



East Gippsland **Water**

DRINKING WATER QUALITY ANNUAL REPORT 2021-22

EAST GIPPSLAND WATER



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CONTENTS

1.	INTRODUCTION	1
1.1.	Characteristics of the system	1
2.	WATER TREATMENT AND QUALITY RISK MANAGEMENT SYSTEMS	3
2.1.	Water Supply System Summary	5
2.2.	Issues	9
2.3.	Source Water Protection	9
3.	EMERGENCY INCIDENT AND EVENT MANAGEMENT	10
3.1.	COVID-19.....	10
3.2.	Section 18 Notifications.....	10
3.3.	Section 22 Notifications.....	10
4.	QUALITY OF DRINKING WATER FOR 2021-22	11
4.1.	Regulated Parameters	12
4.1.1.	Escherichia coli (E. coli).....	12
4.1.2.	Total Trihalomethanes.....	13
4.1.3.	Turbidity.....	14
4.1.4.	Fluoride.....	15
4.2.	Other Substances	16
4.2.1.	Arsenic.....	16
4.2.2.	Barium	17
4.2.3.	Cadmium	18
4.2.4.	Chlorite	19
4.2.5.	Chromium.....	19
4.2.6.	Copper	20
4.2.7.	Cyanide.....	21
4.2.8.	Dichloroacetic Acid	22
4.2.9.	Free Chlorine.....	23
4.2.10.	Iodide	24
4.2.11.	Lead	24
4.2.12.	Manganese.....	25
4.2.13.	Trichloroacetic Acid.....	26
4.3.	Aesthetic Characteristics	27
4.3.1.	Colour (True)	27
4.3.2.	Hardness	28
4.3.3.	Iron.....	28
4.3.4.	pH	29
4.3.5.	Zinc	30
4.3.6.	Acid Soluble Aluminium.....	31
4.4.	Analysis of Results.....	32
5.	QUALITY OF RAW AND PARTIALLY TREATED WATER FOR 2021-22	34



5.1.	Other Substances	34
5.1.1.	Radiological.....	34
5.1.2.	Biocides in raw water sources	35
5.1.3.	Blue green algae in raw water and clear water	36
6.	CONTINUOUS IMPROVEMENT MEASURES	38
7.	COMPLAINTS RELATING TO WATER QUALITY.....	39
7.1.	Alleged Health Complaints.....	40
7.2.	Discoloured Water	40
7.3.	Taste and Odour	40
7.4.	Air in Water (White Water).....	40
8.	REGULATED WATER	41
9.	UNDERTAKINGS, AESTHETIC STANDARD VARIATIONS AND EXEMPTIONS	41
10.	FURTHER INFORMATION	41
11.	GLOSSARY OF TERMS	42
APPENDIX A.	RISK MANAGEMENT PLAN CERTIFICATE OF COMPLIANCE.....	44

LIST OF FIGURES

Figure 1:	EGW's region of operation	2
Figure 2:	Structure of the Drinking Water Quality Risk Management System	5
Figure 3:	EGW Source water catchments (Source: vro.agriculture.vic.gov.au).....	10

LIST OF TABLES

Table 1:	Action Plan and Status in response to the 2019/20 Drinking Water Risk Management Plan Audit	3
Table 2:	Water Supply and Treatment Systems Summary.....	6
Table 3:	Safe Drinking Water Regulations 2015 – Schedule 2 Drinking Water Quality Standards	11
Table 4:	<i>E. coli</i> sampling frequency and results for 2021-22.....	13
Table 5:	Total Trihalomethanes sampling frequency and results for 2021-22	13
Table 6:	Turbidity sampling frequency and results for 2021-22	14
Table 7:	Fluoride sampling frequency and results for 2021-22	15
Table 8:	Arsenic sampling frequency and results for 2021-22	16
Table 9:	Barium sampling frequency and results for 2020/21.....	17
Table 10:	Cadmium sampling frequency and results for 2021-22	18
Table 11:	Chlorite sampling frequency and results for 2020/21.....	19
Table 12:	Chromium sampling frequency and results for 2021-22	20
Table 13:	Copper sampling frequency and results for 2021-22	20
Table 14:	Cyanide sampling frequency and results for 2021-22	21
Table 15:	Dichloroacetic Acid sampling frequency and results for 2021-22	22
Table 16:	Free Chlorine sampling frequency and results for 2021-22	23
Table 17:	Iodide sampling frequency and results for 2021-22	24



Table 18: Lead sampling frequency and results for 2021-22	25
Table 19: Manganese sampling frequency and results for 2021-22.....	25
Table 20: Trichloroacetic Acid sampling frequency and results for 2020/21.....	26
Table 21: Colour sampling frequency and results for 2021-22.....	27
Table 22: Hardness sampling frequency and results for 2021-22	28
Table 23: Iron sampling frequency and results for 2021-22.....	29
Table 24: pH sampling frequency and results for 2021-22.....	30
Table 25: Zinc sampling frequency and results for 2021-22	30
Table 26: Acid Soluble Aluminium sampling frequency and results for 2021-22.....	31
Table 27: Reticulation and entry point monitoring and results 2021-22	33
Table 28: Reticulation and entry point - other parameter monitoring results 2019-2022	34
Table 29: Biocide sampling program and results 2021-22	35
Table 30: Blue green algae sampling program and results 2021-22	37
Table 31 Summary of all customer water quality complaints 2021-2022.....	39
Table 32 Summary of all customer water quality complaints per locality 2021-22	39



1. INTRODUCTION

Our role at East Gippsland Water (EGW) is to provide quality water and wastewater services to sustain and enhance our community. We are committed to providing customers with excellent quality and safe drinking water that meets the requirements of the *Safe Drinking Water Act 2003*, Statement of Obligations and customer expectations and in line with EGW's Drinking Water Quality Policy Statement. Providing our customers with safe and reliable drinking water that meets health-based requirements and is delivered to our customers when they need it.

Last financial year we treated and delivered over 4,857ML of drinking water. This water was distributed to around 27,440 customer connections across East Gippsland. The quality of our drinking water consistently performs well against the *Safe Drinking Water Regulations 2015* with all drinking water supplied to our customers being fully compliant with drinking water quality standards during 2021-22.

We continue to improve our supplies through strategic investment in new infrastructure and focus on maintenance systems for existing infrastructure. We continue to improve our operational activities to identify and manage risks.

1.1. Characteristics of the system

Our service region covers approximately 21,000 square kilometres and extends east from Lindenow and Bairnsdale, through Lakes Entrance to Mallacoota near the New South Wales border, and as far north as Dinner Plain in the High Country of the Victorian Alps (Figure 1).

Most of the water delivered to customers is sourced from local river systems. Underground aquifers are utilised in our Mallacoota and Mitchell systems to supplement supply. Dinner Plain is our only locality where all drinking water is sourced from local aquifers.

Nine separate water supply systems serve the communities of Bairnsdale, Bemm River, Bruthen, Buchan, Cann River, Dinner Plain, Eagle Point, Johnsonville, Lakes Entrance, Lake Tyers Aboriginal Trust, Lake Tyers Beach, Lindenow, Lindenow South, Mallacoota, Marlo, Metung, Newlands Arm, Newmerella, Nicholson, Nowa Nowa, Omeo, Orbost, Paynesville, Raymond Island, Sarsfield, Swan Reach and Swifts Creek. A summary of our water supply and treatment systems is provided in Section 2.1.



Figure 1: EGW's region of operation



2. WATER TREATMENT AND QUALITY RISK MANAGEMENT SYSTEMS

To manage water quality risks, a Drinking Water Quality Risk Management System (DWQRMS) supports and identifies key risks ensuring they are managed appropriately. The DWQRMS has been developed in accordance with the Australian Drinking Water Guidelines 2011 (Version 3.8, Sept 22). An overview of its structure is shown in Figure 2.

Internal audits of the DWQRMS are undertaken routinely to ensure we continually improve our systems. There was no audit undertaken during this reporting period. The previous external audit was undertaken at the request of a written notice of the Secretary of the Department of Health (DH) under section 11 of the *Safe Drinking Water Act 2003* in April 2020, this was reported to DH in our 2020-21 Drinking Water Quality Annual Report. Our next external water quality audit is scheduled for February 2023.

EGW was non-compliant with the obligations imposed by section 7 (1) of the Act. One minor non-compliance with three (3) recommendations (REC) and three (3) opportunities for improvement (OFI) were identified during the external audit. EGW has reviewed all recommendations and incorporated multiple changes within our business (Table 1).

Table 1: Action Plan and Status in response to the 2019-20 Drinking Water Risk Management Plan Audit

REFERENCE	ACTION	STATUS
REC-2020-001	Review the methodology used to assess catchment categories to ensure the nominated methodology has been consistently and transparently applied.	East Gippsland Water engaged Water Futures to review the methodology employed by EGW to assess catchment categories, and to verify that the nominated methodology has been consistently and transparently applied.
REC-2020-003	Review health-based target (HBT) assessments to ensure there is adequate treatment for all catchment categories.	Water Futures independently reviewed the HBT assessment and catchment categories proposed by EGW for the catchments identified by the auditor as an area of concern. This process is being extended to all other HBT assessments.
REC-2020-002	Develop and implement <i>E. coli</i> monitoring programs to ensure a sufficient number of samples are taken weekly to inform the HBT Assessment process.	East Gippsland Water recently engaged Water Futures to review our drinking water sampling program. Changes have been implemented.
OFI-2020-001	Establish processes to ensure the emergency contacts list is reviewed regularly.	East Gippsland Water has a process for updating the emergency contact list – every 3 months. The list was scheduled to be updated in March 2020 but was not completed due to East Gippsland Bushfires and COVID-19 response. EGW has included this requirement into the Drinking Water Risk Management Plan. This list is



		currently available to all staff via the Intranet. EGW will to regularly update the list.
OFI-2020-002	Develop a formal process for progressing preventive and reactive maintenance and keeping records of maintenance work completed.	<p>East Gippsland Water continues to prioritise a step change in its asset management practices through the implementation of our Asset Management Improvement Project (AMIP). This project includes actions across the whole asset lifecycle, including actions related to maintenance procedures.</p> <p>AMIP is a current and long-term project. Formalising the process for preventative and reactive maintenance is expected to be developed and rolled out across the business over the next three years.</p>
OFI-2020-003	Consider undertaking Tier 2 assessments for catchments that may have anomalous microbial indicator concentrations.	East Gippsland Water will consider implementing this OFI should the Health Based Target assessment review recommend it.

As a Victorian water agency, EGW treats the regulatory risk management plan audit findings seriously. The minor non-compliance RECs and OFIs stated above had no impact on the quality of water being delivered to customers.

