

Water Quality Annual Report 2011/2012



October 2012

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Managing Director's Report

I am pleased to present East Gippsland Water's Annual Water Quality Report for the 2011/2012 financial year. This report has been produced in accordance with the requirements of the *Safe Drinking Water Act 2003* and with the *Department of Health Drinking Water Regulation Guidance Note* (May 2012).

In 2011/12 East Gippsland Water continued to demonstrate our commitment to providing excellent water quality to our customers with 100% compliance achieved with all water quality standards in all localities. Further to this, a number of water quality improvement projects were delivered; including a new clear water storage tank at Swifts Creek and the decommissioning of aging storages in Dinner Plain and Lindenow South. The Corporation continues to invest further in automation and the monitoring of water treatment sites, and each year its dedicated SCADA team work to continuously improve these systems, further ensuring water supplies entering our networks are of the highest quality.

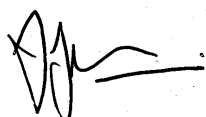
At the coal face, our operations teams remain on standby 24 hours-a-day, seven days-a-week to respond to water quality alerts or emergency events. Our highly skilled and experienced operators came to the fore in June 2012 when our region experienced severe storms and widespread flooding. Despite extended power outages, communication faults and inaccessible sites (from fallen trees and/or flooded roads), East Gippsland Water continued to supply water of the highest quality with no disruption to our customers. This outcome was achieved through careful planning, implementation of robust systems, and the dedication and skill level of our staff.

During the 2011/12 period, East Gippsland Water also awarded routine water quality sampling services to a NATA accredited company that have now established a base in East Gippsland for the first time. Our water quality monitoring systems have required significant adjustment to achieve this outcome and it demonstrates our commitment to transparent and quality processes.

In February 2012, East Gippsland Water was subject to a Drinking Water Quality Management System Regulatory Audit and was found to comply with the requirements of the Safe Drinking Water Act and Regulations. The audit report made note of the significant improvements made to infrastructure associated with delivery of high quality drinking water and to the management systems that have advanced significantly since the previous audit.

Importantly, last year water quality complaints continued to remain well below target limits, demonstrating that we are meeting and responding to our customers' expectations in relation to water quality, appearance and taste.

I hope that you will find this report interesting and informative and that it conveys East Gippsland Water's commitment to the delivery of high quality water to its customers.



Les Mathieson

Managing Director

East Gippsland Water

1 Introduction

East Gippsland Water delivers the full range of retail water supply functions including water harvesting and storage, and urban water supply. It also provides wastewater collection, treatment and recycling services, as well as trade waste services to industrial and commercial customers.

Each year, East Gippsland Water demonstrates its commitment to delivering excellent drinking water quality by continuing to improve internal procedures, customer service, best practice operations and strong investment in infrastructure, regardless of the size of the community.

1.1 Characterisation of the System

East Gippsland Water serves a region covering 21,000 square kilometres in the far south east corner of Victoria, with a customer base of 21,774 connections (Figure 1).

East Gippsland Water's service area 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.

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 the water supply and treatment systems is provided in Section 2.1.

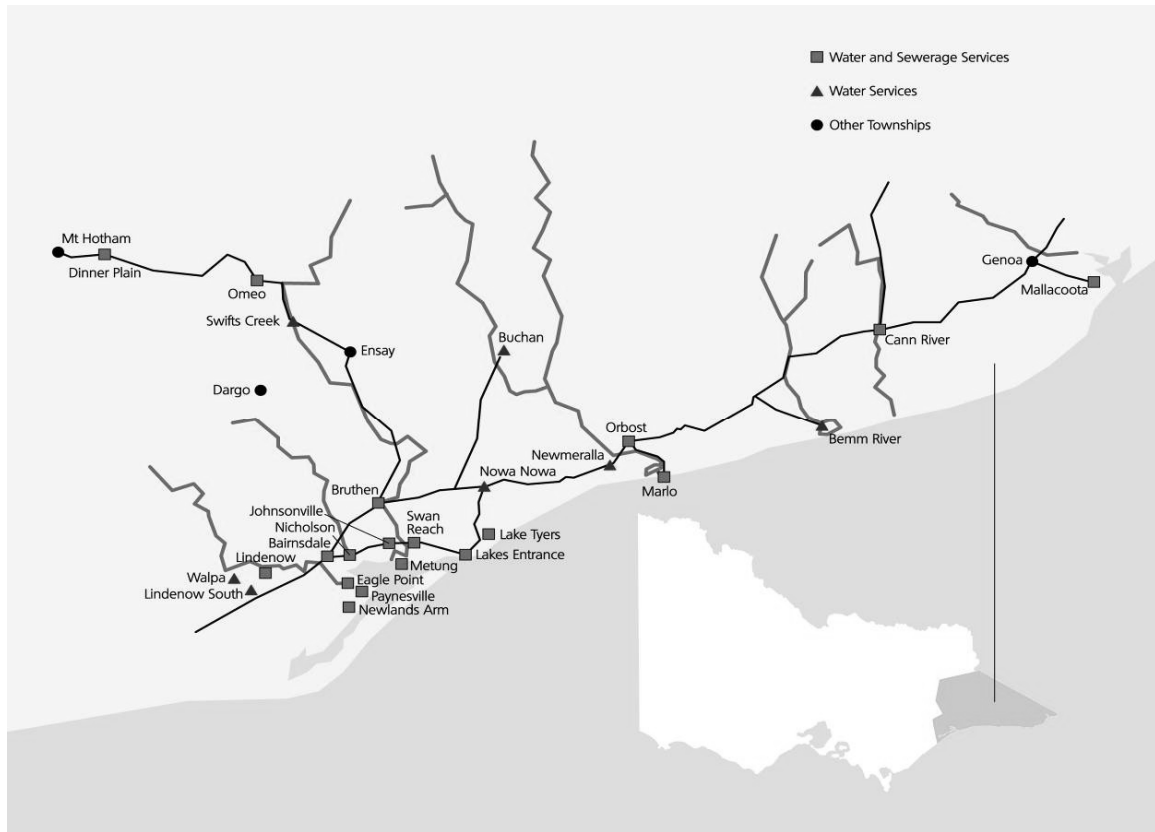


Figure 1: East Gippsland Water's Region of Operation

2 Water treatment and quality management systems

East Gippsland Water operates nine water treatment systems, supplying 21,774 connections in 19 water sampling localities across East Gippsland. A summary of these systems is provided in Table 2.1.

East Gippsland Water has a Drinking Water Quality Risk Management System (DWQRMS) to ensure key risks for each of the aforementioned supply systems are managed effectively. East Gippsland Water’s DWQRMS has been developed in accordance with Australian Drinking Water Guidelines 2011 Framework for Management of Drinking Water Quality. An overview of the DWQMS structure is detailed in Figure 2 below.

Each year internal audits of the DWQRMS are conducted to ensure continuous improvement. East Gippsland Water’s undertook an external audit in February 2012, and passed, receiving no non-conforming issues (refer to Section 7 for more details). This audit is undertaken at the request of the Department of Health.

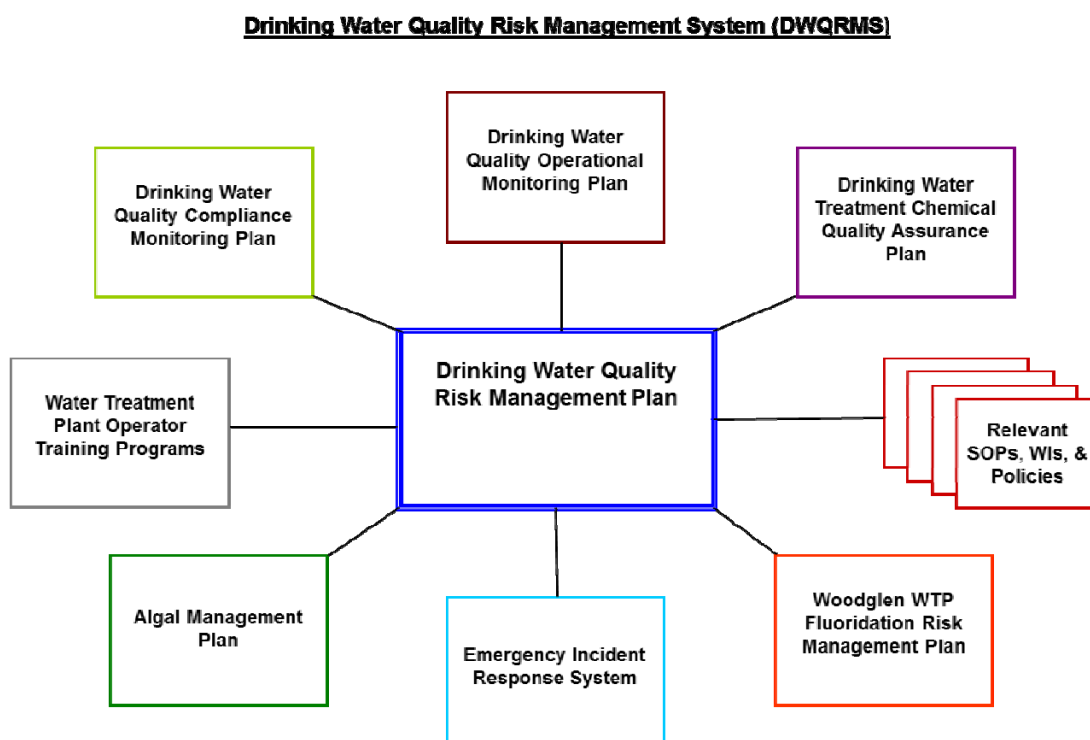


Figure 2: Structure of the Drinking Water Quality Risk Management System (DWQRMS)

2.1 Water Treatment

A summary of the processes by which drinking water is disinfected and/or treated is presented in Table 2.1 below. With the exception of the commissioning of the Swifts Creek treated water storage tank, no significant changes have been made to the water treatment process in East Gippsland Water’s water sampling localities in 2011/2012.

