wannonWATER

Water Quality Annual Report

2023/24

OFFICIAL

Prepared for
Department of Health
(Water Program)
October 2024

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1. INTRODUCTION

Wannon Water is committed to providing safe, reliable drinking water to south-west Victoria. Wannon Water provides water and sewer services to a population of approximately 84,000 people (100,000 during peak season). The area serviced extends from the South Australian border in the west, to Balmoral in the north, to Lismore in the east and the lower Gellibrand River catchment on the coast.

Wannon Water has aligned its drinking water quality management system with the Australian Drinking Water Guidelines 2011 (ADWG) and Hazard Analysis and Critical Control Point (HACCP) risk management principles. Wannon Water will continue to improve its drinking water quality management program to ensure that water is delivered to customers within the limits of the *Safe Drinking Water Act 2003* and associated Regulations.

This 2023/24 Quality of Drinking Water Annual Report has been developed in accordance with the requirements of the *Safe Drinking Water Act 2003* and Safe Drinking Water Regulations 2015. The report highlights the programs and initiatives Wannon Water has in place to provide safe drinking water to the people living in Wannon Water's water sampling localities.

Wannon Water has a comprehensive water quality monitoring program extending across a region of 24,500 square kilometres. Samples are collected from: raw water sources, water entry points, water storages, and at specific points in the reticulation representing the "customer's tap". All samples collected are analysed by an independent laboratory certified by the National Association of Testing Authorities (NATA).

The high standard of drinking water provided is reflected in customers' continued satisfaction with Wannon Water's performance.

The 2024 customer value survey showed that 95 per cent of domestic customers were satisfied with the water supply from Wannon Water, while 78 per cent of customers were satisfied with their water quality.

Defining drinking water

The *Safe Drinking Water Act 2003* defines two types of water quality categories.

Drinking Water – Water that is intended for human consumption or for purposes connected with human consumption, such as the preparation of food or the making of ice for consumption or for the preservation of unpackaged food, whether or not the water is used for other purposes.

Regulated Water – This is water that is not intended for human consumption but could be mistaken as drinking water. If there is a potential for the supply to be mistaken as drinking water, then the Secretary to the Department of Health – may declare the water as Regulated Water.

Sources of water

During 2023/24, Wannon Water supplied drinking water to residential, rural, commercial and industrial customers. The water is harvested from a variety of sources and supplied through approximately 1,910 kilometres of water mains.

Wannon Water harvested approximately 14,692 megalitres (ML) of water to supply its customers. This water comes from a variety sources, namely protected catchment areas, agricultural land, groundwater and, in three supply systems, is supplied/subsidised with raw water supply from another regional water corporation. Specifically, Rocklands Reservoir supplies Balmoral and supplements the Hamilton system and various source water is supplied from the Willaura pipeline to Glenthompson. The Warrnambool supply is also supplemented with an innovative roof water harvesting network collecting rainwater from rooftops in residential subdivisions and a new industrial estate.

Water is supplied to customers with varying degrees of treatment, dependent on the characteristics of the raw water quality. Wannon Water also provides water to areas outside our catchment to Parks Victoria at the Twelve Apostles Visitor Centre.

Figure 1-1 illustrates the localities and where the water is sourced from. Table 1-1 details: Wannon Water's water sampling localities; the sources of supply; how the water is stored after treatment and the treatment facilities operated by Wannon Water.

Microbial quality of drinking water

Microbial risk poses the greatest threat to water safety but are also very difficult to quantify. Until recently, management of this risk was based on how water suppliers perceived the risk and most historic plant performance issues and events, which may result in a waterborne disease outbreak, have been minor or hidden by background levels of community illness. Like many water authorities in Australia, Wannon Water historically has not had any known outbreaks of waterborne disease in its service communities. Data from incidents which have occurred worldwide show that there is usually a number of simultaneous failures which need to occur before a waterborne disease outbreak is detected in the community.

Wannon Water has implemented best practice quantitative health-based targets methodology for assessing microbial risk.

The methodology consists of four key steps:

1. Source water assessment
2. Water treatment assessment
3. Water safety assessment
4. Water Safety Improvement Plan development

By creating Water Safety Improvement Plans and associated risk assessments and implementing treatment plant augmentations it is suggested the risk of simultaneous failures of treatment processes, resulting in a community outbreak, continue to be reduced.

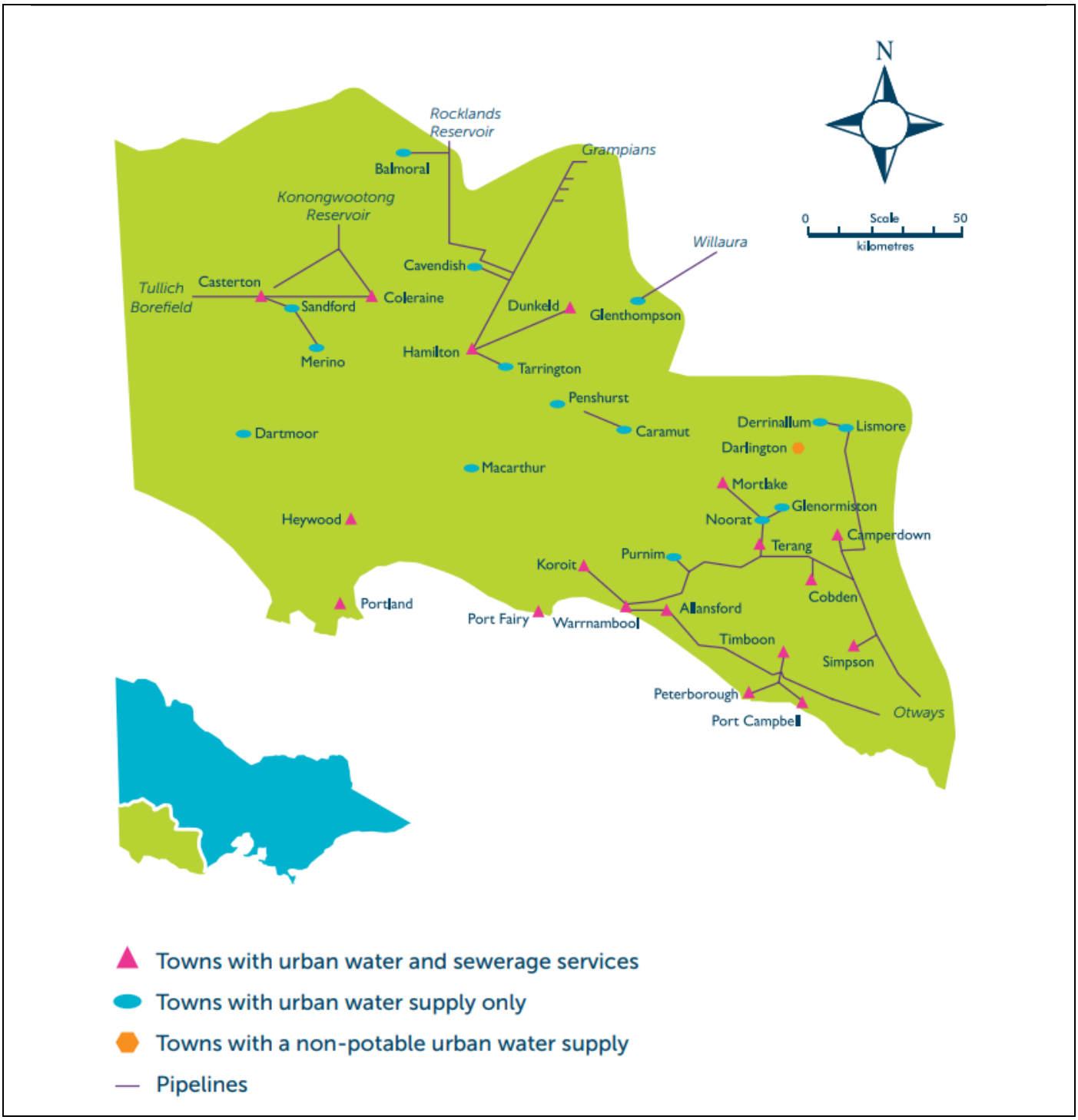

Figure 1-1 - Wannon Water Service Area

Table 1-1 - Source water and treatment systems summary

Water sampling locality	Number of customers	Source water	Raw water storage	Treatment plant	Treated water storage
Allansford - via Warrnambool Water Treatment Plant (WTP)	375	Arkins Creeks (3)	Gellibrand Tank	Warrnambool WTP	Allansford clear water storage
		Gellibrand River	South Otway Tank	Allansford Disinfection Plant (DP)	
		Carlisle Bores (2)	Ewen's Hill Reservoir		
		– via North Otway Pipeline	Plantation Rd Storage		
			Tank Hill Reservoir		
		Gellibrand River – South Otway Pipeline	Warrnambool Storage 1		
			Warrnambool Storage 2		
		Albert Park Bores (3)	Brierly Basin		
		Roof water (North Warrnambool)	Albert Park Raw Water Storage		
Balmoral	152	Rocklands Reservoir (Grampians Wimmera Mallee Water)	Balmoral Service Basin	Balmoral WTP	Balmoral clear water storage
Camperdown (Rural)	410	Arkins Creeks (3)	Gellibrand Tank	Camperdown WTP	Camperdown (Rural) clear water storage
		Gellibrand River	Donald's Hill Reservoir		
		Carlisle Bores (2)			
		– via North Otway Pipeline			
Camperdown (Urban)	1887	Arkins Creeks (3)	Gellibrand Tank	Camperdown WTP	Camperdown (Urban) service basin
		Gellibrand River	Donald's Hill Reservoir		Mt Leura Tank
		Carlisle Bores (2)			Park Lane elevated storage
		– via North Otway Pipeline			
Caramut	74	Caramut Bores (2)	Caramut Service Basin	Caramut DP	Caramut clear water storage
			Caramut Tank (Raw Water)		
Casterton	991	Tullich Bores (4)	N/A	Casterton WTP	Casterton clear water storage
					Casterton Arundel Road Basin
Cavendish	101	Grampians National Park	Cavendish Service Basin	Cavendish Disinfection Plant	Cavendish clear water storage
		7 streams on the western slopes of the Victoria Range and drought relief bores (2)			
Cobden	939	Arkins Creeks (3)	Gellibrand Tank	Cobden WTP	Cobden clear water storage
		Gellibrand River	Cobden Service Basin		
		Carlisle Bores (2)			
		– via North Otway Pipeline			
Coleraine - via Casterton WTP	621	Tullich Bores (4)	N/A	Casterton WTP	Casterton clear water storage
					Casterton Arundel Road Basin
				Coleraine DP	Coleraine clear water storage
Darlington (Regulated Supply)	22	Darlington Bore (1)	Darlington Elevated Tank	Nil Treatment	N/A
Dartmoor	151	Dartmoor Bore (1)	N/A	Dartmoor DP	Dartmoor clear water storage
Derrinallum - via Camperdown WTP	258[1]	Arkins Creeks (3)	Gellibrand Tank	Camperdown WTP	Camperdown (Rural) clear water storage
		Gellibrand River	Donald's Hill Reservoir	Ettrick's Springs DP	Camperdown (Urban) service basin

