



Gippsland Water

Safe Drinking Water Act 2003
Annual Report 2009-10

EXECUTIVE SUMMARY

Gippsland Water is committed to providing safe drinking water that meets customer and stakeholder expectations. Gippsland Water's objective is to ensure the quality of water supplied to its customers meets the requirements of the *Safe Drinking Water Act 2003 (SDWA)*.

The *SDWA* came into effect on 1 July 2004 and is the first Act in Victoria to deal specifically with the regulation of drinking water supplies.

The *SDWA* requires water suppliers and water storage managers to provide the Department of Health (DoH) with an annual report, covering issues relating to the quality and management of drinking water.

A region-wide water quality monitoring program tests the quality of the drinking water present at customer taps in accordance with the Safe Drinking Water Regulations (SDWR) 2005. A summary of the results for the reporting period of July 2009 to June 2010 has been provided for water quality parameters. The regulated parameters include *E.coli*, turbidity, aluminium and disinfection by-products (chloroacetic acid, dichloroacetic acid, trichloroacetic acid and trihalomethanes).

Gippsland Water successfully complied with the obligations imposed by section 7(1) of the *SDWA* during the 2009-2010 reporting period.

As part of Gippsland Water's monitoring program over 12,000 tests were performed on samples taken from customer taps against the requirements of the *SDWA*. One was found to be non-compliant for the following water quality parameter:

- Aluminium - Rawson (May 2010)

Although this parameter was non-compliant with the aesthetic values of Australian Drinking Water Guidelines 2004 (*ADWG*), there are no health based guidelines for this parameter and therefore this exceedance did not represent an immediate risk to public health.

Gippsland Water successfully implemented its emergency management and business continuity responses, and customer water supply quality was maintained within regulatory requirements.

Gippsland Water supplies 65,202 properties with water and received 209 complaints regarding water quality (discoloured, air in water, blue water, illness, taste, odour, and other) during the reporting period. The corporation's extensive customer complaint response procedure ensures all complaints are responded to effectively and in a timely manner. There have been no outstanding or major issues arising from the customer complaints process.

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1 INTRODUCTION

1.1 CHARACTERISATION OF THE SYSTEM

The Central Gippsland Region Water Corporation, trading as Gippsland Water, was constituted on 21 December 1994 under the *Water Act 1989*. During the reporting period the responsible Minister for Gippsland Water was the Honorable Tim Holding, Minister for Water.

Gippsland Water is the second largest regional water corporation in Victoria in terms of revenue earned and is the largest in terms of the total volume of water supplied and wastewater collected. It manages 17 water treatment plants, 14 wastewater treatment plants and two ocean outfalls.

Gippsland Water provides water and wastewater services to customers in the central Gippsland region of Victoria. Its geographic region stretches from Drouin in the west to Stratford in the east, and from Mirboo North in the south to Rawson and Briagalong in the north.

Gippsland Water manages five business streams, one of which is the provision of water services. Its region consists of 42 towns with approximately 65,202 properties connected to the 17 drinking water supply systems. These towns are grouped into 35 localities for the purposes of monitoring and reporting in accordance with the *Safe Drinking Water Regulations (SDWR) 2005*.

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

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

Our mission

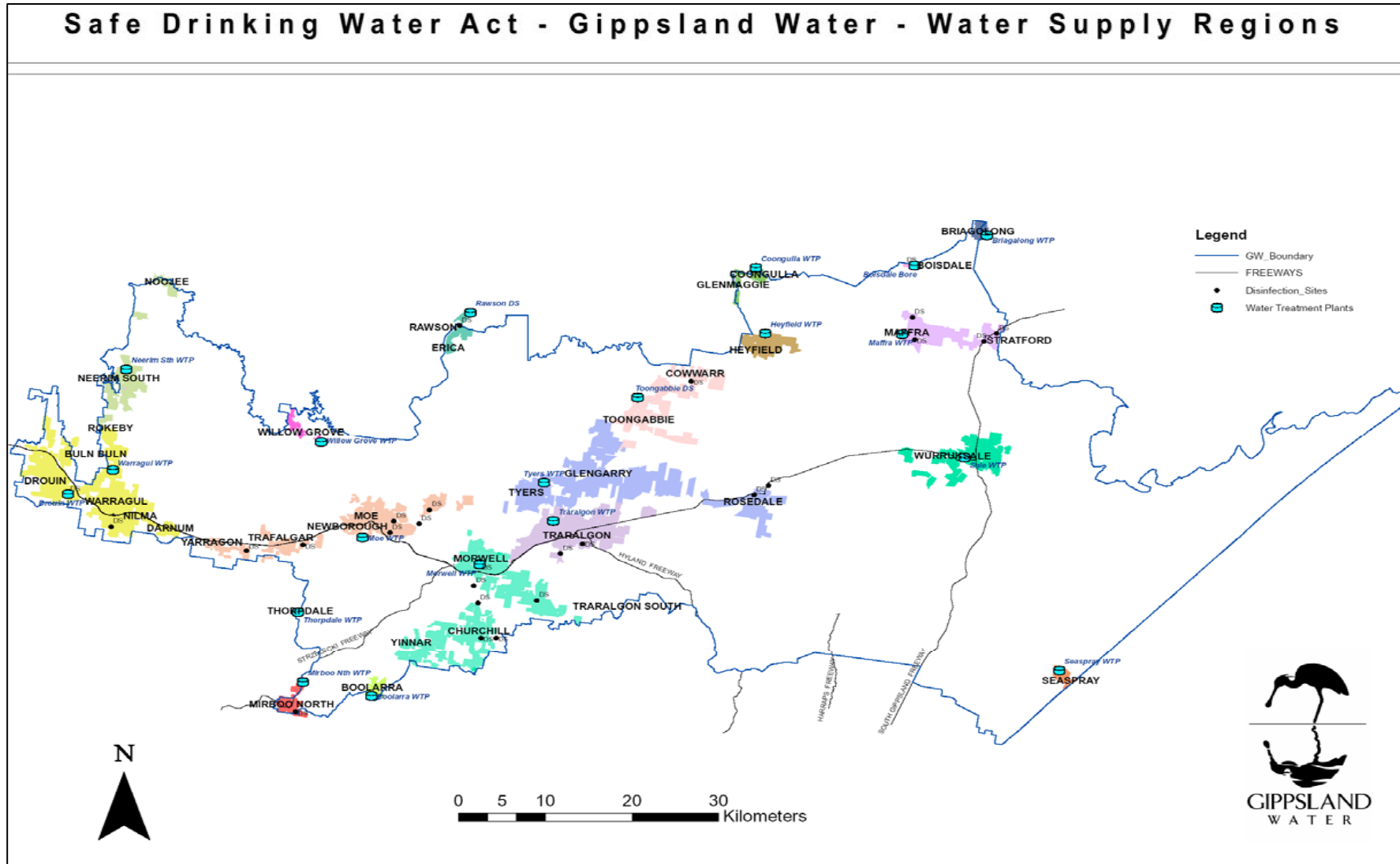
To manage the resources in our care in a manner that ensures Gippsland's sustainability and secures social, environmental and economic benefits to our customers, stakeholders and region.

Our vision

In an increasingly challenging operating environment, Gippsland Water will strive for best practice sustainable water and waste management within central Gippsland.

1.1.1 Map of the Gippsland Water system

Figure 1: Overview of water supply system operated by Gippsland Water



1.1.2 Source of water

Gippsland Water operated 17 water treatment systems supplying 35 localities and 42 towns in 2009-10. The water for these systems is sourced from a variety of water supplies including stream off-takes, reservoirs, and groundwater (bore water). The table below provides information on where the raw water is sourced for each of the water sampling localities and identifies the raw water storage - if one exists prior to the water treatment plants.

Table 1: Gippsland Water Locality Water Source and Water treatment process

Locality	Population ¹	Source water	Storage	Water treatment plant	Treatment process	Added substances	Comments
Maffra	5390	Macalister River	N/A	Maffra	Coagulation, Flocculation Primary Solids Separation - (Clarification) Secondary Solids Separation - (Sand Filters) Primary and Secondary Disinfection, pH Correction, Fluoridation	Soda Ash Hydrofluorosilic acid Alum Polymer LT22, PACL-23, Chlorine (gas) Sodium Hypochlorite Powdered Activated Carbon (PAC)	PAC use as required to treat for taste and odour compounds. PACL-23 is used as required, to treat highly turbid waters.
Stratford	2130						
Boisdale	90						
Boolarra	710	Walkley Creek O'Gradys Creek (supplementary supply)	Boolarra Raw water basin	Boolarra	Coagulation Primary Solids Separation – (Plate Clarifier) Secondary Solids Separation – (Dual Media Filter) Disinfection, pH Correction	Alum Chlorine (gas) Soda Ash	
Briagolong	930	Bore (Freestone Creek Aquifer)	N/A	Briagolong	Coagulation, Flocculation Primary and Secondary Filtration Disinfection, pH Correction	PFS (Polymerised Ferric Sulphate) Polymers 1115 and 1160 Sodium Hypochlorite Soda Ash	
Morwell	16540	Tyers River	Moondarra	Morwell	Coagulation, Flocculation Primary Solids Separation (Clarification), Secondary Solids Separation – (Sand Filters), Primary and Secondary Disinfection, pH Correction, Fluoridation	Soda Ash Alum, Polymer LT20 Chlorine (gas) Sodium Hypochlorite Sodium Fluoride * Calcium Hypochlorite	
Churchill	5420						
Yinnar	1100						
Jumbuk	380						
Traralgon South/Hazelwood North	2370						

Locality	Population ¹	Source water	Storage	Water treatment plant	Treatment process	Added substances	Comments
Tyers/Glengarry	2290	Tyers River	Moondarra	Tyers	Coagulation, Flocculation Plant 1 Primary and Secondary Filtration Primary and Secondary Disinfection, pH Correction Plant 2 Primary Solids Separation (Dissolved Air Flotation) Secondary Solids Separation (Dual Media Filters) Tertiary Solids Separation (Micro Membrane Filtration)	Soda Ash Alum Polymers 1115 and 1160 Sodium Hypochlorite Calcium Hypochlorite	
Rosedale	1850						
Toongabbie	960						
Cowwarr	370						
Traralgon	29490	Tyers River	Moondarra	Traralgon	Coagulation, Flocculation Primary Solids Separation - (Dissolved Air Flotation) Secondary Solids Separation - (Dual Media Filters) Primary and Secondary Disinfection, pH Correction, Fluoridation	Soda Ash, Alum Polymer LT20 Chlorine (gas) Sodium Hypochlorite Sodium Fluoride *	
Warragul (including Nilma, Darnum, Drouin East)	16210	Pederson Weir (Tarago River) Tarago Reservoir - (supplementary supply)	Tarago Reservoir (supplementary supply)	Warragul	Coagulation, Flocculation Primary Solids Separation - (Dissolved Air Flotation) Secondary Solids Separation - (Dual Media Filters) Primary and Secondary Disinfection, pH Correction, Fluoridation	Lime Alum, Polymer LT20 Chlorine (gas) Sodium Hypochlorite Sodium Fluoride *	
Warragul South	820						
Drouin	11000						
Rokeby/Buln Buln	490						
Coongulla/ Glenmaggie	310	Macalister River	Lake Glenmaggie	Coongulla	Coagulation, Flocculation Primary and Secondary Filtration Disinfection, pH Correction, Granular Activated Carbon (GAC) Filtration	Soda Ash Alum 90, Polymers 1190, 1115 (1160) Sodium Hypochlorite	