Table 2.1 Water Sampling Locality and Treatment Summary Table

Water Sampling Locality	Population Supplied (Connections)	Source Water	Catchment Description	Raw Water Storage	Treatment Plant	Treatment process	Added substances	Comments
Bairnsdale	7211	Mitchell River	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 (850 ML) & 2 (713 ML) storage basins	Woodglen	Coagulation, flocculation, dissolved air flotation, filtration, disinfection	Caustic soda, poly (LT 25 ¹ & 27 ²), fluoride ³ , poly aluminium chlorohydrate ³ (PAC 23), chlorine; fluoride ³	¹ LT 25 used for backwash water clarification ² LT 27 used for centrifuge ³ Fluoride dosing commenced in August 2010
Lindenow	215	Aquifer (5 bores, seasonal supplemental supply)						
Lindenow South	156							
Sarsfield-Bruthen	572							
Merrangbaur	851							
Sunlakes-Toorloo	2897							
Kalimna	635							
Eagle Point-Paynesville	3424							
Nicholson-Swan Reach	556							
Metung	1106							
Nowa Nowa	99							
Buchan	105	Buchan River	80% forest with some impacts (forestry, agriculture, cattle and camping)	n/a	Buchan	Coagulation, flocculation, dissolved air flotation, filtration, disinfection	Caustic soda, poly aluminium chlorohydrate (PAC 23), poly (LT 25 ¹), chlorine	¹ LT 25 used for backwash water clarification
Cann River	196	Cann River	Forest, agricultural land (cattle), some septic tanks, roads and logging.	n/a	Cann River			
Swifts Creek	126	Tambo River	Forest, agricultural land (cattle), some septic tanks, roads and logging.	4.6 ML basin (shade-cloth covered)	Swifts Creek			
Bemm River	92	Bemm River	90% forest, with some forestry, agricultural and human impacts	n/a	Bemm River			
Orbost	1973	Brodribb River & Rocky River	90% Forest, with some forestry, agricultural and human impacts	6 ML basin	Orbost	Coagulation, flocculation, upflow clarification, filtration, disinfection	Soda ash, poly aluminium chlorohydrate (PAC 23), poly (LT 20), chlorine	
Omeo	250	Butchers Creek	State forest with minimal human impacts (some grazing)	5 ML (shade-cloth covered); 10 ML basin (off-line in 2011/2012)	Omeo			
Mallacoota	911	Betka River & Aquifer (2 bores)	State forest with minimal human impacts (some forestry)	41 ML basin (shade-cloth covered)	Mallacoota		Caustic soda, poly aluminium chlorohydrate (PAC 23), poly (LT 20 & 25 ¹), chlorine	¹ LT 25 used for backwash water clarification
Dinner Plain	399	Aquifer (2 bores)	Supply is extracted from bores deeper than 70m, with an exclusion zone	700 kL tank	Dinner Plain	UV disinfection	None	

2.2 Issues

No notable issues with water quality were identified in the 2011/2012 reporting period. A summary of the opportunities for improvement identified during the February 2012 Drinking Water Regulatory Audit, alongside their current progress, is provided in Section 7.

Three Section 22 notifications under the Safe Drinking Water Act 2003 were lodged in the 2011/2012 reporting period. Further information relating to these notifications is presented in Section 5.

3 Water Quality Highlights 2011/12

East Gippsland Water is committed to providing excellent drinking water quality to our customers. East Gippsland Water is also committed to continuously reducing potential risks to water quality. As a result, a significant number of projects and operational improvements were completed in 2011/2012 to ensure we continue to provide the highest quality drinking water to all our customers. A summary of the notable water quality investigation/improvement projects completed in 2011/2012 are outlined below:

Swifts Creek Clear Water Tank: This year, East Gippsland Water commissioned a new treated water storage tank for the community of Swifts Creek. This new asset further improves the water quality, by reducing the risk of environmental contamination entering the treated water supply. In addition, conversion of the existing basin to a raw water storage increases the town's raw water storage capacity to 4.6 ML, by allowing previously-collected river water to be stored during sizeable water flow events. This increased raw water storage capacity will protect the community against prolonged periods of dry weather into the future.



Figure 3: Swifts Creek Tank

Proactive Pipeline Cleaning: More than 125km of water main (some 14 per cent of the total network) was extensively cleaned to ensure the efficiency of the supply network and maintain drinking water quality. Communities to benefit included Paynesville, Eagle Point, Orbost, Raymond Island, Sarsfield, Kalimna, Bruthen, Marlo, Lakes Entrance and Lake Tyers Beach.

Outsourcing of Routine Water Quality Sampling to an Independent Laboratory: In 2011/2012, East Gippsland Water successfully laid the groundwork to outsource routine water quality scheduling and sampling to an independent, NATA-accredited, laboratory. This programme is due to commence in 2012/2013. This will provide greater transparency with regard to East Gippsland Water's water quality sampling activities and will ensure that samples continue to be taken with the highest degree of sample integrity. Further, as part of this process, East Gippsland Water will now be able to benefit from critical microbiological

results becoming available within 24-hours of the sample being taken. This will allow East Gippsland Water to respond more rapidly in the unlikely event of a contamination incident.

Independent Verification of all Fluoridation Alarms and Interlocks at Woodglen Treatment Facility: In May 2011, East Gippsland Water engaged independent telemetry consultants to review and test all fluoride dosing-related alarms at the Woodglen water treatment facility. Testing indicated that all alarms and interlocks were functioning effectively, providing continued assurance of the safety of water supplied to customers within the fluoridated Mitchell System.

Replacement of Aging Intermediate Storages: In 2011/2012, East Gippsland Water replaced a number of elevated intermediate water storages with variable speed drive pumps. Old water storages are often reported as the source of microbiological contamination during water quality incidents worldwide. Intermediate storages were taken off-line in the Lindenow South and Dinner Plain water sampling localities, eliminating a potential water quality risk within each of these sites. A programmed replacement of aging storages will continue in 2012/2013.

Elimination of Stock Accessing Source Water: East Gippsland Water worked closely with a local Catchment Management Authority and crown frontage licensee to eliminate stock accessing a river upstream of a raw water off-take. To facilitate this, East Gippsland Water provided an independent off-stream watering system to supply river water to an adjacent stock trough. This enabled the section of river to be fenced off to eliminate stock from entering the river. An intensive revegetation programme is to be undertaken along this section of river in 2012/2013 to restore an appropriate riparian buffer zone (approximately 10 m), to ensure the quality of river, and the raw water source, are maintained into the future.

Investigation into the Water Quality Impacts of Elevated pH in Metung: East Gippsland Water, in conjunction with a visiting placement engineering student from Ensil University of Limoges (France), undertook an investigation into the impacts of elevated pH levels in the Metung water sampling locality. The report found that no health-related (i.e. microbiological quality) nor aesthetic (i.e. taste/odour, colour, corrosion customer notifications/complaints) water quality impacts are evident in this sampling locality, relative to a control water sampling locality, where pH values remain closer to a neutral pH of 7.

4 Quality of Drinking Water for 2011/2012

4.1 Regulated Parameters- *Escherichia coli* (*E. coli*)

E. coli samples are taken at least weekly in each of the water sampling localities. Compliance is measured as: $\geq 98\%$ of samples containing no *E. coli*.

Water Sampling Locality	Sampling Frequency	No. of Samples taken	Maximum Result (orgs/100mL)	% samples with no <i>E. coli</i>	Complying (Yes / No)
Bairnsdale	Weekly	72	0	100%	Yes
Bemm River	Weekly	52	2	98.1%	Yes
Buchan	Weekly	52	0	100%	Yes
Cann River	Weekly	52	1	98.1%	Yes
Dinner Plain	Weekly	52	0	100%	Yes
Eagle Point- Paynesville	Weekly	52	0	100%	Yes
Kalimna	Weekly	52	0	100%	Yes
Lindenow	Weekly	52	0	100%	Yes
Lindenow South	Weekly	52	0	100%	Yes
Mallacoota	Weekly	51 ^a	0	100%	Yes
Merrangbaur	Weekly	52	0	100%	Yes
Metung	Weekly	52	0	100%	Yes
Nicholson-Swan Reach	Weekly	52	0	100%	Yes
Nowa Nowa	Weekly	52	0	100%	Yes
Omeo	Weekly	52	0	100%	Yes
Orbost	Weekly	52	0	100%	Yes
Sarsfield-Bruthen	Weekly	52	0	100%	Yes
Sunlakes-Toorloo	Weekly	57 ^b	0	100%	Yes
Swifts Creek	Weekly	52	0	100%	Yes

^a*E. coli* samples taken in Mallacoota on 10th October 2011 failed to make it to the laboratory within the requisite 24-hour holding period due to a courier delivery van breakdown and laboratory registration error (further details presented in Section 4.1.1); accordingly, the results from only 51 samples are presented.

^bThe frequency of *E. coli* samples taken in Sunlakes-Toorloo increased between December 2011 to February 2012 due to seasonal population influxes during the summer period.

4.1.1 Comments on Results

Bemm River and Cann River *E. coli* detection: In February 2012, low levels of *E. coli* were detected in the reticulation samples from both Bemm River and Cann River water sampling localities (both samples were taken together on the same day). In response to this occurrence, East Gippsland Water enacted a full sanitary inspection of the supply systems, in parallel with a detailed field investigation and a systematic programme of flushing and sampling throughout both reticulation systems. All investigation samples returned zero *E. coli* on two consecutive days of full reticulation system resampling. Further, no discernible source of contamination was identified, nor was there any breach in the barriers to contamination throughout either system. Accordingly, the source of the *E. coli* was likely to have been introduced during the sampling process, during sample transit to the laboratory or during the laboratory processing of samples (further information provided in Section 5). Following this

incident, the importance of sanitary/aseptic technique during sample collection and laboratory handling was communicated to relevant personnel.

Mallacoota Sample Delivery Issue: In October 2011, an *E. coli* sample failed to make it to the testing laboratory in metropolitan Melbourne (a distance of c. 500 km) within the requisite 24-hour holding time due to a courier delivery van break down. In addition, the testing laboratory incorrectly registered the expired samples as within the correct holding time, meaning that the issue was not identified with sufficient time to resample the reticulation site within the required 7-day period. Following this, the critical importance of next day delivery for water samples was impressed upon the courier company. Further, the testing laboratory provided assurance that the analysts and reviewers were now clearly aware of the importance of following the relevant procedures to ensure the correct registration and processing of newly arrived samples. Additional follow-up sampling and review of water treatment plant trends around this period confirmed that the microbiological integrity of the Mallacoota reticulation system was assured during this period.