Water sampling locality	Number of customers	Source water	Raw water storage	Treatment plant	Treated water storage
		Carlisle Bores (2)		Lismore/Derrinallum Tank DP	Lismore Tank
		– via North Otway Pipeline			
Dunkeld - via Hamilton WTP	409	Grampians National Park	Hayes Reservoir	Hamilton WTP	Hamilton clear water storage
		7 streams on the western slopes of the Victoria Range and drought relief bores (2)	Cruckoor Reservoir	Dunkeld DP	
			Hartwichs Reservoir		
			Hamilton Service Basins 1 & 2		
		Rocklands Reservoir (Grampians Wimmera Mallee Water)			Dunkeld Covered Basin
Glenthompson	132	Yuppeckiar Creek Catchment and	Glenthompson Reservoir	Glenthompson WTP	Glenthompson clear water storage
		Grampians Wimmera Mallee Water			
Hamilton	5545	Grampians National Park	Hayes Reservoir	Hamilton WTP	Hamilton clear water storage
		7 streams on the western slopes of the Victoria Range and drought relief bores (2)	Cruckoor Reservoir		
			Hartwichs Reservoir		
			Hamilton Service Basins 1 & 2		
		Rocklands Reservoir (Grampians Wimmera Mallee Water)			
Heywood	769	Heywood Bores (2)	N/A	Heywood WTP	Heywood clear water storage
Koroit - via Warrnambool WTP	891	Arkins Creeks (3)	Gellibrand Tank	Warrnambool WTP	Warrnambool clear water storage
		Gellibrand River	South Otway Tank		Harrington Road clear water storage
		Carlisle Bores (2)	Ewen's Hill Reservoir		Dennington elevated storage
		– via North Otway Pipeline	Plantation Rd Storage	Illowa (Koroit) DP	Koroit Basin
			Tank Hill Reservoir		
		Gellibrand River – South Otway Pipeline	Warrnambool Storage 1		
			Warrnambool Storage 2		
		Albert Park Bores (3)	Brierly Basin		
		Roof water (North Warrnambool)	Albert Park Raw Water Storage		
Lismore - via Camperdown WTP	258[1]	Arkins Creeks (3)	Gellibrand Tank	Camperdown WTP	Camperdown (Rural) clear water storage
		Gellibrand River	Donald's Hill Reservoir	Ettrick's Springs DP	Camperdown (Urban) service basin
		Carlisle Bores (2)		Lismore/Derrinallum Tank DP	Lismore Tank
		– via North Otway Pipeline			
Macarthur	175	Macarthur Bore	N/A	Macarthur WTP	Macarthur clear water storage
Merino - via Casterton WTP	186	Tullich Bores - Bore Field (4)	N/A	Casterton WTP	Casterton clear water storage
					Casterton Arundel Road Basin
				Merino DP	Merino clear water storage
Mortlake - via Terang WTP	693	Arkins Creeks (3)	Gellibrand Tank	Terang WTP	Terang clear water storage
		Gellibrand River	Ewen's Hill Reservoir	Mortlake DP	Noorat Tank
		Carlisle Bores (2)			

Water sampling locality	Number of customers	Source water	Raw water storage	Treatment plant	Treated water storage
		– via North Otway Pipeline	Absalom's Bore Balance Tank		Mortlake clear water storage
		and Absalom's Bore (2)			
Noorat/Glenormiston - via Terang WTP	258	Arkins Creeks (3)	Gellibrand Tank	Terang WTP	Terang clear water storage
		Gellibrand River	Ewen's Hill Reservoir		
		Carlisle Bores (2)			Noorat Tank
		– via North Otway Pipeline			
Paaratte - via Port Campbell WTP	30	Port Campbell Bore (1)	N/A	Port Campbell WTP	Paaratte Tower
Penshurst	324	Penshurst Bore (1)	N/A	Penshurst DP	Penshurst clear water storage
Peterborough - via Port Campbell WTP	376	Port Campbell Bore (1)	N/A	Port Campbell WTP	Port Campbell clear water storage
					Brumby's Road Tank
Port Campbell	312	Port Campbell Bore (1)	N/A	Port Campbell WTP	Port Campbell clear water storage
Port Fairy	2454	Port Fairy Bores (2)	N/A	Port Fairy WTP	Port Fairy clear water storage
Portland	6014	Wyatt Street Bore (1)	N/A	Portland Wyatt St WTP	Portland Wyatt St clear water storage (currently offline)
		Bald Hill Bores (2)		Portland Bald Hill WTP	Portland clear water storage
Purnim	104	Arkins Creeks (3)	Gellibrand Tank	Purnim DP	Purnim elevated storage
		Gellibrand River	Ewen's Hill Reservoir		
		Carlisle Bores (2)	Tank Hill Reservoir		
		– via North Otway Pipeline	Purnim Raw Water Tank		
Sandford - via Casterton WTP	92	Tullich Bores - (4)	N/A	Casterton WTP	Casterton clear water storage
					Casterton Arundel Road Basin
Simpson	107	Arkins Creeks (3)	Gellibrand Tank	Simpson WTP	Simpson clear water storage
		Gellibrand River	Simpson Service Basin		
		Carlisle Bores (2)			
		– via North Otway Pipeline			
Tarrington - via Hamilton WTP	168	Grampians National Park	Hayes Reservoir	Hamilton WTP	Hamilton clear water storage
		7 streams on the western slopes of the Victoria Range and drought relief bores (2)	Cruckoor Reservoir		
			Hartwich's Reservoir		Tarrington Pierrepoint Tank
			Hamilton Service Basins 1 & 2		
		Rocklands Reservoir (Grampians Wimmera Mallee Water)			
Terang	1104	Arkins Creeks (3)	Gellibrand Tank	Terang WTP	Terang clear water storage
		Gellibrand River	Ewen's Hill Reservoir		
		Carlisle Bores (2)			
		– via North Otway Pipeline			
Timboon - via Port Campbell WTP	638	Port Campbell Bore (1)	N/A	Port Campbell WTP	Port Campbell clear water storage
					Peterborough Road Tank
					Timboon Basin

Water sampling locality	Number of customers	Source water	Raw water storage	Treatment plant	Treated water storage
					Timboon Elevated Tank
					Timboon Rands Road Tank
Warrnambool	17235	Arkins Creeks (3)	Gellibrand Tank	Warrnambool WTP	Warrnambool clear water storage
		Gellibrand River	South Otway Tank		Liebig St Basin
		Carlisle Bores (2)	Ewen's Hill Reservoir		Liebig St elevated storage
		– via North Otway Pipeline	Plantation Rd Storage		East Warrnambool elevated storage
			Tank Hill Reservoir		Dooley's Hill elevated storage
		Gellibrand River – South Otway Pipeline	Warrnambool Storage 1		Warrnambool West elevated storage
			Warrnambool Storage 2		Harrington Road clear water storage
		Albert Park Bores (3)	Brierly Basin		Harrington Road elevated storage
		Roof water (North Warrnambool)	Albert Park Raw Water Storage		Hopkins Point Road Tank

N/A not applicable

[1] Assumption (Lismore and Derrinallum customers 516)

2. MANAGING WATER QUALITY

Wannon Water bases its water quality compliance on the ADWG, as governed by the *Safe Drinking Water Act 2003* and associated Regulations. These guidelines are used for establishing microbiological, physical and chemical monitoring programs, which provide the basis for assessing drinking water quality.

Water quality Schedule 2 standards
The Safe Drinking Water Regulations 2015 specify the water quality standards and the frequency at which they will be sampled. An explanation of the water quality standards is given below.

***Escherichia coli* (*E. coli*) -** is a bacterial species belonging to the Coliforms group. It is only found naturally in the digestive tract of warm-blooded animals. The presence of *E. coli* is indicative that faecal contamination may have occurred. One sample per week is required per locality. The water quality standard for *E. coli* is zero organisms per 100mL. Any detection of *E. coli* must be thoroughly investigated, and the investigation will confirm whether or not the standard was met (a false positive) or not. Specifically:

- All other factors in the water sampling locality at the time of the investigation that would indicate the presence of *E. coli* are not present; and
- The drinking water treatment process applied, or other specified actions taken by the water supplier, are such as would be reasonably expected to have eliminated the presence of *E. coli* in the water sampling locality at the relevant time; and
- All plant and infrastructure associated with the water treatment process were operating to specification at all relevant times; and
- There were no issues arising from degradation of plant or infrastructure in or around the relevant water sampling locality that could reasonably be suspected to have contributed to the presence of *E. coli* in the drinking water in that water sampling locality.

Trihalomethanes - form when chlorine reacts with naturally occurring organic matter in the water supply. One sample per month is required per locality. Trihalomethanes (THMs) have a standard limit of 0.25 mg/L.

Turbidity - is a measure of particulate and suspended matter in water (cloudiness). Turbidity is caused by the presence of fine suspended matter such as clay, silt, colloidal particles and micro-organisms. Turbidity is measured in Nephelometric Turbidity Units (NTU). One sample per week is required per locality. The standard is defined as the 95th percentile of results for samples in any 12-month period must be less than or equal to 5.0 NTU.

Wannon Water's water sampling programs monitor for additional algal, microbiological, chemical, physical, and radiological parameters. Results from the monitoring of the parameters that have a potential health or aesthetic impact on customers are presented in Section 6.

Undertakings under Section 30 of the Act

Should drinking water continually not meet the quality criterion then the Corporation is required to commit to an undertaking with the Department of Health (DH) to remediate the problem.

Wannon Water did not apply for any undertakings in 2023/24.

Variation to aesthetic standards

In accordance with the *Safe Drinking Water Act 2003* a water supplier may apply to the Minister for Health for an exemption to a water quality standard. The Minister will, if satisfied, exempt the water supplier from complying with the water quality standard, as it applies to drinking water supplied by the water supplier. As noted, approved exemptions release water suppliers from the requirement to meet a specified quality standard for a period, but do not release them from the obligation to minimise any risk to the public.

Wannon Water did not apply for any exemptions in 2023/24.

Regulated water

The Minister for Health has declared the following systems as regulated water:

- Darlington was declared a regulated water supply on 7 September 2006 (Gazette number G36). Darlington's water is sourced from a bore at Darlington. The number of properties connected to this system is 22.
- North Otway Pipeline was declared a regulated water supply on 26 June 2008 (Gazette number S168). The North Otway Pipeline is sourced from Arkins Creek Catchment and Gellibrand River Catchment and is supplemented in the drier months from the Carlisle River Borefield. The number of properties connected to the system is 461.

In accordance with section 7 of the *Safe Drinking Water Act 2003* Wannon Water has a regulated water risk management plan that covers the two regulated water localities.

Wannon Water communicates to customers and the general public via notices on the regular water bill and a 12 monthly notice for each non-drinking water supply. This information is also included in the new

customer welcome package. Customers are offered stickers or signage at any time where required.

Wannon Water has a list of where public taps are located. Wannon Water communicates the locations of signage to the Environmental Health Officer of the relevant councils on an annual basis and will supply council with extra signage if new public taps are installed in regulated supply areas.

