlorine gas Ammonia	UV irradiation system and Chlorine contact tank added to treatment process.

Water sampling locality	Treatment plant	Treatment process	Added substances	Comments
Kyneton Malmsbury Tylden	Kyneton	Coagulation/flocculation Microfiltration Ozonation BAC filtration Fluoridation pH correction Chlorination	Carbon dioxide ACH Ozone Hydrofluorosilicic acid Lime Chlorine gas	
Bealiba Dunolly Laanecoorie Tarnagulla	Laanecoorie	Coagulation/flocculation Clarification Oxidation Dual Media filtration UV irradiation pH correction Chlorination/ Chloramination ³	PAC Aluminium sulphate Polyelectrolyte Caustic soda Chlorine gas Ammonia Sodium hypochlorite	Water mains cleaning was undertaken by changing the chlorine disinfection method from chloramination to chlorination. This work was undertaken December 2023 through to end of January 2024. A pre-dosing hypochlorite system implemented
Leitchville	Leitchville	Coagulation/flocculation Clarification Microfiltration pH correction UV irradiation Chlorination	PAC Aluminium sulphate Polyelectrolyte Caustic soda Chlorine gas	
Lockington	Lockington	Coagulation/flocculation DAFF pH correction Chlorination	PAC ACH Polyelectrolyte Caustic soda Calcium Hypochlorite	Replaced roof of clear water storage
Pyramid Hill	Pyramid Hill	Coagulation/flocculation Clarification Dual-media filtration pH correction Chlorination	PAC Aluminium sulphate ACH Polyelectrolyte Caustic soda Chlorine gas	Upgraded chlorine dosing system, and refurbishment of the filter and clarifier.
Rochester	Rochester	Coagulation/flocculation Clarification Microfiltration GAC filtration pH correction Chlorination	Aluminium sulphate Chlorine gas Caustic Soda	
Serpentine	Serpentine	Coagulation/flocculation Clarification Dual-media filtration pH correction Chlorination	Aluminium sulphate Polyelectrolyte Caustic soda Chlorine gas	

Water sampling locality	Treatment plant	Treatment process	Added substances	Comments
Trentham	Trentham	Ultrafiltration GAC filtration Chlorination	Calcium Hypochlorite	Added a new 1.2 megalitre clear water storage.

Note:

- 1 A water sampling locality is a discrete area of similar water quality.
- 2 There is no permanent PAC dosing system at these treatment plants; however, there is provision for a mobile PAC dosing system to be added into the process when required.
- 3 Primary disinfection occurs through chlorination, and then the treated water is chloraminated, to maintain disinfection residual for a longer period of time.

2.2 Improvements to water supply and treatment

The major water treatment plant improvement works which were carried out in 2023/24 are captured in Table 5.

Table 5: Treatment plant key improvements 2023/24

Water treatment plant	Key improvement works
Bendigo	Clear water storage liner was replaced as part of standard maintenance. Membranes were replaced as part of standard maintenance.
Cohuna	Duty/standby system implemented for the low-lift pumps. Cover installed over the caustic and hypo pumps. Air filter added to the blower to improve maintenance management.
Echuca	UV irradiation system and chlorine contact tank process units added. Two 3.3 megalitre clear water storage tanks built. Raw water supply from the Murray River had an upgrade with one new suction line, the foot valves on both suction lines were replaced, and contingency pipework and pumps prepared for the raw water supply.
Elmore	High level water tower refurbished.
Heathcote	Raw water pump station located at Lake Eppalock upgraded as part of resilience against future flooding.
Korong Vale	UV irradiation system and chlorine contact tank process units added.
Laanecoorie	A pre-dosing hypochlorite system implemented.
Leitchville	Membranes were replaced. Chlorine dosing system upgraded.
Pyramid Hill	Upgraded chlorine dosing system. Refurbishment of the filter and clarifier. Raw water piped from channel to raw water basin, replacing open channel.
Trentham	New 1.2 megalitre clear water storage built.

We have replaced approximately 11.27 kilometres of water mains over the past 12 months as part of our ongoing water mains renewal program, at a cost of just over \$2.27 million. These pipelines are replaced on a priority basis by analysing a range of criteria including risks to customers, the number of recorded failures, the number of customers impacted and the assessed remaining useful life of the asset. The mains were renewed using directional boring, a trenchless technology that reduces the need for excavations and results in overall cost savings of 25 to 50 per cent.

In 2023/24, in excess of 500 kilometres of water mains cleaning was completed in Echuca, Goornong, Gunbower, Heathcote, Inglewood, Leitchville, Maldon, Serpentine, Cohuna, Strathdale, Flora Hill, Quarry Hill and Kennington, at a

cost of approximately \$285,000 This program removes sediment from the water mains, improves chlorine residuals across our networks and has the least interruption to our customers.

Our ongoing water mains cleaning and renewal program helps protect the integrity of the water system, enhances the drinking water quality we supply to customers and ensures our water continues to meet Australian Drinking Water Guidelines.

Additional works have been carried out to replace key water control valves in various network systems that will help future reliance of our networks.

Mitiamo received an upgrade to its non-potable supply by replacing an old earthen dam with 12 poly tanks and a booster pump system. This will improve water quality and pressure for residents by removing the dam from the supply system that had persistent algae and dirty water issues.

Works have also started to review all water network assets, such as tanks and pumps, to ensure they have the capacity to continually supply water to our growing region.

The detail in this report is focused on the management of drinking water quality. We compile an Annual Report that encompasses all of our business activities, including financial statements, which contains details on our capital expenditure. This report is available on our website.

2.3 Issues

During 2023/24 the drinking water supplied to our customers was of a high standard, except as described below.

Schedule 2 of Victoria's SDWR lists three specific drinking water quality standards that apply to all drinking water supplies in Victoria: *Escherichia coli* (*E. coli*), Total Trihalomethanes (THM) and Turbidity, all of which have mandated limits, and frequencies for sampling and testing.

During 2023/24, nitrification was identified in the Laanecoorie system. Our nitrification strategy identifies free chlorination as a process to assist in the management of nitrification. A free chlorine project was carried out in the Laanecoorie system, which required the changing of the disinfection process from chloramination to free chlorination. The risk assessment for the project identified THM formation as a risk; however, the benefits of the chlorination program to improve network health and ongoing protection to public health, meant that it was considered reasonable.

Prior to and during the free chlorination project, the Laanecoorie treatment plant processes were evaluated and verified to be optimised. However, the management of THMs was difficult and a number of non-compliant THM results were recorded. This was due to the raw water quality in the Loddon River, which is the raw water source for the plant. This quality declined during the project and details on this are included in section 4.1. As the raw water quality continued to deteriorate, the free chlorination project concluded earlier than scheduled.

Section 18 notifications were completed for the THM non-compliances.

2.3.1 Aesthetic Guideline value exceedances

A range of organisms that grow naturally in water bodies can produce substances that can create unpleasant Tastes and Odours (T&O) in drinking water supplies. The most common of these substances are Geosmin and 2-Methylisoborneol (MIB). While these substances create unpleasant T&Os in drinking water, they do not pose a risk to public health.

Elevated concentrations of these T&O compounds, but primarily Geosmin, were experienced in the Murray River, which affected the quality of the drinking water produced for Echuca.

The Echuca plant includes a process known as Powder Activated Carbon (PAC) to manage T&O compounds. Water quality sampling identified an increased level of T&O compounds in the water supplied to customers. An issue was found (broken chain on the auger) in the PAC unit, reducing the dose rate of PAC, therefore, it was not removing the Geosmin and MIB from the raw water as efficiently as it could. The issue was fixed, and the PAC unit returned to running at capacity to manage the T&O compounds.

A Section 22 notification was complete as there was potential for widespread customer complaints.

2.3.2 Event Incidents reported to Department of Health

Following a major storm event, at approximately 5am, on Monday 25 December 2023, the Elmore plant stopped running. With no water being produced, the treated water storage (TWS) was drained, and the town ran out of water. This impacted approximately 840 customers.

The draining of the TWS dropped the pressure across the Elmore distribution network to effectively zero. The primary concern was that, with a depressurised network, and heavy rain over the past 24 hours, untreated water may have infiltrated the network. This would result in drinking water supplied to customers that was potentially unsafe to drink.

A rapid risk assessment was completed and it was concluded that a 'Do not Drink' (DnD) advisory was required. This information was presented to Department of Health (DH) and it was agreed that a DnD advisory was required for Elmore.

DH were advised of this event and a Section 22 report was submitted, refer to Section 3.1 for more details.

2.3.3 Fluoride Notifications

DH was notified of the following fluoride shutdowns during 2023/24, as the fluoride concentration in the drinking water was less than 0.6mg/L for a continuous period of >72 hours. Details of each shutdown are detailed below:

1. On 23 August 2023, DH was advised the Echuca fluoride system had been operating, but with low fluoride dosing over previous weeks. The operator had been troubleshooting the low fluoride dosing issue, by cleaning and replacing parts. It was then identified the fluoride dosing line appeared to have a blockage, possibly in the underground pipework. Late on Friday 18 August the system was shutdown. The fluoride dropped by <0.6mg/L for more than 72 hours (Monday 21 August at 7pm). On Tuesday 22 August the section of pipework with the blockage was identified and a temporary bypass was installed, and the system was again operating.
2. Ongoing issues relating to safety, operability and environmental concerns in running the Echuca fluoride system led to the decision to shutdown the system on 12 September 2023. The shutdown was instigated in response to a review that was conducted on the system.

The shutdowns, as outlined above, affected the rolling annual average fluoride concentration in the drinking water supplied to the Echuca network, which is highlighted in the Table 12 Fluoride-WTP exit/storage points for 2023/24, and Table 32 Fluoride-Customer Tap Sites 2023/24.

3 Emergency Incident and Event Management

Sections 3.1 and 4.1 include all Section 22 reports and Section 18 notifications that were made to DH during 2023/24.

3.1 Section 22 Reports

The following reports were made to the Water Unit of DH under Section 22 of the Act. Two Section 22 reports were submitted to DH, and all were submitted within the required timeframe.

Table 6: Section 22 Reports 2023/24

Water sampling locality/date	Nature of incident	Actions taken in response to incident
Potential widespread customer complaints relating to taste and odour issues		
Echuca 2 February 2024	<ul style="list-style-type: none"> • A range of organisms that grow naturally in water bodies can produce substances that can create T&O in drinking water supplies. • The most common of these substances are geosmin and MIB. • While these substances create unpleasant T&O in drinking water, they do not pose a risk to public health. • Elevated concentrations of these compounds, but mainly Geosmin, were in the Murray River, the source water for the Echuca plant. • The plant uses a PAC dosing system to reduce T&O compounds, which was found to be not operating as designed. • The treated water leaving the plant contained geosmin at a concentration above the T&O threshold (10 ng/L), that is mentioned in the ADWG. • Multiple customer complaints were received. 	Corrective actions: <ul style="list-style-type: none"> • A failure of the PAC dosing system (broken chain on the auger) resulted in T&O concentration above the ADWG threshold being delivered to customers. The issue was fixed immediately, and the process returned to normal. • The network was flushed to remove the water containing high T&O compound. • Communication to public was via Coliban Water’s website, social media, and SMS messaging.

Water sampling locality/date	Nature of incident	Actions taken in response to incident
'Do not Drink' Advisory		
Elmore 25 December 2023	<ul style="list-style-type: none"> • At approximately 5am, on Monday 25 December 2023 following a large storm event, the Elmore plant stopped running. With no water being produced, the TWS emptied and the town ran out of water. This resulted in zero pressure in the network. • The primary concern was that, with an effectively depressurised network and heavy rain over 24 hours, untreated water may have infiltrated the network. This would result in the drinking water being supplied to customers being potentially unsafe to drink. • Information was presented to DH and it was agreed that a DnD advisory be put in place. 	<p>Corrective actions:</p> <ul style="list-style-type: none"> • The plant was checked and returned to operation. • The network was flushed twice to ensure any potentially contaminated water was removed, and the flushing points sampled. • Customer tap sampling was carried out twice following the flushing, to ensure water was safe to drink. • The water quality leaving the plant was sampled twice following the flushing, to ensure water was safe to drink. • Following completion of actions, and confirmation the water is safe to drink, the DnD was removed. <p>Customer/Community Communication:</p> <ul style="list-style-type: none"> • A range of channels used, including <ul style="list-style-type: none"> • media release • social media (Facebook & Twitter) • Coliban Water website • SMS messages • Messaging via Vic Emergency App • Variable Message Signs were put in placed at each entry to town • Where SMS details were not available, door knocking was carried out on 26 December 2023. • Signage was placed at public toilet • Bottled water deployed to Elmore, together with a water trailer for public access. • Water trailers were arranged for three businesses to enable continued operation.

4 Drinking Water Quality Standards

The SDWR 2015, detail specific water quality standards under Schedule 2. Any exceedance of water quality standards is notifiable to the DH under Section 18 of the Act.

4.1 Section 18 Notifications

The following notifications were made to the Water Program of DH under Section 18 of the Act. Other than one Section 18 notification, all were submitted to DH within the required timeframe.

Table 7: Section 18 Notifications 2023/24

Water sampling locality/date	Nature of incident	Actions taken in response to incident
Laanecoorie 21 December 2023	A routine sample collected from a Laanecoorie customer tap site, had a THM's result of 0.27mg/L, which exceeded the ADWG health-based guideline value (0.25 mg/L).	<ul style="list-style-type: none"> The Laanecoorie system was being free chlorinated during this period in line with our strategy to manage nitrification within the distribution network. The Laanecoorie plant was constantly being optimised as raw water quality deteriorated. The Risk Assessment identified a maximum THM result needed to be reached before the system would be returned to chloramination. The Risk Assessment maximum THM result was reached, and the system was switched back to chloramination. The THM results returned to below the ADWG health-based guideline value, and the water quality standard listed in Schedule 2 of the SDWR 2015.
Tarnagulla 21 December 2023	A routine sample collected from a Tarnagulla customer tap site, had a THM's result of 0.29mg/L, which exceeded the ADWG health-based guideline value (0.25 mg/L).	
Tarnagulla 21 December 2023	A routine sample collected from a Tarnagulla tank site, had a THM's result of 0.29mg/L, which exceeded the ADWG health-based guideline value (0.25 mg/L).	
Tarnagulla 29 December 2023	A routine sample collected from a Tarnagulla tank site, had a THM's result of 0.35mg/L, which exceeded the ADWG health-based guideline value (0.25 mg/L).	
Dunolly 29 December 2023	A routine sample collected from a Dunolly customer tap site, had a THM's result of 0.30 mg/L, which exceeded the ADWG health-based guideline value (0.25 mg/L).	
Tarnagulla 3 January 2024	A routine sample collected from a Tarnagulla tank site, had a THM's result of 0.38mg/L, which exceeded the ADWG health-based guideline value (0.25 mg/L).	
Bealiba 3 January 2024	A routine sample collected from a Bealiba customer tap site, had a THM's result of 0.27 mg/L, which exceeded the ADWG health-based guideline value (0.25 mg/L).	
Bealiba 3 January 2024	A routine sample collected from a Bealiba tank site, had a THM's result of 0.31 mg/L, which exceeded the ADWG health-based guideline value (0.25 mg/L).	
Dunolly 11 January 2024	A routine sample collected from a Dunolly tank site, had a THM's result of 0.31 mg/L, which exceeded the ADWG health-based guideline value (0.25 mg/L).	
Tarnagulla 11 January 2024	A routine sample collected from a Tarnagulla tank site, had a THM's result of 0.33 mg/L, which exceeded the ADWG health-based guideline value (0.25 mg/L).	
Tarnagulla 17 January 2024	A routine sample collected from a Tarnagulla tank site, had a THM's result of 0.43 mg/L, which exceeded the ADWG health-based guideline value (0.25 mg/L).	
Tarnagulla 24 January 2024	A routine sample collected from a Tarnagulla tank site, had a THM's result of 0.55 mg/L, which exceeded the ADWG health-based guideline value (0.25 mg/L).	
Tarnagulla 31 January 2024	A routine sample collected from a Tarnagulla tank site, had a THM's result of 0.38 mg/L, which exceeded the ADWG health-based guideline value (0.25 mg/L).	

Water sampling locality/date	Nature of incident	Actions taken in response to incident
Bealiba 07 February 2024	A routine sample collected from a Bealiba customer tap site, had a THM's result of 0.34mg/L, which exceeded the ADWG health-based guideline value (0.25 mg/L).	
Bealiba 07 February 2024	A routine sample collected from a Bealiba tank site, had a THM's result of 0.32 mg/L, which exceeded the ADWG health-based guideline value (0.25 mg/L).	

4.2 Water Quality Sampling Program

The SDWR 2015 require water suppliers to incorporate a water sampling program into their risk management plan. Our water sampling program is reviewed annually. It is separated into three categories - raw water, storage tanks and contact points (i.e. storage tanks that are used to provide contact time for chlorine or chloramine disinfection) and distribution networks (i.e. customer taps).

Raw water sites include catchments, raw water storage reservoirs/basins and irrigation storages. Storage tanks and contact points include storage tanks in both our potable and non-potable (regulated) water supplies. The final verification monitoring is carried out at customer tap sites.

The parameters included in the sampling program include the SDWR 2015 Schedule 2 requirements, together with the parameters that would identify any algal toxins, pathogens, chemical, radiological or other substances that may pose a risk to human health, and the parameters which are included in the program are based on system-specific and catchment-based risk assessments.

During the review process consideration is given to:

- ADWG recommendations.
- The likelihood of a particular hazard being present in the water, and historical data trends; and
- Operational changes.

With regard to raw water quality monitoring, additional consideration was given to seasonal impacts on water quality and data required to assess microbial hazards.

The following changes were made to the water quality sampling programs for 2023/24:

1. Raw Water:
 - We added extra parameters to the Murray River raw water sampling location to accommodate the requirements of the Echuca plant supernatant return water discharge Environmental Improvement Program (EIP) monitoring project.
2. Tanks/contact points:
 - Increased THM monitoring post the Tarnagulla tank (weekly during summer) to monitor for the risk of THM formation exceeding the ADWG health-based guideline value (0.25 mg/L)
 - Geosmin and MIB were added to the monitoring program for relevant sampling localities rather than being ad hoc sampling carried out in response to an issue.

4.3 Water Quality Monitoring results

The following table is a comparison of the analysis for each parameter in the monitoring programs for the period from 2021/22 to 2023/24.

Sections 4.4.1 and 4.4.2 contain the individual data tables for each parameter sampled, as per the monitoring program undertaken during 2023/24.

4.3.1 Analysis of Water Sampling Results

We have carried out substantial water quality monitoring for a number of years. The following table refers to compliance with the parameters in our drinking water sampling programs for 2021/22 to 2023/24.

Table 8: Water Quality Parameter Comparison Results 2021/22 to 2023/24

Parameter	Compliant localities 2021/22	Compliant localities 2022/23	Compliant localities 2023/24
<i>Escherichia coli</i> ¹	100%	90%	100%
Trihalomethanes ¹	100%	95%	90%
Turbidity ¹	100%	100%	100%
Chloroacetic acid ²	100%	100%	100%
Dichloroacetic acid ²	100%	100%	100%
Trichloroacetic acid ²	100%	100%	100%
Bromate ²	100%	100%	100%
Formaldehyde ²	100%	100%	100%
Aluminium ³	100%	100%	100%
Fluoride ²	100%	100%	100%
Arsenic ²	100%	100%	100%
Cadmium ²	100%	100%	100%
Chlorine ²	98%	100%	100%
Chromium ²	100%	100%	100%
Cyanide ²	100%	100%	100%
Mercury ²	100%	100%	100%
Nitrate ²	100%	100%	100%
Selenium ²	100%	100%	100%
Sulphate ²	100%	100%	100%
Manganese ²	100%	100%	100%
Copper ²	100%	100%	100%
Lead ²	100%	100%	100%
Nickel ²	100%	100%	100%
Gross alpha ²	100%	100%	100%
Gross beta ²	100%	100%	100%
Nitrite ²	100%	100%	100%
pH ³	79%	74%	71%
Hardness ³	100%	98%	98%
Iron ³	98%	95%	100%
True Colour ³	100%	100%	100%
Electrical Conductivity ³	100%	100%	95%
Sodium ³	100%	100%	100%
Chloride ³	100%	98%	98%
Zinc ³	100%	100%	100%
Ammonia ³	98%	100%	100%
NDMA ²	100%	100%	100%
Total no. water sampling localities	42	42	42

Note:

1 This parameter is a water quality standard as listed in Schedule 2 of the SDWR 2015.

- 2 This parameter is a water quality standard with reference to the relevant ADWG health-based guideline value.
- 3 This parameter has an ADWG aesthetic guideline value.

Our compliance against most sampled parameter in 2023/24 was consistent with the previous two years, other than for THMs. Sections 4.3.1.1 and 4.3.1.2 contain the details for the non-compliant parameters for 2023/24.

4.3.1.1 Actions Undertaken for Schedule 2 Non-compliant Health Parameters

Trihalomethanes (THM)

The THM results that exceeded the health-based guideline value in the ADWG were recorded in the Laanecoorie system, which covers the Laanecoorie, Bealiba, Dunolly and Tarnagulla water sampling localities, which are all supplied by the Laanecoorie plant. Details of the actions carried out in response to these exceedances are included in Section 4.1- Section 18 Notifications.

4.3.1.2 Actions undertaken for Aesthetic Parameters that were not met

pH

Twelve water sampling localities did not meet the ADWG aesthetic guideline value range for pH (pH 6.5 to 8.5). Seven of these localities are supplied with treated water from chloramination treatment systems. An elevated pH (>8.0) is maintained to improve the effectiveness of chloramination.

Additionally, we have systems that have long cement-lined mains in the network, which have alkalinity drawn out from the cement, and this causes a rise in alkalinity levels and an increase in pH. We have a routine water mains renewal program to replace the water mains based on a number of criteria, such as age, size, population served, and frequency of failures etc. These cement-lined pipes will be renewed with pipes made of an appropriate material when they meet the criteria for renewal.

Chloride, hardness & electrical conductivity

The Tarnagulla WSL (chloride, hardness & electrical conductivity), and Bealiba WSL (electrical conductivity), are both supplied from the Laanecoorie plant. The source water for the Laanecoorie plant is the Loddon River, which is challenging raw water to treat, and constantly changing in quality.

4.4 Water Quality Data for Sampling Localities: 1 July 2023 – 30 June 2024

As described in Section 4.2, we carry out a comprehensive water quality monitoring program that includes collecting samples from various points in the water supply system:

- Exit points from plants and water storage tanks into the distribution system.
- Customer tap sites, which are dedicated sampling points that are prior to the customer's water meter.

4.4.1 Treated Water results from plant exit/storage points.

Following are tables that detail the sampling results for each parameter at plant exit/storage points in each of the water sampling localities.

Escherichia coli (E. coli) – plant exit/storage points for 2023/24

E. coli is monitored in all water sampling localities as it is an indicator of the potential presence of faecal contamination in water.

