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Westernport Water Annual Drinking Water Quality Report 2014-15

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Benita Russell

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1. Introduction

1.1 Westernport Water - Overview

Westernport Region Water Corporation (WPW) provides water, wastewater and gas services in an economically, environmentally and socially sound manner to customers within its service area.

WPW services Phillip Island and an area of the mainland from The Gurdies to Archies Creek. Individual towns that are provided with drinking water include Bass, Grantville, Corinella, Kilcunda (including Dalyston), San Remo, Cape Woolamai, Rhyll, Cowes and Ventnor. A map of the service area is included in this report as figure 1-1

1.2 Aims and Objectives of this Report

Under section 26 of the *Safe Drinking Water Act 2003* (SDWA), WPW is required to provide the Department of Health and Human Services (DHHS) with an annual report on the quality of drinking water supplied to its customers.

The aim of this report is to provide all stakeholders, including the community, with water quality information compliant with Section 26 of the SDWA. The report covers issues relating to the quality of drinking water and the management of regulated water.

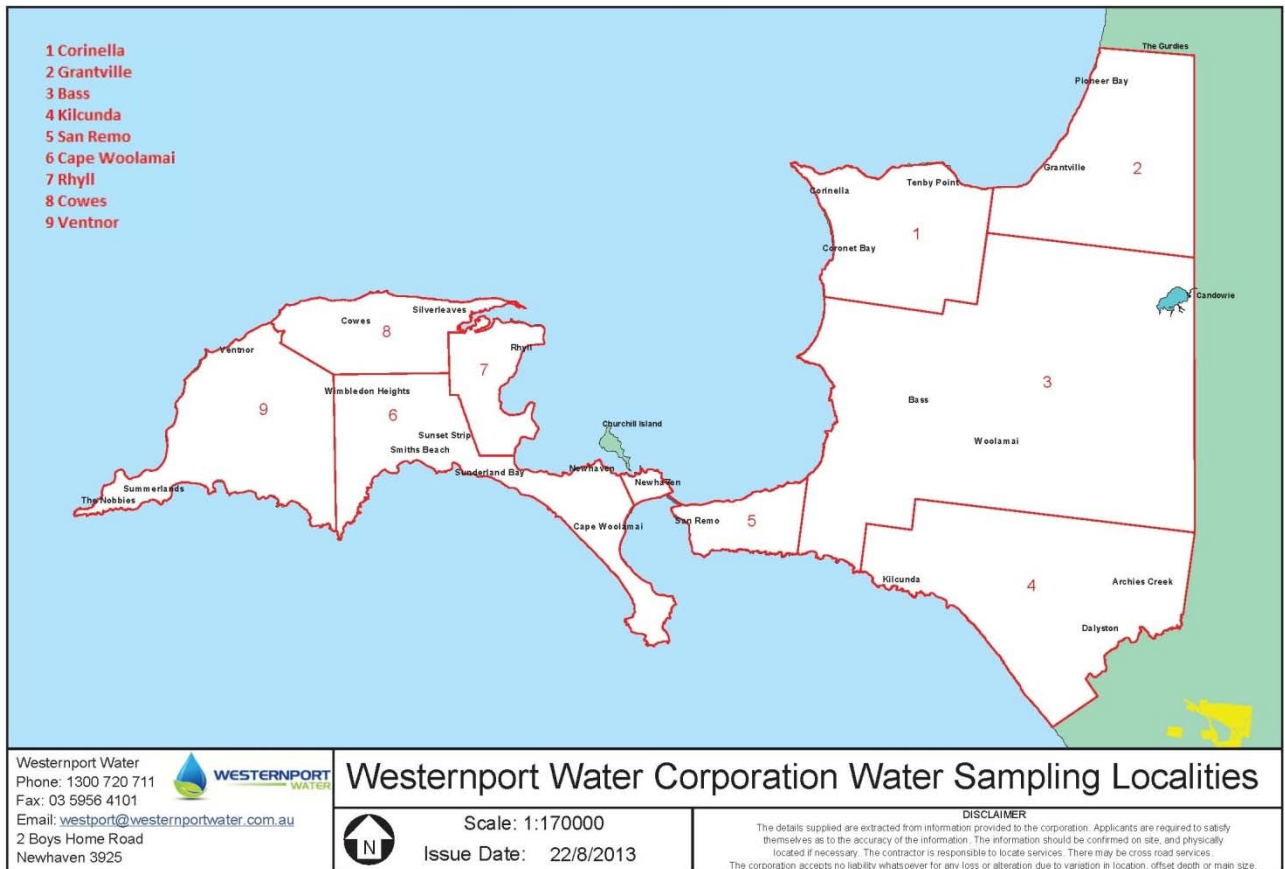
1.3 Westernport Water's Commitment to Drinking Water Quality

WPW is committed to a comprehensive risk assessment/ risk management approach to the safe provision of drinking water to its customers. This is achieved through the adoption of the framework for the management of drinking water quality outlined in the 2011 Australian Drinking Water Guidelines, (ADWG) and implemented through continual review/improvement of WPW Water Quality Risk Management Plan (WQRMP).

WPW's commitment to drinking water quality is highlighted in the foundation of its drinking water quality policy (endorsed by senior management and WPW's board). The policy demonstrates WPW's support and long-term commitment to the development and implementation of an effective system for drinking water quality management.