Rawson	350	Trigger Creek	Amours Basins	Rawson	Coagulation, Flocculation Primary Solids Separation - (Dissolved Air Flotation) Secondary Solids Separation - (Dual Media Filters) Primary and Secondary Disinfection, pH Correction	Soda Ash Polymer 1160, PACL / Ferric Chloride Sodium Hypochlorite	Coagulant changed from PACL to Ferric Chloride in May 2010
Erica	230						
Heyfield	2130	Thomson River	Heyfield Raw water storage	Heyfield	Coagulation, Flocculation Primary and Secondary Filtration Disinfection, pH Correction	PFS, Polymers 1115 and 1160, Chlorine (gas) Soda Ash, Alum 90	Alum 90 coagulant used during poor /dirty raw water periods.
Mirboo North	1980	Little Morwell River	N/A	Mirboo North	Coagulation, Flocculation Primary Solids Separation - (Dissolved Air Flotation) Secondary Solids Separation - (Dual Media Filters) Primary and Secondary Disinfection, pH Correction	Soda Ash PASS, Polymer LT20 Chlorine (gas) Sodium Hypochlorite	
Moe	11510	Tanjil River and Narracan Creek	N/A	Moe	Coagulation, Flocculation Primary Solids Separation - (Clarification) Secondary Solids Separation - (Sand Filters & Dual Media Filters) Primary and Secondary Disinfection, pH Correction, Fluoridation	Alum, Polymer LT20 Chlorine (gas) Lime, Soda Ash Sodium Hypochlorite Sodium Fluoride * Carbon Dioxide	
Newborough	7250						
Yallourn North	1590						
Trafalgar	3700						
Yarragon	1450						
Neerim South	1460	Tarago River	Tarago Reservoir	Neerim South	Coagulation, Flocculation Primary and Secondary Filtration Chlorination and Chloramination Disinfection, pH Correction	Soda Ash PFS, Polymers 1115 and 1160 Sodium Hypochlorite Ammonia (Noojee system only)	
Noojee	350						
Sale/Wurruk	17080	Bore (Boisdale Aquifer)	N/A	Sale	Aeration, Chemical Oxidisation, Precipitation Primary Solids Separation - (Sedimentation) Secondary Solids Separation - (Dual Media Filters) Disinfection, Fluoridation	Lime Potassium Permanganate Chlorine (gas), Sodium Fluoride *	
Seaspray	240	Merrimans Creek	N/A	Seaspray	Coagulation, Flocculation Primary and Secondary Filtration Disinfection, pH Correction	Soda Ash, Alum 90, Polymers 1115, (1160) Sodium Hypochlorite	

Thorpdale	240	Easterbrook Creek	Thorpdale raw water storage	Thorpdale	Coagulation, Flocculation Primary Solids Separation - (Clarification) Secondary Solids Separation - (Dual Media Filters) Disinfection, pH Correction	Alum Soda Ash Sodium Hypochlorite	
Willow Grove	360	Tanjil River	Blue Rock Lake	Willow Grove	Coagulation, Flocculation Secondary Solids Separation - (Dual Media Filter) Chloramination Disinfection pH Correction	Soda Ash Alum, Polymer 1115 and 1160 Sodium Hypochlorite Ammonia	

1. The listed populations are for the water sampling localities calculated using 2006 census data to calculate the number of persons per dwelling per locality and then multiplying it with Gippsland Water's 2009-2010 figures for number of connections. Figures have also been rounded to the nearest 10.
2. * Sodium Fluoride - (dissolvable PVA bag)

2 WATER TREATMENT AND QUALITY MANAGEMENT SYSTEMS

The regulatory environment in which Gippsland Water operates is to provide safe drinking water at **all** times. Safe drinking water is water that does not cause illness in those who consume it. To achieve this, the water must be free of pathogens and free of harmful chemicals. The corporation uses the following treatment processes to produce safe drinking water.

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

- Victorian Safe Drinking Water Act 2003
- Australian Drinking Water Guidelines 2004
- Victorian Safe Drinking Water Regulations 2005
- Code of Practice for Fluoridation of Drinking Water Supplies 2009

2.1 WATER TREATMENT

Gippsland Water operates 17 water supply systems, with 17 water treatment plants (WTP), supplying 35 localities (42 towns).

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

Table 1 identifies the regular treatment process for each of the water localities and lists the added substances and any periodic treatment activities.

The corporation uses the following treatment processes to produce safe drinking water.

2.1.1 Coagulation / Flocculation

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

2.1.2 Clarification / Sedimentation

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

2.1.3 Filtration

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

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

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

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

2.1.4 Disinfection

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

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

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

2.1.5 Fluoridation

Gippsland Water fluoridates the drinking water supplies of Moe, Morwell, Maffra Traralgon, Sale, and Warragul. For information about the health issues associated with the water fluoridation program contact the Department of Health (DoH) on 1800 651 723.

2.2 SYSTEM ISSUES FOR 2009-10

During the 2009-10 monitoring period, the following issues occurred in the water supply systems;

- Traralgon Water reticulation dirty water (turbidity) event October 2009
- Rawson Acid Soluble aluminium exceedance May 2010

These events were notifiable under Section 22 & 18 respectively and as such are detailed in Section 4 of this report.

3 QUALITY OF DRINKING WATER 2009-10

The *SDWR 2005* require a water quality monitoring program to be undertaken to verify compliance or non-compliance of specified water quality parameters as listed in the regulations. The quality of water is to be measured at a customer's tap in each of the 35 localities to determine that the water meets the specified quality standard. The following section provides a summary of the results against the water quality parameters monitored through the year at the required sampling frequency.

A brief explanation of the required water quality parameters is provided below. A more detailed explanation can be obtained from the *ADWG* prepared by the National Health and Medical Research Council (Section 10).

Escherichia coli (*E.coli*) – *E.coli* is the most common thermo tolerant coliform present in faeces and is regarded as the most specific indicator of recent faecal contamination from warm blooded animals. The presence of *E.coli* in the water supply can therefore indicate the potential for other pathogenic bacteria to be present. Any *E.coli* detections at customer tap samples must be reported to DoH under *SDWA* reporting requirements.

Chloroacetic, Dichloroacetic and Trichloroacetic Acid – These chloroacetic acids are produced in drinking water as by-products of the reaction between chlorine and naturally occurring organic matter derived from the decay of aquatic and terrestrial vegetative matter, present in water supplies. Results from samples taken at customer taps that exceed the maximum levels for these parameters are reported to the DoH under *SDWA* reporting requirements.

Trihalomethanes (THM) – Trihalomethanes are a category of by-products produced in drinking water, principally as a result of disinfection chemicals (chlorine) reacting with naturally occurring organic matter derived from the decay of aquatic and terrestrial vegetative matter, present in water supplies. Results from samples taken at customer taps that exceed the maximum levels for these parameters are reported to DoH under *SDWA* reporting requirements.

Acid Soluble Aluminium – Aluminium concentrations may be present in water through natural leaching from soil and rock, or from the use of aluminium salts as coagulants in water treatment. The naturally occurring aluminium concentrations are removed using conventional water treatment practices. "Acid soluble aluminium" is the biologically available fraction of aluminium present in water. Results from samples taken at customer taps that exceed the maximum level of this parameter are reported to DoH under *SDWA* reporting requirements.

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

3.1 ESCHERICHIA COLI (*E. COLI*) RESULTS

3.1.1 E coli results

Compliance under the *SDWR 2005* requires at least 98% of all samples of drinking water collected within a locality in any 12 month period to contain no *E.coli* organism/100ml of drinking water. All Gippsland Water sites achieved 100% compliance with this standard for the 2009-10 reporting period.

Table 2: E.coli results for localities 2009-10

Locality	Sampling Frequency	No. of samples	No. of Non complying results	Max result	% with no <i>E. coli</i>	Complying (Yes/No)
Boisdale	Weekly	52	0	0	100%	Yes
Boolarra	Weekly	52	0	0	100%	Yes
Briagolong	Weekly	52	0	0	100%	Yes
Churchill	Weekly	52	0	0	100%	Yes
Coongulla-Glenmaggie	Weekly	52	0	0	100%	Yes
Cowwarr	Weekly	52	0	0	100%	Yes
Drouin	Weekly	64*	0	0	100%	Yes
Erica	Weekly	52	0	0	100%	Yes
Heyfield	Weekly	52	0	0	100%	Yes
Jumbuk	Weekly	52	0	0	100%	Yes
Maffra	Weekly	52	0	0	100%	Yes
Mirboo North	Weekly	52	0	0	100%	Yes
Moe	Weekly	104*	0	0	100%	Yes
Morwell	Weekly	76*	0	0	100%	Yes
Neerim South	Weekly	52	0	0	100%	Yes
Newborough	Weekly	52	0	0	100%	Yes
Noojee	Weekly	52	0	0	100%	Yes
Rawson	Weekly	52	0	0	100%	Yes
Rokeby-Buln Buln	Weekly	52	0	0	100%	Yes
Rosedale	Weekly	52	0	0	100%	Yes
Sale-Wurruk	Weekly	76*	0	0	100%	Yes
Seaspray	Weekly	52	0	0	100%	Yes
Stratford	Weekly	52	0	0	100%	Yes
Thorpdale	Weekly	52	0	0	100%	Yes
Toongabbie	Weekly	52	0	0	100%	Yes
Trafalgar	Weekly	52	0	0	100%	Yes
Traralgon	Weekly	104*	0	0	100%	Yes
Traralgon South-Hazelwood North	Weekly	52	0	0	100%	Yes
Tyers-Glengarry	Weekly	52	0	0	100%	Yes
Warragul	Weekly	76*	0	0	100%	Yes
Warragul South	Weekly	52	0	0	100%	Yes
Willow Grove	Weekly	52	0	0	100%	Yes
Yallourn North	Weekly	52	0	0	100%	Yes
Yarragon	Weekly	52	0	0	100%	Yes
Yinnar	Weekly	52	0	0	100%	Yes

* The number of samples collected in a locality is determined by the *ADWG* recommendations (10-5) regarding population-based sampling frequency for *E.coli*. Localities with populations greater than 5,000 have samples taken more frequently than weekly.

3.1.2 Actions taken in relation to non-compliance

All towns complied with this water quality parameter.

3.2 CHLORINE BASED DISINFECTION BY-PRODUCT CHEMICALS

3.2.1 Chloroacetic acid results

For compliance with the *SDWR 2005*, a sample result must not exceed 0.15 mg/L for chloroacetic acid. All Gippsland Water sites achieved 100% compliance with this standard for the 2009-10 reporting period.

Table 3: Chloroacetic acid results for all localities 2009-10

Locality	Frequency of sampling	No. of samples	Max* (mg/L)	Min* (mg/L)	Complying (Yes/No)	Non compliant results
Boisdale	Monthly	12	<0.01	<0.005	Yes	0
Boolarra	Monthly	12	<0.01	<0.005	Yes	0
Briagolong	Monthly	12	<0.01	<0.005	Yes	0
Churchill	Monthly	12	<0.01	<0.005	Yes	0
Coongulla-Glenmaggie	Monthly	12	<0.01	<0.005	Yes	0
Cowwarr	Monthly	12	<0.01	<0.005	Yes	0
Drouin	Monthly	12	<0.01	<0.005	Yes	0
Erica	Monthly	12	<0.01	<0.005	Yes	0
Heyfield	Monthly	12	<0.01	<0.005	Yes	0
Jumbuk	Monthly	12	<0.01	<0.005	Yes	0
Maffra	Monthly	12	<0.01	<0.005	Yes	0
Mirboo North	Monthly	12	<0.01	<0.005	Yes	0
Moe	Monthly	12	<0.01	<0.005	Yes	0
Morwell	Monthly	12	<0.01	<0.005	Yes	0
Neerim South	Monthly	12	<0.01	<0.005	Yes	0
Newborough	Monthly	12	<0.01	<0.005	Yes	0
Noojee	Monthly	12	<0.01	<0.005	Yes	0
Rawson	Monthly	12	<0.01	<0.005	Yes	0
Rocheby-Buln Buln	Monthly	12	<0.01	<0.005	Yes	0
Rosedale	Monthly	12	<0.01	<0.005	Yes	0
Sale-Wurruk	Monthly	12	<0.01	<0.005	Yes	0
Seaspray	Monthly	12	<0.01	<0.005	Yes	0
Stratford	Monthly	12	<0.01	<0.005	Yes	0
Thorpdale	Monthly	12	<0.01	<0.005	Yes	0
Toongabbie	Monthly	12	<0.01	<0.005	Yes	0
Trafalgar	Monthly	12	<0.01	<0.005	Yes	0
Traralgon	Monthly	12	<0.01	<0.005	Yes	0
Traralgon South-Hazelwood North	Monthly	12	<0.01	<0.005	Yes	0
Tyers-Glengarry	Monthly	12	<0.01	<0.005	Yes	0
Warragul	Monthly	12	<0.01	<0.005	Yes	0
Warragul South	Monthly	12	<0.01	<0.005	Yes	0
Willow Grove	Monthly	12	<0.01	<0.005	Yes	0
Yallourn North	Monthly	12	<0.01	<0.005	Yes	0
Yarragon	Monthly	12	<0.01	<0.005	Yes	0
Yinnar	Monthly	12	<0.01	<0.005	Yes	0

3.2.1.1 Actions taken in relation to non-compliance

All towns complied with this water quality parameter.

3.2.2 Dichloroacetic acid results

For compliance with the *SDWR 2005*, a sample result must not exceed 0.1 mg/L dichloroacetic acid. All Gippsland Water sites achieved 100% compliance with this standard for the 2009-10 reporting period.