Table 9: E. coli results for plant exit/storage points (water quality standard: No E. coli per 100mL of drinking water, with the exception of any false positive samples¹)

Water sampling locality	Sampling frequency	Number of samples ¹	Maximum detected (cfu/100m L)	Number of detections and investigations conducted (s.22)	Number of samples where standard was not met
Axedale	weekly	52	0	0	0
Bealiba	weekly	52	0	0	0
Bendigo (Northern)	twice weekly	104	0	0	0
Bendigo (Southern)	twice weekly	208	0	0	0
Bendigo (Spring Gully)	twice weekly	104	0	0	0
Big Hill	weekly	104	0	0	0
Bort	weekly	104	0	0	0
Bridgewater - Inglewood	weekly	104	0	0	0
Castlemaine	twice weekly / weekly	156	0	0	0
Cohuna	weekly	104	0	0	0
Dunolly	weekly	52	0	0	0
Echuca	weekly	104	0	0	0
Elmore	weekly	52	0	0	0
Epsom - Huntly	twice weekly	104	0	0	0
Fryerstown	weekly	52	0	0	0
Goornong	weekly	104	0	0	0
Guildford	twice weekly	104	0	0	0
Gunbower	weekly	104	0	0	0
Harcourt	twice weekly / weekly	156	0	0	0
Heathcote	weekly	52	0	0	0
Junortoun	twice weekly	104	0	0	0
Korong Vale	weekly	104	0	0	0
Kyneton	twice weekly / weekly	156	0	0	0
Laanecoorie	weekly	52	0	0	0
Leitchville	weekly	52	0	0	0
Lockington	weekly	52	0	0	0
Maiden Gully - Marong	twice weekly	156	0	0	0
Maldon	weekly	52	0	0	0
Malmsbury	twice weekly / weekly	156	0	0	0
Newstead	weekly	52	0	0	0
Pyramid Hill	weekly	52	0	0	0
Raywood	weekly	52	0	0	0
Rochester	weekly	52	0	0	0
Sebastian	weekly	52	0	0	0
Serpentine	weekly	52	0	0	0
Strathfieldsaye	twice weekly	104	0	0	0
Taradale - Elphinstone	twice weekly	104	0	0	0
Tarnagulla	weekly	52	0	0	0
Tooborac	weekly	52	0	0	0
Trentham	weekly	52	0	0	0
Tylden	weekly	52	0	0	0
Wedderburn	weekly	104	0	0	0

Note:

- 1 The number of samples will vary due to the different number of exit/storage samples points within each water sampling locality.

Trihalomethanes (THM) – plant exit/storage points for 2023/24

THM are formed as a byproduct, predominantly when chlorine is used to disinfect water to make it safe for drinking. They represent one group of chemicals generally referred to as disinfection byproducts.

Table 10: Trihalomethanes results for plant exit/storage points (Water quality standard for THM is 0.25 mg/L)

Water sampling locality	Sampling frequency	Number of Samples ¹	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale ²	monthly	23	0.1300	0.0867	0
Bealiba ³	monthly	12	0.3200	0.1373	2
Bendigo (Northern)	monthly	12	0.1170	0.0374	0
Bendigo (Southern)	monthly	12	0.1170	0.0374	0
Bendigo (Spring Gully)	monthly	12	0.1170	0.0374	0
Big Hill ²	monthly	58	0.1200	0.0607	0
Boort	monthly	12	0.1500	0.1108	0
Bridgewater - Inglewood	monthly	24	0.0730	0.0183	0
Castlemaine	monthly	24	0.1480	0.0882	0
Cohuna	monthly	12	0.0860	0.0430	0
Dunolly ³	monthly	12	0.3100	0.1445	1
Echuca	monthly	24	0.0960	0.0395	0
Elmore	monthly	12	<0.001	<0.001	0
Epsom - Huntly	monthly	12	0.1170	0.0374	0
Fryerstown	monthly	12	0.1200	0.1001	0
Goornong	monthly	24	0.1700	0.1174	0
Guildford	monthly	12	0.1480	0.0991	0
Gunbower	monthly	12	0.1200	0.0605	0
Harcourt	monthly	24	0.1480	0.1020	0
Heathcote	monthly	12	0.1100	0.0830	0
Junortoun	monthly	12	0.1170	0.0374	0
Korong Vale	n/a	n/a	n/a	n/a	n/a
Kyneton	monthly	24	0.1350	0.0875	0
Laanecoorie	monthly	12	0.2300	0.1284	0
Leitchville	monthly	12	0.0590	0.0348	0
Lockington	monthly	12	0.0350	0.0207	0
Maiden Gully - Marong ²	monthly	28	0.1170	0.0625	0
Maldon	monthly	12	0.1300	0.1063	0
Malmsbury	monthly	24	0.1350	0.0920	0
Newstead	monthly	12	0.1300	0.0984	0
Pyramid Hill	monthly	12	0.0360	0.0248	0
Raywood ²	monthly	23	0.1300	0.0933	0
Rochester	monthly	12	0.0950	0.0345	0
Sebastian ²	monthly	23	0.1100	0.0634	0
Serpentine	monthly	12	0.0400	0.0268	0
Strathfieldsaye	monthly	12	0.1170	0.0374	0
Taradale - Elphinstone	n/a	n/a	n/a	n/a	n/a
Tarnagulla ³	seasonal weekly ⁴	40	0.5500	0.1643	7
Tooborac	monthly	12	0.0960	0.0760	0
Trentham	monthly	12	0.0500	0.0284	0
Tylden	monthly	12	0.1000	0.0777	0
Wedderburn	n/a	n/a	n/a	n/a	n/a

Note:

n/a – sampling is not required, either because there is no definitive exit point into the water sampling locality from which a sample could be collected, or Coliban Water's risk assessments has indicated that THM sampling is not necessary to manage water quality risks.

1 The number of samples will vary due to the different number of exit/storage samples points within each locality.

- 2 Sampling increased as part of free chlorination project.
- 3 Details of the water quality exceedances are located in Section 4.1.
- 4 Seasonal Weekly is Weekly September to April, and monthly the other months.

Turbidity – plant exit/storage points for 2023/24

Turbidity is a measure of the particulate matter in water and is monitored in all water sampling localities. High turbidity in the reticulation may indicate poor operation of the water treatment process and/or increased risk of microbiological contamination.

Table 11: Turbidity results for plant exit/storage points (Water quality standard: 95th percentile of results over a 12-month period must be ≤ 5.0 NTU)

Water sampling locality	Sampling frequency	Number of samples ¹	Maximum value (NTU)	95th percentile of results (NTU)	Number of 95th percentile of results above standard
Axedale	monthly	12	0.1	0.1	0
Bealiba	monthly	12	0.9	0.6	0
Bendigo (Northern)	twice weekly	104	0.5	0.1	0
Bendigo (Southern)	twice weekly	208	0.5	0.1	0
Bendigo (Spring Gully)	twice weekly	104	0.2	0.1	0
Big Hill	monthly	24	0.4	0.2	0
Boort	monthly	24	0.3	0.2	0
Bridgewater - Inglewood	monthly	25	0.2	0.2	0
Castlemaine	twice weekly/mthly	116	0.4	0.2	0
Cohuna	monthly	12	2.3	1.3	0
Dunolly	monthly	12	0.2	0.1	0
Echuca	monthly	24	0.2	0.2	0
Elmore	monthly	12	0.1	0.1	0
Epsom - Huntly	twice weekly	104	0.5	0.1	0
Fryerstown	monthly	12	0.2	0.1	0
Goornong	monthly	24	0.2	0.2	0
Guildford	twice weekly	104	0.4	0.1	0
Gunbower	monthly	24	0.1	0.1	0
Harcourt	twice weekly/mthly	116	0.4	0.1	0
Heathcote	monthly	12	0.1	0.1	0
Junortoun	twice weekly	104	0.5	0.1	0
Korong Vale	monthly	24	1.7	0.8	0
Kyneton	twice weekly/mthly	116	0.2	0.2	0
Laanecoorie	monthly	12	0.3	0.2	0
Leitchville	monthly	12	0.2	0.1	0
Lockington	monthly	12	0.1	0.1	0
Maiden Gully - Marong	twice weekly/mthly	116	0.5	0.1	0
Maldon	monthly	12	0.2	0.1	0
Malmsbury	twice weekly/mthly	116	0.2	0.1	0
Newstead	monthly	12	0.2	0.1	0
Pyramid Hill	monthly	12	0.2	0.1	0
Raywood	monthly	12	0.1	0.1	0
Rochester	monthly	12	0.2	0.1	0
Sebastian	monthly	12	0.1	0.1	0
Serpentine	monthly	12	0.2	0.2	0
Strathfieldsaye	twice weekly	104	0.3	0.2	0
Taradale - Elphinstone	twice weekly	104	0.9	0.2	0
Tarnagulla	monthly	12	0.1	0.1	0
Tooborac	monthly	12	0.7	0.4	0
Trentham	monthly	12	0.1	0.1	0
Tylden	monthly	12	0.1	0.1	0
Wedderburn	monthly	24	1.7	0.8	0

Note:

- The number of samples will vary due to the different number of exit/storage samples points within each locality.

Fluoride – WTP exit/storage points for 2023/24

Table 12: Fluoride results for plant exit/storage points (Water quality standard – ADWG health-based guideline value: 1.5 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Target optimum operating fluoride concentration (mg/L)	Max (mg/L)	Min (mg/L)	Ave (mg/L)	Number of samples where standard was not met
Axedale	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Bealiba	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Bendigo (Northern)	twice weekly	104	0.9	0.980	0.720	0.860	0
Bendigo (Southern)	twice weekly	104	0.9	0.980	0.720	0.860	0
Bendigo (Spring Gully)	twice weekly	104	0.9	0.980	0.720	0.860	0
Big Hill	twice weekly	104	0.9	0.980	0.720	0.860	0
Boort	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Bridgewater - Inglewood	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Castlemaine	twice weekly	104	0.9	0.980	0.800	0.889	0
Cohuna ¹	monthly	12	0.8	0.790	<0.05	0.652	0
Dunolly	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Echuca ²	monthly	3	0.8	0.700	0.09	0.42	0
Elmore	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	twice weekly	104	0.9	0.980	0.720	0.860	0
Fryerstown	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Goornong	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Guildford	twice weekly	104	0.9	0.980	0.800	0.889	0
Gunbower	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Harcourt	twice weekly	104	0.9	0.980	0.800	0.889	0
Heathcote	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Junortoun	twice weekly	104	0.9	0.980	0.720	0.860	0
Korong Vale	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Kyneton	twice weekly	104	0.9	0.990	0.770	0.887	0
Laanecoorie	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Leitchville	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Lockington	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Maiden Gully - Marong	twice weekly	104	0.9	0.980	0.720	0.860	0
Maldon	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Malmsbury	twice weekly	104	0.9	0.990	0.770	0.887	0
Newstead	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Pyramid Hill	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Raywood	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Rochester	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sebastian	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Serpentine	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Strathfieldsaye	twice weekly	104	0.9	0.980	0.720	0.860	0
Taradale - Elphinstone	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tarnagulla	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tooborac	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Trentham	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tylden	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Wedderburn	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Note:

Fluoride is only currently added to drinking water at the Bendigo, Castlemaine, Cohuna, Echuca and Kyneton Water Treatment Plants.

- 1 Cohuna plant - January 2024 monthly compliance sample result was incorrect. The on-site analyser and customer tap sample verified fluoride was within the required range.
 - 2 Echuca fluoride system was indefinitely shut down on 8 September 2023. Sampling ceased, with the last sample taken on 11 September 2023
- n/a - not applicable, as the drinking water is not fluoridated.

Bromate – plant exit/storage points for 2023/24

Table 13: Bromate results for plant exit/storage points (Water quality standard – ADWG health-based guideline value: 0.02 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	n/a	n/a	n/a	n/a	n/a
Bealiba	n/a	n/a	n/a	n/a	n/a
Bendigo (Northern)	monthly	12	0.01	0.00	0
Bendigo (Southern)	monthly	12	0.01	0.00	0
Bendigo (Spring Gully)	monthly	12	0.01	0.00	0
Big Hill	monthly	12	0.01	0.00	0
Boort	n/a	n/a	n/a	n/a	n/a
Bridgewater - Inglewood	n/a	n/a	n/a	n/a	n/a
Castlemaine	monthly	12	0.01	0.00	0
Cohuna	n/a	n/a	n/a	n/a	n/a
Dunolly	n/a	n/a	n/a	n/a	n/a
Echuca	n/a	n/a	n/a	n/a	n/a
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	monthly	12	0.01	0.00	0
Fryerstown	n/a	n/a	n/a	n/a	n/a
Goornong	n/a	n/a	n/a	n/a	n/a
Guildford	monthly	12	0.01	0.00	0
Gunbower	n/a	n/a	n/a	n/a	n/a
Harcourt	monthly	12	0.01	0.00	0
Heathcote	n/a	n/a	n/a	n/a	n/a
Junortoun	monthly	12	0.01	0.00	0
Korong Vale	n/a	n/a	n/a	n/a	n/a
Kyneton	monthly	12	0.01	0.00	0
Laanecoorie	n/a	n/a	n/a	n/a	n/a
Leitchville	n/a	n/a	n/a	n/a	n/a
Lockington	n/a	n/a	n/a	n/a	n/a
Maiden Gully - Marong	monthly	12	0.01	0.00	0
Maldon	n/a	n/a	n/a	n/a	n/a
Malmsbury	monthly	12	0.01	0.00	0
Newstead	n/a	n/a	n/a	n/a	n/a
Pyramid Hill	n/a	n/a	n/a	n/a	n/a
Raywood	n/a	n/a	n/a	n/a	n/a
Rochester	n/a	n/a	n/a	n/a	n/a
Sebastian	n/a	n/a	n/a	n/a	n/a
Serpentine	n/a	n/a	n/a	n/a	n/a
Strathfieldsaye	monthly	12	0.01	0.00	0
Taradale - Elphinstone	n/a	n/a	n/a	n/a	n/a
Tarnagulla	n/a	n/a	n/a	n/a	n/a
Tooborac	n/a	n/a	n/a	n/a	n/a
Trentham	n/a	n/a	n/a	n/a	n/a
Tylden	n/a	n/a	n/a	n/a	n/a
Wedderburn	n/a	n/a	n/a	n/a	n/a

Note:

Bromate is monitored in localities where ozone is used in treatment, as ozone can result in the production of this by-products in drinking water.

Ozone is used at the Bendigo, Castlemaine and Kyneton plants.

Ozone-based disinfection byproducts are not deemed to be a significant risk in drinking water we supply that has not been ozonated, therefore it is not monitored.

Formaldehyde – plant exit/storage points for 2023/24

Table 14: Formaldehyde results for plant exit/storage points (Water quality standard – ADWG health-based guideline value: 0.5 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	n/a	n/a	n/a	n/a	n/a
Bealiba	n/a	n/a	n/a	n/a	n/a
Bendigo (Northern)	monthly	12	0.1	0.0	0
Bendigo (Southern)	monthly	12	0.1	0.0	0
Bendigo (Spring Gully)	monthly	12	0.1	0.0	0
Big Hill	monthly	12	0.1	0.0	0
Boort	n/a	n/a	n/a	n/a	n/a
Bridgewater - Inglewood	n/a	n/a	n/a	n/a	n/a
Castlemaine	monthly	12	0.1	0.0	0
Cohuna	n/a	n/a	n/a	n/a	n/a
Dunolly	n/a	n/a	n/a	n/a	n/a
Echuca	n/a	n/a	n/a	n/a	n/a
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	monthly	12	0.1	0.0	0
Fryerstown	n/a	n/a	n/a	n/a	n/a
Goornong	n/a	n/a	n/a	n/a	n/a
Guildford	monthly	12	0.1	0.0	0
Gunbower	n/a	n/a	n/a	n/a	n/a
Harcourt	monthly	12	0.1	0.0	0
Heathcote	n/a	n/a	n/a	n/a	n/a
Junortoun	monthly	12	0.1	0.0	0
Korong Vale	n/a	n/a	n/a	n/a	n/a
Kyneton	monthly	12	0.1	0.0	0
Laanecoorie	n/a	n/a	n/a	n/a	n/a
Leitchville	n/a	n/a	n/a	n/a	n/a
Lockington	n/a	n/a	n/a	n/a	n/a
Maiden Gully - Marong	monthly	12	0.1	0.0	0
Maldon	n/a	n/a	n/a	n/a	n/a
Malmsbury	monthly	12	0.1	0.0	0
Newstead	n/a	n/a	n/a	n/a	n/a
Pyramid Hill	n/a	n/a	n/a	n/a	n/a
Raywood	n/a	n/a	n/a	n/a	n/a
Rochester	n/a	n/a	n/a	n/a	n/a
Sebastian	n/a	n/a	n/a	n/a	n/a
Serpentine	n/a	n/a	n/a	n/a	n/a
Strathfieldsaye	monthly	12	0.1	0.0	0
Taradale - Elphinstone	n/a	n/a	n/a	n/a	n/a
Tarnagulla	n/a	n/a	n/a	n/a	n/a
Tooborac	n/a	n/a	n/a	n/a	n/a
Trentham	n/a	n/a	n/a	n/a	n/a
Tylden	n/a	n/a	n/a	n/a	n/a
Wedderburn	n/a	n/a	n/a	n/a	n/a

Note:

Formaldehyde is monitored in localities where ozone is used in treatment, as ozone can result in the production of this by-products in drinking water.

Ozone is used at the Bendigo, Castlemaine and Kyneton plants.

Ozone-based disinfection byproducts are not deemed to be a significant risk in drinking water we supply that has not been ozonated so is not monitored.

Arsenic – plant exit/storage points for 2023/24

Table 15: Arsenic results for plant exit/storage points (Water quality standard - ADWG health-based guideline value: 0.01 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	n/a	n/a	n/a	n/a	n/a
Bealiba	n/a	n/a	n/a	n/a	n/a
Bendigo (Northern)	monthly	12	0.0005	0.0005	0
Bendigo (Southern)	monthly	12	0.0005	0.0005	0
Bendigo (Spring Gully)	monthly	12	0.0005	0.0005	0
Big Hill	monthly	12	0.0005	0.0005	0
Boort	n/a	n/a	n/a	n/a	n/a
Bridgewater - Inglewood	n/a	n/a	n/a	n/a	n/a
Castlemaine	monthly	12	0.0005	0.0005	0
Cohuna	n/a	n/a	n/a	n/a	n/a
Dunolly	n/a	n/a	n/a	n/a	n/a
Echuca	n/a	n/a	n/a	n/a	n/a
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	monthly	12	0.0005	0.0005	0
Fryerstown	n/a	n/a	n/a	n/a	n/a
Goornong	n/a	n/a	n/a	n/a	n/a
Guildford	monthly	12	0.0005	0.0005	0
Gunbower	n/a	n/a	n/a	n/a	n/a
Harcourt	monthly	12	0.0005	0.0005	0
Heathcote	n/a	n/a	n/a	n/a	n/a
Junortoun	monthly	12	0.0005	0.0005	0
Korong Vale	n/a	n/a	n/a	n/a	n/a
Kyneton	monthly	12	0.0005	0.0005	0
Laanecoorie	n/a	n/a	n/a	n/a	n/a
Leitchville	n/a	n/a	n/a	n/a	n/a
Lockington	n/a	n/a	n/a	n/a	n/a
Maiden Gully - Marong	monthly	12	0.0005	0.0005	0
Maldon	n/a	n/a	n/a	n/a	n/a
Malmsbury	monthly	12	0.0005	0.0005	0
Newstead	n/a	n/a	n/a	n/a	n/a
Pyramid Hill	n/a	n/a	n/a	n/a	n/a
Raywood	n/a	n/a	n/a	n/a	n/a
Rochester	n/a	n/a	n/a	n/a	n/a
Sebastian	n/a	n/a	n/a	n/a	n/a
Serpentine	n/a	n/a	n/a	n/a	n/a
Strathfieldsaye	monthly	12	0.0005	0.0005	0
Taradale - Elphinstone	n/a	n/a	n/a	n/a	n/a
Tarnagulla	n/a	n/a	n/a	n/a	n/a
Tooborac	n/a	n/a	n/a	n/a	n/a
Trentham	n/a	n/a	n/a	n/a	n/a
Tylden	n/a	n/a	n/a	n/a	n/a
Wedderburn	n/a	n/a	n/a	n/a	n/a

n/a - sampling is not required, either because there is no definitive exit point into the water sampling locality from which a sample could be collected, or Coliban Water's risk assessments has indicated that arsenic sampling is not necessary to manage water quality risks.

Nitrate – plant exit/storage points for 2023/24

Table 16: Nitrate results for plant exit/storage points (Water quality standard – ADWG health-based guideline value: 50 mg/L)

Water sampling locality	Sampling frequency	Number of samples ¹	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	n/a	n/a	n/a	n/a	n/a
Bealiba	n/a	n/a	n/a	n/a	n/a
Bendigo (Northern)	n/a	n/a	n/a	n/a	n/a
Bendigo (Southern)	n/a	n/a	n/a	n/a	n/a
Bendigo (Spring Gully)	n/a	n/a	n/a	n/a	n/a
Big Hill ²	monthly	18	1.0	0.5	0
Boort	n/a	n/a	n/a	n/a	n/a
Bridgewater - Inglewood	monthly	12	0.1	0.1	0
Castlemaine	n/a	n/a	n/a	n/a	n/a
Cohuna	n/a	n/a	n/a	n/a	n/a
Dunolly ²	weekly	44	2.6	0.6	0
Echuca	n/a	n/a	n/a	n/a	n/a
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	n/a	n/a	n/a	n/a	n/a
Fryerstown	n/a	n/a	n/a	n/a	n/a
Goornong	n/a	n/a	n/a	n/a	n/a
Guildford	n/a	n/a	n/a	n/a	n/a
Gunbower	n/a	n/a	n/a	n/a	n/a
Harcourt	n/a	n/a	n/a	n/a	n/a
Heathcote	n/a	n/a	n/a	n/a	n/a
Junortoun	n/a	n/a	n/a	n/a	n/a
Korong Vale	fortnightly	26	0.2	0.1	0
Kyneton	n/a	n/a	n/a	n/a	n/a
Laanecoorie	n/a	n/a	n/a	n/a	n/a
Leitchville	n/a	n/a	n/a	n/a	n/a
Lockington	n/a	n/a	n/a	n/a	n/a
Maiden Gully - Marong ²	monthly	9	0.5	0.4	0
Maldon	n/a	n/a	n/a	n/a	n/a
Malmsbury	n/a	n/a	n/a	n/a	n/a
Newstead	n/a	n/a	n/a	n/a	n/a
Pyramid Hill	n/a	n/a	n/a	n/a	n/a
Raywood	n/a	n/a	n/a	n/a	n/a
Rochester	n/a	n/a	n/a	n/a	n/a
Sebastian	n/a	n/a	n/a	n/a	n/a
Serpentine	n/a	n/a	n/a	n/a	n/a
Strathfieldsaye	n/a	n/a	n/a	n/a	n/a
Taradale - Elphinstone	n/a	n/a	n/a	n/a	n/a
Tarnagulla ²	weekly	44	1.6	0.6	0
Tooborac	n/a	n/a	n/a	n/a	n/a
Trentham	n/a	n/a	n/a	n/a	n/a
Tylden	n/a	n/a	n/a	n/a	n/a
Wedderburn	fortnightly	52	0.4	0.1	0

Note:

- 1 The number of samples will vary due to the different number of exit/storage samples within each locality.
- 2 Sampling on-hold during free chlorination project.

n/a - sampling is not required, either because there is no definitive exit point into the water sampling locality from which a sample could be collected, or Coliban Water's risk assessments has indicated that nitrate sampling is not necessary to manage water quality risks.