4.2 Regulated Parameters- *Trihalomethanes*

Trihalomethanes samples are taken monthly in each of the water sampling localities. Compliance is measured as: trihalomethanes < 0.250 milligrams per litre.

Water Sampling Locality	Sampling Frequency	No. of Samples	No. of Non-complying samples	Maximum (mg/L)	Complying (Yes / No)
Bairnsdale	Monthly	12	0	0.033	Yes
Bemm River	Monthly	12	0	0.037	Yes
Buchan	Monthly	12	0	0.073	Yes
Cann River	Monthly	12	0	0.057	Yes
Dinner Plain	n/a ^a	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Eagle Point- Paynesville	Monthly	12	0	0.047	Yes
Kalimna	Monthly	12	0	0.058	Yes
Lindenow	Monthly	12	0	0.023	Yes
Lindenow South	Monthly	12	0	0.029	Yes
Mallacoota	Monthly	12	0	0.200	Yes
Merrangbaur	Monthly	12	0	0.068	Yes
Metung	Monthly	12	0	0.064	Yes
Nicholson-Swan Reach	Monthly	12	0	0.055	Yes
Nowa Nowa	Monthly	12	0	0.091	Yes
Omeo	Monthly	12	0	0.041	Yes
Orbost	Monthly	12	0	0.100	Yes
Sarsfield-Bruthen	Monthly	12	0	0.044	Yes
Sunlakes-Toorloo	Monthly	12	0	0.076	Yes
Swifts Creek	Monthly	12	0	0.063	Yes

^an/a– not applicable; Dinner Plain water sampling locality is not sampled for chlorine-based disinfection by-products as ultra-violet disinfection is employed in lieu of chlorine.

4.2.1 Comments on Results

All water quality locations were compliant for trihalomethanes for the 2011/2012 reporting period.

East Gippsland Water has been 100% compliant for this standard in each sampling locality for 2007/2008, 2008/2009, 2009/2010, 2010/2011 and 2011/2012.

4.3 Regulated Parameters - *Chloroacetic acid*

Chloroacetic acid samples are taken monthly in each of the water sampling localities. Compliance is measured as: chloroacetic acid < 0.150 milligrams per litre.

Water Sampling Locality	Sampling Frequency	No. of Samples	No. of Non-complying samples	Maximum (mg/L)	Complying (Yes / No)
Bairnsdale	Monthly	12	0	0.005	Yes
Bemm River	Monthly	12	0	0.005	Yes
Buchan	Monthly	12	0	0.005	Yes
Cann River	Monthly	12	0	0.005	Yes
Dinner Plain	n/a ^a	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Eagle Point- Paynesville	Monthly	12	0	0.005	Yes
Kalimna	Monthly	12	0	0.005	Yes
Lindenow	Monthly	12	0	0.005	Yes
Lindenow South	Monthly	12	0	0.005	Yes
Mallacoota	Monthly	12	0	0.005	Yes
Merrangbaur	Monthly	12	0	0.005	Yes
Metung	Monthly	12	0	0.005	Yes
Nicholson-Swan Reach	Monthly	12	0	0.005	Yes
Nowa Nowa	Monthly	12	0	0.005	Yes
Omeo	Monthly	12	0	0.005	Yes
Orbost	Monthly	12	0	0.005	Yes
Sarsfield-Bruthen	Monthly	12	0	0.005	Yes
Sunlakes-Toorloo	Monthly	12	0	0.005	Yes
Swifts Creek	Monthly	12	0	0.005	Yes

^an/a– not applicable; Dinner Plain water sampling locality is not sampled for chlorine-based disinfection by-products as ultra-violet disinfection is employed in lieu of chlorine.

4.3.1 Comments on Results

All water quality locations were compliant for chloroacetic acid for the 2011/2012 reporting period.

East Gippsland Water has been 100% compliant for this standard in each sampling locality for 2007/2008, 2008/2009, 2009/2010, 2010/2011 and 2011/2012.

4.4 Regulated Parameters- *Dichloroacetic acid*

Dichloroacetic acid samples are taken monthly in each of the water sampling localities. Compliance is measured as: dichloroacetic acid < 0.100 milligrams per litre.

Water Sampling Locality	Sampling Frequency	No. of Samples	No. of Non-complying samples	Maximum (mg/L)	Complying (Yes / No)
Bairnsdale	Monthly	12	0	0.007	Yes
Bemm River	Monthly	12	0	0.005	Yes
Buchan	Monthly	12	0	0.006	Yes
Cann River	Monthly	12	0	0.006	Yes
Dinner Plain	n/a ^a	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Eagle Point- Paynesville	Monthly	12	0	0.006	Yes
Kalimna	Monthly	12	0	0.011	Yes
Lindenow	Monthly	12	0	0.005	Yes
Lindenow South	Monthly	12	0	0.005	Yes
Mallacoota	Monthly	12	0	0.019	Yes
Merranqbaur	Monthly	12	0	0.010	Yes
Metung	Monthly	12	0	0.007	Yes
Nicholson-Swan Reach	Monthly	12	0	0.014	Yes
Nowa Nowa	Monthly	12	0	0.012	Yes
Omeo	Monthly	12	0	0.018	Yes
Orbost	Monthly	12	0	0.010	Yes
Sarsfield-Bruthen	Monthly	12	0	0.015	Yes
Sunlakes-Toorloo	Monthly	12	0	0.009	Yes
Swifts Creek	Monthly	12	0	0.012	Yes

^an/a– not applicable; Dinner Plain water sampling locality is not sampled for chlorine-based disinfection by-products as ultra-violet disinfection is employed in lieu of chlorine.

4.4.1 Comments on Results

All water quality locations were compliant for dichloroacetic acid for the 2011/2012 reporting period.

East Gippsland Water has been 100% compliant for this standard in each sampling locality for 2007/2008, 2008/2009, 2009/2010, 2010/2011 and 2011/2012.

4.5 Regulated Parameters- *Trichloroacetic acid*

Trichloroacetic acid samples are taken monthly in each of the water sampling localities. Compliance is measured as: trichloroacetic acid < 0.100 milligrams per litre.

Water Sampling Locality	Sampling Frequency	No. of Samples	No. of Non-complying samples	Maximum (mg/L)	Complying (Yes / No)
Bairnsdale	Monthly	12	0	0.009	Yes
Bemm River	Monthly	12	0	0.005	Yes
Buchan	Monthly	12	0	0.016	Yes
Cann River	Monthly	12	0	0.005	Yes
Dinner Plain	n/a ^a	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Eagle Point- Paynesville	Monthly	12	0	0.010	Yes
Kalimna	Monthly	12	0	0.013	Yes
Lindenow	Monthly	12	0	0.006	Yes
Lindenow South	Monthly	12	0	0.007	Yes
Mallacoota	Monthly	12	0	0.026	Yes
Merrangbaur	Monthly	12	0	0.013	Yes
Metung	Monthly	12	0	0.011	Yes
Nicholson-Swan Reach	Monthly	12	0	0.011	Yes
Nowa Nowa	Monthly	12	0	0.016	Yes
Omeo	Monthly	12	0	0.024	Yes
Orbost	Monthly	12	0	0.023	Yes
Sarsfield-Bruthen	Monthly	12	0	0.013	Yes
Sunlakes-Toorloo	Monthly	12	0	0.013	Yes
Swifts Creek	Monthly	12	0	0.022	Yes

^an/a– not applicable; Dinner Plain water sampling locality is not sampled for chlorine-based disinfection by-products as ultra-violet disinfection is employed in lieu of chlorine.

4.5.1 Comments on Results

All water quality locations were compliant for trichloroacetic acid for the 2011/2012 reporting period.

East Gippsland Water has been 100% compliant for this standard in each sampling locality for 2007/2008, 2008/2009, 2009/2010, 2010/2011 and 2011/2012.

4.6 Regulated Parameters- Aluminium (acid soluble)

Aluminium samples are taken monthly in each of the water sampling localities. Compliance is measured as: aluminium (acid soluble) < 0.20 milligrams per litre.

Water Sampling Locality	Sampling Frequency	No. of Samples	No. of Non-complying samples	Maximum (mg/L)	Complying (Yes / No)
Bairnsdale	Monthly	12	0	0.02	Yes
Bemm River	Monthly	12	0	0.02	Yes
Buchan	Monthly	12	0	0.11	Yes
Cann River	Monthly	12	0	0.06	Yes
Dinner Plain	n/a ^a	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Eagle Point- Paynesville	Monthly	12	0	0.02	Yes
Kalimna	Monthly	12	0	0.02	Yes
Lindenow	Monthly	12	0	0.02	Yes
Lindenow South	Monthly	12	0	0.02	Yes
Mallacoota	Monthly	12	0	0.06	Yes
Merrangbaur	Monthly	12	0	0.02	Yes
Metung	Monthly	12	0	0.03	Yes
Nicholson-Swan Reach	Monthly	12	0	0.02	Yes
Nowa Nowa	Monthly	12	0	0.04	Yes
Omeo	Monthly	12	0	0.03	Yes
Orbost	Monthly	12	0	0.07	Yes
Sarsfield-Bruthen	Monthly	12	0	0.02	Yes
Sunlakes-Toorloo	Monthly	12	0	0.02	Yes
Swifts Creek	Monthly	12	0	0.04	Yes

^an/a- not applicable; Dinner Plain water sampling locality is exempt from aluminium testing requirements as aluminium-based coagulants are not used for treatment within this locality.

4.6.1 Comments on Results

East Gippsland Water has been 100% compliant for this standard in each sampling locality for 2007/2008, 2008/2009, 2009/2010 and 2011/2012.

Following the detection of reportable levels of aluminium (acid soluble) in Omeo reticulation samples on two occasions in 2010/2011, an effective programme of operational improvements and mains and tank cleaning resulted in a return to 100% compliance in this sampling locality in 2011/2012.

4.7 Regulated Parameters- *Turbidity*

Turbidity samples are taken monthly in each of the water sampling localities. Compliance is measured as: 95% upper confidence limit (UCL) of the mean < 5.0 NTU.

