Gippsland Water

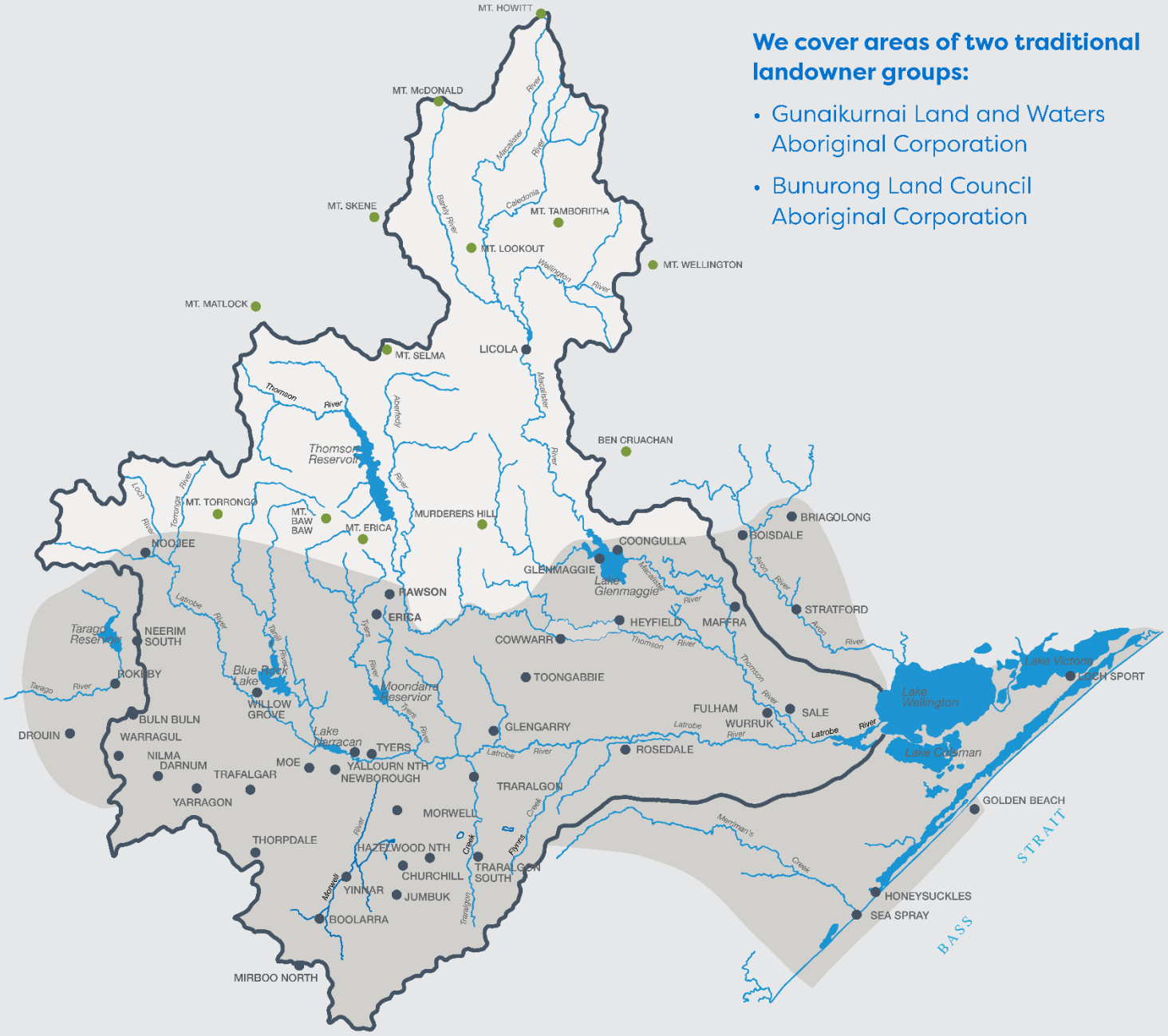
Annual report on drinking water quality 2020-21

Our Service Area

We acknowledge Traditional Custodians of the land on which we live and work. We pay respect to Elders past and present. We are committed to working respectfully to honour their ongoing cultural and spiritual connections to this country. We recognise the role and value of culture in our work and community.

We cover areas of two traditional landowner groups:

- Gunaikurnai Land and Waters Aboriginal Corporation
- Bunurong Land Council Aboriginal Corporation



Legend

Latrobe River catchment boundary

Gippsland Water operating area

Contents

Tables

Figures

Document Control

Description	Version number	Date
Final report	1	28-10-21

Document reference : COR/21/165572

1 Introduction

1.1 Characterisation of the system

We are the Central Gippsland Region Water Corporation, and trade as Gippsland Water. We are a regional water corporation in Victoria established under the *Water Act 1989* and constituted on 21 December 1994.

This Annual Report on Drinking Water Quality 2020-21 is prepared for compliance with Section 26 of the Safe Drinking Water Act 2003 (SDWA).

With over 300 operational, engineering, financial, environmental and administrative employees, we are a major local employer for the region serving a population base of approximately 157,000 people.

We deliver water to 73,641 customers and wastewater services to 66,195 customers in 43 towns. Our customers include major industries, some of which are of state and national significance.

These towns are grouped into 35 localities for the purposes of monitoring and reporting in accordance with the *Safe Drinking Water Regulations 2015 (SDWR)*.

Our service area spans from Drouin in the west, to Loch Sport in the east, from Briagolong in the north, to Mirboo North in the south. This covers approximately 5,000 square kilometres in the municipalities of the Baw Baw Shire, Latrobe City, South Gippsland Shire, and Wellington Shire.

The way we treat water depends on where it is sourced. We take water from 13 different sources including aquifers, rivers, creeks and reservoirs. Our largest storage is Moondarra Reservoir, south of Erica, with a capacity of 30,458ML. We also take water from storages managed by Southern Rural Water (Blue Rock Dam and Lake Glenmaggie) and Melbourne Water (Tarago Reservoir).

We are the second largest regional water corporation in Victoria in terms of revenue earned and is the largest in terms of the total volume of water supplied and wastewater collected. We own and maintain a $1 billion infrastructure network which includes:

- More than 2,000 kilometres of water mains, 65 treated water storages, and 48 pump stations.
- More than 1,700 kilometres of sewer mains and 199 sewer pump stations.
- 15 water treatment plants.
- 14 wastewater treatment plants including the Gippsland Water Factory.
- Two ocean outfalls (McGaurans Beach and Delray Beach).
- Soil and organic recycling facility; and
- Agribusiness

We are committed to providing responsible asset management, quality management, incident management and operational audit of the reticulated urban water supply system to ensure that customer service levels are achieved according to its Customer Charter targets and the *Safe Drinking Water Act 2003 (SDWA).*

A major objective for the corporation is to achieve and maintain community confidence in the safety, reliability and quality of their water supply.

To ensure customers are provided with safe drinking water, we maintain a '*risk based*' drinking water quality management system, which covers the entire water supply system from the catchment to customers' taps. The system entails:

- Detailed water quality risk identification processes;
- Audited control measures to manage risks;
- Continuous improvement project to increase system capability, manage risk and improve customer experiences; and
- Verification systems, including an independent water quality monitoring program.

1.2 Water quality activities

In 2020-21, we made many improvements to ensure our customers' water quality was maintained, including:

- Successfully passed the Safe Drinking Water Act 2003 external audit
- Commenced implementation of Integrated Catchment Land Use Options Strategy outcomes for the Moondarra catchment to protect water quality;
- Continued upgrading a number of our secondary disinfection systems to maintain water quality safety as part of our rolling upgrade program;
- Completed filter media replacements as part of a rolling filter maintenance program at Mirboo North and Morwell.
- Returned two major drinking water service basin floating liners and covers to service after replacements were completed in Morwell and Sale.
- Commenced a drinking water basin relining and recovering project in Churchill
- Continued with water quality inspections of drinking water tanks and storage basins and as part of regular inspection programs
- Commenced two major projects at Moe to upgrade the treatment plant chemical storage and dosing equipment and construct a new drinking water storage basin.
- Maintaining and refreshing the 'Five Cs for Protecting Water Quality' initiative for unplanned water main breaks. Our teams refer to the five Cs to ensure: Clean pipes – check before installing; Clearance – stop contaminated water running into pipes; Chlorination – flush after repair; Cleanliness – clean tools and separate from contamination; and Clothing – wear appropriate clothing;
- Continued delivering air scouring works to maintain water quality in our reticulation networks by cleaning pipes in Trafalgar, Neerim South and Morwell.

Our Vision and Values

Our Strategic Priorities

OUR STRATEGIC PRIORITIES FOCUS ON THE FOLLOWING SIX THEMES:

Each of these strategic themes has a five year destination statement, strategic objectives to focus our attention and resources, and a set of strategic actions to deliver on those objectives.

Healthy people, healthy environment
We are a leader in safety, public health and the environment to support a healthier community.

Enabling our people
Through a constructive culture, we are an engaged and empowered workforce capable of delivering on our priorities.

Strengthening relationships
On behalf of our community we help shape the health and prosperity of the Gippsland region.

Customer focussed
We learn from our customers and deliver on our promises.

Business sustainability
We invest strategically and make evidence-based decisions that deliver value for money to secure our future.

Clever thinking
We foster innovation and empower people to find and deliver efficiencies that transform our business.

2. Drinking water quality management framework

The regulatory environment in which we operate is to provide safe drinking water at **all** times. Safe drinking water is water that does not cause illness in those who consume it. To achieve this, the water must be free of pathogens and harmful chemicals.

Guidance regarding the structure of this report has been provided by the Department of Health (DH) in accordance with the *Safe Drinking Water Act 2003* (Section 26) and the current Water Quality Annual Report Guidance, June 2017.

Drinking water supplied by us must meet the obligations under the *Safe Drinking Water Act 2003* and the Safe Drinking Water Regulations 2015. The Australian Drinking Water Guidelines 2011 (ADWG) are used as a benchmark for safe drinking water. The guidelines provide a framework for good management of drinking water supplies that if implemented, will ensure safety at the point of use.

The ADWG include two types of guideline values:

- A health related guideline value, which is the concentration or measure of a water quality characteristic that, based on present knowledge, does not result in any significant risk to health of the consumer over a lifetime of consumption; and
- An aesthetic guideline value, which is the concentration or measure of a water quality characteristic that is associated with acceptability of water to the consumer, such as appearance, taste and odour.

The regulatory environment that provides guidance in the production of safe drinking water consists of:

- ***Victorian Safe Drinking Water Act 2003 (SDWA)***

The Victorian State Government passed the *Safe Drinking Water Act* 2003 in June 2003. This Act provides details of further requirements for Victorian water corporations.

The purpose of the *Safe Drinking Water Act (2003)* is to make provision for the supply of safe drinking water. In outline this Act:

- Requires water suppliers and water storage managers to prepare and implement plans to manage risks in relation to drinking water and some types of non-potable water;
- Provides for the auditing of those plans by approved auditors;
- Requires water suppliers to ensure that the drinking water they supply meets quality standards specified by the regulations;
- Requires water suppliers to disclose to the public information concerning the quality of drinking water;
- Provides for the variation, after community consultation, of water quality standards that relate only to aesthetic factors;
- Requires the reporting of known or suspected contamination of drinking water to the Secretary to the Department of Health; and
- Empowers the Secretary to enforce this Act.

- ***Victorian Safe Drinking Water Regulations 2015 (SDWR 2015)***

The Victorian State Government passed the Safe Drinking Water Regulations 2005 in July 2005. These Regulations provides details of further requirements for Victorian water corporations. The Safe Drinking Water Regulations 2015 came into operation on 18 July 2015 with the Safe Drinking Water Regulations 2005 being revoked.

The purpose of the Safe Drinking Water Regulations 2015 is to make further provision for the supply of safe drinking water. In outline, the regulations include:

- Setting out further matters to be addressed in risk management plans and the risks to be addressed in those plans; and
- Specifying the documents to be made available for inspection in a risk management plan audit; and
- Specifying the issues relating to the quality of drinking water and regulated water that are to be dealt with by a water supplier and water storage manager in an annual report; and
- Providing for other matters required to be prescribed under the Safe Drinking Water Act 2003.

○ *Australian Drinking Water Guidelines 2011 (ADWG)*

The purpose of the *Australian Drinking Water Guidelines 2011* is to provide the authoritative reference for use within Australia's administrative and legislative framework to ensure the accountability of drinking water suppliers. The ADWG are not mandatory legally enforceable standards.

The guidelines set the framework for the management of drinking water quality known as the 12 elements. We have adopted the 12 elements of the ADWG 2011 that comprise:

1. Commitment to Drinking Water Quality Management.
    (i) Drinking Water Quality Policy
    (ii) Regulatory and formal requirements
    (iii) Engaging stakeholder
2. Assessment of the Drinking Water Supply System.
    (i) Water supply system analysis
    (ii) Assessment of water quality data
    (iii) Hazard identification and risk assessment
3. Preventive Measures for Drinking Water Quality Management.
    (i) Preventative measures and multiple barriers
    (ii) Critical control points
4. Operational Procedures and Process Control.
    (i) Operational procedures
    (ii) Operational monitoring
    (iii) Corrective action
    (iv) Equipment capability and maintenance
    (v) Materials and chemicals
5. Verification of Drinking Water Quality.
    (i) Drinking water quality monitoring
    (ii) Consumer satisfaction
    (iii) Short term evaluation of results
    (iv) Corrective action
6. Management of Incidents and Emergencies.
    (i) Communications
    (ii) Incident and emergency response protocols
7. Employee Awareness and Training.
    (i) Employee awareness and involvement
    (ii) Employee training
8. Community Involvement and Awareness.
    (i) Community consultation
    (ii) Communication
9. Research and Development.
    (i) Investigative studies and research monitoring
    (ii) Validation of processes
    (iii) Design of equipment

10. Documentation and Reporting.
    (i) Management of documentation and records
    (ii) Reporting
11. Evaluation and Audit.
    (i) Long term evaluation of results
    (ii) Audit of drinking water quality management
12. Review and Continual Improvement
    (i) Review by senior executive
    (ii) Drinking water quality management improvement plan

- ***Health (Fluoridation) Act 1973***

The *Health (Fluoridation) Act 1973* ('the Act') regulates the safe and effective addition of fluoride into drinking water supplies in Victoria.

Under the Act, the Secretary to the Department of Health has the power to direct water supply authorities to commence water fluoridation.

- **Code of Practice for Fluoridation of Drinking Water Supplies; Second Edition (2018) – *Health (Fluoridation) Act 1973*.**

This code provides details of further requirements for Victorian water corporations.

The objective of the code is to provide for the safe and effective addition of fluoride into the drinking water supply. This will be achieved by specifying:

(a) The optimum fluoride levels for drinking water supplies and the design control limits for fluoridation plants;
(b) The minimum requirements for the safe and effective addition of fluoride chemicals to drinking water supplies, covering the design and operation of a fluoridation plant; and
(c) Monitoring and reporting requirements for the proposed fluoridation scheme.

The code also includes works undertaken on fluoridation plants and integrates the practices with the SDWA through:

(a) The inclusion of water fluoridation into the corporations' risk management plan under the SDWA; and
(b) Integration and compliance with the auditing, notification and reporting requirements of the SDWA.

The code also describes the gap analysis and subsequent works program associated with water fluoridation plant through:

a) The regulatory frame work including the procedure to fluoridate;
b) Safety in design;
c) Requirements for the design and control of fluoridation facilities; and
d) Requirements for plant operation including monitoring, training or personnel, occupational health and safety, security and environmental protection.

- **Health Based Targets (HBT)**

The National Health and Medical Research Council (NHMRC) released a discussion paper in 2009 on introducing a health-based target (HBT) for microbial water quality in the *Australian Drinking Water Guidelines* (ADWG). In December 2011, Water Services Association of Australia's (WSAA) Water Quality Network considered the HBT proposition at their annual meeting. Outcomes from that meeting formed the basis of a subsequent WSAA submission to the National Health and Medical Research Council (NHMRC).

The WSAA *Drinking Water Source Assessment and Treatment Requirements Manual for the Application of Health-Based Treatment Targets Release No. 2 September 2015* was adopted by Gippsland Water for assessing the microbiological risk associated with its catchments and treatment processes in place (log removal requirements) to manage these risks.

The HBT comprises four parts:

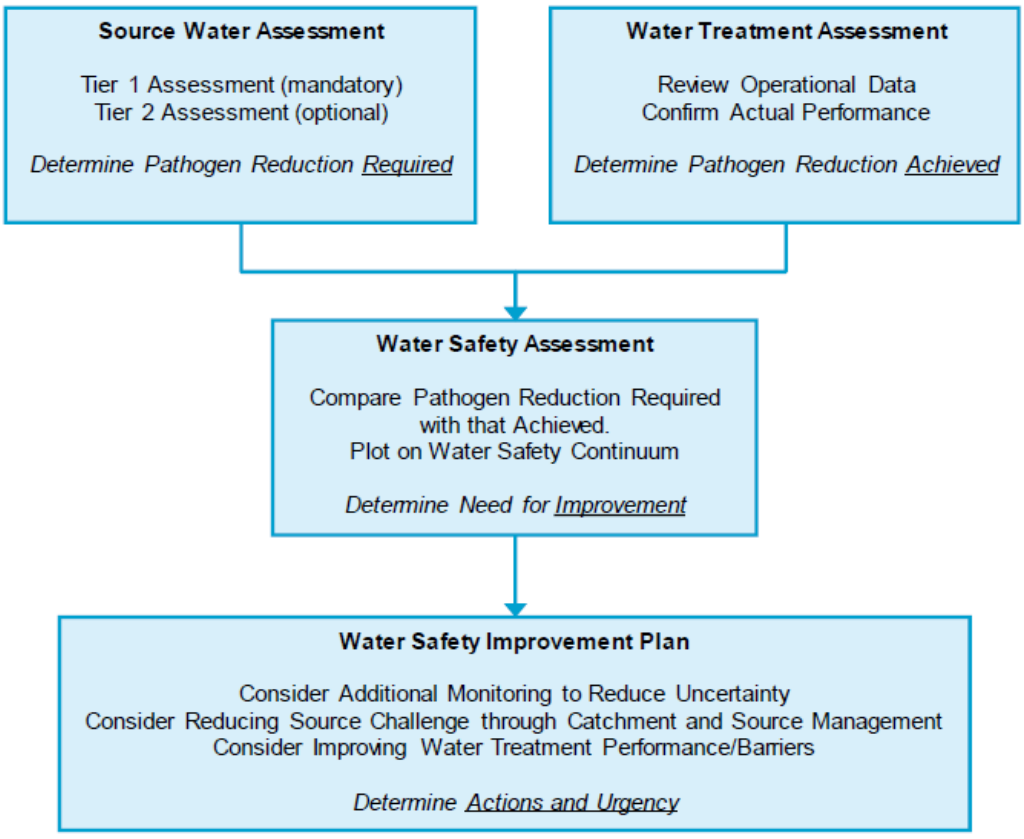
(a) ***Source water assessment*** (microbial risk). Pathogen risk assessment is conducted in accordance with the Water Service Association of Australia's (WSAA) *Manual for the Application of Health-Based Treatment Targets Release No 2* and is consistent with the ADWG 2011 Framework. Figure 1 below sets out WSAA's approach to quantitative risk assessment that has been adopted by the Corporation

(b) ***Water treatment plant process assessment*** The water treatment assessment involves assigning estimates of pathogen reduction to the treatment processes deployed at a source.