Manganese – plant exit/storage points for 2023-24

Table 17: Manganese results for plant exit/storage points (Water quality standard – ADWG health-based guideline value: 0.5 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	n/a	n/a	n/a	n/a	n/a
Bealiba	n/a	n/a	n/a	n/a	n/a
Bendigo (Northern)	monthly	12	0.003	0.002	0
Bendigo (Southern)	monthly	12	0.003	0.002	0
Bendigo (Spring Gully)	monthly	12	0.003	0.002	0
Big Hill	monthly	12	0.003	0.002	0
Boort	weekly	52	0.006	0.002	0
Bridgewater - Inglewood	monthly	12	0.002	0.001	0
Castlemaine	monthly	12	0.005	0.001	0
Cohuna	weekly	52	0.018	0.004	0
Dunolly	n/a	n/a	n/a	n/a	n/a
Echuca	weekly	52	0.020	0.004	0
Elmore	monthly	12	0.001	0.001	0
Epsom - Huntly	monthly	12	0.003	0.002	0
Fryerstown	n/a	n/a	n/a	n/a	n/a
Goornong	monthly	12	0.003	0.001	0
Guildford	monthly	12	0.005	0.001	0
Gunbower	weekly	52	<0.001	<0.001	0
Harcourt	monthly	12	0.005	0.001	0
Heathcote	weekly	52	0.300	0.017	0
Junortoun	monthly	12	0.003	0.002	0
Korong Vale	monthly	12	0.001	0.001	0
Kyneton	monthly	12	0.002	0.001	0
Laanecoorie	weekly	52	0.094	0.011	0
Leitchville	weekly	52	0.012	0.003	0
Lockington	monthly	12	<0.001	<0.001	0
Maiden Gully - Marong	monthly	12	0.003	0.002	0
Maldon	n/a	n/a	n/a	n/a	n/a
Malmsbury	monthly	12	0.002	0.001	0
Newstead	n/a	n/a	n/a	n/a	n/a
Pyramid Hill	monthly	12	0.003	0.002	0
Raywood	n/a	n/a	n/a	n/a	n/a
Rochester ¹	weekly	52	0.020	0.003	0
Sebastian	n/a	n/a	n/a	n/a	n/a
Serpentine	monthly	12	0.009	0.003	0
Strathfieldsaye	monthly	12	0.003	0.002	0
Taradale - Elphinstone	n/a	n/a	n/a	n/a	n/a
Tarnagulla	n/a	n/a	n/a	n/a	n/a
Tooborac	n/a	n/a	n/a	n/a	n/a
Trentham	monthly	12	<0.001	<0.001	0
Tylden	n/a	n/a	n/a	n/a	n/a
Wedderburn	n/a	n/a	n/a	n/a	n/a

Note:

n/a – sampling is not required, either because there is no definitive exit point into the water sampling locality from which a sample could be collected, or Coliban Water's risk assessments has indicated that manganese sampling is not necessary to manage water quality risks.

Nitrite – plant exit/storage points for 2023/24

Table 18: Nitrite Results for plant exit/storage points (Water quality standard – ADWG health-based guideline value: 3.0 mg/L)

Water sampling locality	Sampling frequency	Number of samples ¹	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	n/a	n/a	n/a	n/a	n/a
Bealiba	n/a	n/a	n/a	n/a	n/a
Bendigo (Northern)	n/a	n/a	n/a	n/a	n/a
Bendigo (Southern)	n/a	n/a	n/a	n/a	n/a
Bendigo (Spring Gully)	n/a	n/a	n/a	n/a	n/a
Big Hill ²	monthly	18	0.32	0.09	0
Boort	n/a	n/a	n/a	n/a	n/a
Bridgewater - Inglewood	monthly	12	0.01	0.01	0
Castlemaine	n/a	n/a	n/a	n/a	n/a
Cohuna	n/a	n/a	n/a	n/a	n/a
Dunolly ²	weekly	44	0.02	0.01	0
Echuca	n/a	n/a	n/a	n/a	n/a
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	n/a	n/a	n/a	n/a	n/a
Fryerstown	n/a	n/a	n/a	n/a	n/a
Goornong	n/a	n/a	n/a	n/a	n/a
Guildford	n/a	n/a	n/a	n/a	n/a
Gunbower	n/a	n/a	n/a	n/a	n/a
Harcourt	n/a	n/a	n/a	n/a	n/a
Heathcote	n/a	n/a	n/a	n/a	n/a
Junortoun	n/a	n/a	n/a	n/a	n/a
Korong Vale	fortnightly	26	0.02	0.01	0
Kyneton	n/a	n/a	n/a	n/a	n/a
Laanecoorie	n/a	n/a	n/a	n/a	n/a
Leitchville	n/a	n/a	n/a	n/a	n/a
Lockington	n/a	n/a	n/a	n/a	n/a
Maiden Gully - Marong ²	monthly	9	0.43	0.24	n/a
Maldon	n/a	n/a	n/a	n/a	n/a
Malmsbury	n/a	n/a	n/a	n/a	n/a
Newstead	n/a	n/a	n/a	n/a	n/a
Pyramid Hill	n/a	n/a	n/a	n/a	n/a
Raywood	n/a	n/a	n/a	n/a	n/a
Rochester	n/a	n/a	n/a	n/a	n/a
Sebastian	n/a	n/a	n/a	n/a	n/a
Serpentine	n/a	n/a	n/a	n/a	n/a
Strathfieldsaye	n/a	n/a	n/a	n/a	n/a
Taradale - Elphinstone	n/a	n/a	n/a	n/a	n/a
Tarnagulla ²	weekly	44	0.02	0.01	0
Tooborac	n/a	n/a	n/a	n/a	n/a
Trentham	n/a	n/a	n/a	n/a	n/a
Tylden	n/a	n/a	n/a	n/a	n/a
Wedderburn	fortnightly	52	0.23	0.03	0

Note:

- 1 The number of samples will vary due to the different number of exit/storage samples within each locality.
- 2 Sampling on-hold during free chlorination project.

n/a – sampling is not required, either because there is no definitive exit point into the water sampling locality from which a sample could be collected, or Coliban Water's risk assessments has indicated that nitrite sampling is not necessary to manage water quality risks.

Aluminium – plant exit/storage points for 2023-24

Table 19: Aluminium results (Total & Soluble) for plant exit/storage points (ADWG aesthetic guideline value: 0.2 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where guideline was not met
Axedale	n/a	n/a	n/a	n/a	n/a
Bealiba	n/a	n/a	n/a	n/a	n/a
Bendigo (Northern) ¹	weekly	52	0.060	0.033	0
Bendigo (Southern) ¹	weekly	52	0.060	0.033	0
Bendigo (Spring Gully) ¹	weekly	52	0.060	0.033	0
Big Hill ¹	weekly	52	0.060	0.033	0
Boort ²	quarterly	4	0.030	0.018	0
Bridgewater - Inglewood ²	quarterly	4	0.020	0.014	0
Castlemaine ¹	weekly	52	0.060	0.028	0
Cohuna ²	quarterly	4	0.020	0.018	0
Dunolly	n/a	n/a	n/a	n/a	n/a
Echuca ²	monthly	12	0.150	0.051	0
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly ¹	weekly	52	0.060	0.033	0
Fryerstown	n/a	n/a	n/a	n/a	n/a
Goornong ²	monthly	12	0.150	0.064	0
Guildford ¹	weekly	53	0.030	0.019	0
Gunbower ²	quarterly	4	0.090	0.053	0
Harcourt ¹	weekly	53	0.030	0.019	0
Heathcote ²	quarterly	4	0.020	0.018	0
Junortoun ¹	weekly	53	0.050	0.025	0
Korong Vale ²	quarterly	4	0.020	0.015	0
Kyneton ¹	weekly	53	0.030	0.023	0
Laanecoorie ²	quarterly	4	0.030	0.025	0
Leitchville ²	quarterly	4	0.020	0.011	0
Lockington ²	quarterly	4	0.100	0.070	0
Maiden Gully - Marong ¹	weekly	53	0.050	0.025	0
Maldon	n/a	n/a	n/a	n/a	n/a
Malmsbury ¹	weekly	53	0.030	0.023	0
Newstead	n/a	n/a	n/a	n/a	n/a
Pyramid Hill ²	quarterly	4	0.050	0.023	0
Raywood	n/a	n/a	n/a	n/a	n/a
Rochester ²	quarterly	4	<0.01	<0.01	0
Sebastian	n/a	n/a	n/a	n/a	n/a
Serpentine ²	quarterly	4	0.010	0.009	0
Strathfieldsaye ¹	weekly	53	0.050	0.025	0
Taradale - Elphinstone	n/a	n/a	n/a	n/a	n/a
Tarnagulla	n/a	n/a	n/a	n/a	n/a
Tooborac	n/a	n/a	n/a	n/a	n/a
Trentham	n/a	n/a	n/a	n/a	n/a
Tylden	n/a	n/a	n/a	n/a	n/a
Wedderburn	n/a	n/a	n/a	n/a	n/a

Note:

- 1 Total aluminium.
- 2 Soluble aluminium

n/a - sampling is not required, either because there is no definitive exit point into the water sampling locality from which a sample could be collected, or Coliban Water's risk assessments has indicated that aluminium sampling is not necessary to manage water quality risks.

Iron – plant exit/storage points for 2023/24

Table 20: Iron results for plant exit/storage points (ADWG aesthetic guideline value: 0.3mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where guideline was not met
Axedale	n/a	n/a	n/a	n/a	n/a
Bealiba	n/a	n/a	n/a	n/a	n/a
Bendigo (Northern)	monthly	12	0.02	0.01	0
Bendigo (Southern)	monthly	12	0.02	0.01	0
Bendigo (Spring Gully)	monthly	12	0.02	0.01	0
Big Hill	monthly	12	0.02	0.01	0
Boort	weekly	52	0.06	0.02	0
Bridgewater - Inglewood	monthly	12	<0.01	<0.01	0
Castlemaine	monthly	12	0.01	0.01	0
Cohuna	weekly	52	<0.01	<0.01	0
Dunolly	n/a	n/a	n/a	n/a	n/a
Echuca	weekly	52	0.02	0.01	0
Elmore	monthly	12	<0.01	<0.01	0
Epsom - Huntly	monthly	12	0.02	0.01	0
Fryerstown	n/a	n/a	n/a	n/a	n/a
Goornong	monthly	12	<0.01	<0.01	0
Guildford	monthly	12	0.01	0.01	0
Gunbower	weekly	52	<0.01	<0.01	0
Harcourt	monthly	12	0.01	0.01	0
Heathcote	weekly	52	0.08	0.01	0
Junortoun	monthly	12	0.02	0.01	0
Korong Vale	monthly	12	<0.01	<0.01	0
Kyneton	monthly	12	0.01	0.01	0
Laanecoorie	weekly	52	0.02	0.01	0
Leitchville	weekly	52	0.07	0.01	0
Lockington	monthly	12	<0.01	<0.01	0
Maiden Gully - Marong	monthly	12	0.02	0.01	0
Maldon	n/a	n/a	n/a	n/a	n/a
Malmsbury	monthly	12	0.01	0.01	0
Newstead	n/a	n/a	n/a	n/a	n/a
Pyramid Hill	monthly	12	<0.01	<0.01	0
Raywood	n/a	n/a	n/a	n/a	n/a
Rochester ¹	weekly	52	<0.01	<0.01	0
Sebastian	n/a	n/a	n/a	n/a	n/a
Serpentine	monthly	12	0.02	0.01	0
Strathfieldsaye	monthly	12	0.02	0.01	0
Taradale - Elphinstone	n/a	n/a	n/a	n/a	n/a
Tarnagulla	n/a	n/a	n/a	n/a	n/a
Tooborac	n/a	n/a	n/a	n/a	n/a
Trentham	monthly	12	<0.01	<0.01	0
Tylden	n/a	n/a	n/a	n/a	n/a
Wedderburn	n/a	n/a	n/a	n/a	n/a

Note:

n/a – sampling is not required, either because there is no definitive exit point into the water sampling locality from which a sample could be collected, or Coliban Water’s risk assessments has indicated that iron sampling is not necessary to manage water quality risks.

Chlorine – plant exit/storage points for 2023/24

Table 21: Chlorine results for plant exit/storage points (ADWG health-based guideline value: 5.0mg/L)

Water sampling locality	Sampling frequency	Number of samples ¹	Maximum (mg/L)	Average (mg/L)	Number of samples where guideline was not met
Axedale	weekly	52	3.0	1.6	0
Bealiba	weekly	52	2.4	0.7	0
Bendigo (Northern)	n/a	n/a	n/a	n/a	n/a
Bendigo (Southern)	n/a	n/a	n/a	n/a	n/a
Bendigo (Spring Gully)	n/a	n/a	n/a	n/a	n/a
Big Hill	weekly	104	3.8	0.7	0
Boort	weekly	104	3.7	1.9	0
Bridgewater - Inglewood	weekly	104	3.3	1.7	0
Castlemaine	weekly	52	1.9	1.1	0
Cohuna	weekly	104	2.5	1.8	0
Dunolly	weekly	52	2.1	1.3	0
Echuca	weekly	104	3.8	1.8	0
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	n/a	n/a	n/a	n/a	n/a
Fryerstown	weekly	52	2.4	1.4	0
Goornong	weekly	104	2.8	1.2	0
Guildford	n/a	n/a	n/a	n/a	n/a
Gunbower	weekly	104	4.0	1.8	0
Harcourt	weekly	52	2.2	1.5	0
Heathcote	weekly	52	2.6	2.1	0
Junortoun	n/a	n/a	n/a	n/a	n/a
Korong Vale	weekly	104	3.3	2.1	0
Kyneton	weekly	52	2.0	1.5	0
Laanecoorie	weekly	52	2.6	2.0	0
Leitchville	weekly	52	2.7	2.0	0
Lockington	weekly	52	3.1	2.1	0
Maiden Gully - Marong	weekly	52	1.8	0.6	0
Maldon	weekly	52	1.9	1.1	0
Malmsbury	weekly	52	1.8	1.0	0
Newstead	weekly	52	2.0	1.2	0
Pyramid Hill	weekly	52	2.6	2.1	0
Raywood	weekly	52	1.8	1.3	0
Rochester	weekly	52	3.2	1.9	0
Sebastian	weekly	52	2.6	1.6	0
Serpentine	weekly	52	3.7	2.2	0
Strathfieldsaye	n/a	n/a	n/a	n/a	n/a
Taradale - Elphinstone	n/a	n/a	n/a	n/a	n/a
Tarnagulla	weekly	52	1.8	1.2	0
Tooborac	weekly	52	1.7	1.3	0
Trentham	weekly	52	3.5	2.0	0
Tylden	weekly	52	2.2	1.1	0
Wedderburn	weekly	104	3.3	1.7	0

Note:

1 The number of samples will vary due to the different number of exit/storage samples within each locality.

n/a - sampling is not required as there is no definitive exit point into the water sampling locality from which a sample is collected.

Ammonia – plant exit/storage points for 2023-24

Table 22: Ammonia results for plant exit/storage points (ADWG aesthetic guideline value is 0.5 mg/L)

Water sampling locality	Sampling frequency	Number of samples ¹	Maximum (mg/L)	Average (mg/L)	Number of samples where guideline was not met
Axedale	n/a	n/a	n/a	n/a	n/a
Bealiba ²	fortnightly	22	0.390	0.148	0
Bendigo (Northern)	weekly	53	0.340	0.125	0
Bendigo (Southern)	weekly	53	0.340	0.125	0
Bendigo (Spring Gully)	weekly	53	0.340	0.125	0
Big Hill	weekly	53	0.340	0.125	0
Boort	n/a	n/a	n/a	n/a	n/a
Bridgewater - Inglewood	fortnightly/monthly	38	0.260	0.134	0
Castlemaine	n/a	n/a	n/a	n/a	n/a
Cohuna	n/a	n/a	n/a	n/a	n/a
Dunolly ²	weekly	44	0.310	0.189	0
Echuca	n/a	n/a	n/a	n/a	n/a
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	weekly	53	0.340	0.125	0
Fryerstown	n/a	n/a	n/a	n/a	n/a
Goornong	n/a	n/a	n/a	n/a	n/a
Guildford	n/a	n/a	n/a	n/a	n/a
Gunbower	n/a	n/a	n/a	n/a	n/a
Harcourt	n/a	n/a	n/a	n/a	n/a
Heathcote	fortnightly	26	0.250	0.135	0
Junortoun	Weekly	53	0.340	0.125	0
Korong Vale	fortnightly	52	0.370	0.175	0
Kyneton	n/a	n/a	n/a	n/a	n/a
Laanecoorie ²	fortnightly	22	0.170	0.105	0
Leitchville	n/a	n/a	n/a	n/a	n/a
Lockington	n/a	n/a	n/a	n/a	n/a
Maiden Gully - Marong ²	weekly/mthly	62	0.340	0.116	0
Maldon	n/a	n/a	n/a	n/a	n/a
Malmsbury	n/a	n/a	n/a	n/a	n/a
Newstead	n/a	n/a	n/a	n/a	n/a
Pyramid Hill	n/a	n/a	n/a	n/a	n/a
Raywood	n/a	n/a	n/a	n/a	n/a
Rochester	n/a	n/a	n/a	n/a	n/a
Sebastian	n/a	n/a	n/a	n/a	n/a
Serpentine	n/a	n/a	n/a	n/a	n/a
Strathfieldsaye	weekly	53	0.340	0.125	0
Taradale - Elphinstone	n/a	n/a	n/a	n/a	n/a
Tarnagulla ²	weekly	44	0.320	0.198	0
Tooborac	n/a	n/a	n/a	n/a	n/a
Trentham	n/a	n/a	n/a	n/a	n/a
Tylden	n/a	n/a	n/a	n/a	n/a
Wedderburn	fortnightly	52	0.370	0.167	0

Note:

- 1 The number of samples will vary due to the different number of exit/storage samples within each locality.
- 2 Sampling on-hold during free chlorination project.

n/a - sampling is not required, either because there is no definitive exit point into the water sampling locality from which a sample could be collected, or Coliban Water's risk assessments has indicated that ammonia sampling is not necessary to manage water quality risks.

Alkalinity – plant exit/storage points for 2023-24

Table 23: Alkalinity results for plant exit/storage points – whilst there is no ADWG guideline limit for alkalinity, it is monitored for operational purposes.

Water Sampling Locality	Sampling frequency	Number of Samples	Maximum (mg/L)	Average (mg/L)
Axedale	n/a	n/a	n/a	n/a
Bealiba	n/a	n/a	n/a	n/a
Bendigo (Northern)	weekly	53	62	54
Bendigo (Southern)	weekly	53	62	54
Bendigo (Spring Gully)	weekly	53	62	54
Big Hill	weekly	53	62	54
Boort	n/a	n/a	n/a	n/a
Bridgewater - Inglewood	n/a	n/a	n/a	n/a
Castlemaine	weekly	53	55	51
Cohuna	n/a	n/a	n/a	n/a
Dunolly	n/a	n/a	n/a	n/a
Echuca	n/a	n/a	n/a	n/a
Elmore	n/a	n/a	n/a	n/a
Epsom - Huntly	weekly	53	62	54
Fryerstown	n/a	n/a	n/a	n/a
Goornong	n/a	n/a	n/a	n/a
Guildford	weekly	53	55	51
Gunbower	n/a	n/a	n/a	n/a
Harcourt	weekly	53	55	51
Heathcote	n/a	n/a	n/a	n/a
Junortoun	weekly	53	62	54
Korong Vale	n/a	n/a	n/a	n/a
Kyneton	weekly	53	77	55
Laanecoorie	n/a	n/a	n/a	n/a
Leitchville	n/a	n/a	n/a	n/a
Lockington	n/a	n/a	n/a	n/a
Maiden Gully - Marong	weekly	53	62	54
Maldon	n/a	n/a	n/a	n/a
Malmsbury	weekly	53	77	55
Newstead	n/a	n/a	n/a	n/a
Pyramid Hill	n/a	n/a	n/a	n/a
Raywood	n/a	n/a	n/a	n/a
Rochester	n/a	n/a	n/a	n/a
Sebastian	n/a	n/a	n/a	n/a
Serpentine	n/a	n/a	n/a	n/a
Strathfieldsaye	weekly	53	62	54
Taradale - Elphinstone	n/a	n/a	n/a	n/a
Tarnagulla	n/a	n/a	n/a	n/a
Tooborac	n/a	n/a	n/a	n/a
Trentham	n/a	n/a	n/a	n/a
Tylden	n/a	n/a	n/a	n/a
Wedderburn	n/a	n/a	n/a	n/a

n/a – sampling is not required, either because there is no definitive exit point into the water sampling locality from which a sample could be collected, or Coliban Water’s risk assessments has indicated that alkalinity sampling is not necessary to manage water quality risks.

4.4.2 Treated Water results from customer tap sample points

Following are tables of sampling results for each parameter at customer tap sample points in each of the sampling localities.

Escherichia coli (E. coli) – Customer tap sites 2023-24

E. coli is monitored in all water sampling localities as it is an indicator of the potential presence of faecal contamination in water.

Table 24: *E. coli* results for customer tap sites (Schedule 2 Drinking water quality standards: No *E. coli* per 100mL of drinking water, with the exception of any false positive sample[^]).

Water sampling locality	Sampling frequency	Number of samples	Maximum detected (orgs/100mL)	Number of detections and investigations conducted (s.22)	Number of samples where standard was not met
Axedale	weekly	52	0	0	0
Bealiba	weekly	52	0	0	0
Bendigo (Northern)	weekly	136	0	0	0
Bendigo (Southern)	weekly	136	0	0	0
Bendigo (Spring Gully)	weekly	76	0	0	0
Big Hill	weekly	52	0	0	0
Boort	weekly	52	0	0	0
Bridgewater-Inglewood	weekly	52	0	0	0
Castlemaine	weekly	76	0	0	0
Cohuna	weekly	52	0	0	0
Dunolly	weekly	52	0	0	0
Echuca	weekly	76	0	0	0
Elmore	weekly	52	0	0	0
Epsom - Huntly	weekly	64	0	0	0
Fryerstown	weekly	52	0	0	0
Goornong	weekly	52	0	0	0
Guildford	weekly	52	0	0	0
Gunbower	weekly	52	0	0	0
Harcourt	weekly	52	0	0	0
Heathcote	weekly	52	0	0	0
Junortoun	weekly	52	0	0	0
Korong Vale	weekly	52	0	0	0
Kyneton	weekly	64	0	0	0
Laanecoorie	weekly	52	0	0	0
Leitchville	weekly	52	0	0	0
Lockington	weekly	52	0	0	0
Maiden Gully - Marong	weekly	64	0	0	0
Maldon	weekly	52	0	0	0
Malmsbury	weekly	52	0	0	0
Newstead	weekly	52	0	0	0
Pyramid Hill	weekly	52	0	0	0
Raywood	weekly	52	0	0	0
Rochester	weekly	52	0	0	0
Sebastian	weekly	52	0	0	0
Serpentine	weekly	52	0	0	0
Strathfieldsaye	weekly	64	0	0	0
Taradale - Elphinstone	weekly	52	0	0	0
Tarnagulla	weekly	52	0	0	0
Tooborac	weekly	52	0	0	0
Trentham	weekly	52	0	0	0
Tylden	weekly	52	0	0	0
Wedderburn	weekly	52	0	0	0

Note:

Localities with populations greater than 5,000 have additional sampling to the one sample per week (one additional sample per month for each 5,000 above 5,000 population in accordance with the Australian Drinking Water Guidelines (2011).