Non-Drinking Water

In addition to the drinking water and regulated water supplies, Wannon Water also provides water to approximately 130 customers that are currently classified as “non-potable / non-drinking” (This is water that is not intended for human consumption and does not have the potential to be mistaken as drinking water). Eight of the 34 localities, listed in the table below, contain customers that are supplied with non-potable water. All these customers are known as raw water ‘supply by agreement’ customers. They have each signed a contract with Wannon Water, or its predecessors, that indicates that the water is not fit for human consumption. These customers receive water from the system prior to treatment or disinfection.

Table 2-1 – Non potable drinking water supplies

Locality	Source of water
Balmoral	Rocklands Reservoir
Casterton	Konongwootong Reservoir or Tullich bores
Cavendish	Grampians
Coleraine	Konongwootong Reservoir
Dunkeld	Hamilton Pipeline or Basin 2
Glenthompson	Glenthompson Reservoir
Hamilton	Grampians
Caramut	Caramut bores

3. ENSURING SAFE DRINKING WATER

Drinking water quality policy

At Wannon Water, our priority and obligation has always been to provide safe drinking water to our customers every day.

This commitment forms part of our Zero Harm Policy, including:

- Managing water quality at all points from "catchment to customer tap"
- Designing and maintaining facilities, assets and processes to ensure safe drinking water.
- Complying with, as a minimum, all legislative, regulatory and other obligations relevant to our activities
- Implementing a system for the proactive and systematic identification, assessment, control and review of hazards and risks relevant to our activities; taking reasonably practicable steps to eliminate or minimise them.
- Maintaining voluntary certification of our management system compliant with standards:
    - OH&S ISO 45001.
    - Environmental Management Systems ISO 14001.
- Continually improving capability by providing resources, information, training and supervision to ensure a systematic approach.

The Zero Harm Policy is available on Wannon Water's website.

Water quality management system

Wannon Water maintains a drinking water quality management system based on Hazard Analysis Critical Control Point (HACCP) and the ADWG risk management principles. Wannon Water utilises a multiple barrier approach to ensure that drinking water is safe and aesthetically pleasing. The strength of this approach is that if a barrier is compromised it is able to be compensated for by the effective operation of the remaining barriers. This approach minimises the likelihood of contaminants passing through the treatment system and potentially causing harm to consumers.

The barriers utilised are:

- Catchment management and source water protection.
- Detention in protected reservoirs or storages.
- Extraction management.
- Treatment.
- Disinfection; and
- Maintenance of the distribution system; including maintaining adequate chlorine or chloramine residuals.

Raw (source) water from surface and groundwater supplies may contain contaminants such as sediment, microorganisms and dissolved organic compounds. Such water may not be aesthetically pleasing or safe to drink. To create a safe drinking supply Wannon Water monitors at various locations from source to tap and then treats the water through differing processes. The treated water is then reticulated through a number of storage tanks and pipes before being delivered to customers.

Risk management plan audit

The Safe Drinking Water Act 2003 (the Act) requires water suppliers to prepare, implement, review, and revise risk management plans for their supply of drinking water. Under Section 11 of the Act, a water supplier must have their management plan independently audited.

The most recent regulatory audit as required by the Secretary to the Department of Health (DH), was undertaken between 14 February 2023 to 16 February 2023, for the audit period 1 January 2021 to 31 December 2022. Wannon Water's Drinking Water Quality Risk Management Plan (DWQRMP) was found to be fully with the obligations imposed by Section 7(1) of the Safe Drinking Water Act 2003.

Wannon Water was not required to undertake an audit of their DWQRMP in 2023/24.

The Audit report highlights:

"Wannon Water demonstrated a culture of openness and continuous improvement and allocated significant resources to ensure the audit objectives were met. Wannon Water demonstrated strong commitment to establishing a DWQ RMP that meets the requirement of the legislation and reflects the guiding principles of the ADWG.

Wannon Water has commenced a large body of work to review, update and improve the health-based targets assessments and use the outcomes to revise the CCPs and critical limits. This is seen as an extremely positive improvement and invaluable development of in-house capability in this area.

Operational teams demonstrated a strong sense of personal responsibility for providing safe drinking water and demonstrated that processes and procedures are consistently operated across regions.

Operational monitoring results and trending confirm the treatment processes are well operated.

Water quality compliance monitoring results demonstrate consistent compliance with the water quality standards.

During the audit, Wannon Water demonstrated that implementation of the DWQRMP is standard business practice, which is an indicator of a mature risk-based management system".

The Auditor identified two opportunities for improvement to further strengthen the risk management plan and are summarised in Table 3-1. The Audit Certificate is provided in the appendices of this report.

Table 3-1 Detailed Audit Findings

Opportunities for improvement	Action	Status
Consider relabelling the risks assessment columns to clearly delineate the inherent risk, relevant controls for the area being assessed and residual risk.	Update the Water Quality Risk Assessment template to clearly delineate the inherent risk, relevant controls for the area being assessed and residual risk.	Complete
Undertake a program to assess the condition of bore heads, and in particular the risk of stormwater ingress into the bore heads for category 1 and 2 catchments.	Conduct an audit on all the bores and determine which bore heads need to be replaced as per best practice standards.	Complete
	Develop an annual bore head integrity inspection program.	Complete

4. WATER TREATMENT

Water treatment at Wannon Water varies by system, ranging from no treatment for regulated water supplies, to full treatment via a water treatment plant.

Table 4-1 details the treatment processes utilised within each of Wannon Water's drinking water treatment plants.

The water treatment processes employed during 2023/24 were similar to 2022/23. Changes and improvements to the system are outlined in Section 5.

Table 4-1 - Treatment Processes and Added Substances 2023/24

Water Treatment Plants	Raw Water Detention	Cooling / aeration towers	Upstream Water Treatment Plant	Pre-Chlorination Sodium Hypo	pH Adjust				Coagulation			Flocculation				Clarification		Filtration	Adsorption		Disinfection				pH Adjust			Fluoridisation	Clear Water Storage
					Caustic soda	Soda Ash	Hydrated Lime	Carbon Dioxide	Ferric Chloride	Aluminium chlorohydrate (ACH)	Aluminium Sulphate	Polyelectrolyte Nalco 3482	Flopam AN913 PWG flocculant	Polymer Nalclear 8170PULN	Polymer Klaraid	Clarifier	Dissolved air floatation		Activated Carbon	Calgon	Chlorine gas	Sodium hypochlorite	Aqueous ammonia	UV	Caustic soda	Soda Ash	Hydrated Lime	Fluorosilicic acid	
Allansford			✓																			✓							✓
Balmoral	✓									✓							✓	✓	✓	✓		✓	✓						✓
Camperdown	✓						✓				✓						✓	✓			✓						✓	✓	✓
Caramut																						✓		✓					✓
Carlisle River																					✓								
Casterton				✓					✓				✓			✓		✓				✓							✓
Cavendish	✓																				✓			✓			✓		✓
Cobden	✓					✓					✓				✓	✓		✓		✓	✓				✓				✓
Coleraine			✓																			✓							✓
Dartmoor																						✓							✓
Dunkeld			✓																			✓							
Ewen's Hill	✓																				✓					✓			
Glenthompson	✓									✓						✓		✓	✓	✓		✓	✓	✓					✓
Hamilton	✓						✓				✓			✓			✓	✓			✓		✓				✓	✓	✓
Heywood		✓																		✓	✓								✓
Koroit			✓																		✓								✓
Ettrick Springs			✓																		✓								
Lismore/Derrinallum			✓																			✓							✓
Macarthur				✓					✓				✓			✓		✓				✓							✓
Merino			✓																			✓							✓
Mortlake			✓																		✓			✓					✓
Penshurst																						✓		✓					✓
Port Campbell		✓																✓			✓								✓
Port Fairy		✓																		✓	✓								✓
Portland Wyatt St		✓																			✓								✓
Portland Bald Hill		✓																			✓								✓
Purnim	✓																					✓		✓					
Simpson	✓				✓						✓						✓	✓			✓				✓				✓
Tank Hill	✓																				✓				✓				
Terang	✓					✓					✓				✓	✓		✓			✓					✓			✓
Warrnambool	✓										✓	✓				✓	✓	✓			✓			✓			✓	✓	✓

^ See Glossary for description of each treatment process

5. MAINTAINING HIGH QUALITY WATER

Staff awareness and training

Wannon Water has adopted the Best Practice Guidelines for Victorian Framework for Water Treatment Operator Competencies. Wannon Water is dedicated to providing relevant employees with water industry training and awareness via formal training and attendance at relevant conferences and information sessions. In 2023/24 this included:

- Certification III and IV in Water Industry Operations
- Attendance at Water Industry Operators Association (WIOA) Conference
- Attendance at Victorian Drinking Water Network meetings
- Internal refresher training

Distribution system

Flushing program

Wannon Water has a regular preventative flushing program for drinking water localities. Frequency of flushing is risk-based, and Wannon Water utilises field data and customer feedback in scheduling the program, which is reviewed as required.

Reactive flushing is carried out to remove colour or turbidity in response to reaching critical limits or when a customer complaint is received. Flushing is also used to increase chlorine residual at locations where water usage is low.

Wannon Water also uses a private contractor to deliver network diagnostics to determine the effectiveness of flushing programs.

Water mains renewal program

Wannon Water has an asset replacement program created and prioritised via a risk-based process using event information, condition assessments and asset modelling. In 2023/24 Wannon Water spent approximately $613,299 replacing approximately 594 meters of water mains in Warrnambool.

Water treatment plant changes and improvements

Balmoral
Replaced clear water storage

Coleraine
Replaced clear water storage roof vents.

Casterton
Relocated chlorine dosing system
Improved borehead integrity

Hamilton
Replaced coagulant dosing system
Installed backup power generator
Replaced chemical dosing lines

Warrnambool
Added UV disinfection
Replaced filter backwash pumps
Replaced coagulant dosing lines

Improved borehead integrity

Cobden
Replaced chlorine drum scales
Replaced polymer pumps
Installed backup power generator

Camperdown
Replaced air dryer for plant valve control
Replaced coagulant dosing pumps

Macarthur
Replaced media in pressure filters
Improved borehead integrity

All locations
Clear water storage monitoring and cleaning program bolstered to ensure structural security and water quality within these structures is of the highest quality.

Treatment process changes and issues

Simpson & Camperdown

Challenges in treating raw water effectively led to the need for increased alum dosing and additional pre pH correction. To address this, ACH was trialled and proved capable of treating the raw water effectively without requiring pre pH correction. Consequently, a permanent switch to ACH from alum was made at Simpson and Camperdown is currently being trialled.

Glenthompson

Difficulty treating highly coloured raw water quality at the Glenthompson WTP resulted in increased operational monitoring and testing of various coagulants to achieve optimal plant performance. In February 2024, the plants flow rate was reduced, and a smaller inline mixer was installed to improve coagulation. These changes enabled the plant to keep up with supply demand. Longer term treatment strategies are being developed.

6. DRINKING WATER QUALITY RESULTS 2023/24

Sampling frequency

The frequency of sampling of the water quality parameters (*Escherichia coli*, Trihalomethanes and turbidity) is specified in Schedule 2 of the Safe Drinking Water Regulations 2015. Wannon Water uses its risk assessment process to select an appropriate sampling frequency for additional microbiological, chemical, physical, radiological and algal monitoring.