(c) ***Water safety assessment*** Comparing the log reduction required from the source assessment with the log reduction values claimable from the water treatment assessment.

(d) ***Water Safety Improvement Plan*** The water safety improvement plan involves planning improvements to improve water safety. Where the HBT is not achieved, the water supplier should undertake improvements.

Figure 1: WSAA Water Safety Assessment Process



3 Drinking Water Quality Policy

1. Policy statement and purpose

Gippsland Water is committed to managing its water supply systems to provide safe drinking water for customers at all times. This is achieved by managing catchments, treatment and water supply assets and systems in an efficient and sustainable manner reflecting the current and future commitments.

Drinking water is managed in accordance with our Drinking Water Quality Manual that outlines the strategic and operational processes which reflect our attitude to our customers, our product, our service delivery and each other, in a matter which demonstrates that we:-.

- Understand our obligations to public health
- Are committed to high quality products and services
- Behave openly, ethically and fairly
- Focus on customer satisfaction
- Promote innovative solutions
- Strive to get the best out of our systems all of the time

2. Our commitments

To continually improve our drinking water quality performance by:

- Meeting all of our legislated drinking water quality requirements, and moving our practices beyond compliance with relevant legislation only, where sustainable and economic opportunities are identified;
- Managing the water quality aspects of all our activities by training our people, incorporating water quality objectives and targets into our business planning activities, and implementing appropriate risk based approaches to ensure we provide safe drinking water at all times;
- Working with our customers and suppliers to jointly understand and be more effective in the management of water quality products and services supplied to us; and
- Undertaking whole-of-water supply catchment to tap assessments as part of an integrated approach to the sustainable management of our water resources and treatment activities.

To communicate with our community by:

- Openly sharing and publishing information on our drinking water quality activities and performance;
- Utilising our water industry partners, advisory committees and other consultative mechanisms, to seek community involvement in policy development and planning processes and by contributing to initiatives and activities that educate and enhance community awareness of water resources, catchments, water treatment and water quality issues; and
- Co-operating with all stakeholders within the community to identify, influence and participate in sustainable solutions to global and regional drinking water quality priorities.

4 Drinking water supply systems

4.1 Source of water

We operate 15 water treatment systems supplying 35 water sampling localities and 42 towns in 2020-21. The water for these systems is sourced from a variety of water supplies including stream off-takes, reservoirs, and groundwater (bore water). The table below provides information on where the raw water is sourced for each water sampling locality, identifies the raw water storage (if one exists prior to each water treatment plant) and details the water treatment processes used to produce safe drinking water.

We interact with many stakeholders regarding catchment management. For details regarding catchment management activities refer to section 9.6.

Table 1: Gippsland Water - water sampling locality source water and water treatment processes

Water sampling Locality	Estimated Population Serviced[1]	Source water	Raw Water Storage	Water Treatment Plant	Treatment process										Sludge Thickening Dewatering	Added substances						
						Clarification		Filtration		Disinfection				Other								
					Coagulation & Flocculation	Sedimentation / Clarification	Dissolved Air Flotation	Granular Media Filter	Membrane	Chlorine Gas	Chloramination	Sodium Hypochlorite	Calcium Hypochlorite	Activated Carbon (PAC / GAC)[4]		Lime / Soda Ash	Alum Based Coagulants	Iron Based Coagulants	Potassium Permanganate	Polymers	Sodium Fluoride / Hydrofluorosilicic Acid	Calgon sodium hexametaphosphate
Maffra	5,240	Macalister River	N/A	Maffra	X	X		X		X		Stratford and Boisdale		X		Soda Ash	Alum/PACl-23* (High Turbidity)			LT22	Sodium Fluoride	X
Stratford	2,530																					
Boisdale	70																					
Briagolong	750	Bore - Wa De Lock Aquifer	N/A	Briagolong	X			X				X				Soda Ash		Polymerised Ferric Sulphate		1115 & 1160		

1 = The listed populations are for the water sampling localities calculated using Gippsland Water's number of residential water connections, the 2016 ABS census data of number of persons per dwelling, and adjusted for estimates of permanent occupation rates. Figures have been rounded to the nearest 10 people.
3 = The water supplied to Darnum changed from the Warragul system to the Moe system in March 2012.
4 = PAC/GAC used as required to treat for taste and odour compounds.
* = PACl-23 used as required to treat high turbidity raw water.
X_1 = Plant capability for activated carbon dosing (not currently in use).

Table 1 (cont.): Gippsland Water - water sampling locality source water and water treatment processes

Water Sampling Locality	Estimated Population Serviced[1]	Source water	Storage	Water Treatment Plant	Treatment process										Sludge Thickening Dewatering	Added substances					
					Coagulation & Flocculation	Clarification		Filtration		Disinfection				Other		Lime / Soda Ash	Alum Based Coagulants	Iron Based Coagulants	Potassium Permanganate	Polymers	Sodium Fluoride / Hydrofluorosilicic Acid
						Sedimentation / Clarification	Dissolved Air Flotation	Granular Media Filter	Membrane	Chlorine Gas	Chloramination	Sodium Hypochlorite	Calcium Hypochlorite	Activated Carbon (PAC / GAC)[4]							
Morwell	14,920	Tyers River	Moondarra	Morwell	X	X		X		X		Morwell, Churchill, Jumbuk, Hazelwood Nth, Boolarra	Traralgon South			Soda Ash	Alum			LT20	Sodium Fluoride
Boolarra	630																				
Churchill	5,930																				
Yinnar	1,350																				
Jumbuk	370																				
Traralgon South/Hazelwood North	1,970																				
Tyers/Glengarry	2,270	Tyers River	Moondarra	Tyers (Plant 1)	X			X				Tyers, Rosedale & Toongabbie			X	Soda Ash	Alum			1115 & 1160	
Rosedale	1,710																				
Toongabbie	1,030			Tyers (Plant 2)	X		X	X	X												
Cowwarr	260																				
Traralgon	30,220	Tyers River	Moondarra	Traralgon	X		X	X		X						Soda Ash	Alum			LT20	Sodium Fluoride

1 = The listed populations are for the water sampling localities calculated using Gippsland Water's number of residential water connections, the 2016 ABS census data of number of persons per dwelling, and adjusted for estimates of permanent occupation rates. Figures have been rounded to the nearest 10 people.
3 = The water supplied to Darnum changed from the Warragul system to the Moe system in March 2012.
4 = PAC/GAC used as required to treat for taste and odour compounds.
* = PACl-23 used as required to treat high turbidity raw water.
X_1 = Plant capability for activated carbon dosing (not currently in use).

Table 1 (cont.): Gippsland Water - water sampling locality source water and water treatment processes

Water Sampling Locality	Estimated Population Serviced[1]	Source water	Storage	Water Treatment Plant	Treatment process										Sludge Thickening Dewatering	Added substances						
					Coagulation & Flocculation	Clarification		Filtration		Disinfection				Other		Lime / Soda Ash	Alum Based Coagulants	Iron Based Coagulants	Potassium Permanganate	Polymers	Sodium Fluoride / Hydrofluorosilicic Acid	Calgon sodium hexametaphosphate
						Sedimentation / Clarification	Dissolved Air Flotation	Granular Media Filter	Membrane	Chlorine Gas	Chloramination	Sodium Hypochlorite	Calcium Hypochlorite	Activated Carbon (PAC / GAC)[4]								
Warragul[3] (including Nilma, Drouin East)	19,640	Pederson Weir (Tarago River) Tarago Reservoir - (supplementary supply)	Tarago Reservoir (supplementary supply)	Warragul	X		X	X		X		Warragul South & Drouin		X_1	X	Lime	Alum			LT20	Sodium Fluoride	
Warragul South	160																					
Drouin	15,340																					
Rokeby/Buln Buln	480																					
Coongulla/ Glenmaggie	260	Macalister River	Lake Glenmaggie	Coongulla	X			X				X		X	X	Soda Ash	Alum 90			1160, 1115		
Rawson	290	Trigger Creek	Amours Basins	Rawson	X		X	X				Rawson WTP, Parkers Corner			X	Soda Ash		PFS (Polymerised Ferric Sulphate)		1160		
Erica	310																					
Heyfield	1,920	Thomson River	Heyfield raw water storage	Heyfield	X			X		X				X	X	Soda Ash		PFS (Polymerised Ferric Sulphate)		1115, 1160		X

1 = The listed populations are for the water sampling localities calculated using Gippsland Water's number of residential water connections, the 2016 ABS census data of number of persons per dwelling, and adjusted for estimates of permanent occupation rates. Figures have been rounded to the nearest 10 people.
3 = The water supplied to Darnum changed from the Warragul system to the Moe system in March 2012.
4 = PAC/GAC used as required to treat for taste and odour compounds.
* = PACl-23 used as required to treat high turbidity raw water.
X_1 = Plant capability for activated carbon dosing (not currently in use).

Table 1 (cont.): Gippsland Water - water sampling locality source water and water treatment processes

Water Sampling Locality	Estimated Population Serviced[1]	Source water	Storage	Water Treatment Plant	Treatment process										Sludge Thickening Dewatering	Added Substances						
					Coagulation & Flocculation	Clarification		Filtration		Disinfection				Other		Lime / Soda Ash	Alum Based Coagulants	Iron Based Coagulants	Potassium Permanganate	Polymers	Sodium Fluoride / Hydrofluorosilicic Acid	Calgon sodium hexametaphosphate
						Sedimentation / Clarification	Dissolved Air Flotation	Granular Media Filter	Membrane	Chlorine Gas	Chloramination	Sodium Hypochlorite	Calcium Hypochlorite	Activated Carbon (PAC / GAC)[4]								
Mirboo North	1,890	Little Morwell River	N/A	Mirboo North	X	X	X	X				X			X	Soda Ash	PASS			LT20		
Moe (inc Darnum[3])	11,760	Tanjil River and Narracan Creek	N/A	Moe	X	X		X		X		Newborough, Yallourn North, Trafalgar, Yarragon & Darnum			X	Soda Ash	Alum			LT20	Sodium Fluoride	X
Newborough	8,980																					
Yallourn North	1,550																					
Trafalgar	3,720																					
Yarragon	1,100																					
Neerim South	1,430	Tarago River	Tarago Reservoir	Neerim South	X		X	X			X (Noojee System)	X (Neerim South)			X	Soda Ash		PFS (Polymerised Ferric Sulphate)		1115, 1160		X
Noojee	310																					
Sale/Wurruk	18,030	Bore (Boisdale Aquifer)	N/A	Sale				X		X						Lime			X		Sodium Fluoride	

1 = The listed populations are for the water sampling localities calculated using Gippsland Water's number of residential water connections, the 2016 ABS census data of number of persons per dwelling, and adjusted for estimates of permanent occupation rates. Figures have been rounded to the nearest 10 people.
3 = The water supplied to Darnum changed from the Warragul system to the Moe system in March 2012. Darnum is not a designated water sampling locality under the SDWR.
4 = PAC/GAC used as required to treat for taste and odour compounds.
* = PACI-23 used as required to treat high turbidity raw water.
X_1 = Plant capability for activated carbon dosing (not currently in use).

Table 1 (cont.): Gippsland Water - water sampling locality source water and water treatment processes

Water Sampling Locality	Estimated Population Serviced [1]	Source water	Storage	Water Treatment Plant	Treatment process										Sludge Thickening Dewatering	Added Substances						
						Clarification		Filtration		Disinfection				Other								
					Coagulation & Flocculation	Sedimentation / Clarification	Dissolved Air Flotation	Granular Media Filter	Membrane	Chlorine Gas	Chloramination	Sodium Hypochlorite	Calcium Hypochlorite	Activated Carbon (PAC / GAC)[4]		Lime / Soda Ash	Alum Based Coagulants	Iron Based Coagulants	Potassium Permanganate	Polymers	Sodium Fluoride / Hydrofluorosilicic Acid	Calgon sodium hexametaphosphate
Seaspray	230	Merrimans Creek	Seaspray raw water storage	Seaspray	X			X				X		X	X	Soda Ash	Alum 90			1115, 1160		
Thorpdale (water carting from Moe water sampling locality)	170	Tanjil River and Narracan Creek (September 2015 - ongoing)	N/A	Moe	X	X		X		X		Newborough, Yallourn North, Trafalgar, Yarragon & Darnum			X	Soda Ash	Alum			LT20	Sodium Fluoride	X
Willow Grove	370	Tanjil River	Blue Rock Lake	Willow Grove	X			X			X				X	Soda Ash	Alum			1115, 1160		

1 = The listed populations are for the water sampling localities calculated using Gippsland Water's number of residential water connections, the 2016 ABS census data of number of persons per dwelling, and adjusted for estimates of permanent occupation rates. Figures have been rounded to the nearest 10 people.
3 = The water supplied to Darnum changed from the Warragul system to the Moe system in March 2012.
4 = PAC/GAC used as required to treat for taste and odour compounds.
* = PACl-23 used as required to treat high turbidity raw water.
X_1 = Plant capability for activated carbon dosing (not currently in use).

4.2 WATER QUALITY MANAGEMENT SYSTEM

The *Safe Drinking Water Act 2003* (the Act) provides a regulatory framework for drinking water quality including a risk management framework and water quality standards. The Act requires all Victorian Water Corporations to prepare, implement and review a risk management plan. To assist with this requirement, we have made a commitment to establish and maintain a Drinking Water Quality Management System (DWQMS) that considers the principles of the Framework for the Management of Drinking Water Quality within the *Australian Drinking Water Guidelines 2011* (ADWG). This quality management framework is specific for the water industry and incorporates a preventive risk management approach from catchment to consumer.

We utilise the ADWG Framework principles in its Water Quality Management System for the supply of safe drinking water. The ADWG Framework is based on 12 elements outlined in Chapter 2.

The 12 elements of the Water Quality Management System must be met, and the key processes undertaken to meet these requirements include:

4.2.1 Hazard and risk identification

To determine the key risk to a water supply to enable control measures to be implemented, we undertake an extensive hazard assessment process from the catchment to the end user involving management, operational staff, system operators and key stakeholders.

The risks identified during this process are reviewed regularly to identify changes to risks, new risks, or when processes and system changes occur.

4.2.2 Control measures

Control measures are established to reduce the key risk or likelihood of the risk occurring. The intent is to manage or reduce the risk to an acceptable level. Within our Water Quality Management System, this consists of:

- Critical Control Points (CCPs) that are alarmed and have the ability to stop processes before a water quality failure occurs. The CCPs are documented and apply to critical process steps in the treatment process;
- Maintenance programs that include preventive maintenance of critical assets used in the treatment process and control systems such as dosing systems, monitoring instrumentation for key assets and system-based maintenance such as mains flushing, air scouring, tank and basin cleaning as well as asset maintenance and replacement programs; and
- Trained and competent water treatment technicians manage the operation and maintenance of water treatment plants and water supply systems. All technicians undertake industry based training to ensure a high level of knowledge of treatment processes and associated risks. Our technicians are trained in accordance with the Water Industry Operator Certification Framework 2018: Drinking Water, Wastewater, Recycled Water effective 1 July 2019 requirements to Certificate 3 and Certificate 4 level in water industry operations.

4.2.3 Verification and monitoring

Verification and monitoring is used to confirm and authenticate the performance of water treatment processes and water supply systems to ensure compliance with SDWR 2015 standards and ADWG health related and aesthetic guideline values. Our verification and monitoring includes:

- Supervisory control and data acquisition systems (SCADA) at:
    - Individual water treatment plants;
    - Secondary disinfection systems; and
    - Water supply treated water tanks, storages and pump stations.
- System-wide telemetry and alarms 24 hours a day, 7 days a week;
    - Critical Control Point (CCP) alert and critical process alarms;
- Water treatment and water quality Technicians on-call 24 hours a day, 7 days a week for system monitoring and alarm verification and response;

- A drinking water quality monitoring program covering the catchment, water treatment plant process and water supply system testing and undertaken by an independent National Association of Testing Authorities (NATA) accredited laboratory that include:
    - Pathogenic microorganisms;
    - Inorganic chemicals, including inorganic disinfection by-products;
    - Organic chemicals, including pesticides, pesticide residues and organic disinfection by-products;
    - Radiological parameters; and
    - Algal toxins (as required when algal events occur).
- A water treatment chemical quality assurance program undertaken by an independent laboratory that includes certificates of analysis prior to receipt of chemicals for use;
- Calibration programs of on-line and benchtop critical instruments used for process control and alert and critical alarm processes by independent service providers; and
- Customer feedback captured through our water quality complaint resolution procedure.

4.2.4 System auditing

Internal and external auditing programs have been established to assess compliance of the Water Quality Management System. This includes auditing:

- Water treatment plant records, systems and processes;
- Water supply system infrastructure (water mains repairs, treated water storage tanks and basins);
- Challenging testing CCP alert and critical alarms; and
- Behavioural audits to verify compliance with control, verification and monitoring requirements.

4.3 WATER TREATMENT PROCESSES

The source waters for our 16 water supply systems are treated prior to distribution with the objective of providing safe drinking water at all times. The treatment varies for each water supply system with the specific treatment process dependent on the quality and risks of the source water.

Table 1 identifies the regular treatment process for each of the water localities and lists the added substances and any periodic treatment activities. The treatment process used depends on the source and quality of the water to be treated. The corporation uses the following treatment processes to produce safe drinking water:

4.3.1 Coagulation/flocculation

Coagulation is a process to remove very fine suspended particles often associated with turbidity, colour or colloidal matter in water. These particles have a negative charge that causes them to repel each other and stay suspended in water. The addition of a suitable 'coagulant' of iron and/or aluminium salt with a positive charge neutralises or destabilises the negative charge enabling the fine particles to join together to form larger particles. The flocculation (floc) process involves stirring the water gently after the coagulant has been added. This allows the particles to come into contact, and eventually causes it to stick together and form floc. This process removes the fine particles, dirt and colour present in the water.

Chemicals used for coagulation/flocculation at the water treatment plants include aluminium sulphate, ferric sulphate and poly-aluminium silicate sulphate solution (PASS).

4.3.2 Clarification/sedimentation

The clarification or sedimentation of the floc particles formed during the coagulation/flocculation process is usually carried out under still conditions (e.g. in the sedimentation tank or clarifier). A sedimentation tank relies on gravity to separate the floc from the water, which is heavy and falls to the bottom of the tank – leaving the 'cleaner' water on top. A clarifier uses a mechanical process to separate the floc, and the water is collected in troughs at the surface. Once the floc has been removed the clean water is sent to filters.

4.3.3 Membrane filtration

Membrane filtration is used to remove suspended solids and some colloidal matter from the source water. The water is pumped through the filter membrane trapping suspended solids in the process. The concentrate (material that does not pass through the membrane) is periodically removed to waste to prevent the blocking of the membrane filters.

4.3.4 Filtration

The clarified water is passed through a filter consisting of several types of graded filter media (sand, gravel and coal) to remove any remaining particles, floc or dissolved chemicals that may have passed through the clarification/sedimentation process.