^ no false positive E. coli results were recorded during 2023/24.

Trihalomethanes (THM) – Customer tap sites 2023-24

THM are formed as a byproduct, predominantly when chlorine is used to disinfect water for drinking. They represent one group of chemicals generally referred to as disinfection by-products.

Table 25: THM results for customer tap sites (Schedule 2 – Drinking water quality standards - Less than or equal to 0.25 mg/L of drinking water.)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale ¹	monthly/wkly	23	0.1400	0.0902	0
Bealiba ²	monthly	12	0.3400	0.1331	2
Bendigo (Northern) ¹	monthly/wkly	23	0.1100	0.0573	0
Bendigo (Southern) ¹	monthly/wkly	23	0.1000	0.0477	0
Bendigo (Spring Gully) ¹	monthly/wkly	23	0.1000	0.0493	0
Big Hill ¹	monthly/wkly	23	0.1100	0.0547	0
Boort	monthly	12	0.1700	0.1255	0
Bridgewater - Inglewood	monthly	12	0.0270	0.0189	0
Castlemaine	monthly	12	0.0980	0.0760	0
Cohuna	monthly	12	0.0920	0.0537	0
Dunolly ²	monthly	12	0.3500	0.1421	1
Echuca	monthly	12	0.0970	0.0504	0
Elmore	monthly	12	<0.001	<0.001	0
Epsom – Huntly ¹	monthly/wkly	23	0.1100	0.0577	0
Fryerstown	monthly	12	0.1400	0.1132	0
Goornong	monthly	12	0.1700	0.1127	0
Guildford	monthly	13	0.1300	0.0978	0
Gunbower	monthly	12	0.1400	0.0669	0
Harcourt	monthly	12	0.1400	0.1095	0
Heathcote	monthly	12	0.1300	0.0881	0
Junortoun ¹	monthly/wkly	23	0.1100	0.0580	0
Korong Vale	monthly	12	0.0320	0.0163	0
Kyneton	monthly	13	0.0900	0.0686	0
Laanecoorie ²	monthly	13	0.2700	0.1314	1
Leitchville	monthly	12	0.0880	0.0470	0
Lockington	monthly	12	0.0630	0.0443	0
Maiden Gully – Marong ¹	monthly/wkly	24	0.1200	0.0536	0
Maldon	monthly	12	0.1400	0.1133	0
Malmsbury	monthly	12	0.1100	0.0940	0
Newstead	monthly	12	0.1300	0.1001	0
Pyramid Hill	monthly	12	0.0740	0.0448	0
Raywood ¹	monthly/wkly	23	0.1400	0.1003	0
Rochester	monthly	12	0.1400	0.0459	0
Sebastian ²	monthly	23	0.1600	0.1019	0
Serpentine	monthly	12	0.1000	0.0586	0
Strathfieldsaye ¹	monthly/wkly	23	0.0930	0.0510	0
Taradale - Elphinstone	monthly	12	0.1100	0.0852	0
Tarnagulla ²	monthly	12	0.3700	0.1438	1
Tooborac	monthly	12	0.1300	0.0899	0
Trentham	monthly	12	0.0520	0.0377	0
Tylden	monthly	12	0.0980	0.0749	0
Wedderburn	monthly	12	0.0240	0.0144	0

Note:

- 1 Monthly sampling increased to weekly during free chlorination project.
- 2 Details of the water quality exceedances are located in Section 4.1

Turbidity – Customer tap sites 2023/24

Turbidity is a measure of the particulate matter in water and is monitored in all water sampling localities. High turbidity in the reticulation may indicate poor operation of the water treatment process and/or increased risk of microbiological contamination.

Table 26: Turbidity results for customer tap sites (Schedule 2 – Drinking water quality standards: 95th percentile of results over a 12-month period must be ≤ 5.0 NTU)

Water sampling locality	Sampling frequency	Number of samples	Maximum value (NTU)	95th percentile of results (NTU)	Number of 95th percentile of results above standard
Axedale	weekly	52	0.3	0.1	0
Bealiba	weekly	52	0.7	0.2	0
Bendigo (Northern)	weekly	52	0.2	0.2	0
Bendigo (Southern)	weekly	52	0.2	0.1	0
Bendigo (Spring Gully)	weekly	52	0.2	0.1	0
Big Hill	weekly	52	0.2	0.2	0
Boort	weekly	52	0.2	0.2	0
Bridgewater – Inglewood	weekly	52	0.2	0.2	0
Castlemaine	weekly	52	0.2	0.1	0
Cohuna	weekly	52	0.3	0.2	0
Dunolly	weekly	52	0.2	0.1	0
Echuca	weekly	52	0.2	0.2	0
Elmore	weekly	52	0.1	0.1	0
Epsom - Huntly	weekly	52	1.1	0.2	0
Fryerstown	weekly	52	0.5	0.2	0
Goornong	weekly	52	0.4	0.2	0
Guildford	weekly	52	0.2	0.1	0
Gunbower	weekly	52	0.5	0.1	0
Harcourt	weekly	52	0.2	0.1	0
Heathcote	weekly	52	0.3	0.2	0
Junortoun	weekly	52	0.3	0.1	0
Korong Vale	weekly	52	0.6	0.4	0
Kyneton	weekly	52	0.2	0.1	0
Laanecoorie	weekly	52	2.1	0.4	0
Leitchville	weekly	52	2.1	0.3	0
Lockington	weekly	52	0.5	0.1	0
Maiden Gully - Marong	weekly	52	0.3	0.1	0
Maldon	weekly	52	0.2	0.2	0
Malmsbury	weekly	52	0.2	0.1	0
Newstead	weekly	52	0.2	0.2	0
Pyramid Hill	weekly	52	0.1	0.1	0
Raywood	weekly	52	0.2	0.1	0
Rochester	weekly	52	0.3	0.2	0
Sebastian	weekly	52	0.3	0.2	0
Serpentine	weekly	52	0.4	0.4	0
Strathfieldsaye	weekly	52	0.3	0.2	0
Taradale - Elphinstone	weekly	52	0.6	0.2	0
Tarnagulla	weekly	52	0.2	0.1	0
Tooborac	weekly	52	0.9	0.3	0
Trentham	weekly	52	0.3	0.1	0
Tylden	weekly	52	0.2	0.1	0
Wedderburn	weekly	52	1.1	0.4	0

Chloroacetic Acid – Customer tap sites 2023/24

Table 27: Chloroacetic acid results for customer tap sites (Water quality standard – ADWG health-based guideline value: 0.15 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	quarterly	4	<0.005	<0.005	0
Bealiba	quarterly	4	<0.005	<0.005	0
Bendigo (Northern)	quarterly	4	<0.005	<0.005	0
Bendigo (Southern)	quarterly	4	<0.005	<0.005	0
Bendigo (Spring Gully)	quarterly	4	<0.005	<0.005	0
Big Hill	quarterly	4	<0.005	<0.005	0
Boort	quarterly	4	<0.005	<0.005	0
Bridgewater - Inglewood	quarterly	4	<0.005	<0.005	0
Castlemaine	quarterly	4	<0.005	<0.005	0
Cohuna	quarterly	4	<0.005	<0.005	0
Dunolly	quarterly	4	<0.005	<0.005	0
Echuca	quarterly	4	<0.005	<0.005	0
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	quarterly	4	<0.005	<0.005	0
Fryerstown	quarterly	4	<0.005	<0.005	0
Goornong	quarterly	4	<0.005	<0.005	0
Guildford	quarterly	4	<0.005	<0.005	0
Gunbower	quarterly	4	<0.005	<0.005	0
Harcourt	quarterly	4	<0.005	<0.005	0
Heathcote	quarterly	4	<0.005	<0.005	0
Junortoun	quarterly	4	<0.005	<0.005	0
Korong Vale	quarterly	4	<0.005	<0.005	0
Kyneton	quarterly	4	<0.005	<0.005	0
Laanecoorie	quarterly	4	<0.005	<0.005	0
Leitchville	quarterly	4	<0.005	<0.005	0
Lockington	quarterly	4	<0.005	<0.005	0
Maiden Gully - Marong	quarterly	4	<0.005	<0.005	0
Maldon	quarterly	4	<0.005	<0.005	0
Malmsbury	quarterly	4	<0.005	<0.005	0
Newstead	quarterly	4	<0.005	<0.005	0
Pyramid Hill	quarterly	4	<0.005	<0.005	0
Raywood	quarterly	4	<0.005	<0.005	0
Rochester	quarterly	4	<0.005	<0.005	0
Sebastian	quarterly	4	<0.005	<0.005	0
Serpentine	quarterly	4	<0.005	<0.005	0
Strathfieldsaye	quarterly	4	<0.005	<0.005	0
Taradale - Elphinstone	quarterly	4	<0.005	<0.005	0
Tarnagulla	quarterly	4	<0.005	<0.005	0
Tooborac	quarterly	4	<0.005	<0.005	0
Trentham	quarterly	4	<0.005	<0.005	0
Tylden	quarterly	4	<0.005	<0.005	0
Wedderburn	quarterly	4	<0.005	<0.005	0

Note:

1 Chlorine is not used for disinfection at Elmore. Chlorine-based disinfection by-products are not deemed to be a significant risk in drinking water supplied by Coliban Water that has not been chlorinated.

Dichloroacetic Acid – Customer tap sites 2023/24

Table 28: Dichloroacetic acid results for customer tap sites (Water quality standard – ADWG health-based guideline value: 0.1 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	quarterly	4	0.010	0.009	0
Bealiba	quarterly	4	<0.005	<0.005	0
Bendigo (Northern)	quarterly	4	0.028	0.016	0
Bendigo (Southern)	quarterly	4	0.034	0.015	0
Bendigo (Spring Gully)	quarterly	4	0.035	0.014	0
Big Hill	quarterly	4	0.025	0.012	0
Boort	quarterly	4	0.017	0.012	0
Bridgewater - Inglewood	quarterly	4	0.008	0.004	0
Castlemaine	quarterly	4	0.030	0.024	0
Cohuna	quarterly	4	0.017	0.012	0
Dunolly	quarterly	4	0.023	0.017	0
Echuca	quarterly	4	0.023	0.016	0
Elmore ¹	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	quarterly	4	0.025	0.010	0
Fryerstown	quarterly	4	0.045	0.020	0
Goornong	quarterly	4	0.011	0.006	0
Guildford	quarterly	4	0.025	0.010	0
Gunbower	quarterly	4	0.025	0.020	0
Harcourt	quarterly	4	0.008	0.006	0
Heathcote	quarterly	4	0.028	0.020	0
Junortoun	quarterly	4	0.036	0.015	0
Korong Vale	quarterly	4	0.008	0.005	0
Kyneton	quarterly	4	0.031	0.020	0
Laanecoorie	quarterly	4	0.024	0.016	0
Leitchville	quarterly	4	0.020	0.016	0
Lockington	quarterly	4	0.012	0.007	0
Maiden Gully - Marong	quarterly	4	0.033	0.015	0
Maldon	quarterly	4	<0.005	<0.005	0
Malmsbury	quarterly	4	<0.005	<0.005	0
Newstead	quarterly	4	0.027	0.014	0
Pyramid Hill	quarterly	4	0.011	0.010	0
Raywood	quarterly	4	0.010	0.008	0
Rochester	quarterly	4	0.007	0.005	0
Sebastian	quarterly	4	<0.005	<0.005	0
Serpentine	quarterly	4	0.015	0.012	0
Strathfieldsaye	quarterly	4	0.025	0.012	0
Taradale - Elphinstone	quarterly	4	0.030	0.026	0
Tarnagulla	quarterly	4	0.031	0.020	0
Tooborac	quarterly	4	0.018	0.011	0
Trentham	quarterly	4	0.014	0.011	0
Tylden	quarterly	4	0.030	0.024	0
Wedderburn	quarterly	4	0.012	0.009	0

Note:

- 1 Chlorine is not used for disinfection at Elmore. Chlorine-based disinfection by-products are not deemed to be a significant risk in drinking water supplied by Coliban Water that has not been chlorinated.

Trichloroacetic Acid – Customer tap sites 2023/24

Table 29: Trichloroacetic acid results for customer tap sites (Water quality standard – ADWG health-based guideline value 0.1 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	quarterly	4	0.017	0.008	0
Bealiba	quarterly	4	0.006	0.003	0
Bendigo (Northern)	quarterly	4	0.028	0.015	0
Bendigo (Southern)	quarterly	4	0.037	0.014	0
Bendigo (Spring Gully)	quarterly	4	0.039	0.013	0
Big Hill	quarterly	4	0.036	0.017	0
Boort	quarterly	4	0.009	0.004	0
Bridgewater - Inglewood	quarterly	4	<0.005	<0.005	0
Castlemaine	quarterly	4	0.023	0.020	0
Cohuna	quarterly	4	0.015	0.010	0
Dunolly	quarterly	4	0.038	0.012	0
Echuca	quarterly	4	0.031	0.016	0
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	quarterly	4	0.036	0.017	0
Fryerstown	quarterly	4	0.045	0.024	0
Goornong	quarterly	4	0.010	0.006	0
Guildford	quarterly	4	0.021	0.011	0
Gunbower	quarterly	4	0.026	0.020	0
Harcourt	quarterly	4	0.034	0.024	0
Heathcote	quarterly	4	0.019	0.011	0
Junortoun	quarterly	4	0.033	0.016	0
Korong Vale	quarterly	4	<0.005	<0.005	0
Kyneton	quarterly	4	0.034	0.025	0
Laanecoorie	quarterly	4	0.019	0.008	0
Leitchville	quarterly	4	0.017	0.013	0
Lockington	quarterly	4	0.005	0.003	0
Maiden Gully - Marong	quarterly	4	0.034	0.014	0
Maldon	quarterly	4	<0.005	<0.005	0
Malmsbury	quarterly	4	0.021	0.012	0
Newstead	quarterly	4	0.030	0.024	0
Pyramid Hill	quarterly	4	0.006	0.003	0
Raywood	quarterly	4	0.007	0.006	0
Rochester	quarterly	4	0.017	0.006	0
Sebastian	quarterly	4	<0.005	<0.005	0
Serpentine	quarterly	4	0.010	0.008	0
Strathfieldsaye	quarterly	4	0.027	0.014	0
Taradale - Elphinstone	quarterly	4	0.027	0.024	0
Tarnagulla	quarterly	4	0.022	0.007	0
Tooborac	quarterly	4	0.011	0.009	0
Trentham	quarterly	4	0.017	0.011	0
Tylden	quarterly	4	0.026	0.024	0
Wedderburn	quarterly	4	<0.005	<0.005	0

Note:

- 1 Chlorine is not used for disinfection at Elmore. Chlorine-based disinfection by-products are not deemed to be a significant risk in drinking water supplied by Coliban Water that has not been chlorinated.

Bromate – Customer tap sites 2023/24

Table 30: Bromate results for customer tap sites (Water quality standard - ADWG health-based guideline value: 0.02 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	monthly	12	<0.005	<0.005	0
Bealiba	n/a	n/a	n/a	n/a	n/a
Bendigo (Northern)	monthly	12	<0.005	<0.005	0
Bendigo (Southern)	monthly	12	<0.005	<0.005	0
Bendigo (Spring Gully)	monthly	12	<0.005	<0.005	0
Big Hill	monthly	12	<0.005	<0.005	0
Boort	n/a	n/a	n/a	n/a	n/a
Bridgewater - Inglewood	n/a	n/a	n/a	n/a	n/a
Castlemaine	quarterly	4	<0.005	<0.005	0
Cohuna	n/a	n/a	n/a	n/a	n/a
Dunolly	n/a	n/a	n/a	n/a	n/a
Echuca	n/a	n/a	n/a	n/a	n/a
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	monthly	12	<0.005	<0.005	0
Fryerstown	quarterly	4	<0.005	<0.005	0
Goornong	n/a	n/a	n/a	n/a	n/a
Guildford	quarterly	4	<0.005	<0.005	0
Gunbower	n/a	n/a	n/a	n/a	n/a
Harcourt	quarterly	4	<0.005	<0.005	0
Heathcote	n/a	n/a	n/a	n/a	n/a
Junortoun	monthly	12	<0.005	<0.005	0
Korong Vale	n/a	n/a	n/a	n/a	n/a
Kyneton	quarterly	4	<0.005	<0.005	0
Laanecoorie	n/a	n/a	n/a	n/a	n/a
Leitchville	n/a	n/a	n/a	n/a	n/a
Lockington	n/a	n/a	n/a	n/a	n/a
Maiden Gully - Marong	monthly	12	<0.005	<0.005	0
Maldon	quarterly	4	<0.005	<0.005	0
Malmsbury	quarterly	4	<0.005	<0.005	0
Newstead	quarterly	4	<0.005	<0.005	0
Pyramid Hill	n/a	n/a	n/a	n/a	n/a
Raywood	monthly	12	<0.005	<0.005	0
Rochester	n/a	n/a	n/a	n/a	n/a
Sebastian	monthly	12	<0.005	<0.005	0
Serpentine	n/a	n/a	n/a	n/a	n/a
Strathfieldsaye	monthly	12	<0.005	<0.005	0
Taradale - Elphinstone	quarterly	4	<0.005	<0.005	0
Tarnagulla	n/a	n/a	n/a	n/a	n/a
Tooborac	n/a	n/a	n/a	n/a	n/a
Trentham	n/a	n/a	n/a	n/a	n/a
Tylden	quarterly	4	<0.005	<0.005	0
Wedderburn	n/a	n/a	n/a	n/a	n/a

Note:

Bromate is monitored in localities where ozone is used in treatment, as ozone can result in the production of this by-products in drinking water.

Ozone is used at the Bendigo, Castlemaine and Kyneton plants. Review of historical data has identified sampling localities supplied from Castlemaine and Kyneton plants as low risk, therefore monitoring is quarterly in those localities.

Ozone-based disinfection by-products are not deemed to be a significant risk in drinking water we supply that has not been ozonated.

Formaldehyde – Customer tap sites 2023/24

Table 31: Formaldehyde results for customer tap sites (Water quality standard - ADWG health-based guideline value: 0.5 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	monthly	12	<0.05	<0.05	0
Bealiba	n/a	n/a	n/a	n/a	n/a
Bendigo (Northern)	monthly	12	<0.05	<0.05	0
Bendigo (Southern)	monthly	12	<0.05	<0.05	0
Bendigo (Spring Gully)	monthly	12	<0.05	<0.05	0
Big Hill	monthly	12	<0.05	<0.05	0
Boort	n/a	n/a	n/a	n/a	n/a
Bridgewater - Inglewood	n/a	n/a	n/a	n/a	n/a
Castlemaine	quarterly	4	<0.05	<0.05	0
Cohuna	n/a	n/a	n/a	n/a	n/a
Dunolly	n/a	n/a	n/a	n/a	n/a
Echuca	n/a	n/a	n/a	n/a	n/a
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	monthly	12	<0.05	<0.05	0
Fryerstown	quarterly	4	<0.05	<0.05	0
Goornong	n/a	n/a	n/a	n/a	n/a
Guildford	quarterly	4	<0.05	<0.05	0
Gunbower	n/a	n/a	n/a	n/a	n/a
Harcourt	quarterly	4	<0.05	<0.05	0
Heathcote	n/a	n/a	n/a	n/a	n/a
Junortoun	monthly	12	<0.05	<0.05	0
Korong Vale	n/a	n/a	n/a	n/a	n/a
Kyneton	quarterly	4	<0.05	<0.05	0
Laanecoorie	n/a	n/a	n/a	n/a	n/a
Leitchville	n/a	n/a	n/a	n/a	n/a
Lockington	n/a	n/a	n/a	n/a	n/a
Maiden Gully - Marong	monthly	12	<0.05	<0.05	0
Maldon	quarterly	4	<0.05	<0.05	0
Malmsbury	quarterly	4	<0.05	<0.05	0
Newstead	quarterly	4	<0.05	<0.05	0
Pyramid Hill	n/a	n/a	n/a	n/a	n/a
Raywood	monthly	12	<0.05	<0.05	0
Rochester	n/a	n/a	n/a	n/a	n/a
Sebastian	monthly	12	<0.05	<0.05	0
Serpentine	n/a	n/a	n/a	n/a	n/a
Strathfieldsaye	monthly	12	<0.05	<0.05	0
Taradale - Elphinstone	quarterly	4	<0.05	<0.05	0
Tarnagulla	n/a	n/a	n/a	n/a	n/a
Tooborac	n/a	n/a	n/a	n/a	n/a
Trentham	n/a	n/a	n/a	n/a	n/a
Tylden	quarterly	4	<0.05	<0.05	0
Wedderburn	n/a	n/a	n/a	n/a	n/a

Note:

Formaldehyde is monitored in localities where ozone is used in treatment, as ozone can result in the production of this by-products in drinking water.

Ozone is used at the Bendigo, Castlemaine and Kyneton plants. Review of historical data has identified sampling localities supplied from Castlemaine and Kyneton plants as low risk, therefore monitoring is quarterly in those localities.

Ozone-based disinfection by-products are not deemed to be a significant risk in drinking water we supply that has not been ozonated.

Fluoride – Customer tap sites 2023/24

Table 32: Fluoride results for customer tap sites (Water quality standard – ADWG health-based guideline value: 1.5 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Target optimum operating fluoride concentration (mg/L)	Max (mg/L)	Min (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	monthly	12	0.9	0.930	0.800	0.868	0
Bealiba	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Bendigo (Northern)	monthly	12	0.9	0.920	0.820	0.868	0
Bendigo (Southern)	monthly	12	0.9	0.920	0.800	0.853	0
Bendigo (Spring Gully)	monthly	12	0.9	0.970	0.800	0.868	0
Big Hill	monthly	12	0.9	0.950	0.800	0.860	0
Boort	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Bridgewater - Inglewood	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Castlemaine	monthly	12	0.9	0.990	0.820	0.911	0
Cohuna	weekly	52	0.8	0.880	0.580	0.724	0
Dunolly	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Echuca ¹	weekly	11	0.8	0.720	0.2	0.522	0
Elmore	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	monthly	12	0.9	0.910	0.750	0.850	0
Fryerstown	monthly	12	0.9	0.980	0.830	0.907	0
Goornong	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Guildford	monthly	12	0.9	0.970	0.850	0.898	0
Gunbower	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Harcourt	monthly	12	0.9	0.980	0.850	0.908	0
Heathcote	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Junortoun	monthly	12	0.9	0.990	0.750	0.873	0
Korong Vale	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Kyneton ²	weekly	52	0.9	0.980	<0.05	0.871	0
Laanecoorie	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Leitchville	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Lockington	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Maiden Gully - Marong	monthly	12	0.9	0.930	0.780	0.851	0
Maldon	monthly	12	0.9	0.960	0.850	0.894	0
Malmsbury	weekly	52	0.9	1.000	0.810	0.886	0
Newstead	monthly	12	0.9	0.980	0.850	0.906	0
Pyramid Hill	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Raywood	monthly	12	0.9	0.960	0.770	0.864	0
Rochester	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sebastian	monthly	12	0.9	0.940	0.720	0.863	0
Serpentine	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Strathfieldsay	monthly	12	0.9	0.910	0.790	0.852	0
Taradale - Elphinstone	monthly	12	0.9	0.990	0.840	0.889	0
Tarnagulla	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tooborac	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Trentham	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tylden	weekly	52	0.9	0.990	0.820	0.888	0
Wedderburn	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Note:

- 1 Echuca fluoride system was indefinitely shut down on 8 September 2023. Sampling ceased, with last sample taken 11 September 2023
- 2 Kyneton sampling locality had one fluoride customer tap sample result that was incorrect. The on-site analyser and tank sample data verified fluoride was within the required range.