Table 4: Dichloroacetic acid results for all localities 2009-10

Locality	Frequency of sampling	No. of samples	Max* (mg/L)	Min* (mg/L)	Complying (Yes/No)	Non compliant results
Boisdale	Monthly	12	<0.020	<0.005	Yes	0
Boolarra	Monthly	12	<0.020	<0.005	Yes	0
Briagolong	Monthly	12	<0.005	<0.005	Yes	0
Churchill	Monthly	12	<0.020	<0.005	Yes	0
Coongulla-Glenmaggie	Monthly	12	<0.005	<0.005	Yes	0
Cowwarr	Monthly	12	<0.020	<0.005	Yes	0
Drouin	Monthly	12	0.023	<0.005	Yes	0
Erica	Monthly	12	<0.020	<0.005	Yes	0
Heyfield	Monthly	12	<0.005	<0.005	Yes	0
Jumbuk	Monthly	12	<0.005	<0.005	Yes	0
Maffra	Monthly	12	<0.020	<0.005	Yes	0
Mirboo North	Monthly	12	<0.005	<0.005	Yes	0
Moe	Monthly	12	<0.020	<0.005	Yes	0
Morwell	Monthly	12	<0.020	<0.005	Yes	0
Neerim South	Monthly	12	<0.020	<0.005	Yes	0
Newborough	Monthly	12	<0.020	<0.005	Yes	0
Noojee	Monthly	12	<0.020	<0.005	Yes	0
Rawson	Monthly	12	0.024	<0.005	Yes	0
Rokeyby-Buln Buln	Monthly	12	0.023	<0.005	Yes	0
Rosedale	Monthly	12	<0.020	<0.005	Yes	0
Sale-Wurruk	Monthly	12	<0.005	<0.005	Yes	0
Seaspray	Monthly	12	<0.020	<0.005	Yes	0
Stratford	Monthly	12	<0.020	<0.005	Yes	0
Thorpdale	Monthly	12	0.008	<0.005	Yes	0
Toongabbie	Monthly	12	<0.020	<0.005	Yes	0
Trafalgar	Monthly	12	<0.020	<0.005	Yes	0
Traralgon	Monthly	12	<0.020	<0.005	Yes	0
Traralgon South-Hazelwood North	Monthly	12	<0.020	<0.005	Yes	0
Tyers-Glengarry	Monthly	12	<0.020	<0.005	Yes	0
Warragul	Monthly	12	<0.020	<0.005	Yes	0
Warragul South	Monthly	12	<0.020	<0.005	Yes	0
Willow Grove	Monthly	12	<0.020	<0.005	Yes	0
Yallourn North	Monthly	12	<0.020	<0.005	Yes	0
Yarragon	Monthly	12	<0.020	<0.005	Yes	0
Yinnar	Monthly	12	<0.020	<0.005	Yes	0

3.2.2.1 Actions taken in relation to non-compliance

All towns complied with this water quality parameter.

3.2.3 Trichloroacetic acid results

For compliance with the *SDWR 2005*, a sample result must not exceed 0.1 mg/L trichloroacetic acid. All Gippsland Water sites achieved 100% compliance with this standard for the 2009-10 reporting period.

Table 5: Trichloroacetic acid for all localities 2009-10

Locality	Frequency of sampling	No. of samples	Max* (mg/L)	Min* (mg/L)	Complying (Yes/No)	Non Compliant Results
Boisdale	Monthly	12	<0.020	0.009	Yes	0
Boolarra	Monthly	12	<0.020	<0.005	Yes	0
Briagolong	Monthly	12	<0.005	<0.005	Yes	0
Churchill	Monthly	12	0.026	0.009	Yes	0
Coongulla-Glenmaggie	Monthly	12	0.007	<0.005	Yes	0
Cowwarr	Monthly	12	0.023	0.009	Yes	0
Drouin	Monthly	12	0.032	0.013	Yes	0
Erica	Monthly	12	0.020	0.006	Yes	0
Heyfield	Monthly	12	<0.005	<0.005	Yes	0
Jumbuk	Monthly	12	0.023	0.014	Yes	0
Maffra	Monthly	12	<0.020	<0.005	Yes	0
Mirboo North	Monthly	12	<0.005	<0.005	Yes	0
Moe	Monthly	12	<0.020	<0.005	Yes	0
Morwell	Monthly	12	<0.020	0.007	Yes	0
Neerim South	Monthly	12	<0.020	<0.005	Yes	0
Newborough	Monthly	12	<0.020	<0.005	Yes	0
Noojee	Monthly	12	<0.005	<0.005	Yes	0
Rawson	Monthly	12	0.020	0.007	Yes	0
Rokeby-Buln Buln	Monthly	12	0.027	0.014	Yes	0
Rosedale	Monthly	12	0.022	0.011	Yes	0
Sale-Wurruk	Monthly	12	<0.005	<0.005	Yes	0
Seaspray	Monthly	12	0.020	<0.005	Yes	0
Stratford	Monthly	12	<0.020	0.006	Yes	0
Thorpdale	Monthly	12	<0.005	<0.005	Yes	0
Toongabbie	Monthly	12	0.021	0.01	Yes	0
Trafalgar	Monthly	12	<0.020	<0.005	Yes	0
Traralgon	Monthly	12	<0.020	<0.005	Yes	0
Traralgon South-Hazelwood North	Monthly	12	0.022	0.011	Yes	0
Tyers-Glengarry	Monthly	12	<0.020	0.01	Yes	0
Warragul	Monthly	12	0.025	0.011	Yes	0
Warragul South	Monthly	12	0.032	0.014	Yes	0
Willow Grove	Monthly	12	<0.005	<0.005	Yes	0
Yallourn North	Monthly	12	<0.020	<0.005	Yes	0
Yarragon	Monthly	12	<0.020	<0.005	Yes	0
Yinnar	Monthly	12	0.026	0.014	Yes	0

3.2.3.1 Actions taken in relation to non-compliance

All towns complied with this water quality parameter.

3.2.4 Trihalomethanes (THM) results

For compliance with the *SDWR 2005*, a sample result must not exceed 0.25 mg/L trihalomethane. All Gippsland Water sites achieved 100% compliance with this standard for the 2009-10 reporting period.

Table 6: Trihalomethanes results for all localities for 2009-10

Locality	Frequency of sampling	No. of samples	Max (mg/L)	Min (mg/L)	Complying (Yes/No)	Non compliant results
Boisdale	Monthly	12	0.060	0.031	Yes	0
Boolarra	Monthly	12	0.130	0.053	Yes	0
Briagolong	Monthly	12	0.020	0.003	Yes	0
Churchill	Monthly	12	0.094	0.031	Yes	0
Coongulla-Glenmaggie	Monthly	12	0.033	0.009	Yes	0
Cowwarr	Monthly	12	0.062	0.040	Yes	0
Drouin	Monthly	12	0.083	0.042	Yes	0
Erica	Monthly	12	0.090	0.051	Yes	0
Heyfield	Monthly	12	0.032	0.016	Yes	0
Jumbuk	Monthly	12	0.093	0.051	Yes	0
Maffra	Monthly	12	0.052	0.020	Yes	0
Mirboo North	Monthly	12	0.068	0.021	Yes	0
Moe	Monthly	12	0.071	0.029	Yes	0
Morwell	Monthly	12	0.059	0.023	Yes	0
Neerim South	Monthly	12	0.050	0.031	Yes	0
Newborough	Monthly	12	0.051	0.033	Yes	0
Noojee	Monthly	12	0.031	0.022	Yes	0
Rawson	Monthly	12	0.076	0.046	Yes	0
Rokeby-Buln Buln	Monthly	12	0.083	0.038	Yes	0
Rosedale	Monthly	12	0.100	0.036	Yes	0
Sale-Wurruk	Monthly	12	0.038	0.019	Yes	0
Seaspray	Monthly	12	0.220	0.078	Yes	0
Stratford	Monthly	12	0.060	0.020	Yes	0
Thorpdale	Monthly	12	0.087	0.032	Yes	0
Toongabbie	Monthly	12	0.064	0.038	Yes	0
Trafalgar	Monthly	12	0.071	0.042	Yes	0
Traralgon	Monthly	12	0.044	0.019	Yes	0
Traralgon South-Hazelwood North	Monthly	12	0.059	0.032	Yes	0
Tyers-Glengarry	Monthly	12	0.073	0.037	Yes	0
Warragul	Monthly	12	0.082	0.032	Yes	0
Warragul South	Monthly	12	0.100	0.057	Yes	0
Willow Grove	Monthly	12	0.012	0.001	Yes	0
Yallourn North	Monthly	12	0.063	0.039	Yes	0
Yarragon	Monthly	12	0.087	0.046	Yes	0
Yinnar	Monthly	12	0.097	0.051	Yes	0

3.2.4.1 Actions taken in relation to non-compliance

All towns complied with this water quality parameter.

3.3 OZONE BASED DISINFECTION BY-PRODUCT CHEMICALS

Gippsland Water has no ozone dosing systems and therefore the ozone based chemical concentrations of bromate and formaldehyde have not been included in the routine testing program.

3.4 ALUMINIUM

3.4.1 Aluminium results

For compliance with the *SDWR 2005*, a sample result must not exceed a maximum of 0.2mg/L aluminium (acid soluble) in drinking water. Gippsland Water recorded one exceedance for aluminium in the 2009-10 reporting period with all other sites achieving 100% compliance.

Table 7: Aluminium results for all localities in 2009-10

Locality	Frequency of Sampling	No. of Samples	Max* (mg/L)	Min* (mg/L)	Complying (Yes/No)	Non Compliant Results
Boisdale	Monthly	12	0.04	0.01	Yes	0
Boolarra	Monthly	12	0.02	<0.01	Yes	0
Briagolong	Monthly	12	0.01	<0.01	Yes	0
Churchill	Monthly	12	0.03	0.01	Yes	0
Coongulla & Glenmaggie	Monthly	12	0.05	<0.01	Yes	0
Cowwarr	Monthly	12	0.03	0.01	Yes	0
Drouin	Monthly	12	0.16	0.02	Yes	0
Erica	Monthly	12	0.23	0.04	Yes	0
Heyfield	Monthly	12	0.01	<0.01	Yes	0
Jumbuk	Monthly	12	0.03	0.01	Yes	0
Maffra	Monthly	12	0.03	<0.01	Yes	0
Mirboo North	Monthly	12	0.04	<0.01	Yes	0
Moe	Monthly	12	0.02	<0.01	Yes	0
Morwell	Monthly	12	0.06	0.01	Yes	0
Neerim South	Monthly	12	0.02	<0.01	Yes	0
Newborough	Monthly	12	0.02	<0.01	Yes	0
Noojee	Monthly	12	0.01	<0.01	Yes	0
Rawson	Monthly	12	0.61	0.05	No	1
Rokeyby & Buln Buln	Monthly	12	0.05	0.03	Yes	0
Rosedale	Monthly	12	0.06	0.01	Yes	0
Sale/Wurruk	Monthly	12	0.02	<0.01	Yes	0
Seaspray	Monthly	12	0.04	<0.01	Yes	0
Stratford	Monthly	12	0.02	<0.01	Yes	0
Thorpdale	Monthly	12	0.08	<0.01	Yes	0
Toongabbie	Monthly	12	0.04	0.01	Yes	0
Trafalgar	Monthly	12	0.03	<0.01	Yes	0
Traralgon	Monthly	12	0.03	0.02	Yes	0
Traralgon South & Hazelwood North	Monthly	12	0.03	0.01	Yes	0
Tyers & Glengarry	Monthly	12	0.04	0.01	Yes	0
Warragul	Monthly	12	0.06	0.03	Yes	0
Warragul South	Monthly	12	0.05	0.04	Yes	0
Willow Grove	Monthly	12	0.07	<0.01	Yes	0
Yallourn North	Monthly	12	0.01	<0.01	Yes	0
Yarragon	Monthly	12	0.03	<0.01	Yes	0
Yinnar	Monthly	12	0.03	0.01	Yes	0

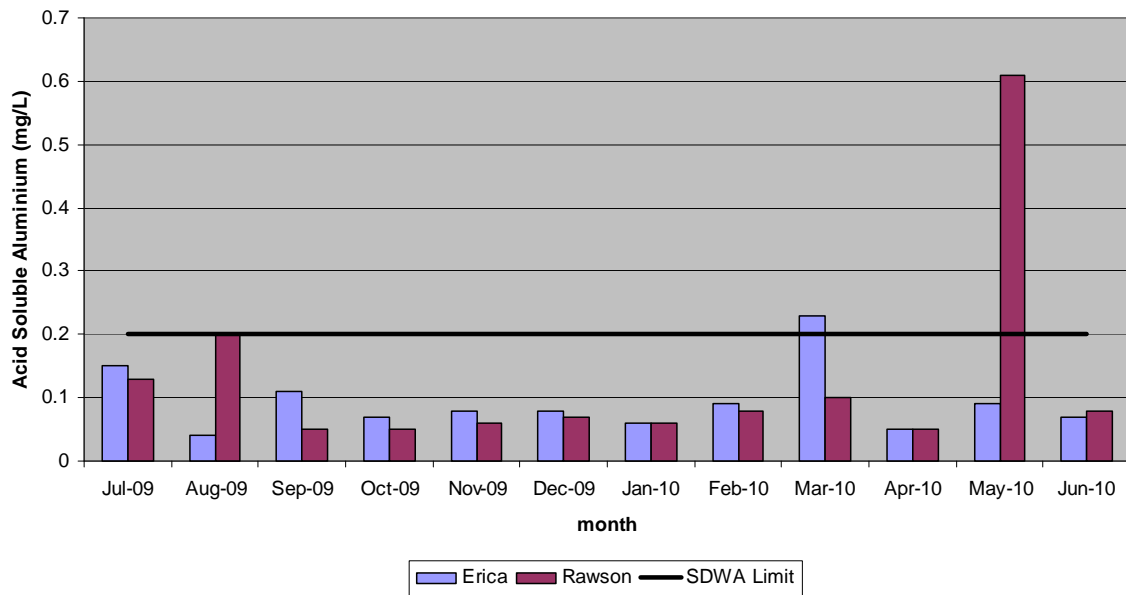
3.4.1.1 Actions taken in relation to non-compliance

During the 2009-2010 reporting period, one locality recorded an elevated Aluminium (Acid Soluble) level.