Another method used utilises Dissolved Air Flotation and Filtration (DAFF) which relies on the injection of microscopic air particles into the water stream, causing the flocculated particles to float to the surface. These particles are then drawn off the surface and off the filtration tank and removed to waste. The clear water then is filtered, as above, through graded filter media.

Over time, the filters gradually become clogged with trapped particles. A filter backwash is carried out to clean the filters, returning it to optimum condition. Air and water is forced up through the filter nozzles to agitate the filter bed and remove any trapped particles. The final turbidity of water leaving the filters, during normal plant operation, is less than 0.1 NTU (Nephelometric Turbidity Units - unit of measure for turbidity).

The backwash water produced during the filter cleaning process is discharged to the sludge thickening system to separate solids from process water. To maximise water use, the separated process water is then returned to the treatment plant and mixed with new raw water to recommence the treatment process.

4.3.5 Sequestration

Sequestration involves the addition of sequestering agents followed by chlorination which keeps dissolved iron and manganese from oxidising and precipitating.

4.3.6 Disinfection

Drinking water is disinfected to prevent the spread of waterborne pathogens that cause diseases such as dysentery, cholera, typhoid and gastroenteritis.

A low residual level of disinfection also ensures that the water remains disinfected once it leaves the water treatment plant until it arrives at the customer’s tap.

In our service area, chlorination is the most commonly used disinfectant because of its reliability and cost effectiveness. Chlorine is the most widely used disinfectant for drinking water supplies in the world. The other disinfection treatment process used in our region is chloramination.

Chlorination

Chlorine is widely used throughout the world to disinfect drinking water and control disease causing organisms. The type of chlorine used at our plants is either chlorine gas or sodium hypochlorite.

Chloramination

Chloramination is also used throughout the world as a means of disinfecting drinking water to control disease causing organisms. Small amounts of chlorine and ammonia are added to the water to form chloramines, providing a relatively long lasting process to safely disinfect water.

Secondary disinfection

Disinfectant residuals decrease with time as water passes throughout the distribution system and within storage tanks. Secondary water disinfection plants are used to maintain adequate disinfection levels within the distribution system.

We operate a number of secondary water disinfection sites that are in place to ensure disinfection residuals are maintained throughout the distribution system by topping up chlorine levels to maintain a balance between adequate disinfection residuals and aesthetic water quality. Sodium hypochlorite is used in these secondary disinfection plants.

4.3.7 Added substances

Lime/Soda ash

To assist with the treatment process and to ensure the pH level in the raw water (before treatment chemicals are added) and filtered water (after treatment) is within the required ranges, lime or soda ash is added. Lime or soda ash is added to the raw water to adjust the pH to ensure the optimum level for chemical reactions to occur in the coagulation/flocculation process.

Lime or soda ash is also added to the water before it leaves the water treatment plant to maintain the pH in the desired range to optimise the effectiveness of disinfection chlorinated systems and to minimise the risk of corrosion and improve water taste.

Potassium permanganate

Potassium permanganate can be added to the water supply as required to reduce iron and manganese levels. When present in higher concentrations, these metals can cause staining of laundry and plumbing fixtures and contribute to ‘dirty water’ events.

Powdered activated carbon

Powdered activated carbon can be added to the water supply as required to remove compounds that contribute to taste and odour issues, usually associated with higher levels of certain algae in raw water.

Fluoridation

In accordance with DH requirements, we fluoridate the drinking water supplies at 6 of our 15 water treatment plants (Moe, Morwell, Maffra, Traralgon, Sale, and Warragul). Any fluoride present in those systems that do not have fluoride dosing systems is due to naturally occurring sources. For information about the health issues associated with the water fluoridation program, contact the Department of Health (DH) on 1800 651 723.

Sodium hexametaphosphate

Sodium hexametaphosphate can be added to the water supply as required as a sequestration agent to prevent the oxidation of trace levels of manganese in the water supply that can contribute to dirty water issues.

4.3.8 Distribution

After water is filtered and disinfected, it is relayed to customers through a vast network of tanks, basins, pumps and pipes. We use positive pressure, gravity and backflow prevention to ensure safe drinking water. Positive pressure pushes contaminants away from the water supply system if leaks occur. The corporation requires high risk properties install and maintain a testable backflow prevention device before connecting to the water supply network.

Where works are required on water mains, the safety of drinking water is maintained through pro-actively managing any risks. Programs such as our 5Cs (clean pipes, clearance, chlorination, cleanliness, clothing) is specifically designed to address any contamination risk. See Figure 2.

The water distribution system is also strategically flushed to remove build-up of naturally occurring sediments from pipes that can cause customers to experience dirty water.

Figure 2: Gippsland Water's 5Cs program

5 System issues for 2020-21

During the 2020-21 monitoring period, there was one event reportable under Section 22 of the SDWA, and is detailed in Section 6.5 of this report.

Our area was significantly impacted by a storm event in June 2021.

Widespread power outages, inundation at key sites and raw water quality changes were experienced which reduced some water systems treatment capacity.

To assist in maintaining water supplies to all communities, we requested community assistance in putting off any non-essential water use until normal capacity was resumed.

Emergency response measures included power generators, intensive monitoring and review of treatment plant operations, asset condition inspections, water tankering to systems with reduced supply capacity.

By effective implementation of these measures, we were able to maintain supply of safe drinking water to all communities.

Any other non-reportable systems issues were dealt with through the customer water quality complaints process outlined in section 6.

6 Quality of drinking water 2020-21

The SDWR require a water quality monitoring program to be undertaken to verify compliance or non-compliance of specified water quality parameters as listed in the regulations. The quality of water is measured across each of the 35 localities to determine that the water meets the specified quality standard. Over the reporting period, more than 2,500 samples were collected for quality testing and over 28,000 tests performed. The following section provides a summary of the results against the water quality parameters monitored through the year at the required sampling frequency.

A brief explanation of the required water quality parameters is provided below. A more detailed explanation can be obtained from the ADWG prepared by the National Health and Medical Research Council (NHMRC).

www.nhmrc.gov.au/about-us/publications/australian-drinking-water-guidelines

6.1 Water quality standards (SDWR 2015)

***Escherichia coli* (*E. coli*) –** *E. coli* is the most common thermo-tolerant coliform present in faeces and is regarded as the most specific indicator of recent faecal contamination from warm blooded animals. The presence of *E. coli* in the water supply can therefore indicate the potential for other pathogenic bacteria to be present. Results from samples taken within the water sampling locality that exceed the maximum level of this parameter are reported to DH, as required under Section 18 of the SDWA.

Trihalomethanes (THM) – Trihalomethanes are a category of by-products produced in drinking water, principally as a result of disinfection chemicals (chlorine) reacting with naturally occurring organic matter derived from the decay of aquatic and terrestrial vegetative matter present in water supplies. Results from samples taken within the water sampling locality that exceed the maximum level of this parameter are reported to DH, as required under Section 18 of the SDWA.

Turbidity – Turbidity is caused by the presence of fine suspended matter such as clay, silt, colloidal particles, algae and other microscopic organisms in the water. In high levels, this matter gives the water the appearance of being dirty, muddy or milky. Turbidity is best removed by coagulation and filtration treatment processes. Results from samples taken within the water sampling locality that exceed the maximum level of this parameter are reported to DH, as required under Section 18 of the SDWA.

The Safe Drinking Water Regulations (2015) monitoring requirements are summarised in Table 2:

Table 2: Summary of the Safe Drinking Water Regulations 2015 (Schedule 2):

Parameter	**SDWR (2015)** **Drinking Water Quality Standard**
Escherichia coli	All samples of drinking water collected are found to contain no Escherichia coli per 100 millilitres, with the exception of any false positive sample.
Trihalomethanes	Less than or equal to 0.25 mg/L
Turbidity	The 95th percentile of results for samples in any 12 month period must be less than or equal to 5·0 Nephelometric Turbidity Units.

6.2 Water quality standards

We must ensure that all drinking water supplied to our localities complies with the quality standards specified under Part 3 of the SDWA (2003). As well as the above parameters that are required under Schedule 2 of the SDWR (2015), many other tests are conducted to ensure that the water supplied is safe to drink. These parameters are determined by assessing the risks to each system and monitoring to verify that these risks are being controlled effectively.

The quality standards applied for the additional parameters in most instances are derived from the ADWG.

6.3 Emergency/incident management

We have aligned our incident/emergency management approach to the Australasian Inter-service Incident Management Systems (AIIMS) as part of its SDWA and SDWR emergency and incident management processes.

We are currently reviewing our All Hazards Incident Management Plan to ensure ongoing compliance with the requirements of Part 7a of the *Emergency Management Act (2013).*

6.4 Incident and potential water quality events

Section 18 of the SDWA states:

'A water supplier must notify the Secretary in writing if it becomes aware that the drinking water it is supplying to another person does not comply, or is not likely to comply, with any relevant water quality standard and must do so within 10 days after it becomes aware of the fact.'

In 2020-21, the water quality events reported to the DH pursuant to section 18 of the SDWA are summarised below.

Table 3: Summary of notifications under Section 18

Water Sampling Locality Affected	Date and duration of incident	Location of incident	Nature of the incident	Drinking water supplies affected	Safe Drinking Water Regulations (Schedule 2) – Standard Not Met
Boisdale	21 June 2020	Boisdale tanks and sampling point	E coli detection	Boisdale	E coli

Refer to Section 6.5 for more information on this event and actions taken to manage and return the drinking water supply to specification, and preventative actions.

6.5 Emergencies and water quality events

Section 22 of the SDWA states:

'(1) This section applies if an officer of a water supplier believes or suspects on reasonable grounds that the water supplied, or to be supplied for drinking purposes –
(a) may be the cause of illness; or
(b) may be the means by which an illness is being, has been or will be transmitted; or
(c) may contain any pathogens, substance, chemical or blue-green algae toxin, whether alone or in combination, at levels that may pose a risk to human health; or
(d) may cause widespread public complaint.

'(2) On forming that belief or suspicion, the officer must immediately report his or her belief or suspicion to the Secretary, and must make the report in the form required by the Secretary.'

During the 2020-21 reporting year, there was one reportable event that required notification to the Drinking Water Regulatory Unit of DH, under section 22 of the SDWA. This notification is summarised below:

Table 4: Summary of incidents and actions taken under Section 22

Water Sampling Locality Affected	Date and duration of incident	Location of incident	Nature of the incident	Drinking water supplies affected	Actions taken in response to the incident	Was the community notified
Boisdale Ecoli detection	21 June 2021 One routine drinking water sample	Boisdale drinking water reticulation sample point	Detection of E. Coli at a concentration of 1 org/100mL in routine drinking water sampling program	Boisdale	Resampling of the Boisdale reticulation system including the water storage tanks and all available sampling points. Asset inspections and risk assessment of the Boisdale water system. Spot dosing of the Boisdale water tanks and flushing of the reticulation system Two repeat sampling events of the Boisdale reticulation 24 hrs apart. Minor repairs to the one water storage tank.	No. All water quality indicators including residual free chlorine were within our CCPs for system protection and immediate risk determined to be very low.

We were notified on 22 June 2020 by the independent analytical laboratory of the positive detection of E coli in a sample of drinking water collected on 21 June 2020 at a concentration of 1 org/100mL.

Other water quality parameters reported for this sample included :

- Free Chlorine 0.79mg/L
- Total Chlorine 0.87 mg/L
- pH 7.8 units
- Turbidity 0.1 NTU
- Coliforms >200 orgs/100mL
- Plate Count 22C = 620 cfu/mL.

We notified the Department of Health immediately, submitted the required notification forms, undertook a rapid risk assessment and immediately commenced a response to ensure customers were not put at risk.

The laboratory was requested to retest the sample, which confirmed the presence of E.coli bacteria in the original sample.

On 22 June 2020 we collected water samples from the Boisdale water supply system including the water storage tanks and all available water sampling points. The residual free chlorine measurements were found to be within our critical control limits for reticulation system operation. The Boisdale water storage tanks were spot dosed with sodium hypochlorite to temporarily increase the chlorine residual as a precaution, and this water flushed through the Boisdale reticulation system followed by water sample collection.

Asset condition inspections were completed on the water sampling points, water storage tanks, sodium hypochlorite dosing system and sampling equipment used in the collection of water samples. Our asset database was queried for any recent planned or reactive works in the system. A precautionary improvement to the Boisdale tank inspection hatches were completed during the inspections. No evidence of contamination, vermin or debris was observed during the asset inspection.

Further water samples were collected 24 hours after the system flushing.

All repeat water sampling was found to be clear of E coli and system chlorine residuals within our reticulation CCPs.

We prepared an Ecoli Investigation Report in accordance with the Department of Health Secretary's guidelines "Appendix 1: Guidelines for the investigation and reporting of E. coli detections, July 2015".

Following consideration of our Investigation Report, the Department of Health determined that we had not met the standard for E.coli in drinking water for the Boisdale water sampling locality on 21 June 2021 and

that a Section 18 notification was required. The Section 18 notification was provided to the Department of Health on 20 August 2021.

Table 5: Water quality results during investigation

Water Sampling Locality	Number of samples	E Coli	Free chlorine reticulation and tanks	Turbidity
		Maximum detected (orgs/100mL)	Range (mg/L)	Range (NTU)
Boisdale	18	0	0.64 to 2.7	0.07 to 0.70

The incident based water quality sampling data has not been included in the data presented in Section 9. As required by DH, only samples scheduled as part of the risk management plan monitoring programs are included for data analysis and statistics.

6.6 Other events not reportable

In 2020-21, there were no other water quality events that occurred.

7 Complaints

7.1 Water quality complaints

We are committed to providing safe drinking water to our customers at all times. We record all complaints relating to drinking water quality. The types of water quality complaints logged by us are classified as follows:

- Discoloured/dirty water;
- Taste/odour;
- Blue water;
- Air in water;
- Alleged illness.

The complaints are compared to the number of customers (per 100 customers) to enable comparisons with other water supplies and localities. A summary of customer complaints we received relating to the quality of drinking water supplied is reported below.

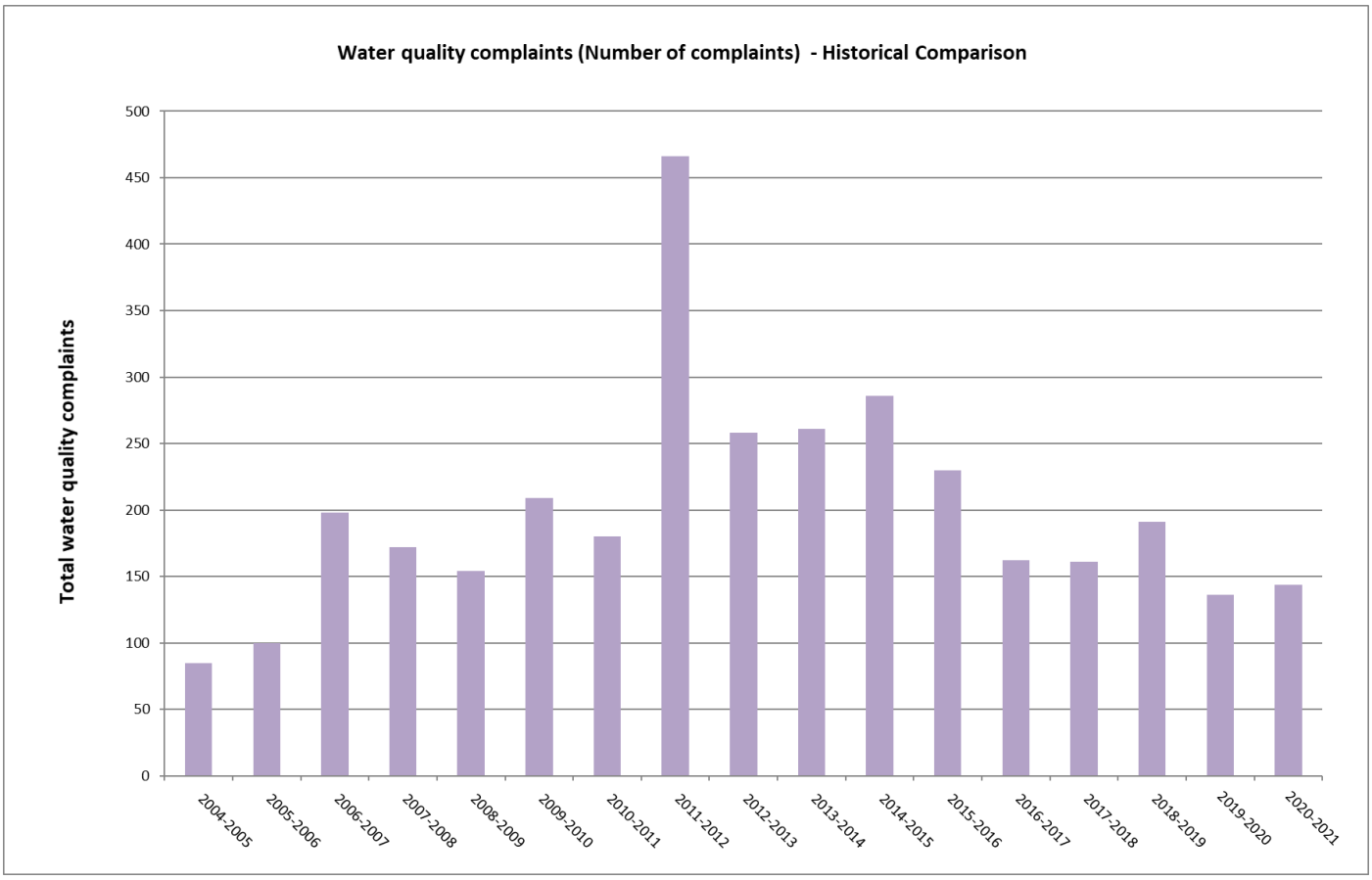
Each water quality complaint received is responded to as per Figure 6 whereby the customer complaint is logged by our Customer Service or after-hours staff, and a Gippsland Water representative responds to the complaint and initiates any corrective actions as required.

Table 6: Water quality complaints per 100 customers supplied

Type of Complaint	2020-21		2019-20		2018-19	
	No. of Complaints	Complaints per 100 customers	No. of complaints	Complaints per 100 customers	No. of Complaints	Complaints per 100 customers
Discoloured water	71	0.105	47	0.072	108	0.166
Taste / Odour	48	0.071	64	0.098	49	0.075
Blue water	0	0.000	4	0.006	1	0.002
Air in water	20	0.030	11	0.017	27	0.041
Alleged illness	5	0.007	10	0.015	6	0.009
Total	144	0.213	136	0.209	191	0.293

The total number of complaints we received during the 2020-21reporting period was similar to the 2018-20 reporting period. The results are presented below by type and locality.

Figure 3: Total customer complaints for 2004-05 to 2020-21



When calculating the number of complaints per 100 customers, there were no localities within our supply district which exceeded four complaints per 100 customers, as represented in the figure below.

