South East Water

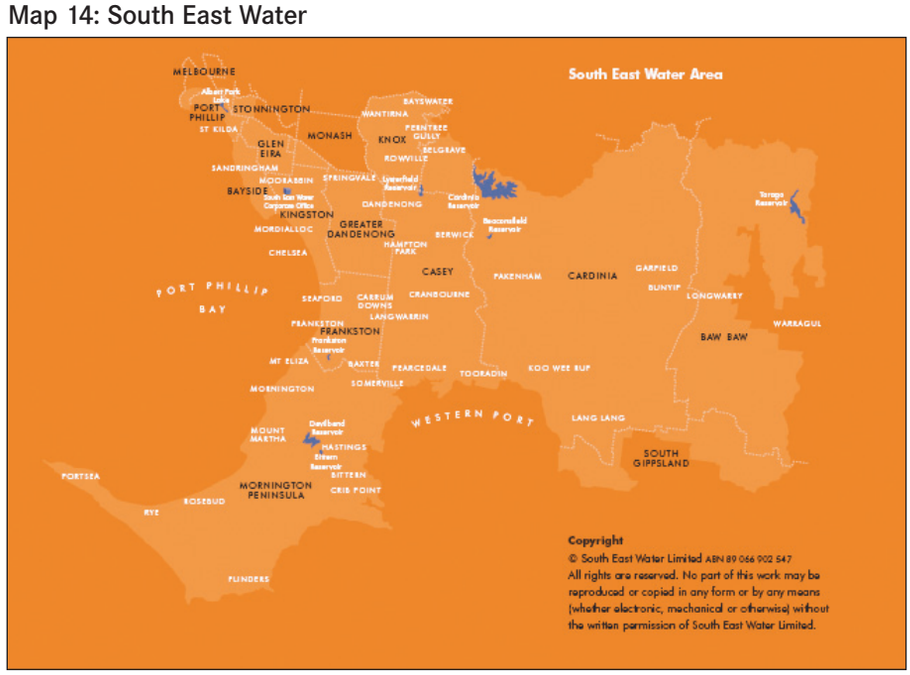
Head office: Moorabbin

Localities supplied with drinking water: Balnarring, Bayswater, Beaumaris, Belgrave, Berwick, Bittern, Brighton/Heatherton, Bunyip, Carrum Downs, Caulfield, Chelsea, Cora Lynn, Cranbourne, Dandenong, Dandenong North, Devon Meadows, Dromana, Ferntree Gully, Frankston, Frankston South, Garfield, Hallam, Hastings, Karingal, Koo Wee Rup, Lang Lang, Moorooduc, Mordialloc, Mornington, Mount Martha, Pakenham, Rowville, Rye, Shoreham, Somerville, South Melbourne, Tynong, Upper Beaconsfield and Wantirna (please refer to Appendix J for a list of all individual suburbs supplied). All drinking water supplies are fluoridated.

Population supplied with drinking water: approximately 1,421,030

Towns and areas supplied with non-potable (non-drinking) water: A small number of customers receive water from an open channel system supplied from the Bunyip and Tarago Rivers. This water is untreated and used for stock and domestic purposes.

Map 14: South East Water



Performance against water quality standards

Drinking water supplied in all localities by South East Water during 2006–07 complied with the water quality standards.

South East Water has advised that the chemicals derived from disinfection or treatment with ozone (bromate and formaldehyde) were not tested for since South East Water does not use this form of treatment. Aluminium levels were monitored in the South Melbourne locality, as water supplied to this locality was treated with aluminium based chemicals, but not in other localities where the water was not treated with aluminium based chemicals.

Map prepared by, and used with the permission of, South East Water

Other water quality issues of potential health significance

Manganese was detected in one water sample from Frankston at a level exceeding the health-related guideline value of 0.5 mg/L set out in the *Australian Drinking Water Guidelines* (2004). This sample was taken in February 2007. All previous and subsequent manganese results at the same site, and in all localities supplied from Cardinia Reservoir, have been considerably less than the guideline value, typically in the range 0.002 to 0.007 mg/L. The high result was considered by South East Water to be an outlier which was not representing the true level of manganese in the drinking water – no reason for the high result could be determined.

Other than the manganese detection described above, no other parameters measured by South East Water as part of its drinking water quality monitoring program exceeded the relevant health-related guideline values set out in the *Australian Drinking Water Guidelines* (2004) during the reporting period.

As indicated above, a small number of customers receive untreated water from an open channel system supplied from the Bunyip and Tarago Rivers. South East Water has advised that each customer receiving such water has an individual supply agreement with South East Water to provide them water and that the agreement specifically states that the water supplied is not fit for human consumption.

For detailed water quality data, including data about other aesthetic characteristics of the water, please refer to South East Water's annual drinking water quality report for 2006–07.

Water quality incidents and events

During 2006–07, the following water quality incidents were reported:

Date	Supply	Issue	Action(s)
January 2007	Rye	Detection of *E. coli* in drinking water.	System inspected, follow-up samples collected were clear.
February 2007	Cranbourne	Detection of *E. coli* in water from new subdivision development.	The existing and new mains were flushed and three resamples taken the following day were clear.
March 2007	Dromana	Detection of *E. coli* in drinking water.	System inspected, follow-up samples collected were clear.
April 2007	Port Melbourne	Detection of *E. coli* in drinking water.	System inspected, follow-up samples collected were clear.
April 2007	Chelsea	Widespread public complaint – chlorine taste and odour	Mechanical failure at local chlorination plant was repaired.
April 2007	Narre Warren South	Widespread public complaint – dirty water	Burst water main repaired and mains recharged.
May 2007	Chelsea	Detection of *E. coli* in water from the storage.	System inspected, follow-up samples collected were clear.
May 2007	Mordialloc	Detection of *E. coli* in drinking water.	System inspected, follow-up samples collected were clear.
May 2007	Doveton	Detection of *E. coli* in drinking water.	System inspected, follow-up samples collected were clear.

For further information on the water quality incidents listed above please refer to South East Water's annual drinking water quality report for 2006–07.

Customer complaints related to water quality

A summary of the customer complaints related to water quality that were recorded by South East Water during 2006–07 is provided in the table below.

Complaint Category	Number of Complaints	No. of Complaints per 100 customers
Discoloured water	711	0.115
Taste/odour	213	0.035
Blue water	32	0.005
Air in water	78	0.013
Suspected illness	7	0.001
Other	99	0.016

The majority of discoloured water quality complaints were caused by an increase in the flow of water through the main and through the disturbance or resuspension of fine sediment material from the source water that can settle in the main during periods of low flow. This increase in discoloured water complaints was attributed by South East Water to a few burst water main events caused by third parties. The most significant incident occurred in April 2007 and was caused by a burst water main in Narre Warren South.

In April 2007, the Chelsea and Dandenong North localities experienced elevated numbers of taste and odour complaints. In Chelsea there was a significant increase in complaints because of a failure in the secondary disinfection dosing. The Dandenong North locality event was caused by source water changes in the Mount View Reservoir distribution system. The source water change affected the flow direction and consequently the water quality, with customers reporting a change to the taste of the water. The system changes were later returned to normal.

The ‘Other’ category water quality complaints were either from industrial customers seeking information on water quality results for their area or residential customers with general enquiries about water quality such as blackening of kettles and issues with aquariums.