One sample of elevated aluminium level was recorded for the Rawson locality in May 2010. Gippsland Water investigated the exceedance and could not identify an exact cause however due to the occasional historical exceedance opted to change over the chemical coagulant to remove the risk of future exceedance. Refer to Section 4.1 where this incident was reported under *SDWA* Section 18 to DoH.

The figure below gives a 12-month trend for each of the Erica and Rawson townships supplied with treated water from the Rawson WTP. Rawson experienced an Acid Soluble Aluminium non-conformance in the year.

Figure 2: Acid Soluble Aluminium (mg/L) for 2009-10 for Erica and Rawson



Note that the data point in March 2010 for the Erica locality is 0.23 mg/L and is compliant with the requirements of the SDWA.

3.5 TURBIDITY

3.5.1 Turbidity results

For compliance with the *SDWR 2005*, the 95% upper confidence limit of the mean of all values for samples of drinking water collected in any 12-month period, must have turbidity measured as less than or equal to 5.0 NTU (Nephelometric Turbidity Unit). All Gippsland Water sites achieved 100% compliance with this standard for the 2009-10 reporting period.

Table 8: Turbidity results for all localities in 2009-10

Locality	Frequency of Sampling	No. of Samples	Max (NTU)	Min (NTU)	95% UCL of mean*	Complying (Yes/No)	Non Compliant Results
Boisdale	Weekly	52	0.5	0.1	0.2	Yes	0
Boolarra	Weekly	52	0.6	0.1	0.2	Yes	0
Briagolong	Weekly	52	0.3	0.1	0.2	Yes	0
Churchill	Weekly	52	0.9	0.1	0.2	Yes	0
Coongulla & Glenmaggie	Weekly	52	0.4	0.1	0.2	Yes	0
Cowwarr	Weekly	52	0.6	0.1	0.2	Yes	0
Drouin	Weekly	52	1.1	0.1	0.3	Yes	0
Erica	Weekly	52	0.6	0.1	0.2	Yes	0
Heyfield	Weekly	52	1.2	0.1	0.2	Yes	0
Jumbuk	Weekly	52	0.5	0.1	0.2	Yes	0
Maffra	Weekly	52	0.7	0.1	0.2	Yes	0
Mirboo North	Weekly	52	0.3	0.1	0.2	Yes	0
Moe	Weekly	52	0.3	0.1	0.3	Yes	0
Morwell	Weekly	52	0.4	0.1	0.2	Yes	0
Neerim South	Weekly	52	0.4	0.1	0.2	Yes	0
Newborough	Weekly	52	0.7	0.1	0.2	Yes	0
Noojee	Weekly	52	1.0	0.1	0.3	Yes	0
Rawson	Weekly	52	0.6	0.1	0.2	Yes	0
Rokeby & Buln Buln	Weekly	52	0.6	0.1	0.2	Yes	0
Rosedale	Weekly	52	0.7	0.1	0.2	Yes	0
Sale/Wurruk	Weekly	52	0.6	0.1	0.2	Yes	0
Seaspray	Weekly	52	2.9	0.1	0.7	Yes	0
Stratford	Weekly	52	0.3	0.1	0.2	Yes	0
Thorpdale	Weekly	52	0.6	0.1	0.6	Yes	0
Toongabbie	Weekly	52	0.6	0.1	0.2	Yes	0
Trafalgar	Weekly	52	0.7	0.1	0.2	Yes	0
Traralgon	Weekly	52	0.9	0.1	0.2	Yes	0
Traralgon South & Hazelwood North	Weekly	52	1.1	0.1	0.2	Yes	0
Tyers & Glengarry	Weekly	52	0.9	0.1	0.2	Yes	0
Warragul	Weekly	52	0.6	0.1	0.2	Yes	0
Warragul South	Weekly	52	1.0	0.1	0.3	Yes	0
Willow Grove	Weekly	52	0.6	0.1	0.2	Yes	0
Yallourn North	Weekly	52	4.0	0.1	0.4	Yes	0
Yarragon	Weekly	52	0.4	0.1	0.2	Yes	0
Yinnar	Weekly	52	0.3	0.1	0.3	Yes	0

*In order to calculate the mean, std deviation and confidence levels results <0.1NTU were rounded up to 0.1NTU

3.5.1.1 Actions taken in relation to non-compliance

All towns complied with this water quality parameter.

3.6 FLUORIDE

Fluoride testing has been performed in the water supply systems where fluoride is artificially added to the water (supplies of Maffra, Warragul, Sale Traralgon, Morwell and Moe).

Gippsland Water has sampled localities on a weekly basis even though some of the localities listed in table 10 require monthly samples according to section 5.1.4 of the Code of Practice for Fluoridation of Drinking Water Supplies (ie if a fluoride plant supplies five or more water sampling localities then the authority must take a sample each month from a water sampling point in each sampling locality supplied from those plant such that a sample is collected from the distribution system at least once per week).

3.6.1 Fluoride results

Based on health considerations, no single sample concentration of fluoride in drinking water should exceed 1.5 mg/L, and the average level of fluoride should not exceed 1.0 mg/L. All Gippsland Water sites achieved 100% compliance with this standard for the 2009-10 reporting period.

Table 9: Fluoride results for all fluoridated localities in 2009-10

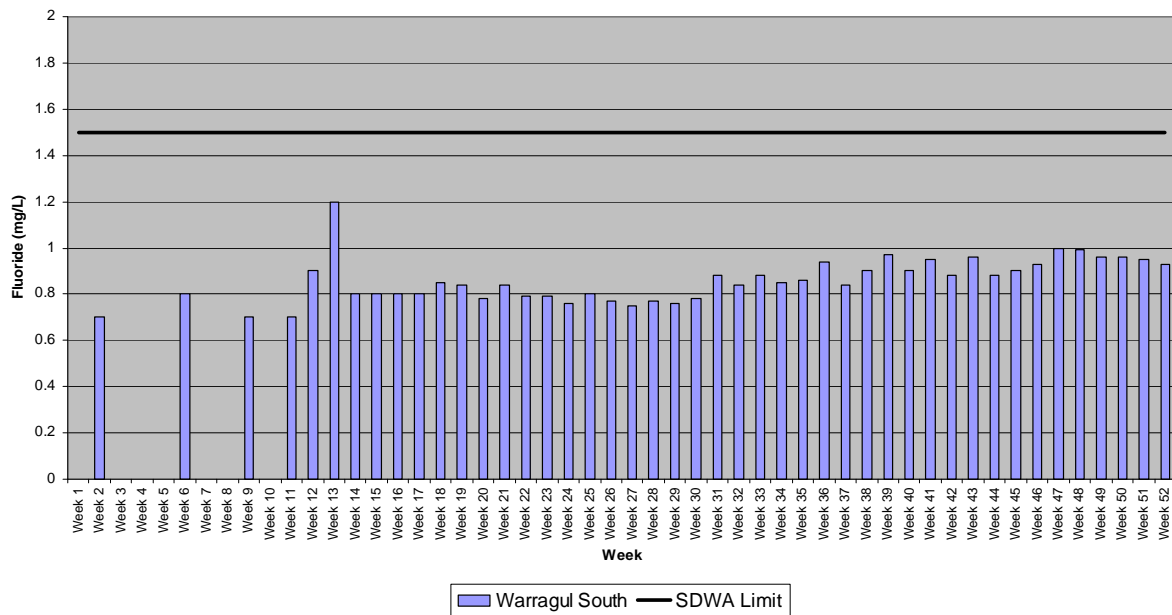
Treatment Plant	Locality	Required Frequency of Sampling	Actual No. of Samples	Max (mg/L)	Min (mg/L)	Average (mg/L)	Complying (Yes/No)
Maffra	Boisdale	Weekly	52	1.2	0.8	0.94	Yes
	Maffra	Weekly	52	1.2	0.73	0.91	Yes
	Stratford	Weekly	52	1.1	0.77	0.91	Yes
Morwell	Churchill	Monthly	52	1.1	0.77	0.93	Yes
	Jumbuk	Monthly	52	1.1	0.7	0.92	Yes
	Morwell	Monthly	49	1.3	0.2	0.90	Yes
	Traralgon South/ Hazelwood North	Monthly	52	1.4	0.73	0.94	Yes
	Yinnar	Monthly	52	1.1	0.7	0.92	Yes
Moe	Moe	Monthly	45	0.98	0.1	0.82	Yes
	Newborough	Monthly	52	1.1	0.25	0.86	Yes
	Trafalgar	Monthly	52	1.1	0.14	0.86	Yes
	Yallourn North	Monthly	51	1.1	0.72	0.87	Yes
	Yarragon	Monthly	52	1.2	0.22	0.87	Yes
Sale	Sale	Weekly	52	1.1	0.6	0.88	Yes
Traralgon	Traralgon	Weekly	52	1.1	0.38	0.86	Yes
Warragul	Drouin	Weekly	52	1.2	0.7	0.87	Yes
	Rokeby/Buln Buln	Weekly	52	1.1	0.7	0.86	Yes
	Warragul	Weekly	52	1.1	0.6	0.86	Yes
	Warragul South	Weekly	45	1.2	0.7	0.86	Yes

3.6.1.1 Actions taken in relation to non-compliance

Of the samples taken, all towns complied with this water quality parameter. However, for the Warragul South locality only one sample per month was taken for July 2009 and August 2009, then four samples taken in September 2009. Samples from October 2009 to June 2010 were taken weekly in accordance with the code of practice. This is represented in the figure below.

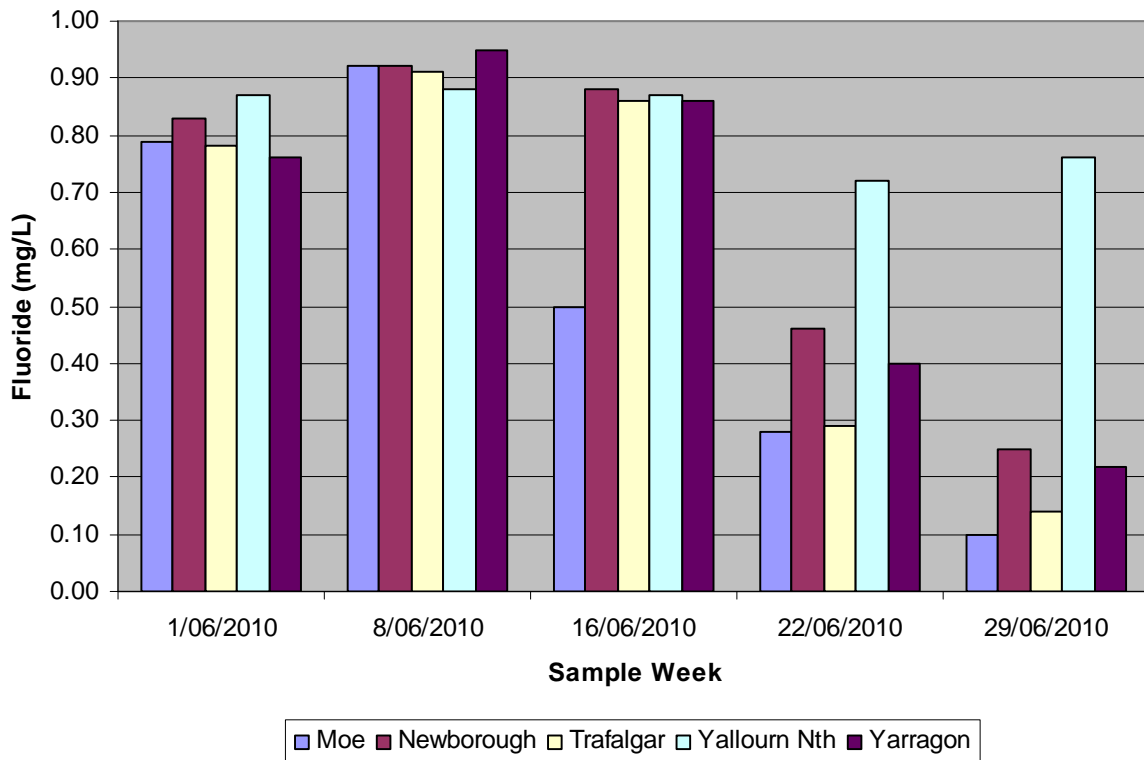
The decrease in sample numbers between July and September 2009 for the Warragul South locality was associated with Gippsland Water's implementation of the revised monitoring program.