Figure 4: Customer complaints per 100 customers for 2020-21

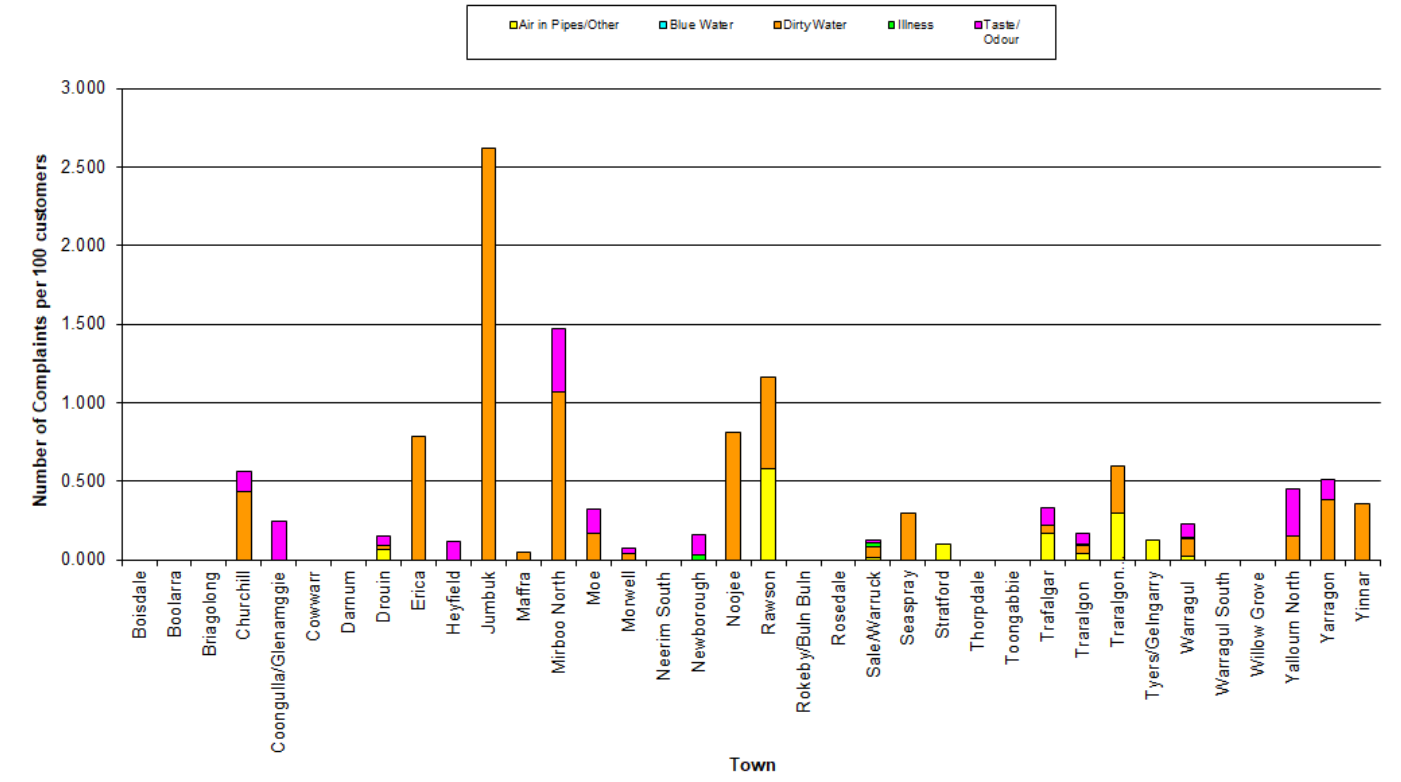
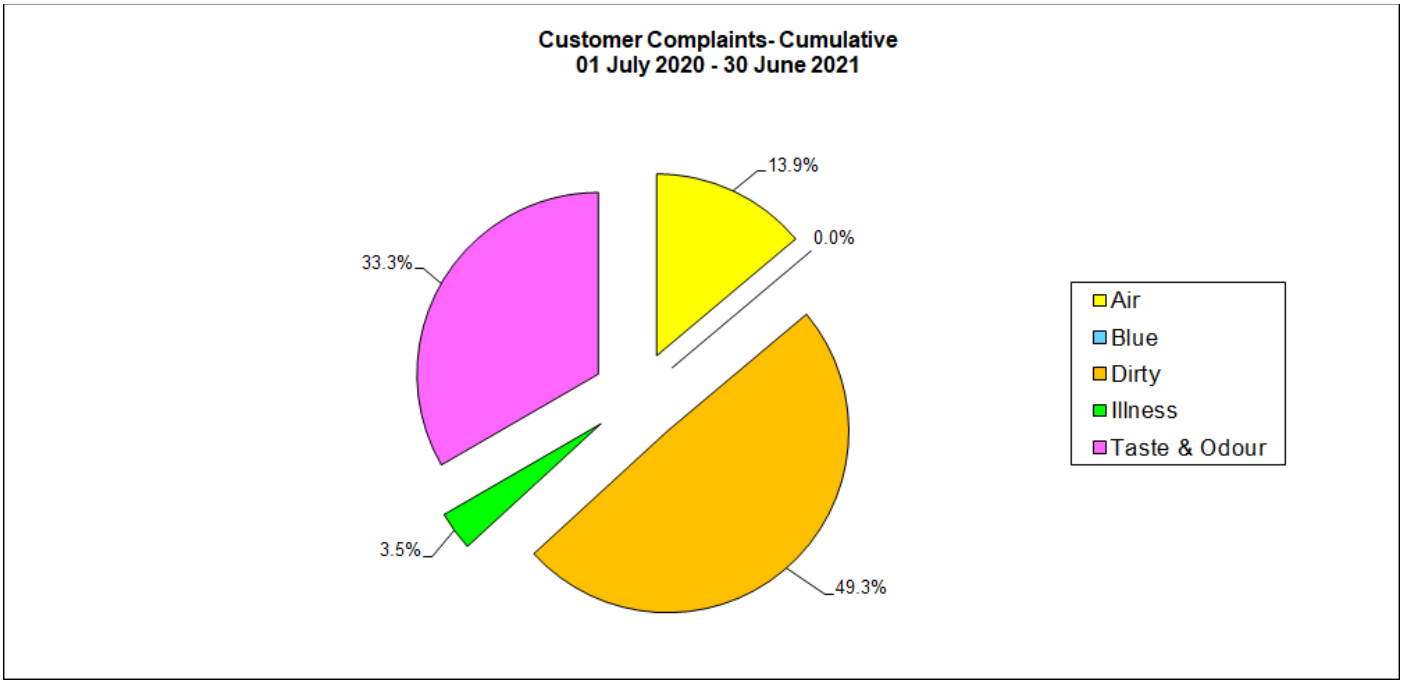


Figure 5: Customer water quality complaints by type 2020-21



The majority of customer complaints for the 2020-21 period related to discoloured/dirty water followed by taste and odour (Figure 5).

Table 7: Customer complaints summary for each water sampling locality 2020-21

Water Sampling Locality	Population (Customers = Number of Connections)	Total Complaints Received 2020-21	No. Complaints per 100 customers 2020-21
Boisdale	30	0	0.000
Boolarra	295	0	0.000
Briagolong	320	0	0.000
Churchill	2318	13	0.561
Coongulla/Glenmaggie	407	1	0.246
Cowwarr	109	0	0.000
Drouin	6522	10	0.153
Erica	127	1	0.787
Heyfield	883	1	0.113
Jumbuk	153	4	2.614
Maffra	2290	1	0.044
Mirboo North	750	11	1.467
Moe	5256	17	0.323
Morwell	7133	5	0.070
Neerim South	613	0	0.000
Newborough	3181	5	0.157
Noojee	124	1	0.806
Rawson	172	2	1.163
Rokeby / Buln Buln	196	0	0.000
Rosedale	754	0	0.000
Sale / Wurruk	7324	9	0.123
Seaspray	342	1	0.292
Stratford	1035	1	0.097
Thorpdale	76	0	0.000
Toongabbie	367	0	0.000
Trafalgar	1796	6	0.334
Traralgon	12878	22	0.171
Traralgon South / Hazelwood Nth	676	4	0.592
Tyers / Glengarry	787	1	0.127
Warragul	8286	19	0.229
Warragul South	195	0	0.000
Willow Grove	167	0	0.000
Yallourn North	664	3	0.452
Yarragon	780	4	0.513
Yinnar	564	2	0.355

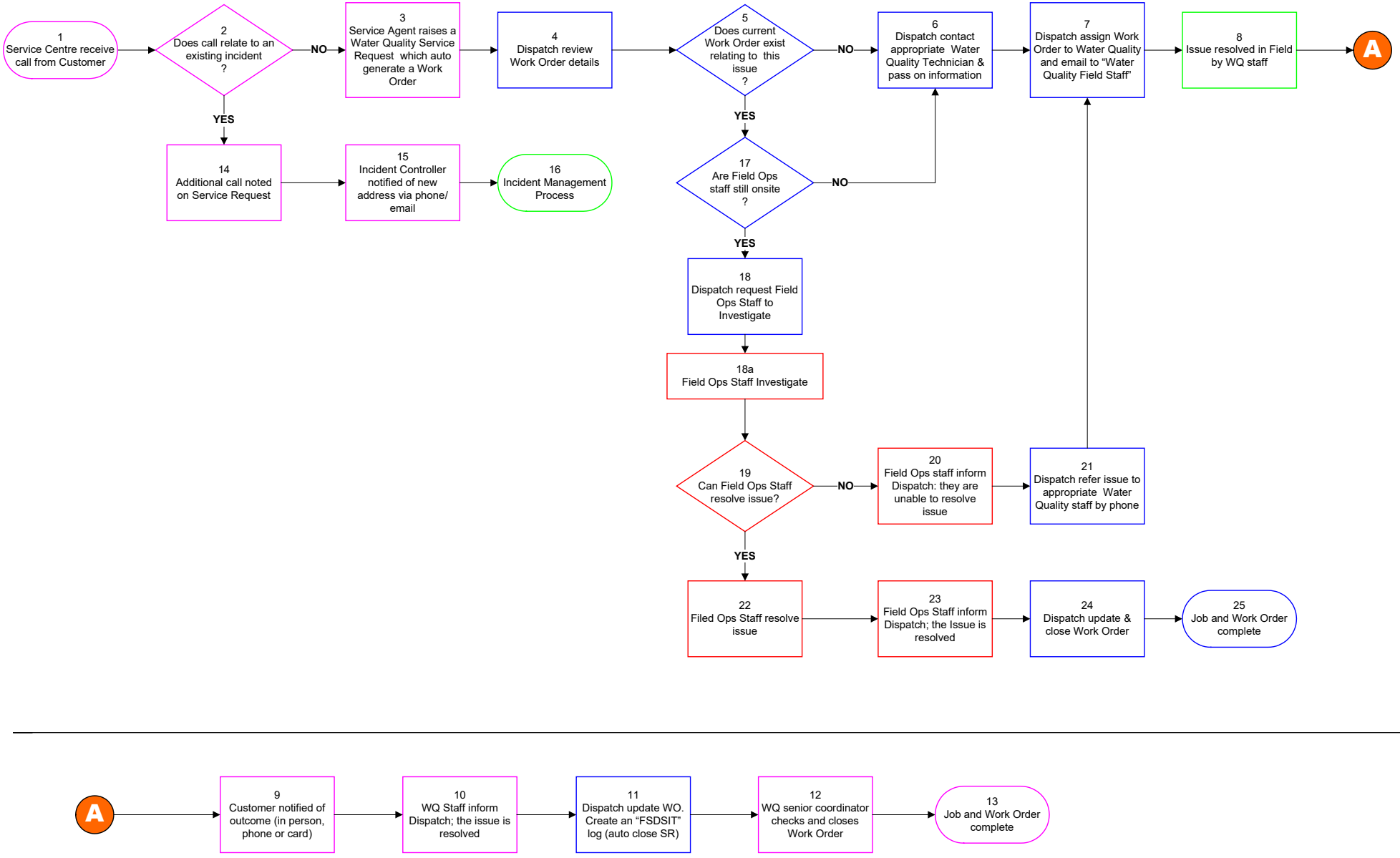
7.2 A summary of the customer complaint process

Customer complaints are managed according to the following summary procedure:

- Customer complaints received by our Customer Contact Centre are recorded in a corporate database. Details include information of who, where, time and nature of complaint.
- The Water Quality Group investigates by contacting the customer and visiting the site if necessary to determine details of the water quality problem.
- For complaints associated with taste and odour, dirty water, and air in pipes, field measurements are performed, the reticulation system is typically flushed then field measurements are taken again to verify the problem has been corrected.
- Follow up contact may be made with the customer to determine if they are satisfied with the quality of service, or alternatively our standard contact card is left with the customer. This also encourages customers to keep us informed of any reoccurrence of water quality problems.
- Details of actions undertaken are entered into a database to provide a record/history of the site, to document issues for maintenance programs, and to inform capital upgrade requirements where a history of system failures occurs.

This procedure is presented in more detail in the figure on the following page.

Figure 6: Water quality complaints resolution procedure



This page intentionally left blank

8 Risk management plan audit

Our Water Quality Risk Management Plan has been operational since 2005 and adopts the 12 elements outlined in the ADWG and preventative risk management strategies outlined in the SDWA.

Our Water Quality Risk Management Plan was last audited in August 2020 by DH approved (Exemplar Global) auditors for compliance with section 7(1) of the SDWA 2003.

We were found to be compliant with the requirements of the Act and Regulations. One opportunity for improvement (OFI) was identified during the audit and one observation recorded. The audit findings are summarised in the following table, Table 9.

A copy of the compliant risk management plan audit certificate, 26 August 2020, is attached in Appendix 2.

Table 8: Risk Management Plan outcomes

Outcomes	GW Action Identified and Status
2020 Audit outcome	
Opportunity for Improvement (OFI) OFI-2020-001 Consider raising work orders for reactive mains flushing in response to network monitoring results	We identified the following actions. • Interim response includes continuing to record reactive mains flushing activities on existing paper forms and storing in corporate records management system – **In place** • Scoping of work order requirements and assessment of existing system capability – **Complete** • Software development – **Underway** • Testing and deployment of solution - **Expected completion in late 2021/early 2022**
Observation One source water microbial assessment indicated that the sanitary survey results were anomalous, and that reassessment was required.	We identified the following actions • Collect further information and when sufficient data/results is available GW will reassess source water risks and treatment capability. - **Underway** • Review assessment where source water conditions or treatment plant capability change (i.e. treatment needs for installation of UV disinfection - **Ongoing**

9 Water quality results for 2020-21

9.1 Escherichia coli (e. Coli)

9.1.1 E. coli results

Compliance under the SDWR (2015) requires all samples of drinking water collected within a water sampling locality to contain no *E. coli* organism/100mL of drinking water, with the exception of any false positive sample. All our localities achieved compliance with this standard for the 2020-21 reporting period, except the Boisdale locality.

For further details of the detection and failure to meet the water quality standard at Boisdale, refer to Section 6.5.

Tables 9 and 10 below details all *E.coli* notifications for the reporting period 1 July 2020 to 30 June 2021 under the *Safe Drinking Water Regulations (2015)*.

Table 9: *E. coli* detections for water sampling localities 2020-21

Water Sampling Locality	No. of investigations conducted (s.22)	No. of confirmed false positives	No. of investigations where standard not met (s.18)
Boisdale	1	0	1

Table 10: *E. coli* results for all water sampling localities for 2020-21

Water Sampling Locality	Frequency of Sampling	Number of samples*	Maximum Detected (orgs/100mL)	No. of detections and investigations conducted (s.22)	No. of samples where standard was not met (s.18)
Boisdale	Weekly	104	1	1	1#
Boolarra	Weekly	104	0	0	0
Briagolong	Weekly	105	0	0	0
Churchill	Weekly	171	0	0	0
Coongulla-Glenmaggie	Weekly	104	0	0	0
Cowwarr	Weekly	52	0	0	0
Drouin	Weekly	158	0	0	0
Erica	Weekly	52	0	0	0
Heyfield	Weekly	104	0	0	0
Jumbuk	Weekly	104	0	0	0
Maffra	Weekly	119	0	0	0
Mirboo North	Weekly	106	0	0	0
Moe#	Weekly	156	0	0	0
Morwell	Weekly	247	0	0	0
Neerim South	Weekly	104	0	0	0
Newborough#	Weekly	113	0	0	0
Noojee	Weekly	157	0	0	0
Rawson	Weekly	104	0	0	0
Rokeby-Buln Buln	Weekly	52	0	0	0
Rosedale	Weekly	104	0	0	0
Sale-Wurruk	Weekly	191	0	0	0
Seaspray	Weekly	106	0	0	0

Table 10: *E. coli* results for all localities for 2020-21 (cont.)

Water Sampling Locality	Frequency of Sampling	Number of samples*	Maximum Detected (orgs/100mL)	No. of detections and investigations conducted (s.22)	No. of samples where standard was not met (s.18)
Stratford	Weekly	53	0	0	0
Thorpdale	Weekly	106	0	0	0
Toongabbie	Weekly	105	0	0	0
Trafalgar	Weekly	116	0	0	0
Traralgon	Weekly	156	0	0	0
Traralgon South-Hazelwood North	Weekly	53	0	0	0
Tyers-Glengarry	Weekly	104	0	0	0
Warragul	Weekly	183	0	0	0
Warragul South	Weekly	104	0	0	0
Willow Grove	Weekly	104	0	0	0
Yallourn North#	Weekly	104	0	0	0
Yarragon	Weekly	117	0	0	0
Yinnar	Weekly	53	0	0	0

*= The number of samples collected is based on the population of the water sampling locality and is calculated based on the guidance provided in ADWG (2014) - Table 9.4 Recommended minimum frequency of E. coli monitoring.
= Refer to Section 6.5 for details of the E.coli detection in the Boisdale locality

Table 11: Comparison of *E. coli* results for previous years (2018-2021)

Water Sampling Locality	2020 - 2021		2019 - 2020		2018 - 2019	
	Maximum Detected (orgs/100mL)	No. of samples where standard was not met (s.18)	Maximum Detected (orgs/100mL)	No. of samples where standard was not met (s.18)	Maximum Detected (orgs/100mL)	No. of samples where standard was not met (s.18)
Boisdale	1	1	0	0	0	0
Boolarra	0	0	0	0	0	0
Briagolong	0	0	0	0	0	0
Churchill	0	0	0	0	0	0
Coongulla/Glenmaggie	0	0	0	0	0	0
Cowwarr	0	0	0	0	0	0
Drouin	0	0	0	0	0	0
Erica	0	0	0	0	0	0
Heyfield	0	0	0	0	0	0
Jumbuk	0	0	0	0	0	0
Maffra	0	0	0	0	0	0
Mirboo North	0	0	0	0	0	0
Moe	0	0	0	0	0	0
Morwell	0	0	0	0	0	0
Neerim South	0	0	0	0	0	0
Newborough	0	0	0	0	0	0
Noojee	0	0	0	0	0	0

Table 11: Comparison of *E.* coli results for previous years (2018-2021) (cont.)