Figure 1-1 WPW region including water sampling localities





2. Characterisation of Westernport Water's Supply System

2.1 System Overview

WPW has a single water supply storage (Candowie Reservoir), which is an on-stream storage on Tennent Creek, located in the Bass Hills near Glen Forbes.

Water is treated at the Ian Bartlett Water Purification Plant (IBWPP) and then reticulated to communities through a single main supply line, with a number of smaller off takes servicing each of the residential communities within WPW area of supply. A plan of the distribution system is included in this report as figure 2-1.

Raw water quality in Candowie Reservoir is generally considered poor for human consumption due to intensive farming activities and runoff from cleared land within the catchment area. Before treatment, the raw water is high in nutrients and organics and quality is typical of water that is sourced from an unprotected catchment. Following treatment, the water complies with the ADWG and standards outlined in regulation 10 of the Safe Drinking Water Regulations, 2005 (SDWR).

Localities and population supplied in WPW region, water sources and the treatment process are outlined in table 3-1 under section 3.

2.2 Water Sources

Other sources of water are available to supplement Candowie Reservoir during low rainfall periods. These alternative sources are: groundwater from bores constructed in the Corinella Groundwater Management Unit (GMU) and surface water from the Bass River. Water from these alternative sources is pumped via a pipeline to Candowie Reservoir for centralised storage and treatment at the IBWPP. Table 3-1 lists where raw water is sourced and the treatment processes used to produce potable water to customers

2.2.1 Groundwater

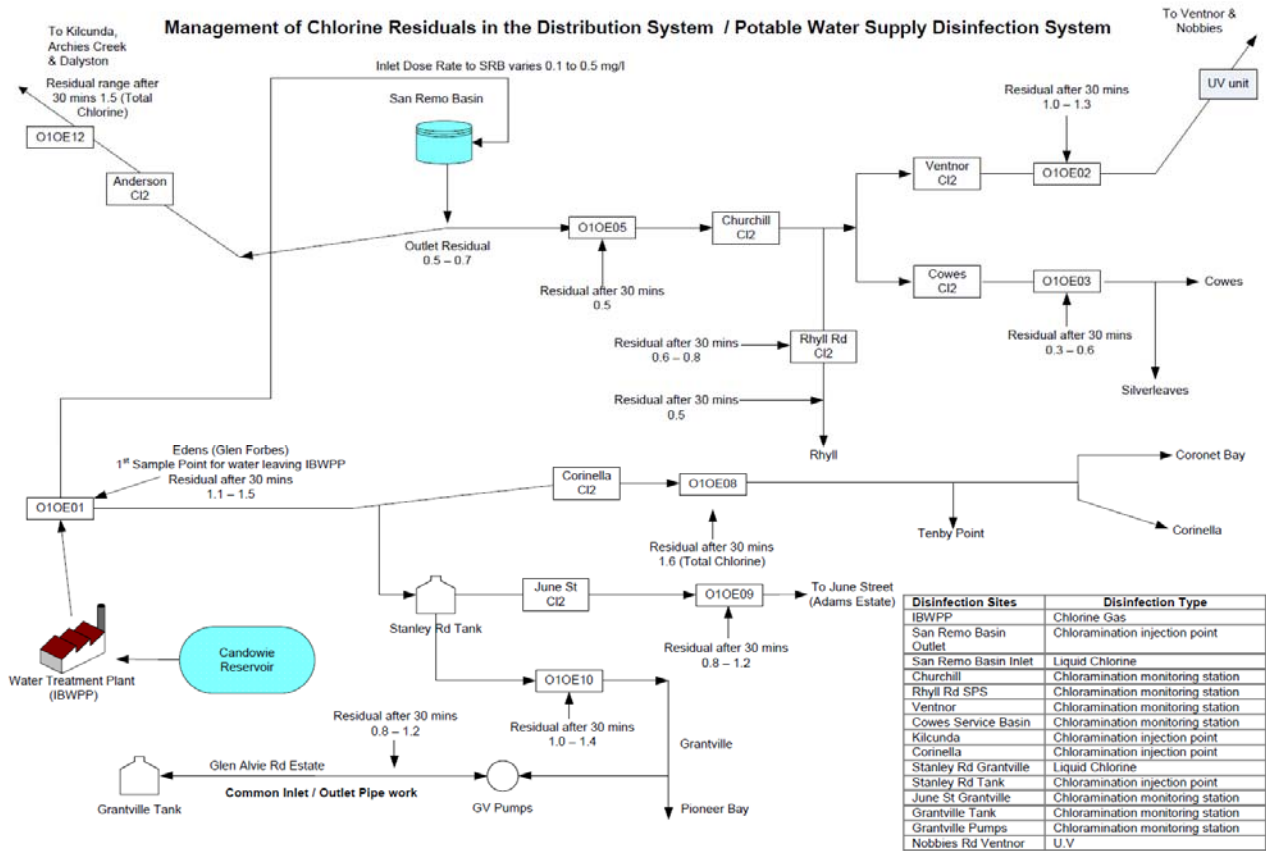
WPW have four bores licenced to take and use groundwater within the Corinella GMU. WPW has an entitlement of 490 ML/year. No groundwater was extracted during 2014-15 reporting period.