Figure 3: Fluoride (mg/L) for 2009-10 for Warragul South



The fluoride system at the Moe Water Treatment plant was turned off within the reporting period between 18th June 2010 to 30th June due to issues with the delivery system, as corresponded to DoH on 21st June 2010. During this period, non fluoridated water was supplied to the localities for the Moe WTP as presented in the figure below.

Figure 4: Fluoride (mg/L) for June – July 2010 for the localities supplied by Moe WTP



Since the fluoride product is supplied in Polyvinyl Alcohol (PVA) dissolvable bags, PVA monitoring was undertaken in the reticulation systems of the following localities on a monthly basis between April 2010 to June 2010, to assess any product carry over from the fluoridation process. All Gippsland Water sites tested achieved compliance with the guideline limits for the 2009-10 reporting period.

Table 10: Polyvinyl Alcohol results for fluoridated systems in 2009-10

Locality	Frequency of Sampling	No. of Samples	Max (mg/L)*
Moe	Monthly	3	<0.01
Morwell	Monthly	3	<0.01
Sale	Monthly	3	<0.01
Traralgon	Monthly	3	<0.01
Warragul	Monthly	3	<0.01

*Results of <0.01 mg/L are at the detection limit for this parameter.

3.7 OTHER ALGAE, PATHOGEN, CHEMICAL OR SUBSTANCE NOT SPECIFIED THAT MAY POSE A RISK TO HUMAN HEALTH

3.7.1 Overall results

During the reporting period, the corporation monitored for the following health-related aspects of the drinking water supplied to customer taps. Table 11 lists the parameters and the frequency of samples taken across all localities, comparing the results to the *ADWG* and the recommended value.

Table 11: Other sampled parameter results for all localities in 2009-10

Parameter	Frequency of sampling	No. samples	Results According to ADWG values		
			Recommended value	Result	Locality
Nitrite	Weekly (3 Localities)	127*	≤ 3 mg/L	All results below ADWG health guideline values.	
Mercury	Quarterly	140	≤ 0.001 mg/L		
Chromium	Quarterly	140	≤ 0.05 mg/L		
Cadmium	Quarterly	140	≤ 0.002 mg/L		
Nitrate	Quarterly	140	≤ 50 mg/L		
Nickel	Annual	35	≤ 0.02 mg/L		

*Sampling of Willow Grove and Noojee for Nitrite was completed for the full reporting period however Neerim South was added to the program as the third locality in late October 2009. Sampling of Neerim South commenced mid November 2009.

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

The following table contains Blue Green Algae (BGA) monitoring undertaken across Gippsland Water storages based on visual and water quality triggers. Major raw water supply/storages are routinely monitored for BGA as part of the routine catchment monitoring program.

Table 12: Routine BGA monitoring for raw water supplies in 2009-10

Location	Jul '09	Aug '09	Sept '09	Oct '09	Nov '09	Dec '09	Jan '10	Feb '10	Mar '10	Apr '10	May '10	Jun '10
Maffra Weir		1									1	
Heyfield Raw Water Storage	1	1	1							1	1	1
Boolarra Raw Water Storage		1									1	
Thorpdale Raw Water Storage	1	1									1	1
Neerim South Tarago Reservoir												
Rawson Amours Basin		1									1	
Blue Rock Lake	<i>As required (Southern Rural Water BGA Program)</i>											
Lake Glenmaggie	<i>As required (Southern Rural Water BGA Program)</i>											
Tarago Reservoir	<i>As required (Melbourne Water BGA Program)</i>											
Moondarra Surface	1	1	1	1	1	1	1	1	1	1	1	1
Moondarra Pipe line	1	1	1	1						1	1	1
Moondarra Upper reaches	<i>As required</i>											

3.7.2 Manganese

Manganese can be naturally present in either soluble or insoluble forms in water. When concentrations exceed the aesthetic guideline of 0.1 mg/L, manganese can create unacceptable tastes in water, as well as stain fixtures and laundry. Compliance is measured against the health guideline value of 0.5 mg/L in *ADWG*. Gippsland Water sites achieved 100% compliance against manganese guideline values.

Table 13: Manganese results for all localities in 2009-10

Locality	Frequency of Sampling	No. of Samples	Max (mg/L)	Min (mg/L)	Complying (Yes/No)
Boisdale	Monthly	12	0.091	<0.001	Yes
Boolarra	Monthly	12	0.017	0.004	Yes
Briagolong	Monthly	12	0.001	<0.001	Yes
Churchill	Monthly	12	0.001	<0.001	Yes
Coongulla & Glenmaggie	Monthly	12	0.007	0.001	Yes
Cowwarr	Monthly	12	0.001	<0.001	Yes
Drouin	Monthly	12	0.005	<0.001	Yes
Erica	Monthly	12	0.003	<0.001	Yes
Heyfield	Monthly	12	0.027	0.001	Yes
Jumbuk	Monthly	12	0.001	<0.001	Yes
Maffra	Monthly	12	0.002	<0.001	Yes
Mirboo North	Monthly	12	0.001	<0.001	Yes
Moe	Monthly	12	0.009	<0.001	Yes
Morwell	Monthly	12	0.001	<0.001	Yes
Neerim South	Monthly	12	0.013	<0.001	Yes
Newborough	Monthly	12	0.006	<0.001	Yes
Noojee	Monthly	12	0.014	<0.001	Yes
Rawson	Monthly	12	0.002	<0.001	Yes
Rokeby & Buln Buln	Monthly	11*	0.006	<0.001	Yes
Rosedale	Monthly	12	0.002	<0.001	Yes
Sale/Wurruk	Monthly	12	0.002	<0.001	Yes
Seaspray	Monthly	12	0.067	0.002	Yes
Stratford	Monthly	12	0.004	<0.001	Yes
Thorpdale	Monthly	12	0.075	0.003	Yes
Toongabbie	Monthly	12	0.001	<0.001	Yes
Trafalgar	Monthly	12	0.007	<0.001	Yes
Traralgon	Monthly	12	0.001	<0.001	Yes
Traralgon South & Hazelwood North	Monthly	12	0.001	<0.001	Yes
Tyers & Glengarry	Monthly	12	0.002	<0.001	Yes
Warragul	Monthly	12	0.006	<0.001	Yes
Warragul South	Monthly	12	0.003	<0.001	Yes
Willow Grove	Monthly	12	0.012	0.001	Yes
Yallourn North	Monthly	12	0.004	<0.001	Yes
Yarragon	Monthly	12	0.013	<0.001	Yes
Yinnar	Monthly	12	0.001	<0.001	Yes

*Manganese analysis was not undertaken during August 2010 for Rokeby Buln Buln

3.7.3 Lead

Lead can be present in drinking water as a result of dissolution from natural sources or from household plumbing. Based on health considerations in the *ADWG*, concentrations of lead in drinking water should not exceed 0.01 mg/L. Gippsland Water sites achieved 100% compliance against lead guideline values.

Table 14: Lead results for all localities in 2009-10

Locality	Frequency of Sampling	No. of Samples	Max (mg/L)	Min (mg/L)	Complying (Yes/No)
Boisdale	Quarterly	4	0.001	<0.001	Yes
Boolarra	Quarterly	4	<0.001	<0.001	Yes
Briarolong	Quarterly	4	<0.001	<0.001	Yes
Churchill	Quarterly	4	<0.001	<0.001	Yes
Coongulla & Glenmaggie	Quarterly	4	<0.001	<0.001	Yes
Cowwarr	Quarterly	4	<0.001	<0.001	Yes
Drouin	Quarterly	4	<0.001	<0.001	Yes
Erica	Quarterly	4	<0.001	<0.001	Yes
Heyfield	Quarterly	4	<0.001	<0.001	Yes
Jumbuk	Quarterly	4	<0.001	<0.001	Yes
Maffra	Quarterly	4	<0.001	<0.001	Yes
Mirboo North	Quarterly	4	<0.001	<0.001	Yes
Moe	Quarterly	4	<0.001	<0.001	Yes
Morwell	Quarterly	4	<0.001	<0.001	Yes
Neerim South	Quarterly	4	<0.001	<0.001	Yes
Newborough	Quarterly	4	<0.001	<0.001	Yes
Noojee	Quarterly	4	<0.001	<0.001	Yes
Rawson	Quarterly	4	<0.001	<0.001	Yes
Rokeyby & Buln Buln	Quarterly	4	<0.001	<0.001	Yes
Rosedale	Quarterly	4	<0.001	<0.001	Yes
Sale/Wurruk	Quarterly	4	<0.001	<0.001	Yes
Seaspray	Quarterly	4	<0.001	<0.001	Yes
Stratford	Quarterly	4	0.001	<0.001	Yes
Thorpdale	Quarterly	4	<0.001	<0.001	Yes
Toongabbie	Quarterly	4	<0.001	<0.001	Yes
Trafalgar	Quarterly	4	<0.001	<0.001	Yes
Traralgon	Quarterly	4	<0.001	<0.001	Yes
Traralgon South & Hazelwood North	Quarterly	4	<0.001	<0.001	Yes
Tyers & Glengarry	Quarterly	4	<0.001	<0.001	Yes
Warragul	Quarterly	4	<0.001	<0.001	Yes
Warragul South	Quarterly	4	<0.001	<0.001	Yes
Willow Grove	Quarterly	4	0.001	<0.001	Yes
Yallourn North	Quarterly	4	<0.001	<0.001	Yes
Yarragon	Quarterly	4	<0.001	<0.001	Yes
Yinnar	Quarterly	4	<0.001	<0.001	Yes

3.7.4 Copper

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

Table 15: Copper results for all localities in 2009-10

Locality	Frequency of Sampling	No. of Samples	Max (mg/L)	Min (mg/L)	Complying (Yes/No)
Boisdale	Quarterly	4	0.008	0.002	Yes
Boolarra	Quarterly	4	0.013	0.006	Yes
Briagolong	Quarterly	4	0.006	0.004	Yes
Churchill	Quarterly	4	0.005	0.002	Yes
Coongulla & Glenmaggie	Quarterly	4	0.013	0.002	Yes
Cowwarr	Quarterly	4	0.008	0.002	Yes
Drouin	Quarterly	4	0.002	<0.001	Yes
Erica	Quarterly	4	0.002	<0.001	Yes
Heyfield	Quarterly	4	0.018	0.007	Yes
Jumbuk	Quarterly	4	0.023	0.002	Yes
Maffra	Quarterly	4	0.016	0.003	Yes
Mirboo North	Quarterly	4	0.018	0.004	Yes
Moe	Quarterly	4	0.011	0.005	Yes
Morwell	Quarterly	4	0.006	0.002	Yes
Neerim South	Quarterly	4	0.050	0.010	Yes
Newborough	Quarterly	4	0.004	0.002	Yes
Noojee	Quarterly	4	0.016	0.002	Yes
Rawson	Quarterly	4	0.004	<0.001	Yes
Rokeby & Buln Buln	Quarterly	3*	0.004	0.002	Yes
Rosedale	Quarterly	4	0.007	0.001	Yes
Sale-Wurruk	Quarterly	4	0.003	<0.001	Yes
Seaspray	Quarterly	4	0.027	0.005	Yes
Stratford	Quarterly	4	0.012	0.002	Yes
Thorpdale	Quarterly	4	0.018	0.008	Yes
Toongabbie	Quarterly	4	0.011	0.002	Yes
Trafalgar	Quarterly	4	0.004	0.002	Yes
Traralgon	Quarterly	4	0.012	0.001	Yes
Traralgon South & Hazelwood North	Quarterly	4	0.011	0.002	Yes
Tyers & Glengarry	Quarterly	4	0.007	0.004	Yes
Warragul	Quarterly	4	0.002	<0.001	Yes
Warragul South	Quarterly	4	0.012	<0.001	Yes
Willow Grove	Quarterly	4	0.018	0.005	Yes
Yallourn North	Quarterly	4	0.029	0.003	Yes
Yarragon	Quarterly	4	0.008	<0.001	Yes
Yinnar	Quarterly	4	0.004	0.002	Yes