Water Sampling Locality	2020 - 2021		2019 - 2020		2018 - 2019	
	Maximum Detected (orgs/100mL)	No. of samples where standard was not met (s.18)	Maximum Detected (orgs/100mL)	No. of samples where standard was not met (s.18)	Maximum Detected (orgs/100mL)	No. of samples where standard was not met (s.18)
Rawson	0	0	0	0	0	0
Rokeby/Buln Buln	0	0	0	0	0	0
Rosedale	0	0	0	0	0	0
Sale/Wurruk	0	0	0	0	0	0
Seaspray	0	0	0	0	0	0
Stratford	0	0	0	0	0	0
Thorpdale	0	0	0	0	0	0
Toongabbie	0	0	0	0	0	0
Trafalgar	0	0	0	0	0	0
Traralgon	0	0	0	0	0	0
Traralgon South/ Hazelwood North	0	0	0	0	0	0
Tyers/Glengarry	0	0	0	0	0	0
Warragul	0	0	0	0	0	0
Warragul South	0	0	0	0	0	0
Willow Grove	0	0	0	0	0	0
Yallourn North	0	0	0	0	0	0
Yarragon	0	0	0	0	0	0
Yinnar	0	0	0	0	0	0

Results obtained for the 2020-21 reporting period for each of the localities, with the exception of Boisdale, were similar to that of previous years.

E coli has not been previously detected in Boisdale system, and this result is not consistent with historic E coli test results.

9.2 Chlorine based disinfection by-product chemicals

9.2.1 Trihalomethanes (THM) results

For compliance with the SDWR (2015), a sample result must not exceed 0.25 mg/L trihalomethanes. All our sites achieved 100% compliance with this standard for the 2020-21 reporting period.

Table 12: Trihalomethanes results for all localities for 2020-21

Water Sampling Locality	Frequency of sampling	No. of samples	No. of non-complying samples	Max (mg/L)	Min (mg/L)	Complying (Yes/No)
Boisdale	Monthly	12	0	0.052	0.028	Yes
Boolarra	Monthly	12	0	0.100	0.056	Yes
Briagolong	Monthly	12	0	0.014	0.006	Yes
Churchill	Monthly	12	0	0.094	0.032	Yes
Coongulla-Glenmaggie	Monthly	12	0	0.018	0.007	Yes
Cowwarr	Monthly	12	0	0.091	0.054	Yes
Drouin	Monthly	12	0	0.076	0.029	Yes
Erica	Monthly	12	0	0.035	0.015	Yes
Heyfield	Monthly	12	0	0.031	0.011	Yes
Jumbuk	Monthly	12	0	0.087	0.049	Yes
Maffra	Monthly	12	0	0.037	0.015	Yes
Mirboo North	Monthly	12	0	0.036	0.02	Yes
Moe	Monthly	11#	0	0.059	0.019	Yes
Morwell	Monthly	12	0	0.052	0.014	Yes
Neerim South	Monthly	12	0	0.049	0.028	Yes
Newborough	Monthly	12	0	0.060	0.028	Yes
Noojee	Monthly	12	0	0.044	0.027	Yes
Rawson	Monthly	12	0	0.022	0.012	Yes
Rokeby-Buln Buln	Monthly	12	0	0.073	0.03	Yes
Rosedale	Monthly	12	0	0.092	0.041	Yes
Sale-Wurruk	Monthly	12	0	0.022	0.014	Yes
Seaspray	Monthly	12	0	0.170	0.091	Yes
Stratford	Monthly	12	0	0.051	0.022	Yes
Thorpdale	Monthly	12	0	0.070	0.04	Yes
Toongabbie	Monthly	12	0	0.069	0.042	Yes
Trafalgar	Monthly	12	0	0.045	0.024	Yes
Traralgon	Monthly	12	0	0.038	0.013	Yes
Traralgon South-Hazelwood North	Monthly	12	0	0.048	0.001	Yes
Tyers-Glengarry	Monthly	12	0	0.060	0.033	Yes
Warragul	Monthly	12	0	0.078	0.028	Yes
Warragul South	Monthly	12	0	0.078	0.042	Yes
Willow Grove	Monthly	12	0	0.001	<0.001	Yes
Yallourn North	Monthly	12	0	0.056	0.016	Yes
Yarragon	Monthly	12	0	0.052	0.024	Yes
Yinnar	Monthly	12	0	0.085	0.040	Yes

12 samples were collected for analysis, however only 11 samples were analysed due to a power failure affecting analysis equipment during the storm event in the Latrobe Valley in early June 2021. Refer to Section 9.2.2 for additional information.

Table 13: Comparison of Trihalomethane (THM) results for previous years (2018-2021)

Water Sampling Locality	2020 - 2021		2019 - 2020		2018 - 2019	
	Maximum THM in a sample (mg/L)	Complying (Yes/No)	Maximum THM in a sample (mg/L)	Complying (Yes/No)	Maximum THM in a sample (mg/L)	Complying (Yes/No)
Boisdale	0.052	Yes	0.100	Yes	0.036	Yes
Boolarra	0.100	Yes	0.086	Yes	0.072	Yes
Briagolong	0.014	Yes	0.028	Yes	0.006	Yes
Churchill	0.094	Yes	0.093	Yes	0.068	Yes
Coongulla/Glenmaggie	0.018	Yes	0.019	Yes	0.020	Yes
Cowwarr	0.091	Yes	0.086	Yes	0.073	Yes
Drouin	0.076	Yes	0.075	Yes	0.096	Yes
Erica	0.035	Yes	0.032	Yes	0.040	Yes
Heyfield	0.031	Yes	0.033	Yes	0.027	Yes
Jumbuk	0.087	Yes	0.093	Yes	0.088	Yes
Maffra	0.037	Yes	0.031	Yes	0.027	Yes
Mirboo North	0.036	Yes	0.053	Yes	0.052	Yes
Moe	0.059	Yes	0.069	Yes	0.048	Yes
Morwell	0.052	Yes	0.049	Yes	0.041	Yes
Neerim South	0.049	Yes	0.055	Yes	0.070	Yes
Newborough	0.060	Yes	0.070	Yes	0.051	Yes
Noojee	0.044	Yes	0.039	Yes	0.047	Yes
Rawson	0.022	Yes	0.022	Yes	0.027	Yes
Rokeby/Buln Buln	0.073	Yes	0.076	Yes	0.094	Yes
Rosedale	0.092	Yes	0.120	Yes	0.085	Yes
Sale/Wurruk	0.022	Yes	0.023	Yes	0.029	Yes
Seaspray	0.170	Yes	0.160	Yes	0.190	Yes
Stratford	0.051	Yes	0.042	Yes	0.032	Yes
Thorpdale	0.070	Yes	0.095	Yes	0.074	Yes
Toongabbie	0.069	Yes	0.071	Yes	0.065	Yes
Trafalgar	0.045	Yes	0.072	Yes	0.041	Yes
Traralgon	0.038	Yes	0.060	Yes	0.064	Yes
Traralgon South/ Hazelwood North	0.048	Yes	0.052	Yes	0.045	Yes
Tyers/Glengarry	0.060	Yes	0.059	Yes	0.064	Yes
Warragul	0.078	Yes	0.087	Yes	0.081	Yes
Warragul South	0.078	Yes	0.092	Yes	0.100	Yes
Willow Grove	0.001	Yes	0.001	Yes	0.001	Yes
Yallourn North	0.056	Yes	0.064	Yes	0.050	Yes
Yarragon	0.052	Yes	0.093	Yes	0.094	Yes
Yinnar	0.085	Yes	0.070	Yes	0.056	Yes

Results obtained for each of the localities was similar to the previous two reporting periods.

9.2.2 Actions taken in relation to non-compliance

All localities complied with this water quality parameter.

On review of all water quality data, Gippsland Water identified that one sample result for THMs was not available for the Moe locality from June 2021. After investigation it was determined that the sample had been collected as required in the water sampling schedule on 8 June 2021, submitted to the analytical laboratory, but was not analysed. The analytical laboratory advised that during preparation the sample for analysis, equipment was affected by a widespread power outage caused by a severe weather event in the Latrobe Valley from 9 June 2021.

On this occasion Gippsland Water failed to fulfil its obligations under Regulation 14(2)

> *"A water supplier must ensure that every sample of drinking water given under subregulation (1) to an accredited laboratory for analysis is analysed by that accredited laboratory to measure, in relation to each of the parameters identified in the water sampling program set out in its current risk management plan, the amount of that parameter in the sample."*

We notified DH as soon as becoming aware of the missed analysis. We have commenced working with the laboratory to identify the point of failure of notifications, contributing factors and notification process improvements that may be feasible to avoid similar future situations.

9.3 Turbidity

9.3.1 Turbidity results

For compliance with the SDWR (2015), the 95th percentile of results for samples of drinking water collected in any 12-month period, must be less than or equal to 5.0 NTU (Nephelometric Turbidity Unit). All of our water sampling localities achieved 100% compliance with this standard for the 2020-21 reporting period for the scheduled sampling results.

Table 14: Turbidity results for all water sampling localities in 2020-21

Water Sampling Locality	Frequency of Sampling	Number of Samples	Maximum turbidity in a sample (NTU)	Maximum 95th Percentile of turbidity results in any 12 months (NTU)*	No. of 95th Percentile of results in any 12 months above standard (s.18)	Complying (Yes/No)
Boisdale	Weekly	52	0.1	0.1	0	Yes
Boolarra	Weekly	52	0.2	0.2	0	Yes
Briagolong	Weekly	53	0.1	0.1	0	Yes
Churchill	Weekly	52	0.6	0.4	0	Yes
Coongulla/Glenmaggie	Weekly	52	0.3	0.3	0	Yes
Cowwarr	Weekly	52	0.6	0.2	0	Yes
Drouin	Weekly	52	0.1	0.1	0	Yes
Erica	Weekly	52	0.8	0.4	0	Yes
Heyfield	Weekly	52	0.3	0.2	0	Yes
Jumbuk	Weekly	52	1.3	0.2	0	Yes
Maffra	Weekly	52	0.1	0.1	0	Yes
Mirboo North	Weekly	53	0.3	0.2	0	Yes
Moe	Weekly	52	0.9	0.4	0	Yes
Morwell	Weekly	53	1.4	0.5	0	Yes
Neerim South	Weekly	52	0.8	0.7	0	Yes
Newborough	Weekly	52	0.9	0.4	0	Yes
Noojee	Weekly	52	0.8	0.4	0	Yes
Rawson	Weekly	52	1.0	0.3	0	Yes
Rokeby/Buln Buln	Weekly	52	0.2	0.1	0	Yes
Rosedale	Weekly	52	1.4	0.4	0	Yes
Sale/Wurruk	Weekly	53	0.2	0.1	0	Yes
Seaspray	Weekly	53	0.3	0.3	0	Yes
Stratford	Weekly	52	0.7	0.1	0	Yes
Thorpdale	Weekly	53	2.4	0.4	0	Yes
Toongabbie	Weekly	53	0.2	0.1	0	Yes
Trafalgar	Weekly	52	0.1	0.1	0	Yes
Traralgon	Weekly	51#	0.2	0.1	0	Yes
Traralgon South/ Hazelwood North	Weekly	53	0.3	0.1	0	Yes
Tyers/Glengarry	Weekly	52	0.2	0.2	0	Yes
Warragul	Weekly	104	0.3	0.1	0	Yes
Warragul South	Weekly	52	0.2	0.1	0	Yes
Willow Grove	Weekly	52	0.1	0.1	0	Yes
Yallourn North	Weekly	52	0.2	0.1	0	Yes
Yarragon	Weekly	52	0.2	0.1	0	Yes
Yinnar	Weekly	53	0.3	0.2	0	Yes

* = For calculation purposes, all results reported as <0.1 NTU were rounded to 0.1 NTU for calculating the maximum 95th percentile.

= Due to scheduling, the first weekly turbidity sample for the 2020-21 reporting period occurred on Tuesday 30 June 2020 and the final sample on Thursday 1 July 2021. This totals 52 weeks in duration however as both the first and last week of Turbidity sampling is outside of the reporting period, a total of 51 results are reported for the Traralgon locality. The minimum frequency of weekly sampling for Turbidity was met for the Traralgon locality during the 2020-21 reporting period.

Table 15: Comparison of Turbidity results for previous years (2018-2021)

Water Sampling Locality	2020 - 2021		2019 - 2020		2018 - 2019	
	Maximum turbidity in a sample (NTU)	Maximum 95th Percentile of turbidity results in any 12 months (NTU)*	Maximum turbidity in a sample (NTU)	Maximum 95th Percentile of turbidity results in any 12 months (NTU)*	Maximum turbidity in a sample (NTU)	Maximum 95th Percentile of turbidity results in any 12 months (NTU)*
Boisdale	0.1	0.1	0.1	0.1	0.3	0.1
Boolarra	0.2	0.2	0.5	0.3	0.4	0.3
Briagolong	0.1	0.1	0.2	0.1	0.1	0.1
Churchill	0.6	0.4	0.1	0.1	0.5	0.2
Coongulla/Glenmaggie	0.3	0.3	0.2	0.2	0.2	0.2
Cowwarr	0.6	0.2	5.0	0.2	0.2	0.1
Drouin	0.1	0.1	0.2	0.1	0.2	0.1
Erica	0.8	0.4	2.2	0.5	1.3	0.7
Heyfield	0.3	0.2	0.8	0.2	0.3	0.2
Jumbuk	1.3	0.2	0.2	0.1	0.3	0.2
Maffra	0.1	0.1	0.2	0.1	0.1	0.1
Mirboo North	0.3	0.2	0.5	0.2	0.3	0.1
Moe#	0.9	0.4	1.6	0.3	4.4	0.6
Morwell	1.4	0.5	0.2	0.1	0.1	0.1
Neerim South	0.8	0.7	0.4	0.4	0.3	0.2
Newborough#	0.9	0.4	1.7	0.7	2.8	0.4
Noojee	0.8	0.4	0.7	0.3	0.4	0.4
Rawson	1.0	0.3	0.3	0.3	2.2	0.9
Rokeby/Buln Buln	0.2	0.1	0.1	0.1	0.2	0.1
Rosedale	1.4	0.4	0.2	0.2	0.3	0.2
Sale/Wurruk	0.2	0.1	0.1	0.1	0.1	0.1
Seaspray	0.3	0.3	0.8	0.6	1.9	0.7
Stratford	0.7	0.1	0.2	0.1	0.4	0.3
Thorpdale	2.4	0.4	0.3	0.2	0.7	0.3
Toongabbie	0.2	0.1	0.2	0.1	0.1	0.1
Trafalgar	0.1	0.1	0.2	0.1	0.7	0.3
Traralgon	0.2	0.1	0.3	0.2	0.1	0.1
Traralgon South/ Hazelwood North	0.3	0.1	0.2	0.1	0.5	0.2
Tyers/Glengarry	0.2	0.2	3.2	1.2	2.6	0.2
Warragul	0.3	0.1	0.4	0.1	0.4	0.2
Warragul South	0.2	0.1	1.0	0.3	0.1	0.1
Willow Grove	0.1	0.1	0.2	0.1	0.1	0.1
Yallourn North#	0.2	0.1	1.0	0.7	0.6	0.4
Yarragon	0.2	0.1	1.0	0.2	0.7	0.2
Yinnar	0.3	0.2	0.4	0.3	0.4	0.3

*For calculation purposes, all results reported as <0.1 NTU were rounded to 0.1 NTU for calculating the maximum 95th percentile.

Refer to 2019-20 Annual Water Quality report for information on Moe and Newborough localities

Results obtained for each of the localities was similar to the previous two reporting periods.

9.3.2 Actions taken in relation to non-compliance

All localities complied with this water quality parameter.

9.4 Fluoride

Fluoride testing has been performed in the water supply systems where fluoride is added to the water. This includes the Maffra, Warragul, Sale, Traralgon, Morwell and Moe systems reaching over 90% of our population.

We have sampled localities on a weekly basis even though some of the localities listed in Table 17 require monthly samples according to section 5.1.3 of the *Code of Practice for Fluoridation of Drinking Water Supplies (second edition) 2018* (i.e. if a fluoride plant supplies five or more water sampling localities then the corporation must take a sample each month from a water sampling point in each water sampling locality supplied from those plants such that a sample is collected from the distribution system at least once per week).

9.4.1 Fluoride results

Based on health considerations and the *Health (fluoridation) Act 1973*, no single sample concentration of fluoride in drinking water should exceed 1.5 mg/L, and the average optimum concentration of fluoride should not exceed 1.0 mg/L. All our sites achieved 100% compliance with this standard for the 2020-21 reporting period.

The *Code of Practice for Fluoridation of Drinking Water Supplies (second edition) 2018* , section 4.2.2, defines the operating range of annual average concentration of fluoride being the operating target set by the Department of Health (0.9mg/L for our plants) plus/minus 0.1 mg/L of fluoride. All drinking water fluoridation system operating averages achieved this target for the reporting period. The localities of Churchill, Jumbuk, Yarragon and Sale/Wurruk met the lower operating target of 0.8mg/L, and other localities were between 0.01 and 0.05mg/L below the lower operating target, including when dosing did not occur

Table 16: Fluoride results for all fluoridated localities in 2020-21

Treatment Plant	Water Sampling Locality	Frequency of Sampling	Number of Samples	Operating Target	Max (mg/L)	Min (mg/L)	Overall Average[1] (mg/L)	Operating Average[2] (mg/L)	Comply[3] (Yes /No)	Meeting Obligations[4] (Yes/No)
Maffra	Boisdale	Weekly	52	0.9	0.88	0.67	0.79	0.79	Yes	Yes
	Maffra	Weekly	104	0.9	0.96	0.30	0.78	0.79	Yes	Yes
	Stratford	Weekly	52	0.9	0.88	0.65	0.79	0.79	Yes	Yes
Morwell	Churchill	Monthly	52	0.9	0.85	0.72	0.80	0.80	Yes	Yes
	Boolarra	Monthly	52	0.9	0.84	0.74	0.79	0.79	Yes	Yes
	Jumbuk	Monthly	52	0.9	0.86	0.72	0.80	0.80	Yes	Yes
	Morwell	Weekly	106	0.9	0.91	0.32	0.79	0.81	Yes	Yes
	Traralgon South/ Hazelwood North	Monthly	53	0.9	0.89	0.37	0.79	0.81	Yes	Yes
	Yinnar	Monthly	53	0.9	0.84	0.70	0.79	0.79	Yes	Yes
Moe	Moe	Weekly	104	0.9	0.87	<0.05	0.77	0.80	Yes	Yes
	Newborough	Monthly	52	0.9	0.86	0.20	0.77	0.79	Yes	Yes
	Trafalgar	Monthly	52	0.9	0.89	0.34	0.79	0.80	Yes	Yes
	Yallourn North	Monthly	52	0.9	0.87	0.32	0.77	0.79	Yes	Yes
	Thorpdale[5]	Monthly	53	0.9	0.86	0.51	0.78	0.79	Yes	Yes
	Yarragon	Monthly	52	0.9	0.91	0.34	0.80	0.80	Yes	Yes
Sale	Sale/Wurruk	Weekly	106	0.9	0.90	0.72	0.82	0.82	Yes	Yes
Traralgon	Traralgon	Weekly	102	0.9	0.91	<0.05	0.75	0.79	Yes	Yes

1 = The overall average value calculated based on all monitoring conducted over the 2019-20 reporting period, including when dosing did not occur.
2 = The operating average is calculated excluding the times where dosing did not occur (concentration decreased below 0.2mg/L).
3 = Complying is defined as any sample not exceeding 1.5 mg/L, or the 12-month rolling average not exceeding 1.0 mg/L.
4 = Meeting obligation is defined as the annual average concentration of fluoride was within the operating target plus/minus 0.1mg/L excluding when dosing did not occur.
5 = Water carting to Thorpdale from the Moe system (Trafalgar) commenced in September 2015.