South Gippsland Water

Head office: Foster

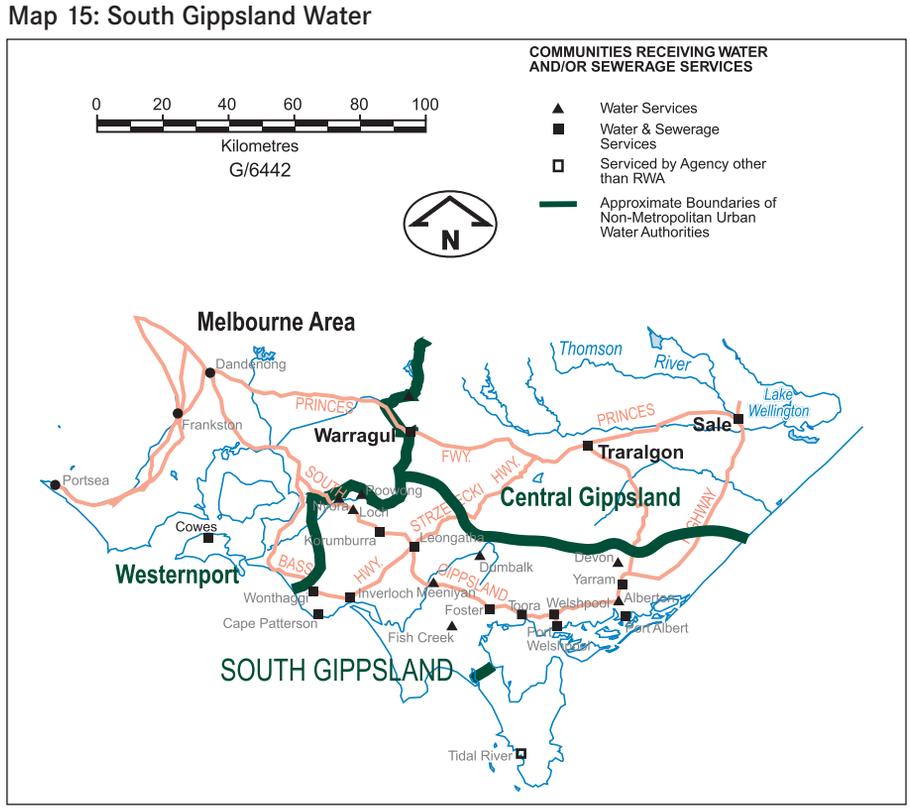
Localities supplied with drinking water: Alberton, Cape Paterson, Dumbalk, Fish Creek, Foster, Inverloch, Koonwarra, Korumburra, Leongatha, Lance Creek, Loch, Meeniyan, Nyora, Poowong, Port Franklin, Port Welshpool, Toora, Wonthaggi and Yarram.

The Lance Creek locality was monitored for the first time in 2006/07. The Yarram locality includes Devon North, the Alberton locality includes Port Albert and the Port Welshpool locality includes Welshpool.

South Gippsland Water also functions as a water storage manager under the Act, as it supplies water from Lance Creek Reservoir to Westernport Water at Candowie Reservoir. This supply is untreated.

Population supplied with drinking water: approximately 24,380

Map 15: South Gippsland Water



Map prepared by, and used with the permission of, Department of Sustainability and Environment

Performance against water quality standards

Drinking water supplied in all localities by South Gippsland Water during 2006–07 complied with the water quality standards, except as noted in the table below.

Parameter	Localities not complying with water quality standards
Trihalomethanes	Wonthaggi, Lance Creek, Cape Paterson, Dumbalk
Aluminium	Leongatha

South Gippsland Water has advised that as it does not use ozone for treatment or disinfection of drinking water chemicals such as bromate and formaldehyde, which are derived from the use of ozone, are not likely to be present in the drinking water and therefore were not sampled and analysed during 2006–07.

South Gippsland Water has implemented a number of responses to individual high results for trihalomethanes detected in the Wonthaggi, Lance Creek, Cape Paterson and Dumbalk supplies in April and May 2007. These responses are set out in their annual drinking water quality report and include improvements to chemical dosing levels, operation of powdered activated carbon at Lance Creek reservoir and introduction of aeration to remove volatile organic compounds. The high results for trihalomethanes did not pose a risk to public health.

In May 2007 the Department accepted written undertakings from South Gippsland Water that set out a number of longer term solutions for these supplies, including replacing chlorination with chloramination for the Lance Creek, Wonthaggi, Cape Paterson and Inverloch supplies. The undertakings are scheduled to conclude on 1 April 2009.

South Gippsland Water has also implemented a number of responses to individual high results for aluminium detected in six samples in Leongatha in February and March 2007. These responses are set out in their annual drinking water quality report and include improvements to the pH and reviewing the operation of the water treatment plant supplying Leongatha. The high results for aluminium did not pose a risk to health.

Other water quality issues of potential health significance

No other parameters measured by South Gippsland Water as part of its drinking water quality monitoring program exceeded the relevant health-related guideline values set out in the *Australian Drinking Water Guidelines* (2004) during the reporting period.

For detailed water quality data, including data about other aesthetic characteristics of the water and details on South Gippsland Water's undertakings, please refer to South Gippsland Water's annual drinking water quality report for 2006–07.

Water quality incidents and events

During 2006–07, the following water quality incidents and events occurred:

Date	Supply	Issue	Action(s)
November 2006	Foster water storage	Detection of *E. coli* in drinking water	Disinfection system and storage inspected, follow-up samples were clear of *E. coli*.
November 2006	Fish Creek water storage	Detection of *E. coli* in drinking water	Disinfection system and storage inspected, follow-up samples were clear of *E. coli*.
November 2006	Toora water storage	Detection of *E. coli* in drinking water	Disinfection system and storage inspected, follow-up samples were clear of *E. coli*.
January 2007	Korumburra distribution system	Detection of *E. coli* in drinking water	System inspected and flushed, follow-up samples were clear of *E. coli*.
January 2007	Alberton distribution system	Detection of *E. coli* in drinking water	System inspected and flushed, follow-up samples collected which were clear of *E. coli*.
May 2007	Loch distribution system	Detection of *E. coli* in drinking water	System inspected and flushed and roof replaced on Loch water storage tower. Follow-up samples were clear of *E. coli*.

For further information on the water quality incidents and events listed above, please refer to South Gippsland Water's annual drinking water quality report for 2006–07.

In addition to the incidents listed above, an algal bloom event was reported in February 2007 for Poowong Reservoir. During this incident the toxic filamentous blue-green algae, *Anabaena circinalis*, was observed at cell count levels of approximately 60,000 cells/mL. South Gippsland Water advised that they monitored algal levels in the reservoir, notified major customers in the water sampling localities, destratified the reservoir, dosed the reservoir with algicide and with powdered activated carbon to minimise taste and odour and ensured that the affected reservoir water was not released to the environment.

Following implementation of the incident response processes, levels of the observed blue-green algae were controlled and reduced in the reservoir. South Gippsland Water advised that additional toxicity testing conducted throughout the incident indicate that saxitoxin levels did not exceed the analytical detection limit of 2 ug/L.

Customer complaints related to water quality

A summary of the customer complaints related to water quality that were recorded by South Gippsland Water during 2006–07 is provided in the table below.

Complaint Category	Number of Complaints	No. of Complaints per 100 customers
Discoloured water	157	0.91
Taste/odour	13	0.08
Blue water	0	0
Air in water	0	0
Suspected illness	0	0
Other	8	0.05

Discoloured water complaints primarily resulted from:

- High manganese levels that exist naturally in the soils around South Gippsland that are washed down to surface water reservoirs and rivers.
- Accumulation of sediment.
- Scouring of mains following high flows or recharging of the system.

South Gippsland Water has advised that scheduled air scouring and flushing programs were progressively implemented within all water sampling localities to remove manganese and accumulated sediment. Potassium permanganate dosing systems have been introduced at all water treatment plants to oxidise and remove soluble manganese from source waters.