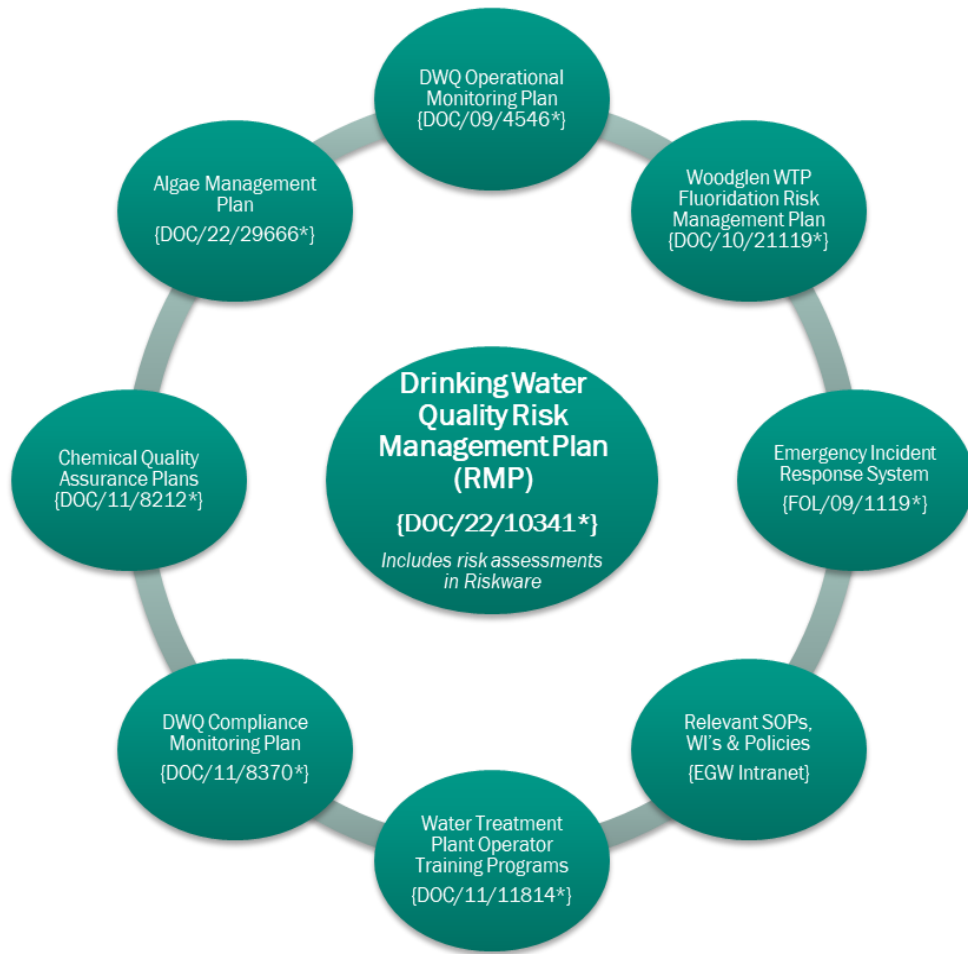


Figure 2: Structure of the Drinking Water Quality Risk Management System

2.1. Water Supply System Summary

Water treatment processes vary slightly according to each locality. A description of each treatment process and chemical additives is included in the glossary of terms.

A summary of the nine systems is provided in Table 2 below.

Table 2: Water Supply and Treatment Systems Summary

WATER SAMPLING LOCALITY	DRINKING WATER CONNECTIONS*	SOURCE WATER	CATCHMENT DESCRIPTION	RAW WATER STORAGE	TREATMENT PLANT	TREATMENT PROCESS	ADDED SUBSTANCES	COMMENTS
BAIRNSDALE	8522	Mitchell River Aquifer (5 bores, seasonal supplemental supply)	Primarily forest (> 90%) with some human, forestry and agricultural impacts, some cattle and some septic tanks particularly around the town of Dargo. The non-forested area is around 5-10% of the catchment, but is mostly located near the river banks	Woodglen No. 1 (850ML) & 2 (713ML) storage basins	Woodglen	Coagulation, flocculation, clarification (dissolved air flotation), filtration (granular media filter), disinfection, fluoridation, mechanical dewatering	Caustic soda, poly (LT 25 & 27), poly aluminium chlorohydrate (PAC 23), chlorine (compressed chlorine gas and sodium hypochlorite); fluoride (fluorosilicic acid), powder activated carbon.	LT 25 used for backwash water clarification LT 27 used for centrifuge Fluoride dosing commenced in August 2010 Capacity for powder activated carbon addition exists, but is not currently in use
LINDENOW	245							
LINDENOW SOUTH	189							
SARSFIELD-BRUTHEN	620							
MERRANGBAUR	1005							
SUNLAKES-TOORLOO	3080							
KALIMNA	696							
EAGLE POINT-PAYNESVILLE	4174							
NICHOLSON-SWAN REACH	914							
METUNG	1450							
NOWA NOWA	113							
BUCHAN	109	Buchan River	80% forest with some minor impacts (forestry, agriculture,	N/A	Buchan	Coagulation, flocculation, clarification (dissolved air flotation),	Caustic soda, poly aluminium chlorohydrate (PAC 23), poly (LT 25),	LT 25 used for backwash water clarification



WATER SAMPLING LOCALITY	DRINKING WATER CONNECTIONS*	SOURCE WATER	CATCHMENT DESCRIPTION	RAW WATER STORAGE	TREATMENT PLANT	TREATMENT PROCESS	ADDED SUBSTANCES	COMMENTS
			cattle and camping)			filtration (granular media filter), disinfection, Geobag dewatering	chlorine (sodium hypochlorite)	1 modular floating cover
CANN RIVER	194	Cann River	Forest, some agricultural land (cattle), minimal septic tanks, roads	3.4ML basin (shade-cloth covered)	Cann River			
BEMM RIVER	102	Bemm River	90% forest, with some minor forestry, agricultural and human impacts.	6.4 ML covered basin ¹ .	Bemm River			
SWIFTS CREEK	128	Tambo River	Forest, agricultural land (cattle), some septic tanks, roads and logging	4.6ML basin (shade-cloth covered)	Swifts Creek	Coagulation, flocculation, dissolved air flotation, filtration, disinfection (Ultraviolet (UV) and chlorine), Geobag	Caustic soda, poly aluminium chlorohydrate (PAC 23), poly (LT 25), chlorine (sodium hypochlorite)	LT 25 used for backwash water clarification



WATER SAMPLING LOCALITY	DRINKING WATER CONNECTIONS*	SOURCE WATER	CATCHMENT DESCRIPTION	RAW WATER STORAGE	TREATMENT PLANT	TREATMENT PROCESS	ADDED SUBSTANCES	COMMENTS
ORBOST	2054	Brodribb River & Rocky River	90% forest, with some forestry, agricultural and human impacts	6ML basin	Orbost	Coagulation, flocculation, clarification (upflow clarifier), filtration (granular media filter), disinfection, Geobag dewatering,	Caustic Soda, poly aluminium chlorohydrate (PAC 23), poly (LT 20), chlorine (sodium hypochlorite)	1 modular floating cover
OME0	264	Butchers Creek	State forest with minimal human impacts (some grazing)	5ML (shade-cloth covered) and 10ML covered basin ¹	Omeo			
MALLACOOTA	1017	Betka River & Aquifer (3 bores)	State forest with minimal human impacts (some forestry)	41ML basin (shade-cloth covered)	Mallacoota	Ultraviolet (UV) disinfection (Mallacoota only)	Caustic soda, poly aluminium chlorohydrate (PAC 23), poly (LT 20 & 25), chlorine (sodium hypochlorite)	LT 25 used for backwash water clarification
DINNER PLAIN	395	Aquifer (2 bores)	Supply is extracted from bores deeper than 70m, with an exclusion	700kL tank	Dinner Plain	Ultraviolet (UV) disinfection	Nil	Nil

Note*: Number of customer connections includes both residential and non-residential customers.

2.2. Issues

There were no other issues in addition to what has been reported in this document.

2.3. Source Water Protection

The Drinking Water Quality Risk Management Plan (RMP), identifies risks to drinking water quality at all steps in the water supply chain, from catchment to consumer, and ensures that appropriate control measures and checks are in place to effectively manage those risks.

In accordance with Catchment and Water Protection Policy we recognise the critical importance of sustainable catchment management for the protection of water quality and quantity. We work in collaboration with a number of external stakeholders, including the Department of Environment, Land, Water and Planning, the East Gippsland and North East Catchment Management Authorities to identify and manage water quality risks at the catchment level. Our catchments' health risks are addressed in comprehensive waterway strategies developed by the above authorities with the support of EGW with the primary goal of continual improvement to river and catchment health. The works conducted as part of the waterway strategies reduce source water quality risks, through initiatives such as livestock exclusion from rivers, riparian zone revegetation and river bank stabilisation for erosion control.

This integrated management approach to source water protection is ensured through the following legislation:

- *Water Act 1989*
- *Planning and Environment Act 1987*
- *Catchment and Land Protection Act 1994*
- *Land Act 1958*
- *Environment Protection Act 2017* (including relevant State Environment Protection Policies - SEPPs)

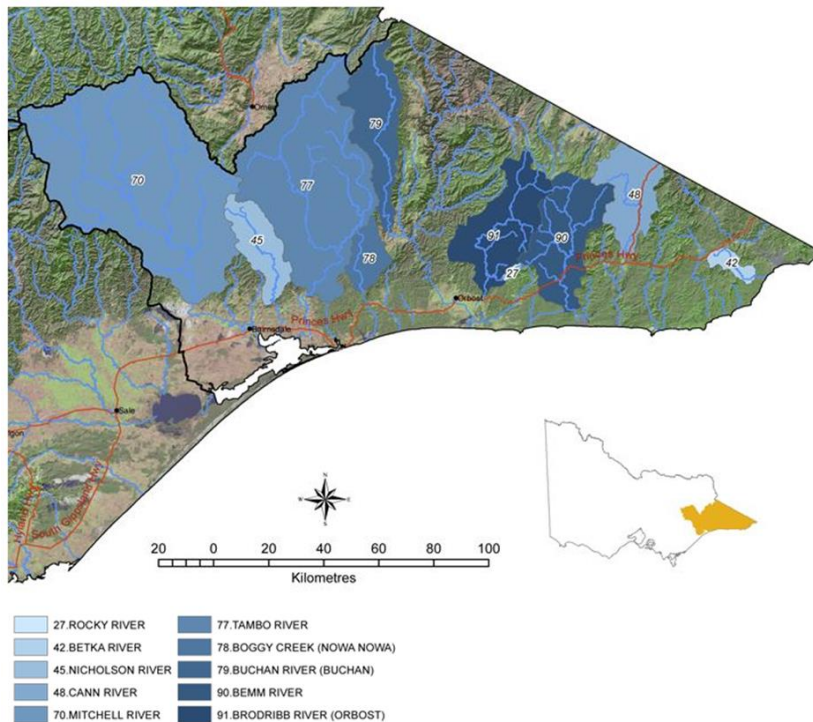


Figure 3: EGW Source water catchments (Source: vro.agriculture.vic.gov.au)

3. EMERGENCY INCIDENT AND EVENT MANAGEMENT

3.1. COVID-19

As an essential service, EGW maintained its focus to deliver safe drinking water to our customers during the COVID-19 pandemic. Whilst adjustments have been made to EGW staff working arrangements, the delivery of safe drinking water continues to be maintained.

3.2. Section 18 Notifications

A Section 18 notification is a notification to DH required under Section 18 of the *Safe Drinking Water Act 2003*. Section 18 of the *Safe Drinking Water Act 2003* 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 that fact.’

In 2021-22, no Section 18 notifications were made to DH.

3.3. Section 22 Notifications

A Section 22 report is a report to DH required under Section 22 of the *Safe Drinking Water Act 2003*. Section 22 of the *Safe Drinking Water Act 2003* states:

‘(1) This section applies if an officer of a water supplier, water storage manager or council believes or suspects, on reasonable grounds, that water supplied, or to be supplied, for drinking purposes-

(a) may be the cause of an illness; or

- (b) may be the means by which an illness is being, has been or will be, transmitted; or
- (c) may contain any pathogen, 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.’

In 2021-22, two Section 22 reports were made to DH.

The first report related to a small number of public complaints of taste and odour in Orbost, and was due to the presence of algae in the raw water storage basins. Corrective action to safely discharge the water and replace it with fresh river water eliminated the issue. There was no threat to health and the water remained compliant with drinking water quality standards.

The second report was in relation to an *E. coli* detection in Metung. The investigation into this incident concluded that the water sample was not representative of the water supplied in the Metung location and the detection was a false positive in accordance with schedule 2 of the *Safe Drinking Water Regulations 2015*. The *E. coli* detection was found to be due to the use of unsterilised sampling equipment at one water sampling point. At no time was the water unsafe to drink and it was confirmed that drinking water was free of contaminants.

4. QUALITY OF DRINKING WATER FOR 2021-22

The 2021-22 Water Quality Annual Report includes Regulated Parameter data for the *Safe Drinking Water Regulations 2015*. All results irrespective of sample location and type for drinking water supply have been included.