Arsenic – Customer tap sites 2023/24

Table 33: Arsenic results for customer tap sites (Water quality standard - ADWG health-based guideline value: 0.01 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	quarterly	4	<0.001	<0.001	0
Bealiba	quarterly	4	<0.001	<0.001	0
Bendigo (Northern)	quarterly	4	<0.001	<0.001	0
Bendigo (Southern)	quarterly	4	<0.001	<0.001	0
Bendigo (Spring Gully)	quarterly	4	<0.001	<0.001	0
Big Hill	quarterly	4	<0.001	<0.001	0
Boort	quarterly	4	<0.001	<0.001	0
Bridgewater - Inglewood	quarterly	4	<0.001	<0.001	0
Castlemaine	quarterly	4	<0.001	<0.001	0
Cohuna	quarterly	4	<0.001	<0.001	0
Dunolly	quarterly	4	<0.001	<0.001	0
Echuca	quarterly	4	<0.001	<0.001	0
Elmore	quarterly	4	<0.001	<0.001	0
Epsom - Huntly	quarterly	4	<0.001	<0.001	0
Fryerstown	quarterly	4	<0.001	<0.001	0
Goornong	quarterly	4	<0.001	<0.001	0
Guildford	quarterly	4	<0.001	<0.001	0
Gunbower	quarterly	4	<0.001	<0.001	0
Harcourt	quarterly	4	<0.001	<0.001	0
Heathcote	quarterly	4	<0.001	<0.001	0
Junortoun	quarterly	4	<0.001	<0.001	0
Korong Vale	quarterly	4	<0.001	<0.001	0
Kyneton	quarterly	4	<0.001	<0.001	0
Laanecoorie	quarterly	4	<0.001	<0.001	0
Leitchville	quarterly	4	<0.001	<0.001	0
Lockington	quarterly	4	<0.001	<0.001	0
Maiden Gully - Marong	quarterly	4	<0.001	<0.001	0
Maldon	quarterly	4	<0.001	<0.001	0
Malmsbury	quarterly	4	<0.001	<0.001	0
Newstead	quarterly	4	<0.001	<0.001	0
Pyramid Hill	quarterly	4	<0.001	<0.001	0
Raywood	quarterly	4	<0.001	<0.001	0
Rochester	quarterly	4	<0.001	<0.001	0
Sebastian	quarterly	4	<0.001	<0.001	0
Serpentine	quarterly	4	<0.001	<0.001	0
Strathfieldsaye	quarterly	4	<0.001	<0.001	0
Taradale - Elphinstone	quarterly	4	<0.001	<0.001	0
Tarnagulla	quarterly	4	<0.001	<0.001	0
Tooborac	quarterly	4	<0.001	<0.001	0
Trentham	quarterly	4	<0.001	<0.001	0
Tylden	quarterly	4	<0.001	<0.001	0
Wedderburn	quarterly	4	<0.001	<0.001	0

Cadmium – Customer tap sites 2023/24

Table 34: Cadmium results for customer tap sites (Water quality standard – ADWG health-based guideline value: 0.002 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	quarterly	4	<0.0002	<0.0002	0
Bealiba	quarterly	4	<0.0002	<0.0002	0
Bendigo (Northern)	quarterly	4	<0.0002	<0.0002	0
Bendigo (Southern)	quarterly	4	<0.0002	<0.0002	0
Bendigo (Spring Gully)	quarterly	4	<0.0002	<0.0002	0
Big Hill	quarterly	4	<0.0002	<0.0002	0
Boort	quarterly	4	<0.0002	<0.0002	0
Bridgewater - Inglewood	quarterly	4	<0.0002	<0.0002	0
Castlemaine	quarterly	4	0.0006	0.0002	0
Cohuna	quarterly	4	<0.0002	<0.0002	0
Dunolly	quarterly	4	<0.0002	<0.0002	0
Echuca	quarterly	4	0.0004	0.0002	0
Elmore	quarterly	4	0.0004	0.0002	0
Epsom - Huntly	quarterly	4	<0.0002	<0.0002	0
Fryerstown	quarterly	4	0.0006	0.0002	0
Goornong	quarterly	4	0.0005	0.0002	0
Guildford	quarterly	4	0.0006	0.0002	0
Gunbower	quarterly	4	<0.0002	<0.0002	0
Harcourt	quarterly	4	<0.0002	<0.0002	0
Heathcote	quarterly	4	<0.0002	<0.0002	0
Junortoun	quarterly	4	<0.0002	<0.0002	0
Korong Vale	quarterly	4	<0.0002	<0.0002	0
Kyneton	quarterly	4	<0.0002	<0.0002	0
Laanecoorie	quarterly	4	<0.0002	<0.0002	0
Leitchville	quarterly	4	<0.0002	<0.0002	0
Lockington	quarterly	4	0.0005	0.0002	0
Maiden Gully - Marong	quarterly	4	<0.0002	<0.0002	0
Maldon	quarterly	4	<0.0002	<0.0002	0
Malmsbury	quarterly	4	<0.0002	<0.0002	0
Newstead	quarterly	4	0.0005	0.0002	0
Pyramid Hill	quarterly	4	<0.0002	<0.0002	0
Raywood	quarterly	4	<0.0002	<0.0002	0
Rochester	quarterly	4	0.0005	0.0002	0
Sebastian	quarterly	4	<0.0002	<0.0002	0
Serpentine	quarterly	4	<0.0002	<0.0002	0
Strathfieldsaye	quarterly	4	<0.0002	<0.0002	0
Taradale - Elphinstone	quarterly	4	<0.0002	<0.0002	0
Tarnagulla	quarterly	4	<0.0002	<0.0002	0
Tooborac	quarterly	4	<0.0002	<0.0002	0
Trentham	quarterly	4	<0.0002	<0.0002	0
Tylden	quarterly	4	<0.0002	<0.0002	0
Wedderburn	quarterly	4	<0.0002	<0.0002	0

Chlorine – Customer tap sites 2023/24

Table 35: Chlorine results for customer tap sites (Water quality standard - ADWG health-based guideline value: 5 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	weekly	52	2.40	1.36	0
Bealiba	weekly	52	2.10	0.56	0
Bendigo (Northern)	weekly	136	2.20	1.04	0
Bendigo (Southern)	weekly	136	2.30	1.20	0
Bendigo (Spring Gully)	weekly	76	2.60	1.37	0
Big Hill	weekly	52	2.60	0.83	0
Boort	weekly	52	2.50	1.09	0
Bridgewater - Inglewood	weekly	52	2.80	1.78	0
Castlemaine	weekly	76	2.30	1.59	0
Cohuna	weekly	52	2.20	1.47	0
Dunolly	weekly	52	2.10	1.14	0
Echuca	weekly	76	3.10	1.52	0
Elmore ¹	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	weekly	64	2.20	0.86	0
Fryerstown	weekly	52	2.10	0.73	0
Goornong	weekly	52	2.60	1.23	0
Guildford	weekly	52	1.30	0.39	0
Gunbower	weekly	52	3.70	1.55	0
Harcourt	weekly	52	2.00	0.65	0
Heathcote	weekly	52	2.20	1.71	0
Junortoun	weekly	52	2.00	0.54	0
Korong Vale	weekly	52	3.20	1.93	0
Kyneton	weekly	64	2.60	1.79	0
Laanecoorie	weekly	52	2.20	1.22	0
Leitchville	weekly	52	2.50	1.67	0
Lockington	weekly	52	2.40	1.42	0
Maiden Gully - Marong	weekly	64	2.20	1.20	0
Maldon	weekly	52	1.20	0.77	0
Malmsbury	weekly	52	1.40	0.42	0
Newstead	weekly	52	1.60	0.72	0
Pyramid Hill	weekly	52	2.20	1.43	0
Raywood	weekly	52	1.70	0.91	0
Rochester	weekly	52	3.10	1.54	0
Sebastian	weekly	52	1.60	0.43	0
Serpentine	weekly	52	2.20	1.25	0
Strathfieldsaye	weekly	64	2.20	1.12	0
Taradale - Elphinstone	weekly	52	2.20	1.26	0
Tarnagulla	weekly	52	1.60	0.94	0
Tooborac	weekly	52	1.70	0.71	0
Trentham	weekly	52	2.40	1.67	0
Tylden	weekly	52	2.20	1.55	0
Wedderburn	weekly	52	2.20	1.37	0

Localities with populations greater than 5,000 have additional sampling to the one sample per week (one additional sample per month for each 5,000 above 5,000 population in accordance with the Australian Drinking Water Guidelines (2011)).

Note:

1 Chlorine is not used for disinfection at Elmore.

Chromium – Customer tap sites 2023/24

Table 36: Chromium results for customer tap sites (Water quality standard – ADWG health-based guideline value: 0.05 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	quarterly	4	<0.001	<0.001	0
Bealiba	quarterly	4	<0.001	<0.001	0
Bendigo (Northern)	quarterly	4	<0.001	<0.001	0
Bendigo (Southern)	quarterly	4	<0.001	<0.001	0
Bendigo (Spring Gully)	quarterly	4	<0.001	<0.001	0
Big Hill	quarterly	4	<0.001	<0.001	0
Boort	quarterly	4	<0.001	<0.001	0
Bridgewater - Inglewood	quarterly	4	<0.001	<0.001	0
Castlemaine	quarterly	4	<0.001	<0.001	0
Cohuna	quarterly	4	<0.001	<0.001	0
Dunolly	quarterly	4	<0.001	<0.001	0
Echuca	quarterly	4	<0.001	<0.001	0
Elmore	quarterly	4	<0.001	<0.001	0
Epsom - Huntly	quarterly	4	<0.001	<0.001	0
Fryerstown	quarterly	4	<0.001	<0.001	0
Goornong	quarterly	4	<0.001	<0.001	0
Guildford	quarterly	4	<0.001	<0.001	0
Gunbower	quarterly	4	<0.001	<0.001	0
Harcourt	quarterly	4	<0.001	<0.001	0
Heathcote	quarterly	4	<0.001	<0.001	0
Junortoun	quarterly	4	<0.001	<0.001	0
Korong Vale	quarterly	4	<0.001	<0.001	0
Kyneton	quarterly	4	<0.001	<0.001	0
Laanecoorie	quarterly	4	<0.001	<0.001	0
Leitchville	quarterly	4	<0.001	<0.001	0
Lockington	quarterly	4	<0.001	<0.001	0
Maiden Gully - Marong	quarterly	4	<0.001	<0.001	0
Maldon	quarterly	4	<0.001	<0.001	0
Malmsbury	quarterly	4	<0.001	<0.001	0
Newstead	quarterly	4	<0.001	<0.001	0
Pyramid Hill	quarterly	4	<0.001	<0.001	0
Raywood	quarterly	4	<0.001	<0.001	0
Rochester	quarterly	4	<0.001	<0.001	0
Sebastian	quarterly	4	<0.001	<0.001	0
Serpentine	quarterly	4	<0.001	<0.001	0
Strathfieldsaye	quarterly	4	<0.001	<0.001	0
Taradale - Elphinstone	quarterly	4	<0.001	<0.001	0
Tarnagulla	quarterly	4	<0.001	<0.001	0
Tooborac	quarterly	4	<0.001	<0.001	0
Trentham	quarterly	4	<0.001	<0.001	0
Tylden	quarterly	4	<0.001	<0.001	0
Wedderburn	quarterly	4	<0.001	<0.001	0

Cyanide – Customer tap sites 2023/24

Table 37: Cyanide results for customer tap sites (Water quality standard - ADWG health-based guideline value: 0.08 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	quarterly	4	<0.005	<0.005	0
Bealiba	quarterly	4	<0.005	<0.005	0
Bendigo (Northern)	quarterly	4	<0.005	<0.005	0
Bendigo (Southern)	quarterly	4	<0.005	<0.005	0
Bendigo (Spring Gully)	quarterly	4	<0.005	<0.005	0
Big Hill	quarterly	4	<0.005	<0.005	0
Boort	quarterly	4	<0.005	<0.005	0
Bridgewater - Inglewood	quarterly	4	<0.005	<0.005	0
Castlemaine	quarterly	4	<0.005	<0.005	0
Cohuna	quarterly	4	<0.005	<0.005	0
Dunolly	quarterly	4	<0.005	<0.005	0
Echuca	quarterly	4	<0.005	<0.005	0
Elmore	quarterly	4	<0.005	<0.005	0
Epsom - Huntly	quarterly	4	<0.005	<0.005	0
Fryerstown	quarterly	4	<0.005	<0.005	0
Goornong	quarterly	4	<0.005	<0.005	0
Guildford	quarterly	4	<0.005	<0.005	0
Gunbower	quarterly	4	<0.005	<0.005	0
Harcourt	quarterly	4	<0.005	<0.005	0
Heathcote	quarterly	4	<0.005	<0.005	0
Junortoun	quarterly	4	<0.005	<0.005	0
Korong Vale	quarterly	4	<0.005	<0.005	0
Kyneton	quarterly	4	<0.005	<0.005	0
Laanecoorie	quarterly	4	<0.005	<0.005	0
Leitchville	quarterly	4	<0.005	<0.005	0
Lockington	quarterly	4	<0.005	<0.005	0
Maiden Gully - Marong	quarterly	4	<0.005	<0.005	0
Maldon	quarterly	4	<0.005	<0.005	0
Malmsbury	quarterly	4	<0.005	<0.005	0
Newstead	quarterly	4	<0.005	<0.005	0
Pyramid Hill	quarterly	4	<0.005	<0.005	0
Raywood	quarterly	4	<0.005	<0.005	0
Rochester	quarterly	4	<0.005	<0.005	0
Sebastian	quarterly	4	<0.005	<0.005	0
Serpentine	quarterly	4	<0.005	<0.005	0
Strathfieldsaye	quarterly	4	<0.005	<0.005	0
Taradale - Elphinstone	quarterly	4	<0.005	<0.005	0
Tarnagulla	quarterly	4	0.006	0.003	0
Tooborac	quarterly	4	<0.005	<0.005	0
Trentham	quarterly	4	<0.005	<0.005	0
Tylden	quarterly	4	<0.005	<0.005	0
Wedderburn	quarterly	4	<0.005	<0.005	0

Mercury – Customer tap sites 2023/24

Table 38: Mercury results for customer tap sites (Water quality standard – ADWG health-based guideline value: 0.001 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	quarterly	4	<0.0001	<0.0001	0
Bealiba	quarterly	4	<0.0001	<0.0001	0
Bendigo (Northern)	quarterly	4	0.00050	0.00016	0
Bendigo (Southern)	quarterly	4	<0.0001	<0.0001	0
Bendigo (Spring Gully)	quarterly	4	0.00020	0.00009	0
Big Hill	quarterly	4	<0.0001	<0.0001	0
Boort	quarterly	4	<0.0001	<0.0001	0
Bridgewater - Inglewood	quarterly	4	<0.0001	<0.0001	0
Castlemaine	quarterly	4	0.00040	0.00014	0
Cohuna	quarterly	4	<0.0001	<0.0001	0
Dunolly	quarterly	4	<0.0001	<0.0001	0
Echuca	quarterly	4	0.00030	0.00011	0
Elmore	quarterly	4	0.00040	0.00014	0
Epsom - Huntly	quarterly	4	<0.0001	<0.0001	0
Fryerstown	quarterly	4	0.00050	0.00016	0
Goornong	quarterly	4	0.00050	0.00016	0
Guildford	quarterly	4	0.00040	0.00014	0
Gunbower	quarterly	4	<0.0001	<0.0001	0
Harcourt	quarterly	4	<0.0001	<0.0001	0
Heathcote	quarterly	4	<0.0001	<0.0001	0
Junortoun	quarterly	4	0.00040	0.00014	0
Korong Vale	quarterly	4	<0.0001	<0.0001	0
Kyneton	quarterly	4	<0.0001	<0.0001	0
Laanecoorie	quarterly	4	<0.0001	<0.0001	0
Leitchville	quarterly	4	<0.0001	<0.0001	0
Lockington	quarterly	4	0.00030	0.00011	0
Maiden Gully - Marong	quarterly	4	<0.0001	<0.0001	0
Maldon	quarterly	4	<0.0001	<0.0001	0
Malmsbury	quarterly	4	<0.0001	<0.0001	0
Newstead	quarterly	4	0.00040	0.00014	0
Pyramid Hill	quarterly	4	<0.0001	<0.0001	0
Raywood	quarterly	4	<0.0001	<0.0001	0
Rochester	quarterly	4	0.00040	0.00014	0
Sebastian	quarterly	4	<0.0001	<0.0001	0
Serpentine	quarterly	4	<0.0001	<0.0001	0
Strathfieldsaye	quarterly	4	0.00070	0.00021	0
Taradale - Elphinstone	quarterly	4	<0.0001	<0.0001	0
Tarnagulla	quarterly	4	<0.0001	<0.0001	0
Tooborac	quarterly	4	<0.0001	<0.0001	0
Trentham	quarterly	4	<0.0001	<0.0001	0
Tylden	quarterly	4	<0.0001	<0.0001	0
Wedderburn	quarterly	4	<0.0001	<0.0001	0

Nitrate – Customer tap sites 2023/24

Table 39: Nitrate results for customer tap sites (Water quality standard - ADWG health-based guideline value: 50 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale ²	quarterly	4	0.9	0.6	0
Bealiba ^{1&3}	fortnightly	25	2.2	0.8	0
Bendigo (Northern) ^{1&3}	fortnightly	21	0.6	0.3	0
Bendigo (Southern) ^{1&3}	fortnightly	21	0.5	0.3	0
Bendigo (Spring Gully) ^{1&3}	fortnightly	21	0.4	0.3	0
Big Hill ^{1&3}	fortnightly	20	0.8	0.4	0
Boort ²	quarterly	4	0.2	0.1	0
Bridgewater-Inglewood ¹	fortnightly	28	0.1	0.1	0
Castlemaine ²	quarterly	4	0.2	0.2	0
Cohuna ²	quarterly	4	0.4	0.1	0
Dunolly ^{1&3}	fortnightly	25	1.7	0.6	0
Echuca ²	quarterly	4	0.3	0.1	0
Elmore ²	quarterly	4	1.3	1.3	0
Epsom - Huntly ^{1&3}	fortnightly	22	1.0	0.4	0
Fryerstown ²	quarterly	4	0.2	0.2	0
Goornong ²	quarterly	4	0.3	0.1	0
Guildford ²	quarterly	4	0.2	0.2	0
Gunbower ²	quarterly	4	0.3	0.1	0
Harcourt ²	quarterly	4	0.2	0.2	0
Heathcote ¹	fortnightly	28	0.3	0.2	0
Junortoun ^{1&3}	fortnightly	20	0.9	0.5	0
Korong Vale ¹	fortnightly	28	0.2	0.1	0
Kyneton ²	quarterly	4	0.4	0.4	0
Laanecoorie ^{1&3}	fortnightly	24	2.1	0.6	0
Leitchville ²	quarterly	4	0.3	0.1	0
Lockington ²	Quarterly	4	0.1	0.0	0
Maiden Gully - Marong ^{1&3}	fortnightly	22	0.8	0.4	0
Maldon ²	quarterly	4	0.2	0.2	0
Malmsbury ²	quarterly	4	0.4	0.4	0
Newstead ²	quarterly	4	0.2	0.2	0
Pyramid Hill ²	quarterly	4	0.1	0.0	0
Raywood ²	quarterly	4	0.9	0.6	0
Rochester ²	quarterly	4	1.7	0.5	0
Sebastian ²	quarterly	4	0.9	0.7	0
Serpentine ²	quarterly	4	0.2	0.2	0
Strathfieldsaye ^{1&3}	fortnightly	22	0.5	0.3	0
Taradale - Elphinstone ²	quarterly	4	0.2	0.2	0
Tarnagulla ^{1&3}	fortnightly	24	1.5	0.6	0
Tooborac ²	quarterly	4	0.5	0.4	0
Trentham ²	quarterly	4	1.5	1.0	0
Tylden ²	quarterly	4	0.4	0.4	0
Wedderburn ¹	fortnightly	28	0.4	0.2	0

Note:

- 1 Chloraminated systems are sampled fortnightly, to assist in monitoring for nitrification.
- 2 Chlorinated systems are sampled quarterly.
- 3 Sampling on-hold during free chlorination project.