Southern Rural Water

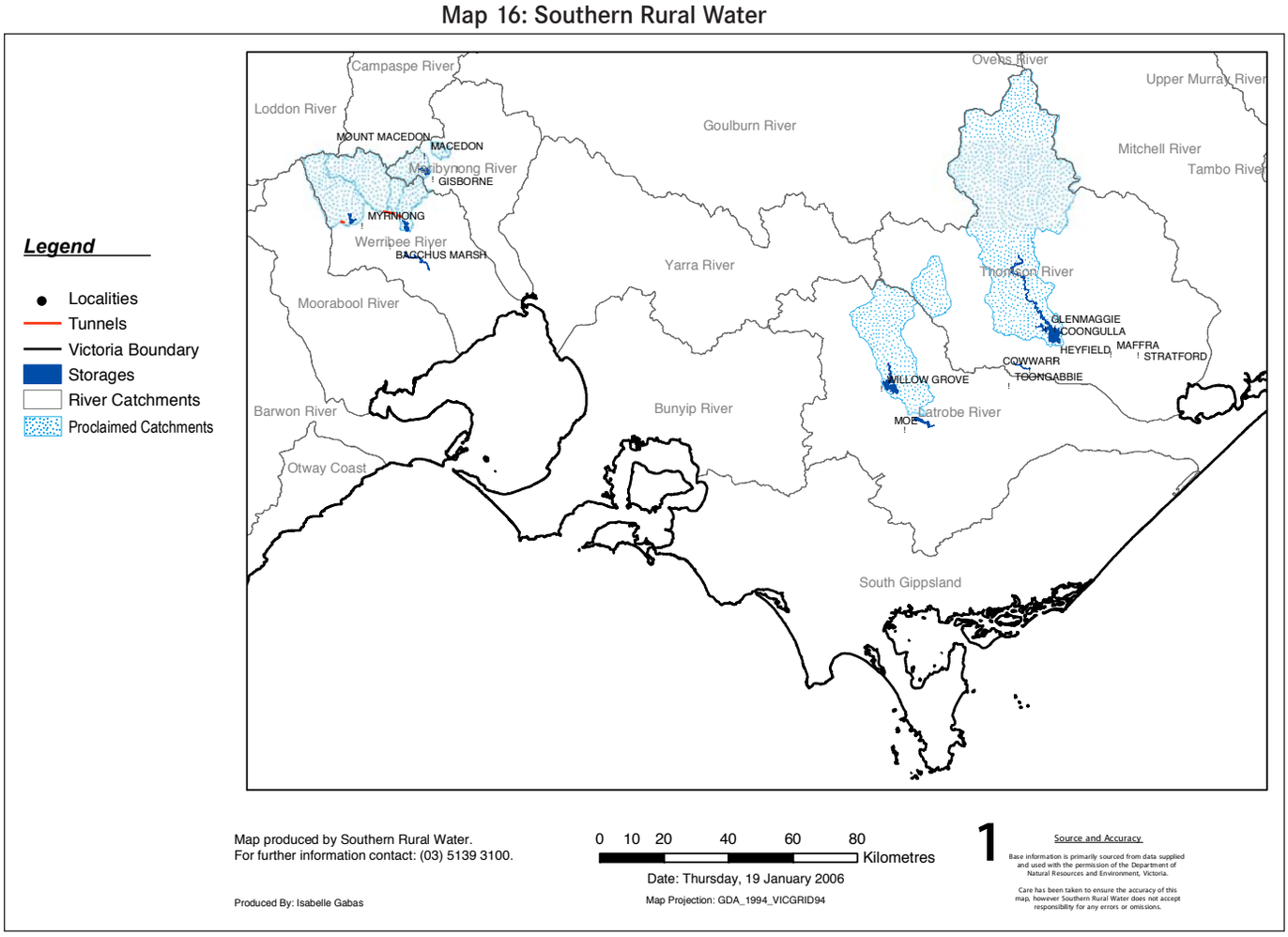
Head office: Maffra

Water Suppliers serviced: Gippsland Water and Western Water (untreated water).

Major water storages:

- Gippsland Region – Glenmaggie, Blue Rock Lake
- Western Region – Merrimu, Pykes Creek and Rosslynne

Map 16: Southern Rural Water



Overview

Southern Rural Water supplies untreated raw water to Gippsland Water and Western Water. These water suppliers then treat the raw water for use as drinking water. Southern Rural Water manages their water storages so as to optimise the quality of raw water.

Map prepared by, and used with the permission of, Southern Rural Water

Water quality events and incidents

The following water quality incidents occurred during the 2006 – 2007 reporting period. The Gippsland Region experienced the majority of incidents, which comprised of blue-green algal blooms, flooding and stock issues. Incidents occurring in the Western Region were all related to blue-green algal blooms.

Date	Supply	Issue	Actions
Gippsland Region			
December 2006 to February 2007	Blue Rock Lake (Supplies water for the township of Willow Grove)	Blue-green algal bloom	Monitoring frequency increased and warning signs erected. Three media releases issued and notifications made to Gippsland Water and regulatory agencies.
February 2007	Blue Rock Lake (Supplies water for the township of Willow Grove)	Dead cows and sick stock presenting respiratory difficulties	Three days of investigation showed that there was no public health threat from the water supplied. Tests carried out on tributaries and were clear for blue-green algae. Notifications made to Gippsland Water, Baw Baw Shire Council and regulatory agencies. Final veterinary report established the cause as Infectious Bovine Rhinotrachetitis.
February 2006 to November 2006	Lake Glenmaggie (Supplies water for the townships of Coongulla and Glenmaggie)	Blue-green algal bloom	Algal monitoring frequency was increased and regular notifications were made to Gippsland Water and regulatory agencies. Gippsland Water organised additional treatment, alternative supplies, and other activities such as media releases regarding quality of drinking water.
February 2007 to March 2007	Thomson River and Cowwarr Weir (Supplies water for the township of Heyfield, Toongabbie and Cowwarr)	Debris from flash flooding following bushfires	Increased monitoring prior to and during the flood. Monitoring was in conjunction with Gippsland Water and results were shared across both businesses.
February 2007 to March 2007	Lake Glenmaggie and Macalister River (Supplies water for the townships of Coongulla, Glenmaggie, Maffra, Stratford and Boisdale)	Dirty water from flash flooding following bushfires	Increased monitoring prior to and during the flood. Monitoring was in conjunction with Gippsland Water and results were shared across both businesses. Gippsland Water provided an alternate source of treated water to Coongulla and Glenmaggie. The volume of water released from Lake Glenmaggie was reduced to decrease the water quality impacts downstream near the Maffra off-take. Local water restrictions and community announcements over the period.
June 2007	Lake Glenmaggie and Macalister River (Supplies water for the townships of Coongulla, Glenmaggie, Maffra, Stratford and Boisdale)	Major Flood	Flood warning released by Southern Rural Water on 27 June to stakeholders when levels within Lake Glenmaggie indicated flooding was imminent. Ongoing high turbidity levels in the water released from Lake Glenmaggie
June 2007	Thomson River and Cowwarr Weir (Supplies water for the township of Heyfield, Toongabbie and Cowwarr)	Major Flood	Flood warning released by Southern Rural Water on 27 June to stakeholders when flows at Cowwarr Weir indicated flooding was imminent.
Western Region			
January 2006 (ongoing)	Merrimu Reservoir (Supplies water for the townships of Bacchus Marsh and Melton)	Blue-green algal bloom	Monitoring frequency increased, media releases issued and notifications made to Western Water and regulatory agencies
December 2006 to January 2007	Rosslynne Reservoir (Supplies water for the township of Macedon, Gisborne and Mount Macedon)	Blue-green algal bloom	Monitoring frequency increased, media releases issued and notifications made to Western Water and regulatory agencies

Date	Supply	Issue	Actions
February 2007 to March 2007	Rosslynne Reservoir (Supplies water for the township of Macedon, Gisborne and Mount Macedon)	Blue-green algal bloom	Monitoring frequency increased, media releases issued and notifications made to Western Water and regulatory agencies
May 2006 to July 2006	Pykes Creek Reservoir (Supplies water for the township of Myrniong)	Blue-green algal bloom	Monitoring frequency was increased, media releases were issued and notifications made to Western Water and regulatory agencies
April 2007 to July 2007	Pykes Creek Reservoir (Supplies water for the township of Myrniong)	Blue-green algal bloom	Monitoring frequency was increased and warning signs erected on site. Two media releases were issued and notifications made to Western Water and regulatory agencies.

As detailed in the table above, the majority of drinking water storages managed by Southern Rural Water experienced blooms at levels that required reporting to the department under the relevant reporting protocols. The effects of these blooms on drinking water quality are discussed in greater detail in the Gippsland Water and Western Water sections of this report.

The nature of the water storage areas, and the current climatic and low flow conditions, are likely to result in ongoing algal issues. Current protocols and management strategies are viewed as being adequate to minimise the risk to drinking water quality in the event of a bloom, and there appears to be effective cooperation between Southern Rural Water and the water suppliers they supply.