*Copper analysis was not undertaken during August 2010 for Rokeby Buln Buln

3.8 AESTHETICS

3.8.1 pH results

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

Table 16: pH results for all localities in 2009-10

Locality	Frequency of Sampling	No. of Samples	Max (mg/L)	Min (mg/L)
Boisdale	Weekly	52	8.3	7.3
Boolarra	Weekly	52	7.8	7.0
Briagolong	Weekly	52	7.9	7.0
Churchill	Weekly	52	7.8	6.8
Coongulla & Glenmaggie	Weekly	52	9.3	7.0
Cowwarr	Weekly	52	8.4	7.2
Drouin	Weekly	52	7.9	7.0
Erica	Weekly	52	9.5	7.3
Heyfield	Weekly	52	8.2	7.0
Jumbuk	Weekly	52	8.4	7.1
Maffra	Weekly	52	7.7	7.0
Mirboo North	Weekly	52	7.9	6.7
Moe	Weekly	52	7.6	6.8
Morwell	Weekly	52	9.9	6.9
Neerim South	Weekly	52	7.6	6.6
Newborough	Weekly	52	7.8	6.8
Noojee	Weekly	52	8.6	6.3
Rawson	Weekly	52	9.2	7.2
Rokeby & Buln Buln	Weekly	52	9.0	6.5
Rosedale	Weekly	52	9.2	7.1
Sale/Wurruk	Weekly	52	8.7	7.0
Seaspray	Weekly	52	8.9	6.8
Stratford	Weekly	52	7.8	7.1
Thorpdale	Weekly	52	8.6	6.9
Toongabbie	Weekly	52	7.7	7.0
Trafalgar	Weekly	52	7.9	6.8
Traralgon	Weekly	52	7.7	6.8
Traralgon South & Hazelwood North	Weekly	52	8.5	6.9
Tyers & Glengarry	Weekly	52	8.7	6.9
Warragul	Weekly	52	8.5	6.8
Warragul South	Weekly	52	8.8	7.1
Willow Grove	Weekly	52	7.6	6.1
Yallourn North	Weekly	52	8.0	6.9
Yarragon	Weekly	52	9.1	7.1
Yinnar	Weekly	52	8.3	7.0

Some systems have experienced elevated pH results, as a result of long residence of water in the reticulation, cement-lined pipes in parts of the reticulation and reduced flushing programs due to the permanent water saving rules in place.

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

3.8.2 Iron results

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

Table 17: Iron results for all localities in 2009-10

Locality	Frequency of Sampling	No. of Samples	Max* (mg/L)	Min* (mg/L)	Complying (Yes/No)
Boisdale	Monthly	12	<0.01	<0.01	Yes
Boolarra	Monthly	12	0.1	<0.01	Yes
Briagolong	Monthly	12	<0.01	<0.01	Yes
Churchill	Monthly	12	<0.01	<0.01	Yes
Coongulla & Glenmaggie	Monthly	12	<0.01	<0.01	Yes
Cowwarr	Monthly	12	<0.01	<0.01	Yes
Drouin	Monthly	12	0.1	<0.01	Yes
Erica	Monthly	12	<0.01	<0.01	Yes
Heyfield	Monthly	12	0.1	<0.01	Yes
Jumbuk	Monthly	12	0.1	<0.01	Yes
Maffra	Monthly	12	<0.01	<0.01	Yes
Mirboo North	Monthly	12	0.1	<0.01	Yes
Moe	Monthly	12	0.1	<0.01	Yes
Morwell	Monthly	12	0.1	<0.01	Yes
Neerim South	Monthly	12	0.1	<0.01	Yes
Newborough	Monthly	12	<0.01	<0.01	Yes
Noojee	Monthly	12	0.1	<0.01	Yes
Rawson	Monthly	12	<0.01	<0.01	Yes
Rokeby & Buln Buln	Monthly	12	0.1	<0.01	Yes
Rosedale	Monthly	12	<0.01	<0.01	Yes
Sale/Wurruk	Monthly	12	<0.01	<0.01	Yes
Seaspray	Monthly	12	0.5	<0.01	No
Stratford	Monthly	12	<0.01	<0.01	Yes
Thorpdale	Monthly	12	0.2	<0.01	Yes
Toongabbie	Monthly	12	<0.01	<0.01	Yes
Trafalgar	Monthly	12	<0.01	<0.01	Yes
Traralgon	Monthly	12	<0.01	<0.01	Yes
Traralgon South & Hazelwood North	Monthly	12	<0.01	<0.01	Yes
Tyers & Glengarry	Monthly	12	<0.01	<0.01	Yes
Warragul	Monthly	12	<0.01	<0.01	Yes
Warragul South	Monthly	12	<0.01	<0.01	Yes
Willow Grove	Monthly	12	0.1	<0.01	Yes
Yallourn North	Monthly	12	<0.01	<0.01	Yes
Yarragon	Monthly	12	<0.01	<0.01	Yes
Yinnar	Monthly	12	0.2	<0.01	Yes

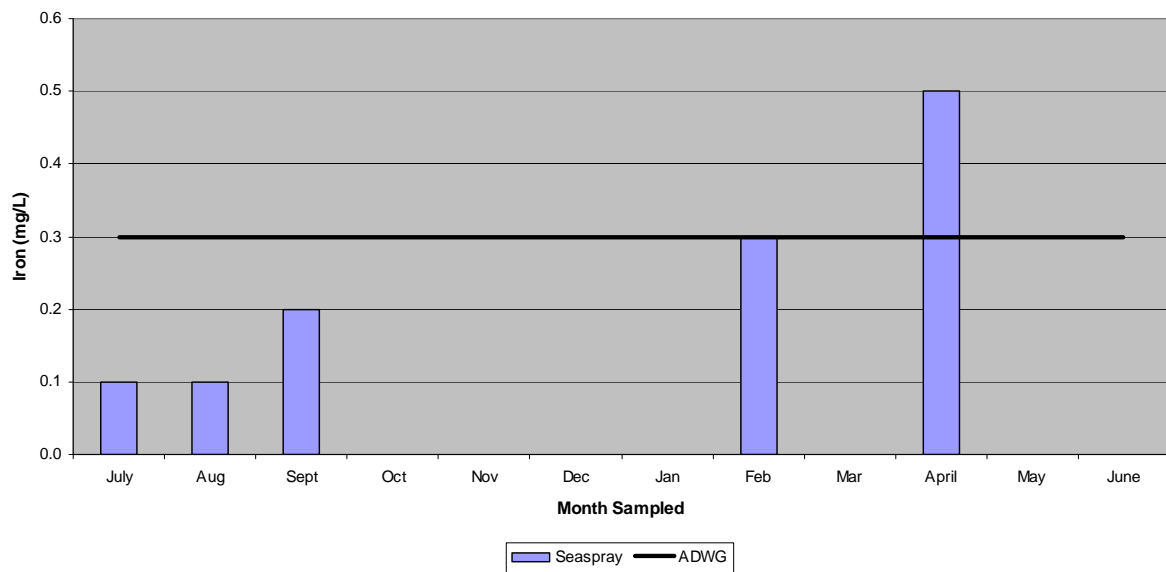
*Results of <0.01 mg/L are at the detection limit for this parameter.

3.8.2.1 Actions taken in relation to non-compliance

For the period of During the 2009-2010 reporting period, all localities were compliant with the exception of Seaspray. Seaspray recorded an elevated iron of 0.5 mg/L in April 2010 however this was not evidenced again the following months. It is believed that this result

(and the result of 0.3 mg/L recorded in February 2010) was a result of elevated levels in the raw water supply from Merriman's Creek.

Figure 5: Iron results for (mg/L) for 2009-10 for Seaspray



3.9 ANALYSIS OF RESULTS

3.9.1 Comparison to previous years

The water quality parameters required under the *SDWR* have been represented as trend data over the previous four financial years. This information allows for a comparison of data for the major towns.

An analysis by the percentage of water sampling localities where the drinking water complied with each of Schedule 2 of the *SDWR* parameters, over the past three reporting periods, is shown below. The table also shows an analysis of the percentage of customers supplied with drinking water that complied with the standards.

Table 18: Compliance by locality and population

Parameter	Percentage by Locality			Percentage by Population		
	2007-2008	2008-2009	2009-2010	2007-2008	2008-2009	2009-2010
Aluminium	91.43%	97.15%	97.14%	81.82%	99.75%	99.77%
Chloroacetic Acid	100%	100%	100%	100%	100%	100%
Dichloroacetic Acid	100%	100%	100%	100%	100%	100%
<i>E.coli</i>	100%	100%	100%	100%	100%	100%
Trichloroacetic Acid	100%	100%	100%	100%	100%	100%
Trihalomethanes	97.14%	100%	100%	99.81%	100%	100%
Turbidity	100%	100%	100%	100%	100%	100%

Aluminium percentages were less than 100% during the 2009-2010 reporting period. For further information refer to section 3.4 *Aluminium* of this report.

4 EMERGENCY/INCIDENT MANAGEMENT

4.1 EMERGENCY/INCIDENT MANAGEMENT

During the reporting year there was one reportable event that required notification to the Drinking Water Regulatory Unit of DoH, under section 22 of the *SDWA 2003*.

As a result of a chemical dosing system failure at the Traralgon Water Treatment plant, there was an incident of elevated turbidity within the Traralgon Water reticulation system, which resulted in a number of customer complaints.

DoH was notified of this incident under a *SDWA* Section 22 notification. The 2009-2010 Events and Incidents are summarised below.

Table 19: Summary of incidents and actions taken under Section 22

Locality	Date and duration of incident	Location of incident	Nature of the incident	Drinking water supplies affected	Actions taken in response to the incident	Was the community notified
Traralgon	21/10/2010 to 22/10/2010	Traralgon Water Reticulation	Number of Customer complaints due to dirty water	Traralgon Water reticulation	Department of Health (DoH) Notification under Section 22 <i>SDWA</i> . Extensive flushing undertaken throughout the reticulation network and additional monitoring of water quality parameters undertaken during and after the event. All reticulation monitoring subsequent was compliant.	No

During the reporting year there was one reportable event that required notification to the Drinking Water Regulatory Unit of DoH, under section 18 of the *SDWA 2003*.

There was an Aluminium exceedance of 0.61 mg/L experienced in the Rawson water reticulation system in May 2010. DoH was notified of this incident under a *SDWA* Section 18 notification. The 2009-2010 Events and Incidents are summarised below.

Table 20: Summary of incidents and actions taken under Section 18

Locality	Date and duration of incident	Location of incident	Nature of the incident	Drinking water supplies affected	Actions taken in response to the incident	Was the community notified
Rawson	13/5/2010	Rawson Township	Non Compliant Acid Soluble Aluminium result	Rawson	Department of Health (DoH) Notification under Section 18 <i>SDWA</i> . All follow up monitoring of the Rawson system was compliant. Extensive flushing undertaken throughout the reticulation network. Additional monitoring of Acid Soluble Aluminium was undertaken at the	No

Locality	Date and duration of incident	Location of incident	Nature of the incident	Drinking water supplies affected	Actions taken in response to the incident	Was the community notified
					<p>non compliant site and all other registered sample sites within the locality during and after the event.</p> <p>Chemical coagulant changed from PACL to Ferric chloride</p>	

4.1.1 Other Events Not Reportable

There were no other events to note for the reporting period of 2009-2010.

5 COMPLAINTS

5.1 WATER QUALITY COMPLAINTS

A summary of customer complaints received by Gippsland Water relating to the quality of drinking water supplied is reported below.