Water Sampling Locality	Sampling Frequency	No. of Samples	Max (NTU)	95% UCL of mean	Complying (Yes / No)
Bairnsdale	Weekly	72	1.1	0.2	Yes
Bemm River	Weekly	52	1.5	0.8	Yes
Buchan	Weekly	52	0.7	0.2	Yes
Cann River	Weekly	52	1.9	0.5	Yes
Dinner Plain	Weekly	52	0.9	0.3	Yes
Eagle Point-	Weekly	52	0.3	0.1	Yes
Kalimna	Weekly	52	0.4	0.1	Yes
Lindenow	Weekly	52	2.0	0.3	Yes
Lindenow South	Weekly	52	4.4	0.5	Yes
Mallacoota	Weekly	52	5.5	0.9	Yes
Merrangbaur	Weekly	52	0.5	0.2	Yes
Metung	Weekly	52	0.4	0.1	Yes
Nicholson-Swan Reach	Weekly	52	0.5	0.2	Yes
Nowa Nowa	Weekly	52	1.3	0.2	Yes
Omeo	Weekly	52	1.4	0.2	Yes
Orbost	Weekly	52	7.8	0.6	Yes
Sarsfield-Bruthen	Weekly	52	0.9	0.2	Yes
Sunlakes-Toorloo	Weekly	57 ^a	2.5	0.2	Yes
Swifts Creek	Weekly	52	5.2	1.2	Yes

^aThe frequency of turbidity samples taken in Sunlakes-Toorloo increased in December 2011 to February 2012 due to seasonal population influxes during the summer period.

4.7.1 Comments on Results

All water quality locations were compliant for turbidity for the 2011/2012 reporting period.

East Gippsland Water has been 100% compliant for the turbidity standard in each sampling locality for 2007/2008, 2008/2009, 2009/2010, 2010/2011 and 2011/2012.

4.8 Fluoride

Fluoridation of the Mitchell System (i.e. Bairnsdale, Eagle Point-Paynesville, Kalimna, Lindenow, Lindenow South, Merrangbaur, Metung, Nicholson-Swan Reach, Nowa Nowa, Sarsfield-Bruthen, Sunlakes-Toorloo) began in August 2010.

Fluoride samples are taken monthly in each of the fluoridated water sampling localities, such that a weekly sample is taken at different locations in the fluoridated Mitchell system.

Compliance is measured as: annual average fluoride level must not exceed 1.00 milligram per litre and all individual samples must be <1.50 milligram per litre.

Water Sampling Locality	Sampling Frequency	No. of Samples	Min. (mg/L)	Max. (mg/L)	Average (mg/L)	Complying (Yes / No)
Bairnsdale	Monthly	12	0.75	0.91	0.85	Yes
Bemm River	n/a ^a	n/a ^a	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Buchan	n/a ^a	n/a ^a	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Cann River	n/a ^a	n/a ^a	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Dinner Plain	n/a ^a	n/a ^a	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Eagle Point- Paynesville	Monthly	12	0.76	0.91	0.84	Yes
Kalimna	Monthly	12	0.80	0.89	0.84	Yes
Lindenow	Monthly	12	0.79	0.86	0.82	Yes
Lindenow South	Monthly	12	0.79	0.91	0.83	Yes
Mallacoota	n/a ^a	n/a ^a	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Merrangbaur	Monthly	12	0.78	0.90	0.84	Yes
Metung	Monthly	12	0.77	0.90	0.85	Yes
Nicholson-Swan Reach	Monthly	12	0.79	0.95	0.86	Yes
Nowa Nowa	Monthly	12	0.74	0.89	0.85	Yes
Omeo	n/a ^a	n/a ^a	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Orbost	n/a ^a	n/a ^a	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Sarsfield-Bruthen	Monthly	12	0.78	0.89	0.85	Yes
Sunlakes-Toorloo	Monthly	12	0.78	0.89	0.84	Yes
Swifts Creek	n/a ^a	n/a ^a	n/a ^a	n/a ^a	n/a ^a	n/a ^a

^an/a – not applicable; fluoridation is not in place within these localities.

4.8.1 Comments on Results

All water quality locations were compliant for fluoride for the 2011/2012 reporting period. East Gippsland Water has been 100% compliant for this standard at each fluoridated sampling locality for 2010/2011 and 2011/2012.

The Department of Health was notified of two brief high fluoride exceedences (>1.5 milligrams per litre) at Woodglen water treatment facility in 2011/2012. The events were caused by a brief spike in filtered water fluoride concentrations at plant start-up following planned maintenance works (exceedence on 18th July 2011) and a temporary low-flow event on fluoridation system dilution water (exceedence on 16th February 2012). In both instances,

the fluoride concentration in the treated water supply remained unaffected, and the events did not impact the quality of water supplied to customers.

4.9 Other Substances- *Blue green algae*

Blue green algae (or 'cyanobacteria') 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. All biovolume results > 0.200 millimetres cubed per litre are reported to the Department of Sustainability and Environment.

The Department of Health must also be notified under section 22 of the *Safe Drinking Water Act 2003* if any of the following are true:

- 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 millimetres cubed per litre;
- Total combined biovolume of all cyanobacterial species is greater than or equal to 10 millimetres cubed per litre.

And the cyanobacterial issue is likely to impact on the quality of drinking water being supplied to customers

Water Sampling Locality	Raw Water Storage		Clear Water Storage	
	No. of Samples	Maximum (mm ³ /L)	No. of Samples	Maximum (mm ³ /L)
Bairnsdale	69	0.443	11	0
Bemm River	n/a ^a	n/a ^a	12	0.002
Buchan	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Cann River	n/a ^a	n/a ^a	12	0.169
Dinner Plain	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Eagle Point- Paynesville	n/a ^a	n/a ^a	2	0
Kalimna	n/a ^a	n/a ^a	4	0
Lindenow	n/a ^a	n/a ^a	12	0.001
Lindenow South	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Mallacoota	18	0.009	12	0.002
Merrangbaur	n/a ^a	n/a ^a	8	0.003
Metung	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Nicholson-Swan Reach	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Nowa Nowa	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Omeo	15	0.06	n/a ^a	n/a ^a
Orbost	30	0.06	30	0.095
Sarsfield-Bruthen	n/a ^a	n/a ^a	2	0
Sunlakes-Toorloo	14	0	14	0
Swifts Creek	4	0.006	7	0.004

^an/a – not applicable; this may be due to the absence of the specified storage within this locality, or due to the absence of any minimal risk from algal growth due to the presence of a fully sealed tank storage tank.

4.9.1 Comments on Results

No samples exceeded the reporting criteria for Section 22 of the *Safe Drinking Water Act (2003)* in 2011/2012.

4.10 Other Substances- Cadmium

Cadmium samples are taken quarterly in each of the water sampling localities. Compliance is measured as: ≤ 0.002 milligrams per litre (health-based guideline value under the Australian Drinking Water Guidelines).

Water Sampling Locality	Frequency	No. of Samples	Maximum (mg/L)	Complying (Yes / No)
Bairnsdale	Quarterly	4	0.0002	Yes
Bemm River	Quarterly	4	0.0002	Yes
Buchan	Quarterly	4	0.0002	Yes
Cann River	Quarterly	4	0.0002	Yes
Dinner Plain	Quarterly	4	0.0002	Yes
Eagle Point- Paynesville	Quarterly	4	0.0002	Yes
Kalimna	Quarterly	4	0.0002	Yes
Lindenow	Quarterly	4	0.0002	Yes
Lindenow South	Quarterly	4	0.0002	Yes
Mallacoota	Quarterly	4	0.0002	Yes
Merrangbaur	Quarterly	4	0.0002	Yes
Metung	Quarterly	4	0.0002	Yes
Nicholson-Swan Reach	Quarterly	4	0.0002	Yes
Nowa Nowa	Quarterly	4	0.0002	Yes
Omeo	Quarterly	4	0.0002	Yes
Orbost	Quarterly	4	0.0002	Yes
Sarsfield-Bruthen	Quarterly	4	0.0002	Yes
Sunlakes-Toorloo	Quarterly	4	0.0002	Yes
Swifts Creek	Quarterly	4	0.0002	Yes

4.10.1 Comments on Results

All water quality locations were compliant for cadmium for the 2011/2012 reporting period.

4.11 Other Substances- Chromium

Chromium samples are taken quarterly in each of the water sampling localities. Compliance is measured as: ≤ 0.050 milligrams per litre of Cr(VI) (health-based guideline value under the Australian Drinking Water Guidelines).

Water Sampling Locality	Sampling Frequency	No. of Samples	Maximum (mg/L)	Complying (Yes / No)
Bairnsdale	Quarterly	4	0.001	Yes
Bemm River	Quarterly	4	0.001	Yes
Buchan	Quarterly	4	0.001	Yes
Cann River	Quarterly	4	0.001	Yes
Dinner Plain	Quarterly	4	0.001	Yes
Eagle Point- Paynesville	Quarterly	4	0.001	Yes
Kalimna	Quarterly	4	0.001	Yes
Lindenow	Quarterly	4	0.001	Yes
Lindenow South	Quarterly	4	0.001	Yes
Mallacoota	Quarterly	4	0.001	Yes
Merrangbaur	Quarterly	4	0.001	Yes
Metung	Quarterly	4	0.001	Yes
Nicholson-Swan Reach	Quarterly	4	0.001	Yes
Nowa Nowa	Quarterly	4	0.001	Yes
Omeo	Quarterly	4	0.001	Yes
Orbost	Quarterly	4	0.001	Yes
Sarsfield-Bruthen	Quarterly	4	0.001	Yes
Sunlakes-Toorloo	Quarterly	4	0.001	Yes
Swifts Creek	Quarterly	4	0.001	Yes

4.11.1 Comments on Results

All water quality localities were compliant for chromium for the 2011/2012 reporting period.

4.12 Other Substances- Arsenic

Arsenic samples are taken biannually in each applicable water sampling locality. Compliance is measured as: ≤ 0.010 milligrams per litre (health-based guideline value under the Australian Drinking Water Guidelines).