Table 3: Safe Drinking Water Regulations 2015 – Schedule 2 Drinking Water Quality Standards

SCHEDULE 2 PARAMETER	RELEVANT SAMPLING FREQUENCY PER WATER SAMPLING LOCALITY	WATER QUALITY STANDARD FOR EACH WATER SAMPLING LOCALITY	PRESENTATION OF EGW RESULTS
ESCHERICHIA COLI (E.coli)	One sample per week	All samples of drinking water collected are found to contain no <i>Escherichia coli</i> per 100 millilitres of drinking water, with the exception of any false positive sample	Reported as 0 <i>Escherichia coli</i> detected in 100mL
TOTAL TRIHALOMETHANES	One sample per month	Less than or equal to 0.25 milligrams per litre of drinking water	Results expressed to two decimal places

TURBIDITY	One sample per week	The 95 th percentile of results for samples in any 12-month period must be less than or equal to 5.0 NTU	Results expressed to one decimal place.
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EGW follows a risk-based sampling program from catchment to consumer throughout each drinking water supply system. In addition to the drinking water parameters sampled for, this determines the location and frequency of samples taken throughout each system.

In 2021-22 EGW did not fully comply with the risk-based drinking water sampling program and therefore has not met its regulatory obligation, specifically regulation 13(1) of the *Safe Drinking Water Regulations 2015*. One (1) water quality sample was missed at the Lefcol Bullock Island Sample Point - Bullock Island on the 27th April 2022. This was due to the site being temporarily inaccessible behind a locked construction fence managed by a third-party contractor. This had no impact on the quality of water being delivered to customers.

Points to note include:

- No reticulation samples for the locality have been missed.
- All critical control points were functioning as per the risk management plan and no control point failures occurred during this period.
- Weekly routine visual inspections of the Sunlakes Clear Water Basin have been completed as per normal operations.

In response to this incident, EGW is developing a sampling scheduling dashboard on our Water Information Management System (WIMS). This will give the ability to easily cross-check the samples collected against the schedule, allowing remedial action to be taken in a timely manner if required.

The total number of samples described in the water quality tables following are dependent on the number of sample sites within the locality and the number of sampling days per calendar year. Additional sampling is often conducted based on observed changes within the system.

4.1. Regulated Parameters

4.1.1. *Escherichia coli* (*E. coli*)

E. coli is a microorganism that may cause illness in susceptible individuals. *E. coli* is associated with contamination of water supplies with faecal material and is therefore considered to be an important indicator of the safety of the water supply. Samples are taken at least weekly in each of the water sampling localities. There must be 0 *E. coli*/100 ml within drinking water with the exception of any false positive sample.

Table 4: *E. coli* sampling frequency and results for 2021-22

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	MAXIMUM DETECTED (ORGS/100ML)	NUMBER OF DETECTIONS AND INVESTIGATIONS CONDUCTED (S.22)	NUMBER OF SAMPLES WHERE STANDARD WAS NOT MET.	COMMENTS COMPLYING (YES / NO)
BAIRNSDALE	Weekly	105	0		0	Yes
BEMM RIVER	Weekly	88	0		0	Yes
BUCHAN	Weekly	86	0		0	Yes
CANN RIVER	Weekly	86	0		0	Yes
DINNER PLAIN	Weekly	89	0		0	N/A
EAGLE POINT-PAYNESVILLE	Weekly	88	0		0	Yes
KALIMNA	Weekly	86	0		0	Yes
LINDENOW	Weekly	86	0		0	Yes
LINDENOW SOUTH	Weekly	86	0		0	Yes
MALLACOOTA	Weekly	86	0		0	Yes
MERRANGBAUR	Weekly	86	0		0	Yes
METUNG	Weekly	106	12	1	0*	Yes*
NICHOLSON-SWAN REACH	Weekly	86	0		0	Yes
NOWA NOWA	Weekly	87	0		0	Yes
OMEQ	Weekly	86	0		0	Yes
ORBOST	Weekly	87	0		0	Yes
SARFIELD-BRUTHEN	Weekly	86	0		0	Yes
SUNLAKES-TOORLOO	Weekly	92	0		0	Yes
SWIFTS CREEK	Weekly	86	0		0	Yes

All water sampling localities were compliant with the *E. coli* water quality standard for the 2021-22 reporting period (Table 4). *The Metung (false positive) incident has been described in Section 3.3 above.

4.1.2. Total Trihalomethanes

Trihalomethanes (THMs) are compounds that may be produced when chlorine disinfectant reacts with organic material present in the water. These compounds may impact public health if they are present in drinking water in high concentrations over a long period of time. Samples are taken monthly in each of the water sampling localities. There must be less than or equal to 0.25 mg/L of Total Trihalomethanes within drinking water.

Table 5: Total Trihalomethanes sampling frequency and results for 2021-22

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	NO. OF SAMPLES ABOVE THE STANDARD	MAX MG/L	AVERAGE MG/L	MET THE STANDARD (YES / NO)
BAIRNSDALE	Monthly	12	0	0.06	0.03	Yes
BEMM RIVER	Monthly	12	0	0.08	0.04	Yes

BUCHAN	Monthly	12	0	0.09	0.05	Yes
CANN RIVER	Monthly	12	0	0.08	0.05	Yes
DINNER PLAIN	Monthly	12	0	0.00	0.00	Yes
EAGLE POINT-PAYNESVILLE	Monthly	14	0	0.07	0.04	Yes
KALIMNA	Monthly	12	0	0.08	0.05	Yes
LINDENOW	Monthly	14	0	0.03	0.02	Yes
LINDENOW SOUTH	Monthly	14	0	0.04	0.03	Yes
MALLACOOTA	Monthly	13	0	0.13	0.05	Yes
MERRANGBAUR	Monthly	12	0	0.08	0.05	Yes
METUNG	Monthly	12	0	0.09	0.05	Yes
NICHOLSON-SWAN REACH	Monthly	12	0	0.07	0.04	Yes
NOWA NOWA	Monthly	13	0	0.10	0.06	Yes
OMEIO	Monthly	12	0	0.06	0.04	Yes
ORBOST	Monthly	12	0	0.06	0.04	Yes
SARSFIELD-BRUTHEN	Monthly	12	0	0.06	0.04	Yes
SUNLAKES-TOORLOO	Monthly	12	0	0.09	0.06	Yes
SWIFTS CREEK	Monthly	12	0	0.08	0.05	Yes

All water sampling localities were compliant with the Total Trihalomethanes water quality standard for the 2021-22 reporting period (Table 5).

4.1.3. Turbidity

Turbidity measures the presence of fine suspended material present in the water and at elevated levels may result in a 'cloudy' appearance of water. Turbidity is an indirect indicator for the general quality of water and may represent fine particles such as clays, minerals or microscopic organisms. Samples are taken weekly in each of the water sampling localities (Table 6). The 95th percentile of turbidity results for samples in any 12-month period must be less than or equal to 5.0 NTU within drinking water.

Table 6: Turbidity sampling frequency and results for 2021-22

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	MAX NTU	95TH PERCENTILE	MET THE STANDARD (YES / NO)
BAIRNSDALE	Weekly	129	5.4	0.1	Yes
BEMM RIVER	Weekly	108	4.8	1.2	Yes
BUCHAN	Weekly	106	1.4	0.1	Yes
CANN RIVER	Weekly	106	0.2	0.1	Yes
DINNER PLAIN	Weekly	104	1.0	0.2	Yes
EAGLE POINT-PAYNESVILLE	Weekly	109	0.2	0.1	Yes
KALIMNA	Weekly	106	2.1	0.3	Yes
LINDENOW	Weekly	107	0.3	0.2	Yes
LINDENOW SOUTH	Weekly	107	0.3	0.2	Yes
MALLACOOTA	Weekly	106	1.2	0.4	Yes

MERRANGBAUR	Weekly	106	0.1	0.1	Yes
METUNG	Weekly	125	1.6	0.2	Yes
NICHOLSON-SWAN REACH	Weekly	105	0.4	0.2	Yes
NOWA NOWA	Weekly	107	0.7	0.2	Yes
OMEIO	Weekly	104	0.8	0.2	Yes
ORBOST	Weekly	105	0.4	0.3	Yes
SARFIELD-BRUTHEN	Weekly	104	0.2	0.1	Yes
SUNLAKES-TOORLOO	Weekly	112	0.2	0.1	Yes
SWIFTS CREEK	Weekly	104	0.5	0.2	Yes

All samples taken in water sampling localities were compliant with the turbidity water quality standard for the 2021-22 reporting period (Table 6).

4.1.4. Fluoride

Fluoride is added to the water sampling localities of the Mitchell system to promote oral health by DH under the *Health (Fluoridation) Act 1973*. Fluoride samples are taken monthly in each of the fluoridated water sampling localities, effectively resulting in a weekly sample being taken at different locations in the fluoridated Mitchell system.

Compliance is measured as: annual average fluoride level must not exceed 1 milligram per litre and all individual samples must be less than 1.5 milligrams per litre. *Meeting Obligation* is measured as: annual average fluoride level between 0.8 – 1.0 milligrams per litre in fluoridated systems.

Table 7: Fluoride sampling frequency and results for 2021-22

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	OPERATING TARGET (MG/L)	MAX (MG/L)	AVERAGE	NUMBER OF SAMPLES WHERE STANDARD (>1.5MG/L) WAS NOT MET.
BAIRNSDALE	Monthly	15	0.9	0.90	0.84	0
BEMM RIVER	Biannually	2	N/A	0.05	0.05	0
BUCHAN	Biannually	2	N/A	0.05	0.05	0
CANN RIVER	Biannually	2	N/A	0.06	0.06	0
DINNER PLAIN	Biannually	2	N/A	0.05	0.05	0
EAGLE POINT-PAYNESVILLE	Biannually	14	0.9	0.91	0.85	0
KALIMNA	Monthly	14	0.9	0.89	0.86	0
LINDENOW	Monthly	15	0.9	0.90	0.84	0
LINDENOW SOUTH	Monthly	15	0.9	0.87	0.83	0
MALLACOOTA	Biannually	2	N/A	0.05	0.05	0
MERRANGBAUR	Monthly	14	0.9	0.92	0.86	0
METUNG	Monthly	14	0.9	0.91	0.86	0

NICHOLSON-SWAN REACH	Monthly	15	0.9	0.91	0.85	0
NOWA NOWA	Monthly	14	0.9	0.91	0.86	0
OMELO	Biannually	2	N/A	0.05	0.05	0
ORBOST	Biannually	2	N/A	0.45	0.25	0
SARSFIELD-BRUTHEN	Monthly	14	0.9	0.91	0.87	0
SUNLAKES-TOORLOO	Monthly	14	0.9	0.90	0.86	0
SWIFTS CREEK	Monthly	2	N/A	0.08	0.08	0

N/A - Not Applicable as these systems are not fluoridated.

All water sampling localities were compliant for fluoride in the 2021-22 reporting period (Table 7). EGW has been 100% compliant with this standard at each fluoridated sampling locality since fluoridation began in 2010.

The variance in levels of throughout the Mitchell system is likely due to periods where the fluoridation plant was offline for maintenance purposes. This can lead to periods of lower levels of fluoride moving through the network.

Low levels of fluoride detected in non-fluoridated water sampling localities is due to the natural occurrence of fluoride in source waters.

4.2. Other Substances

4.2.1. Arsenic

Arsenic is a naturally occurring element, which can be introduced into water in the catchment through the presence of naturally occurring minerals and ores. Short and long-term exposure to arsenic may result in potential health impacts. Samples are taken biannually in each applicable water sampling locality.

Compliance is measured as: less than or equal to 0.01 milligrams per litre (health-based guideline value under the Australian Drinking Water Guidelines 2011).