Selenium – Customer tap sites 2023/24

Table 40: Selenium results for customer tap sites (Water quality standard – ADWG health-based guideline value: 0.01 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	quarterly	4	<0.001	<0.001	0
Bealiba	quarterly	4	<0.001	<0.001	0
Bendigo (Northern)	quarterly	4	<0.001	<0.001	0
Bendigo (Southern)	quarterly	4	<0.001	<0.001	0
Bendigo (Spring Gully)	quarterly	4	<0.001	<0.001	0
Big Hill	quarterly	4	<0.001	<0.001	0
Boort	quarterly	4	<0.001	<0.001	0
Bridgewater - Inglewood	quarterly	4	<0.001	<0.001	0
Castlemaine	quarterly	4	<0.001	<0.001	0
Cohuna	quarterly	4	<0.001	<0.001	0
Dunolly	quarterly	4	<0.001	<0.001	0
Echuca	quarterly	4	<0.001	<0.001	0
Elmore	quarterly	4	0.001	0.001	0
Epsom - Huntly	quarterly	4	<0.001	<0.001	0
Fryerstown	quarterly	4	<0.001	<0.001	0
Goornong	quarterly	4	<0.001	<0.001	0
Guildford	quarterly	4	<0.001	<0.001	0
Gunbower	quarterly	4	<0.001	<0.001	0
Harcourt	quarterly	4	<0.001	<0.001	0
Heathcote	quarterly	4	<0.001	<0.001	0
Junortoun	quarterly	4	<0.001	<0.001	0
Korong Vale	quarterly	4	<0.001	<0.001	0
Kyneton	quarterly	4	<0.001	<0.001	0
Laanecoorie	quarterly	4	<0.001	<0.001	0
Leitchville	quarterly	4	<0.001	<0.001	0
Lockington	quarterly	4	<0.001	<0.001	0
Maiden Gully - Marong	quarterly	4	<0.001	<0.001	0
Maldon	quarterly	4	<0.001	<0.001	0
Malmsbury	quarterly	4	<0.001	<0.001	0
Newstead	quarterly	4	<0.001	<0.001	0
Pyramid Hill	quarterly	4	<0.001	<0.001	0
Raywood	quarterly	4	<0.001	<0.001	0
Rochester	quarterly	4	<0.001	<0.001	0
Sebastian	quarterly	4	<0.001	<0.001	0
Serpentine	quarterly	4	<0.001	<0.001	0
Strathfieldsaye	quarterly	4	<0.001	<0.001	0
Taradale - Elphinstone	quarterly	4	<0.001	<0.001	0
Tarnagulla	quarterly	4	<0.001	<0.001	0
Tooborac	quarterly	4	<0.001	<0.001	0
Trentham	quarterly	4	<0.001	<0.001	0
Tylden	quarterly	4	<0.001	<0.001	0
Wedderburn	quarterly	4	<0.001	<0.001	0

Sulphate – Customer tap sites 2023/24

Table 41: Sulphate results for customer tap sites (Water quality standard - ADWG health-based guideline value 500 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	quarterly	4	2	2	0
Bealiba	quarterly	4	80	75	0
Bendigo (Northern)	quarterly	4	2	2	0
Bendigo (Southern)	quarterly	4	2	2	0
Bendigo (Spring Gully)	quarterly	4	2	2	0
Big Hill	quarterly	4	2	1	0
Boort	quarterly	4	80	62	0
Bridgewater - Inglewood	quarterly	4	3	3	0
Castlemaine	quarterly	4	3	3	0
Cohuna	quarterly	4	41	34	0
Dunolly	quarterly	4	89	77	0
Echuca	quarterly	4	38	29	0
Elmore	quarterly	4	9	9	0
Epsom - Huntly	quarterly	4	3	2	0
Fryerstown	quarterly	4	4	4	0
Goornong	quarterly	4	90	69	0
Guildford	quarterly	4	4	3	0
Gunbower	quarterly	4	4	3	0
Harcourt	quarterly	4	4	4	0
Heathcote	quarterly	4	55	50	0
Junortoun	quarterly	4	4	3	0
Korong Vale	quarterly	4	15	14	0
Kyneton	quarterly	4	2	1	0
Laanecoorie	quarterly	4	92	76	0
Leitchville	quarterly	4	33	28	0
Lockington	quarterly	4	71	20	0
Maiden Gully - Marong	quarterly	4	2	2	0
Maldon	quarterly	4	4	4	0
Malmsbury	quarterly	4	2	1	0
Newstead	quarterly	4	4	3	0
Pyramid Hill	quarterly	4	35	32	0
Raywood	quarterly	4	3	2	0
Rochester	quarterly	4	68	33	0
Sebastian	quarterly	4	3	2	0
Serpentine	quarterly	4	24	21	0
Strathfieldsaye	quarterly	4	2	2	0
Taradale - Elphinstone	quarterly	4	4	3	0
Tarnagulla	quarterly	4	90	77	0
Tooborac	quarterly	4	64	55	0
Trentham	quarterly	4	<1	<1	0
Tylden	quarterly	4	1	1	0
Wedderburn	quarterly	4	15	14	0

Manganese – Customer tap sites 2023/24

Table 42: Manganese results for customer tap sites (Water quality standard - ADWG health-based guideline value: 0.5 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	monthly	12	0.004	0.001	0
Bealiba	monthly	12	0.012	0.003	0
Bendigo (Northern)	monthly	12	0.002	0.001	0
Bendigo (Southern)	monthly	12	0.006	0.002	0
Bendigo (Spring Gully)	monthly	12	0.003	0.002	0
Big Hill	monthly	12	0.004	0.002	0
Boort	monthly	12	0.003	0.001	0
Bridgewater - Inglewood	monthly	12	0.002	0.001	0
Castlemaine	monthly	12	0.003	0.001	0
Cohuna	monthly	12	0.019	0.005	0
Dunolly	monthly	12	0.015	0.006	0
Echuca	monthly	12	0.009	0.003	0
Elmore	monthly	12	<0.001	<0.001	0
Epsom - Huntly	monthly	12	0.003	0.001	0
Fryerstown	monthly	12	0.002	0.001	0
Goornong	monthly	12	0.002	0.001	0
Guildford	monthly	13	0.003	0.001	0
Gunbower	monthly	12	0.001	0.001	0
Harcourt	monthly	12	0.005	0.001	0
Heathcote	monthly	12	0.190	0.021	0
Junortoun	monthly	12	0.002	0.001	0
Korong Vale	monthly	12	0.003	0.001	0
Kyneton	monthly	13	0.002	0.001	0
Laanecoorie	monthly	13	0.056	0.012	0
Leitchville	monthly	12	0.040	0.005	0
Lockington	monthly	12	<0.001	<0.001	0
Maiden Gully - Marong	monthly	12	0.002	0.001	0
Maldon	monthly	12	0.013	0.002	0
Malmsbury	monthly	12	0.002	0.001	0
Newstead	monthly	12	0.013	0.002	0
Pyramid Hill	monthly	12	0.003	0.002	0
Raywood	monthly	12	<0.001	<0.001	0
Rochester	monthly	12	0.019	0.005	0
Sebastian	monthly	12	0.001	0.001	0
Serpentine	monthly	12	0.008	0.004	0
Strathfieldsaye	monthly	12	0.003	0.002	0
Taradale - Elphinstone	monthly	12	0.005	0.001	0
Tarnagulla	monthly	12	0.012	0.004	0
Tooborac	monthly	12	0.013	0.003	0
Trentham	monthly	12	0.002	0.001	0
Tylden	monthly	12	0.006	0.001	0
Wedderburn	monthly	12	<0.001	<0.001	0

Copper – Customer tap sites 2023/24

Table 43: Copper results for customer tap sites (Water quality standard - ADWG health-based guideline value: 2.0 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	monthly	12	0.01	0.00	0
Bealiba	monthly	12	0.01	0.01	0
Bendigo (Northern)	monthly	12	0.02	0.01	0
Bendigo (Southern)	monthly	12	0.02	0.01	0
Bendigo (Spring Gully)	monthly	12	0.02	0.01	0
Big Hill	monthly	12	0.04	0.01	0
Boort	monthly	12	0.01	0.00	0
Bridgewater - Inglewood	monthly	12	0.00	0.00	0
Castlemaine	monthly	12	0.06	0.02	0
Cohuna	monthly	12	0.01	0.00	0
Dunolly	monthly	12	0.01	0.00	0
Echuca	monthly	12	0.00	0.00	0
Elmore	monthly	12	0.01	0.00	0
Epsom - Huntly	monthly	12	0.01	0.01	0
Fryerstown	monthly	12	0.05	0.03	0
Goornong	monthly	12	0.00	0.00	0
Guildford	monthly	13	0.02	0.01	0
Gunbower	monthly	12	0.01	0.00	0
Harcourt	monthly	12	0.05	0.02	0
Heathcote	monthly	12	0.01	0.00	0
Junortoun	monthly	12	0.01	0.01	0
Korong Vale	monthly	12	0.00	0.00	0
Kyneton	monthly	13	0.03	0.01	0
Laanecoorie	monthly	13	0.01	0.00	0
Leitchville	monthly	12	0.01	0.00	0
Lockington	monthly	12	0.00	0.00	0
Maiden Gully - Marong	monthly	12	0.01	0.01	0
Maldon	monthly	12	0.08	0.04	0
Malmsbury	monthly	12	0.02	0.01	0
Newstead	monthly	12	0.03	0.01	0
Pyramid Hill	monthly	12	0.01	0.01	0
Raywood	monthly	12	0.02	0.01	0
Rochester	monthly	12	0.07	0.02	0
Sebastian	monthly	12	0.03	0.01	0
Serpentine	monthly	12	0.02	0.01	0
Strathfieldsaye	monthly	12	0.02	0.01	0
Taradale - Elphinstone	monthly	12	0.05	0.02	0
Tarnagulla	monthly	12	0.02	0.01	0
Tooborac	monthly	12	0.02	0.01	0
Trentham	monthly	12	0.01	0.00	0
Tylden	monthly	12	0.05	0.01	0
Wedderburn	monthly	12	0.00	0.00	0

Lead – Customer tap sites 2023/24

Table 44: Lead results for customer tap sites (Water quality standard – ADWG health-based guideline value: 0.01 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	monthly	12	<0.001	<0.001	0
Bealiba	monthly	12	<0.001	<0.001	0
Bendigo (Northern)	monthly	12	<0.001	<0.001	0
Bendigo (Southern)	monthly	12	<0.001	<0.001	0
Bendigo (Spring Gully)	monthly	12	<0.001	<0.001	0
Big Hill	monthly	12	<0.001	<0.001	0
Boort	monthly	12	<0.001	<0.001	0
Bridgewater - Inglewood	monthly	12	<0.001	<0.001	0
Castlemaine	monthly	12	<0.001	<0.001	0
Cohuna	monthly	12	<0.001	<0.001	0
Dunolly	monthly	12	<0.001	<0.001	0
Echuca	monthly	12	<0.001	<0.001	0
Elmore	monthly	12	<0.001	<0.001	0
Epsom - Huntly	monthly	12	<0.001	<0.001	0
Fryerstown	monthly	12	0.0010	0.0005	0
Goornong	monthly	12	<0.001	<0.001	0
Guildford	monthly	12	<0.001	<0.001	0
Gunbower	monthly	12	<0.001	<0.001	0
Harcourt	monthly	12	<0.001	<0.001	0
Heathcote	monthly	12	<0.001	<0.001	0
Junortoun	monthly	12	<0.001	<0.001	0
Korong Vale	monthly	12	<0.001	<0.001	0
Kyneton	monthly	12	<0.001	<0.001	0
Laanecoorie	monthly	12	<0.001	<0.001	0
Leitchville	monthly	12	<0.001	<0.001	0
Lockington	monthly	12	<0.001	<0.001	0
Maiden Gully - Marong	monthly	12	<0.001	<0.001	0
Maldon	monthly	12	0.0010	0.0005	0
Malmsbury	monthly	12	<0.001	<0.001	0
Newstead	monthly	12	0.0010	0.0005	0
Pyramid Hill	monthly	12	<0.001	<0.001	0
Raywood	monthly	12	<0.001	<0.001	0
Rochester	monthly	12	<0.001	<0.001	0
Sebastian	monthly	12	<0.001	<0.001	0
Serpentine	monthly	12	0.0040	0.0008	0
Strathfieldsaye	monthly	12	<0.001	<0.001	0
Taradale - Elphinstone	monthly	12	<0.001	<0.001	0
Tarnagulla	monthly	12	<0.001	<0.001	0
Tooborac	monthly	12	<0.001	<0.001	0
Trentham	monthly	12	<0.001	<0.001	0
Tylden	monthly	12	<0.001	<0.001	0
Wedderburn	monthly	12	<0.001	<0.001	0

Nickel – Customer tap sites 2023/24

Table 45: Nickel results for customer tap sites (Water quality standard - ADWG health-based guideline value: 0.02 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	monthly	12	0.00	0.00	0
Bealiba	monthly	12	0.00	0.00	0
Bendigo (Northern)	monthly	12	0.00	0.00	0
Bendigo (Southern)	monthly	12	0.00	0.00	0
Bendigo (Spring Gully)	monthly	12	0.00	0.00	0
Big Hill	monthly	12	0.00	0.00	0
Boort	monthly	12	0.00	0.00	0
Bridgewater - Inglewood	monthly	12	<0.001	<0.001	0
Castlemaine	monthly	12	0.00	0.00	0
Cohuna	monthly	12	<0.001	<0.001	0
Dunolly	monthly	12	0.00	0.00	0
Echuca	monthly	12	<0.001	<0.001	0
Elmore	monthly	12	<0.001	<0.001	0
Epsom - Huntly	monthly	12	0.00	0.00	0
Fryerstown	monthly	12	0.00	0.00	0
Goornong	monthly	12	0.00	0.00	0
Guildford	monthly	12	0.00	0.00	0
Gunbower	monthly	12	<0.001	<0.001	0
Harcourt	monthly	12	<0.001	<0.001	0
Heathcote	monthly	12	0.00	0.00	0
Junortoun	monthly	12	0.00	0.00	0
Korong Vale	monthly	12	<0.001	<0.001	0
Kyneton	monthly	12	<0.001	<0.001	0
Laanecoorie	monthly	12	0.00	0.00	0
Leitchville	monthly	12	<0.001	<0.001	0
Lockington	monthly	12	<0.001	<0.001	0
Maiden Gully - Marong	monthly	12	0.00	0.00	0
Maldon	monthly	12	<0.001	<0.001	0
Malmsbury	monthly	12	<0.001	<0.001	0
Newstead	monthly	12	0.00	0.00	0
Pyramid Hill	monthly	12	<0.001	<0.001	0
Raywood	monthly	12	0.00	0.00	0
Rochester	monthly	12	0.00	0.00	0
Sebastian	monthly	12	0.00	0.00	0
Serpentine	monthly	12	<0.001	<0.001	0
Strathfieldsaye	monthly	12	0.00	0.00	0
Taradale - Elphinstone	monthly	12	0.00	0.00	0
Tarnagulla	monthly	12	0.00	0.00	0
Tooborac	monthly	12	0.00	0.00	0
Trentham	monthly	12	<0.001	<0.001	0
Tylden	monthly	12	<0.001	<0.001	0
Wedderburn	monthly	12	<0.001	<0.001	0

Alpha Count – Customer tap sites 2023/24

Table 46: Alpha count results for customer tap sites (Water quality standard - ADWG health-based guideline value: 0.5 bq/L)

Water sampling locality	Sampling frequency	Number of samples	Value (bq/L)	Number of samples where standard was not met
Axedale	annual	1	<0.05	0
Bealiba	annual	1	<0.05	0
Bendigo (Northern)	annual	1	<0.05	0
Bendigo (Southern)	annual	1	<0.05	0
Bendigo (Spring Gully)	annual	1	<0.05	0
Big Hill	annual	1	<0.05	0
Boort	annual	1	<0.05	0
Bridgewater - Inglewood	annual	1	<0.05	0
Castlemaine	annual	1	<0.05	0
Cohuna	annual	1	<0.05	0
Dunolly	annual	1	<0.05	0
Echuca	annual	1	<0.05	0
Elmore	annual	1	<0.05	0
Epsom - Huntly	annual	1	<0.05	0
Fryerstown	annual	1	<0.05	0
Goornong	annual	1	<0.05	0
Guildford	annual	1	<0.05	0
Gunbower	annual	1	<0.05	0
Harcourt	annual	1	<0.05	0
Heathcote	annual	1	<0.05	0
Junortoun	annual	1	<0.05	0
Korong Vale	annual	1	<0.05	0
Kyneton	annual	1	<0.05	0
Laanecoorie	annual	1	<0.05	0
Leitchville	annual	1	<0.05	0
Lockington	annual	1	<0.05	0
Maiden Gully - Marong	annual	1	<0.05	0
Maldon	annual	1	<0.05	0
Malmsbury	annual	1	<0.05	0
Newstead	annual	1	<0.05	0
Pyramid Hill	annual	1	<0.05	0
Raywood	annual	1	<0.05	0
Rochester	annual	1	<0.05	0
Sebastian	annual	1	<0.05	0
Serpentine	annual	1	<0.05	0
Strathfieldsaye	annual	1	<0.05	0
Taradale - Elphinstone	annual	1	<0.05	0
Tarnagulla	annual	1	<0.05	0
Tooborac	annual	1	<0.05	0
Trentham	annual	1	<0.05	0
Tylden	annual	1	<0.05	0
Wedderburn	annual	1	<0.05	0

Beta Count – Customer tap sites 2023/24

Table 47: Beta count results for customer tap sites (Water quality standard - ADWG health-based guideline value: 0.5 bq/L)

Water sampling locality	Sampling frequency	Number of samples	Value (bq/L)	Number of samples where standard was not met
Axedale	annual	1	<0.10	0
Bealiba	annual	1	<0.1	0
Bendigo (Northern)	annual	1	<0.10	0
Bendigo (Southern)	annual	1	<0.10	0
Bendigo (Spring Gully)	annual	1	<0.1	0
Big Hill	annual	1	<0.10	0
Boort	annual	1	<0.1	0
Bridgewater - Inglewood	annual	1	<0.1	0
Castlemaine	annual	1	<0.1	0
Cohuna	annual	1	<0.1	0
Dunolly	annual	1	<0.1	0
Echuca	annual	1	<0.10	0
Elmore	annual	1	<0.1	0
Epsom - Huntly	annual	1	<0.10	0
Fryerstown	annual	1	<0.10	0
Goornong	annual	1	<0.10	0
Guildford	annual	1	<0.10	0
Gunbower	annual	1	<0.10	0
Harcourt	annual	1	<0.1	0
Heathcote	annual	1	<0.10	0
Junortoun	annual	1	<0.10	0
Korong Vale	annual	1	<0.1	0
Kyneton	annual	1	<0.1	0
Laanecoorie	annual	1	<0.10	0
Leitchville	annual	1	<0.1	0
Lockington	annual	1	<0.10	0
Maiden Gully - Marong	annual	1	<0.1	0
Maldon	annual	1	<0.10	0
Malmsbury	annual	1	<0.10	0
Newstead	annual	1	<0.10	0
Pyramid Hill	annual	1	<0.1	0
Raywood	annual	1	<0.1	0
Rochester	annual	1	<0.10	0
Sebastian	annual	1	<0.10	0
Serpentine	annual	1	<0.10	0
Strathfieldsaye	annual	1	<0.10	0
Taradale - Elphinstone	annual	1	<0.1	0
Tarnagulla	annual	1	<0.1	0
Tooborac	annual	1	<0.10	0
Trentham	annual	1	<0.10	0
Tylden	annual	1	<0.1	0
Wedderburn	annual	1	<0.1	0

Nitrite – Customer tap sites 2023/24

Table 48: Nitrite results for customer tap sites (Water quality standard – ADWG health-based guideline value: 3.0 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	n/a	n/a	n/a	n/a	n/a
Bealiba ¹	fortnightly	22	0.37	0.09	0
Bendigo (Northern) ¹	fortnightly	17	0.46	0.19	0
Bendigo (Southern) ¹	fortnightly	17	0.36	0.11	0
Bendigo (Spring Gully) ¹	fortnightly	17	0.30	0.08	0
Big Hill ¹	fortnightly	18	0.36	0.12	0
Boort	n/a	n/a	n/a	n/a	n/a
Bridgewater - Inglewood	fortnightly	26	0.03	0.01	0
Castlemaine	n/a	n/a	n/a	n/a	n/a
Cohuna	n/a	n/a	n/a	n/a	n/a
Dunolly ¹	fortnightly	22	0.20	0.03	0
Echuca	n/a	n/a	n/a	n/a	n/a
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly ¹	fortnightly	19	0.49	0.18	0
Fryerstown	n/a	n/a	n/a	n/a	n/a
Goornong	n/a	n/a	n/a	n/a	n/a
Guildford	n/a	n/a	n/a	n/a	n/a
Gunbower	n/a	n/a	n/a	n/a	n/a
Harcourt	n/a	n/a	n/a	n/a	n/a
Heathcote	fortnightly	26	0.18	0.01	0
Junortoun ¹	fortnightly	18	0.53	0.19	0
Korong Vale	fortnightly	26	0.04	0.01	0
Kyneton	n/a	n/a	n/a	n/a	n/a
Laanecoorie ¹	fortnightly	22	0.03	0.01	0
Leitchville	n/a	n/a	n/a	n/a	n/a
Lockington	n/a	n/a	n/a	n/a	n/a
Maiden Gully - Marong ¹	fortnightly	18	0.42	0.13	0
Maldon	n/a	n/a	n/a	n/a	n/a
Malmsbury	n/a	n/a	n/a	n/a	n/a
Newstead	n/a	n/a	n/a	n/a	n/a
Pyramid Hill	n/a	n/a	n/a	n/a	n/a
Raywood	n/a	n/a	n/a	n/a	n/a
Rochester	n/a	n/a	n/a	n/a	n/a
Sebastian	n/a	n/a	n/a	n/a	n/a
Serpentine	n/a	n/a	n/a	n/a	n/a
Strathfieldsaye ¹	fortnightly	19	0.35	0.12	0
Taradale - Elphinstone	n/a	n/a	n/a	n/a	n/a
Tarnagulla ¹	fortnightly	22	0.18	0.04	0
Tooborac	n/a	n/a	n/a	n/a	n/a
Trentham	n/a	n/a	n/a	n/a	n/a
Tylden	n/a	n/a	n/a	n/a	n/a
Wedderburn	fortnightly	26	0.26	0.07	0

Note:

1 Sampling on-hold during free chlorination project.

NDMA – Customer tap sites 2023/24

Table 49: NDMA results for customer tap sites (Water quality standard – ADWG health-based guideline value: 0.1 ug/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (ug/L)	Average (ug/L)	Number of samples where standard was not met
Axedale ¹	quarterly	3	<0.003	<0.003	0
Bealiba	quarterly	4	0.0240	0.0135	0
Bendigo (Northern) ¹	quarterly	3	<0.003	<0.003	0
Bendigo (Southern) ¹	quarterly	3	<0.003	<0.003	0
Bendigo (Spring Gully) ¹	quarterly	3	<0.003	<0.003	0
Big Hill ¹	quarterly	3	<0.003	<0.003	0
Boort	n/a	n/a	n/a	n/a	n/a
Bridgewater – Inglewood	quarterly	4	0.0140	0.0095	0
Castlemaine	n/a	n/a	n/a	n/a	n/a
Cohuna	n/a	n/a	n/a	n/a	n/a
Dunolly	quarterly	4	0.0120	0.0085	0
Echuca	n/a	n/a	n/a	n/a	n/a
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom – Huntly ¹	quarterly	3	<0.003	<0.003	0
Fryerstown	n/a	n/a	n/a	n/a	n/a
Goornong	n/a	n/a	n/a	n/a	n/a
Guildford	n/a	n/a	n/a	n/a	n/a
Gunbower	n/a	n/a	n/a	n/a	n/a
Harcourt	n/a	n/a	n/a	n/a	n/a
Heathcote	quarterly	4	0.0090	0.0059	0
Junortoun ¹	quarterly	3	<0.003	<0.003	0
Korong Vale	quarterly	4	0.0050	0.0033	0
Kyneton	n/a	n/a	n/a	n/a	n/a
Laanecoorie	quarterly	4	0.0090	0.0075	0
Leitchville	n/a	n/a	n/a	n/a	n/a
Lockington	n/a	n/a	n/a	n/a	n/a
Maiden Gully – Marong ¹	quarterly	3	<0.003	<0.003	0
Maldon	n/a	n/a	n/a	n/a	n/a
Malmsbury	n/a	n/a	n/a	n/a	n/a
Newstead	n/a	n/a	n/a	n/a	n/a
Pyramid Hill	n/a	n/a	n/a	n/a	n/a
Raywood ¹	quarterly	3	<0.003	<0.003	0
Rochester	n/a	n/a	n/a	n/a	n/a
Sebastian ¹	quarterly	3	<0.003	<0.003	0
Serpentine	n/a	n/a	n/a	n/a	n/a
Strathfieldsaye ¹	quarterly	3	<0.003	<0.003	0
Taradale – Elphinstone	n/a	n/a	n/a	n/a	n/a
Tarnagulla	quarterly	4	0.0250	0.0135	0
Tooborac	quarterly	4	0.0120	0.0080	0
Trentham	n/a	n/a	n/a	n/a	n/a
Tylden	n/a	n/a	n/a	n/a	n/a
Wedderburn	quarterly	4	0.0120	0.0068	0

Note:

Localities where chloramination is not part of the treatment process have not had NDMA included in their monitoring program.