Water Sampling Locality	Sampling Frequency	No. of Samples	Maximum (mg/L)	Complying (Yes / No)
Bairnsdale	Biannually	2	0.001	Yes
Bemm River	Biannually	2	0.001	Yes
Buchan	Biannually	2	0.001	Yes
Cann River	Biannually	2	0.001	Yes
Dinner Plain	Biannually	2	0.001	Yes
Eagle Point- Paynesville	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Kalimna	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Lindenow	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Lindenow South	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Mallacoota	Biannually	2	0.001	Yes
Merrangbaur	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Metung	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Nicholson-Swan Reach	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Nowa Nowa	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Omeo	Biannually	2	0.001	Yes
Orbost	Biannually	2	0.001	Yes
Sarsfield-Bruthen	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Sunlakes-Toorloo	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Swifts Creek	Biannually	2	0.001	Yes

^anot applicable; Bairnsdale samples represent the entry point for the Mitchell system; accordingly, arsenic is not routinely sampled in the other Mitchell system sampling localities i.e. Eagle Point-Paynesville, Kalimna, Lindenow, Lindenow South, Merrangbaur, Metung, Nicholson-Swan Reach, Nowa Nowa, Sarsfield-Bruthen, Sunlakes Toorloo.

4.12.1 Comments on Results

All water quality localities were compliant for arsenic for the 2011/2012 reporting period.

4.13 Other Substances- Cyanide

Testing for cyanide is performed biannually in each applicable water sampling locality. Compliance is measured as: ≤ 0.080 milligram per litre (health-based guideline value under the Australian Drinking Water Guidelines).

Water Sampling Locality	Sampling Frequency	No. of Samples	Maximum (mg/L)	Complying (Yes / No)
Bairnsdale	Biannually	2	0.005	Yes
Bemm River	Biannually	2	0.005	Yes
Buchan	Biannually	2	0.005	Yes
Cann River	Biannually	2	0.005	Yes
Dinner Plain	Biannually	2	0.005	Yes
Eagle Point- Paynesville	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Kalimna	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Lindenow	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Lindenow South	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Mallacoota	Biannually	2	0.005	Yes
Merrangbaur	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Metung	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Nicholson-Swan Reach	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Nowa Nowa	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Omeo	Biannually	2	0.005	Yes
Orbost	Biannually	2	0.005	Yes
Sarsfield-Bruthen	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Sunlakes-Toorloo	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Swifts Creek	Biannually	2	0.005	Yes

^anot applicable; Bairnsdale samples represent the entry point for the Mitchell system; accordingly, arsenic is not routinely sampled in the other Mitchell system sampling localities i.e. Eagle Point-Paynesville, Kalimna, Lindenow, Lindenow South, Merrangbaur, Metung, Nicholson-Swan Reach, Nowa Nowa, Sarsfield-Bruthen, Sunlakes Toorloo.

4.13.1 Comments on Results

All water quality localities were compliant for cyanide for the 2011/2012 reporting period.

4.14 Other Substances- Copper

Copper samples are taken quarterly in each applicable water sampling localities. Compliance is measured as: ≤ 2.000 mg/L (health-based guideline value under the Australian Drinking Water Guidelines) and ≤ 1.000 milligram per litre (aesthetic guideline value under the Australian Drinking Water Guidelines).

Water Quality	Location	Sampling Frequency	No. of Samples	Maximum (mg/L)	Complying (Yes / No)
	Bairnsdale	Quarterly	4	0.009	Yes
	Bemm River	Quarterly	4	0.012	Yes
	Buchan	Quarterly	4	0.001	Yes
	Cann River	Quarterly	4	0.003	Yes
	Dinner Plain	Quarterly	4	0.410	Yes
	Eagle Point- Paynesville	Quarterly	4	0.004	Yes
	Kalimna	Quarterly	4	0.010	Yes
	Lindenow	Quarterly	4	0.014	Yes
	Lindenow South	Quarterly	4	0.018	Yes
	Mallacoota	Quarterly	4	0.003	Yes
	Merrangbaur	Quarterly	4	0.008	Yes
	Metung	Quarterly	4	0.001	Yes
	Nicholson-Swan Reach	Quarterly	4	0.020	Yes
	Nowa Nowa	Quarterly	4	0.004	Yes
	Omeo	Quarterly	4	0.005	Yes
	Orbost	Quarterly	4	0.002	Yes
	Sarsfield-Bruthen	Quarterly	4	0.047	Yes
	Sunlakes-Toorloo	Quarterly	4	0.009	Yes
	Swifts Creek	Quarterly	4	0.009	Yes

4.14.1 Comments on Results

All water quality localities were compliant for copper for the 2011/2012 reporting period.

4.15 Other Substances- Lead

Lead samples are taken quarterly in each applicable water sampling locality. Compliance is measured as: ≤ 0.010 milligram per litre (health-based guideline value under the Australian Drinking Water Guidelines).

Water Quality Location	Sampling Frequency	No. of Samples	Maximum (mg/L)	Complying (Yes / No)
Bairnsdale	Quarterly	4	0.001	Yes
Bemm River	Quarterly	4	0.001	Yes
Buchan	Quarterly	4	0.001	Yes
Cann River	Quarterly	4	0.001	Yes
Dinner Plain	Quarterly	4	0.002	Yes
Eagle Point- Paynesville	Quarterly	4	0.001	Yes
Kalimna	Quarterly	4	0.001	Yes
Lindenow	Quarterly	4	0.001	Yes
Lindenow South	Quarterly	4	0.002	Yes
Mallacoota	Quarterly	4	0.001	Yes
Merrangbaur	Quarterly	4	0.001	Yes
Metung	Quarterly	4	0.001	Yes
Nicholson-Swan Reach	Quarterly	4	0.001	Yes
Nowa Nowa	Quarterly	4	0.001	Yes
Omeo	Quarterly	4	0.001	Yes
Orbost	Quarterly	4	0.001	Yes
Sarsfield-Bruthen	Quarterly	4	0.001	Yes
Sunlakes-Toorloo	Quarterly	4	0.001	Yes
Swifts Creek	Quarterly	4	0.001	Yes

4.15.1 Comments on Results

All water quality localities were compliant for lead for the 2011/2012 reporting period.

4.16 Other Substances- *Biocides*

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

In 2011/2012, East Gippsland Water expanded its biocide monitoring programme (to include the triazine and phenoxy acid families of biocides), in close consultation with local Catchment Management Authority, and based on land management activities in the water supply catchments. The addition of approximately 30 of these biocide compounds to the screening programme provides further assurance that the low risk of biocide impacting drinking water supplies is effectively managed in all water sampling localities. East Gippsland Water maintains close liaison with local stake holders (e.g. Catchment Management Authority, Vic Forests) regarding biocide application in water supply catchments, to ensure minimal risk to the drinking water supply.

In July 2011, surface raw water samples were analysed from Bemm River, Buchan, Cann River and Orbost. In September 2011, surface raw water samples were analysed from the Mitchell River, Woodglen storages (1 and 2), Mallacoota, Swifts Creek and Omeo.

Water Quality Location	Sampling Frequency	Class	Compound	Units	Result	Complying (Yes / No)
July 2011 Bemm River, Buchan, Cann River & Orbost	Annually	n/a	Glyphosate	mg/L	<0.03	Yes
		n/a	Metsulfuron Methyl	µg/L	<0.1	Yes
Organochlorine Biocides		Aldrin	mg/L	<0.00001	Yes	
		BHC (Alpha Isomer)	mg/L	<0.00005	Yes	
		BHC (Beta Isomer)	mg/L	<0.00005	Yes	
		BHC (Delta Isomer)	mg/L	<0.00005	Yes	
		cis-Chlordane	mg/L	<0.00001	Yes	
		trans-Chlordane	mg/L	<0.00001	Yes	
		4,4'-DDD	mg/L	<0.00006	Yes	
		4,4'-DDE	mg/L	<0.00006	Yes	
		4,4'-DDT	mg/L	<0.00006	Yes	
		Dieldrin	mg/L	<0.00001	Yes	
		Endosulfan I	mg/L	<0.00005	Yes	
		Endosulfan II	mg/L	<0.00005	Yes	
		Endosulphan Sulphate	mg/L	<0.00005	Yes	
		Endrin	mg/L	<0.0001	Yes	
		Endrin Aldehyde	mg/L	<0.0001	Yes	
Hexachlorobenzene	mg/L	<0.000002	Yes			
September 2011 Bairnsdale (Mitchell River, Woodglen storages 1 & 2), Mallacoota, Omeo & Swifts Creek						

Water Quality Location	Sampling Frequency	Class	Compound	Units	Result	Complying (Yes / No)
			Heptachlor	mg/L	<0.00005	Yes
			Heptachlor Epoxide	mg/L	<0.00005	Yes
			Lindane (BHC Gamma	mg/L	<0.00005	Yes
			Methoxychlor	mg/L	<0.0002	Yes
			Endrin Ketone	mg/L	<0.00005	Yes
		Organo-phosphorus Biocides	Dichlorvos	mg/L	<0.001	Yes
			Monocrotophos	mg/L	<0.001	Yes
			Prophos	mg/L	<0.001	Yes
			Tetraethylthiopyrphos	mg/L	<0.001	Yes
			Phorate	mg/L	<0.001	Yes
			Demeton-S	mg/L	<0.001	Yes
			Diazinon	mg/L	<0.001	Yes
			Methyl Parathion	mg/L	<0.001	Yes
			Ronnel	mg/L	<0.001	Yes
			Malathion	mg/L	<0.001	Yes
			Fenthion	mg/L	<0.001	Yes
			Chloropyrifos	mg/L	<0.001	Yes
			Ethyl Parathion	mg/L	<0.001	Yes
			Trichlorinate	mg/L	<0.001	Yes
			Tetrachlovinphos	mg/L	<0.001	Yes
			Tukuthion	mg/L	<0.001	Yes
			Fensulfothion	mg/L	<0.001	Yes
			EPN	mg/L	<0.001	Yes
			Coumaphos	mg/L	<0.001	Yes
		Triazines	Ametryn	mg/L	<0.002	Yes
			Atrazine	mg/L	<0.002	Yes
			Prometon	mg/L	<0.002	Yes
			Prometryn	mg/L	<0.002	Yes
			Propazine	mg/L	<0.002	Yes
			Simazine	mg/L	<0.002	Yes
			Terbutylazine	mg/L	<0.002	Yes
			Simetryn	mg/L	<0.002	Yes
			Terbutryn	mg/L	<0.002	Yes
		Phenoxy acid biocides	2,4,5-T	µg/L	<0.01	Yes
			2,4,5-TP	µg/L	<0.01	Yes
			2,4,6-T	µg/L	<0.1	Yes
			2,4-D	µg/L	<0.01	Yes

Water Quality Location	Sampling Frequency	Class	Compound	Units	Result	Complying (Yes / No)
			2,4-DB	µg/L	<0.01	Yes
			2,4-DP	µg/L	<0.01	Yes
			2,6-D	µg/L	<0.1	Yes
			4 Chlorophenoxy Acetic	µg/L	<0.01	Yes
			Clopyralid	µg/L	<0.05	Yes
			Dicamba	µg/L	<0.01	Yes
			Fluroxypyr	µg/L	<0.05	Yes
			MCPA	µg/L	<0.01	Yes
			MCPB	µg/L	<0.01	Yes
			Mecoprop	µg/L	<0.01	Yes
			Metsulfuron Methyl	µg/L	<0.1	Yes
			Picloram	µg/L	<0.05	Yes
			Triclopyr	µg/L	<0.01	Yes

4.16.1 Comments on Results

All the above results were below the health-based guideline value in the Australian Drinking Water Guidelines, or if not specified in the Guidelines, were below the lower limits of detection, and therefore were deemed to be compliant in 2011/2012.