Table 16 (cont.): Fluoride results for all fluoridated localities in 2020-21

Treatment Plant	Water Sampling Locality	Frequency of Sampling	Number of Samples	Operating Target	Max (mg/L)	Min (mg/L)	Overall Average[1] (mg/L)	Operating Average[2] (mg/L)	Comply[3] (Yes /No)	Meeting Obligations[4] (Yes/No)
Warragul	Drouin	Weekly	52	0.9	0.87	0.64	0.82	0.82	Yes	Yes
	Rokeby/Buln Buln	Weekly	52	0.9	0.91	0.71	0.83	0.83	Yes	Yes
	Warragul	Weekly	104	0.9	0.89	0.63	0.82	0.82	Yes	Yes
	Warragul South	Weekly	52	0.9	0.85	0.76	0.81	0.81	Yes	Yes

1 = The overall average value calculated based on all monitoring conducted over the 2019-20 reporting period, including when dosing did not occur.
2 = The operating average is calculated excluding the times where dosing did not occur (concentration decreased below 0.2mg/L).
3 = Complying is defined as any sample not exceeding 1.5 mg/L, or the 12-month rolling average not exceeding 1.0 mg/L.
4 = Meeting obligation is defined as the annual average concentration of fluoride was within the operating target plus/minus 0.1mg/L excluding when dosing did not occur.
5 = Water carting to Thorpdale from the Moe system (Trafalgar) commenced in September 2015.

Table 17: Comparison of Fluoride results for previous years (2018-2021)

Treatment Plant	Water Sampling Locality	2020 - 2021			2019 - 2020			2018 - 2019		
		Max (mg/L)	Min (mg/L)	Overall Average[1] (mg/L)	Max (mg/L)	Min (mg/L)	Overall Average[1] (mg/L)	Max (mg/L)	Min (mg/L)	Overall Average[1] (mg/L)
Maffra	Boisdale	0.88	0.67	0.79	0.91	0.64	0.81	0.90	0.71	0.81
	Maffra	0.96	0.30	0.78	0.92	<0.05	0.81	0.92	0.58	0.82
	Stratford	0.88	0.65	0.79	0.90	0.74	0.81	0.90	0.68	0.82
Morwell	Churchill	0.85	0.72	0.80	0.92	0.74	0.83	0.92	0.80	0.86
	Boolarra	0.84	0.74	0.79	0.89	0.76	0.83	0.90	0.80	0.85
	Jumbuk	0.86	0.72	0.80	0.91	0.74	0.84	0.90	0.81	0.86
	Morwell	0.91	0.32	0.79	1.00	0.54	0.84	1.00	0.08	0.83
	Traralgon South/ Hazelwood North	0.89	0.37	0.79	0.93	0.71	0.85	0.95	0.64	0.86
	Yinnar	0.84	0.70	0.79	0.90	0.74	0.83	0.90	0.80	0.85
Moe	Moe	0.87	<0.05	0.77	0.93	0.17	0.79	0.92	0.35	0.80
	Newborough	0.86	0.20	0.77	0.90	0.28	0.79	0.88	0.58	0.79
	Trafalgar	0.89	0.34	0.79	0.96	0.31	0.80	0.90	0.50	0.80
	Yallourn North	0.87	0.32	0.77	0.87	0.69	0.80	0.89	0.55	0.79
	Thorpdale[5]	0.86	0.51	0.78	0.88	0.62	0.80	0.88	0.54	0.79
	Yarragon	0.91	0.34	0.80	0.97	0.46	0.79	0.96	0.54	0.80
Sale	Sale/Wurruk	0.90	0.72	0.82	0.99	0.59	0.81	0.90	0.65	0.84
Traralgon*	Traralgon	0.91	<0.05	0.75	0.94	0.42	0.82	0.90	0.20	0.79
Warragul	Drouin	0.87	0.64	0.82	0.90	0.65	0.80	1.00	0.80	0.90
	Rokeby/Buln Buln	0.91	0.71	0.83	0.92	0.65	0.81	1.00	0.79	0.90
	Warragul	0.89	0.63	0.82	0.90	0.56	0.80	1.00	0.79	0.90
	Warragul South	0.85	0.76	0.81	0.87	0.68	0.80	0.97	0.83	0.90

1 = The average value calculated based on all monitoring conducted over the 2019-20 reporting period, including when dosing did not occur.

All fluoride dosing systems performed within requirements for the 2020-21 reporting period. Overall system performance has been consistent when compared to the 2018-19 and 2019-20 reporting periods.

9.4.2 Actions taken in relation to non-compliance

All systems achieved compliance against the standard (no single sample concentration of fluoride in drinking water should exceed 1.5 mg/L, and the average level of fluoride should not exceed 1.0 mg/L).

All systems achieved the operating range requirements of the *Code of Practice for Fluoridation of Drinking Water Supplies (second edition) 2018* for the reporting period.

9.4.3 Fluoride dosing systems performance and maintenance 2020-21

Under the *Code of Practice for Fluoridation of Drinking Water Supplies (second edition) 2018*, we are required to notify the DH if the fluoride concentration in drinking water, measured at the fluoridation plant, is less than 0.6 mg/L for a continuous period of greater than 72 hours. Notifications are included under each fluoride plant.

A number of improvements to the fluoridation systems was undertaken during the reporting period. These improvements included the installation of additional protective curtains, automatic shutoff valves at the point of injection, and improvements to bunding arrangements. This improvements were identified as part of a technical audit conducted on the Maffra fluoridation system, with the recommendations applied across all systems.

- Traralgon
  The fluoride dosing system at the Traralgon Water Treatment Plant was operational for the duration of the reporting period.

- Maffra
  The fluoride dosing system at the Maffra Water Treatment Plant was operational for the duration of the reporting period.

- Warragul
  The fluoride dosing system at the Warragul Water Treatment Plant was operational for the duration of the reporting period.

- Sale
  The fluoride dosing system at the Sale Water Treatment Plant was operational for the duration of the reporting period.

- Morwell
  The fluoride dosing system at the Morwell Water Treatment Plant was operational during the reporting period.

- Moe
  The fluoride dosing system at the Moe Water Treatment Plant was operational during the reporting period.

In August 2020, the DH was notified of one occasion which required the Moe fluoride system to be turned off between 11/08/2020 and 21/08/2020 for system maintenance (routine cleaning and replacement of the filter media on the sodium fluoride saturation tank).

9.5 Water treatment, quality and catchment projects and programs undertaken

During the 2020-21 reporting period, we undertook a number of works, programs and projects to ensure that continual improvements were made for the provision of safe drinking water to our customers. These included:

- Major projects for asset replacements
  - Completion of basin liner and cover replacements as Sale WTP and Buckley's Hill basin
  - Commencement of Northways Basin liner and cover replacement
  - Completion of new drinking water storage tank at Warragul South
- Treated water storage basins and tank condition assessments as part of the ongoing inspection, maintenance and cleaning program;

- Ongoing water treatment plant filter upgrades and refurbishment program
    - Morwell WTP,
    - Mirboo North WTP
    - Warragul WTP
    - Traralgon WTP;
- Installation and upgrades of remote secondary disinfection sites and monitoring installations
    - Yallourn North basin
    - Rosedale basin
- Ongoing implementation of water reticulation mains air scouring program, flushing and cleaning;
    - Rawson and Erica
    - Neerim South
    - Trafalgar
    - Morwell high level zone
- Ongoing replacement and upgrade of water quality on-line and field instrumentation;
- Willow Grove (DELWP IWM project) stormwater quality improvement
- Catchment bushfire preparedness inspections with CFA and Forest Fire Management Vic
- Planned fuel reduction burns in catchment areas
- Weed and pest control in catchment areas in conjunction with DELWP and plantation operators
- Catchment and waterway improvement projects

The following figures depict some of our projects and programs:

Figure 7: Revegetation at Willow Grove stormwater for water quality improvement

Figures 8: Preventative Air Scouring mains cleaning in Trafalgar and Morwell

Figure 9: Environmental water delivery area, Heyfield

Figure 10: Catchment fuel reduction burns

Figure 11: Scheduled manual cleaning of filter media at Morwell WTP

Figure 12: Cleaning and disinfection of drinking water storage tank in Noojee

Figure 13: Replacement of water storage tank assets, Warragul South

Figures 14: Installation of automatic flushing devices for managing water quality at extremities of system

Figure 15: Refitting of Neerim South WTP laboratory

Figure 16: Filter outlet turbidity instrument replacements Morwell WTP

9.6 Catchment projects and programs undertaken

We work in partnership with West Gippsland Catchment Management Authority (WGCMA), Landcare groups and local councils to improve and preserve our waterway ecosystems.

We are a stakeholder in the review of the West Gippsland Regional Catchment Strategy and West Gippsland Waterway Strategy. These strategies are due to be reviewed in the coming year. We are working with WGCMA to ensure water quality considerations include potable water supply catchments. The recently reviewed Environment Protection Act 2017 (Vic) and environmental regulations will sharpen the focus on the public health implications of potable water supply protection in these regional strategies.

We contributed $40,000 into a joint project with Wellington Shire Council to assess and rectify with landowners' risks associated with the working condition of septic tanks installed within drinking water catchments. The aim of this program is to reduce human impacts on water quality. We also continue to contribute to a Baw Baw Shire project for septic tanks installed within drinking water catchments as risk and opportunities are identified.

Our biodiversity management programs and extensive carbon sequestration plantings at Dutson Downs also contribute to key objectives in the Regional Catchment Strategy and to improving the overall health of the Ramsar-listed Gippsland Lakes through revegetation and threatened species preservation.

We delivered a project from the Gippsland Integrated Water Management Plan, which involved planting native shrubs and grasses at Willow Grove to protect Blue Rock Lake from pollutants. We partnered with Southern Rural Water, WGCMA, Tanjil Landcare, the grazier who leases the land and Baw Baw Shire Council to revegetate a section of land by the lake to capture pollutants in stormwater coming from nearby homes. We will monitor the impacts of this project on water quality at this site for five years.

Table 18: Gippsland Water - water supply locality water source and activities undertaken

Source water	Raw Water Storage	Water Treatment Plant	Water Sampling Locality	Water Storage Manager	Catchment Management Authority	Catchment Activity Interactions
Macalister River	Lake Glenmaggie	Maffra WTP	Maffra Stratford Boisdale	Southern Rural Water	West Gippsland Catchment Management Authority	• Ongoing participation in Victorian Environmental Water Holder's, Macalister River Environmental Water Advisory Group • Third year funding inspections of on-site waste treatment facilities (septics) with Wellingtons Shire • Water Licence applications referrals – water quality assessments • Planning application assessments: including coordination with Southern Rural Water, as co-referral authority. • Participation as a stakeholder in DELWP Gippsland Strategic Fuel Breaks Project • Discussion with DELWP regarding future catchment declaration • Participation in DELWP-funded Integrated Water Management Planning for Wellington Shire Council • Ongoing liaison with Friends of Bell Bird Corner, Landcare group • Liaison with SRW on Newry Pipeline (irrigation upgrade) project • Sharing of water quality data with WGCMA and SRW for environmental & recreational water monitoring • Sharing of water quality data with horticultural producers • Participation in pre-bushfire season briefing with Forest Fire Management Victoria Heyfield
Bore - Wa De Lock Aquifer	N/A	Briagalong WTP	Briagolong	Southern Rural Water	West Gippsland Catchment Management Authority	• PFAS/PFOA monitoring • Water Licence applications referrals – water quality assessments • Participation as a stakeholder in DELWP Gippsland Strategic Fuel Breaks Project • Engagement with Friends of Blue Pools, Landcare group • Test bore to investigate future water security options • Participation in pre-bushfire season briefing with Forest Fire Management Victoria Heyfield

Table 18 (cont.): Gippsland Water - water sampling locality water source

Source water	Raw Water Storage	Water treatment Plant	Water Sampling Locality	Water Storage Manager	Catchment Management Authority	Catchment Activity Interactions
Tyers River (including Trigger Creek)	Moondarra Reservoir	Morwell WTP	Morwell Boolarra Churchill Yinnar Jumbuk Traralgon South/Hazelwood North	Gippsland Water	West Gippsland Catchment Management Authority	• Moondarra Land Use Options Plan • Hosted pre-bushfire season meeting and field inspection of Moondarra catchment with CFA & DELWP fire crews • Road Maintenance, including at Trigger Creek weir • Participation as a stakeholder in DELWP Gippsland Strategic Fuel Breaks Project • Pre-bushfire season orientation with fire agencies. • Planning application assessments: for water quality risks • Ongoing participation in the Regional Water Monitoring Partnership. • Timber production from GW-owned pine plantation: including harvest & site preparation for re-establishment. • Ongoing liaison with Friends of Tyers State Park • Liaison with Baw Baw shire as major road maintenance manager. • Participation in DELWP-funded Integrated Water Management Planning for Baw Baw Shire Council • Gathering of intelligence data for trespass into closed catchment area • Participation in DELWP Sustainable Water Strategy Review, specific to recreation • Review of forest plantation pesticide application operational plans • Weir maintenance and inspection at Trigger Creek • Reporting of rubbish dumping on Crown land to DELWP & Parks Victoria • Bulk Water shoreline assessments of Moondarra Reservoir
		Tyers WTP	Tyers/Glengarry Rosedale Toongabbie Cowwarr			
		Traralgon WTP	Traralgon			
	Amours Basins	Rawson WTP	Rawson Erica			

Table 18 (cont.): Gippsland Water - water sampling locality water source

Source water	Raw Water Storage	Water Treatment Plant	Water Sampling Locality	Water Storage Manager	Catchment Management Authority	Catchment Activity Interactions
Pederson Weir (Tarago River) Tarago Reservoir - (supplementary supply)	Tarago Reservoir (supplementary supply)	Warragul WTP	Warragul (including Nilma, Drouin East) Warragul South Drouin Rokeby/Buln Buln	Melbourne Water	West Gippsland Catchment Management Authority	• Planning application assessments, including liaison with Melbourne Water • Ongoing liaison with Melbourne Water, specific to Tarago Reservoir water quality. • Engagement with VicForests for timber production coupe over GW pipeline in Tarago state forest • Participation in DELWP Sustainable Water Strategy Review, specific to recreation
		Neerim South WTP	Neerim South Noojee			
Macalister River	Lake Glenmaggie	Coongulla WTP	Coongulla/ Glenmaggie	Southern Rural Water	West Gippsland Catchment Management Authority	•
Bore (Boisdale Aquifer)	N/A	Sale WTP	Sale / Wurruk	Southern Rural Water	West Gippsland Catchment Management Authority	• PFAS/PFOA monitoring • Water Licence applications referrals – water quality assessments
Merrimans Creek	Seaspray raw water storage	Seaspray WTP	Seaspray	Gippsland Water	West Gippsland Catchment Management Authority	• Assist with funding inspections of on-site waste treatment facilities (septics) • PFAS/PFOA monitoring • Ongoing monitoring of the trial of algae control measures in raw water basin • Forestry Spray application program review • Forestry pesticide application, on ground observance and infield monitoring data gathering with HVP Plantations • Ongoing working relationship with Merriman Creek Landcare • Water Licence applications referrals – water quality assessments
Tanjil River	Blue Rock Lake	Willow Grove WTP	Willow Grove	Southern Rural Water	West Gippsland Catchment Management Authority	

Table 18 (cont.): Gippsland Water - water sampling locality water source

Source water	Raw Water Storage	Water treatment plant	Water Sampling Locality	Water Storage Manager	Catchment Management Authority	Catchment Activity Interactions
Thomson River	Heyfield raw water storage	Heyfield WTP	Heyfield	Gippsland Water	West Gippsland Catchment Management Authority	• Planning application assessments, including coordination with Melbourne Water • Participate in Gippsland Strategic Bushfire Fuel Management Planning Project • Discussion with DELWP regarding future catchment declaration • Liaise with Melbourne Water, including Thomson dam visit by Bulk Water staff • Ongoing participation in Victorian Environmental Water Holder's, Thomson River Environmental Water Advisory Group • Participation in WGCMA's Rainbow Creek / Thomson River avulsion working group • Coordination of planning of major project to connect Heyfield WTP to Coongulla supply system • Water Licence applications referrals – water quality assessments
Little Morwell River	N/A	Mirboo North WTP	Mirboo North	N/A	West Gippsland Catchment Management Authority	• Engagement with upstream landholders and assessment of sediment runoff mitigation potentials • Reporting of rubbish dumping in State forest to DELWP • Water Licence applications referrals – water quality assessments
Tanjil River and Narracan Creek	N/A	Moe WTP	Moe Newborough Yallourn North Trafalgar Yarragon Darnum Thorpdale (water carting from Moe water sampling locality)	N/A	West Gippsland Catchment Management Authority	• Third year of co-funding inspections of on-site waste treatment facilities (septics) and stormwater systems • Planning application assessments, including liaison with SRW • Ongoing participation in the Regional Water Monitoring Partnership. • Planning and delivery of a DELWP-funded Integrated Water Management Project at Willow Grove to intercept stormwater, prior to discharge into Blue Rock Lake. • Participation in planting days with Tanjil Landcare • Participation in DELWP-funded Integrated Water Management Planning for Baw Baw Shire Council • Water Licence applications referrals – water quality assessments • Water Act, irrigation dam work permit referrals.

9.7 Other algae, pathogen, chemical or substance not specified that may pose a risk to human health

9.7.1 Overall results

During the reporting period, the corporation monitored for the following health-related aspects of the drinking water supplied to customer taps. The following table lists the parameters and the frequency of samples taken across all localities, comparing the results to the ADWG and the health-based guideline value.

Table 19: Other sampled parameter results for all localities in 2020-21 (Health Based Parameters)

Parameter	Frequency of sampling	2020-21 No. of Samples	2020-21 Maximum Value Recorded for All Localities (mg/L)	2019-20 Maximum Value Recorded for All Localities (mg/L)	2018-19 Maximum Value Recorded for All Localities (mg/L)	Health Based Guideline value (mg/L)	Result
Nitrite	Weekly*/6 Monthly	459	0.031	0.031	0.018	< 3	All results below ADWG health guideline values
Mercury	Quarterly	394	0.0009	0.0001	0.0001	< 0.001	
Chromium	Quarterly	166	<0.001	<0.001	<0.001	< 0.05	
Cadmium	Quarterly	166	<0.0002	<0.0002	<0.0002	< 0.002	
Nitrate	Weekly*/Quarterly	300	1.8	1.5	1.4	< 50	
Nickel	Annually	57	0.010	0.004	0.004	< 0.02	
Arsenic	Annually/Quarterly	130	<0.001	<0.001	<0.001	< 0.01	
Cyanide	Annually	35	<0.005	<0.005	<0.005	< 0.08	
Selenium	Annually/Quarterly	131	<0.001	<0.001	<0.001	< 0.01	
Beryllium	Annually/6 Monthly	70	<0.01	<0.001	<0.01	< 0.06	
Chloryl Hydrate	Monthly	140	0.012	0.014	0.017	< 0.1	
2, 4-Dichlorophenoxy acetic acid	Monthly	140	<0.01	<0.01	<0.01	< 0.03	
Nitrosodimethylamin	Monthly**	25	0.000016	0.000023	0.000014	< 0.0001	
2,4,6-Trichlorophenol	Monthly***	136	<0.001	<0.001	<0.001	< 0.02	
2,4-Dichlorophenol	Monthly***	140	<0.01	<0.001	<0.001	< 0.2	
2- Chlorophenol	Monthly***	136	<0.001	<0.001	<0.001	< 0.3	
Pentachlorophenol	Monthly	140	<0.001	<0.00	<0.001	< 0.01	
Chloride	Annually/Quarterly	225	220	220	180	<250	
Zinc	Annually	57	0.023	0.046	0.018	<3	
Hardness ($CaCO_3$)	Annually/Quarterly	176	78	170	130	<200	
Total dissolved	Annually/Quarterly	138	320	370	380	<600	
Silica	Annually/Quarterly	181	15	15	15	<80	
Sulphate	Annually/Quarterly	156	130	130	63	<250	

*- Weekly monitoring undertaken on chloraminated systems
**- Monthly monitoring undertaken on chloraminated systems
***- Frequency Increased from quarterly to monthly during reporting period

Monitoring for other parameters such as radiological, pesticides, protozoan organisms is conducted routinely. A complete list of raw water parameters monitored is included in Appendix 1. Additional monitoring is performed on a risk basis and as the need arises.