Wannon Water

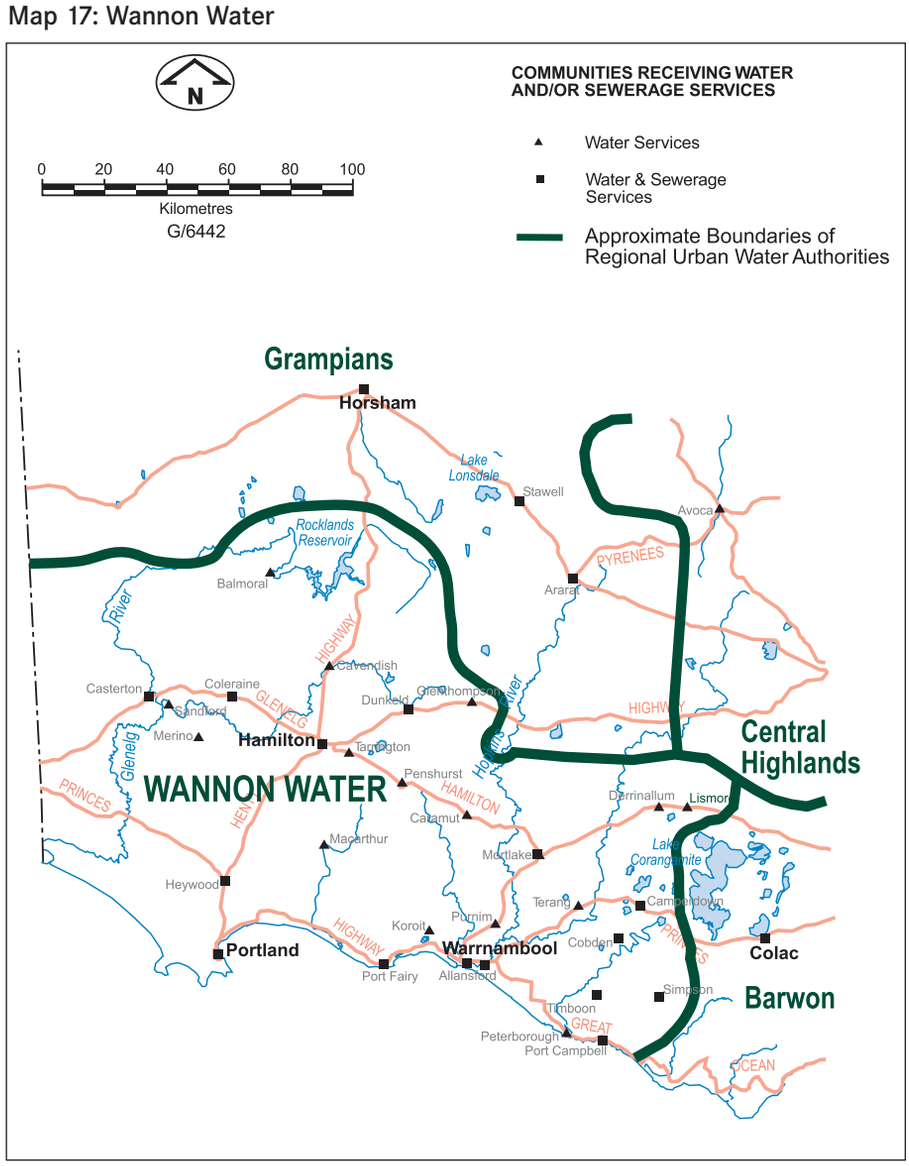
Head office: Warrnambool

Localities supplied with drinking water: Allansford, Balmoral, Camperdown – Rural, Camperdown – Urban, Caramut, Casterton, Cavendish, Cobden, Coleraine, Dartmoor, Derrinallum, Dunkeld, Glenthompson, Hamilton, Heywood, Koroit, Lismore, Noorat – Glenormiston, Merino, Mortlake, Paaratte, Penshurst, Peterborough, Port Campbell, Port Fairy, Portland, Purnim, Sandford, Simpson, Tarrington, Terang, Timboon, Warrnambool

Towns supplied with regulated (non-drinking) water: Darlington and Macarthur

Population supplied with drinking water: approximately 71,570

Map 17: Wannon Water



Map prepared by, and used with the permission of, Department of Sustainability and Environment

Performance against water quality standards

All water sampling localities complied with the drinking water quality standards during 2006–07 reporting period, except as noted in the table below.

Parameter	Localities not complying with water quality standard
Escherichia coli	Cavendish
Trihalomethanes	Balmoral, Coleraine, Hamilton, Tarrington
Aluminium	Camperdown Rural, Camperdown Urban, Cobden, Derrinallum, Glenthompson, Hamilton, Lismore

The water supplied to the Macarthur water sampling locality was declared as regulated water by the Minister for Health on 6 September 2006. For the purposes of this reporting period Macarthur was considered a non-drinking water supply.

Two related *E. coli* detections were recorded in the Cavendish locality during the reporting period. The detections, which occurred on 22 May 2007, were associated with an air lock that caused the chlorination pump to stop operating. This detection is discussed in more detail in the incidents and events section below.

During the reporting period undertakings were in place to manage the identified non-compliances at Balmoral, Cobden, Coleraine and Glenthompson. More detail on these undertakings can be found in Appendix D.

With regard to the Balmoral trihalomethanes issue, the undertaking involved the construction of a new water treatment plant. By the end of the reporting period construction of the plant was progressing well, and was on target to be completed by the target date in the undertaking of 31 December 2007.

With regard to the trihalomethanes exceedances in the Coleraine locality, the proposed solution in the accepted undertaking is to construct a pipeline to connect Coleraine to the Casterton Water Treatment Plant. The pipeline is due to be completed by 30 June 2009.

The trihalomethanes exceedances in the Hamilton and Tarrington localities were considered to be isolated incidents. In response to lower than target chlorine residuals across the Hamilton and Tarrington localities the disinfection process was temporarily changed from chloramination to chlorination. This allowed for an improvement in disinfection residuals, but resulted in the generation of elevated amounts of trihalomethanes. After one month, the disinfection was reverted back to chloramination, resulting in a reduction in trihalomethanes levels.

By the start of the reporting period, Wannon Water had implemented the proposed actions in their undertakings to address non-compliance with the aluminium standard in the Camperdown Rural, Camperdown Urban, Cobden, Derrinallum and Glenthompson supply systems. During the reporting period performance against the aluminium standard improved markedly in all localities, and ongoing compliance was achieved by 31December 2006.

In the case of the Hamilton locality, because of the drought, surface water run-off from the Grampians catchment ceased during 2006–07. Therefore the Hamilton

system became totally dependent on groundwater harvested from the Grampians area. The water quality of the groundwater was significantly different from the surface water run-off, containing higher salt levels, iron and manganese. The treatment processes at Hamilton were not designed to optimally treat water with this chemical makeup resulting in non-compliance with the aluminium standard. Instances of non-compliance with the standard were periodic, but if they continue an undertaking to address the issue may become necessary.

With regard to the Lismore locality, there was a single aluminium exceedance during the reporting period. No further action was considered necessary.

Other water quality issues of potential health significance

As with the previous two reporting periods, the other major water quality issue for Wannon Water was elevated arsenic levels in the water supplies of Merino and Macarthur.

The bore water that is used to supply both towns contains levels of naturally occurring arsenic that are above the health-related guideline value specified in the *Australian Drinking Water Guidelines* (2004) (0.007 mg/L). Illness as a result of the consumption of water that contains arsenic requires long-term consumption of large quantities of contaminated water.

In the case of Macarthur, Wannon Water entered into an undertaking with the Department to address the issue. Modifications to the existing treatment process were undertaken in an attempt to reduce the level of arsenic in the treated water, but the modifications were unsuccessful in reducing the arsenic below the guideline value.

In response to this the Minister for Health declared the water supplied to the Macarthur locality as regulated water on 6 September 2006.

A community consultation process was undertaken by Wannon Water to determine the future of the Macarthur water supply. The Macarthur community indicated that their preferred option is for Wannon Water to implement ion sorption technology in order to bring the water up to a drinking water standard. Wannon Water has commenced a feasibility study and detailed design process.

In the case of the Merino supply, the problem was resolved by the construction of a pipeline from Casterton water supply system. This pipeline was operational by January 2006. Residual arsenic in the Merino Service Basin and subsequent recontamination of the supply necessitated the construction of a new temporary enclosed tank at Merino. Upon completion of the works arsenic levels in the Merino supply were below the health guideline value.

Single elevated lead results were detected in Coleraine, Camperdown (Urban), Koroit, Mortlake, Port Fairy, Portland, Purnim and Warrnambool in samples collected in January 2007. These systems historically have not had an issue with lead and there is no record of lead fitting or fixtures. All repeat analyses on re-samples were below the health guideline value specified in the *Australian Drinking Water Guidelines* (2004). The lack of pattern or consistency with the exceedances suggested a

possible issue with the integrity of the sample collection/analysis process, rather than an issue with contamination. No further action was considered necessary by the department.

A single elevated manganese result, above the health guideline value specified in the *Australian Drinking Water Guidelines* (2004), was recorded in the Cobden locality. The elevated result occurred during a major water main maintenance period and is likely the result of sediment from within the main being resuspended. Wannon Water intends to investigate this issue further during 2007–08.