4.17 Other Substances- *Radiological*

Radiological activity sample are taken from bore waters biennially (i.e. every two years). While there are no specific guidelines for radiological activity, the Australian Drinking Water Guidelines advise that radionuclides should be identified and determined if gross alpha or beta activities exceed 0.5 Bq/L.

Water Quality Location	Sampling Frequency	No. of Sites Sampled	Gross Alpha Activity Max. (Bq/L)	Gross Beta Activity Max. (Bq/L)	Complying (Yes / No)
Dinner Plain	Biennially	3	0.008	0.35	Yes
Mallacoota (Bore No. 3)	Biennially	1	0.04	0.01	Yes

Bairnsdale and Mallacoota (bore No. 4) bores were sampled in 2010/2011, and were fully complainant with the Guidelines.

4.17.1 Comments on Results

All results obtained were below the guideline values in Australian Drinking Water Guidelines and were therefore deemed compliant for the 2011/2012 reporting period.

Although below the thresholds of concern, results obtained from the Dinner Plain water sampling locality were elevated above background levels. This prompted further sampling in this locality at an increased frequency. The results from this additional sampling demonstrated radiological levels consistent with background readings for this locality.

4.18 Aesthetic Characteristics- pH

pH samples are taken weekly in each water sampling locality. Compliance is measured as: ≥ 6.5 and ≤ 8.5 pH units (aesthetic guideline limit as per the Australian Drinking Water Guidelines). As cement mortar-lined pipes and newly constructed concrete water storages may raise pH, values up to pH 9.2 are deemed compliant in this instance, provided no deterioration in microbiological quality of the water supply is observed.

Water Quality Location	Sampling Frequency	No. of Samples	Minimum (mg/L)	Maximum (mg/L)	Average (mg/L)	Complying (Yes / No) ^a
Bairnsdale	Weekly	72	7.2	8.0	7.5	Yes
Bemm River	Weekly	52	7.1	8.2	7.4	Yes
Buchan	Weekly	52	8.0	9.3	8.5	Yes
Cann River	Weekly	52	7.2	8.7	8.1	Yes
Dinner Plain	Weekly	52	6.7	7.1	6.8	Yes
Eagle Point-	Weekly	52	7.4	9.0	7.8	Yes
Kalimna	Weekly	52	7.3	7.8	7.5	Yes
Lindenow	Weekly	52	7.3	8.4	7.6	Yes
Lindenow South	Weekly	52	7.5	8.2	7.9	Yes
Mallacoota	Weekly	52	7.4	8.3	7.9	Yes
Merrangbaur	Weekly	52	7.4	7.9	7.6	Yes
Metung	Weekly	52	7.8	9.2	8.8	Yes
Nicholson-Swan	Weekly	52	7.3	9.0	7.9	Yes
Nowa Nowa	Weekly	52	7.6	9.4	8.6	Yes
Omeo	Weekly	52	7.6	8.8	8.0	Yes
Orbost	Weekly	52	7.6	9.0	8.2	Yes
Sarsfield-Bruthen	Weekly	52	7.2	8.3	7.5	Yes
Sunlakes-Toorloo	Weekly	57 ^b	7.4	7.5	7.8	Yes
Swifts Creek	Weekly	52	7.6	8.2	8.0	Yes

^acompliance is measured as yearly mean values ≥ 6.5 and ≤ 8.5 pH units, unless locality contains cement mortar-lined pipes, in which case ≤ 9.2 pH units is considered compliant.

^bThe frequency of pH samples taken in Sunlakes-Toorloo increased in December 2011 to February 2012 due to seasonal population influxes during the summer period.

4.18.1 Comments on Results

Based on mean yearly values, all localities comply with the guideline range for pH. Instances of exceedence of guideline values are due to a number of factors: changes in sample composition during transit to the testing laboratory; interaction between the water and pipe material (leaching of lime etc. from cement concrete mains); presence of algae in the source water and booster sodium hypochlorite stations throughout the system. The impact of algae is being addressed through the implementation of an Algal Management Plan, as well as replacement/covering of open storages.

Although fully compliant with the guideline values in the Australian Drinking Water Guidelines, higher pH values have been observed in Buchan, Nowa Nowa and Metung water sampling localities. This is largely due to the presence of cement-lined distribution pipes. In

2011/2012, East Gippsland Water undertook an investigation into the impact of high pH in the Metung locality. Based on an assessment of historical water quality data (including microbiological parameters) and historical customer notifications/complaints, it was determined that the higher pH values have not impacted the aesthetic quality, or safety, of the water supplied in Metung. Similarly, water supplied in Nowa Nowa and Buchan water sampling localities achieved high microbiological (Table 3.1) and aesthetic quality (Section 5) during 2011/2012.

4.19 Aesthetic Characteristics- Free chlorine

Compliance is measured as: mean yearly values ≤ 0.80 milligrams per litre (aesthetic limit); all values ≤ 5 milligrams per litre (health guideline value under the Australian Drinking Water Guidelines).

Water Quality Location	Sampling Frequency	No. of Samples	Minimum (mg/L)	Maximum (mg/L)	Average (mg/L)	Complying (Yes / No)
Bairnsdale	Weekly	72	0.30	0.88	0.71	Yes
Bemm River	Weekly	52	0.22	1.08	0.58	Yes
Buchan	Weekly	52	0.30	0.90	0.61	Yes
Cann River	Weekly	52	0.12	1.75	0.62	Yes
Dinner Plain	Weekly	n/a ^a	n/a ^a	n/a ^a	n/a ^a	n/a ^a
Eagle Point-	Weekly	52	0.22	0.67	0.48	Yes
Kalimna	Weekly	52	0.34	0.84	0.60	Yes
Lindenow	Weekly	52	0.43	1.05	0.75	Yes
Lindenow South	Weekly	52	0.12	0.85	0.54	Yes
Mallacoota	Weekly	52	0.09	0.75	0.37	Yes
Merrangbaur	Weekly	52	0.27	0.87	0.69	Yes
Metung	Weekly	52	0.22	1.06	0.57	Yes
Nicholson-Swan Reach	Weekly	52	0.20	1.02	0.78	Yes
Nowa Nowa	Weekly	52	0.20	0.83	0.58	Yes
Omeo	Weekly	52	0.24	0.90	0.56	Yes
Orbost	Weekly	52	0.15	1.26	0.70	Yes
Sarsfield-Bruthen	Weekly	52	0.30	1.09	0.70	Yes
Sunlakes-Toorloo	Weekly	57 ^b	0.34	1.26	0.78	Yes
Swifts Creek	Weekly	52	0.35	1.12	0.70	Yes

^aDinner Plain is not sampled for free chlorine as ultra-violet disinfection is employed in lieu of chlorine.

^bThe frequency of free chlorine residual samples taken in Sunlakes-Toorloo increased in December 2011 to February 2012 due to seasonal population influxes during the summer period.

4.19.1 Comments on Results

Based on mean yearly values, all water sampling localities were compliant for the stated chlorine aesthetic and health-related guideline values. Variations in residual levels can arise from a number of factors: proximity to a disinfection plant; interaction with pipe material; increase/decrease in usage (and therefore flow rates and detention times); changes in water temperature; and the presence of organic matter in the water / pipeline.

East Gippsland Water strives to balance the requirement for adequate disinfection throughout our distribution system (health considerations), whilst supplying water that is organoleptically acceptable to customer (aesthetic considerations). This is evidenced by our full compliance with free chlorine levels in all relevant water sampling localities (above), as well as the low level of chlorine-related customer complaints in 2011/2012 (refer Section 6).

4.20 Aesthetic Characteristics- Colour

Compliance is measured as: ≤ 15 PCU (Australian Drinking Water Guidelines aesthetic value).

Water Quality Location	Sampling Frequency	No. of Samples	Minimum (PCU)	Maximum (PCU)	% Complying
Bairnsdale	Monthly	12	2	2	100%
Bemm River	Monthly	12	2	4	100%
Buchan	Monthly	12	2	2	100%
Cann River	Monthly	12	2	4	100%
Dinner Plain	Monthly	12	2	2	100%
Eagle Point-	Monthly	12	2	2	100%
Kalimna	Monthly	12	2	2	100%
Lindenow	Monthly	12	2	2	100%
Lindenow South	Monthly	12	2	2	100%
Mallacoota	Monthly	12	2	6	100%
Merrangbaur	Monthly	12	2	2	100%
Metung	Monthly	12	2	2	100%
Nicholson-Swan Reach	Monthly	12	2	2	100%
Nowa Nowa	Monthly	12	2	2	100%
Omeo	Monthly	12	2	2	100%
Orbost	Monthly	12	2	2	100%
Sarsfield-Bruthen	Monthly	12	2	2	100%
Sunlakes-Toorloo	Monthly	12	2	2	100%
Swifts Creek	Monthly	12	2	8	100%

4.20.1 Comments on Results

All water quality localities were compliant for colour for the 2011/2012 reporting period.

4.21 Aesthetic Characteristics- Manganese

Compliance is measured as: ≤ 0.100 milligrams per litre (Australian Drinking Water Guidelines aesthetic value) and ≤ 0.500 milligrams per litre (Australian Drinking Water Guidelines health-based guideline value).