Table 8: Arsenic sampling frequency and results for 2021-22

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	NO. OF SAMPLES ABOVE THE STANDARD	MAX (MG/L)	COMPLYING (YES / NO)
BAIRNSDALE	Biannually	2	0	<0.001	Yes
BEMM RIVER	Biannually	2	0	<0.001	Yes
BUCHAN	Biannually	2	0	<0.001	Yes
CANN RIVER	Biannually	2	0	<0.001	Yes
DINNER PLAIN	Biannually	2	0	<0.001	Yes
EAGLE POINT-PAYNESVILLE	Biannually	2	0	<0.001	Yes
KALIMNA	Biannually	2	0	<0.001	Yes
LINDENOW	Biannually	2	0	<0.001	Yes

LINDENOW SOUTH	Biannually	2	0	<0.001	Yes
MALLACOOTA	Biannually	2	0	<0.001	Yes
MERRANGBAUR	Biannually	2	0	<0.001	Yes
METUNG	Biannually	2	0	<0.001	Yes
NICHOLSON-SWAN REACH	Biannually	2	0	<0.001	Yes
NOWA NOWA	Biannually	3	0	<0.001	Yes
OMEQ	Biannually	2	0	<0.001	Yes
ORBOST	Biannually	2	0	<0.001	Yes
SARFIELD-BRUTHEN	Biannually	2	0	<0.001	Yes
SUNLAKES-TOORLOO	Biannually	2	0	<0.001	Yes
SWIFTS CREEK	Biannually	2	0	<0.001	Yes

Note: The average of Arsenic has not been provided because the majority of results were below detectable limits.

All water sampling localities were compliant for Arsenic in the 2021-22 reporting period (Table 8).

4.2.2. Barium

Barium in drinking water is primarily from natural sources. Based on health considerations, the concentration of barium in drinking water should not exceed 2 mg/L under the Australian Drinking Water Guidelines 2011.

Table 9: Barium sampling frequency and results for 2020/21

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	NO. OF SAMPLES ABOVE THE STANDARD	MAX (MG/L)	COMPLYING (YES / NO)
BAIRNSDALE	Biannually	2	0	0.012	Yes
BEMM RIVER	Biannually	2	0	0.013	Yes
BUCHAN	Biannually	2	0	0.009	Yes
CANN RIVER	Biannually	2	0	0.010	Yes
DINNER PLAIN	Biannually	2	0	0.002	Yes
EAGLE POINT-PAYNESVILLE	Biannually	2	0	0.012	Yes
KALIMNA	Biannually	2	0	0.011	Yes
LINDENOW	Biannually	2	0	0.011	Yes
LINDENOW SOUTH	Biannually	2	0	0.009	Yes
MALLACOOTA	Biannually	2	0	0.035	Yes
MERRANGBAUR	Biannually	2	0	0.012	Yes
METUNG	Biannually	2	0	0.013	Yes
NICHOLSON-SWAN REACH	Biannually	2	0	0.012	Yes
NOWA NOWA	Biannually	3	0	0.012	Yes
OMEQ	Biannually	2	0	0.011	Yes
ORBOST	Biannually	2	0	0.009	Yes

SARFIELD-BRUTHEN	Biannually	2	0	0.012	Yes
SUNLAKES-TOORLOO	Biannually	2	0	0.012	Yes
SWIFTS CREEK	Biannually	2	0	0.018	Yes

All water sampling localities were compliant for Barium in the 2020/21 reporting period (Table 9).

4.2.3. Cadmium

Cadmium may be introduced into drinking water supplies through corrosion of pipes and fittings. Exposure to high concentrations of cadmium may result in potential health implications. Samples are taken quarterly in each of the water sampling localities.

Compliance is measured as: less than or equal to 0.002 milligrams per litre (health-based guideline value under the Australian Drinking Water Guidelines 2011).

Table 10: Cadmium sampling frequency and results for 2021-22

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	NO. OF NON-COMPLYING SAMPLES	MAXIMUM (MG/L)	COMPLYING (YES / NO)
BAIRNSDALE	Quarterly	4	0	<0.0002	Yes
BEMM RIVER	Quarterly	4	0	<0.0002	Yes
BUCHAN	Quarterly	4	0	<0.0002	Yes
CANN RIVER	Quarterly	4	0	<0.0002	Yes
DINNER PLAIN	Quarterly	4	0	<0.0002	Yes
EAGLE POINT-PAYNESVILLE	Quarterly	6	0	<0.0002	Yes
KALIMNA	Quarterly	4	0	<0.0002	Yes
LINDENOW	Quarterly	4	0	<0.0002	Yes
LINDENOW SOUTH	Quarterly	4	0	<0.0002	Yes
MALLACOOTA	Quarterly	4	0	<0.0002	Yes
MERRANGBAUR	Quarterly	4	0	<0.0002	Yes
METUNG	Quarterly	4	0	<0.0002	Yes
NICHOLSON-SWAN REACH	Quarterly	4	0	<0.0002	Yes
NOWA NOWA	Quarterly	5	0	<0.0002	Yes
OMELO	Quarterly	4	0	<0.0002	Yes
ORBOST	Quarterly	4	0	<0.0002	Yes
SARFIELD-BRUTHEN	Quarterly	4	0	<0.0002	Yes
SUNLAKES-TOORLOO	Quarterly	4	0	<0.0002	Yes
SWIFTS CREEK	Quarterly	4	0	<0.0002	Yes

All water sampling localities were compliant for Cadmium in the 2021-22 reporting period (Table 10).

4.2.4. Chlorite

Chlorine dioxide (chlorite) is rarely used as a disinfectant in Australian reticulated supplies. When used, the chlorite residual is generally maintained between 0.2 mg/L and 0.4 mg/L.

Table 11: Chlorite sampling frequency and results for 2020/21

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	NO. OF NON-COMPLYING SAMPLES	MAXIMUM (MG/L)	COMPLYING (YES / NO)
BAIRNSDALE	Annually	1	0	<0.050	Yes
BEMM RIVER	Annually	1	0	<0.050	Yes
BUCHAN	Annually	1	0	<0.050	Yes
CANN RIVER	Annually	1	0	<0.050	Yes
DINNER PLAIN	Annually	N/A	N/A	N/A	N/A
EAGLE POINT-PAYNESVILLE	Annually	3	0	<0.050	Yes
KALIMNA	Annually	1	0	<0.050	Yes
LINDENOW	Annually	1	0	<0.050	Yes
LINDENOW SOUTH	Annually	1	0	<0.050	Yes
MALLACOOTA	Annually	1	0	<0.050	Yes
MERRANGBAUR	Annually	1	0	<0.050	Yes
METUNG	Annually	1	0	<0.050	Yes
NICHOLSON-SWAN REACH	Annually	1	0	<0.050	Yes
NOWA NOWA	Annually	1	0	<0.050	Yes
OMELO	Annually	1	0	<0.050	Yes
ORBOST	Annually	1	0	<0.050	Yes
SARFIELD-BRUTHEN	Annually	1	0	<0.050	Yes
SUNLAKES-TOORLOO	Annually	1	0	<0.050	Yes
SWIFTS CREEK	Annually	1	0	<0.050	Yes

All water sampling localities were compliant for Chlorite in the 2020/21 reporting period Table 11.

4.2.5. Chromium

Chromium may occur naturally in the environment or be introduced through human activity. Exposure to high concentrations of Chromium may have adverse dermatological effects over many years, such as allergic dermatitis (skin reactions). Samples are taken quarterly in each of the water sampling localities.

Compliance is measured as: less than or equal to 0.05 milligrams per litre of Cr (VI) (health-based guideline value under the Australian Drinking Water Guidelines 2011).

Table 12: Chromium sampling frequency and results for 2021-22

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	NO. OF NON-COMPLYING SAMPLES	MAXIMUM (MG/L)	COMPLYING (YES / NO)
BAIRNSDALE	Quarterly	4	0	<0.001	Yes
BEMM RIVER	Quarterly	4	0	<0.001	Yes
BUCHAN	Quarterly	4	0	<0.001	Yes
CANN RIVER	Quarterly	4	0	<0.001	Yes
DINNER PLAIN	Quarterly	4	0	<0.001	Yes
EAGLE POINT-PAYNESVILLE	Quarterly	6	0	<0.001	Yes
KALIMNA	Quarterly	4	0	<0.001	Yes
LINDENOW	Quarterly	4	0	<0.001	Yes
LINDENOW SOUTH	Quarterly	4	0	<0.001	Yes
MALLACOOTA	Quarterly	4	0	<0.001	Yes
MERRANGBAUR	Quarterly	4	0	<0.001	Yes
METUNG	Quarterly	4	0	<0.001	Yes
NICHOLSON-SWAN REACH	Quarterly	4	0	<0.001	Yes
NOWA NOWA	Quarterly	5	0	<0.001	Yes
OMEQ	Quarterly	4	0	<0.001	Yes
ORBOST	Quarterly	4	0	<0.001	Yes
SARSFIELD-BRUTHEN	Quarterly	4	0	<0.001	Yes
SUNLAKES-TOORLOO	Quarterly	4	0	<0.001	Yes
SWIFTS CREEK	Quarterly	4	0	<0.001	Yes

All water sampling localities were compliant for Chromium in the 2021-22 reporting period (Table 12).

4.2.6. Copper

Copper may occur naturally in the environment or be introduced into water through contact with corroding copper pipes and fittings. Exposure to high levels of copper can cause nausea, vomiting, diarrhoea, gastric (stomach) complaints and headaches. Samples are taken quarterly in each applicable water sampling locality.

Compliance is measured as: less than 2 milligrams per litre (health-based guideline value under the Australian Drinking Water Guidelines 2011) and less than or equal to 1 milligram per litre (aesthetic guideline value under the Australian Drinking Water Guidelines 2011).

Table 13: Copper sampling frequency and results for 2021-22

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	NO. OF NON-COMPLYING SAMPLES	MAXIMUM (MG/L)	COMPLYING (YES / NO)
BAIRNSDALE	Quarterly	4	0	0.016	Yes
BEMM RIVER	Quarterly	4	0	0.012	Yes

BUCHAN	Quarterly	4	0	<0.001	Yes
CANN RIVER	Quarterly	4	0	<0.001	Yes
DINNER PLAIN	Quarterly	4	0	0.120	Yes
EAGLE POINT-PAYNESVILLE	Quarterly	6	0	0.005	Yes
KALIMNA	Quarterly	4	0	0.014	Yes
LINDENOW	Quarterly	4	0	0.027	Yes
LINDENOW SOUTH	Quarterly	4	0	0.015	Yes
MALLACOOTA	Quarterly	16	0	0.004	Yes
MERRANGBAUR	Quarterly	4	0	0.007	Yes
METUNG	Quarterly	4	0	0.025	Yes
NICHOLSON-SWAN REACH	Quarterly	4	0	0.012	Yes
NOWA NOWA	Quarterly	5	0	0.014	Yes
OMEQ	Quarterly	4	0	0.003	Yes
ORBOST	Quarterly	27	0	0.004	Yes
SARFIELD-BRUTHEN	Quarterly	4	0	0.061	Yes
SUNLAKES-TOORLOO	Quarterly	4	0	0.008	Yes
SWIFTS CREEK	Quarterly	4	0	0.011	Yes

All water sampling localities were compliant for Copper in the 2021-22 reporting period (Table 13).

4.2.7. Cyanide

Cyanide may occur naturally in the environment or be introduced through human activity. Exposure to Cyanide may cause rapid breathing, tremors and other neurological effects. Testing for Cyanide is performed biannually in each applicable water sampling locality.

Compliance is measured as: less than or equal to 0.08 milligrams per litre (health-based guideline value under the Australian Drinking Water Guidelines 2011).