Testing programs

The number of samples collected, and frequency of testing varies for each locality according to population and risk. The geographic location of customer sampling taps is designed to ensure that the samples collected are representative of the supply system. The sampling program is reviewed on a regular basis to align with changes in the risk profile for each locality.

During 2023/24 Wannon Water performed more than 90,000 individual tests. Approximately 24 per cent of the tests were sampled at customer's taps within 34 localities.

Any missed regulatory samples are communicated to the department of Health. No Schedule 2 regulatory samples were missed this reporting period.

Interpreting the results

The units of results are dependent on the parameter being analysed. The most common unit used within this report is milligrams per litre (**mg/L**). This unit is interchangeable with parts per million (ppm). Other units within this report include:

- **cfu/100mL** used for measurement of *E. coli.*
- Nephelometric Turbidity Units (**NTU**) a measurement for turbidity.
- **pH units** for measurement of pH.
- Platinum-Cobalt (**Pt.-Co.**) units for measurement of colour. This unit is interchangeable with Hazen Units (HU).
- **mg/L as calcium carbonate ($CaCO_3$)** used for measuring total hardness.

More than one sample collected per week – Localities where more than one sample is collected per week are marked with an asterisk (*).

Less than limit of detection – The symbol for less than (<) is used when the concentration of a parameter is less than what can be detected accurately by the instrument. The level which an instrument can accurately detect is known as the "limit of detection".

Safe Drinking Water Regulations 2015 Standards

Escherichia coli (E. coli)

Standard: No *E. coli* per 100 millilitres of drinking water, with the exception of any false positive sample.
Outcome: The Standard was met at all localities comparable to the previous two years.

Table 6-1 *E. coli* – Customer taps 2023/24

E.coli

Locality	Sampling Frequency	No. of Samples	No. of Non complying samples	% of samples with no E.coli	Maximum result (orgs/100ml) Raw	Compliant
Allansford	Weekly	52	0	100.0	0.00	Yes
Balmoral	Weekly	52	0	100.0	0.00	Yes
Camperdown (Rural)	Weekly	52	0	100.0	0.00	Yes
Camperdown (Urban)	Weekly	52	0	100.0	0.00	Yes
Caramut	Weekly	52	0	100.0	0.00	Yes
Casterton	Weekly	52	0	100.0	0.00	Yes
Cavendish	Weekly	52	0	100.0	0.00	Yes
Cobden	Weekly	52	0	100.0	0.00	Yes
Coleraine	Weekly	52	0	100.0	0.00	Yes
Dartmoor	Weekly	52	0	100.0	0.00	Yes
Derrinallum	Weekly	52	0	100.0	0.00	Yes
Dunkeld	Weekly	52	0	100.0	0.00	Yes
Glenthompson	Weekly	52	0	100.0	0.00	Yes
Hamilton	Weekly	104	0	100.0	0.00	Yes
Heywood	Weekly	52	0	100.0	0.00	Yes
Koroit	Weekly	52	0	100.0	0.00	Yes
Lismore	Weekly	52	0	100.0	0.00	Yes
Macarthur	Weekly	52	0	100.0	0.00	Yes
Merino	Weekly	52	0	100.0	0.00	Yes
Mortlake	Weekly	52	0	100.0	0.00	Yes
Noorat/Glenormiston	Weekly	52	0	100.0	0.00	Yes
Paaratte	Weekly	52	0	100.0	0.00	Yes
Penshurst	Weekly	52	0	100.0	0.00	Yes
Peterborough	Weekly	52	1	98.1	1.00	Yes
Port Campbell	Weekly	52	0	100.0	0.00	Yes
Port Fairy	Weekly	104	0	100.0	0.00	Yes
Portland	Weekly	104	0	100.0	0.00	Yes
Purnim	Weekly	52	0	100.0	0.00	Yes
Sandford	Weekly	52	0	100.0	0.00	Yes
Simpson	Weekly	52	0	100.0	0.00	Yes
Tarrington	Weekly	52	0	100.0	0.00	Yes
Terang	Weekly	52	0	100.0	0.00	Yes
Timboon	Weekly	52	0	100.0	0.00	Yes
Warrnambool	Weekly	156	0	100.0	0.00	Yes

Table 6-2 *E. coli* – Network clear water storages 2023/24

E. coli

Water sampling locality	Frequency of sampling	Number of samples	Maximum detected (cfu/100mL)	No. of investigations conducted (s. 22)	No. of samples where standard not met (s.18)
Warrnambool Dennington elevated storage	Weekly	52	0	0	0
Warrnambool Dooleys Hill elevated storage	Weekly	52	0	0	0
Warrnambool East elevated storage	Weekly	52	0	0	0
Warrnambool Liebig St elevated storage	Weekly	52	0	0	0
Warrnambool West elevated storage	Weekly	52	1	1	0
Camperdown (Urban) Park Lane elevated storage	Weekly	52	0	0	0
Camperdown (Urban) service basin	Weekly	52	0	0	0
Casterton basin	Weekly	52	0	0	0
Koroit basin	Weekly	52	0	0	0
Lismore/Derrinallum tank	Weekly	52	0	0	0
Noorat tank	Weekly	52	0	0	0
Paaratte tower	Weekly	52	0	0	0
Peterborough tank	Weekly	52	0	0	0
Allansford tower	Weekly	52	0	0	0
Purnim tank	Weekly	52	0	0	0
Timboon low level tank	Weekly	52	0	0	0
Timboon elevated tank	Weekly	52	0	0	0
Timboon covered basin	Weekly	52	0	0	0
Port Campbell high level tank	Weekly	52	0	0	0
Dunkeld covered basin	Weekly	52	0	0	0
Tarrington Pierrepoint tank	Weekly	52	0	0	0

Trihalomethanes (THMs)

Standard: Less than or equal to 0.25 milligrams per litre of drinking water
Outcome: The Standard was met at all localities comparable to the previous two years.

Table 6-3 Trihalomethanes results by locality 2023/24

Total THM

Locality	Sampling Frequency	No. of Samples	No. of Non complying samples	Maximum result (mg/L)	Average (mg/L)	Compliant
Allansford	Monthly	12	0	0.092	0.075	Yes
Balmoral	Monthly	12	0	0.084	0.051	Yes
Camperdown (Rural)	Monthly	12	0	0.110	0.078	Yes
Camperdown (Urban)	Monthly	12	0	0.097	0.058	Yes
Caramut	Monthly	12	0	0.039	0.026	Yes
Casterton	Monthly	12	0	0.140	0.111	Yes
Cavendish	Monthly	12	0	0.160	0.122	Yes
Cobden	Monthly	12	0	0.069	0.054	Yes
Coleraine	Monthly	12	0	0.180	0.153	Yes
Dartmoor	Monthly	12	0	0.012	0.003	Yes
Derrinallum	Monthly	12	0	0.160	0.127	Yes
Dunkeld	Monthly	12	0	0.051	0.037	Yes
Glenthompson	Monthly	12	0	0.087	0.056	Yes
Hamilton	Monthly	12	0	0.015	0.009	Yes
Heywood	Monthly	12	0	0.019	0.013	Yes
Koroit	Monthly	12	0	0.100	0.083	Yes
Lismore	Monthly	12	0	0.130	0.101	Yes
Macarthur	Monthly	12	0	0.040	0.032	Yes
Merino	Monthly	12	0	0.160	0.124	Yes
Mortlake	Monthly	12	0	0.095	0.086	Yes
Noorat/Glenormiston	Monthly	12	0	0.087	0.071	Yes
Paaratte	Monthly	12	0	0.015	0.011	Yes
Penshurst	Monthly	12	0	0.044	0.027	Yes
Peterborough	Monthly	12	0	0.016	0.013	Yes
Port Campbell	Monthly	12	0	0.014	0.011	Yes
Port Fairy	Monthly	12	0	0.001	0.001	Yes
Portland	Monthly	12	0	0.002	0.001	Yes
Purnim	Monthly	12	0	0.140	0.117	Yes
Sandford	Monthly	12	0	0.140	0.127	Yes
Simpson	Monthly	12	0	0.055	0.041	Yes
Tarrington	Monthly	12	0	0.015	0.007	Yes
Terang	Monthly	12	0	0.067	0.046	Yes
Timboon	Monthly	12	0	0.027	0.023	Yes
Warrnambool	Monthly	12	0	0.091	0.064	Yes

Turbidity

Standard: The 95th percentile of results for samples in any 12-month period must be less than or equal to 5.0 NTU

Outcome: The Standard was met at all localities, which is consistent with the previous two years.

Table 6-4 Turbidity results by locality 2023/24

Turbidity					
Locality	**Sampling Frequency**	**No. of Samples**	**Maximum result NTU**	**95% UCL of Mean**	**Compliant**
Allansford	Weekly	52	1.8	0.3	Yes
Balmoral	Weekly	52	0.3	0.1	Yes
Camperdown (Rural)	Weekly	52	1.8	0.4	Yes
Camperdown (Urban)	Weekly	52	1.0	0.3	Yes
Caramut	Weekly	52	0.5	0.1	Yes
Casterton	Weekly	52	1.6	0.2	Yes
Cavendish	Weekly	52	2.3	0.6	Yes
Cobden	Weekly	52	0.8	0.3	Yes
Coleraine	Weekly	52	0.3	0.1	Yes
Dartmoor	Weekly	52	0.8	0.1	Yes
Derrinallum	Weekly	52	13.0	1.0	Yes
Dunkeld	Weekly	52	0.6	0.2	Yes
Glenthompson	Weekly	52	0.6	0.2	Yes
Hamilton	Weekly	104	2.8	0.2	Yes
Heywood	Weekly	52	1.0	0.7	Yes
Koroit	Weekly	52	0.4	0.1	Yes
Lismore	Weekly	52	5.3	0.6	Yes
Macarthur	Weekly	52	0.2	0.1	Yes
Merino	Weekly	52	2.2	0.3	Yes
Mortlake	Weekly	52	0.5	0.2	Yes
Noorat/Glenormiston	Weekly	52	0.2	0.1	Yes
Paaratte	Weekly	52	0.2	0.2	Yes
Penshurst	Weekly	52	1.1	0.2	Yes
Peterborough	Weekly	52	0.1	0.1	Yes
Port Campbell	Weekly	52	1.1	0.3	Yes
Port Fairy	Weekly	104	0.8	0.5	Yes
Portland	Weekly	104	0.4	0.1	Yes
Purnim	Weekly	52	6.3	1.6	Yes
Sandford	Weekly	52	1.0	0.2	Yes
Simpson	Weekly	52	1.0	0.2	Yes
Tarrington	Weekly	52	0.6	0.2	Yes
Terang	Weekly	52	0.4	0.1	Yes
Timboon	Weekly	52	1.5	0.2	Yes
Warrnambool	Weekly	157	2.2	0.2	Yes

Other – may pose a risk to human health.

Fluoride

Standard: All samples of drinking water collected within a locality not to exceed 1.5 mg/L (ADWG – Health).
Outcome: The Standard was met at all localities, which is consistent with the previous two years.