Water Quality Location	Sampling Frequency	No. of Samples	Maximum (mg/L)	% Complying
Bairnsdale	Monthly	12	0.005	100%
Bemm River	Monthly	12	0.012	100%
Buchan	Monthly	12	0.001	100%
Cann River	Monthly	12	0.003	100%
Dinner Plain	Monthly	12	0.001	100%
Eagle Point- Paynesville	Monthly	12	0.001	100%
Kalimna	Monthly	12	0.001	100%
Lindenow	Monthly	12	0.001	100%
Lindenow South	Monthly	12	0.002	100%
Mallacoota	Monthly	12	0.001	100%
Merrangbaur	Monthly	12	0.001	100%
Metung	Monthly	12	0.001	100%
Nicholson-Swan Reach	Monthly	12	0.002	100%
Nowa Nowa	Monthly	12	0.004	100%
Omeo	Monthly	12	0.001	100%
Orbost	Monthly	12	0.002	100%
Sarsfield-Bruthen	Monthly	12	0.001	100%
Sunlakes-Toorloo	Monthly	12	0.004	100%
Swifts Creek	Monthly	12	0.002	100%

4.21.1 Comments on Results

All water quality localities were compliant for manganese for the 2011/2012 reporting period (both aesthetic and health values).

4.22 Aesthetic Characteristics- Iron

Compliance is measured as: ≤ 0.30 milligrams per litre (Australian Drinking Water Guidelines aesthetic value).

Water Quality Location	Sampling Frequency	No. of Samples	Minimum (mg/L)	Maximum (mg/L)	% Complying
Bairnsdale	Monthly	12	0.01	0.10	100%
Bemm River	Monthly	12	0.03	0.11	100%
Buchan	Monthly	12	0.01	0.03	100%
Cann River	Monthly	12	0.01	0.03	100%
Dinner Plain	Monthly	12	0.01	0.07	100%
Eagle Point- Paynesville	Monthly	12	0.01	0.02	100%
Kalimna	Monthly	12	0.01	0.01	100%
Lindenow	Monthly	12	0.01	0.18	100%
Lindenow South	Monthly	12	0.01	0.05	100%
Mallacoota	Monthly	12	0.01	0.04	100%
Merrangbaur	Monthly	12	0.01	0.02	100%
Metung	Monthly	12	0.01	0.02	100%
Nicholson-Swan Reach	Monthly	12	0.01	0.05	100%
Nowa Nowa	Monthly	12	0.01	0.14	100%
Omeo	Monthly	12	0.01	0.03	100%
Orbost	Monthly	12	0.01	0.02	100%
Sarsfield-Bruthen	Monthly	12	0.01	0.02	100%
Sunlakes-Toorloo	Monthly	12	0.01	0.15	100%
Swifts Creek	Monthly	12	0.01	0.26	100%

4.22.1 Comments on Results

All water quality localities were compliant for iron for the 2011/2012 reporting period.

4.23 Aesthetic Characteristics- Zinc

Compliance is measured as: ≤ 3.00 milligrams per litre (Australian Drinking Water Guidelines aesthetic value).

Water Quality Location	Sampling Frequency	No. of Samples	Minimum (mg/L)	Maximum (mg/L)	% Complying
Bairnsdale	Quarterly	4	0.001	0.002	100%
Bemm River	Quarterly	4	0.006	0.011	100%
Buchan	Quarterly	4	0.001	0.001	100%
Cann River	Quarterly	4	0.001	0.002	100%
Dinner Plain	Quarterly	4	0.013	0.110	100%
Eagle Point-	Quarterly	4	0.001	0.008	100%
Kalimna	Quarterly	4	0.001	0.003	100%
Lindenow	Quarterly	4	0.001	0.001	100%
Lindenow South	Quarterly	4	0.003	0.019	100%
Mallacoota	Quarterly	4	0.002	0.008	100%
Merrangbaur	Quarterly	4	0.001	0.012	100%
Metung	Quarterly	4	0.001	0.002	100%
Nicholson-Swan Reach	Quarterly	4	0.001	0.003	100%
Nowa Nowa	Quarterly	4	0.001	0.011	100%
Omeo	Quarterly	4	0.001	0.004	100%
Orbost	Quarterly	4	0.001	0.002	100%
Sarsfield-Bruthen	Quarterly	4	0.001	0.015	100%
Sunlakes-Toorloo	Quarterly	4	0.001	0.002	100%
Swifts Creek	Quarterly	4	0.003	0.011	100%

4.23.1 Comments on Results

All water quality localities were compliant for zinc for the 2011/2012 reporting period.

4.24 Analysis of Results

Comparing the percentage compliance in all water sampling localities (refer to Figure 4) demonstrates East Gippsland Water’s high standard of compliance over the past three years. All sampling localities were fully compliant with the parameters described in Schedule 2 of the Safe Drinking Water Regulations 2005 in 2011/2012. East Gippsland Water supplied 100% of our connections with fully compliant drinking water in 2011/2012 (refer to Figure 5).

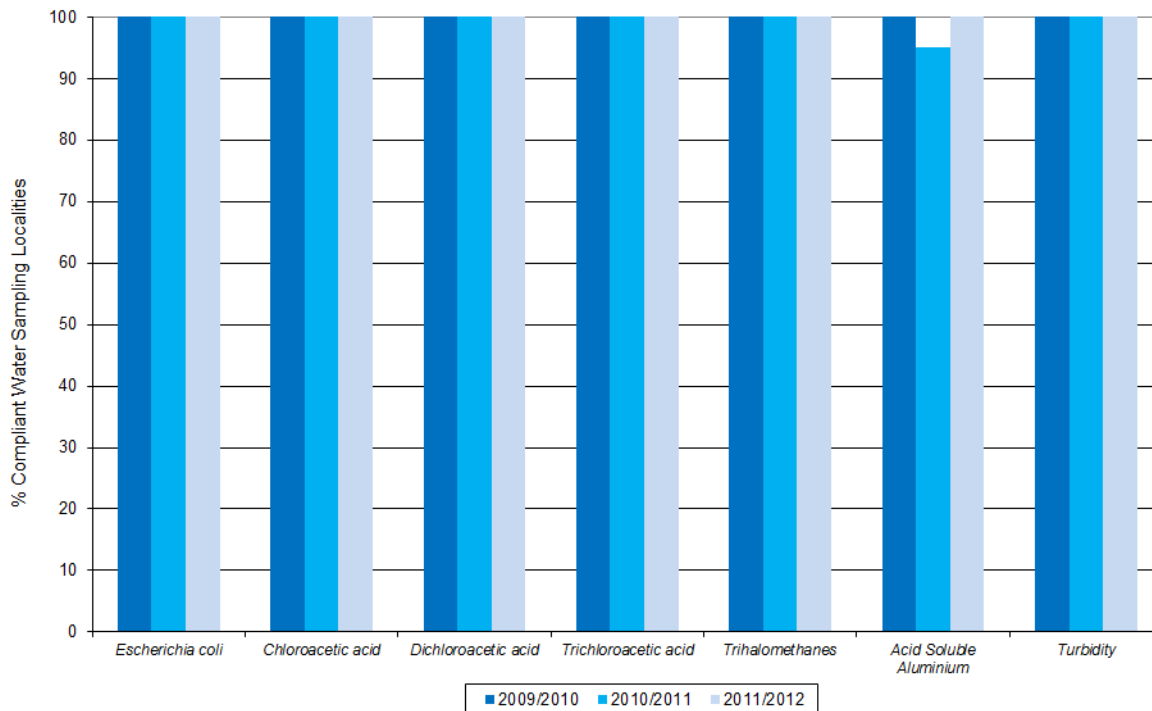


Figure 4: Percentage of Water Sampling Localities Compliant with Schedule 2 Parameters

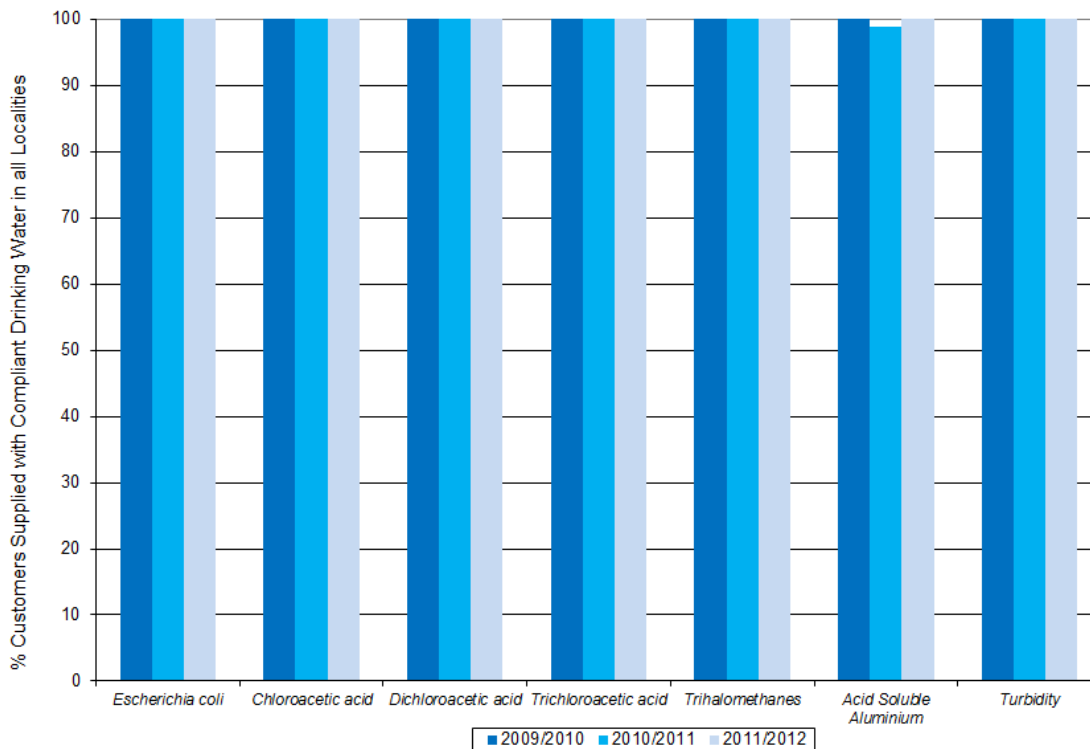


Figure 5: Percentage of Connections Supplied with Compliant Drinking Water in all Localities

5 Emergency and incident management

5.1 Notification Events under Section 22 or Section 18

During 2011/2012, three separate Section 22 notifications were issued by East Gippsland Water:

Cann River Temporary Loss of Disinfection during Power Outage July 2011: Cann River water supply system consists of a water treatment plant which filters and disinfects the water, prior to storage in a large treated water storage basin. This basin is shade-cloth covered to minimise environmental contamination re-entering the treated water. Treated water is further disinfected by a booster chlorination station before entering the town supply.