Table 14: Cyanide sampling frequency and results for 2021-22

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	NO. OF NON-COMPLYING SAMPLES	MAXIMUM (MG/L)	COMPLYING (YES / NO)
BAIRNSDALE	Biannually	2	0	<0.005	Yes
BEMM RIVER	Biannually	2	0	<0.005	Yes
BUCHAN	Biannually	2	0	<0.005	Yes
CANN RIVER	Biannually	2	0	<0.005	Yes
DINNER PLAIN	Biannually	2	0	<0.005	Yes
EAGLE POINT-PAYNESVILLE	Biannually	2	0	<0.005	Yes
KALIMNA	Biannually	2	0	<0.005	Yes
LINDENOW	Biannually	2	0	<0.005	Yes
LINDENOW SOUTH	Biannually	2	0	<0.005	Yes
MALLACOOTA	Biannually	2	0	<0.005	Yes

MERRANGBAUR	Biannually	2	0	<0.005	Yes
METUNG	Biannually	2	0	<0.005	Yes
NICHOLSON-SWAN REACH	Biannually	2	0	<0.005	Yes
NOWA NOWA	Biannually	2	0	<0.005	Yes
OMEIO	Biannually	2	0	<0.005	Yes
ORBOST	Biannually	2	0	<0.005	Yes
SARFIELD-BRUTHEN	Biannually	2	0	<0.005	Yes
SUNLAKES-TOORLOO	Biannually	2	0	<0.005	Yes
SWIFTS CREEK	Biannually	2	0	<0.005	Yes

All water sampling localities were compliant for Cyanide in the 2021-22 reporting period (Table 14).

4.2.8. Dichloroacetic Acid

Based on preliminary data, concentrations of dichloroacetic acid in Australian drinking waters range from 0.001 mg/L to 0.1 mg/.

Table 15: Dichloroacetic Acid sampling frequency and results for 2021-22

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	NO. OF NON-COMPLYING SAMPLES	MAXIMUM (MG/L)	COMPLYING (YES / NO)
BAIRNSDALE	Biannually	4	0	0.012	Yes
BEMM RIVER	Biannually	4	0	0.014	Yes
BUCHAN	Biannually	4	0	0.006	Yes
CANN RIVER	Biannually	4	0	0.009	Yes
DINNER PLAIN	N/A	N/A	N/A	N/A	N/A
EAGLE POINT-PAYNESVILLE	Biannually	8	0	0.007	Yes
KALIMNA	Biannually	4	0	0.008	Yes
LINDENOW	Biannually	4	0	<0.005	Yes
LINDENOW SOUTH	Biannually	4	0	<0.005	Yes
MALLACOOTA	Biannually	8	0	<0.005	Yes
MERRANGBAUR	Biannually	4	0	0.009	Yes
METUNG	Biannually	4	0	0.010	Yes
NICHOLSON-SWAN REACH	Biannually	4	0	0.008	Yes
NOWA NOWA	Biannually	4	0	0.013	Yes
OMEIO	Biannually	4	0	0.009	Yes
ORBOST	Biannually	4	0	<0.005	Yes
SARFIELD-BRUTHEN	Biannually	4	0	0.006	Yes
SUNLAKES-TOORLOO	Biannually	4	0	0.008	Yes
SWIFTS CREEK	Biannually	4	0	0.015	Yes

All water sampling localities were compliant for Dichloroacetic Acid in the 2021-22 reporting period Table 15.

4.2.9. Free Chlorine

Chlorine is a disinfection agent that is added to drinking water to kill harmful microorganisms and ensure the water is safe to drink.

The Australian Drinking Water Guidelines 2011 state that Chlorine concentrations in the drinking water supply must be less than or equal to 5 milligrams per litre for health purposes.

Table 16: Free Chlorine sampling frequency and results for 2021-22

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	MINIMUM (MG/L)	MAXIMUM (MG/L)	AVERAGE (MG/L)	COMPLYING (YES / NO)
BAIRNSDALE	Weekly	128	0.25	1.00	0.84	Yes
BEMM RIVER	Weekly	106	0.60	1.20	0.92	Yes
BUCHAN	Weekly	104	0.20	1.20	0.88	Yes
CANN RIVER	Weekly	104	0.26	1.30	0.89	Yes
DINNER PLAIN	NA	NA	NA	NA	NA	Yes
EAGLE POINT-PAYNESVILLE	Weekly	106	0.09	0.79	0.57	Yes
KALIMNA	Weekly	104	0.48	0.97	0.76	Yes
LINDENOW	Weekly	104	0.45	1.30	0.90	Yes
LINDENOW SOUTH	Weekly	104	0.05	1.00	0.60	Yes
MALLACOOTA	Weekly	105	0.26	1.40	0.93	Yes
MERRANGBAUR	Weekly	104	0.35	0.88	0.71	Yes
METUNG	Weekly	124	0.42	1.00	0.74	Yes
NICHOLSON-SWAN REACH	Weekly	105	0.57	1.20	0.80	Yes
NOWA NOWA	Weekly	105	0.24	0.90	0.64	Yes
OMELO	Weekly	102	0.05	1.00	0.63	Yes
ORBOST	Weekly	105	0.43	1.80	0.98	Yes
SARFIELD-BRUTHEN	Weekly	102	0.06	1.20	0.73	Yes
SUNLAKES-TOORLOO	Weekly	110	0.45	1.00	0.81	Yes
SWIFTS CREEK	Weekly	102	0.19	0.96	0.67	Yes

Notes:

1 Dinner Plain was previously not sampled for free chlorine as ultra-violet disinfection was employed in lieu of chlorine. In response to E.Coli detection in the Dinner Plain raw water source, chlorine disinfection has recently been introduced as a secondary treatment barrier and the sampling program updated.

2 EGW aims for a free chlorine concentration of >0.2 mg/L within all reticulation systems. Whilst these free chlorine levels were above 0.2 mg/L, they were not considered a health risk.

All water sampling localities were compliant for Free Chlorine in the 2021-22 reporting period (Table 16).

4.2.10. Iodide

The element iodine is present naturally in seawater, nitrate minerals and seaweed, mostly in the form of iodide salts. Concentrations of iodide in Australian source or treated water ranges from 0.005 to 2.9 mg/L (median 0.03 mg/L, mean 0.1 mg/L).

Table 17: Iodide sampling frequency and results for 2021-22

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	NO. OF NON-COMPLYING SAMPLES	MAXIMUM (MG/L)	COMPLYING (YES / NO)
BAIRNSDALE	Biannually	2	0	<0.010	Yes
BEMM RIVER	Biannually	2	0	<0.020	Yes
BUCHAN	Biannually	2	0	<0.010	Yes
CANN RIVER	Biannually	2	0	<0.010	Yes
DINNER PLAIN	N/A	N/A	N/A	N/A	N/A
EAGLE POINT-PAYNESVILLE	Biannually	2	0	<0.010	Yes
KALIMNA	Biannually	2	0	<0.010	Yes
LINDENOW	Biannually	2	0	<0.010	Yes
LINDENOW SOUTH	Biannually	2	0	<0.010	Yes
MALLACOOTA	Biannually	2	0	<0.010	Yes
MERRANGBAUR	Biannually	2	0	<0.010	Yes
METUNG	Biannually	2	0	<0.010	Yes
NICHOLSON-SWAN REACH	Biannually	2	0	<0.010	Yes
NOWA NOWA	Biannually	2	0	<0.010	Yes
OMELO	Biannually	2	0	<0.010	Yes
ORBOST	Biannually	2	0	<0.010	Yes
SARSFIELD-BRUTHEN	Biannually	2	0	<0.010	Yes
SUNLAKES-TOORLOO	Biannually	2	0	<0.010	Yes
SWIFTS CREEK	Biannually	2	0	<0.010	Yes

All water sampling localities were compliant for Iodine in the 2021-22 reporting period Table 17.

4.2.11. Lead

Lead may occur naturally in water or be introduced through contact with lead pipes and joint fittings. Human exposure to high levels of lead may result in toxic effects. Samples are taken quarterly in each applicable water sampling locality.

Compliance is measured as: less than or equal to 0.01 milligrams per litre (health-based guideline value under the Australian Drinking Water Guidelines 2011).

Table 18: Lead sampling frequency and results for 2021-22

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	NO. OF NON-COMPLYING SAMPLES	MAXIMUM (MG/L)	COMPLYING (YES / NO)
BAIRNSDALE	Quarterly	4	0	<0.001	Yes
BEMM RIVER	Quarterly	4	0	<0.001	Yes
BUCHAN	Quarterly	4	0	<0.001	Yes
CANN RIVER	Quarterly	4	0	<0.001	Yes
DINNER PLAIN	Quarterly	4	0	<0.001	Yes
EAGLE POINT-PAYNESVILLE	Quarterly	6	0	<0.001	Yes
KALIMNA	Quarterly	4	0	<0.001	Yes
LINDENOW	Quarterly	4	0	<0.001	Yes
LINDENOW SOUTH	Quarterly	4	0	<0.001	Yes
MALLACOOTA	Quarterly	4	0	<0.001	Yes
MERRANGBAUR	Quarterly	4	0	<0.001	Yes
METUNG	Quarterly	4	0	<0.001	Yes
NICHOLSON-SWAN REACH	Quarterly	4	0	<0.001	Yes
NOWA NOWA	Quarterly	5	0	<0.001	Yes
OMELO	Quarterly	4	0	<0.001	Yes
ORBOST	Quarterly	4	0	<0.001	Yes
SARSFIELD-BRUTHEN	Quarterly	4	0	<0.001	Yes
SUNLAKES-TOORLOO	Quarterly	4	0	<0.001	Yes
SWIFTS CREEK	Quarterly	4	0	<0.001	Yes

All water sampling localities were compliant for Lead in the 2021-22 reporting period (Table 18).

4.2.12. Manganese

Manganese may occur naturally in the environment, or may be introduced through industrial activity. Manganese may cause aesthetic issues such as taste or staining of laundry and appliances as well as health issues at high concentrations.

Compliance is measured as: less than or equal to 0.1 milligrams per litre (aesthetic value) and less than or equal to 0.5 milligrams per litre (health-based guideline value under the Australian Drinking Water Guidelines 2011).

Table 19: Manganese sampling frequency and results for 2021-22

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	MINIMUM (MG/L)	MAXIMUM (MG/L)	COMPLYING (YES / NO)
BAIRNSDALE	Quarterly	16	<0.001	<0.001	Yes
BEMM RIVER	Quarterly	8	<0.001	0.010	Yes
BUCHAN	Quarterly	8	<0.001	<0.001	Yes
CANN RIVER	Quarterly	8	<0.001	<0.001	Yes

DINNER PLAIN	Quarterly	4	<0.001	<0.001	Yes
EAGLE POINT-PAYNESVILLE	Quarterly	6	<0.001	<0.001	Yes
KALIMNA	Quarterly	4	<0.001	<0.001	Yes
LINDENOW	Quarterly	4	<0.001	<0.001	Yes
LINDENOW SOUTH	Quarterly	4	<0.001	<0.001	Yes
MALLACOOTA	Monthly	24	<0.001	<0.001	Yes
MERRANGBAUR	Quarterly	4	<0.001	<0.001	Yes
METUNG	Quarterly	4	<0.001	<0.001	Yes
NICHOLSON-SWAN REACH	Quarterly	4	<0.001	<0.001	Yes
NOWA NOWA	Quarterly	5	<0.001	0.003	Yes
OMEIO	Quarterly	8	<0.001	<0.001	Yes
ORBOST	Quarterly	8	<0.001	<0.001	Yes
SARFIELD-BRUTHEN	Quarterly	4	<0.001	<0.001	Yes
SUNLAKES-TOORLOO	Quarterly	4	<0.001	<0.001	Yes
SWIFTS CREEK	Quarterly	8	<0.001	<0.001	Yes

All water sampling localities were compliant for Manganese in the 2021-22 reporting period (both aesthetic and health values) (Table 19).

4.2.13. Trichloroacetic Acid

Based on preliminary data, concentrations of trichloroacetic acid in Australian drinking waters range from 0.001 mg/L to 0.1 mg/L for trichloroacetic acid.