Two elevated manganese results above the health-related guideline value were recorded in the Merino locality. Particulate material containing iron and manganese had been accumulating within the mains as a result of the process difficulties at the Casterton Water Treatment Plant. High levels of sediment were present at the time of sample collection. Wannon Water is working with consultants to alter the design of the plant to improve performance. In addition, consistent flushing of the Merino pipeline was conducted.

No other parameters measured by Wannon Water as part of its drinking water quality monitoring program were reported to have exceeded the relevant health guideline values detailed in the *Australian Drinking Water Guidelines* (2004) during the reporting period.

Water quality incidents and events

During 2006–07, the following water quality incidents and events were reported by Wannon Water.

Date	Supply	Issue	Action(s)
July 2006	Portland	*E. coli*	A sample collected from the Portland locality returned a positive result for *E. coli*. At the time of sampling a low chlorine residual was detected. The exact cause of the positive *E. coli* result was unable to be determined. The area in the vicinity of the sample site was flushed until adequate disinfection residual was restored. Further samples were taken to confirm the effectiveness of the remedial measures. All additional samples taken indicated that no *E. coli* were present.
July & August 2006	Glenthompson	Aluminium	Instances of non-compliance with the aluminium standard were recorded in the Glenthompson locality during the reporting period. In response to the low water levels mains flushing/cleaning was kept to a minimum to conserve water. It is likely that the two readings were the result of sediment build-up of aluminium within the reticulation. A program of mains cleaning utilising water capture was implemented to reduce the likelihood of further exceedances.
August 2006	Camperdown (Rural) & (Urban)	Aluminium	Aluminium levels in excess of the regulatory limit of 0.2 mg/L were detected in the Camperdown – Rural and Camperdown – Urban localities in samples collected during August 2006. During late winter/early spring, the source water typically has a very low alkalinity. This results in difficulty in controlling pH through the water treatment process. Low pH can be experienced upon the addition of alum. This low pH allows dissolved aluminium to pass through the filtration process. A reduction in the alum dose rate was implemented to reduce the likelihood of further exceedances. The addition of lime and carbon dioxide at the Camperdown treatment plant is proposed as a future improvement.

Date	Supply	Issue	Action(s)
August & September 2006	Cobden	Aluminium	A number of instances of non-compliance with the aluminium standard were observed during the months of August and September 2006. A number of improvements to the water treatment plant were undertaken prior to this incident in an attempt to prevent non-compliance with the aluminium standard from occurring. Due to the seasonal nature of the issue, the success of the improvements was difficult to determine prior to the event. Further adjustments to the treatment process, in particular the pre pH correction and alum dosing point, were made to improve water quality.
September 2006	Hamilton	Aluminium	A result of 0.5 mg/L was recorded at a site within the Hamilton locality. The non-compliance with the standard was likely to be related to the use of higher doses of alum to treat highly coloured raw water entering the water treatment plant during maximisation of surface water harvesting. Alternative coagulants pH control measures were trialled in an attempt to reduce the alum dosage.
October 2006	Hamilton	Aluminium	Non-compliance with the aluminium standard (0.24 mg/L) was recorded within the Hamilton locality. The exceedance was to be related to the use of higher doses of alum to treat highly coloured raw water entering the water treatment plant during maximisation of surface water harvesting. Alternative coagulants pH control measures were trialled in an attempt to reduce the alum dosage.
October 2006	Hamiton	*E. coli*	*E. coli* detected in a sample collected from the clear water storage at the Hamilton Water Treatment Plant. In addition to *E. coli*, low disinfectant residuals were noted. Additional sampling was undertaken and an investigation into the positive *E. coli* results initiated. The investigation revealed a failure of the disinfection system at the Hamilton Water Treatment Plant. A major power outage affecting the whole of south west Victoria caused faults in both chlorination units stopping the flow of chlorine disinfectant. Online monitoring normally used to detect low disinfectant residuals had failed the previous week and had been removed for repair. The clear water storage disinfection residual was increased immediately through manual dosing. The reticulation was then flushed to allow the higher disinfection residual water to be passed into the reticulation. Additional testing confirmed the presence of a disinfection residual and the absence of *E. coli*. As a result of the incident, procedures for equipment maintenance have been changed. A full HACCP assessment has been undertaken on the Hamilton Water Treatment Plant, with certification being obtained in June 2007.
October 2006	Portland	*E. coli*	A sample taken collected at the entry point for the locality returned a positive result for *E. coli.* The sample point was located at the Wyatt Street Clear Water Storage. The Clear Water Storage is used to boost the Portland supply during periods of peak demand. During the cooler months, the tank remains unused for long periods of time and hence loose chlorine residual. At the time of collection, the tank had a very low chlorine residual. The tank was isolated from the system at the time of sample collection. Additional chlorine dosing was undertaken. The tank remained isolated until repeat testing confirmed adequate disinfection. A chlorine analyser has been installed on the outlet of the tank to alarm when low chlorine residuals are detected.
October 2006	Caramut	*E. coli*	*E. coli* were detected in the elevated tank within the Caramut locality. Low chlorine residual levels were also noted at the time of sampling. The tank was immediately isolated and additional samples from the tank and reticulation collected and analysed. The presence of *E. coli* in the tank was confirmed, with no *E. coli* detected in the reticulation. Investigation into the cause of the *E. coli* revealed that the access hatch of the elevated tank had corroded and dislodged, allowing bird access. The hatch was re-instated and the tank flushed and re-filled with chlorinated water. Testing was conducted on the tank prior to it being returned to service. The results of these samples indicated no *E. coli* present.

Date	Supply	Issue	Action(s)
October 2006	Casterton	Iron	A major augmentation of the Casterton Water Treatment Plant was undertaken and commissioned in October 2006. Technical issues with the design resulted in water containing either dissolved or particulate iron reaching customers. Due to coloured water causing widespread customer complaint, the Department of Human Services was notified.
October 2006 to May 2007	Coleraine, Mortlake, Purnim, Warrnambool, Camperdown (Urban), Portland, Koroit and Port Fairy	Lead	Between October 2006 and May 2007 a series of samples collected from the localities of Coleraine, Mortlake, Purnim, Warrnambool, Camperdown (Urban), Portland, Koroit and Port Fairy for lead analysis all returned values above the health-related value for lead in drinking water. None of the localities had a history of lead contamination or any known issues with lead fittings or fixtures. In all instances re-samples were collected after each occurrence, with all subsequent results well below the guideline value. It is believed that at some point the integrity of the sample has been compromised, either during sampling or analysis.
November 2006	Casterton	Loss of power	The water for Casterton is sourced from groundwater bores located approximately 15 kilometres from Casterton. Bushfires in the local area resulted in a loss of power and an inability to pump water from the Tullich Bore field. Although water quality was not compromised for the towns of Casterton, Sandford and Merino, the security of supply was threatened. The fires caused only minor damage to infrastructure and a back-up emergency generator was installed to ensure continued supply.
February 2007	Simpson	*E. coli*	A sample collected at the entry point to the locality on 20 February 2006 returned a positive result for *E. coli*. The sample point was located at the Simpson contact tank. A free chlorine residual of 0.9 mg/L was measured at the time of sample collection. No cause for the positive result could be determined, as there was sufficient chlorine residual for disinfection. The site was immediately resampled. *E. coli* was absent from the resample.
March 2007	Hamilton – Tarrington	Treatment Issue	On 9 March 2007 Wannon Water received a number of calls from residents in Hamilton in relation to dirty water and taste complaints. The cause of these was attributed to a change to groundwater reserves due to the cessation of surface runoff from the Grampians catchment area. Three complaints from customers who believed that their water supply was causing them to feel ill also occurred at this time. The three sites were visited and disinfection residual measured. It was found that there was little or no disinfectant residual at the three sites. Water samples were collected for analysis. In consultation with the Department of Human Services, a boil water notice was issued until the disinfection residual was increased and water samples confirmed that there was no contamination. The boil water notice was issued on the afternoon of Friday 9 March. On Tuesday 13 March the boil water notice was lifted, following confirmation of test results. A subsequent investigation into the incident determined that the low chlorine residuals observed in the reticulation were the result of a higher chlorine demand due to the presence of manganese in the raw water. Manganese was passing through the treatment process and being oxidised after chlorination. This also was the cause of the dirty water complaints. The taste complaints related to an increase in total dissolved salts from approximately 150 mg/L to 800 mg/L over a four week period.
March 2007	Warrnambool	Groundwater issue	On 23 March 2007, Wannon Water was advised by the Warrnambool City Council of the failure of a sewerage wet well located in the vicinity of the Albert Park Reserve in Warrnambool. The site was located approximately 1.5 kilometres from the Albert Park Bore at the Warrnambool Water Treatment Plant. Historical data from the bore was analysed and no detrimental impact on water quality was found. As a precaution, additional samples were collected and analysed. No impact on water quality was observed.