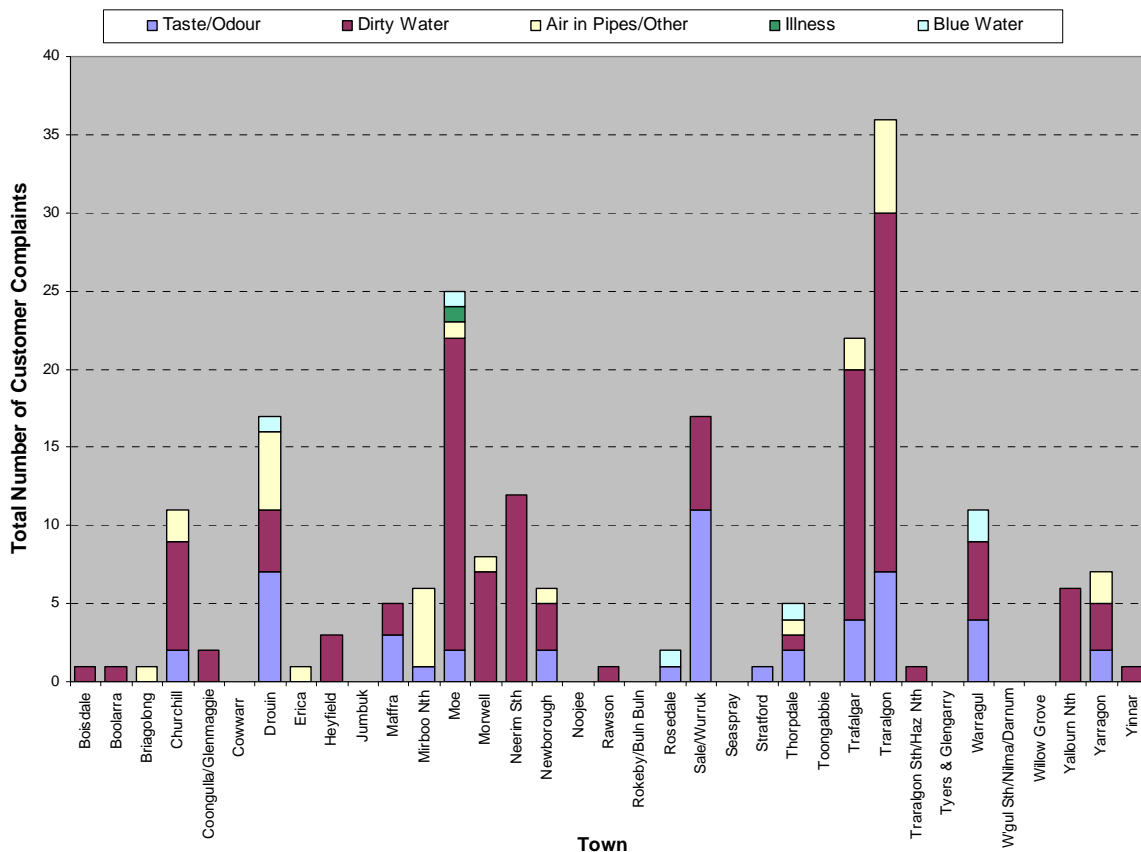
Gippsland Water records and reports on customer complaints relating to dirty water, taste and odour problems, illness/health concerns, blue water, and appearance of air-filled or “white” water received from the tap.

Table 21: Water quality complaints per 100 customers supplied

Type of Complaint	2009-2010		2008-2009	2007-2008	2006-2007
	No. of Complaints	Complaints per 100 customers	Complaints per 100 customers	Complaints per 100 customers	Complaints per 100 customers
Discoloured water	125	0.192	0.145	0.116	0.162
Taste / odour	49	0.075	0.084	0.113	0.091
Blue water	6	0.009	0.000	0.000	0.005
Air in water	28	0.043	0.035	0.042	0.039
Illness	1	0.002	0.007	0.019	0.025
Other	0	0.000	0.000	0.000	0.012
Total	209	0.321	0.270	0.290	0.334

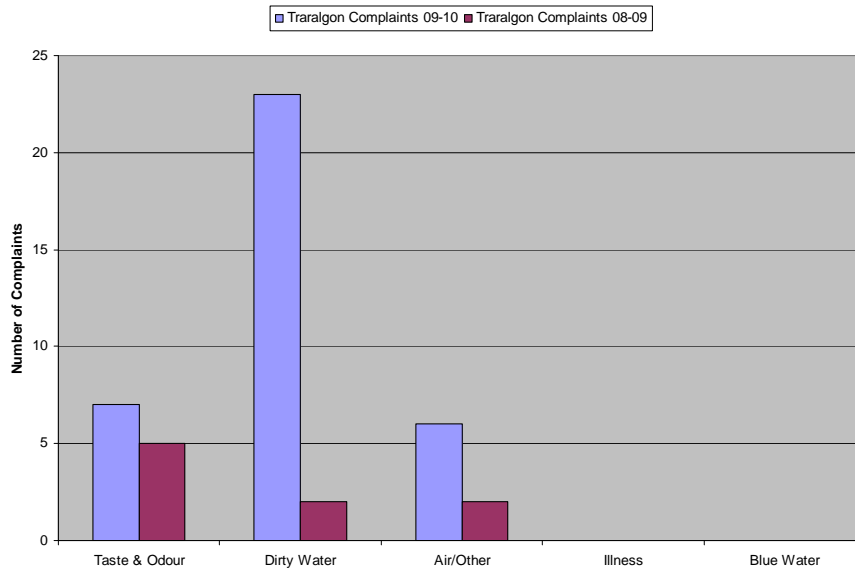
The total number of complaints received by Gippsland Water is presented below by type and locality.

Figure 6: Total Customer Complaints for 2009-10



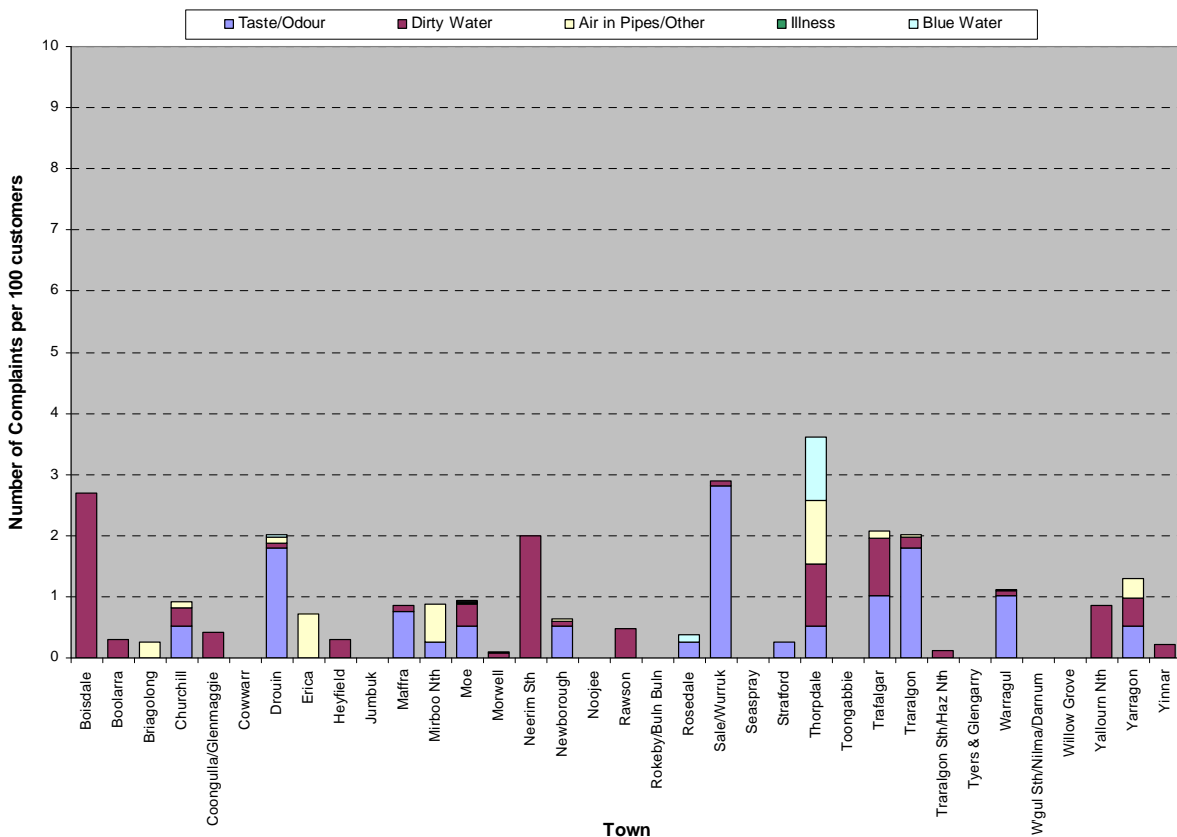
Of note is the slight increase in the number of dirty water complaints between 2008-09 to 2009-10. This is predominantly due to the Traralgon dirty water event experienced in October 2009 and as described earlier in section 4 of this report. During the event approximately 20 dirty water complaints were received. A comparison between 2008-2009 and 2009-2010 for the Traralgon locality is summarised in the figure below.

Figure 7: Customer Complaints per 100 customers for 2009-10



When calculating the number of complaints per 100 customers, there are no localities within Gippsland Water's supply district which exceed 10 complaints per 100 customers as represented in the figure below.

Figure 8: Customer Complaints per 100 customers for 2009-10



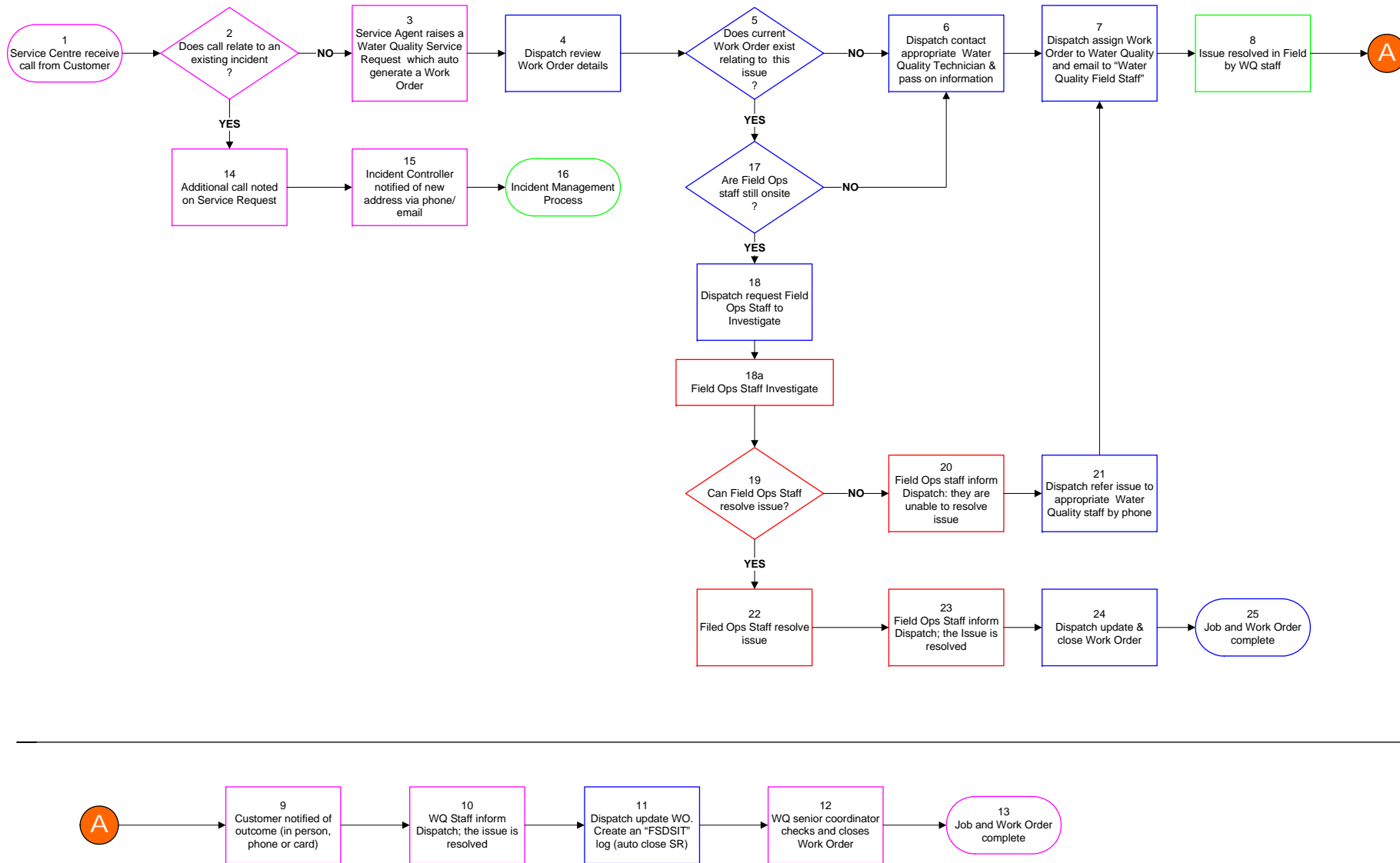
5.2 A SUMMARY OF THE CUSTOMER COMPLAINT PROCESS

Customer complaints are managed according to the following summary procedure:

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

This procedure is presented in more detail in the figure below.

Figure 9: Water Quality Complaints Resolution Procedure



6 RISK MANAGEMENT

Gippsland Water's Water Quality Risk Management Plan was audited in November 2009 for compliance with section 7(1) of the *SDWA*. The audit period was January 2009 to November 2009. The auditor found that Gippsland Water complied with the obligations of the Act, and seven opportunities for improvement as minor non-compliances were identified.