Blue Green Algae (BGA) monitoring is undertaken across our storages based on visual and water quality triggers. Major raw water supply/storages are routinely monitored for BGA as part of the routine catchment monitoring program. The frequency of sampling is determined by the assessed risk and historical bloom occurrences.

For water storages not managed by us, the Water Storage Manager (Melbourne Water – Tarago, Southern Rural Water – Blue Rock and Lake Glenmaggie) undertakes monitoring and advise us of the results in accordance with their respective algae management plans.

Table 20: Routine BGA monitoring for raw water supplies in 2020-21 (samples per month collected)

Location	Jul '20	Aug '20	Sept '20	Oct '20	Nov '20	Dec '20	Jan '21	Feb '21	Mar '21	Apr '21	May '21	Jun '21
Maffra Weir	2	3	3	2	3	5	4	4	5	4	2	5
Heyfield Raw Water Storage	4	3	5	3	5	4	4	4	5	4	5	2
Neerim South Tarago Reservoir	1		1	1	1	1	1	1	1	1	1	1
Rawson Amours Basin	1	1	1	1	1	1	1	1	1	1	1	1
Seaspray Raw Water Storage	2	3	3	2	4	5	4	4	5	4	2	4
Seaspray – Merriman Creek	1	2	1	1	2	3	2	2	1	2	1	2
Blue Rock Lake (Southern Rural Water BGA Program)	Southern Rural Water (SRW) BGA Monitoring Program											
Lake Glenmaggie (Southern Rural Water BGA Program)	Southern Rural Water (SRW) BGA Monitoring Program											
Coongulla WTP Inlet – Lake Glenmaggie	2	2	2	2	3	4	3	4	5	4	2	1
Tarago Reservoir (Melbourne Water BGA Program)	Melbourne Water BGA Monitoring Program											
Moondarra Surface	1	1	1	1	1	1	1		1	1	1	1
Moondarra pipeline		1	1	1	1			1			1	

During the reporting period, although there were algae and blue green algae blooms, none of these impacted the water treatment process or the production of safe drinking water.

9.7.2 Manganese

Manganese can be naturally present in raw water supplies as either a soluble or insoluble form. When concentrations exceed the aesthetic guideline of 0.1 mg/L, manganese can create unacceptable tastes in water, as well as stain fixtures and laundry. The ADWG guideline value is measured against the health guideline value of 0.5 mg/L in ADWG. Our sites achieved 100% manganese ADWG guideline value.

Table 21: Manganese results for all water sampling localities in 2020-21

Water Sampling Locality	Frequency of Sampling	No. of Samples	Average# (mg/L)	Max (mg/L)	Min (mg/L)	Drinking Water Quality Standard Met (ADWG) (Yes/No)^
Boisdale	Monthly	12	0.001	0.002	<0.001	Yes
Boolarra	Weekly	64	0.001	<0.001	<0.001	Yes
Briagolong	Weekly	64	0.001	<0.001	<0.001	Yes
Churchill	Monthly	17	0.002	<0.001	<0.001	Yes
Coongulla/Glenmaggie	Weekly	64	0.002	0.017	<0.001	Yes
Cowwarr	Monthly	12	0.001	<0.001	<0.001	Yes
Drouin	Monthly	12	0.001	0.003	<0.001	Yes
Erica	Monthly	12	0.009	0.018	0.006	Yes
Heyfield	Weekly	64	0.008	0.14	0.002	Yes
Jumbuk	Monthly	12	0.001	<0.001	<0.001	Yes
Maffra	Weekly	64	0.008	0.071	<0.001	Yes
Mirboo North	Weekly	65	0.004	0.009	0.002	Yes
Moe	Weekly	64	0.006	0.036	<0.001	Yes
Morwell	Weekly	155	0.002	0.012	<0.001	Yes
Neerim South	Weekly	64	0.012	0.021	0.007	Yes
Newborough	Monthly	12	0.001	0.003	<0.001	Yes
Noojee	Monthly	13	0.012	0.016	0.008	Yes
Rawson	Weekly	64	0.007	0.019	<0.001	Yes
Rokeby/Buln Buln	Monthly	12	0.001	0.001	<0.001	Yes
Rosedale	Monthly	12	0.001	0.002	<0.001	Yes
Sale/Wurruk	Weekly	65	0.001	0.002	<0.001	Yes
Seaspray	Weekly	65	0.007	0.009	0.004	Yes
Stratford	Monthly	12	0.001	0.002	<0.001	Yes
Thorpdale	Weekly	65	0.001	0.002	<0.001	Yes
Toongabbie	Monthly	12	0.001	<0.001	<0.001	Yes
Trafalgar	Weekly	64	0.001	0.009	<0.001	Yes
Traralgon	Weekly	63	0.001	0.007	<0.001	Yes
Traralgon South/Hazelwood North	Monthly	12	0.001	<0.001	<0.001	Yes
Tyers/Glengarry	Weekly	64	0.002	0.007	<0.001	Yes
Warragul	Weekly	113	0.009	0.015	<0.001	Yes
Warragul South	Monthly	12	0.001	<0.001	<0.001	Yes
Willow Grove	Weekly	64	0.002	0.008	<0.001	Yes
Yallourn North	Monthly	12	0.001	0.002	<0.001	Yes
Yarragon	Weekly	64	0.001	0.011	<0.001	Yes
Yinnar	Monthly	12	0.001	<0.001	<0.001	Yes

*= average unable to be calculated as all results for reporting period were below detection level
#= average values calculated using the detection limit value for sample results showing less than detection limit.
^= Based on the maximum value being below the ADWG guideline health limit of 0.5 mg/L.

9.7.3 Actions taken in relation to non-compliance

All localities complied with this water quality parameter.

9.7.4 Lead

Lead can be present in drinking water as a result of dissolution from natural sources or from household plumbing. Based on health considerations in the ADWG guidelines, concentrations of lead in drinking water should not exceed 0.01 mg/L. Our sites achieved 100% ADWG guideline value against lead guideline values for all customer tap sites.

Table 22: Lead results for all water sampling localities in 2020-21

Water Sampling Locality	Frequency of Sampling	No. of Samples	Average# (mg/L)	Max (mg/L)	Min (mg/L)	Drinking Water Quality Standard Met (ADWG) (Yes/No)^
Boisdale	Quarterly	4	<0.001	<0.001	<0.001	Yes
Boolarra	Quarterly	4	<0.001	<0.001	<0.001	Yes
Briagolong	Quarterly	4	<0.001	<0.001	<0.001	Yes
Churchill	Quarterly	4	<0.001	<0.001	<0.001	Yes
Coongulla/Glenmaggie	Quarterly	4	<0.001	<0.001	<0.001	Yes
Cowwarr	Quarterly	4	<0.001	<0.001	<0.001	Yes
Drouin	Quarterly	4	<0.001	<0.001	<0.001	Yes
Erica	Quarterly	4	<0.001	<0.001	<0.001	Yes
Heyfield	Quarterly	4	<0.001	<0.001	<0.001	Yes
Jumbuk	Quarterly	4	<0.001	<0.001	<0.001	Yes
Maffra	Quarterly	4	<0.001	<0.001	<0.001	Yes
Mirboo North	Quarterly	4	<0.001	<0.001	<0.001	Yes
Moe	Quarterly	4	<0.001	<0.001	<0.001	Yes
Morwell	Quarterly	4	<0.001	<0.001	<0.001	Yes
Neerim South	Quarterly	4	<0.001	<0.001	<0.001	Yes
Newborough	Quarterly	4	<0.001	<0.001	<0.001	Yes
Noojee	Quarterly	4	<0.001	0.001	<0.001	Yes
Rawson	Quarterly	4	<0.001	<0.001	<0.001	Yes
Rokeby/Buln Buln	Quarterly	4	<0.001	<0.001	<0.001	Yes
Rosedale	Quarterly	4	<0.001	<0.001	<0.001	Yes
Sale/Wurruk	Quarterly	4	<0.001	<0.001	<0.001	Yes
Seaspray	Quarterly	4	<0.001	<0.001	<0.001	Yes
Stratford	Quarterly	4	<0.001	<0.001	<0.001	Yes
Thorpdale	Quarterly	4	<0.001	<0.001	<0.001	Yes
Toongabbie	Quarterly	4	<0.001	<0.001	<0.001	Yes
Trafalgar	Quarterly	4	<0.001	<0.001	<0.001	Yes
Traralgon	Quarterly	4	<0.001	0.001	<0.001	Yes
Traralgon South/Hazelwood North	Quarterly	4	<0.001	<0.001	<0.001	Yes
Tyers/Glengarry	Quarterly	4	<0.001	<0.001	<0.001	Yes
Warragul	Monthly	22	<0.001	<0.001	<0.001	Yes
Warragul South	Quarterly	4	<0.001	<0.001	<0.001	Yes
Willow Grove	Quarterly	4	<0.001	<0.001	<0.001	Yes
Yallourn North	Quarterly	4	<0.001	<0.001	<0.001	Yes
Yarragon	Quarterly	4	<0.001	<0.001	<0.001	Yes
Yinnar	Quarterly	4	<0.001	<0.001	<0.001	Yes

*= average unable to be calculated as all results for reporting period were below detection level
#= average values calculated using the detection limit value for sample results showing less than detection limit.
^= Based on the maximum value being below the ADWG guideline health limit of 0.01 mg/L.

9.7.5 Actions taken in relation to non-compliance

All localities complied with this water quality parameter.

9.7.6 Copper

Copper is present in raw water supplies at very low concentrations. Copper can be found in higher concentrations in drinking water as a result of corrosion of copper pipes and fittings. Based on health considerations in the ADWG guideline, concentrations of copper in drinking water should not exceed 2 mg/L. The aesthetic guideline value is 1 mg/L. Our sites achieved 100% ADWG guideline value against both copper guideline values.

Table 23: Copper results for all water sampling localities in 2020-21

Water Sampling Locality	Frequency of Sampling	No. of Samples	Average# (mg/L)	Max (mg/L)	Min (mg/L)	Drinking Water Quality Standard Met (ADWG) (Yes/No)^
Boisdale	Quarterly	4	0.002	0.003	0.001	Yes
Boolarra	Quarterly	4	0.003	0.004	0.002	Yes
Briagolong	Quarterly	4	0.006	0.012	0.002	Yes
Churchill	Quarterly	4	0.004	0.005	0.003	Yes
Coongulla/Glenmaggie	Quarterly	4	0.005	0.008	0.002	Yes
Cowwarr	Quarterly	4	0.011	0.021	0.001	Yes
Drouin	Quarterly	4	0.003	0.005	<0.001	Yes
Erica	Quarterly	4	0.007	0.008	0.005	Yes
Heyfield	Quarterly	4	0.012	0.023	0.003	Yes
Jumbuk	Quarterly	4	0.008	0.02	0.002	Yes
Maffra	Quarterly	4	0.011	0.029	0.001	Yes
Mirboo North	Quarterly	4	0.006	0.012	0.003	Yes
Moe	Quarterly	5	0.004	0.01	<0.001	Yes
Morwell	Quarterly	4	0.003	0.004	0.002	Yes
Neerim South	Quarterly	4	0.013	0.017	0.010	Yes
Newborough	Quarterly	4	0.017	0.062	<0.001	Yes
Noojee	Quarterly	4	0.010	0.017	0.006	Yes
Rawson	Quarterly	4	0.013	0.028	0.002	Yes
Rokeby/Buln Buln	Quarterly	4	0.008	0.01	0.006	Yes
Rosedale	Quarterly	4	0.008	0.013	0.005	Yes
Sale/Wurruk	Quarterly	4	0.014	0.037	0.006	Yes
Seaspray	Quarterly	4	0.012	0.023	0.005	Yes
Stratford	Quarterly	4	0.007	0.016	0.002	Yes
Thorpdale	Quarterly	4	0.005	0.008	0.002	Yes
Toongabbie	Quarterly	4	0.006	0.009	0.004	Yes
Trafalgar	Quarterly	4	0.005	0.007	<0.001	Yes
Traralgon	Quarterly	4	0.003	0.005	<0.001	Yes
Traralgon South/Hazelwood North	Quarterly	4	0.003	0.007	0.002	Yes
Tyers/Glengarry	Quarterly	4	0.014	0.031	0.007	Yes
Warragul	Monthly/Qrty	22	0.001	0.004	<0.001	Yes
Warragul South	Quarterly	4	0.003	0.008	<0.001	Yes
Willow Grove	Quarterly	4	0.005	0.005	0.005	Yes
Yallourn North	Quarterly	4	0.006	0.008	0.004	Yes
Yarragon	Quarterly	4	0.006	0.007	0.004	Yes
Yinnar	Quarterly	4	0.003	0.004	0.001	Yes

*= average unable to be calculated as all results for reporting period were below detection level
#= average values calculated using the detection limit value for sample results showing less than detection limit.
^= Based on the maximum value being below the ADWG guideline health limit of 2 mg/L.

9.7.7 Actions taken in relation to non-compliance

All localities complied with this water quality parameter.

9.8 Aesthetics

9.8.1 pH results

In addition to the monitoring of parameters to determine compliance against the SDWA regulations, pH is routinely monitored in the reticulation system. The ADWG guidelines suggest that the drinking water be between pH 6.5 and pH 8.5. The pH results for all towns are provided below.

Table 24: pH results for all water sampling localities in 2020-21

Water Sampling Locality	Frequency of Sampling	No. of Samples	Average (units)	Max (units)	Min (units)	Drinking Water Aesthetic Operating Range Met (ADWG) (Yes/No)^
Boisdale	Weekly	53	7.5	7.7	7.2	Yes
Boolarra	Weekly	53	7.5	8.3	7.1	Yes
Briagolong	Weekly	53	7.0	7.2	6.9	Yes
Churchill	Weekly	53	7.3	7.8	7.0	Yes
Coongulla/Glenmaggie	Weekly	53	7.8	8.5	7.2	Yes
Cowwarr	Weekly	53	7.7	8.2	7.4	Yes
Drouin	Weekly	53	7.1	7.5	6.9	Yes
Erica	Weekly	53	7.5	8.4	6.7	Yes
Heyfield	Weekly	53	7.2	7.3	7.0	Yes
Jumbuk	Weekly	53	7.2	7.4	7.0	Yes
Maffra	Weekly	53	7.3	7.6	7.0	Yes
Mirboo North	Weekly	52	7.2	7.5	7.0	Yes
Moe	Weekly	163	7.2	8.9	6.8	No
Morwell	Weekly	52	7.1	9.1	6.8	No
Neerim South	Weekly	53	7.6	8.4	7.2	Yes
Newborough	Weekly	101	7.3	9.0	6.9	No
Noojee	Weekly	53	7.8	8.9	7.4	No
Rawson	Weekly	53	7.2	8.2	6.8	Yes
Rokeby/Buln Buln	Weekly	53	7.1	7.4	6.9	Yes
Rosedale	Weekly	53	7.8	9.2	7.2	No
Sale/Wurruk	Weekly	52	7.2	7.9	6.8	Yes
Seaspray	Weekly	52	7.2	7.8	6.8	Yes
Stratford	Weekly	53	7.4	7.7	7.1	Yes
Thorpdale	Weekly	52	8.0	8.8	7.5	No
Toongabbie	Weekly	53	7.2	7.4	7.1	Yes
Trafalgar	Weekly	56	7.3	8.6	7.1	No
Traralgon	Weekly	53	7.2	7.5	7.0	Yes
Traralgon South/Hazelwood North	Weekly	52	7.2	7.5	7.0	Yes
Tyers/Glengarry	Weekly	48	7.3	8.4	7.0	Yes
Warragul	Weekly	53	7.1	7.4	6.9	Yes
Warragul South	Weekly	54	7.3	8.2	7.1	Yes
Willow Grove	Weekly	53	7.8	8.5	7.4	Yes
Yallourn North	Weekly	79	7.2	7.7	6.8	Yes
Yarragon	Weekly	106	7.6	9.8	7.0	No
Yinnar	Weekly	52	7.3	7.8	7.1	Yes

^= Based on the minimum and maximum values being within the ADWG guideline aesthetic operating range of 6.5 – 8.5.

9.8.2 Actions taken in relation to non-compliance

Some systems (such as Moe, Morwell, Newborough, Noojee, Rosedale, Thorpdale, Trafalgar and Yarragon) have experienced elevated pH results, as a result of long residence times of water in the reticulation, cement-lined pipes in parts of the reticulation, and reduced flushing programs due to permanent water saving rules in place. All average pH results were within the range of 6.5 to 8.5. We have continued to monitor pH variations and modify system operation where possible to reduce variability. Automatic flushing devices have been installed in some locations to manage pH changes from excessive “water age”. These also have the benefit of improving chlorine residual in the extremities of the systems.

Reactive flushing of mains based on routine water sampling results is assessed on a case by case basis to manage pH, chlorine residuals and customer water supply pressures.

ADWG states that cement mortar lined pipes can significantly increase the pH and a value up to 9.2 may be tolerated provided monitoring indicates no deterioration in the microbiological quality. No deterioration in the microbiological quality of the water was observed.

9.8.3 Iron results

Iron can become apparent in taste in water at about 0.3 mg/L and above. High concentrations can give water a rust-brown appearance and cause staining of laundry and plumbing fittings. Based on aesthetic considerations the concentration in the ADWG guidelines of iron in drinking water should not exceed 0.3 mg/L, however no health-based guideline value has been set for iron. All sites achieved 100% ADWG guideline value against the aesthetic iron guideline value.