Table 6-5 Fluoride results by locality 2023/24

Fluoride

Locality	Sampling Frequency	No. of Samples	Maximum	Minimum	Average	Compliant
Allansford*	Weekly*	52	0.89	0.20	0.78	Yes
Balmoral	Annual	1	0.05	0.05	0.05	Yes
Camperdown (Rural)*	Weekly*	52	0.90	0.11	0.75	Yes
Camperdown (Urban)*	Weekly*	52	0.86	0.19	0.73	Yes
Caramut	Annual	1	0.05	0.05	0.05	Yes
Casterton	Annual	1	0.05	0.05	0.05	Yes
Cavendish	Annual	1	0.05	0.05	0.05	Yes
Cobden	Annual	1	0.05	0.05	0.05	Yes
Coleraine	Annual	1	0.05	0.05	0.05	Yes
Dartmoor	Annual	1	0.05	0.05	0.05	Yes
Derrinallum*	Weekly*	52	0.88	0.58	0.73	Yes
Dunkeld*	Weekly*	52	0.89	0.67	0.76	Yes
Glenthompson	Annual	1	0.05	0.05	0.05	Yes
Hamilton	Weekly*	106	0.86	0.26	0.78	Yes
Heywood	Annual	1	0.19	0.19	0.19	Yes
Koroit	Weekly*	52	0.89	0.37	0.78	Yes
Lismore	Weekly*	52	0.86	0.18	0.74	Yes
Macarthur	Annual	1	0.17	0.17	0.17	Yes
Merino	Annual	1	0.05	0.05	0.05	Yes
Mortlake**	Weekly*	52	0.08	0.05	0.06	Yes
Noorat/Glenormiston**	Weekly**	52	0.05	0.05	0.05	Yes
Paaratte	Annual	1	0.05	0.05	0.05	Yes
Penshurst	Annual	1	0.05	0.05	0.05	Yes
Peterborough	Annual	1	0.05	0.05	0.05	Yes
Port Campbell	Annual	1	0.05	0.05	0.05	Yes
Port Fairy	Annual	1	0.40	0.40	0.40	Yes
Portland Water	Monthly*	12	0.99	0.89	0.93	Yes
Purnim	Annual	1	0.05	0.05	0.05	Yes
Sandford	Annual	1	0.05	0.05	0.05	Yes
Simpson	Annual	1	0.05	0.05	0.05	Yes
Tarrington*	Weekly*	52	0.86	0.65	0.76	Yes
Terang**	Weekly**	52	0.06	0.05	0.05	Yes
Timboon	Annual	1	0.08	0.08	0.08	Yes
Warrnambool*	Weekly*	156	0.91	0.06	0.79	Yes

⁺ Fluoride added to drinking water supply. For supplies where fluoride has been added, compliance is measured against the ADWG health guideline value.

* More than one sample site was analysed per week for fluoride (based on population) where fluoride is added to the supply.

** The Terang, Mortlake and Noorat/Glenormiston supply locations have weekly fluoride sampling based on the imminent commissioning of the Terang Fluoride Plant supplying water to these localities.

^ It is noted that the Port Fairy and Portland localities have naturally occurring fluoride which achieves the average concentration.

Manganese

Standard All samples of drinking water collected within a locality in any 12-month period having a concentration less than 0.5 mg/L (ADWG).

Outcome: The Standard was met at all localities, which is consistent with the previous two years.

Table 6-6 Manganese results by locality 2023/4

Manganese						
Locality	**Sampling Frequency**	**No. of Samples**	**No. of Non complying samples**	**Maximum result (mg/L)**	**Average (mg/L)**	**Compliant**
Allansford	Monthly	12	0	0.010	0.009	Yes
Balmoral	Monthly	12	0	0.010	0.010	Yes
Camperdown (Rural)	Monthly	12	0	0.010	0.009	Yes
Camperdown (Urban)	Monthly	12	0	0.010	0.009	Yes
Caramut	Monthly	12	0	0.010	0.009	Yes
Casterton	Monthly	12	0	0.010	0.009	Yes
Cavendish	Monthly	12	0	0.010	0.009	Yes
Cobden	Monthly	12	0	0.030	0.011	Yes
Coleraine	Monthly	12	0	0.010	0.010	Yes
Dartmoor	Monthly	13	0	0.010	0.010	Yes
Derrinallum	Monthly	12	0	0.010	0.009	Yes
Dunkeld	Monthly	12	0	0.010	0.009	Yes
Glenthompson	Monthly	12	0	0.010	0.010	Yes
Hamilton	Monthly	13	0	0.010	0.009	Yes
Heywood	Monthly	12	0	0.050	0.035	Yes
Koroit	Monthly	12	0	0.010	0.010	Yes
Lismore	Monthly	12	0	0.010	0.009	Yes
Macarthur	Monthly	12	0	0.010	0.009	Yes
Merino	Monthly	12	0	0.010	0.009	Yes
Mortlake	Monthly	12	0	0.010	0.009	Yes
Noorat/Glenormiston	Monthly	12	0	0.010	0.010	Yes
Paaratte	Monthly	12	0	0.010	0.010	Yes
Penshurst	Monthly	12	0	0.010	0.009	Yes
Peterborough	Monthly	12	0	0.010	0.009	Yes
Port Campbell	Monthly	12	0	0.010	0.010	Yes
Port Fairy	Monthly	12	0	0.010	0.010	Yes
Portland	Monthly	13	0	0.010	0.009	Yes
Purnim	Monthly	12	0	0.020	0.011	Yes
Sandford	Monthly	12	0	0.010	0.010	Yes
Simpson	Monthly	12	0	0.010	0.010	Yes
Tarrington	Monthly	13	0	0.010	0.009	Yes
Terang	Monthly	12	0	0.010	0.010	Yes
Timboon	Monthly	12	0	0.010	0.010	Yes
Warrnambool	Monthly	12	0	0.010	0.010	Yes

Lead

Standard All samples of drinking water collected within a locality in any 12-month period having a concentration less than 0.01 mg/L (ADWG).
Outcome: The Standard was met at all localities, which is consistent with the previous two years.

Table 6-7 Lead results by locality 2023/24

Lead						
Locality	**Sampling Frequency**	**No. of Samples**	**No. of Non complying samples**	**Maximum result (mg/L)**	**Average (mg/L)**	**Compliant**
Allansford	Annually	1	0	0.001	0.001	Yes
Balmoral	Annually	1	0	0.001	0.001	Yes
Camperdown (Rural)	Annually	1	0	0.001	0.001	Yes
Camperdown (Urban)	Annually	1	0	0.001	0.001	Yes
Caramut	Annually	1	0	0.001	0.001	Yes
Casterton	Annually	1	0	0.001	0.001	Yes
Cavendish	Annually	1	0	0.001	0.001	Yes
Cobden	Annually	1	0	0.001	0.001	Yes
Coleraine	Annually	1	0	0.001	0.001	Yes
Dartmoor	Annually	1	0	0.001	0.001	Yes
Derrinallum	Annually	1	0	0.001	0.001	Yes
Dunkeld	Annually	1	0	0.001	0.001	Yes
Glenthompson	Annually	1	0	0.001	0.001	Yes
Hamilton	Annually	1	0	0.001	0.001	Yes
Heywood	Annually	1	0	0.001	0.001	Yes
Koroit	Annually	1	0	0.001	0.001	Yes
Lismore	Annually	1	0	0.001	0.001	Yes
Macarthur	Annually	1	0	0.001	0.001	Yes
Merino	Annually	1	0	0.001	0.001	Yes
Mortlake	Annually	1	0	0.001	0.001	Yes
Noorat/Glenormiston	Annually	1	0	0.001	0.001	Yes
Paaratte	Annually	1	0	0.001	0.001	Yes
Penshurst	Annually	1	0	0.001	0.001	Yes
Peterborough	Annually	1	0	0.001	0.001	Yes
Port Campbell	Annually	1	0	0.001	0.001	Yes
Port Fairy	Annually	1	0	0.001	0.001	Yes
Portland	Annually	1	0	0.001	0.001	Yes
Purnim	Annually	1	0	0.001	0.001	Yes
Sandford	Annually	1	0	0.001	0.001	Yes
Simpson	Annually	1	0	0.001	0.001	Yes
Tarrington	Annually	1	0	0.001	0.001	Yes
Terang	Annually	1	0	0.001	0.001	Yes
Timboon	Annually	1	0	0.001	0.001	Yes
Warrnambool	Annually	1	0	0.001	0.001	Yes

Copper

Standard All samples of drinking water collected within a locality in any 12-month period having a concentration less than 2 mg/L (ADWG).
Outcome: The Standard was met at all localities, which is consistent with the previous two years.

Table 6-8 Copper results by locality 2023/24

Copper						
Locality	**Sampling Frequency**	**No. of Samples**	**No. of Non complying samples**	**Maximum result (mg/L)**	**Average (mg/L)**	**Compliant**
Allansford	Annually	1	0	0.030	0.030	Yes
Balmoral	Annually	1	0	0.001	0.001	Yes
Camperdown (Rural)	Annually	1	0	0.001	0.001	Yes
Camperdown (Urban)	Annually	1	0	0.003	0.003	Yes
Caramut	Annually	1	0	0.002	0.002	Yes
Casterton	Annually	1	0	0.095	0.095	Yes
Cavendish	Annually	1	0	0.003	0.003	Yes
Cobden	Annually	1	0	0.003	0.003	Yes
Coleraine	Annually	1	0	0.130	0.130	Yes
Dartmoor	Annually	1	0	0.011	0.011	Yes
Derrinallum	Annually	1	0	0.001	0.001	Yes
Dunkeld	Annually	1	0	0.006	0.006	Yes
Glenthompson	Annually	1	0	0.006	0.006	Yes
Hamilton	Annually	1	0	0.001	0.001	Yes
Heywood	Annually	1	0	0.003	0.003	Yes
Koroit	Annually	1	0	0.003	0.003	Yes
Lismore	Annually	1	0	0.001	0.001	Yes
Macarthur	Annually	1	0	0.006	0.006	Yes
Merino	Annually	1	0	0.031	0.031	Yes
Mortlake	Annually	1	0	0.002	0.002	Yes
Noorat/Glenormiston	Annually	1	0	0.001	0.001	Yes
Paaratte	Annually	1	0	0.002	0.002	Yes
Penshurst	Annually	1	0	0.003	0.003	Yes
Peterborough	Annually	1	0	0.001	0.001	Yes
Port Campbell	Annually	1	0	0.001	0.001	Yes
Port Fairy	Annually	1	0	0.003	0.003	Yes
Portland	Annually	1	0	0.003	0.003	Yes
Purnim	Annually	1	0	0.095	0.095	Yes
Sandford	Annually	1	0	0.110	0.110	Yes
Simpson	Annually	1	0	0.005	0.005	Yes
Tarrington	Annually	1	0	0.001	0.001	Yes
Terang	Annually	1	0	0.004	0.004	Yes
Timboon	Annually	1	0	0.001	0.001	Yes
Warrnambool	Annually	1	0	0.008	0.008	Yes

Arsenic

Standard All samples of drinking water collected within a locality in any 12-month period having a concentration less than 0.01 mg/L (ADWG).
Outcome: The Standard was met at all localities, which is consistent with the previous two years.