1 Sampling on-hold during free chlorination project.

pH – Customer tap sites 2023/24

Table 50: pH results for customer tap sites (operating range: 6.5 – 8.5 pH Units)

Water sampling locality	Sampling frequency	Number of samples	Minimum	Maximum
Axedale	monthly	12	7.5	8.1
Bealiba ¹	monthly	12	7.9	8.7
Bendigo (Northern)	monthly	12	7.3	8.1
Bendigo (Southern)	monthly	12	7.3	8.0
Bendigo (Spring Gully)	monthly	12	7.4	8.1
Big Hill	monthly	12	7.4	8.1
Boort	monthly	12	7.3	7.9
Bridgewater - Inglewood ¹	monthly	12	7.6	9.1
Castlemaine	monthly	12	7.3	7.9
Cohuna	monthly	12	7.0	7.6
Dunolly ¹	monthly	12	8.2	8.8
Echuca	monthly	12	7.5	7.8
Elmore	monthly	12	7.1	8.1
Epsom - Huntly	monthly	12	7.5	8.1
Fryerstown	monthly	12	7.3	8.0
Goornong ¹	monthly	12	7.2	8.6
Guildford	monthly	13	7.2	7.9
Gunbower	monthly	12	7.4	8.0
Harcourt	monthly	12	7.6	8.2
Heathcote	monthly	12	7.6	8.2
Junortoun	monthly	12	7.4	8.1
Korong Vale ¹	monthly	12	7.3	9.7
Kyneton	monthly	13	7.3	8.0
Laanecoorie	monthly	13	7.8	8.3
Leitchville	monthly	12	7.3	8.1
Lockington ¹	monthly	12	7.6	8.7
Maiden Gully - Marong	monthly	12	7.4	8.1
Maldon	monthly	12	7.6	8.2
Malmsbury ¹	monthly	12	7.6	8.8
Newstead	monthly	12	7.3	8.1
Pyramid Hill	monthly	12	7.0	7.8
Raywood	monthly	12	7.4	7.9
Rochester	monthly	12	7.3	7.6
Sebastian ¹	monthly	12	7.5	8.6
Serpentine ¹	monthly	12	7.4	9.5
Strathfieldsaye	monthly	12	7.2	8.1
Taradale - Elphinstone	monthly	12	7.5	7.9
Tarnagulla ¹	monthly	12	8.2	8.8
Tooborac ¹	monthly	12	7.5	8.8
Trentham	monthly	12	7.6	8.2
Tylden	monthly	12	7.4	7.9
Wedderburn ¹	monthly	12	7.5	9.3

Note:

1 Refer to section 4.3.1.2 for details on exceedances.

Aluminium – Customer tap sites 2023/24

Table 51: Aluminium (soluble) results for customer tap sites (ADWG aesthetic guideline value: 0.2 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met
Axedale	quarterly	4	0.04	0.03	0
Bealiba	quarterly	4	0.03	0.02	0
Bendigo (Northern)	quarterly	4	0.03	0.03	0
Bendigo (Southern)	quarterly	4	0.04	0.03	0
Bendigo (Spring Gully)	quarterly	4	0.03	0.03	0
Big Hill	quarterly	4	0.03	0.02	0
Boort	quarterly	4	0.03	0.02	0
Bridgewater - Inglewood	quarterly	4	0.05	0.03	0
Castlemaine	quarterly	4	0.02	0.02	0
Cohuna	quarterly	4	0.02	0.02	0
Dunolly	quarterly	4	0.02	0.02	0
Echuca	quarterly	4	0.06	0.04	0
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly	quarterly	4	0.04	0.03	0
Fryerstown	quarterly	4	0.02	0.02	0
Goornong	quarterly	4	0.08	0.06	0
Guildford	quarterly	4	0.02	0.02	0
Gunbower	quarterly	4	0.09	0.06	0
Harcourt	quarterly	4	0.03	0.02	0
Heathcote	quarterly	4	0.02	0.02	0
Junortoun	quarterly	4	0.04	0.03	0
Korong Vale	quarterly	4	0.03	0.02	0
Kyneton	quarterly	4	0.03	0.03	0
Laanecoorie	quarterly	4	0.02	0.02	0
Leitchville	quarterly	4	0.02	0.01	0
Lockington	quarterly	4	0.15	0.09	0
Maiden Gully - Marong	quarterly	4	0.04	0.03	0
Maldon	quarterly	4	0.02	0.02	0
Malmsbury	quarterly	4	0.03	0.03	0
Newstead	quarterly	4	0.02	0.02	0
Pyramid Hill	quarterly	4	0.03	0.02	0
Raywood	quarterly	4	0.04	0.03	0
Rochester	quarterly	4	<0.01	<0.01	0
Sebastian	quarterly	4	0.04	0.03	0
Serpentine	quarterly	4	0.01	0.01	0
Strathfieldsaye	quarterly	4	0.03	0.03	0
Taradale - Elphinstone	quarterly	4	0.02	0.02	0
Tarnagulla	quarterly	4	0.02	0.01	0
Tooborac	quarterly	4	0.02	0.02	0
Trentham	n/a	n/a	n/a	n/a	n/a
Tylden	quarterly	4	0.03	0.02	0
Wedderburn	quarterly	4	0.03	0.03	0

Note:

- 1 An aluminium based product is not used for coagulation at Elmore or Trentham, and therefore aluminium is not deemed to be a significant risk in this water supply.

Hardness – Customer tap sites 2023/24

To minimise undesirable build-up of scale in hot water systems, total hardness (as calcium carbonate) in drinking water should not exceed 200 mg/L.

Table 52: Hardness results for customer tap sites (ADWG aesthetic guideline limit: 200mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where guideline was not met
Axedale	quarterly	4	86	78	0
Bealiba	quarterly	4	160	138	0
Bendigo (Northern)	quarterly	4	76	71	0
Bendigo (Southern)	quarterly	4	76	70	0
Bendigo (Spring Gully)	quarterly	4	72	68	0
Big Hill	quarterly	4	81	71	0
Boort	quarterly	4	110	93	0
Bridgewater - Inglewood	quarterly	4	26	20	0
Castlemaine	quarterly	4	77	71	0
Cohuna	quarterly	4	28	24	0
Dunolly	quarterly	4	160	122	0
Echuca	quarterly	4	21	20	0
Elmore	quarterly	4	140	123	0
Epsom - Huntly	quarterly	4	70	67	0
Fryerstown	quarterly	4	80	76	0
Goornong	quarterly	4	120	104	0
Guildford	quarterly	4	79	74	0
Gunbower	quarterly	4	26	23	0
Harcourt	quarterly	4	74	68	0
Heathcote	quarterly	4	96	89	0
Junortoun	quarterly	4	83	71	0
Korong Vale	quarterly	4	20	16	0
Kyneton	quarterly	4	75	66	0
Laanecoorie	quarterly	4	140	115	0
Leitchville	quarterly	4	24	22	0
Lockington	quarterly	4	32	30	0
Maiden Gully - Marong	quarterly	4	74	69	0
Maldon	quarterly	4	78	74	0
Malmsbury	quarterly	4	75	72	0
Newstead	quarterly	4	77	73	0
Pyramid Hill	quarterly	4	41	37	0
Raywood	quarterly	4	79	73	0
Rochester	quarterly	4	88	40	0
Sebastian	quarterly	4	78	72	0
Serpentine	quarterly	4	32	28	0
Strathfieldsaye	quarterly	4	83	74	0
Taradale - Elphinstone	quarterly	4	73	69	0
Tarnagulla	quarterly	4	250	158	1
Tooborac	quarterly	4	120	99	0
Trentham	quarterly	4	58	43	0
Tylden	quarterly	4	75	67	0
Wedderburn	quarterly	4	19	17	0

Note:

- 1 Refer to section 4.3.1.2 for details on exceedances.

Iron – Customer tap sites 2023/24

The samples taken for analysis were obtained from the reticulation system. Iron levels may be higher at customers' internal taps, where galvanised iron pipes have been used in customers' plumbing.

Table 53: Iron results for customer tap sites (ADWG aesthetic guideline limit: 0.3 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where guideline was not met
Axedale	monthly	12	0.04	0.01	0
Bealiba	monthly	12	0.07	0.02	0
Bendigo (Northern)	monthly	12	0.02	0.01	0
Bendigo (Southern)	monthly	12	0.02	0.01	0
Bendigo (Spring Gully)	monthly	12	0.02	0.01	0
Big Hill	monthly	12	0.04	0.02	0
Boort	monthly	12	0.06	0.03	0
Bridgewater - Inglewood	monthly	12	0.03	0.01	0
Castlemaine	monthly	12	0.01	0.01	0
Cohuna	monthly	12	0.03	0.01	0
Dunolly	monthly	12	0.02	0.01	0
Echuca	monthly	12	0.02	0.01	0
Elmore	monthly	12	<0.01	<0.01	0
Epsom - Huntly	monthly	12	0.07	0.02	0
Fryerstown	monthly	12	0.04	0.02	0
Goornong	monthly	12	0.04	0.01	0
Guildford	monthly	13	0.03	0.02	0
Gunbower	monthly	12	0.01	0.01	0
Harcourt	monthly	12	0.03	0.02	0
Heathcote	monthly	12	0.06	0.03	0
Junortoun	monthly	12	0.01	0.01	0
Korong Vale	monthly	12	0.13	0.04	0
Kyneton	monthly	13	0.02	0.01	0
Laanecoorie	monthly	13	0.03	0.01	0
Leitchville	monthly	12	0.03	0.01	0
Lockington	monthly	12	0.01	0.01	0
Maiden Gully - Marong	monthly	12	0.02	0.01	0
Maldon	monthly	12	0.07	0.01	0
Malmsbury	monthly	12	0.02	0.01	0
Newstead	monthly	12	0.05	0.02	0
Pyramid Hill	monthly	12	0.02	0.01	0
Raywood	monthly	12	0.02	0.01	0
Rochester	monthly	12	0.28	0.05	0
Sebastian	monthly	12	0.02	0.01	0
Serpentine	monthly	12	0.07	0.03	0
Strathfieldsaye	monthly	12	0.02	0.01	0
Taradale - Elphinstone	monthly	12	0.02	0.01	0
Tarnagulla	monthly	12	0.07	0.02	0
Tooborac	monthly	12	0.25	0.07	0
Trentham	monthly	12	<0.01	<0.01	0
Tylden	monthly	12	0.05	0.01	0
Wedderburn	monthly	12	0.04	0.02	0

True Colour – Customer tap sites 2023/24

Based on aesthetic considerations, true colour in drinking water should not exceed 15 HU.

Table 54: True Colour results for customer tap sites (ADWG aesthetic guideline limit: 15 HU)

Water sampling locality	Sampling frequency	Number of samples ¹	Maximum (HU)	Average (HU)	Number of samples where guideline was not met
Axedale	monthly	12	<2	<2	0
Bealiba	monthly	12	4	1	0
Bendigo (Northern)	monthly	12	4	1	0
Bendigo (Southern)	monthly	12	4	1	0
Bendigo (Spring Gully)	monthly	12	4	1	0
Big Hill	monthly	12	4	1	0
Boort	monthly	12	<2	<2	0
Bridgewater - Inglewood	monthly	12	2	1	0
Castlemaine	monthly	12	4	2	0
Cohuna	monthly	12	4	1	0
Dunolly	monthly	12	4	1	0
Echuca	monthly	12	4	1	0
Elmore	monthly	12	4	1	0
Epsom - Huntly	monthly	12	4	2	0
Fryerstown	monthly	12	4	1	0
Goornong	monthly	12	4	1	0
Guildford	monthly	13	4	1	0
Gunbower	monthly	12	<2	<2	0
Harcourt	monthly	12	2	1	0
Heathcote	monthly	12	4	2	0
Junortoun	monthly	12	4	2	0
Korong Vale	monthly	12	6	2	0
Kyneton	monthly	13	4	1	0
Laanecoorie	monthly	13	4	2	0
Leitchville	monthly	12	8	2	0
Lockington	monthly	12	4	1	0
Maiden Gully - Marong	monthly	12	4	1	0
Maldon	monthly	12	2	1	0
Malmsbury	monthly	12	4	1	0
Newstead	monthly	12	4	2	0
Pyramid Hill	monthly	12	4	1	0
Raywood	monthly	12	<2	<2	0
Rochester	monthly	12	4	2	0
Sebastian	monthly	12	4	1	0
Serpentine	monthly	12	6	1	0
Strathfieldsaye	monthly	12	2	1	0
Taradale - Elphinstone	monthly	12	4	1	0
Tarnagulla	monthly	12	4	1	0
Tooborac	monthly	12	2	1	0
Trentham	monthly	12	4	1	0
Tylden	monthly	12	4	1	0
Wedderburn	monthly	12	4	2	0

Electrical Conductivity – Customer tap sites 2023/24

Based on taste, total dissolved solids in drinking water should not exceed 600 mg/L, equivalent to approximately 1,200 µS/cm in electrical conductivity.

Table 55: Electrical Conductivity results for customer tap sites (ADWG aesthetic guideline limit: 1,200 µS/cm)

Water sampling locality	Sampling frequency	Number of samples	Maximum (µS/cm)	Average (µS/cm)	Number of samples where guideline was not met
Axedale	monthly	12	250	235	0
Bealiba	monthly	12	1,300	792	1
Bendigo (Northern)	monthly	12	240	221	0
Bendigo (Southern)	monthly	12	230	221	0
Bendigo (Spring Gully)	monthly	12	230	217	0
Big Hill	monthly	12	230	219	0
Boort	monthly	12	630	544	0
Bridgewater - Inglewood	monthly	12	140	119	0
Castlemaine	monthly	12	240	229	0
Cohuna	monthly	12	240	175	0
Dunolly	monthly	12	1,000	741	0
Echuca	monthly	12	180	148	0
Elmore	monthly	12	730	675	0
Epsom - Huntly	monthly	12	240	222	0
Fryerstown	monthly	12	260	239	0
Goornong	monthly	12	600	554	0
Guildford	monthly	13	250	239	0
Gunbower	monthly	12	150	118	0
Harcourt	monthly	12	250	238	0
Heathcote	monthly	12	510	463	0
Junortoun	monthly	12	240	222	0
Korong Vale	monthly	12	140	118	0
Kyneton	monthly	13	220	208	0
Laanecoorie	monthly	13	950	724	0
Leitchville	monthly	12	240	161	0
Lockington	monthly	12	160	138	0
Maiden Gully - Marong	monthly	12	240	220	0
Maldon	monthly	12	250	244	0
Malmsbury	monthly	12	220	212	0
Newstead	monthly	12	250	235	0
Pyramid Hill	monthly	12	240	208	0
Raywood	monthly	12	260	238	0
Rochester	monthly	12	560	209	0
Sebastian	monthly	12	260	233	0
Serpentine	monthly	12	200	166	0
Strathfieldsaye	monthly	12	230	216	0
Taradale - Elphinstone	monthly	12	240	231	0
Tarnagulla	monthly	12	1,300	798	1
Tooborac	monthly	12	510	488	0
Trentham	monthly	12	180	141	0
Tylden	monthly	12	220	208	0
Wedderburn	monthly	12	130	122	0

Note:

- 1 Refer to section 4.3.1.2 for details on exceedances.

Sodium – Customer tap sites 2023/24

Based on aesthetic considerations (taste), the concentration of sodium in drinking water should not exceed 180 mg/L.

Table 56: Sodium results for customer tap sites (ADWG aesthetic guideline limit: 180mg/L)

Water sampling locality	Sampling frequency	Number of Samples	Maximum (mg/L)	Average (mg/L)	Number of samples where guideline was not met
Axedale	quarterly	4	21	18	0
Bealiba	quarterly	4	93	86	0
Bendigo (Northern)	quarterly	4	16	15	0
Bendigo (Southern)	quarterly	4	15	14	0
Bendigo (Spring Gully)	quarterly	4	15	14	0
Big Hill	quarterly	4	15	14	0
Boort	quarterly	4	73	55	0
Bridgewater - Inglewood	quarterly	4	12	12	0
Castlemaine	quarterly	4	19	16	0
Cohuna	quarterly	4	27	21	0
Dunolly	quarterly	4	120	83	0
Echuca	quarterly	4	22	20	0
Elmore	quarterly	4	91	87	0
Epsom - Huntly	quarterly	4	15	14	0
Fryerstown	quarterly	4	19	16	0
Goornong	quarterly	4	67	62	0
Guildford	quarterly	4	18	16	0
Gunbower	quarterly	4	15	12	0
Harcourt	quarterly	4	16	15	0
Heathcote	quarterly	4	55	50	0
Junortoun	quarterly	4	17	14	0
Korong Vale	quarterly	4	15	14	0
Kyneton	quarterly	4	13	12	0
Laanecoorie	quarterly	4	120	86	0
Leitchville	quarterly	4	20	18	0
Lockington	quarterly	4	17	14	0
Maiden Gully - Marong	quarterly	4	16	14	0
Maldon	quarterly	4	20	17	0
Malmsbury	quarterly	4	13	12	0
Newstead	quarterly	4	19	16	0
Pyramid Hill	quarterly	4	23	21	0
Raywood	quarterly	4	19	17	0
Rochester	quarterly	4	65	28	0
Sebastian	quarterly	4	16	15	0
Serpentine	quarterly	4	19	17	0
Strathfieldsaye	quarterly	4	16	14	0
Taradale - Elphinstone	quarterly	4	17	15	0
Tarnagulla	quarterly	4	160	102	0
Tooborac	quarterly	4	58	55	0
Trentham	quarterly	4	10	9	0
Tylden	quarterly	4	13	11	0
Wedderburn	quarterly	4	15	13	0

Chloride – Customer tap sites 2023/24

Based on aesthetic consideration, the chloride concentration in drinking water should not exceed 250 mg/L.

Table 57: Chloride results for customer tap sites (ADWG aesthetic guideline limit: 250mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where guideline was not met
Axedale	quarterly	4	39	36	0
Bealiba	quarterly	4	180	153	0
Bendigo (Northern)	quarterly	4	37	33	0
Bendigo (Southern)	quarterly	4	36	32	0
Bendigo (Spring Gully)	quarterly	4	35	30	0
Big Hill	quarterly	4	34	34	0
Boort	quarterly	4	140	111	0
Bridgewater - Inglewood	quarterly	4	28	26	0
Castlemaine	quarterly	4	39	38	0
Cohuna	quarterly	4	37	20	0
Dunolly	quarterly	4	230	158	0
Echuca	quarterly	4	14	11	0
Elmore ¹	quarterly	4	160	133	0
Epsom - Huntly	quarterly	4	39	33	0
Fryerstown	quarterly	4	38	37	0
Goornong	quarterly	4	110	108	0
Guildford	quarterly	4	37	37	0
Gunbower	quarterly	4	23	17	0
Harcourt	quarterly	4	44	38	0
Heathcote	quarterly	4	99	95	0
Junortoun	quarterly	4	39	33	0
Korong Vale	quarterly	4	21	19	0
Kyneton	quarterly	4	32	28	0
Laanecoorie	quarterly	4	200	150	0
Leitchville	quarterly	4	16	13	0
Lockington	quarterly	4	29	26	0
Maiden Gully - Marong	quarterly	4	34	31	0
Maldon	quarterly	4	44	38	0
Malmsbury	quarterly	4	33	29	0
Newstead	quarterly	4	39	37	0
Pyramid Hill	quarterly	4	30	29	0
Raywood	quarterly	4	41	34	0
Rochester	quarterly	4	110	39	0
Sebastian	quarterly	4	38	34	0
Serpentine	quarterly	4	22	21	0
Strathfieldsaye	quarterly	4	35	31	0
Taradale - Elphinstone	quarterly	4	43	38	0
Tarnagulla ¹	quarterly	4	300	190	1
Tooborac	quarterly	4	100	95	0
Trentham	quarterly	4	14	12	0
Tylden	quarterly	4	33	28	0
Wedderburn	quarterly	4	22	20	0

Note:

1 Refer to section 4.3.1.2 for details on exceedances.

Zinc – Customer tap sites 2023/24

Based on aesthetic consideration (taste), the concentration of zinc in drinking water should not exceed 3 mg/L.

Table 58: Zinc results for customer tap sites (ADWG aesthetic guideline limit: 3 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where guideline was not met
Axedale	monthly	12	0.007	0.003	0
Bealiba	monthly	12	0.018	0.005	0
Bendigo (Northern)	monthly	12	0.005	0.002	0
Bendigo (Southern)	monthly	12	0.008	0.002	0
Bendigo (Spring Gully)	monthly	12	0.005	0.002	0
Big Hill	monthly	12	0.009	0.004	0
Boort	monthly	12	0.006	0.004	0
Bridgewater - Inglewood	monthly	12	0.002	0.001	0
Castlemaine	monthly	12	0.007	0.003	0
Cohuna	monthly	12	0.014	0.005	0
Dunolly	monthly	12	0.005	0.002	0
Echuca	monthly	12	0.002	0.001	0
Elmore	monthly	12	0.010	0.004	0
Epsom - Huntly	monthly	12	0.004	0.001	0
Fryerstown	monthly	12	0.014	0.008	0
Goornong	monthly	12	0.004	0.002	0
Guildford	monthly	13	0.009	0.005	0
Gunbower	monthly	12	0.004	0.001	0
Harcourt	monthly	12	0.008	0.003	0
Heathcote	monthly	12	0.003	0.002	0
Junortoun	monthly	12	0.004	0.001	0
Korong Vale	monthly	12	0.009	0.003	0
Kyneton	monthly	13	0.005	0.002	0
Laanecoorie	monthly	13	0.008	0.004	0
Leitchville	monthly	12	0.007	0.003	0
Lockington	monthly	12	0.001	0.001	0
Maiden Gully - Marong	monthly	12	0.004	0.001	0
Maldon	monthly	12	0.005	0.003	0
Malmsbury	monthly	12	0.012	0.007	0
Newstead	monthly	12	0.014	0.004	0
Pyramid Hill	monthly	12	0.006	0.003	0
Raywood	monthly	12	0.005	0.003	0
Rochester	monthly	12	0.010	0.004	0
Sebastian	monthly	12	0.007	0.004	0
Serpentine	monthly	12	0.009	0.004	0
Strathfieldsaye	monthly	12	0.003	0.002	0
Taradale - Elphinstone	monthly	12	0.007	0.003	0
Tarnagulla	monthly	12	0.005	0.002	0
Tooborac	monthly	12	0.015	0.006	0
Trentham	monthly	12	0.004	0.002	0
Tylden	monthly	12	0.004	0.002	0
Wedderburn	monthly	12	0.006	0.002	0

Ammonia – Customer tap sites 2023/24

Table 59: Ammonia results for customer tap sites (ADWG aesthetic guideline limit: 0.5 mg/L)

Water sampling locality	Sampling frequency	Number of samples	Maximum (mg/L)	Average (mg/L)	Number of samples where guideline was not met
Axedale	n/a	n/a	n/a	n/a	n/a
Bealiba ¹	fortnightly	22	0.430	0.087	0
Bendigo (Northern) ¹	fortnightly	17	0.310	0.122	0
Bendigo (Southern) ¹	fortnightly	17	0.320	0.165	0
Bendigo (Spring Gully) ¹	fortnightly	17	0.280	0.178	0
Big Hill ¹	fortnightly	18	0.240	0.083	0
Boort	n/a	n/a	n/a	n/a	n/a
Bridgewater - Inglewood	fortnightly	26	0.250	0.129	0
Castlemaine	n/a	n/a	n/a	n/a	n/a
Cohuna	n/a	n/a	n/a	n/a	n/a
Dunolly ¹	fortnightly	22	0.300	0.179	0
Echuca	n/a	n/a	n/a	n/a	n/a
Elmore	n/a	n/a	n/a	n/a	n/a
Epsom - Huntly ¹	fortnightly	19	0.360	0.088	0
Fryerstown	n/a	n/a	n/a	n/a	n/a
Goornong	n/a	n/a	n/a	n/a	n/a
Guildford	n/a	n/a	n/a	n/a	n/a
Gunbower	n/a	n/a	n/a	n/a	n/a
Harcourt	n/a	n/a	n/a	n/a	n/a
Heathcote	fortnightly	26	0.340	0.152	0
Junortoun ¹	fortnightly	18	0.360	0.074	0
Korong Vale	fortnightly	26	0.330	0.173	0
Kyneton	n/a	n/a	n/a	n/a	n/a
Laanecoorie ¹	fortnightly	22	0.330	0.153	0
Leitchville	n/a	n/a	n/a	n/a	n/a
Lockington	n/a	n/a	n/a	n/a	n/a
Maiden Gully - Marong ¹	fortnightly	18	0.310	0.114	0
Maldon	n/a	n/a	n/a	n/a	n/a
Malmsbury	n/a	n/a	n/a	n/a	n/a
Newstead	n/a	n/a	n/a	n/a	n/a
Pyramid Hill	n/a	n/a	n/a	n/a	n/a
Raywood	n/a	n/a	n/a	n/a	n/a
Rochester	n/a	n/a	n/a	n/a	n/a
Sebastian	n/a	n/a	n/a	n/a	n/a
Serpentine	n/a	n/a	n/a	n/a	n/a
Strathfieldsaye ¹	fortnightly	19	0.270	0.091	0
Taradale - Elphinstone	n/a	n/a	n/a	n/a	n/a
Tarnagulla ¹	fortnightly	22	0.320	0.189	0
Tooborac	n/a	n/a	n/a	n/a	n/a
Trentham	n/a	n/a	n/a	n/a	n/a
Tylden	n/a	n/a	n/a	n/a	n/a
Wedderburn	fortnightly	26	0.310	0.152	0

Note:

1 Sampling on-hold during free chlorination project.

Alkalinity – Customer tap sites 2023/24

Table 60: Alkalinity results for customer tap sites - whilst there is no ADWG guideline value for alkalinity it is monitored for operational purposes.