Table 20: Trichloroacetic Acid sampling frequency and results for 2020/21

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	NO. OF NON-COMPLYING SAMPLES	MAXIMUM (MG/L)	COMPLYING (YES / NO)
BAIRNSDALE	Biannually	2	0	0.015	Yes
BEMM RIVER	Biannually	2	0	0.009	Yes
BUCHAN	Biannually	2	0	0.009	Yes
CANN RIVER	Biannually	2	0	0.007	Yes
DINNER PLAIN	N/A	N/A	N/A	N/A	N/A
EAGLE POINT-PAYNESVILLE	Biannually	4	0	0.018	Yes
KALIMNA	Biannually	2	0	0.017	Yes
LINDENOW	Biannually	2	0	0.006	Yes
LINDENOW SOUTH	Biannually	2	0	0.006	Yes
MALLACOOTA	Biannually	4	0	<0.005	Yes
MERRANGBAUR	Biannually	2	0	0.018	Yes
METUNG	Biannually	2	0	0.016	Yes
NICHOLSON-SWAN REACH	Biannually	2	0	0.014	Yes
NOWA NOWA	Biannually	2	0	0.020	Yes
OMEIO	Biannually	2	0	0.021	Yes

ORBOST	Biannually	2	0	<0.005	Yes
SARFIELD-BRUTHEN	Biannually	2	0	0.013	Yes
SUNLAKES-TOORLOO	Biannually	2	0	0.018	Yes
SWIFTS CREEK	Biannually	2	0	0.012	Yes

All water sampling localities were compliant for Trichloroacetic Acid in the 2020/21 reporting period Table 20.

4.3. Aesthetic Characteristics

4.3.1. Colour (True)

Colour generally occurs in water as a result of dissolved organic material. Although not a health consideration, elevated colour can be an aesthetic issue.

Compliance is measured as: less than or equal to 15 Hazen Units (HU); (Australian Drinking Water Guidelines 2011 aesthetic value).

Table 21: Colour sampling frequency and results for 2021-22

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	MINIMUM (HU)	MAXIMUM (HU)	COMPLYING (YES / NO)
BAIRNSDALE	Monthly	26	<2	<2	Yes
BEMM RIVER	Monthly	12	<2	<2	Yes
BUCHAN	Monthly	12	<2	<2	Yes
CANN RIVER	Monthly	12	<2	<2	Yes
DINNER PLAIN	Monthly	24	<2	<2	Yes
EAGLE POINT-PAYNESVILLE	Monthly	14	<2	<2	Yes
KALIMNA	Monthly	12	<2	<2	Yes
LINDENOW	Monthly	12	<2	<2	Yes
LINDENOW SOUTH	NA	NA	NA	NA	NA
MALLACOOTA	Monthly	16	<2	<2	Yes
MERRANGBAUR	Monthly	12	<2	<2	Yes
METUNG	Monthly	12	<2	<2	Yes
NICHOLSON-SWAN REACH	NA	NA	NA	NA	NA
NOWA NOWA	Monthly	12	<2	<2	Yes
OMELO	Monthly	24	<2	<2	Yes
ORBOST	Monthly	24	<2	<2	Yes
SARFIELD-BRUTHEN	Monthly	12	<2	<2	Yes
SUNLAKES-TOORLOO	Monthly	12	<2	<2	Yes
SWIFTS CREEK	Monthly	24	<2	<2	Yes

Note: Colour is not sampled in some sampling localities within the Mitchell system based on risk assessment and results from network samples taken downstream of these localities i.e., Lindenow South, Nicholson-Swan Reach.

All water sampling localities were compliant for colour in the 2021-22 reporting period (Table 21).

4.3.2. Hardness

Hardness is caused by the presence of dissolved calcium compounds in water. Hard water may result in scaling issues.

Compliance is measured as: less than or equal to 200 milligrams per litre (Australian Drinking Water Guidelines 2011 aesthetic value) as total hardness (as calcium carbonate).

Table 22: Hardness sampling frequency and results for 2021-22

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	MINIMUM (MG/L)	MAXIMUM (MG/L)	COMPLYING (YES / NO)
BAIRNSDALE	Quarterly	8	16	25	Yes
BEMM RIVER	Quarterly	8	12	20	Yes
BUCHAN	Quarterly	8	16	35	Yes
CANN RIVER	Quarterly	8	15	25	Yes
DINNER PLAIN	Quarterly	4	23	38	Yes
EAGLE POINT-PAYNESVILLE	Quarterly	8	17	25	Yes
KALIMNA	Quarterly	8	16	23	Yes
LINDENOW	Quarterly	8	15	23	Yes
LINDENOW SOUTH	Quarterly	8	16	23	Yes
MALLACOOTA	Quarterly	8	57	83	Yes
MERRANGBAUR	Quarterly	8	17	25	Yes
METUNG	Quarterly	8	17	27	Yes
NICHOLSON-SWAN REACH	Quarterly	N/A	N/A	N/A	N/A
NOWA NOWA	Quarterly	8	17	29	Yes
OMELO	Quarterly	8	9	15	Yes
ORBOST	Quarterly	8	15	24	Yes
SARFIELD-BRUTHEN	Quarterly	8	14	22	Yes
SUNLAKES-TOORLOO	Quarterly	8	17	26	Yes
SWIFTS CREEK	Quarterly	8	34	64	Yes

Notes: N/A - Not Applicable;

Hardness is not sampled in some sampling localities within the Mitchell system based on risk assessment and results from network samples taken downstream of these localities i.e., Nicholson-Swan Reach.

All water sampling localities were compliant for Hardness in the 2021-22 reporting period (Table 22).

4.3.3. Iron

Iron may occur naturally in the environment and can be introduced through industrial activity, as well as through customer piping. High levels of iron in water can impart taste

and may stain laundry or fittings. There is no health-based guideline for iron in drinking water.

Compliance is measured as: less than or equal to 0.3 milligrams per litre (Australian Drinking Water Guidelines 2011 aesthetic value).

Table 23: Iron sampling frequency and results for 2021-22

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	MINIMUM (MG/L)	MAXIMUM (MG/L)	COMPLYING (YES / NO)
BAIRNSDALE	Monthly	16	<0.01	<0.01	Yes
BEMM RIVER	Quarterly	8	<0.01	0.12	Yes
BUCHAN	Quarterly	8	<0.01	<0.01	Yes
CANN RIVER	Quarterly	8	<0.01	<0.01	Yes
DINNER PLAIN	Quarterly	4	<0.01	<0.01	Yes
EAGLE POINT-PAYNESVILLE	Quarterly	6	<0.01	<0.01	Yes
KALIMNA	Quarterly	4	<0.01	<0.01	Yes
LINDENOW	Quarterly	4	<0.01	<0.01	Yes
LINDENOW SOUTH	Quarterly	4	<0.01	<0.01	Yes
MALLACOOTA	Monthly	24	<0.01	0.04	Yes
MERRANGBAUR	Quarterly	4	<0.01	<0.01	Yes
METUNG	Quarterly	4	<0.01	0.04	Yes
NICHOLSON-SWAN REACH	Quarterly	4	<0.01	<0.01	Yes
NOWA NOWA	Quarterly	5	<0.01	0.07	Yes
OMELO	Quarterly	8	<0.01	0.02	Yes
ORBOST	Quarterly	8	<0.01	<0.01	Yes
SARFIELD-BRUTHEN	Quarterly	4	<0.01	0.01	Yes
SUNLAKES-TOORLOO	Quarterly	4	<0.01	<0.01	Yes
SWIFTS CREEK	Quarterly	8	<0.01	0.01	Yes

All water sampling localities were compliant for iron in the 2021-22 reporting period (Table 23).

4.3.4. pH

pH is the measure of the acidity (pH <7.0) or alkalinity (pH >7.0) of the water. Extreme pH values may cause corrosion or scaling in certain circumstances. High pH may also reduce the effectiveness of chlorine disinfection.

The Australian Drinking Water Guidelines 2011 state that the pH of drinking water should be between pH 6.5 and 8.5 (aesthetic guideline limit). However, as cement mortar-lined pipes and newly constructed concrete water storages may raise pH, values up to pH 9.2 may be tolerated provided no deterioration in microbiological quality of the water supply is observed.

Table 24: pH sampling frequency and results for 2021-22

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	MINIMUM (MG/L)	MAXIMUM (MG/L)	AVERAGE (MG/L)
BAIRNSDALE	Weekly	128	7.10	7.70	7.33
BEMM RIVER	Weekly	106	7.30	7.80	7.69
BUCHAN	Weekly	104	7.70	9.30	8.41
CANN RIVER	Weekly	104	7.80	9.40	8.51
DINNER PLAIN	Weekly	103	6.50	8.00	7.00
EAGLE POINT-PAYNESVILLE	Weekly	106	7.10	8.90	7.50
KALIMNA	Weekly	104	7.20	7.60	7.38
LINDENOW	Weekly	104	7.10	8.10	7.49
LINDENOW SOUTH	Weekly	104	7.20	8.00	7.63
MALLACOOTA	Weekly	105	7.40	8.60	7.92
MERRANGBAUR	Weekly	104	7.30	7.70	7.48
METUNG	Weekly	123	7.20	8.90	8.03
NICHOLSON-SWAN REACH	Weekly	105	7.00	7.90	7.30
NOWA NOWA	Weekly	105	7.31	9.30	8.07
OMELO	Weekly	102	7.10	8.80	7.88
ORBOST	Weekly	105	7.50	9.30	8.14
SARFIELD-BRUTHEN	Weekly	102	7.00	8.50	7.45
SUNLAKES-TOORLOO	Weekly	110	7.30	8.50	7.55
SWIFTS CREEK	Weekly	102	7.10	8.10	7.60

Based on the average values over the year (Table 24), pH values for all water sampling localities are within the aesthetic guideline limit (6.5 to 8.5). Elevated individual pH values have been observed in a number of water sampling localities. This is largely due to the presence of cement-lined distribution pipes. However, these higher pH values have not impacted water quality or asset condition (pipes and tanks). When higher than expected pH is detected EGW will flush the network and a review the entry water pH.

4.3.5. Zinc

Zinc may occur naturally in the environment, or may be introduced through industrial activity, as well as through corrosion of customer piping. High levels of zinc in water can impart taste and appearance issues with drinking water.

Compliance is measured as: less than or equal to 3 milligrams per litre (Australian Drinking Water Guidelines 2011 aesthetic value).

Table 25: Zinc sampling frequency and results for 2021-22

WATER SAMPLING LOCALITY	SAMPLING FREQUENCY	TOTAL NO. SAMPLES	MINIMUM (MG/L)	MAXIMUM (MG/L)	% COMPLIANCE
BAIRNSDALE	Quarterly	4	<0.001	0.002	100

BEMM RIVER	Quarterly	4	0.002	0.012	100
BUCHAN	Quarterly	4	<0.001	<0.001	100
CANN RIVER	Quarterly	4	<0.001	<0.001	100
DINNER PLAIN	Quarterly	4	0.005	0.011	100
EAGLE POINT-PAYNESVILLE	Quarterly	6	<0.001	0.001	100
KALIMNA	Quarterly	4	<0.001	0.003	100
LINDENOW	Quarterly	4	<0.001	0.008	100
LINDENOW SOUTH	Quarterly	4	0.001	0.003	100
MALLACOOTA	Quarterly	4	<0.001	0.004	100
MERRANGBAUR	Quarterly	4	0.001	0.002	100
METUNG	Quarterly	4	<0.001	0.002	100
NICHOLSON-SWAN REACH	Quarterly	4	0.001	0.003	100
NOWA NOWA	Quarterly	5	<0.001	0.053	100
OMEIO	Quarterly	4	<0.001	0.003	100
ORBOST	Quarterly	4	<0.001	<0.001	100
SARFIELD-BRUTHEN	Quarterly	4	0.003	0.012	100
SUNLAKES-TOORLOO	Quarterly	4	<0.001	0.002	100
SWIFTS CREEK	Quarterly	4	0.002	0.002	100

All water sampling localities were compliant for Zinc in the 2021-22 reporting period (Table 25).