Table 25: Iron results for all water sampling localities in 2020-21

Water Sampling Locality	Frequency of Sampling	No. of Samples	Average# (mg/L)	Max (mg/L)	Min (mg/L)	Drinking Water Quality Standard Met (ADWG) (Yes/No)
Boisdale	Monthly	12	<0.01	<0.01	<0.01	Yes
Boolarra	Weekly	64	0.03	0.07	0.02	Yes
Briagolong	Weekly	64	0.01	0.02	<0.01	Yes
Churchill	Monthly	17	0.01	0.05	<0.01	Yes
Coongulla/Glenmaggie	Weekly	64	0.01	0.09	<0.01	Yes
Cowwarr	Monthly	12	0.02	0.05	<0.01	Yes
Drouin	Monthly	12	0.01	0.01	<0.01	Yes
Erica	Monthly	12	0.11	0.19	0.03	Yes
Heyfield	Weekly	64	0.01	0.02	<0.01	Yes
Jumbuk	Monthly	12	0.02	0.04	<0.01	Yes
Maffra	Weekly	64	<0.01	<0.01	<0.01	Yes
Mirboo North	Weekly	65	0.01	0.03	<0.01	Yes
Moe	Weekly	64	0.01	0.05	<0.01	Yes
Morwell	Weekly	155	0.02	0.29	<0.01	Yes
Neerim South	Weekly	64	0.03	0.05	0.02	Yes
Newborough	Monthly	12	0.01	0.05	<0.01	Yes
Noojee	Monthly	13	0.03	0.04	0.02	Yes
Rawson	Weekly	64	0.03	0.08	<0.01	Yes
Rokeby/Buln Buln	Monthly	12	0.01	0.02	<0.01	Yes
Rosedale	Monthly	12	0.01	0.02	<0.01	Yes
Sale/Wurruk	Weekly	65	0.01	0.02	<0.01	Yes
Seaspray	Weekly	65	0.06	0.17	0.02	Yes
Stratford	Monthly	12	0.01	0.02	<0.01	Yes
Thorpdale	Weekly	65	0.02	0.1	0.01	Yes
Toongabbie	Monthly	12	<0.01	<0.01	<0.01	Yes
Trafalgar	Weekly	64	0.01	0.01	<0.01	Yes
Traralgon	Weekly	63	0.01	0.01	<0.01	Yes
Traralgon South/Hazelwood North	Monthly	12	0.01	0.03	<0.01	Yes
Tyers/Glengarry	Weekly	64	0.05	0.13	<0.01	Yes
Warragul	Weekly	112	0.02	0.48	<0.01	No
Warragul South	Monthly	12	0.01	0.02	<0.01	Yes
Willow Grove	Weekly	64	0.01	0.01	<0.01	Yes
Yallourn North	Monthly	12	0.01	0.01	<0.01	Yes
Yarragon	Weekly	64	0.01	0.04	<0.01	Yes
Yinnar	Monthly	12	0.02	0.06	<0.01	Yes

*= average unable to be calculated as all results for reporting period were below detection level
#= average values calculated using the detection limit value for sample results showing less than detection limit.
^= Based on the maximum value being below the ADWG guideline aesthetic limit of 0.3 mg/L.

9.8.4 Actions taken in relation to non-compliance

All localities complied with this water quality parameter with the exception of Warragul. A result above the aesthetic guideline was recorded at the water treatment plant sample site in January 2021, most likely the result of sample contamination due to maintenance activities. An additional sample was collected which returned a result of <0.01 mg/L.

9.9 Analysis of results

Comparison to previous years

For the 2020-21 reporting period, all samples analysed complied with the relevant health based water quality standards, with the exception of Boisdale. Refer to Section 6.5 for discussion of the Boisdale Ecoli detection in June 2021. The water quality standards required under the SDWR have been represented as trend data over three financial years. This information allows for a comparison of data for the major towns.

An analysis by the percentage of water sampling localities where the drinking water complied with each of the health based parameters, over three reporting periods, is shown below. The table also shows an analysis of the percentage of customers supplied with drinking water that complied with the standards.

Table 26: Compliance by water sampling locality and population

	Percentage by water sampling Locality			Percentage by Population		
Parameter	**2018-19**	**2019-20**	**2020-21**	**2018-19**	**2019-20**	**2020-21**
Aluminum	100%	100%	100%	100%	100%	100%
Chloroacetic Acid	100%	100%	100%	100%	100%	100%
Dichloroacetic Acid	100%	100%	100%	100%	100%	100%
E. coli	100%	100%	97%	100%	100%	99.96%
Trichloroacetic Acid	100%	100%	100%	100%	100%	100%
Trihalomethanes	100%	100%	100%	100%	100%	100%
Turbidity	100%	100%	100%	100%	100%	100%
Nitrite	100%	100%	100%	100%	100%	100%
Nitrate	100%	100%	100%	100%	100%	100%
Fluoride	100%	100%	100%	100%	100%	100%
Mercury	100%	100%	100%	100%	100%	100%
Chromium	100%	100%	100%	100%	100%	100%
Cadmium	100%	100%	100%	100%	100%	100%
Nickel	100%	100%	100%	100%	100%	100%
Arsenic	100%	100%	100%	100%	100%	100%
Selenium	100%	100%	100%	100%	100%	100%
Beryllium	100%	100%	100%	100%	100%	100%
Copper	100%	100%	100%	100%	100%	100%
Barium	100%	100%	100%	100%	100%	100%
Lead	100%	100%	100%	100%	100%	100%
Manganese	100%	100%	100%	100%	100%	100%
Cyanide	100%	100%	100%	100%	100%	100%
Selenium	100%	100%	100%	100%	100%	100%
Molybdenum	100%	100%	100%	100%	100%	100%
Acrylamide	100%	100%	100%	100%	100%	100%
Boron	100%	100%	100%	100%	100%	100%
Chloryl Hydrate	100%	100%	100%	100%	100%	100%
2, 4-Dichlorophenoxy acetic acid	100%	100%	100%	100%	100%	100%
Nitrosodimethylamine	100%	100%	100%	100%	100%	100%
2,4,6-Trichlorophenol	100%	100%	100%	100%	100%	100%
2,4-Dichlorophenol	100%	100%	100%	100%	100%	100%
2- Chlorophenol	100%	100%	100%	100%	100%	100%
Pentachlorophenol	100%	100%	100%	100%	100%	100%

10 Undertakings under section 30 of the SDWA

We have no undertakings relevant to the 2020-21 reporting year.

11 Exemptions under section 20 of the SDWA

We have no exemptions relevant to the 2020-21 reporting year.

12 Variation in aesthetic standards

We have no variations in aesthetic standards sought under section 19 of the SDWA.

13 Regulated water

Regulated water is water that is not intended for drinking but could reasonably be mistaken as drinking water and declared under Section 6 of the Safe Drinking Water Act 2003

We do not manage any regulated water supplies.

14 Glossary of terms

Table 27: Glossary of terms

ADWG	*Australian Drinking Water Guidelines 2011* prepared by National Health and Medical Research Council that details a framework for the management of drinking water.
DH	Department of Health.
CCP	A physical point in treatment processes that can be controlled either by SCADA, or manually, and has a significant impact on water quality.
Detection limit	The lowest concentration of analytical parameter in the sample that can be detected by the process laboratory.
Drinking Water Supply systems	Towns supplied with water from a common water source (WTP, supply mains and reticulation pipe-work).
E. coli	*Escherichia coli*.
Water Sampling Locality	Under the SDWR, a specified area that is supplied with drinking water by a water supplier.
mg/L	Milligram per litre.
NHMRC	National Health and Medical Research Council.
NTU	Nephelometric Turbidity Units.
Properties	A registered customer connection to the drinking water supply.
RMP	Risk Management Plan.
SCADA system	A Supervisory Control And Data Acquisition (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 processes
SDWA	*Safe Drinking Water Act 2003* Act No.46/2003.
SDWR	Safe Drinking Water Regulations 2015 S.R No.88/2015.
Source Water	Raw water supply for town, prior to treatment.
THM	Trihalomethane.
WSAA	Water Services Association Australia.
WTP	A facility where raw water is directed through various treatment processes and produces treated water fit for human consumption
100mL	100 millilitres.
<	Less than.
>	Greater than.
≤	Less than or equal to.
≥	Greater than or equal to.

15 Further information

The *Safe Drinking Water Act (2003)* No.46/2003, section 23, requires us to disclose water quality monitoring information publically. We publish this Annual Drinking Water Report on the following website : www.gippswater.com.au/residential/about-us/corporate-documents/drinking-water-reports

Customers and members of the public may request further drinking water quality information by phoning 1800 050 500, or visiting our websites:

www.gippswater.com.au or,
www.gippswater.com.au/residential/what-we-do/water-quality

16 References

National Health and Medical Research Council. *Australian Drinking Water Guidelines 2011.*
Web address: www.nhmrc.gov.au

Department of Health and Human Services - Guidance: Water quality annual report Section 26 of the Safe Drinking Water Act 2003 Regulations 16 and 17 of the Safe Drinking Water Regulations 2015 – June 2017

Safe Drinking Water Act (2003) No.46/2003

Safe Drinking Water Regulations (2015) S.R No.88/2015

Health (Fluoridation) Act (1973)

Code of Practice for Fluoridation of Drinking Water Supplies; *Second Edition (2018)*

This page intentionally left blank

Appendix 1: Raw water monitoring

Source water	Water Sampling Locality	Nature of other raw water monitoring programs		
		Weekly/Fortnightly	Monthly	Annual/Quarterly
Moondarra Reservoir via Tyers River	Morwell Churchill Yinnar Jumbuk Boolarra Traralgon South/ Hazelwood North	**Physicals** • Absorbance (254nm) • Colour True (465nm) • Dissolved Oxygen • SUVA (245nm) • Turbidity • Electrical Conductivity @25ºC • pH **Microbiological** • *Escherichia coli* • Total Coliforms • Heterotrophic Plate Count **Metals*** • Iron Total • Manganese Total • Mercury	**Physicals** • Alkalinity Bicarbonate as $CaCO_3$ • Alkalinity Total as $CaCO_3$ • Dissolved Organic Carbon (DOC) • Total Organic Carbon (TOC) • Total Dissolved Solids (TDS) • SUVA (245nm) • Chlorophyll a **Chemical inorganic** • Ammonia as N • Bromide • Chloride • Fluoride • Nitrate as N • Nitrite as N • Organic Nitrogen as N • Phosphorous, Reactive as P • Phosphorous Total as N • Sulphate • Total Kjeldahl Nitrogen as N • Total Nitrogen as N **Biological** • Algae • Blue Green Algae (sampling frequency may vary depending on the season and results received)	**Physicals*** • Total Dissolved Solids (TDS) • Suspended Solids **Chemical inorganic** • Cyanide • Dissolved Organic Carbon (DOC) • Total Organic Carbon (TOC) • Bromide • Fluoride **Metals*** • Aluminium Total • Arsenic Total • Selenium • Cadmium Total • Copper Total • Lead Total • Mercury • Zinc Total **Radiological** • Gross Alpha Activity • Gross Beta Activity **Microbiological** • *Cryptosporidium spp* • *Giardia spp*
	Traralgon			
	Tyers/Glengarry Rosedale Cowwarr Toongabbie			
Macalister River	Maffra			
	Stratford			
	Boisdale			
Bore – Wa De Lock Aquifer	Briagolong			
Pederson Weir (Tarago River) Tarago Reservoir - (supplementary supply)	Warragul (including Nilma, Darnum, Drouin East)			
	Warragul South			
	Drouin			
	Rokeby/Buln Buln			
Macalister River	Coongulla/ Glenmaggie			
Trigger Creek	Rawson			
	Erica			

Source water	Water Sampling Locality	Nature of other raw water monitoring programs		
		Weekly/Fortnightly	Monthly	Annual/Quarterly
Thomson River	Heyfield		**Metals** • Aluminium Total • Arsenic Total • Calcium Total • Cadmium Total • Copper Total • Iron Total • Iron Soluble • Lead Total • Mercury • Potassium • Magnesium • Manganese Total • Manganese Soluble • Selenium • Zinc Total **Chlorophenols (Sale Bores Only)** • 2,3,4,5 Tetrechlorophenol • 2,6-Dichlorphenol • 2-Chlorophenol • 4-Chloro-3-Methylphenol • Total Phenols (Halogenated) • Pentachlorophenol • 2,4,5-Trichlorophenol **PFOS/PFOA suite** (Seaspray, Sale Bores, Briagolong Bores and reticulation)	**Pesticides, Herbicides and Chemical Organics**** • 2,4,5-T (Herbicide) • 2,4,5-Tp (Silvex) • 2,4,6-T • 2,4-D • 2,4-Db • 2,4-Dp • 2,6-D • 3-Hydroxy Carbofuran • 4-Cpa • 4 Chlorophenoxy Acetic Acid • 4,4-Ddd • 4,4-Dde • 4,4-Ddt • Abamectin • Acephate • Alachlor • Aldicarb • Aldrin • Ametryn • Aminopyralid • Amitraz • Ampa • Asulam • Atrazine • Atrazine-Desethyl • Atrazine-Desisopropyl • Azinphos-Ethyl • Azinphos-Methyl • Azoxystrobin • Bendiocarb • Benomyl • Bensulfuron Methyl • Bensulide • Bentazon • BHC (Alpha) • BHC (Beta)
Little Morwell River	Mirboo North			
Tanjil River and Narracan Creek	Moe			
	Newborough			
	Yallourn North			
	Trafalgar			
	Yarragon			
Tarago River	Neerim South			
	Noojee			
Bore (Boisdale Aquifer)	Sale/Wurruk			
Merrimans Creek	Seaspray			
Tanjil River and Narracan Creek	Thorpdale			
Tanjil River	Willow Grove			

Source water	Water Sampling Locality	Nature of other raw water monitoring programs		
		Weekly/Fortnightly	Monthly	Annual/Quarterly
				• BHC (Delta) • Bifenthrin • Boscalid • Brodifacoum • Bromacil • Bromophos-Ethyl • Bromoxynil • Butachlor • Carbaryl • Carbendazim • Carbofenothion • Carbofuran • Carboxin • Carfentrazone-Ethyl • Chlorantraniliprole • Chlordane (Cis) • Chlordane (Trans) • Chlorfenvinphos • Chlorothalonil • Chloroxuron • Chloropyrifos • Chloropyrifos - Methyl • Chlorsulfuron • Clopyralid • Coumaphos • Cyanazine • Cyfluthrin • Cypermethrin • Cyproconazole • Cyprodinil • Cypromazine • Cyromazine • Deltamethrin • Demeton-O • Demeton-S • Demeton-S-Methyl • Diazinon • Dicamba

Source water	Water Sampling Locality	Nature of other raw water monitoring programs		
		Weekly/Fortnightly	Monthly	Annual/Quarterly
				• Dichlobenil • Dichlorprop • Dichlorprop-P • Dichlorvos • Diclofop-Methyl • Dicofol • Dieldrin • Difenoconazole • Diflubenzuron • Diflufenican • Dimethoate • Dinoseb • Diphenamid • Diquat • Disulfoton • Diuron • ENDOSULFAN (Alpha) • ENDOSULFAN (Beta) • Endosulfan Sulphate • Endothal • Endrin • Endrin Aldehyde • Endrin Ketone • Epn • Eptc • Ethion • Ethoprophos • Etridiazole • Fenamiphos • Fenarimol • Fenchlorphos (Ronnel) • Fenitrothion • Fenoxycarb • Fensulfothion • Fenthion • Fenvalerate • Fipronil • Flamprop Methyl

Source water	Water Sampling Locality	Nature of other raw water monitoring programs		
		Weekly/Fortnightly	Monthly	Annual/Quarterly
				• Fluometuron • Flupropanate • Fluroxypyr • Flusilazole • Formothion • Fosetyl Aluminium • Glyphosate • Haloxyfop • Heptachlor • Heptachlor Epoxide • Hexachlorobenzene • Hexaconazole • Hexaflurate • Hexazinone • Imazapyr • Indoxacarb • Iodosulfuron Methyl • Iprodione • Irgarol • Isoproturon • Lindane • Malathion • Mcpa • Mcpb • Mecoprop • Metalaxyl • Metalaxyl-M • Metaldehyde • Methidathion • Methiocarb • Methomyl • Methoxychlor • Metolachlor • Metribuzin • Mevinphos • Molinate • Monocrotophos • Myclobutanil

Source water	Water Sampling Locality	Nature of other raw water monitoring programs		
		Weekly/Fortnightly	Monthly	Annual/Quarterly
				• Naftalofos • Napropamide • Nicarbazin • Nitralin • Norfluazon • Novaluron • Omethoate • Oryzalin • Oxamyl • Oxychlordane • Oxyfluorfen • Paclobutrazole • Paraquat • Parathion • Parathion-Methyl • Pebulate • Penconazole • Pendimethalin • Permethrin • PFAS • Phorate • Picloram • Pirimicarb • Pirimiphos-Ethyl • Pirimiphos-Methyl • Prochloraz • Profenofos • Promecarb • Prometon • Prometryn • Propachlor • Propamocarb • Propanil • Propargite • Propazine • Propiconazole • Propyzamide • Prothiofos

Source water	Water Sampling Locality	Nature of other raw water monitoring programs		
		Weekly/Fortnightly	Monthly	Annual/Quarterly
				• Pyraclostrobin • Pyrasulfatole • Pyrazophos • Pyrimethanil • Pyriproxyfen • Pyroxsulam • Quinclorac • Rimsulfuron • Siduron • Silvex • Simazine • Simetryn • Spirotetramat • Sulfotep • Sulprofos • Tebuconazole • Tebuthiuron • Temephos • Terbacil • Terbufos • Terbuthylazine • Terbutryn • Tertbutryn • Tetrachlorvinphos • Tetraconazole • Thiamethoxam • Thiobencarb • Thiodicarb • Thiometon • Toltrazuril • Trans Chlordane • Triadimefon • Triadimenol • Triazophos • Trichlorfon • Trichloronate • Triclopyr • Trifloxystrobin

Source water	Water Sampling Locality	Nature of other raw water monitoring programs		
		Weekly/Fortnightly	Monthly	Annual/Quarterly
				• Trifloxysulfuron-Sodium • Trifluralin • Trinexapac Ethyl • Vernolate

*Reduced frequency of monitoring in some catchments based on risk profile.
** Note all pesticides, herbicides and chemical organics results were within ADWG guideline values.
Not all parameters were measured at all localities or source waters.
Purpose of monitoring - risk management within catchments and raw water supply systems.
Comprehensiveness (frequency) – weekly, fortnightly, monthly, quarterly and annual monitoring or as risks identified.

Appendix 2: Safe Drinking Water Act Audit Certificate of Compliance

Risk Management Plan Audit Certificate
Safe Drinking Water Regulations 2015

Certificate Number: REC-20-222
Audit period: 31 May 2018 to 26 August 2020

To:
Mr David Toohey
Manager Water Treatment Quality and Catchment
Gippsland Water
55 Hazelwood Road
Traralgon VIC 3844

Australian Business Number (ABN): 75 830 750 413

I, Karen Pither, after conducting a risk management plan audit of the water supplied by Gippsland Water, am of the opinion that—

> Gippsland Water *has* complied with the obligations imposed by section 7(1) of the *Safe Drinking Water Act 2003* during the audit period.

26 August 2020

PO BOX 348
55 Hazelwood Road
Traralgon VIC 3844

Enquiries 1800 050 500
Faults and emergencies 1800 057 057

contactus@gippswater.com.au
www.gippswater.com.au

ABN 75 830 750 413

Gippsland Water