Table 6-9 Arsenic results by locality 2023/24

Arsenic						
Locality	**Sampling Frequency**	**No. of Samples**	**No. of Non complying samples**	**Maximum result (mg/L)**	**Average (mg/L)**	**Compliant**
Allansford	Annually	1	0	0.001	0.001	Yes
Balmoral	Annually	1	0	0.001	0.001	Yes
Camperdown (Rural)	Annually	1	0	0.001	0.001	Yes
Camperdown (Urban)	Annually	1	0	0.001	0.001	Yes
Caramut	Annually	1	0	0.001	0.001	Yes
Casterton	Annually	1	0	0.001	0.001	Yes
Cavendish	Annually	1	0	0.001	0.001	Yes
Cobden	Annually	1	0	0.001	0.001	Yes
Coleraine	Annually	1	0	0.001	0.001	Yes
Dartmoor	Annually	1	0	0.001	0.001	Yes
Derrinallum	Annually	1	0	0.001	0.001	Yes
Dunkeld	Annually	1	0	0.001	0.001	Yes
Glenthompson	Annually	1	0	0.001	0.001	Yes
Hamilton	Annually	1	0	0.001	0.001	Yes
Heywood	Annually	1	0	0.001	0.001	Yes
Koroit	Annually	1	0	0.001	0.001	Yes
Lismore	Annually	1	0	0.001	0.001	Yes
Macarthur	Weekly	52	0	0.002	0.001	Yes
Merino	Annually	1	0	0.001	0.001	Yes
Mortlake	Annually	1	0	0.001	0.001	Yes
Noorat/Glenormiston	Annually	1	0	0.001	0.001	Yes
Paaratte	Annually	1	0	0.001	0.001	Yes
Penshurst	Annually	1	0	0.003	0.003	Yes
Peterborough	Annually	1	0	0.001	0.001	Yes
Port Campbell	Annually	1	0	0.001	0.001	Yes
Port Fairy	Annually	1	0	0.003	0.003	Yes
Portland	Annually	1	0	0.001	0.001	Yes
Purnim	Annually	1	0	0.001	0.001	Yes
Sandford	Annually	1	0	0.001	0.001	Yes
Simpson	Annually	1	0	0.001	0.001	Yes
Tarrington	Annually	1	0	0.001	0.001	Yes
Terang	Annually	1	0	0.001	0.001	Yes
Timboon	Annually	1	0	0.001	0.001	Yes
Warrnambool	Annually	1	0	0.001	0.001	Yes

Water treatment-related chemicals

Table 6-10 lists the water treatment-related chemicals monitored at each locality during 2023/24. All test results were less than detection limits which are below the ADWG health-related guideline values.

Table 6-10 water treatment-related chemical sampling summary and health-related guideline values

Parameter	Sampling frequency	ADWG value (mg/L)
1,1,1-Trichloropropan-2-one	Annually	-
1,1,3-Trichloropropan-2-one	Annually	-
1,1-Dichloropropan-2-one	Annually	-
1,3-Dichloropropan-2-one	Annually	-
2,4,6-Trichlorophenol	Annually	0.02
2,4-Dichlorophenol	Annually	0.2
2-Chlorophenol	Annually	0.3
Carbon tetrachloride	Annually	0.003
Cyanogen Chloride	Annually	0.08
Trichloroacetaldehyde	Quarterly/ Annually	0.021

Inorganics

Table 6-11 lists the metals monitored at each locality during 2023/24. All localities recorded levels less than the ADWG health-related guideline values.

Table 6-11 – metals sampling summary and health-related guideline values

Parameter	Sampling frequency	ADWG value (mg/L)
Cadmium	Annually	0.002
Chromium	Annually	0.05
Nickel	Annually	0.02
Zinc	Annually	3
Tin	Annually	-
Silver	Annually	0.1
Beryllium	Annually	0.06
Uranium	Annually	0.02
Iodide	Annually	0.5
Molybdenum	Annually	0.05
Boron	Annually	4
Barium	Annually	2
Selenium	Annually	0.01
Mercury	Annually	0.001

Polycyclic aromatic hydrocarbon results

Table 6-12 lists the suite of polycyclic aromatic hydrocarbons monitored at each locality during 2023/24. All test results were less than detection limits which are below the ADWG health-related guideline values.

Table 6-12 - PAH sampling summary and health related guideline values

Parameter	Sampling frequency	ADWG value (mg/L)
Acenapthene	Annually	-
Acenapthylene	Annually	-
Anthracene	Annually	-
Benz(a)anthracene	Annually	-
Benzo(a)pyrene	Annually	0.00001
Benzo(b)fluoranthene	Annually	-
Benzo(g,h,i)perylene	Annually	-
Benzo(k)fluoranthene	Annually	-
Chrysene	Annually	-
Dibenz(a,h)anthracene	Annually	-
Fluoranthene	Annually	-
Indeno(1,2,3-cd)pyrene	Annually	-
Phenanthrene	Annually	-
Pyrene	Annually	-
Total PAH	Annually	-

Disinfection by-products

Chlorite

Wannon Water does not disinfect with chlorine dioxide. Therefore, this parameter is not included in the testing regime. Table 6-13 lists the chloramine disinfection by-products monitored at each locality during 2023/24. All test results were less than the ADWG health-related guideline values.

Table 6-13 – chloramine disinfection by-products sampling summary and health-related guideline values

Parameter	Sampling frequency	ADWG value (mg/L)
Nitrate (as nitrate)	Monthly/Quarterly*	50
Nitrite (as nitrite)	Monthly/Annually**	3
1,2-Dibromo-3-Chloropropane	Annually	-
1,2-Dibromoethane	Annually	-

* Monthly at Mortlake and quarterly at Caramut only.

** Monthly at localities where ammonia is added to the drinking water supply, annually at all other localities.

Pesticides/herbicides

Table 6-14 lists the pesticides and herbicides monitored at representative raw water storage and rivers/creeks during 2023/24. All test results were below the ADWG health-related guideline values.

Table 6-14 – pesticide and herbicide sampling summary and health-related guideline valu

Parameter	Sampling frequency	ADWG value (mg/L)
2,4,5-T	Annually	100
2,4,5-TP	Annually	0.1
2,4,6-T	Annually	20
2,4-D	Annually	0.03
2,4-DB	Annually	-
2,4-DP	Annually	0.03
2,6-D	Annually	-
4,4-DDT	Annually	0.009
4-Chlorophenoxy acetic acid	Annually	-
Aldrin	Annually	0.0003
Atrazine	Annually	0.02
BHC (Alpha Isomer)	Annually	-
BHC (Beta Isomer)	Annually	-
BHC (Delta Isomer)	Annually	-
Dicamba	Annually	0.1
Dieldrin	Annually	0.003
Endosulphan 1	Annually	0.02
Endrin	Annually	-
Endrin Aldehyde	Annually	-
Endrin Ketone	Annually	-
Glyphosate	Annually	1
Heptachlor	Annually	0.0003
Heptachlor Epoxide	Annually	0.0003
Hexachlorbenzene	Annually	-
Hexazinone	Annually	400
Lindane	Annually	0.01
MCPA	Annually	0.04
MCPB	Annually	-
Mecoprop	Annually	-
Methoxychlor	Annually	0.3
Molinate	Annually	4
Prometon	Annually	-
Prometryn	Annually	-
Propazine	Annually	0.05
Propiconazole	Annually	100
Simazine	Annually	0.02
Simetryn	Annually	-
Temephos	Annually	400
Trans-Chlordane	Annually	0.011
Trichlopyr	Annually	0.02

Industrial chemicals

Table 6-15 lists industrial chemical health-related parameters tested at each locality during 2023/24. All test results were less than the detection limits which were below the ADWG values.

Table 6-15 – Industrial chemicals sampling summary

Parameter	Sampling frequency
1,1,1,2-Tetrachloroethane	Annually
1,1,1-Trichloroethane	Annually
1,1,2,2-Tetrachloroethane	Annually
1,1,2-Trichloroethane	Annually
1,1-Dichloroethane	Annually
1,1-Dichloroethene	Annually
1,1-Dichloropropene	Annually
1,2,3-Trichlorobenzene	Annually
1,2,3-Trichloropropane	Annually
1,2,4-Trichlorobenzene	Annually
1,2,4-Trimethylbenzene	Annually
1,2-Dibromo-3-Chloropropane	Annually
1,2-Dichlorobenzene	Annually
1,2-Dichloroethane	Annually
1,2-Dichloropropane	Annually
1,3,5-Trimethylbenzene	Annually
1,3-Dichlorobenzene	Annually
1,3-Dichloropropane	Annually
1,4-Dichlorobenzene	Annually
2,2-Dichloropropane	Annually
2,4-Dichlorophenol	Annually
2-Chlorophenol	Annually
2-Chlorotoluene	Annually
4-Chlorotoluene	Annually
Acenaphthene	Annually
Acenaphthylene	Annually
Anthracene	Annually
Benz(a)anthracene	Annually
Benzene	Annually
Benzo(a)pyrene	Annually
Benzo(g,h,i)perylene	Annually
Benzo(k)fluoranthene	Annually
Bis(2-ethylhexyl) adipate	Annually
Bis(2-ethylhexyl) phthalate	Annually
Bromobenzene	Annually
Carbon tetrachloride	Annually
Chlorobenzene	Annually
Chrysene	Annually
CIS-1,3-Dichloropropene	Annually
Cyanide	Annually
Dibromomethane	Annually
Ethylbenzene	Annually
Fluoranthene	Annually
Fluoride	Annually
Hexachloro-1,3-Butadiene	Annually
Indeno(1,2,3-cd)pyrene	Annually
Iodide	Annually
Isopropylbenzene	Annually
Mercury	Annually
Methylenechloride	Annually
N-Butylbenzene	Annually
N-Propylbenzene	Annually
o-xylene	Annually
Phenanthrene	Annually

Pyrene	Annually
Sec-Butylbenzene	Annually
Styrene	Annually
Tert-Butylbenzene	Annually
Tetrachloroethene	Annually
Toluene	Annually
Trans-1,3-Dichloropropene	Annually
Tributyltin as Sn	Annually
Trichloroethene	Annually
Vinyl chloride	Annually

Algae

Wannon Water has an obligation to notify the department of Health if the presence of Blue Green Algae (BGA) may pose a consumption risk for drinking water supplies. The Blue Green Algae Circular (DEECA) sets out different ways toxic BGA species are measured. Where blooms relate to drinking water the triggers are:

- Total microcystins ≥ 1.3 ug/L (microcysitn_LR toxicity equivalents).
- ≥ 6500 cells/mL Microcystis aeruginosa.
- Total combined biovolume of known toxic species ≥ 0.6 mm^3/L.
- Total combined biovolume of all cyanobacterial > 10mm^3/L; or
- BGA is present in drinking water at levels that may cause widespread public complaint for example through taste and odour. If this occurs, then a section 22 report in accordance with the *Safe Drinking Water Act* should be made.

During 2023/24 Wannon Water collected samples following a risk-based approach, sampling monthly to fortnightly from all storages that supplied raw water for treatment into drinking water localities. These samples were sent to a NATA-certified laboratory for algal identification and counts. The sampling frequency was increased if blue green algae were detected, and the numbers were noted to be increasing or if geosmin and methylisoborneol levels were above taste and odour thresholds.