4.3.6. Acid Soluble Aluminium

As outlined in Table 2, EGW applies Poly Aluminium Chlorohydrate to multiple water treatment processes as a coagulant. This can result in the presence of acid soluble aluminium within drinking water. Should acid soluble aluminium exceed a concentration of 0.2 mg/L, a white gelatinous precipitate can form within the distribution network causing “milky coloured” water (depending on the pH of the water).

Table 26: Acid Soluble Aluminium sampling frequency and results for 2021-22

WATER SAMPLING LOCALITY	ENTRY WATER SAMPLING FREQUENCY	RETICULATION SAMPLING FREQUENCY	TOTAL NO. SAMPLES	MIN (MG/L)	MAX (MG/L)	% COMPLIANCE
BAIRNSDALE	Weekly	Quarterly	69	0.01	0.12	100
BEMM RIVER	Monthly	Quarterly	57	<0.01	0.51	98
BUCHAN	Monthly	Quarterly	16	<0.01	0.03	100
CANN RIVER	Monthly	Quarterly	57	<0.01	0.04	100
DINNER PLAIN	NA	NA	NA	NA	NA	NA
EAGLE POINT-PAYNESVILLE	NA	Quarterly	6	0.02	0.03	100
KALIMNA	NA	Quarterly	4	0.02	0.03	100
LINDENOW	NA	Quarterly	4	0.02	0.03	100
LINDENOW SOUTH	Quarterly	Quarterly	8	0.01	0.03	100
MALLACOOTA	Weekly	Quarterly	57	<0.01	0.31	96

MERRANGBAUR	NA	Quarterly	4	0.02	0.03	100
METUNG	NA	Quarterly	4	0.02	0.02	100
NICHOLSON-SWAN REACH	NA	Quarterly	4	0.02	0.03	100
NOWA NOWA	NA	Quarterly	4	0.02	0.04	100
OMELO	Weekly	Quarterly	56	<0.01	0.12	100
ORBOST	Weekly	Quarterly	56	<0.01	0.11	100
SARFIELD-BRUTHEN	NA	Quarterly	4	0.02	0.03	100
SUNLAKES-TOORLOO	NA	Quarterly	4	0.02	0.03	100
SWIFTS CREEK	Weekly	Quarterly	56	<0.01	0.04	100

Note: Dinner Plain does not use aluminium based coagulant. Consequently, acid soluble aluminium is not sampled as it is not deemed a risk to safe drinking water at Dinner Plain.

The majority of sampling localities were compliant for Acid Soluble Aluminium for the 2021-22 reporting period (Table 26), with the exception of Bemm River and Mallacoota. Bemm river entry water had one reading of 0.51 mg/L whilst Mallacoota entry water had one reading of 0.31 mg/L. Both were attributable to water treatment plant performance issues which have since been rectified. Neither were associated with customer complaints of milky coloured water.

4.4. Analysis of Results

Comparing the performance in all water sampling localities demonstrates our high standard of compliance over the past two financial years. All sampling localities were fully compliant with the parameters described in Schedule 2 of the *Safe Drinking Water Regulations 2015*.

EGW samples for additional parameters in raw water, entry points and throughout the reticulation system. As outlined in Table 27, all entry point and reticulation samples have been 100% compliant against the health guideline values in the Australian Drinking Water Guidelines 2011.

Table 27: Reticulation and entry point monitoring and results 2021-22

PARAMETER	UNIT	HEALTH GUIDELINE VALUE (ADWG 2011)	AESTHETIC GUIDELINE VALUE (ADWG 2011)	EGW PERFORMANCE AGAINST GUIDELINE VALUES 2021-22 (% COMPLIANCE)
ACID SOLUBLE ALUMINIUM	mg/L	-	0.2	97.7
ARSENIC	mg/L	0.01	-	100.0
BARIUM	mg/L	2	-	100.0
CADMIUM	mg/L	0.002	-	100.0
CHLORINE (AS FREE CHLORINE)	mg/L	5	0.6	100.0
CHLORITE	mg/L	0.8	-	100.0
CHROMIUM	mg/L	0.05	-	100.0
COLOUR (TRUE)	HU	-	15	100.0
COPPER	mg/L	2	1	100.0
CYANIDE	mg/L	0.08	-	100.0
E.COLI	orgs/100 ml	0	-	100.0
FLUORIDE	mg/L	1.5	-	100.0
DICHLOROACETIC ACID	mg/L	0.1	-	100.0
TRICHLOROACETIC ACID	mg/L	0.1	-	100.0
HARDNESS (AS CaCO ₃)	mg/L	-	200	100.0
IODIDE	mg/L	0.5	-	100.0
IRON	mg/L	-	0.3	100.0
LEAD	mg/L	0.01	-	100.0
MANGANESE	mg/L	0.5	0.1	100.0
PH (FIELD)	mg/L	-	6.5-9.2	99.5
SILVER	mg/L	0.1	-	100.0
TOTAL TRIHALOMETHANES	mg/L	0.25	-	100.0



Based on the average values over the year, pH values for all water sampling localities are within the upper guideline range for pH (i.e., pH < 9.2). Elevated individual pH values have been observed in a number of water sampling localities. This is largely due to the presence of cement-lined distribution pipes. However, these higher pH values have not impacted water quality, as evidenced by compliant microbiological and aesthetic quality in 2021-22.

Parameters not listed in the ADWG are also analysed (Table 28).

Table 28: Reticulation and entry point - other parameter monitoring results 2019-2022

PARAMETER	UNIT	2021-22 MAXIMUM
CALCIUM AS CA	mg/L	16.0
CHLORATE	mg/L	0.39
COLIFORMS	Colilert	2,400
ELECTRICAL CONDUCTIVITY	(μ S/cm @ 25C)	590
MONOCHLOROACETIC ACID	mg/L	0.005
BROMOACETIC ACID	mg/L	0.005
BROMOCHLOROACETIC ACID	mg/L	0.007
BROMODICHLOROACETIC ACID	mg/L	0.007
DIBROMOACETIC ACID	mg/L	0.015
MAGNESIUM	mg/L	11.0
TOTAL ALUMINIUM	mg/L	0.48

5. QUALITY OF RAW AND PARTIALLY TREATED WATER FOR 2021-22

The following information applies to substances of interest that are sampled for in EGW's raw water storages (untreated water) and clear water storages (water that has been treated, but not undergone secondary disinfection).

5.1. Other Substances

5.1.1. Radiological

Radiologically active compounds may impact public health. Based on risk assessment, radiological activity samples are taken from bore waters every two years and from surface waters every five years.

Analyses for gross alpha & beta from bore water are next due in December 2022, and from surface water in December 2023.



5.1.2. Biocides in raw water sources

All surface raw water sources are analysed annually for biocides (i.e., herbicides and pesticides). A representative suite of these biocides is examined based on land management activities in the water supply catchments. Sampling occurs during the months of heaviest rainfall, namely July or September.

The targeted biocides are presented in the table below. Compliance is measured as recorded values being below the Australian Drinking Water Guidelines 2011 health-based guideline value, or if not specified in the Guidelines, the absence of the compound above the laboratory’s limits of detection.

EGW maintains close liaison with local stakeholders (e.g. catchment management authorities) regarding biocide application in water supply catchments to ensure minimal risk to the drinking water supply. This informs the frequency of biocide sampling and testing.

In the 2021-22 period, raw surface water samples were analysed from Buchan, Cann River, Orbost, Bairnsdale, Mallacoota, Omeo, and Swifts Creek.

Table 29: Biocide sampling program and results 2021-22

WATER SAMPLING LOCALITY	CLASS	COMPOUND	UNITS	MAX RESULT
JULY 2021 - BEMM RIVER, BUCHAN, CANN RIVER & ORBOST SEPTEMBER 2021 – BAIRNSDALE, MALLACOOTA, OMEO & SWIFTS CREEK	N/A	Glyphosate	mg/L	<0.030
	Organo-Chlorine Biocides	BHC (Alpha Isomer)	mg/L	<0.0001
		BHC (Beta Isomer)	mg/L	<0.0001
		BHC (Delta Isomer)	mg/L	<0.0001
		cis-Chlordane	mg/L	<0.01000
		trans-Chlordane	mg/L	<0.00001
		4,4'-DDD	mg/L	<0.0001
		4,4'-DDE	mg/L	<0.0001
		4,4'-DDT	mg/L	<0.0600
		Endosulfan I	mg/L	<0.0001
		Endosulfan II	mg/L	<0.0001
		Endosulphan Sulphate	mg/L	<0.0001
		Endrin	mg/L	<0.0001
		Endrin Aldehyde	mg/L	<0.0001
		Heptachlor	mg/L	<0.0500
		Heptachlor Epoxide	mg/L	<0.0500
		Lindane (BHC Gamma Isomer)	mg/L	<0.0001
		Methoxychlor	mg/L	<0.2000
		Organo-Phosphorus Biocides	Dichlorvos	mg/L
	Monocrotophos		mg/L	<0.001
Prophos	mg/L		<0.001	
Tetraethyldithiopyrphos	mg/L		<0.001	
Phorate	mg/L		<0.001	
Demeton-S	mg/L		<0.001	
Diazinon	mg/L		<0.001	

		Methyl Parathion	mg/L	<0.001
		Ronnel	mg/L	<0.001
		Malathion	mg/L	<0.001
		Fenthion	mg/L	<0.001
		Chloropyrifos	mg/L	<0.001
		Trichlorinate	mg/L	<0.001
		Tetrachlovinphos	mg/L	<0.001
		Tukuthion	mg/L	<0.001
		Fensulfothion	mg/L	<0.001
		EPN	mg/L	<0.001
		Coumaphos	mg/L	<0.001
	Phenoxy acid biocides	2,4,5-T	µg/L	<0.01
		2,4,5-TP	µg/L	<0.01
		2,4,6-T	µg/L	<0.1
		2,4-D	µg/L	<0.01
		2,4-DB	µg/L	<0.01
		2,4-DP	µg/L	<0.01
		2,6-D	µg/L	<0.1
		4 Chlorophenoxy Acetic Acid	µg/L	<0.01
		Clopyralid	µg/L	<0.05
		Dicamba	µg/L	<0.01
		Fluroxypyr	µg/L	<0.05
		MCPA	µg/L	<0.01
		MCPB	µg/L	<0.01
		Mecoprop	µg/L	<0.01
		Picloram	µg/L	<0.05
	Triclopyr	µg/L	<0.01	

Table 29 results were below the health-based guideline values in the Australian Drinking Water Guidelines, or if not specified in the Guidelines, were below the lower limits of detection, and were deemed to be compliant in 2021-22.

5.1.3. *Blue green algae in raw water and clear water*

Blue green algae (or cyanobacteria) are microscopic organisms that may thrive in warm, nutrient rich waters. They may impact water quality by releasing taste and odour compounds. In some extreme circumstances, these organisms may release concentrations of toxins. Samples are taken seasonally in each of the relevant water sampling localities. In addition to routine monitoring samples, additional samples may be taken to monitor the progression of algal growth during the summer/autumn seasons.

Under the Victorian Blue Green Algae Circular (2018), DH must be notified when samples representing the quality of drinking water supplied to customers indicate any of the following:

- Total microcystins are detected at greater than or equal to 1.3 micrograms per litre.
- *Microcystis aeruginosa* is present at greater than or equal to 6,500 cells per millilitre.



- Total combined biovolume of known toxic cyanobacterial species is greater than or equal to 0.6 cubic millimetres per litre.
- Total combined biovolume of all cyanobacterial species is greater than or equal to 10 cubic millimetres per litre.

Table 30 below summarises our monitoring program for blue green algae in 2021-22 in both raw water and clear water supplies.