2.2.2 Bass River

Westernport Water's pump station, located along the banks of the Bass River, is used to transfer water into Candowie Reservoir. This is licenced under the Bass River Bulk Entitlement. No water was extracted from the river during the 2014-15 reporting period.



Figure 2-1 WPW distribution system





3. Water treatment and quality management systems

WPW operates a comprehensive water quality management system that complies with the SDWA and SDWR. The system is designed to ensure that customers receive drinking water of acceptable quality at all times, and that public health is protected.

3.1 Water treatment

Raw water from Candowie Reservoir is treated using a combination of oxidation, adsorption, flocculation, coagulation, dissolved air flotation, filtration, pH correction, fluoridation and disinfection at the IBWPP. The source water is predominantly high in nutrients and organics, and quality is typical of water that is sourced from an open, unprotected catchment. The following sections and Table 3-1 highlight the treatment process used at IBWPP.

3.1.1 Oxidation

Oxidation is used to remove iron and manganese from the water. Potassium permanganate is added to aid the removal process.

3.1.2 Adsorption

Adsorption is a process where a solid is used to remove a soluble substance from the water. WPW uses Powdered Activated Carbon (PAC) as the solid in water. Water is pumped through PAC and accumulates the soluble substances in the filter, subsequently removing the substance from the water. Adsorption is used to control potential taste and odour issues, and to remove algal toxins from the water.

3.1.3 Coagulation/flocculation

Coagulation is the process to remove fine suspended particles to aid the removal of colour and turbidity. The particles have a negative charge allowing them to remain suspended in water. Coagulation involves the addition of a coagulant (aluminium sulphate) to water with a positive charge that neutralises the negative charge enabling the fine particles to merge to create larger particles. Flocculation involves gentle mixing of the water which increases the particle size to visible suspended solids. The visible particles are called a 'floc'.

3.1.4 Dissolved air floatation and filtration (DAFF)

DAFF is a process of injecting air particles into water causing the floc to float to the surface. The floc is then removed to waste and the clear water is filtered through graded filter media. The purpose of DAFF is to produce water low in turbidity.

Over time filters become blocked with particles from the floc. To overcome the blockage, the filters are backwashed periodically to allow optimum production in the filters to produce consistently low turbidity results.

3.1.5 Fluoridation

Fluoride is added to treated water to protect against teeth decay and to promote general oral health. Fluoridated water is delivered to all nine localities in WPW distribution system.



3.1.6 pH correction

To ensure treated water is within the ADWG desired range, caustic soda is added to raise pH.

3.1.7 Disinfection

(a) Chlorine

The final stage of treatment at IBWPP is chlorine disinfection. Disinfection is required to prevent the spread of waterborne pathogens and to retain an appropriate chlorine residual throughout the system.

(b) Chloramination

WPW adopt the method of chloramination to address taste & odour issues and total chlorine residuals to the extremities of the distribution system. Chloramination is the process of adding chlorine to a small amount of ammonia. All localities (except Bass) receive chloraminated water.



3.2 Major changes to the arrangements for water supply

There were no major changes to the arrangements for water supply in 2014-15:

3.3 Issues

3.3.1 Candowie Reservoir

There were two issues in Candowie Reservoir in relation to blue-green algal blooms. This is due to the nature of the catchment (open and unprotected) which is intensively grazed.

- An algal bloom was identified around Christmas Day with potentially toxic species evident in the profile samples. The bloom reached its peak in early February. Toxicity testing indicated a small amount of microcystin toxin in the raw water but was below the guideline limit for public health. Sampling of the clear water storage proved that the treatment process was successful in removing algae and associated metabolites. There were no taste and odour complaints related to algal blooms throughout 2014-15.
- Sampling in the clear water storage in late February indicated the presence of algal cells of a non toxic species (*Anabaena Perturbata*). Breakthrough of algae through the filtration process was a concern of WPW due to widespread complaint of taste and odour (associated with the algal species) in 2013-14. Corrective actions included jar tests to confirm appropriate coagulant dosing, data trending of turbidity profiles of filters on SCADA, re-sampling of algae in the clear water storage and geosmin sampling in the filtered water. Re-sampling didn't show anymore breakthrough and geosmin levels in the treated water were below detection limits. No taste and odour complaints related to algae were received during the event.



4. Quality of drinking water for 2014-15

The SDWR requires evidence of compliance or non-compliance with the drinking water quality standards listed in Schedule 2. Regulation 10 refers to ensuring that water is free of other toxins, pathogens, substances or chemicals that may pose a risk to human health. Compliance with Schedule 2 drinking water quality standards and other parameters sampled are presented in tables throughout this section.

All parameters sampled by WPW throughout 2014-15 were compliant with Regulation 10 of the SDWR and health related guideline values in the ADWG. There was one exceedance of ADWG guideline values discussed in section 3.3.2.