Date	Supply	Issue	Action(s)
April 2007	Hamilton – Tarrington	Trihalomethanes	During March 2007, low disinfection residuals were observed within the Hamilton and Tarrington reticulations. In response to this, on 26 March 2007 the disinfection at the Hamilton Water Treatment Plant was changed from chloramination to chlorination to improve disinfection residuals within the localities. Due to the change from chloramination to chlorination, higher levels of disinfection by-products (trihalomethanes) were generated, resulting in exceedences being recorded within the Hamilton and Tarrington Systems. Chloramination was reinstated at the Hamilton Water Treatment Plant on 24 April 2007. Upon return to chloramination, the trihalomethane levels quickly dropped below the regulatory limit of 0.25 mg/L. Disinfection residuals were closely monitored to ensure adequate disinfection and a reduction in the level of trihalomethanes generated.
April 2007	Hamilton	Aluminium	Due to high variability in the quality of the raw water, the dosing of alum to achieve effective treatment of the incoming raw water was difficult. On occasions, there was some carryover of aluminium carry through the treatment process. Non-compliance with the aluminium standard was recorded in the Hamilton locality in April 2007 of 0.50 mg/L. The area in the immediate vicinity was flushed and retesting carried out. The results of the re-tests were below the regulatory limit of 0.2 mg/L.
May 2007	Cavendish	*E. coli*	*E. coli* was detected in two samples from the Cavendish system collected on 22 May 2007. Investigation into the cause determined that the disinfectant dosing pumps developed an air lock, which resulted in no disinfectant being dosed into the system. The on-line chlorine analyser alarmed as a result of the drop in chlorine residual, but the auto-dialler connected to the chlorine analyser was set to stand-by which resulted in the alarm not dialling out to the operator. A low chlorine residual was detected when the reticulation compliance samples were collected on Tuesday 22 May. It is estimated the system failure occurred late on Friday 18 May 2007. The chlorine pumps were immediately reinstated at an increased dose rate. Sodium hypochlorite was added to the service basin for immediate disinfection. Flushing of the mains within the system was undertaken to increase disinfection residual. To reduce the risk of the incident reoccurring, changes were made to the site maintenance procedures which now incorporate frequent alarm testing. Maintenance procedures have also been changed to include reinstatement of systems upon completion of works.

Customer complaints related to water quality

The customer complaints received by Wannon Water during the reporting period are summarised in the table below. As with most water businesses, the highest number of complaints received related to discoloured water.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers supplied
Discoloured water	274	0.82
Taste/odour	70	0.21
Air in water	0	0
Blue water	6	0.02
Illness	3	0.01
Other	13	0.04

Western Water

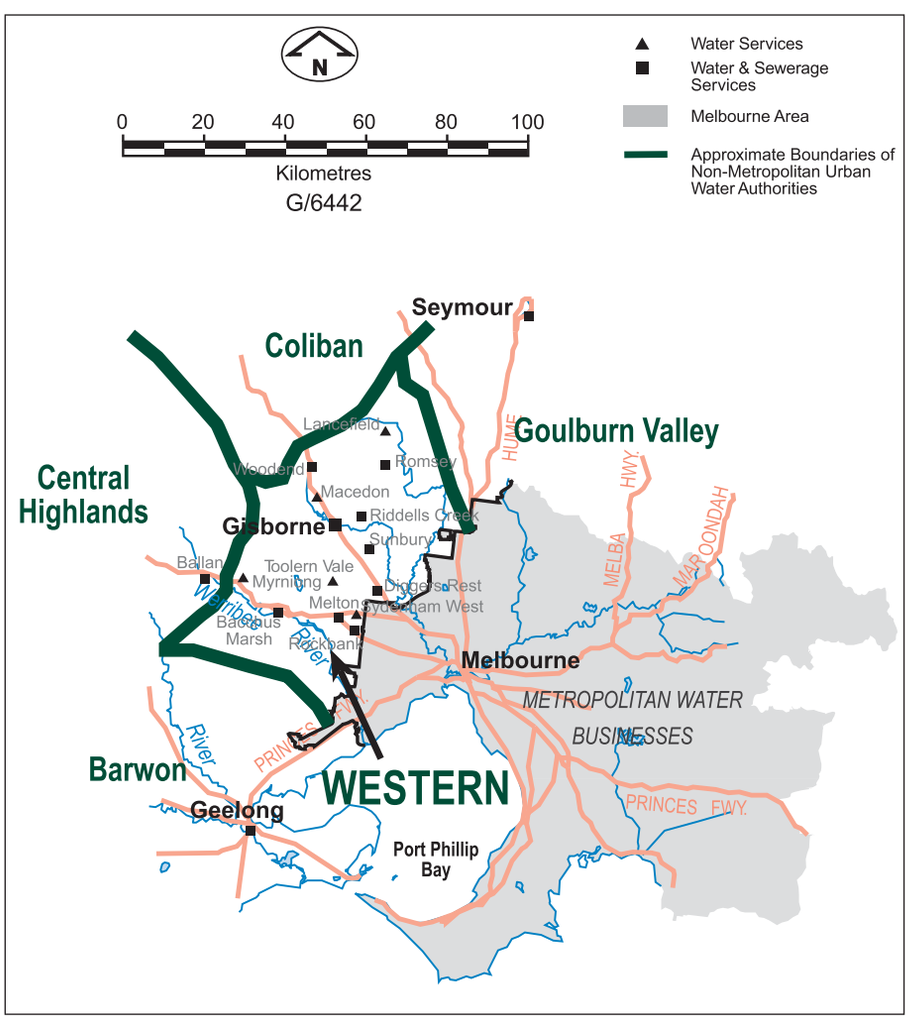
Head office: Sunbury

Localities supplied with drinking water: Bulla, Darley, Diggers Rest, Gisborne, Lancefield, Lerderderg, Macedon, Maddingley, Melton South, Merrimu, Mount Macedon, Myrniong, Riddells Creek, Rockbank, Romsey, Sunbury, Toolern Vale and Woodend.

All drinking water supplies except those for Myrniong, Romsey, Woodend and Lancefield are fluoridated. Supplies for Myrniong, Romsey and Woodend are fluoridated if the local supply is supplemented with water from the Melbourne metropolitan supply system.

Population supplied with drinking water: approximately 131,380

Map 18: Western Water



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Performance against water quality standards

Drinking water supplied in all localities by Western Water during 2006–07 complied with the water quality standards, except as noted in the table below.

Parameter	Locality not complying with water quality standards
Aluminium	Myrniong
Trihalomethanes	

Western Water has advised that it does not use ozone-based chemicals in any of its water quality systems. Therefore, sampling and analyses for bromate and formaldehyde was not undertaken throughout 2006–07. Ozone-based disinfection by-products such as bromate and formaldehyde are not considered to be a risk in drinking water supplied by Western Water. Although water supplied to Lancefield was not treated with aluminium based chemicals in 2006–07, aluminium was nevertheless monitored for this supply.

Drinking water supplied in Myrniong did not comply with the standards for aluminium and trihalomethanes in 2006–07. The water supply for Myrniong is drawn from the nearby Pykes Creek Reservoir, which contains elevated levels of aluminium and turbidity due to the clay which is present as suspended material. This water supply was disinfected, but not filtered, until the Myrniong water filtration plant was completed in March 2007. The water supplied to Myrniong has complied with the standards since that time, although for much of that time water was carted from the Bacchus Marsh supply system, due to an ongoing blue green algae bloom on Pykes Creek reservoir.

The health risk assessment undertaken by the department in relation to the Myrniong water supply concluded that exposure to aluminium and trihalomethanes at the reported concentrations, and for the reported time periods, did not pose a risk to public health.

Other water quality issues of potential health significance

Other than the detections described above for Myrniong, no other parameters measured by Western Water in its drinking water quality monitoring program exceeded the relevant health-related guideline values set out in the Australian Drinking Water Guidelines (2004) during the reporting period.

For detailed water quality data, including data about other aesthetic characteristics of the water, please refer to Western Water's annual drinking water quality report for 2006–07.