Following a power outage, an uninterruptible power supply unit failed to return to service, which resulted in the loss of this booster chlorination station, and a resulting low/no-chlorine event on 18th July 2011. Although the risk from microbial contamination was low, East Gippsland Water notified the Department of Health via a Section 22 notification as a precautionary measure. Following this, extensive flushing and microbiological sampling was undertaken to ensure adequate free chlorine residual was maintained in the distribution system, and the safety of the water was assured. All following investigative microbiological samples indicated the absence of any potentially harmful microorganisms, validating that the microbiological integrity of the water supply was maintained throughout the event.

Bemm River and Cann River E. coli Detections February 2012: During routine water quality sampling of Bemm River and Cann River reticulation systems, low levels of *E. coli* were present in samples taken from both water sampling localities on 6th February 2012. Two separate Section 22 notifications were issued to the Department of Health as a precaution while an immediate investigation was initiated. A systematic programme of sampling and flushing was undertaken at all reticulation sites within the Bemm River and Cann River distribution systems on two consecutive days. The results indicated the absence of *E. coli* in all subsequent samples. In parallel, an extensive sanitary inspection was undertaken throughout both water supply systems, alongside a review of water treatment plant critical operational indicators and an assessment of recent Depot activities and works in the distribution system. Based on these assessments, and the absence of microbial contamination during follow-up monitoring, it was concluded that the presence of *E. coli* was limited to the samples taken on the 6th February 2012, and was not representative of the microbiological integrity of the Bemm River and Cann River water supply systems. Microbial contamination was likely introduced into the samples during water sampling, sample transit or during the laboratory analysis.

5.2 Other

In addition, the Department of Health was notified of water quality related incidents in 2011/2012 that were not required to be classified as Section 22 or section 18 notifications:

High Chlorination Event Eleven Mile Road Tank Sarsfield May 2012: Following essential mains repair works, a line dewatering event led to the elevated chlorine dosing occurring to a water storage tank at Eleven Mile Road, Sarsfield. This resulted in a plug of water with elevated chlorine residual levels being detected on 23rd May. Following this, the tank was scoured, and a precautionary flushing programme was initiated throughout the distribution system. Through this action, the affected water was purged from the system in a timely fashion and no chlorine-related customer notifications/complaints were logged during the event.

Flood Response June 2012: East Gippsland experienced a severe weather event in June 2012 which resulted in widespread power outages across the region (particularly in Buchan, Bemm River, Cann River and Mallacoota water sampling localities) and major flooding in the

Bairnsdale area. Despite the extended loss of power, East Gippsland Water's emergency response protocols ensured the continuation of water quality and supply during the entire period. Sufficient raw water and/or treated water storage capacity at all water treatment facilities ensured that poorer quality river water did not need to be harvested during this period, and that all towns had ample, high quality, treated water in the days that followed the storm event. Generator power at all sites ensured adequate disinfection was maintained. Of note, East Gippsland Water's investment in extensive remote monitoring equipment (SCADA control) allowed the remote supervision of plant operations and on-line review of critical water quality trends, allowing a high degree of assurance that water quality was maintained during the event, even when sites were inaccessible to operators for a number of days due to road closures. Despite the severe disruption to normal operations, East Gippsland Water was able to take the requisite Department of Health weekly reticulation monitoring samples, to provide validation that despite the severe weather event, the high quality of drinking water delivered to our customers was maintained.

6 Complaints Relating to Water Quality

East Gippsland Water's Customer Charter outlines the Corporation's commitments, responsibilities and standards of service to be provided to our customers.

This 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 East Gippsland Water's Customer Charter can be found on the Corporation's website www.eqwater.vic.gov.au

Customer complaints relating to Water Quality in 2011/12 were very low when compared with the previous year which is likely due to (1) the optimisation of booster chlorination in Mitchell System in the past 12 months and (2) air scouring and other proactive maintenance activities. However, the reduction in complaints is also due partly to 'over reporting' in the previous period (90 complaints were registered in 2010/11 compared with only 7 in 2011/12). This customer interface issue has since been rectified and calls were correctly categorized as complaints or otherwise in the 2011/12 period.

Table 6.1 Summary of Water Quality Complaints

Complaint	Number of complaints	Number per 100 customers*
Discoloured Water	1	0.005
Taste and Odour	5	0.023
Dirty Water	0	0.000
Air in water	1	0.005
Alleged Illness	0	0.000
Other	0	0.000

*Calculations based on 21,774 water supply connections as number of customers per connection is unknown.

Discoloured water

Due in part to movement of sediment after reinstatement of mains or temporary shut down of supplies, as well as internal plumbing issues (e.g. galvanised iron pipes). Only one discoloured water complaint was received, compared with 14 the previous financial year.

Taste/odour

Taste and odour complaints are down significantly with only 5 received, as compared to 32 in 2010/11.

- Chlorine: There was variability in customer tolerance to levels of chlorine in drinking water. The complete conversion of the Mitchell system to a closed system in 2010/2011 has resulted in disinfection residuals being more effectively retained during distribution.
- Metallic: the main cause was determined to be pipe corrosion on the customer side of the meter; there were also some instances of chemical reaction between pipe material/internal plumbing and appliances with disinfectant that caused a 'medicinal' taste.

Dirty Water

There were no complaints regarding water quality which related to dirty water.

Air in water

The main cause of air entrapment was air entering the pipes during maintenance/repair works. Only one complaint was received in relation to air in water in the 2011/12 financial year period compared with 34 in the previous reporting period.

Suspected Illness

There were no complaints regarding water quality which related to suspected illness.

Other

Related to non-specific water quality issues.

7 Findings of the most recent risk management plan audit

East Gippsland Water's Drinking Water Quality Risk Management System was audited in February 2012 by an externally certified auditor. The Drinking Water Quality Risk Management Plan (RMP), which is the central component of East Gippsland Water's Drinking Water Quality Risk Management System, outlines a preventive, systematic and comprehensive approach to drinking water quality assurance. The 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 are in place to effectively manage those risks. The RMP also describes supporting plans and policies that are essential to the ongoing provision of safe, high quality drinking water to our consumers. The audit activity found that East Gippsland Water's Drinking Water Quality Risk Management System satisfies the requirements detailed in the Safe Drinking Water Act and associated Regulations.

There were no non-conformances identified during the audit. However three opportunities for improvement (OFIs) were noted by the Auditor. A summary of the OFIs identified during the 2012 audit, alongside their current status, is outlined in the table below.

Table 7.1 Summary of Corrective Actions Following the 2012 Audit

Opportunity For Improvement	Corrective Action Identified	Status
EGW have no recycled water connections across all water supply areas but could develop a policy/procedure to manage water quality if a dual potable water/sewerage burst occurs at the same location.	Risk assessments for all water supply systems to be updated to state that recycled water connections are not present in all 9 water supply systems.	Complete
	Prepare Works Instruction specifically addressing the procedure to manage a dual burst drinking water and sewerage reticulation main in the same location	Complete
<p>EGW have outsourced backflow device inspections to Casey Inspections for device inspections and testing at the required frequency. Records examined included the RPZD inspection devices at Lakes Entrance Hospital & Aged Care centre, Dennison Foods at Bairnsdale and Seamac at EG TAFE at Lakes Entrance which are all classified as high risk.</p> <p>However it has been identified by EGW that Casey Inspections did not inspect a number of High and Medium risk devices in 2011 and there has been no formal process in place where EGW review the performance of Casey on a regular basis.</p>	Standard operating procedure to be created describing the management of back-flow/trade waste risks through an external provider. Document to encompass: (i) monitoring/performance tracking of external service provider and (ii) process for dealing with non-conformances.	In progress
The EGW procedure for Sanitary Operations Procedure for Mains Breaks & Mains Replacement following mains repairs including bursts requires a test for residual chlorine level but records examined for a burst in Wellington St Paynesville in November 2011 had no chlorine residual result recorded. This was also noted for two other bursts in 2011.	The requirement to record free chlorine residuals following mains works to be communicated to all relevant Depot Superintendents at a Networks Operations Co-ordination Meeting.	Complete
	Free chlorine residual data entry field to be coded in Depot works management system (AquaTact) to allow free chlorine residual data to be recorded with each specific mains repair job.	Complete
	Relevant works instructions to be updated to reflect the requirement to enter free chlorine residual field data in	Complete

Opportunity For Improvement	Corrective Action Identified	Status
	AquaTact following completion of mains repair work.	
	Conduct staff training on finalised procedures.	In progress

8 Undertakings under Section 30 of the Act

Section 30 of the *Safe Drinking Water Act 2003* allows for the Secretary of the Department of Health to accept a written undertaking from a water supplier that certain actions will be performed in the event that they are, or are likely to be, in contravention of the *Safe Drinking Water Act 2003* or its associated regulations.

During the 2011/2012 period, East Gippsland Water did not require any undertakings.

9 Regulated water

East Gippsland Water has no declared Regulated Water supplies as defined in section 6 (2) of the *Safe Drinking Water Act 2003*.

East Gippsland Water has a number of customers who are supplied non potable water by agreement. East Gippsland Water regularly reminds those customers through an annual mail-out program that the water supplied is not of drinking water standard.

10 Further Information

The Water Quality Annual Report of East Gippsland Water is prepared in accordance with section 26 of the *Safe Drinking Water Act 2003*. This index facilitates identification of the East Gippsland Water's compliance with statutory disclosure requirements.

For further information regarding water quality information, please refer to the East Gippsland Water's website (www.egwater.vic.gov.au), or contact East Gippsland Water on 1300 720 700.

Glossary of terms

CWS	Clear water storage
DWQMS	Drinking Water Quality Management System
ISES	Integrated standards enforcement system
kL	Kilolitres
L/s	Litres per second
mg/L	Milligrams per litre
ML	Megalitre
n/a	Not applicable
NTU	Nephelometric turbidity units
PAC	Polyaluminium chlorohydrate
PCU	Platinum cobalt units
RMP	Risk management plan
SOP	Standard operating procedure
WTP	Water treatment plant