4.1 Water quality improvements in 2014-15

Water quality improvements through scheduled works programs and projects include:

- All three filters at IBWPP were inspected, scraped and cleaned. Filter media was added in September, resulting in longer filter runtimes, lower turbidity and improved water quality;
- Supervisory control and data acquisition system (SCADA) was refined and improved;
- Annual air scouring continued as an annual routine program.
- Introduced a new routine taste and smell testing by non operational staff to detect changes in geosmin levels to compliment operational testing
- A recycle flow meter was installed to better understand recycle flow rates, providing optimum Dissolved Air Floatation Filtration rates
- pH correction (caustic dosing) tanks were upgraded from steel to poly with duty standby pumps installed for reliability
- The plant start up process was slowed to improve filter operation and decrease risk of pathogen breakthrough
- A monitoring station upgrade on incoming raw water to Candowie reservoir was completed. The upgrade including Integration with SCADA allows for early warning of potential poor water quality



4.2 *Escherichia coli*

The SDWR stipulate that at least 98 % of all samples of drinking water collected in any 12 months period contain no *Escherichia coli* (*E. coli*) per 100mL. The water quality with respect to *E. coli* was compliant with this standard as per table 4-2 below:

Table 4-2 *Escherichia coli*

Locality	Frequency	Samples	No of samples containing <i>E.coli</i>	Max result	% samples with no <i>E.coli</i>	Complying
Bass	Weekly	53	0	0	100	Yes
Cape Woolamai	Weekly	53	0	0	100	Yes
Corinella	Weekly	53	0	0	100	Yes
Cowes	Weekly	60*	0	0	100	Yes
Grantville	Weekly	53	0	0	100	Yes
Kilcunda	Weekly	53	0	0	100	Yes
Rhyll	Weekly	53	0	0	100	Yes
San Remo	Weekly	53	0	0	100	Yes
Ventnor	Weekly	52	0	0	100	Yes

*extra samples taken due to population increase over summer

The requirement of the relevant sampling frequency for *E.coli* is one sample per locality per week. Regulation 11(1) was not met by WPW in the week of the 02/02/2015 in Bass and 26/05/2015 in Ventnor

An *E.coli* sample scheduled for the 02/02/2015 was missed in the locality of Bass. This was due to a scheduling error by the laboratory. An *E.coli* sample scheduled for the 26/05/2015 was missed in the locality of Ventnor. This was due to a communication breakdown between sampler, laboratory and Water Quality Officer.

Corrective actions include:

- An updated communication hierarchy for WPW contacts was provided to the laboratory and that notification of a deviation from the sampling schedule requires the laboratory go to all available lengths to speak with an employee listed in the hierarchy not merely leaving a voicemail message.
- Sampler refresher training will be held in November 2015.

DHHS acknowledged the actions and did not invoke penalty.

An extra *E.coli* sample was taken in May within the Bass locality. This was due to a scheduling error by the laboratory. However WPW still included the result in the reporting.



4.3 Chlorine based disinfection by-product chemicals

4.3.1 Chloroacetic acid

The SDWR stipulate a maximum value of 0.15 mg/L for Chloroacetic acid. All localities were compliant with the water quality standard as per table 4-3.1 below:

Table 4-3.1 Chloroacetic acid

Locality	Frequency	Samples	Non-complying samples	Max result	Complying
Bass	Monthly	12	0	<0.005 ¹	Yes
Cape Woolamai	Monthly	12	0	<0.005	Yes
Corinella	Monthly	12	0	<0.005	Yes
Cowes	Monthly	14*	0	<0.005	Yes
Grantville	Monthly	12	0	<0.005	Yes
Kilcunda	Monthly	12	0	<0.005	Yes
Rhyll	Monthly	12	0	<0.005	Yes
San Remo	Monthly	12	0	<0.005	Yes
Ventnor	Monthly	12	0	<0.005	Yes

¹ Results with a less than qualifier (<) are below the laboratory detection limit

*extra samples taken due to population increase over summer



4.3.2 Dichloroacetic acid

The SDWR stipulate a maximum value of 0.10 mg/L for Dichloroacetic acid. All localities were compliant with the water quality standard as per table 4-3.2 below:

Table 4-3.2 Dichloroacetic acid

Locality	Frequency	Samples	Non-complying samples	Max result	Complying
Bass	Monthly	12	0	0.026	Yes
Cape Woolamai	Monthly	12	0	0.024	Yes
Corinella	Monthly	12	0	0.025	Yes
Cowes	Monthly	14*	0	0.025	Yes
Grantville	Monthly	12	0	0.025	Yes
Kilcunda	Monthly	12	0	0.020	Yes
Rhyll	Monthly	12	0	0.025	Yes
San Remo	Monthly	12	0	0.022	Yes
Ventnor	Monthly	12	0	0.016	Yes

* extra samples taken due to population increase over summer



4.3.3 Trichloroacetic acid

The SDWR stipulate a maximum value of 0.10 mg/L for Trichloroacetic acid. All localities were compliant with the water quality standard as per table 4-3.3 below:

Table 4-3.3 Trichloroacetic acid

Locality	Frequency	Samples	Non-complying samples	Max result	Complying
Bass	Monthly	12	0	0.015	Yes
Cape Woolamai	Monthly	12	0	0.019	Yes
Corinella	Monthly	12	0	0.018	Yes
Cowes	Monthly	14*	0	0.019	Yes
Grantville	Monthly	12	0	0.017	Yes
Kilcunda	Monthly	12	0	0.014	Yes
Rhyll	Monthly	12	0	0.019	Yes
San Remo	Monthly	12	0	0.019	Yes
Ventnor	Monthly	12	0	0.012	Yes

*extra samples taken due to population increase over summer



4.3.4 Trihalomethanes

The SDWR stipulate a maximum value of 0.25 mg/L for Trihalomethanes (THM). All localities were compliant with the water quality standard as per table 4-3.4 below:

Table 4-3.4 – THM

Locality	Frequency	Samples	Non-complying samples	Max result	Complying
Bass	Monthly	12	0	0.140	Yes
Cape Woolamai	Monthly	12	0	0.160	Yes
Corinella	Monthly	12	0	0.140	Yes
Cowes	Monthly	14*	0	0.170	Yes
Grantville	Monthly	12	0	0.130	Yes
Kilcunda	Monthly	12	0	0.150	Yes
Rhyll	Monthly	12	0	0.160	Yes
San Remo	Monthly	12	0	0.160	Yes
Ventnor	Monthly	12	0	0.160	Yes

*extra samples taken due to population increase over summer



4.4 Ozone-based disinfection by-product chemicals

WPW did not sample bromate and formaldehyde throughout 2014/15. The risk arising from the chemicals found in the water supply is assessed as low as WPW do not use ozone based disinfection treatment at IBWPP.

4.5 Aluminium

The SDWR stipulate a maximum value of 0.2 mg/L for Aluminium. All localities were compliant with the water quality standard as per table 4-5 below:

Table 4-5 Aluminium

Locality	Frequency	Samples	Non-complying samples	Max result	Complying
Bass	Monthly	12	0	0.04	Yes
Cape Woolamai	Monthly	12	0	0.06	Yes
Corinella	Monthly	12	0	0.02	Yes
Cowes	Monthly	14*	0	0.07	Yes
Grantville	Monthly	12	0	0.02	Yes
Kilcunda	Monthly	12	0	0.03	Yes
Rhyll	Monthly	12	0	0.06	Yes
San Remo	Monthly	12	0	0.05	Yes
Ventnor	Monthly	12	0	0.02	Yes

*extra samples taken due to population increase over summer



4.6 Turbidity

The SDWR stipulate that the 95% upper confidence limit (UCL) of the mean of drinking water samples collected in the preceding 12 months must be ≤ 5.0 NTU. All localities were compliant with the water quality standard as per table 4-6 below:

Table 4-6 Turbidity

Locality	Frequency	Samples	Max result	95% UCL of mean	Complying
Bass	Weekly	54	1.7	0.3	Yes
Cape Woolamai	Weekly	53	0.4	0.1	Yes
Corinella	Weekly	53	5.4	0.6	Yes
Cowes	Weekly	58*	0.6	0.2	Yes
Grantville	Weekly	53	1.0	0.2	Yes
Kilcunda	Weekly	53	1.5	0.3	Yes
Rhyll	Weekly	53	0.4	0.2	Yes
San Remo	Weekly	53	0.8	0.2	Yes
Ventnor	Weekly	52	1.6	0.2	Yes

*extra samples taken due to population increase over summer

The requirement of the relevant sampling frequency for Turbidity is one sample per locality per week. Regulation 11(1) was not met by WPW in the week of 26/05/2015 in Ventnor. The missed sample was due to a communication breakdown between sampler, laboratory and Water Quality Officer. Corrective actions ensued with DHHS acknowledging the remedial actions and not invoking penalty.

There were no issues with the distribution system during the missed sample and long term compliance with a UCL of 0.2 continues to be achieved in Ventnor.

An extra turbidity sample was taken in May within the Bass locality. This was due to a scheduling error by the laboratory. However WPW still included the result in the reporting.



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

WPW regularly tests for metals in the drinking water they supply to customers. The following sections detail the results for the 2014/15 reporting period

4.8 Fluoride

The health-based guideline value for fluoride in the ADWG is 1.5mg/L. In conjunction with this value the *Health (Fluoridation) Act 1973* states that the annual average for fluoride in drinking water must not exceed 1 mg/L. Fluoride concentrations at all locations were compliant during the reporting period as presented in table 4-7 below:

Table 4-7 Fluoride

Locality	Frequency	Samples	Non-complying samples	Max	Complying
Bass	Monthly	14	0	0.84	Yes
Cape Woolamai	Monthly	13	0	0.78	Yes
Corinella	Monthly	13	0	0.8	Yes
Cowes	Monthly	14	0	0.77	Yes
Grantville	Monthly	14	0	0.77	Yes
Kilcunda	Monthly	13	0	0.79	Yes
Rhyll	Monthly	13	0	0.74	Yes
San Remo	Monthly	13	0	0.78	Yes
Ventnor	Monthly	11	0	0.74	Yes

4.8.1 Antimony

Based on health considerations, the ADWG guideline value for Antimony is 0.003 mg/L. All localities were compliant with the ADWG as per table 4-8.1 below:

Table 4-8.1 Antimony

Locality	Frequency	Samples	Non-complying samples	Max result ¹	Complying
Bass	Annually	1	0	<0.001	Yes
Cape Woolamai	Annually	1	0	<0.001	Yes
Corinella	Annually	1	0	<0.001	Yes



Cowes	Annually	1	0	<0.001	Yes
Grantville	Annually	1	0	<0.001	Yes
Kilcunda	Annually	1	0	<0.001	Yes
Rhyll	Annually	1	0	<0.001	Yes
San Remo	Annually	1	0	<0.001	Yes
Ventnor	Annually	1	0	<0.001	Yes

¹ Results with a less than qualifier (<) are below the laboratory detection limit



4.8.2 Cadmium

Based on health considerations, the ADWG guideline value for Cadmium is 0.002 mg/L. All localities were compliant with the ADWG as per table 4-8.2 below:

Table 4-8.2 Cadmium

Locality	Frequency	Samples	Non-complying samples	Max result ¹	Complying
Bass	Annually	1	0	<0.0002	Yes
Cape Woolamai	Annually	1	0	<0.0002	Yes
Corinella	Annually	1	0	<0.0002	Yes
Cowes	Annually	1	0	<0.0002	Yes
Grantville	Annually	1	0	<0.0002	Yes
Kilcunda	Annually	1	0	<0.0002	Yes
Rhyll	Annually	1	0	<0.0002	Yes
San Remo	Annually	1	0	<0.0002	Yes
Ventnor	Annually	1	0	<0.0002	Yes

¹ Results with a less than qualifier (<) are below the laboratory detection limit



4.8.3 Copper

Based on health considerations, the ADWG health-based guideline value is set at 1 mg/L, and at 2 mg/L for the aesthetic-based guideline. The copper concentration complied with both guideline values at all localities during the reporting period as per table 4-8.3 below:

Table 4-8.3 Copper

Locality	Frequency	Samples	Non-complying samples	Max result	Complying
Bass	Monthly	12	0	0.24	Yes
Cape Woolamai	Monthly	12	0	0.022	Yes
Corinella	Monthly	12	0	0.078	Yes
Cowes	Monthly	14*	0	0.066	Yes
Grantville	Monthly	12	0	0.059	Yes
Kilcunda	Monthly	12	0	0.052	Yes
Rhyll	Monthly	12	0	0.07	Yes
San Remo	Monthly	12	0	0.059	Yes
Ventnor	Monthly	12	0	0.3	Yes

* extra samples taken due to population increase over summer



4.8.4 Lead

Based on health considerations, the ADWG guideline value is set at 0.01 mg/L. Lead concentrations complied with this guideline value at all localities during the reporting period as per table 4-8.4 below:

Table 4-8.4 Lead

Locality	Frequency	Samples	Non-complying samples	Max result	Complying
Bass	Monthly	12	0	0.001	Yes
Cape Woolamai	Monthly	12	0	0.001	Yes
Corinella	Monthly	12	0	0.002	Yes
Cowes	Monthly	14*	0	0.001	Yes
Grantville	Monthly	12	0	0.001	Yes
Kilcunda	Monthly	12	0	0.002	Yes
Rhyll	Monthly	12	0	0.002	Yes
San Remo	Monthly	12	0	0.001	Yes
Ventnor	Monthly	12	0	0.001	Yes

* extra samples taken due to population increase over summer



4.8.5 Nickel

Based on health considerations, the ADWG guideline value is set at 0.02 mg/L. The nickel concentration complied with this guideline value at all localities during the reporting period as per table 4-8.5 below:

Table 4-8.5 Nickel

Locality	Frequency	Samples	Non-complying samples	Max result ¹	Complying
Bass	Annually	1	0	<0.001	Yes
Cape Woolamai	Annually	1	0	<0.001	Yes
Corinella	Annually	1	0	0.002	Yes
Cowes	Annually	1	0	<0.001	Yes
Grantville	Annually	1	0	<0.001	Yes
Kilcunda	Annually	1	0	<0.001	Yes
Rhyll	Annually	1	0	<0.001	Yes
San Remo	Annually	1	0	<0.001	Yes
Ventnor	Annually	1	0	<0.001	Yes

¹ Results with a less than qualifier (<) are below the laboratory detection limit



4.8.6 Zinc

Based on aesthetic considerations, the ADWG guideline value is set at 3 mg/L. The zinc concentration complied with this guideline value at all localities during the reporting period as per table 4-8.6 below:

Table 4-8.6 Zinc

Locality	Frequency	Samples	Non-complying samples	Max result	Complying
Bass	Quarterly	4	0	0.022	Yes
Cape Woolamai	Quarterly	4	0	0.013	Yes
Corinella	Quarterly	4	0	0.087	Yes
Cowes	Quarterly	4	0	0.01	Yes
Grantville	Quarterly	4	0	0.01	Yes
Kilcunda	Quarterly	4	0	0.019	Yes
Rhyll	Quarterly	4	0	0.01	Yes
San Remo	Quarterly	4	0	0.011	Yes
Ventnor	Quarterly	4	0	0.026	Yes



4.8.7 Manganese

The ADWG health-based value is set at 0.5 mg/L, and at 0.1 mg/L for aesthetic-based value. The manganese results met both ADWG values (for aesthetics and health) in all sampling localities during the reporting period as per table 4-8.7 below:

All manganese samples are taken from water entering points not customer taps. The manganese samples at the Bass locality are collected from water entering points outside of the locality as Bass does not have a 30 minute contact point within the distribution system.