Water quality incidents and events

During 2006–07, the following water quality incidents and events occurred:

Date	Supply	Issue	Action(s)
January 2007	Myrniong	Detection of *E. coli* in drinking water	Chlorine dosing increased, follow-up samples were collected and clear of *E. coli*
January 2007	Romsey	Detection of *E. coli* in drinking water tank	System was inspected, follow-up samples were collected and clear of *E. coli*
January 2007	Toolern Vale	Detection of *E. coli* in drinking water tank	System was inspected, follow-up samples were collected and clear of *E. coli*
January – March 2007	Lancefield	Detection of *E. coli* in drinking water	Operational changes made to source of supply, disinfection changed from chloramination to chlorination and boil water notice issued for 55 days until water quality improved.
February 2007	Lancefield	Blue green algae bloom in Lancefield service basin	The basin was monitored for blue green algae, follow up samples indicated bloom dissipated within two days.
April – June 2007	Myrniong	Blue green algae bloom in Pykes Creek reservoir	The reservoir was monitored for blue green algae, drinking water carted from Bacchus Marsh supply, a dosing system was temporarily installed at the Myrniong water filtration plant until the bloom dissipated. Incident lasted for fifty days, no toxins were detected.
Early 2007	Rosslynne supply system	Intermittent high pH levels in water supplied to Gisborne, Riddells Creek, Macedon and Mount Macedon	Lime and carbon dioxide dosing was investigated and was established by the end of 2007.

In May 2007 the department accepted a written undertaking from Western Water that set out a number of longer term solutions in response to the incidents in the Lancefield supply system, including construction of a new water filtration plant. The undertaking is scheduled to conclude on 30 March 2008. The previous undertaking for the Myrniong water supply concluded on 30 March 2007, with the completion of the Myrniong water filtration plant.

For further information on the water quality incidents and events listed above, as well as details on Western Water's undertakings, please refer to Western Water's annual drinking water quality report for 2006–07.

Customer complaints related to water quality

A summary of the customer complaints related to water quality that were recorded by Western Water during 2006–07 is provided in the table below.

Complaint Category	Number of Complaints	No. of Complaints per 100 customers
Discoloured water	138	0.264
Taste/odour	34	0.065
Blue water	0	0
Air in water	3	0.005
Suspected illness	2	0.006
Other	9	0.017

Water quality complaint figures had shown an increasing trend in complaints in recent years, with a large number from the more populous centres of Melton, Sunbury and Lancefield. However, in 2006–07, improvements in water quality supplied to customers and improved management of water main bursts have seen complaints decrease relative to previous years.

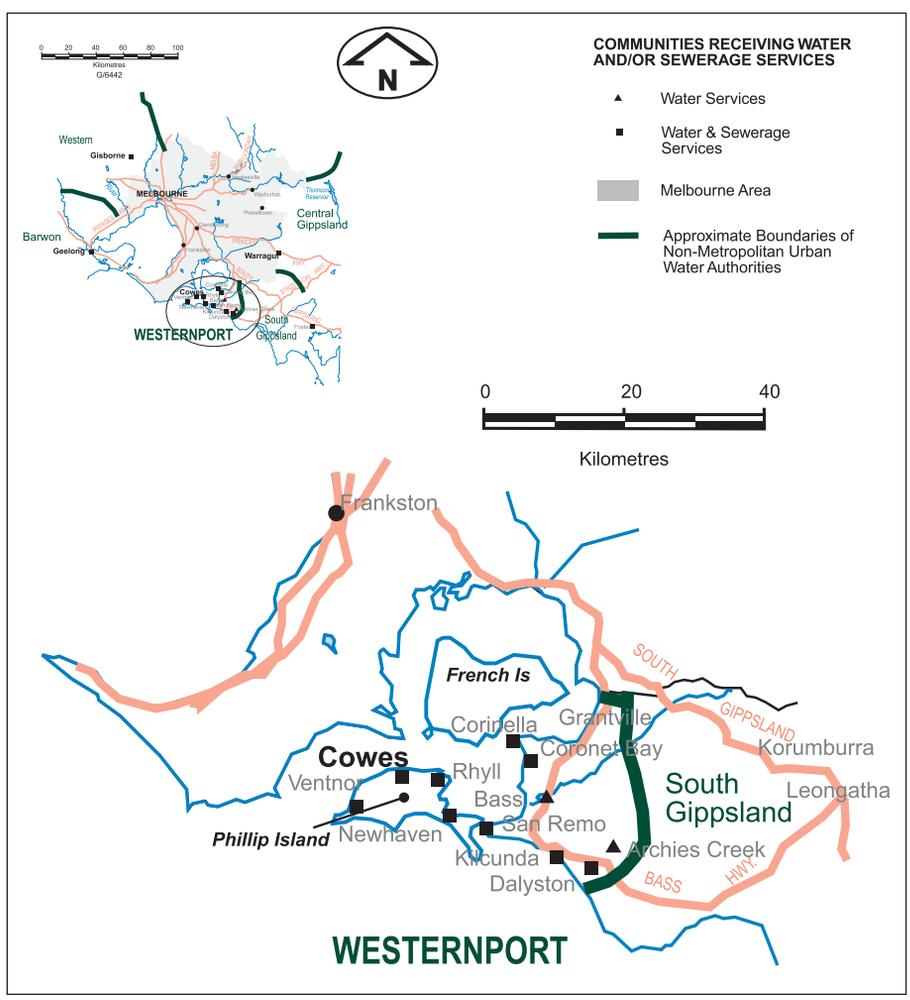
Westernport Water

Head office: Newhaven

Towns supplied with drinking water: Bass, Grantville, Corinella, Kilcunda, San Remo, Cape Woolamai, Rhyll, Cowes, Ventnor

Population supplied with drinking water: approximately 9,760, rising to 33,500 in peak holiday periods

Map 19: Westernport Water



Map prepared by, and used with the permission of, Department of Sustainability and Environment

Performance against water quality standards

All drinking water localities complied with the water quality standards during 2006–07, except as noted in the table below.

Parameter	Localities not complying with water quality standard
Trihalomethanes	Grantville, Kilcunda, San Remo, Cape Woolamai, Rhyll, Cowes, Ventnor

During the 2006–07 reporting period, seven of the nine water sampling localities exceeded the water quality standard for trihalomethanes. Widespread exceedances were recorded in January 2007, although the values were only marginally above the standard. Non-complying localities were flushed when possible and no further actions were taken by Westernport Water. Results returned to below the standard at the next sampling event except in the locality of Ventnor. Further exceedances occurred in Grantville, San Remo, Cape Woolamai, Rhyll and Cowes in March and April 2007. Again, non-complying localities were flushed by Westernport Water and no further actions were taken. All results during the rest of the reporting period were below the standard.

Investigations by Westernport Water indicated that the trihalomethanes exceedances were most likely due to limitations of the Ian Bartlett Water Purification Plant (IBWPP) that did not allow for the accurate control of the chlorine dosage in response to highly variable raw water quality over the 2006–07 period. The variability of the raw water quality is related to the drought conditions being experienced by the region. An upgrade of treatment processes at the plant during the latter part of the reporting period was expected to significantly reduce trihalomethanes production as plant operators were able to better control chlorine dosing. Considerable work was done on reviewing and updating the procedures for testing at the plant. This provided a higher level of certainty in selecting and modifying chlorine and other chemical dose rates.

Ozone is not used by Westernport Water as a treatment chemical, therefore bromate and formaldehyde were not required to be monitored at the frequencies specified in Schedule 2 of the Regulations.

Other water quality issues of potential health significance

Non-compliances with the health-related guideline value for lead, detailed in the *Australian Drinking Water Guidelines* (2004), occurred in single samples collected from the localities of Cowes and Corinella. In response, Westernport Water flushed the reticulation systems in the affected areas to remove any residual lead, until the sampling results were below the guideline value.

Non-compliances with the iron and manganese aesthetic guideline values in the *Australian Drinking Water Guidelines* (2004) occurred during reporting period. In the case of iron, all localities exceeded the aesthetic guideline value on at least one occasion during the reporting period.

In the case of manganese, exceedances occurred in the localities of Bass, Grantville and Corinella. All results were below the health-related guideline for manganese. In response, the reticulation system was flushed to remove any residual manganese, and re-testing after the flushing showed that the manganese values were below the aesthetic guideline value.

Elevated levels of iron and manganese are an ongoing issue for Westernport Water and the causes appear to be drought-related.