Water sampling locality	Sampling frequency	Number of Samples	Maximum (mg CaCO ₃ / L)	Average (mg CaCO ₃ / L)
Axedale	quarterly	4	58	56
Bealiba	quarterly	4	69	67
Bendigo (Northern)	quarterly	4	62	56
Bendigo (Southern)	quarterly	4	58	55
Bendigo (Spring Gully)	quarterly	4	60	55
Big Hill	quarterly	4	62	57
Boort	quarterly	4	45	35
Bridgewater - Inglewood	quarterly	4	22	17
Castlemaine	quarterly	4	55	52
Cohuna	quarterly	4	20	17
Dunolly	quarterly	4	73	66
Echuca	quarterly	4	24	21
Elmore	quarterly	4	140	133
Epsom - Huntly	quarterly	4	60	55
Fryerstown	quarterly	4	62	54
Goornong	quarterly	4	48	40
Guildford	quarterly	4	55	54
Gunbower	quarterly	4	34	29
Harcourt	quarterly	4	55	54
Heathcote	quarterly	4	51	37
Junortoun	quarterly	4	55	54
Korong Vale	quarterly	4	17	13
Kyneton	quarterly	4	60	56
Laanecoorie	quarterly	4	66	59
Leitchville	quarterly	4	22	21
Lockington	quarterly	4	31	28
Maiden Gully - Marong	quarterly	4	58	55
Maldon	quarterly	4	61	57
Malmsbury	quarterly	4	61	58
Newstead	quarterly	4	58	54
Pyramid Hill	quarterly	4	27	24
Raywood	quarterly	4	58	57
Rochester	quarterly	4	24	18
Sebastian	quarterly	4	67	59
Serpentine	quarterly	4	30	23
Strathfieldsaye	quarterly	4	60	55
Taradale - Elphinstone	quarterly	4	55	53
Tarnagulla	quarterly	4	96	76
Tooborac	quarterly	4	47	36
Trentham	quarterly	4	58	45
Tylden	quarterly	4	60	56
Wedderburn	quarterly	4	15	14

Apparent Colour – Customer tap sites 2023/24

Table 61: Apparent colour results for customer tap sites –whilst there is no ADWG guideline value for apparent colour it is monitored for operational purposes.

Water sampling locality	Sampling frequency	Number of samples	Maximum (HU)	Average (HU)
Axedale	monthly	12	2	1
Bealiba	monthly	12	4	2
Bendigo (Northern)	monthly	12	2	1
Bendigo (Southern)	monthly	12	4	2
Bendigo (Spring Gully)	monthly	12	4	1
Big Hill	monthly	12	4	1
Boort	monthly	12	1	1
Bridgewater - Inglewood	monthly	12	4	1
Castlemaine	monthly	12	4	2
Cohuna	monthly	12	4	2
Dunolly	monthly	12	4	2
Echuca	monthly	12	4	1
Elmore	monthly	12	4	1
Epsom - Huntly	monthly	12	4	1
Fryerstown	monthly	12	6	2
Goornong	monthly	12	4	1
Guildford	monthly	12	6	2
Gunbower	monthly	12	2	1
Harcourt	monthly	12	2	1
Heathcote	monthly	12	6	2
Junortoun	monthly	12	6	2
Korong Vale	monthly	12	8	3
Kyneton	monthly	12	4	1
Laanecoorie	monthly	12	14	3
Leitchville	monthly	12	6	2
Lockington	monthly	12	4	1
Maiden Gully - Marong	monthly	12	4	1
Maldon	monthly	12	2	1
Malmsbury	monthly	12	4	1
Newstead	monthly	12	4	2
Pyramid Hill	monthly	12	4	1
Raywood	monthly	12	1	1
Rochester	monthly	12	6	2
Sebastian	monthly	12	4	1
Serpentine	monthly	12	2	1
Strathfieldsaye	monthly	12	2	1
Taradale - Elphinstone	monthly	12	4	1
Tarnagulla	monthly	12	4	1
Tooborac	monthly	12	6	2
Trentham	monthly	12	4	1
Tylden	monthly	12	4	2
Wedderburn	monthly	12	4	2

5 Complaints relating to water quality

5.1 Complaints and responses

Customer queries/complaints relating to drinking water quality are recorded and followed up using a Customer Response Management (CRM) system. Generally, water quality queries are managed at the time of the enquiry, while complaints are forwarded to our Land, Water & Environment team, or Service Stream (our operational partner managing the water distribution network), depending on the type of complaint. The complaint is reviewed and actioned as appropriate.

Some of the actions that can be initiated are:

- Flushing of the main supplying the customer and or flushing of the customer's meter.
- Advisory phone call from Water Quality specialist to the customer.
- A visit to the property or written response by a Land, Water & Environment team member.

Table 62 summarises the water quality complaints we received in each category as recorded in CRM system between 1 July 2023 and 30 June 2024 and compared to the previous two years.

Complaints recorded fall into five categories, "Alleged illness", "Discoloured Water", "Taste/Odour", "Air in Water", and "Other".

Table 62: Complaints related to Water Quality by Classification

Types of complaints	Number of complaints			Comparison with previous reporting periods	Comments
	2023/24	2022/23	2021/22		
Alleged illness	13	10	7	Slight increase; but relative to population number increase.	The calls were all unrelated. Complaints were generally related to health conditions, such as a rash/skin irritation, or upset stomach. Water quality was verified after each contact to confirm that the drinking water supplied did not pose an unacceptable health risk.
Discoloured water	104	84	115	Increase from previous year 2022/23.	A significant source of customer complaints regarding discolouration of the drinking water supply were related to a change in flow in the network. We quickly responded to customer complaints by flushing affected networks, and ensuring better management when other changes were implemented.
Taste or odour	81	142	43	Decrease from previous year 2022/23.	Taste and odour was reported to DH. During January 2024 Echuca experienced a taste and odour event, resulting in 27 complaints being received.
Air in water	12	8	16	Slight increase; but relative to population number increase.	We responded to each complaint by attending and flushing affected main.
Other	0	0	0	Consistently minimal	All water quality complaints were able to be allocated to the other four categories.
Total	210	244	181	Decrease compared to the previous year 2022/23.	

Table 63: Complaints related to water quality by water sampling locality 2023/24.

Water sampling locality	Types of complaints					Total complaints
	Alleged illness	Discoloured water	Taste or odour	Air in water	Other	
Axedale	0	0	1	1	0	2
Bealiba	0	0	0	0	0	0
Bendigo Northern	1	12	8	1	0	22
Bendigo Southern	1	7	8	1	0	17
Bendigo Spring Gully	1	4	4	1	0	10
Big Hill	0	0	0	0	0	0
Boort	0	1	0	0	0	1
Bridgewater-Inglewood	0	0	0	0	0	0
Castlemaine	1	10	5	1	0	17
Cohuna	0	3	3	1	0	7
Dunolly	0	1	0	0	0	1
Echuca	3	10	32	0	0	45
Elmore	0	0	2	0	0	2
Epsom / Huntly	2	30	5	0	0	37
Fryerstown	0	0	0	0	0	0
Goornong	0	0	0	0	0	0
Guildford	0	0	0	1	0	1
Gunbower	0	1	0	0	0	1
Harcourt	0	1	0	1	0	2
Heathcote	0	2	4	0	0	6
Junortoun	0	0	0	0	0	0
Korong Vale	0	0	1	0	0	1
Kyneton	0	6	1	0	0	7
Laanecoorie	0	0	0	0	0	0
Leitchville	0	0	1	0	0	1
Lockington	0	0	0	0	0	0
Maiden Gully / Marong	1	0	1	0	0	2
Maldon	1	3	0	1	0	5
Malmsbury	0	0	0	1	0	1
Newstead	0	0	0	0	0	0
Pyramid Hill	0	0	0	0	0	0
Raywood	0	0	0	0	0	0
Rochester	1	0	3	0	0	4
Sebastian	0	0	0	0	0	0
Serpentine	0	0	0	0	0	0
Strathfieldsaye	0	4	0	2	0	6
Taradale-Elphinstone	0	0	0	0	0	0
Tarnagulla	0	0	0	0	0	0
Tooborac	0	1	1	0	0	2
Trentham	0	0	1	0	0	1
Tylden	1	0	0	0	0	1
Wedderburn	0	8	0	0	0	8
Total Complaints	13	104	81	12	0	210

6 Risk Management Plan Audit Results

6.1 Outcome of the most recent audit

The most recent regulatory audit, as required by the DH Secretary, was carried out between 7 to 9 March 2023, for the audit period 1 January 2021 to 31 December 2022. Our DWQRMP was found to have not complied with the obligations imposed by Section 7(1) of the *Safe Drinking Water Act 2003*. Table 64 below lists the two minor non-complaint findings and opportunities for improvement with the action plan for addressing these findings.

6.2 Findings and Action Plan for audit completed in March 2023

There were two minor non-compliant findings and two Opportunities For Improvement (OFI) identified during the audit. Below is the action plan that was developed to address the findings. All actions have been completed.

Table 64: Coliban Water's DWQRMP 2-23 regulatory audit outcomes Action Plan.

Compliance code	Finding	Responsible team	Actions	Timeframe
Minor non-compliance	OFI-2023-001 - Ensure the risk of people mistaking regulated water for drinking water has been assessed and effective preventive measures have been identified in the DWQRMP and implemented, including regular communication with property owners informing them of the requirement to provide signage on all internal and external taps, particularly properties used by the public, such as community halls.	Land, Water & Environment	Arrange for the Regulated Water section of the Risk Register to be reviewed.	Completed
		Customer Care & Support	Prepare an internal memorandum for forwarding to Customer Care & Support that details the suggested communications to customers in towns supplied with Regulated Water.	Completed
Minor non-compliance	OFI-2023-002 - Review the process for checking for compliance with the sampling program, to ensure that missed samples are identified in a timely manner and rescheduled. OFI-2023-003 - Progress working with ALS to reduce the instance of missed samples and address issues with receiving data.	Land, Water & Environment	Following review of the memorandum, arrange for the implementation of communications to customers in towns supplied with Regulated Water	Completed
			Review ALS program versus Test Counts report to ensure only relevant info is included.	Completed
			Meet with ALS to discuss missed samples issue and current status of new LIMS system.	Completed
			Ensure ALS program versus Test Counts is reviewed weekly.	Completed

Compliance code	Finding	Responsible team	Actions	Timeframe
			Review the ALS program versus Test Counts report for any more improvements e.g. how results are displayed.	Completed
Compliant - OFI	OFI-2023-004 - Consider reviewing Table 1 in the Emergency Management Plan to reflect the current process for managing incidents that involve notification to the Department of Health	Land, Water & Environment	Review relevant table in Emergency Management Plan to ensure it reflects Coliban Water's current response to incidents.	Completed
Compliant - OFI	OFI-2023-005 - Consider working with Veolia to reduce the flow rate of supernatant to the head of plants to align with <i>Good Practice Guide to the Operational of Drinking Water Supply Systems for the Management of Microbial Risk</i> (Water RA 2020)	Land, Water & Environment	Complete a Risk Assessment for this process. Review process to <i>'Good Practice Guide to the Operation of Drinking Water Supply Systems for the Management of Microbial Risk - Second Edition.</i>	Completed Completed

7 Regulated Water

Regulated water is water that is not intended for use as drinking water, but which could be reasonably mistaken for drinking water. Regulated water is non-potable, not suitable for human consumption and generally does not receive any form of treatment. The Minister for Health may declare a water supply as a regulated water supply under Section 6 of the Act. On 2 January 2006, the Minister for Health declared the following water supply systems as regulated water supplies: Borung, Dingee, Jarklin, Macorna, Mitiamo, Mysia and Wychitella

We currently:

- Verify signage is located at publicly accessible water supply points (e.g. toilet blocks) advising that the water supply is not suitable for drinking purposes, and this is done on an annual basis.
- Notify customers on a regular basis that the water is not for drinking and household use with a DnD symbol on their quarterly accounts.
- Our website has information for each town, and advises when water is non-potable.

Table 65: Regulated Water Systems in 2023/24

Area where regulated water is supplied	Source water	Date of publication of gazette notice	Estimated population supplied with regulated water
Borong	GWMW pipeline	19 January 2006	50
Dingee	GMW channel	19 January 2006	60
Jarklin	GMW pipeline	19 January 2006	20
Macorna	GMW channel	19 January 2006	20
Mitiamo	GMW pipeline	19 January 2006	90
Mysia	GMW pipeline	19 January 2006	20
Wychitella	GWMW pipeline	19 January 2006	30

8 Further Information

Section 23 of the Act requires us to make available for inspection by the public the results of any water quality monitoring program we've carried out, on any drinking water we have supplied. Customers and members of the public may access drinking water quality data by contacting us on the details provided below:

Telephone: 1300 363 200

Website: www.coliban.com.au

A list of glossary and terms is attached in Appendix A.

Appendix A – Glossary of Terms

Australian Drinking Water Guidelines (2011) (ADWG)

A publication by National Health and Medical Research Council that details a framework for the management of drinking water supply systems and provides information on a range of potential contaminants of water systems.

BAC Filtration

Biological activated carbon filtration is a unit process, similar to GAC filtration, which has the additional capability of removing dissolved organics by microorganisms that develop on the surface of the carbon granules.

Critical Control Point (CCP)

A point, step or procedure at which control can be applied and which is essential to prevent or eliminate a hazard or reduce it to an acceptable level.

Chloramination

The addition of chlorine compounds (e.g. chlorine gas and sodium hypochlorite) to aid the breakdown of organic matters and the inactivation harmful microorganisms. This process is modified with the addition of ammonia gas to improve total chlorine residual in the distribution network.

Chlorination

The addition of chlorine compounds (e.g. chlorine gas and sodium hypochlorite) to aid the breakdown of organic matter and the inactivation harmful microorganisms.

Clarification

A unit operation where seeds of floc are allowed to grow and settle. Clarification is usually enhanced with the addition of polymer (e.g. polyelectrolyte) to increase the size of floc and increase their settling velocities.

Coagulation/flocculation

A unit process involves addition of positively charged coagulant (e.g. aluminium chlorohydrate or aluminium sulphate) and rapid mixing, causing coalescing of suspended particles, or seeds of flocs to form and settle out of suspension.

DEECA

Department of Energy, Environment, and Climate Action.

Dissolved Air Flotation & Filtration (DAFF)

A combination of dissolved air flotation and sand filtration. Dissolved air flotation is a unit operation where fine suspended particles and floc are removed by rising bubbles in the treatment vessel.

Desalination

A unit operation where virtually all dissolved substances and suspended materials are removed by reverse osmosis and only water molecules are allowed to pass through the membranes.

Dual-media filtration

A unit operation using both anthracite coal and sand to retain floc by both adhesion and physical sieving.

Drinking Water Quality Management System (DWQMS)

A term used interchangeably with Drinking Water Quality Risk Management Plan.

Drinking Water Quality Risk Management Plan (DWQRMP)

A risk management plan relating to water supply is a document that:

- contains a detailed description of the water system.
- identifies the risks to the quality of the water and the risks posed by the quality of water.
- assess those risks.
- set out the steps required to manage those risks, including the development and implementation of preventative strategies.
- contains other matters as required by the Safe Drinking Water Regulations 2015

Fluoridation

The addition of fluorine compounds (e.g. Hydrofluorosilicic Acid) into drinking water to improve the dental health of consumers.

GAC Filtration

A unit operation where floc is removed by granular activated carbon (GAC) by adhesion. GAC is fabricated to have a high surface area and hence improved efficiency for adhesion.

GMW

Goulburn-Murray Water Corporation.

GMMW

Grampians Wimmera Mallee Water Corporation.

Microfiltration/Ultrafiltration

A unit operation where fine suspended solid particles are retained by the pores of a filter membrane.

MIEX

Magnetic Ions Exchange is a unit operation where organic matter is attracted to, and removed by a MIEX resin. MIEX reduces the requirements for chemical dosage during the coagulation process, improves the efficiency of disinfection and improves the aesthetic properties of drinking water.

Minor Non-Conformance

A minor non-conformance is defined as a non-compliance with one or more auditable elements, legislative requirements or risk management activities where the potential impact of the non-conformance is not likely to be a serious or imminent risk to public health.

MoU

Memorandum of Understanding.

Opportunity for Improvement (OFI)

A conforming or non-conforming clause of the RMP or DWQMS system that does not contravene a legislative requirement. It is not itself a non-conformance. It may include opportunities for improvement, comments that may be relevant to the next audit or against best practice considerations, or incidental or isolated discrepancies.

Ozonation

A unit process that uses ozone to aid the breakdown of organic matter and the inactivation harmful microorganisms.

pH Correction

The adjustment of the pH of drinking water to get it into the recommended range, by the addition of carbon dioxide, sulphuric acid, lime, soda ash or caustic soda.

Sand Filtration

A unit operation where suspended solid particles are retained by the pores of a filter media (in this case, sand).

Supervisory Control and Data Acquisition (SCADA)

A SCADA system consists of human-machine interface, computerised logics, telemetry communication system, electronically actuated instruments and sensors. SCADA allows remote control and monitor of all key process parameters.

UV Disinfection

A unit operation where ultra violet light is impinged onto drinking water to inactive harmful microorganisms.

Plant (sometimes described as 'our plant' or 'treatment plant')

A facility where raw water is directed through various treatment processes and produces treated water fit for human consumption.

Appendix B – List of raw water organic (fungicides/herbicides/insecticides) parameters

The following table is a comprehensive list of the organic parameters that are tested for in the raw water.

Fungicides	Herbicides	Insecticides
Azoxystrobin	2,4 D Acid	1, 3-dichloropropene
Boscalid	2,4 D B	Alpha cypermethrin
Captan	Atrazine	Azinphos-methyl
Carbendazim	Diquat	Bendiocarb
Chlorothalonil	Diuron	Bifenthrin
Cyprodinil	Glyphosate	Carbaryl
Difenoconazole	Hexazinone	Chlorantraniliprole
Iprodione	MCPA	Chloropicrin
Mancozeb	Metribuzin	Chlorpyrifos
Metalaxyl-M	Metsulfuron methyl	Cypermethrin
Myclobutanil	Molinate	Cyromazine
Penconazole	Paraquat dichloride	Deltamethrin
Prochloraz	Pendimethalin	Dichlorvos
Pyraclostrobin	Prometryn	Dimethoate
Pyrimethanil	Simazine	Esfenvalerate
Tebuconazole	Triclopyr	Imidacloprid
Thiram	Tebuthiuron	Lambda-cyhalothrin
Trifloxystrobin	Thiobencarb	Malathion
Ziram	Trifluralin	Methomyl
	S-metolachlor	Omethoate
		Permethrin
		Phorate
		Pirimicarb
		Thiodicarb

Appendix C – List of treatment processes and added substances

Plant	Water sampling locality	Treatment process													Added substances								
		Coagulation & flocculation	Clarification		Filtration		Disinfection and/or Oxidation					Other			Sludge thickening / dewatering	Lime / soda ash / caustic soda / carbon dioxide / sulphuric acid /	Aluminium-based coagulants	Iron-based coagulants	Polymers	Chlorine	Ammonia	Fluoride compound	
			Sedimentation / clarification	Dissolved air floatation	Granular media filtration	Membrane filtration	Chlorine gas	Chlorine dioxide	Sodium hypochlorite	Calcium hypochlorite	Ultraviolet (UV)	Ozone	Activated Carbon (PAC/GAC/BAC)	Ion exchange									Reverse osmosis
Bendigo	Axedale	x				x	x					x	x			x	x			x	x	x	
	Bendigo Northern																						
	Bendigo Southern																						
	Bendigo Spring Gully																						
	Big Hill																						
	Epsom - Huntly																						
	Junortoun																						
	Maiden Gully - Marong																						
	Raywood																						
	Sebastian																						
	Strathfieldsaye																						
Boort	Boort	x	x		x	x						x				x	x		x	x			
Bridgewater	Bridgewater - Inglewood	x	x		x	x					x		x				x		x	x	x		
	Castlemaine																						

Plant	Water sampling locality	Coagulation & flocculation	Treatment process												Added substances											
			Clarification		Filtration	Disinfection and/or Oxidation					Other		Sludge thickening / dewatering	Lime / soda ash / caustic soda / carbon dioxide / sulphuric acid /	Aluminium-based coagulants	Iron-based coagulants	Polymers	Chlorine	Ammonia	Fluoride compound						
			Sedimentation / clarification	Dissolved air floatation	Granular media filtration	Membrane filtration	Chlorine gas	Chlorine dioxide	Sodium hypochlorite	Calcium hypochlorite	Ultraviolet (UV)	Ozone									Activated Carbon (PAC/GAC/BAC)	Ion exchange	Reverse osmosis			
	Tylden																									
Laanecoore	Bealiba	x	x		x		x			x		x				x	x		x	x	x					
	Dunolly																									
	Laanecoore																									
	Tarnagulla																									
Leitchville	Leitchville	x	x		x	x				x		x				x	x		x	x						
Lockington	Lockington	x		x	x						x					x	x		x	x						
Pyramid Hill	Pyramid Hill	x	x		x		x					x				x	x		x	x						
Rochester	Rochester	x	x		x	x						x				x	x		x	x						
Serpentine	Serpentine	x	x		x		x									x	x		x	x						
Trentham	Trentham					x					x								x	x						