Table 4-8.7 Manganese

Locality	Frequency	Samples	Non-complying samples	Max result ¹	Complying
Bass	Monthly	12	0	0.030	Yes
Cape Woolamai	Monthly	12	0	0.020	Yes
Corinella	Monthly	12	0	<0.010	Yes
Cowes	Monthly	12	0	<0.010	Yes
Grantville	Monthly	12	0	<0.010	Yes
Kilcunda	Monthly	12	0	0.020	Yes
Rhyll	Monthly	12	0	0.030	Yes
San Remo	Monthly	12	0	0.030	Yes
Ventnor	Monthly	12	0	<0.010	Yes

¹ Results with a less than qualifier (<) are below the laboratory detection limit



4.8.8 All other chemicals or monitored parameters

WPW also sample from water entering points and service basins that deliver water into each locality for health related aspects of drinking water. There are a number of sites that sample different parameters at varying frequencies. These are highlighted, along with compliance with ADWG, in table 4-8.8 below:

4-8.8 Other health related parameters sampled at water entering points and service basins

Parameter	Frequency	Samples	ADWG value (mg/L)	Complying samples
Chromium (as Cr(VI))	Quarterly	36	<0.05	All results from water entering points and service basins were compliant with ADWG health related values
Cyanide	Annually	10	<0.08	
Nitrate	Monthly	103	<50	
Nitrite	Monthly	103	<3	
Sulphate	Annually	4	<500	



4.8.9 Raw water monitoring

As described in section 2.1, the raw water quality in Candowie Reservoir is impacted by intensive farming throughout the open catchment. For this reason WPW monitors a number of parameters in the raw water storage to detect changes in water quality, allowing for proactive management of water treatment processes. Parameters, sampling frequency and location are tabulated below:

Table 4-8.9 Raw water monitoring

Location	Frequency	Parameter
Raw water offtake	Daily	Fluoride, turbidity, pH, iron and manganese
	Weekly	Colilert (200) <i>E. coli</i> , coliforms, standard plate count, dissolved organic carbon and electrical conductivity
	Fortnightly (or increased as required)	Methyl Iso-Borneol (MIB) and geosmin
	Monthly	Alkalinity
	Quarterly	Metals (arsenic, barium, boron, mercury, molybdenum, selenium), herbicides and pesticides, cryptosporidium and giardia
	Annually	Metals (silver iodide, tin and beryllium) and radiation
Profile sampling at surface, 1, 3, 7 and 9 meter depths	Fortnightly (or increased as required)	Blue green algae, nitrate, nitrite, ammonia, phosphorus, silica, iron and manganese
Surface and every meter interval (up to 10m)	Fortnightly	Temperature, dissolved oxygen, pH and electrical conductivity @25°C



4.9 Aesthetics

The SDWR refers to aesthetic water quality and states the annual report must include the steps taken by a water supplier to manage aesthetic characteristics of drinking water supplied. Along with verification monitoring of colour and pH, WPW undertake jar testing for taste and odour characteristics. The jar tests are then taste and smell tested by a group of WPW staff. This allows the PAC dose rate to be effective in removing MIB and Geosmin (taste and odour compounds found in the raw water). Other steps taken to manage aesthetics are reactive maintenance programs: annual air scouring of the distribution pipe network and a quarterly flushing program. The ADWG set the aesthetic based guideline values for true colour, iron and pH. Those parameters sampled throughout the distribution system, indicating compliance, are presented in tables below.

4.9.1 True colour

Sampling for true colour was undertaken at water entering points into the distribution system - not at customer taps. The table below presents the data from a locality perspective rather than for individual water sampling points. The ADWG value is set at 15 HU. True colour results met ADWG in all sampling localities during the reporting period as per table 4-9.1 below:

Table 4-9.1 True colour

Locality	Frequency	Samples	Non-complying samples	Max result	Complying
Bass	Monthly	12	0	2	Yes
Cape Woolamai	Monthly	12	0	2	Yes
Corinella	Monthly	12	0	2	Yes
Cowes	Monthly	12	0	2	Yes
Grantville	Monthly	12	0	4	Yes
Kilcunda	Monthly	12	0	4	Yes
Rhyll	Monthly	12	0	4	Yes
San Remo	Monthly	12	0	4	Yes
Ventnor	Monthly	12	0	4	Yes



4.9.2 Iron

Based on aesthetic considerations, the ADWG guideline value is set at 0.3 mg/L. All localities were compliant with the ADWG in the 2014-15 reporting period as highlighted in table 4-9.2 below

Table 4-9.2 Iron

Locality	Frequency	Samples	Non-complying samples	Max result	Complying
Bass	Fortnightly	12	0	0.04	Yes
Cape Woolamai	Fortnightly	12	0	0.06	Yes
Corinella	Fortnightly	12	0	0.17	Yes
Cowes	Fortnightly	14*	0	0.06	Yes
Grantville	Fortnightly	12	0	0.05	Yes
Kilcunda	Fortnightly	12	0	0.03	Yes
Rhyll	Fortnightly	12	0	0.08	Yes
San Remo	Fortnightly	12	0	0.04	Yes
Ventnor	Fortnightly	12	0	0.04	Yes

*extra samples taken due to population increase over summer



4.9.3 pH

The ADWG aesthetic value for pH is between 6.5 and 8.5. There was one non-compliant result for pH throughout 2014-15. One pH exceedance occurred in September 2014 in the Cowes locality. Exceedance is detailed in section 3.3.2.