Gippsland Water actioned the seven opportunities for improvement during the 2009-2010 reporting period. By the end of the reporting period, all proposed outcomes actioned were completed as part of the Risk Management Review process.

Table 22: Risk Management Plan Opportunity for Improvements

Continuous Improvement Opportunity	Action Completed
Need to formalise who reviews the updated plans. This action can be simply done by recording the information in the appropriate column and the method of revision e.g. requested via email.	The template document was changed to include a review table and will be incorporated in the next risk management review.
<p>Quantification of catchment water quality risks.</p> <p>Improved mapping, and based on such mapping review of risks to groundwater recharge areas.</p> <p>Risk scoring system is currently aligned with the corporate process but could benefit from being expanded to be align with <i>ADWG</i> requirements.</p> <p>Suggest putting a clear statement in Table 1 showing that Toxins and Radiological hazards are clearly identified.</p>	These items have been included in the Drinking Water Catchment 5 year management plan 2009-2014 and will be revised in the next risk management review.
The lack of availability of monthly calibration records on the day of the audit, combined with some significant drift between calibrations, and the use of single rather than two point calibrations, were considered to constitute an opportunity for improvement since these issues applied to critical limit turbidity monitoring instruments.	<p>Process implemented with our mechanical and electrical contractor to complete calibrations in triplicate and centralise calibration records.</p> <p>Preparation of standardised calibration procedures has commenced and will continue to progress.</p>
For distribution diagrams, make sure that direction of water flow is more specific.	Completed
Position title on the intranet also needs to be updated to match that in the generic risk management plan.	Completed
Inspection kits were noted as being 'out of date' during the store inspection as well as rusting of Gibault connectors and parts not being available for a water main repair when required.	The inspection kit in question was for a waste water site and it and the Gibault have been disposed of.
Continue to resource and support the	These items will be incorporated in the

existing broad program of improving the reliability and quality of the telemetry systems.	Gippsland Water corporate plan and labour resource model.
Review the approach used to operationally monitor the integrity of the vermin-proofing and security barriers on tank roofs that are difficult to access, particularly for tanks with low disinfectant residuals, and develop a systematic approach that is considered to reduce water safety risks to acceptable levels.	Tank condition assessment process has been developed by Gippsland Water's planning and development group. This process will be used to assess and prioritise works based on risk.
Review the need for a specific procedure to manage water quality risks arising due to burst main repairs	Liaison with other water suppliers has commenced and a review of the new WSA03 standards will take place over time
Place signage on all chemical filling points	This item has been added to each WTP site improvement plans.
Remove the filter housing on the turbidity line at Moe WTP unless it is there for a good reason.	This action will be clarified as part of the annual site improvement review.
Align limiting numerical values stated in the RMP, SCADA and the alert limit tables. This particularly applied to critical limit if applying the definition literally, as per the <i>ADWG</i>	These items will be incorporated in the next risk management review.
Suggest that GW looks at requesting raw data from MW to allow results to be input into water quality database and analysed together with GW's data. Suggest that GW requests MW to provide it with exceedance results or incidents rather than all data. Suggest that GW feeds back its WTP intake limits to SRW.	These items will be discussed with MW. They currently provide data to GW in report format on a quarterly basis, associated with Tarago Reservoir.
Keep ensuring that operators and all staff are kept up to date with WQ training and the importance of maintaining WQ at all times. Suggest that Treatment Training/Field Operations Matrices are put on TRIM for ease of access. Ensure that emergency management training schedule is resumed	Gippsland Water is currently undertaking a review of operator competencies. Training is in the process of being entered into our performance management system. Emergency management training has been identified and will be implemented on an ongoing basis.

Figure 10: Risk Management Plan Audit Certificate for 2009

Schedule 1

Regulation 8

Safe Drinking Water Regulations 2005

RISK MANAGEMENT PLAN AUDIT CERTIFICATE

Certificate Number: 46

Audit period: 1 January 2009 to 16 December 2009

To: Lynley Keene
Gippsland Water
Hazelwood Road, PO Box 348
Traralgon Vic 3844

Australian Business Number (ABN): 75 830 750 413

We, Dr Annette Davison, Dr Nick O'Connor and Dr Daniel Deere, after conducting a risk management plan audit of the water supplied by Gippsland Water, are of the opinion that—

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

Signature of approved auditors: 
Dr Annette Davison


Dr Daniel Deere


Dr Nick O'Connor

Date: 16 December 2009

7 UNDERTAKINGS UNDER SECTION 30 OF THE ACT

Gippsland Water has no undertakings relevant to the 2009-10 reporting year.

8 EXEMPTIONS UNDER SECTION 20 OF THE ACT

Gippsland Water has no exemptions relevant to the 2009-10 reporting year.

9 VARIATION IN AESTHETIC STANDARDS

Gippsland Water has no variations in aesthetic standards sought under section 19 of the Act

10 REGULATED WATER

Gippsland Water does not manage any regulated water supplies.

11 GLOSSARY OF TERMS

<i>ADWG</i>	<i>Australian Drinking Water Guidelines</i> prepared by National Health and Medical Research Council.
DoH	Department of Health formerly known as DHS (Department of Human Services)
Detection limit	The lowest concentration of analytical parameter in the sample that can be detected by the process laboratory.
Drinking Water Supply systems	Towns supplied with water from a common water source (WTP, supply mains and reticulation pipework).
<i>E.coli</i>	Escherichia coli.
Locality	Under the SDWR, a specified area that is supplied with drinking water by a water supplier.
mg/L	Milligram per litre.
NTU	Nephelometric Turbidity Units.
Properties	A registered customer connection to the drinking water supply.
RMP	Risk Management Plan
SCADA system	Supervisory control and data acquisition system
SDWA	<i>Safe Drinking Water Act 2003</i> Act No.46/2003.
SDWR	Safe Drinking Water Regulations 2005 S.R No.88/2005.
Source Water	Raw water supply for town, prior to treatment.
THM	Trihalomethane.
WTP	Water Treatment Plant.
100mL	100 millilitres.
<	Less than.
>	Greater than.
≤	Less than or equal to.
≥	Greater than or equal to.
<1 MPN/100ml	Reporting for <i>E.coli</i> where the detection limit is less than 1 most probable number of <i>E.coli</i> organism per 100ml.

12 FURTHER INFORMATION

Customers and members of the public may access drinking water quality data and data for associated with water quality, by contacting Gippsland Water on the details 1800 066 401 or visiting www.gippswater.com.au.

13 REFERENCES

National Health and Medical Research Council. *Australian Drinking Water Guidelines 2004*.
Web address www.nhmrc.gov.au

Department of Health *2009-10 Annual report format - Drinking Water Regulation Guidance Note 12 June 2010*

SDWA 2003 Act No.46/2003

Safe Drinking Water Regulations 2005 S.R No.88/2005

Code of Practice for Fluoridation of Drinking Water Supplies Health (Fluoridation) Act 1973
Department of Human Services (March 2009)

APPENDIX 1: RAW WATER MONITORING

Locality	Source water	Nature of Other Raw Water Monitoring Programs		
		Weekly/Fortnightly	Monthly	Annual / Quarterly
Morwell Churchill Yinnar Jumbuk Traralgon South/Hazelwood North	Moondarra Res via Tyers River	Physicals <ul style="list-style-type: none"> Absorbance (254nm) Colour True (465nm) Dissolved Oxygen SUVA (245nm) Turbidity Electrical Conductivity @25°C pH 	Physicals <ul style="list-style-type: none"> Alkalinity Bicarbonate as CaCO₃ Alkalinity Total as CaCO₃ Dissolved Organic Carbon (DOC) Total Organic Carbon (TOC) Total Dissolved Solids (TDS) SUVA (245nm) Chlorophyll a 	Physicals* <ul style="list-style-type: none"> Total Dissolved Solids (TDS) Suspended Solids Chemical Inorganic <ul style="list-style-type: none"> Cyanide Dissolved Organic Carbon (DOC) Total Organic Carbon (TOC) Bromide Fluoride
Traralgon				
Tyers/Glengarry Rosedale Cowwarr Toongabbie				
Maffra	Macalister River	Microbiological <ul style="list-style-type: none"> Escherichia coli Total Coliforms Heterotrophic Plate Count 	Chemical Inorganic <ul style="list-style-type: none"> Ammonia as N Bromide Chloride Fluoride Nitrate as N Nitrite as N Organic Nitrogen as N Phosphorous, Reactive as P Phosphorous Total as N Sulphate Total Kjeldahl Nitrogen as N Total Nitrogen as N 	Metals* <ul style="list-style-type: none"> Aluminium Total Arsenic Total Selenium Cadmium Total Copper Total Lead Total Mercury Zinc Total
Stratford				
Boisdale				
Boolarra	Walkley Creek O'Gradys Creek (supplementary supply)			
Briagolong	Bore (Freestone Creek Aquifer)			
Warragul (including Nilma, Darnum, Drouin East)	Pederson Weir (Tarago River) Tarago Reservoir - (supplementary supply)			Pesticides, Herbicides and Chemical Organics** <ul style="list-style-type: none"> 2,4,5 T (Herbicide) 2,4,5 TP (Silvex) 2,4,6- T 2,4 D 2,4 DB Aldrin Ametryn Atrazine BHC (beta)
Warragul South				
Drouin				
Rokeby/Buln Buln				

Locality	Source water	Nature of Other Raw Water Monitoring Programs				
		Weekly/Fortnightly	Monthly	Annual / Quarterly		
Coongulla/ Glenmaggie	Macalister River		<p>Metals</p> <ul style="list-style-type: none"> • Aluminium Total • Arsenic Total • Calcium Total • Cadmium Total • Copper Total • Iron Total • Iron Soluble • Lead Total • Mercury • Potassium • Magnesium • Manganese Total • Manganese Soluble • Selenium • Zinc Total <p>Chlorophenols (Sale Bores Only)</p> <ul style="list-style-type: none"> • 2,3,4,5 Tetrechlorophenol • 2,3,5,6 Tetrachlorophenol • 2,4-Dichlorophenol • 2,6-Dichlorophenol • 2-Chlorophenol • 4-Chloro-3-Methylphenol • Total Phenols (Halogenated) • Pentachlorophenol • 2,4,5-Trichlorophenol • 2,4,6 Trichlorophenol 	<ul style="list-style-type: none"> • BHC (delta) • Bifenthrin • Chlordane (alpha) • Chlordane (gamma) • Chloropyrifos • Chlopyralid • Coumaphos • Cyfluthrin • Cypermethrin • DDD • DDE • DDT • Deltamethrin • Demoton-S • Diazinon • Dicamba • Dichlorprop • Dichlorvos • Deildrin • Dinoseb • Endosulfan (alpha) • Endosulfan (beta) • Endosulfan Sulphate • Eldrin • Eldrinaldehyde • Endrin Ketone • ENP • Fensulfothion • Fenthion • Fenvalerate • HCB • Heptachlor • Heptachlor Epoxide • Haxazinone 		
Rawson						
Erica	Trigger Creek					
Heyfield	Thomson River					
Mirboo North	Little Morwell River					
Moe	Tanjil River and Narracan Creek					
Newborough						
Yallourn North						
Trafalgar						
Yarragon						
Neerim South	Tarago River					
Noojee						
Sale/Wurruk	Bore (Boisdale Aquifer)					
Seaspray	Merrimans Creek					
Thorpdale	Easterbrook Creek					

Locality	Source water	Nature of Other Raw Water Monitoring Programs		
		Weekly/Fortnightly	Monthly	Annual / Quarterly
Willow Grove	Tanjil River			<ul style="list-style-type: none"> • Lindane • Malathion • MCPA • MCPB • Mecoprop • Methoxychlor • Monocrotophos • Parathion • Permethrin • Phorate • Picloram • Premeton • Prometryn • Propazine • Prophos • Ronnel (Fenchlorfos) • Simazine • Simetryn • Stirofos • Terbutylazine • Terbutryn • Tetraethyldithiopyrphos • Trichlorinate • Triclopyr • Tukuthion <p><u>Radiological</u></p> <ul style="list-style-type: none"> • Gross Alpha Activity • Gross Beta Activity <p><u>Microbiological</u></p> <ul style="list-style-type: none"> • Cryptosporidium spp • Giradia spp

*Reduced frequency of monitoring in some catchments based on risk profile

** Note all Pesticides, Herbicides and Chemical Organics results were within recommended ADWG limits

Not all parameters were measured at all localities or source waters.

Purpose of Monitoring - Risk Management within Catchment and Raw Water Supply Systems

Comprehensiveness (Frequency) – Weekly, Fortnightly, Monthly, Quarterly and Annual Monitoring or as Risks Identified