Radionuclides – gross beta, gross alpha radioactivity

Table 6-16 lists the radionuclides monitored during 2023/24. All test results were less than the detection limits.

Table 6-16 – Radionuclides sampling summary and health-related guideline values

Parameter	Sampling frequency	ADWG value (Bq/L)
Gross Alpha	Every two years in bores, every 5 years in surface water	0.5
Gross Beta	Every two years in bores, every 5 years in surface water	0.5

Aesthetic parameters

pH

Guideline The guideline limit for pH is 6.5-8.5 pH units. There is no health-based guideline.

Table 6-17 pH results by locality 2023/24

pH

Locality	Sampling Frequency	No. of Samples	Max	Min
Allansford	Weekly	52	7.6	6.6
Balmoral	Weekly	52	7.5	6.4
Camperdown (Rural)	Weekly	52	9.0	6.7
Camperdown (Urban)	Weekly	52	7.6	6.6
Caramut	Weekly	52	8.4	7.6
Casterton	Weekly	52	8.1	7.2
Cavendish	Weekly	52	9.6	6.2
Cobden	Weekly	52	8.0	6.2
Coleraine	Weekly	52	8.2	7.4
Dartmoor	Weekly	52	8.2	7.4
Derrinallum	Weekly	52	9.6	7.7
Dunkeld	Weekly	52	6.8	6.3
Glenthompson	Weekly	52	8.3	7.2
Hamilton	Weekly	104*	7.2	6.2
Heywood	Weekly	52	8.6	8.2
Koroit	Weekly	52	7.5	6.5
Lismore	Weekly	52	9.1	7.1
Macarthur	Weekly	52	8.5	7.8
Merino	Weekly	52	8.4	7.5
Mortlake	Weekly	52	8.1	7.1
Noorat/Glenormiston	Weekly	52	8.8	6.4
Paaratte	Weekly	52	8.3	7.6
Penshurst	Weekly	52	8.8	7.8
Peterborough	Weekly	52	8.4	7.3
Port Campbell	Weekly	52	8.3	7.4
Port Fairy	Weekly	104*	8.7	8.3
Portland	Weekly	104*	8.6	8.2
Purnim	Weekly	52	7.4	6.3
Sandford	Weekly	52	8.1	7.3
Simpson	Weekly	52	7.6	6.8
Tarrington	Weekly	52	7.1	6.2
Terang	Weekly	52	7.5	6.4
Timboon	Weekly	52	8.3	6.9
Warrnambool	Weekly	156*	7.5	5.0

* More than one sample per week

Description

A pH of less than 6.5 may be corrosive, greater than pH 8 progressively decreases efficiency of chlorination, greater than 8.5 may cause scale and taste problems. New concrete tanks and cement-mortar lined pipes can significantly increase pH and a value of up to 9.2 may be acceptable provided monitoring indicates no deterioration in microbial quality.

Management of high pH

Camperdown Rural, Derrinallum and Lismore

These localities are all supplied from Camperdown WTP. Regular flushing is conducted to reduce detention times in cement-lined mains and improve pH levels. Gaseous chlorine is utilised to assist in reducing high pH levels.

Cavendish and Noorat/Glenormiston

These localities are both small in population and frequently experience low demand, which leads to long detention times in cement lined mains. Regular flushing is conducted to reduce detention times and improve pH levels.

Iron

Guideline The guideline value for iron is 0.3 mg/L. There is no health-related guideline value.

Table 6-18 Iron results by locality 2023/24

Iron

Locality	Sampling Frequency	No. of Samples	Maximum result (mg/L)	Average (mg/L)
Allansford	Monthly	12	0.05	0.05
Balmoral	Monthly	12	0.13	0.06
Camperdown (Rural)	Monthly	12	0.05	0.05
Camperdown (Urban)	Monthly	12	0.05	0.05
Caramut	Monthly	12	0.05	0.05
Casterton	Monthly	12	0.05	0.05
Cavendish	Monthly	12	0.12	0.06
Cobden	Monthly	12	0.05	0.05
Coleraine	Monthly	12	0.05	0.05
Dartmoor	Monthly	12	0.05	0.05
Derrinallum	Monthly	12	0.09	0.05
Dunkeld	Monthly	12	0.08	0.06
Glenthompson	Monthly	12	0.08	0.06
Hamilton	Monthly	12	0.06	0.05
Heywood	Monthly	12	0.05	0.05
Koroit	Monthly	12	0.05	0.05
Lismore	Monthly	12	0.05	0.05
Macarthur	Monthly	12	0.05	0.05
Merino	Monthly	12	0.10	0.05
Mortlake	Monthly	12	0.05	0.05
Noorat/Glenormiston	Monthly	12	0.05	0.05
Paaratte	Monthly	12	0.33	0.15
Penshurst	Monthly	12	0.05	0.05
Peterborough	Monthly	12	0.08	0.05
Port Campbell	Monthly	12	0.45	0.17
Port Fairy	Monthly	12	0.14	0.09
Portland	Monthly	12	0.05	0.05
Purnim	Monthly	12	0.44	0.19
Sandford	Monthly	12	0.05	0.05
Simpson	Monthly	12	0.05	0.05
Tarrington	Monthly	12	0.11	0.05
Terang	Monthly	12	0.07	0.05
Timboon	Monthly	12	0.46	0.12
Warrnambool	Monthly	12	0.05	0.05

Description

Iron occurs naturally in water; the taste threshold is 0.3 mg/L. High concentrations stain laundry and fittings. Iron bacteria cause pipe blockages, taste/odour and corrosion. Flushing of the reticulation system may be conducted in instances where the taste threshold is exceeded through routine sampling.

This year, the aesthetic guideline value for iron was exceeded in Paaratte, Port Campbell, Purnim and Timboon. Following a result of elevated iron, treatment processes are optimised to ensure iron is oxidised and removed from solution prior to entering the distribution system. The exceedances did not cause any complaints.

Colour results

Guideline 15 HU. There is no health-based guideline.

Table 6-19 True colour results by locality 2023/24

True colour				
Water sampling locality	**Frequency of sampling**	**Number of samples**	**Maximum (Pt-Co)**	**Average result (Pt-Co)**
Allansford	Monthly	12	1	1
Balmoral	Monthly	12	3	2
Camperdown (Rural)	Monthly	12	1	1
Camperdown (Urban)	Monthly	12	1	1
Caramut	Monthly	12	1	1
Casterton	Monthly	12	1	1
Cavendish	Monthly	12	3	2
Cobden	Monthly	12	2	1
Coleraine	Monthly	12	1	1
Dartmoor	Monthly	12	1	1
Derrinallum	Monthly	12	1	1
Dunkeld	Monthly	12	1	1
Glenthompson	Monthly	12	8	5
Hamilton	Monthly	12	1	1
Heywood	Monthly	12	1	1
Koroit	Monthly	12	1	1
Lismore	Monthly	12	1	1
Macarthur	Monthly	12	1	1
Merino	Monthly	12	1	1
Mortlake	Monthly	12	1	1
Noorat/Glenormiston	Monthly	12	1	1
Paaratte	Monthly	12	1	1
Penshurst	Monthly	12	1	1
Peterborough	Monthly	12	1	1
Port Campbell	Monthly	12	1	1
Port Fairy	Monthly	12	2	1
Portland	Monthly	12	3	3
Purnim	Monthly	12	4	3
Sandford	Monthly	12	1	1
Simpson	Monthly	12	1	1
Tarrington	Monthly	12	1	1
Terang	Monthly	12	1	1
Timboon	Monthly	12	1	1
Warrnambool	Monthly	12	1	1

Description
Colour is an important aesthetic characteristic for customer acceptance. Treatment processes can be optimised to remove colour.

Management of colour
The colour of the Cavendish water supply is derived from the raw source water of the Grampians headworks. Surface water run-off, particularly the initial flows of the wet season, tends to be high in colour due to high levels of tannin. Cavendish is a disinfection-only plant and therefore there is no capacity for colour removal. Wannon Water selectively harvests the Cavendish water supply which will reduce the risk of receiving high coloured water to the plant.

High rainfall in the Glenthompson catchment caused the raw water to become highly coloured. Due to the low suspended solids in the storage, the colour became difficult to remove through coagulation. Flow through the treatment plant was slowed to ensure effective treatment could be achieved.

Alkalinity and hardness

Alkalinity guideline
There is no health-based or aesthetic guideline for alkalinity however low levels (<50) can corrode surfaces. High levels (>200) tend to deposit calcium carbonate on pipes, fittings and hot water services.
Description Alkalinity is the ability of water to buffer changes in pH.

Hardness guideline
The guideline limit for hardness is 200 mg/L as calcium carbonate ($CaCO_3$). There is no health-based guideline.
Description Caused by calcium and magnesium salts. Hard water is difficult to lather.
Less than 60 mg/L $CaCO_3$ – soft but possible corrosive
60-200 mg/L $CaCO_3$ – good quality
200-500 mg/L $CaCO_3$ – increasing scaling problems.
Greater than 500 mg/L $CaCO_3$ – severe scaling

Alkalinity and hardness are not controllable by treatment processes at any of Wannon Water localities. Wannon Water has a large, very consistent data set for localities where source water is groundwater and hence elected not to test for these parameters during 2023/24. There is some variation found in surface water, hence representative samples are collected monthly for each of these alternate supply systems. Refer to Tables 6-20 and 6-21 for the 2023/24 representative results for source waters.

Table 6-20 Total alkalinity as $CaCO_3$ results by locality 2023/24

Total Alkalinity as $CaCO_3$				
Water sampling locality	**No. of Samples**	**No. of non-complying samples**	**Maximum result (mg/L CaCO3)**	**Average (mg/L CaCO3)**
Balmoral	12	0	18	13
Camperdown (Urban)	12	0	34	17
Cavendish	12	0	10	6
Glenthompson	12	0	60	48
Hamilton	12	0	8	5
Warrnambool	12	0	43	38

Table 6-21 Total hardness as $CaCO_3$ results by locality 2023/24

Total Hardness as $CaCO_3$				
Water sampling locality	**No. of samples**	**No. of non-complying samples**	**Maximum result (mg/L)**	**Average (mg/L)**
Balmoral	12	0	110	95
Camperdown (Urban)	12	0	49	32
Cavendish	12	0	24	21
Glenthompson	12	0	85	72
Hamilton	12	0	69	58
Warrnambool	12	0	85	73

Total dissolved solids

Guideline 600mg/L. There is no health-based guideline.