Table 4-9.3 pH

Locality	Frequency	Samples	Min	Max	Non-complying samples	Complying
Bass	Fortnightly	27	6.8	7.5	0	Yes
Cape Woolamai	Fortnightly	26	7	7.6	0	No
Corinella	Fortnightly	26	6.9	7.7	0	Yes
Cowes	Fortnightly	28	7.1	8.6	1	No
Grantville	Fortnightly	26	7	7.4	0	Yes
Kilcunda	Fortnightly	26	7.1	7.7	0	Yes
Rhyll	Fortnightly	26	7.1	7.6	0	Yes
San Remo	Fortnightly	26	7	7.4	0	Yes
Ventnor	Fortnightly	25	7.2	8.3	0	Yes

On the 16/09/2014 in the locality of Cowes, pH exceedance of 8.6 was recorded.. The area was flushed and follow up samples showed pH was within the desired range of 6.5-8.5 quoted in the ADWG. At no stage was public health at risk from the exceedance.

4.10 Analysis of results

The SDWR Schedule 2 results have been analysed and expressed in the table below as a comparison of percentage of localities and percentage of customers where drinking water supplied was complying with schedule 2. The table plots the current and last two reporting periods.

WPW have reached 100% compliance with relevant standard in Schedule 2 for the current and two previous reporting periods

Table 4-10 Percentage compliance with Schedule 2 of the SDWR

Parameter	Percentage by locality			Percentage by customer		
	2012/13	2013/14	2014/15	2012/13	2013/14	2014/15
<i>Escherichia coli</i>	100	100	100	100	100	100
Chloroacetic acid	100	100	100	100	100	100
Dichloroacetic acid	100	100	100	100	100	100
Trichloroacetic acid	100	100	100	100	100	100
Trihalomethanes	100	100	100	100	100	100
Aluminium	100	100	100	100	100	100
Turbidity	100	100	100	100	100	100



5. Emergency and incident management

5.1 Reportable events under sections 22 and 18 of the SDWA

There were no reportable events under section 22 or 18 of the SDWA

5.2 Other incidents issues or events not reportable under sections 22 of SDWA

WPW had a blue green algal issue in Candowie Reservoir and a pH exceedance in the distribution system. For further information on these issues please refer to section 3.3.1 and 4.9.3.



6. Complaints relating to water quality

6.1 Summary of complaints

The number of customer complaints to WPW regarding drinking water totalled 28 for 2014/15. This was a decrease of 73 from 2013/14. Table 6-1 highlights the type of customer complaints

Table 6-1 Complaints relating to water quality

Type of complaint	No. of complaints	No of complaints per 100 customers supplied [^]
Discoloured water	18	0.09
Taste/odour	8	0.04
Blue water	0	0.00
Air in water	0	0.00
Other**	2	0.01

[^]for the purposes of this section, the term 'customer' has the same meaning as that used by the Essential Services Commission, that is, a customer = a connection

**the category 'other' includes any calls related to alleged illness

64% of complaints were for discoloured colour, 29% taste/odour and 7% for other. Complaints were related to maintenance activities where water became discoloured or taste/odour complaints due to chlorine levels. No media releases were required and each complaint involved reactive maintenance (flushing, re-samples) where the customer was content with the outcome.

6.2 Response to complaints

WPW is committed to providing its customers with ongoing quality water and services. Our customer service division manages customer complaints and each complaint is lodged using an entry form in WPW customer request management (CRM) system. Depending on the nature of the complaint, the details are electronically forwarded to the Water Quality Officer for water quality complaints; the Maintenance group for bursts and leaks; and the Communications Manager or Customer Service Manager for all other complaints.

After a complaint is lodged, depending on the nature of the complaint, one or a combination of the following actions may be performed:

- Proceed with remedial action such as water sample testing, mains flushing and sometimes water sampling testing after flushing;
- Contact the customer who lodged the complaint to determine the seriousness of the issue;
- Discuss with the complainant the possible causes of the poor water quality i.e. temporary changes to normal operation or high manganese and/or iron in raw water;
- Explain to the complainant the multiple barriers and rigorous sampling and testing regime employed to provide a safe and aesthetically acceptable water; and
- Give feedback to customer in terms of water quality information and links to further information regarding regulatory obligations.



7. Findings of the most recent risk-management plan audit

There was no regulatory audit undertaken in 2014-15.

8. Undertakings under section 30 of the Act

WPW currently has no section 30 undertakings.

9. Exemption under section 20 of the Act

WPW has no exemptions under section 20



10. Glossary of Terms

WPW must make this document and all water quality monitoring information available to public disclosure within 7 days of the request. For information pertaining to water quality in WPW's region please contact the Water Quality Officer via:

Email: jweir@westernportwater.com.au,

Website www.westernportwater.com.au/Services/Waterquality/

Phone (03) 5956 4189.

Term	Meaning
ADWG	<i>Australian Drinking Water Guidelines, 2011</i> prepared by the National Health and Medical Research Council
CRM	Customer Request Management system
DAFF	Dissolved Air Flootation and Filtration
DHHS	Department of Health and Human Services
<i>E.coli</i>	<i>Escherichia coli</i>
GMU	Groundwater Management Unit
IBWPP	Ian Bartlett Water Purification Plant
mg/L	Milligram per litre
NTU	Nephelometric Turbidity Units
PAC	Powdered Activated Carbon
SCADA	Supervisory Control and Data Acquisition
SDWA	<i>Safe Drinking Water Act, 2003 (Victoria)</i>
SDWR	<i>Safe Drinking Water Regulations, 2005</i>
THM	Trihalomethanes
UCL	Upper Confidence Limit
WPW	Westernport Water
WTPO	Water Treatment Plant Operator
WQO	Water Quality Officer
WQRMP	Water Quality Risk Management Plan