Water quality incidents and events

During 2005–06, the following water quality incidents and events occurred:

Date	Supply	Issue	Action(s)
January 2007	Kilcunda, San Remo, Cape Woolamai, Rhyll, Cowes and Ventnor	Elevated trihalomethanes	Problem areas of the reticulation system flushed.
January 2007	Cowes	Elevated lead	Mains flushed until results from sampling showed levels below the guideline value.
February 2007	Cowes and Corinella	Elevated lead	Mains in problem areas flushed.
April 2007	San Remo and Cowes	Elevated trihalomethanes	Problem areas flushed.

Customer complaints related to water quality

A summary of the customer complaints on water quality during the 2006–07 reporting period that were recorded by Westernport Water is provided in the table below.

Complaint category	Number of water quality complaints	Number of complaints per 100 customers supplied
Discoloured water	74	0.9
Taste and odour	30	0.2
Blue water	0	0
Air in water	0	0
Illness	9	0.1
Other	18	0.9

The number of potable water quality complaints reported to Westernport Water during the 2006–07 period decreased slightly from the previous reporting period. The majority of complaints occurred in February 2007 with 22 colour complaints followed by June 2007 with 17 complaints. Westernport Water reported that these complaints were most likely due to the manganese and iron issues in the water supply.

Yarra Valley Water

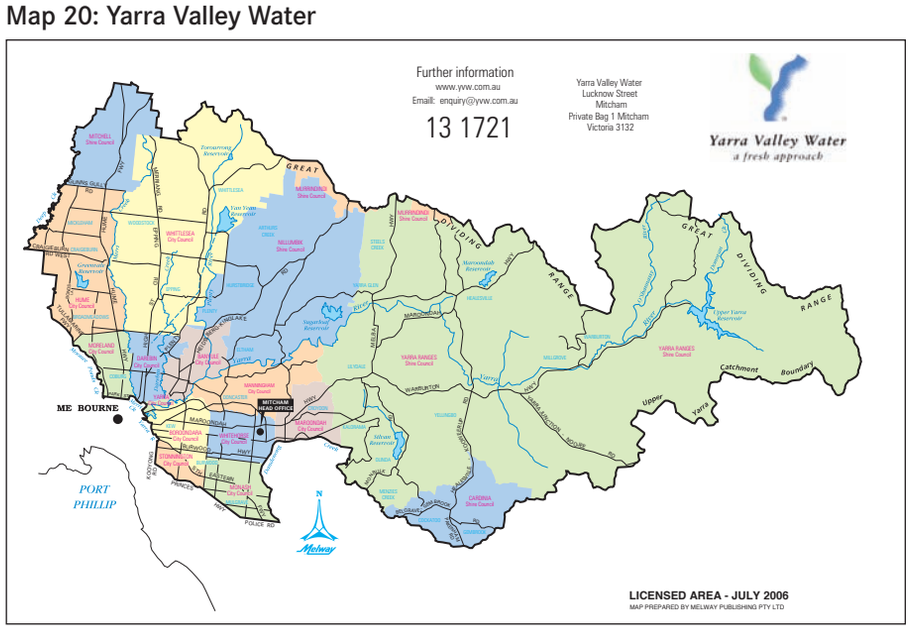
Head office: Mitcham

Localities supplied with drinking water: Glenroy, Preston, Northcote, Somerton, Bundoora, Lower Plenty, Epping, Plenty, Mernda/Hurstbridge, Whittlesea, Warburton, Healesville, Yarra Glen, Seville, Eltham, Woori Yallock, Emerald, Ridge/ Monbulk, Lilydale, Warranwood, Doncaster, Croydon, Mitcham, Kew, Ivanhoe, Montrose, Bayswater North, Glen Waverley, Malvern, Wallan, Yarra Junction, Lyrebird Avenue, Brahams Road.

(Please refer to Appendix J for a list of all individual suburbs supplied).

Population supplied with drinking water: approximately 1,460,000

Map 20: Yarra Valley Water



Map prepared by, and used with the permission of, Yarra Valley Water

Performance against water quality standards

All drinking water localities complied with the drinking water quality standards during 2006–07, except as noted in the table below.

Parameter	Localities not complying with water quality standard
E. coli	Seville

There were two detections of *E. coli* for the Seville locality which were investigated and reported to the Department. The first detection during February 2007 was at a low level and follow-up sampling showed no further detection of *E. coli*. The second detection was in March 2007, where there was a detection of 120 *E. coli*/100mL (see details in the Water quality incidents and events section below).

Also there was no monitoring for bromate and formaldehyde at the frequencies specified in Schedule 2 of the Safe Drinking Water Regulations 2005, as Ozone is not used either by Yarra Valley Water or Melbourne Water as a treatment chemical.

Other water quality issues of potential health significance

No other parameters measured by Yarra Valley Water, as part of its drinking water quality monitoring program, exceeded the relevant health guideline values set out in the *Australian Drinking Water Guidelines* (2004) during the reporting period.

For detailed water quality data, including data about other aesthetic characteristics of the water, please refer to Yarra Valley Water's Drinking Water Quality Annual Report for 2006–07.

Water quality incidents and events

During 2006–07, the following water quality incidents and events occurred:

Date	Supply	Issue	Action(s)
November 2006	Wallan	Detection of *Escherichia coli* at entry point	Localised cleaning of water mains and spot chlorination of storages within the locality. Follow-up samples were clear of *E. coli*.
February 2007	Warburton (Four Mile Creek High Level tank area)	Detection of *Escherichia coli* at tank	Extensive monitoring of the locality revealed the problem was localised. The tank was isolated, drained, inspected, cleaned and refilled. It was then spot dosed with chlorine and subsequent follow-up samples were clear of *E. coli*.
February 2007	Seville	Detection of *Escherichia coli* in drinking water	Localised mains cleaning and spot dosing of Lewis Hill Reservoir were undertaken. Follow-up samples were clear of *E. coli*.
March 2007	Seville	Detection of *Escherichia coli* in drinking water	*E. coli* was detected in significant numbers, 120 *E. coli*/100mL, in a routine sample. Yarra Valley Water conducted an extensive investigation in response to this second *E. coli* detection within the Seville locality. Mains were flushed and a monitoring program established across the entire locality to assess the extent and source of the contamination. Apart from the initial *E. coli* detection and those detected the following day from sampling mainly prior to mains cleaning, no further samples were found to contain *E. coli*. The source of the contamination within the Seville locality was not found. A new water main is proposed to increase turnover of water within the area and this will be constructed during 2007–08.
March 2007	Warburton (Warburton High Level tank)	Detection of *Escherichia coli* at tank	Spot dosing of the tank and mains flushing were undertaken. Follow-up samples were clear of *E. coli*.
April 2007	Preston area	Detection of *Escherichia coli* during main commissioning	*E. coli* was detected in a sample collected from a hydrant during a mains commissioning. The main was supplying customers at the time of sampling. Extensive cleaning of the mains was carried out and follow-up samples from customer taps in the area were clear of *E. coli*.
April 2007	Mt. Waverley, Glen Waverley and Oakleigh areas	Widespread Customer Complaint	Low turnover in two of Melbourne Water's transfer mains, caused by the maximisation of water supplied from Cardinia Reservoir resulted in 40 taste and odour complaints. Operational changes to increase the turnover in these mains were undertaken to prevent any further taste and odour issues.
May 2007	Emerald	Detection of *Escherichia coli* in drinking water	*E. coli* was detected in two samples, at the Gembrook high level tank and at a customer tap. Chlorination was increased and the mains extensively cleaned. Follow-up samples were clear of *E. coli*.
May 2007	East Warburton (Brahams Road)	Detection of *Escherichia coli* in drinking water	The detection of *E. coli* was in a non-routine sample of drinking water. All tanks in the Warburton area were spot dosed and water mains in the East Warburton area were flushed. A temporary chlorinator was installed to improve chlorine residuals across the locality. Follow-up samples were clear of *E. coli*.

Customer complaints related to water quality

A summary of the customer complaints related to water quality that were recorded by Yarra Valley Water during 2006–07 is provided in the table below. The total number of complaints was 0.52/100 customers, a decrease compared with the previous year.

Complaint Category	Number of Complaints	No. of Complaints per 100 customers*
Discoloured Water	2595	0.40
Taste and Odour	390	0.06
Blue Water	40	0.01
Air in Water	209	0.03
Illness – confirmed	0	0
Other (incl. Customer pipes)	162	0.02

* based on customer connections