Table 6-22 Total Dissolved Solids results by locality 2023/24

Total Dissolved Solids				
Treatment Plant	**Water sampling locality**	**Frequency of sampling**	**Number of samples**	**Maximum result (mg/L)**
Balmoral WTP	Balmoral	Quarterly	4	540
Camperdown WTP	Camperdown, Derrinallum, Lismore	Quarterly	4	150
Caramut DP	Caramut	Quarterly	4	270
Casterton WTP	Casterton, Coleraine, Sandford, Merino	Quarterly	4	570
Cavendish DP	Cavendish	Quarterly	4	120
Cobden WTP	Cobden	Quarterly	4	160
Dartmoor WTP	Dartmoor	Quarterly	4	420
Glenthompson WTP	Glenthompson	Quarterly	4	340
Hamilton WTP	Dunkeld, Hamilton, Tarrington	Quarterly	4	160
Heywood WTP	Heywood	Quarterly	4	700
Macarthur WTP	Macarthur	Quarterly	4	1,000
Mortlake DP	Mortlake	Quarterly	4	210
Penshurst DP	Penshurst	Quarterly	4	550
Port Campbell WTP	Peterborough, Port Campbell, Timboon	Quarterly	4	390
Port Fairy WTP	Port Fairy	Quarterly	4	920
Portland Bald Hill WTP	Portland	Quarterly	4	710
Purnim DP	Purnim	Quarterly	4	150
Simpson WTP	Simpson	Quarterly	4	130
Terang WTP	Mortlake, Noorat/ Glenormiston, Terang	Quarterly	4	180
Warrnambool WTP	Allansford, Koroit, Warrnambool	Quarterly	4	210

Description
Based on taste:
Less than 600 mg/L is regarded as good quality drinking water.
600 – 900 mg/L is regarded as fair quality
900 – 1200 mg/L is regarded as poor quality
Greater than 1200 mg/L is regarded as unacceptable

Management of total dissolved solids

Total Dissolved Solids is not controllable by treatment at any of Wannon Water's localities. This is an opportunity for improvement in some of the groundwater supplied townships as demonstrated through the Quality Water for Wannon program which is currently underway.

The Quality Water for Wannon program is a five-year $52.2 million dollar project which is jointly funded by the Australian Government, through the National Water Grid Fund, and Wannon Water to improve the water quality for Portland, Heywood and Port Fairy. Whilst all three towns have a safe and reliable water supply, its saltiness and mineral content sees a high percentage of these communities seeking alternative drinking options. This is an exciting project that will provide many benefits for the communities of Portland, Heywood and Port Fairy.

7. EMERGENCY, INCIDENT AND EVENT MANAGEMENT

Whilst every effort is made to prevent water quality incidents from occurring, there will inevitably be times when things go wrong. Such instances may be due to equipment failure, human error or unforeseen events.

Wannon Water has incident management plans to manage such events to ensure the minimum possible impact on water quality. The incident management plans are a component of Wannon Water's Emergency Management Plan (EMP) which uses the principles of prevention, response and recovery as outlined in the Australian Inter-Service Incidents Management System (AIIMS) structure.

The objectives of this EMP are to ensure a coordinated response to any complex incidents or emergency involving Wannon Water and provide guidance on how to work with external emergency services, municipal, regional and state emergency management agencies in alignment with the Victorian State Emergency Management Plan.

Wannon Water undertakes regular training and joint exercises in emergency simulations and emergency management with key stakeholders. These sessions are designed to put systems, processes, and facilities into an environment as close as possible to a real event. The exercises provide participants with an opportunity to test communications, planning and management procedures and to include emergency management training.

Section 22 incidents

The objective of Section 22 of the *Safe Drinking Water Act 2003* is to protect public health. Wannon Water must inform the Department of Health of any potential or actual contaminated water supplied for drinking purposes. Information relating to all Section 22 incidents during 2023/24 is listed in Table 7-1.

Table 7-1 – Section 22 incidents 2023/24

Date (and duration) of incident	Location of incident	Nature of incident	Potentially affected/ affected drinking water supplies	Actions taken in response to incident
7/02/2024	Peterborough reticulation	*E.coli* 1cfu/100ml	Peterborough	• Monitored results confirmed that plant performance was sufficient for delivering safe drinking water before and after *E.coli* detection. • Ensured no maintenance activities or burst mains compromised the distribution system during the week leading up to the positive detection. • Collected and tested samples from other points in the network on the day of and after the positive detection, showing no further *E.coli* or total coliform results. • Received QC certificates from the laboratory verifying that the sample bottles were suitable for microbiological analysis. • Correct sampling technique refresher training for Operations staff.
14/02/2024	Warrnambool West elevated storage	*E.coli* 1cfu/100ml	Warrnambool	• Assessed the condition of the Warrnambool West elevated storage and found no issues. • Ensured plant performance was adequate for safe drinking water delivery before and after the *E.coli* detection. • Verified that the reticulation system was not affected by maintenance activities or

				burst mains during the week before the positive detection. • Tested samples from other points in the reticulation system on the day of and after the positive detection, finding no further *E.coli* or water quality issues.

Section 18 incidents

The objective of Section 18 of the *Safe Drinking Water Act 2003* is to indicate where drinking water has not complied with drinking water quality standards. Wannon Water must inform the DH when drinking water does not or is not likely to comply with any relevant water quality standard.

There were no incidents reportable under Section 18.

Customer complaints

Wannon Water is actively committed to the successful and efficient management of complaints and disputes to ensure effective customer service and satisfaction levels.

Wannon Water adopts the Essential Services Comission definition of a complaint as ‘any customer contact with respect to water quality’.

The collection, processing and reporting of Wannon Water’s complaints is managed through a customer relationship database, allowing Wannon Water to meet its obligations under the Customer Service Code issued by the Essential Services Commissions reporting principles. This is also supported by Wannon Water’s Customer Charter.

All customer complaints are investigated to determine the cause and significance of the complaint. Operational changes or capital improvements which optimise treated water quality may be implemented in response to valid and significant customer complaints.

In response to a complaint, customers are contacted directly, and a site/vicinity inspection conducted. Appropriate action is then taken. This action will vary depending on the nature of the complaint.

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 a Water Treatment Scientist to the customer.
- A visit to the property by an Operations team member.
- A written response to the customer from the Customer Support Team.

Multiple complaints from a single locality are monitored closely. If the number of complaints within the locality exceeds 10 in any 24-hour period, an incident response team is assembled to investigate the event. Appropriate actions are then taken using the AIIMS structure and Wannon Water’s Emergency Management Plan.

A summary of the types of complaints received is presented in Table 7-2.

Table 7-2 – Types of complaints compared to previous years.

Type of complaint^	2023/24	2022/23	2021/22	Comparison with previous reporting periods
Alleged illness#	8	15	6	Increase in 2023/24 due to algae related taste and odour compounds in Warrnambool
Coloured water	49	44	47	No significant change.
Other	14	9	11	No significant change.
Taste/odour	35	59	37	Increase in 2023/24 due to algae related taste and odour compounds in Warrnambool
Total	106	127	101	The total number of complaints for 2023/24 was lower than 2022/23

^ for the purposes of the complaints section, the term “customer” has the same meaning as that used by the Essential Services Commission, that is a customer = a connection.
# Alleged illness complaints include skin irritation.

T**able 7-3 – Types of complaints by locality**

Locality	Coloured Water	Taste/Odour	Illness / Health Effects	Other	Total
Allansford	0	0	0	0	0
Balmoral	0	0	0	0	0
Camperdown Urban	2	0	0	0	2
Camperdown Rural	2	1	0	0	3
Caramut	0	0	0	0	0
Casterton	1	2	1	0	4
Cavendish	0	0	0	0	0
Cobden	3	1	0	0	4
Coleraine	1	1	0	0	2
Dartmoor	0	0	0	0	0
Dunkeld	1	0	0	0	1
Glenthompson	0	0	0	0	0
Hamilton	2	6	0	1	9
Heywood	6	2	1	1	10
Koroit	1	1	0	0	2
Lismore & Derrinallum	2	0	0	0	2
Macarthur	0	0	0	0	0
Merino	0	2	0	2	4
Mortlake	1	0	1	0	2
Noorat & Glenormiston	0	0	1	0	1
Penshurst	0	0	0	0	0
Peterborough	2	0	0	0	2
Port Campbell	0	0	0	0	0
Port Fairy	3	0	0	1	4
Portland	4	5	3	5	17
Purnim	1	0	0	0	1
Sandford	0	0	0	0	0
Simpson	1	0	0	0	1
Terang	5	0	0	0	5
Timboon	2	2	0	2	6
Warrnambool	9	12	1	2	24

8. GLOSSARY

Adsorption	Process to remove dissolved organic matter, particles, algal toxins and compounds causing taste and odour problems. Granulated activated carbon (GAC) is used for adsorption at Wannon Water.
ADWG	Australian Drinking Water Guidelines (2011)
AIIMS	Australian Inter-Service Incidents Management System
BGA	Blue Green Algae
Dissolved Air Flotation (DAF)	Treatment process for coarse removal of particles through air flotation
DH	Department of Health, Victoria
DP	Disinfection Plant
CCP	Critical control point
Clarification	Two main primary solids removal processes are utilised; sedimentation and dissolved air flotation
Coagulation	Treatment to destabilise colloidal particles (turbidity and colour) by neutralising the surface charge of the particle to allow floc formation. Coagulants used at Wannon Water are ferric chloride, aluminium chlorohydrate (ACH) and aluminium sulphate (alum)
Cooling/ aeration towers	Treatment process which cools water via aeration.
Disinfection	Treatment process to kill bacteria and viruses. Note all drinking water supplied by Wannon Water is disinfected (chlorination, chloramination or UV disinfection) to ensure that microorganisms are eliminated. Chlorine gas, sodium hypochlorite, aqueous ammonia and UV are used for disinfection.
DWQ RMP	Drinking Water Quality Risk Management Plan
Filtration	Treatment process which removes suspended material by passing through a granular media such as sand.
Flocculation	Used to increase the floc size to enhance clarification and aid filtration. Flocculants used at Wannon Water include polyelectrolyte Nalco, Magnafloc, polymer Nalclear and polymer Klaraid.
Fluoridation	Treatment process to provide a dental health benefit. Fluorosilicic acid is used for fluoridation at Wannon Water.
HACCP	Hazard Analysis and Critical Control Point. A system that identifies evaluates and controls hazards.
HBT	Health Based Targets
Mean	The average of a number of numerical values.
ML	Megalitre – one million litres
NATA	National Association of Testing Authorities, Australia.
Oxidation	Process used to convert soluble contaminants to insoluble contaminants for easier removal. Sodium hypochlorite is used for oxidation at Wannon Water.
pH correction/ stabilisation	Treatment to adjust pH, to aid coagulation, to prevent corrosion or scaling and to optimise disinfection. Caustic soda, soda ash and hydrated lime are used for pH correction at Wannon Water.
Raw water	Water that has not been treated in any way.
Raw water detention	Clarification, via settling, microbial die-off and reducing variability in water quality.
Risk assessment	The overall process of risk identification, risk analysis and risk evaluation. Risk analysis the systematic process to understand the nature of and to deduce the level of risk. Risk evaluation the process of comparing the level of risk against risk criteria.
SDWA	*Safe Drinking Water Act 2003*

SDWR	Safe Drinking Water Regulations 2015
Sedimentation	Treatment process for coarse removal of particles through settling under gravity
Sequestration	Treatment process which involves the addition of sequestering agents to keeps dissolved iron and manganese from oxidising and precipitating. Calgon is used as a sequestering agent at Wannon Water.
WTP	Water Treatment Plant

Information regarding water treatment can be obtained from Wannon Water's web site:

www.wannonwater.com.au

Results for water quality parameters can be provided upon request from Wannon Water via:
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