Table 30: Blue green algae sampling program and results 2021-22

WATER SAMPLING LOCALITY	NO. OF SAMPLES (RAW WATER)	NO. OF SAMPLES (CLEAR WATER)
BAIRNSDALE	98	N/A
EAGLE POINT-PAYNESVILLE		N/A
KALIMNA		N/A
LINDENOW		5
LINDENOW SOUTH		0
MERRANGBAUR		N/A
METUNG		N/A
NICHOLSON-SWAN REACH		N/A
NOWA NOWA		N/A
SARFIELD-BRUTHEN		0
SUNLAKES-TOORLOO		0
BEMM RIVER		4
BUCHAN	N/A	N/A
CANN RIVER	4	N/A
DINNER PLAIN	N/A	N/A
MALLACOOTA	13	15
OMEIO	30	N/A
ORBOST	37	30
SWIFTS CREEK	4	0

Note: N/A – Not Applicable; this may be due to the absence of the specified storage within this locality, or due to the low risk from algal growth due to the presence of a fully sealed storage tank.

While no samples exceeded the reporting thresholds for blue green algae (BGA) in 2021-22, some species of algae release compounds (by-products) that have objectionable taste and odour. This caused a number of customer complaints during this last financial year.

Geosmin and MIB are two such compounds produced by BGA. While a source of potential customer complaints, these compounds are not known to be a health risk. Early intervention is required as these compounds are detectable at low concentrations (~9 ng/L).

Under optimal conditions chlorination may destroy some of the above compounds that cause objectional taste and odour however at EGW, activated carbon has been found to be a much more effective treatment method for their removal. While this treatment method is not routinely available at our water treatment plants (only Woodglen WTP), a mobile Powder Activated Carbon (PAC) trailer has been set up to respond to potential taste/odour issues.



To ensure the risks associated with algal blooms are appropriately managed and communicated, EGW have an Algae Risk Management Plan that is regularly reviewed and updated.

6. CONTINUOUS IMPROVEMENT MEASURES

During 2021-22 EGW implemented and continued a number of major initiatives to maintain and improve water quality for customers, such as:

- an ongoing program to replace and/or refurbish ageing water mains, particularly those presenting service reliability risks for customers
- upgrading 1km of water main along the Paynesville Road, between Bairnsdale and Eagle Point and 550m of water main at the entrance to Paynesville
- upgrading 400m of water main along Day Avenue in Omeo, and 100m of problematic water main in Bailey Street, Bairnsdale
- replacing around 200m of ageing water main in Nicholson Street, Orbost
- all air valves (hundreds) were inspected and serviced to help maximise the performance of water reticulation systems
- use of vacuum drones to clean tanks, this may be expanded to include storage basins in the future. This provides a great benefit in not having to take tanks off-line
- detailed sanitary surveys Buchan and Cann River
- sampling program review - initial
- increased focus on operator training and competency
- turbidity meter upgrade in most supply systems
- raw water pre-treatment installed on most supply systems



7. COMPLAINTS RELATING TO WATER QUALITY

Our Customer Charter outlines our commitments, responsibilities and standards of service to be provided to our customers.

The Charter also sets out the obligations to customers as outlined by the Essential Services Commission's Customer Service Code for metropolitan, retail and regional water businesses. This includes specific standards and conditions of service that apply to all water businesses in Victoria.

Further information relating to EGW's Customer Charter can be found on our website www.egwater.vic.gov.au.

EGW defines a water quality complaint as "A customer contacts EGW and informs EGW they are unhappy with the water being supplied, or, informs EGW of an issue that has affected the quality of the water being supplied, or, expresses opposition to EGW's use of water treatment chemicals".

Table 31 Summary of all customer water quality complaints 2021-2022

TYPE OF COMPLAINTS	NUMBER OF COMPLAINTS			COMPARISON BETWEEN YEARS
	2019/20	2020/21	2021-22	
ALLEGED ILLNESS	0	0	0	No significant change.
DISCOLOURED WATER	22	11	18	No significant change.
TASTE AND ODOUR	17	11	23	No significant change.
AIR IN WATER (WHITE WATER)	25	23	7	Significant change.
OTHER	0	6	5	No significant change.
TOTAL	64	51	53	No significant change.

Table 32 Summary of all customer water quality complaints per locality 2021-22

WATER SAMPLING LOCALITY	TYPE OF COMPLAINT					Total
	Alleged Illness	Discoloured Water	Taste and Odour	White Water	Other	
BAIRNSDALE		2	5	1	2	10
BEMM RIVER						
BUCHAN						
CANN RIVER						
DINNER PLAIN		1	3	1		5
EAGLE POINT- PAYNESVILLE		3	2	1	1	7
KALIMNA						
LAKES ENTRANCE		4	2	1	1	8
LINDENOW						



LINDENOW SOUTH						
MALLACOOTA			1		1	2
MERRANGBAUR						
METUNG		1	4	1		6
NICHOLSON-SWAN REACH		1				1
NOWA NOWA						
OMELO						
ORBOST		5	5			10
SUNLAKES-TOORLOO						
SARFIELD-BRUTHEN		1	1	2		4
SWIFTS CREEK						
UNKNOWN (ANONYMOUS)						
TOTAL		18	23	7	5	53

7.1. Alleged Health Complaints

No complaints were recorded in the EGW customer database, alleging health issues had resulted from drinking water (Table 31).

7.2. Discoloured Water

Eighteen (18) complaints of discoloured drinking water were recorded in 2021-22 (32). These were mostly due to works being undertaken on water mains, high draw down from fire hydrants or as a result of internal plumbing issues. The majority of these were managed through flushing of the reticulation system.

7.3. Taste and Odour

Twenty-three (23) taste and odour complaints were recorded in 2021-22 (32). The majority of other complaints related to drinking water taste and the smell of chlorine. EGW manages these complaints by sampling for chlorine residual and/or flushing the system where required. Sampling confirmed 100% compliance with health-based guidelines. In the last financial year periodic algal growth has caused issues with taste and odour (MIB and Geosmin).

7.4. Air in Water (White Water)

Air in water can cause drinking water to appear cloudy in colour as a result of the formation of tiny bubbles. Seven (7) complaints related to air in water were recorded in 2021-22 (Table 32). This was a significant reduction in customer complaints compared to the previous years. This was due to a number of new air valves having been installed across our systems.

Our staff always strive to give the best customer service possible. The results of the regular customer surveys conducted by the Essential Services Commission during 2021-22 continued to rank EGW as one of the top performing water corporations in Victoria. We take



great pride in these results as they reinforce our commitment to provide a level of service that our customers expect.

8. REGULATED WATER

Regulated Water is “water that is not intended for drinking but could reasonably be mistaken for drinking water”. EGW has no declared Regulated Water supplies as defined in Section 6 (2) of the Safe Drinking Water Act 2003.

EGW has no regulated water supplies, however, there are a number of customers who are supplied non-potable water by agreement. We remind those customers that their water is non-potable on their quarterly invoice.

9. UNDERTAKINGS, AESTHETIC STANDARD VARIATIONS AND EXEMPTIONS

EGW has no undertakings, aesthetic standard variations or exemptions relating to the provision of Safe Drinking Water.

10. FURTHER INFORMATION

This Water Quality Annual Report is prepared in accordance with Section 26 of the *Safe Drinking Water Act 2003*.

Section 23 of the *Safe Drinking Water Act 2003* requires that EGW make available for inspection by the public the results of any water quality monitoring program that is conducted on any drinking water supplied by us.

Customers and members of the public may access drinking water quality data by contacting EGW on the details provided below;

For further information regarding water quality information, please refer to the EGW website (www.egwater.vic.gov.au), or contact EGW on 1800 671 841.



11. GLOSSARY OF TERMS

TERM	EXPOSITION
COAGULATION/ FLOCCULATION	Treatment process where chemicals are added to raw water to bind suspended solids, generally expressed as turbidity. Once bound, the chemical and turbidity form “floc” which is either settled out in the clarification process or floated off during the dissolved air flotation process.
CHLORINE GAS	Chemical added for disinfection of water.
CWS	Clear water storage (treated drinking water storage)
DH	Department of Health
DWQRMS	Drinking Water Quality Risk Management System
DISSOLVED AIR FLOTATION	Treatment process utilising air dissolved in water to float suspended particles to the surface of a treatment plant clarifier cell. The float is periodically removed and clear water is drained from the bottom of the cell.
DISINFECTION	Treatment process where chlorine or ultraviolet light is introduced to the flow of clear water prior to customer consumption to kill any pathogenic organisms (make it safe to drink) that may be present in the clear water following the sedimentation/dissolved air flotation and granular media filtration processes.
FLUORIDATION	The addition of Fluoride to the water supply system for the benefit of dental hygiene.
FLUOROSILICIC ACID	Chemical used for fluoridation of water.
GEOBAG DEWATERING	Treatment process utilising large material bags to separate water from solids. The solids are restricted from passing through the fine material while water is able to seep through.
GRANULAR MEDIA FILTRATION	Treatment process which utilises anthracite, sands and gravels to filter out suspended particles following the sedimentation/dissolved air flotation processes. Suspended particles are trapped within the media and clear water passes through prior to being disinfected. The particles build up in the media and are periodically washed out in a reverse flow process.
HU	Hazen units
KL	Kilolitres (1,000 litres)
L/S	Litres per second
MG/L	Milligrams per litre
MECHANICAL DEWATERING	Treatment process where solids and water are separated through a high-speed centrifugal separation process. High speed revolutions force separation between the solid and liquid, solids are captured for processing and water is returned back to the treatment process.
ML	Megalitre (1,000,000 litres)
N/A	Not applicable
NTU	Nephelometric turbidity units
POLY ALUMINIUM CHLOROHYDRATE (PAC 23)	Coagulant chemical used during coagulation process to remove suspended solids from raw water.



POLYMER (LT20, 25, 27)	Chemical used as a flocculation aid to increase settlement rate of suspended solids in the coagulation process.
POWDER ACTIVATED CARBON	Product used for reduction/removal of taste and odour compounds and algae toxins in water.
RMP	Risk management plan
SOP	Standard operating procedure
SODA ASH	Chemical used for pH correction to aid the coagulation/flocculation process
SODIUM HYDROXIDE (CAUSTIC SODA)	Chemical used for pH correction to aid the coagulation/ flocculation process.
SODIUM HYPOCHLORITE	Chemical added for disinfection of water.
SEDIMENTATION/ CLARIFICATION	Treatment process where flocculated particles in the raw water are settled into the bottom of a clarifier and periodically removed. Clear water is taken from the top of the clarifier prior to filtration and disinfection.
WTP	Water treatment plant



APPENDIX A. RISK MANAGEMENT PLAN CERTIFICATE OF COMPLIANCE

Risk Management Plan Audit Certificate
Safe Drinking Water Regulations 2015

Certificate Number: REC-20-223

Audit period: 5 May 2018 to 26 August 2020

To:

Rachael Brownstein

Coordinator Treatment & Environment Systems

East Gippsland Water

PO Box 52

Bairnsdale, Vic 3875

Australian Business Number (ABN): 40 096 764 586

I, Karen Pither, after conducting a risk management plan audit of the water supplied by East Gippsland Water, am of the opinion that East Gippsland Water *has not* complied with the obligations imposed by section 7(1) of the *Safe Drinking Water Act 2003* during the audit period.

The details of the reasons for noncompliance are—

- the microbial risk assessment generally follows the methodology outlined in the WSAA Health Based Targets Manual, however there were number of areas where East Gippsland Water assessments were not consistent with the methodology and there was an absence of data to justify the deviations from the methodology. The non-compliance was considered minor because East Gippsland Water has undertaken the assessment and is progressing with the implementation of the results, however there are areas where more data is required to justify some components of the assessment. Additionally, critical limits for filtered water turbidity, for some systems, are not consistent with the operational ranges that correspond to the pathogen log reduction claimed. Recommendations have been made to review the microbial risk assessment and the critical limits.

26 August 2020



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East Gippsland **Water**