

23. Werribee Basin

23.1 Location of Water Resources

The Werribee Basin is located within the South East Coast Drainage Division and includes Melbourne's western suburbs. The Werribee River and Lerderderg River meet upstream of Melton Reservoir and flows through the township of Werribee before entering Port Phillip Bay. A map of the river basin is shown in Figure 23-1.

Water Supply Protection Areas within the Werribee Basin include the whole Deutgam WSPA. Groundwater Management Areas within the Werribee Basin include the whole Merrimu GMA and part of the Cut Paw Paw GMA.

23.2 Responsibilities for Management of Water Resources

Southern Rural Water is responsible for managing the Werribee and Bacchus Marsh Irrigation Districts and is the licensing authority for groundwater and surface water licensed diversions within the Werribee Basin. Melbourne Water as bulk supplier to City West Water, and City West Water as retail supplier, are responsible for supplying water to those parts of the metropolitan area within the basin. Western Water is responsible for supplying urban demands in the north of the basin including Melton and Bacchus Marsh. The Port Phillip and Westernport Catchment Management Authority is responsible for waterway management in the Werribee Basin.

23.3 Seasonal Overview

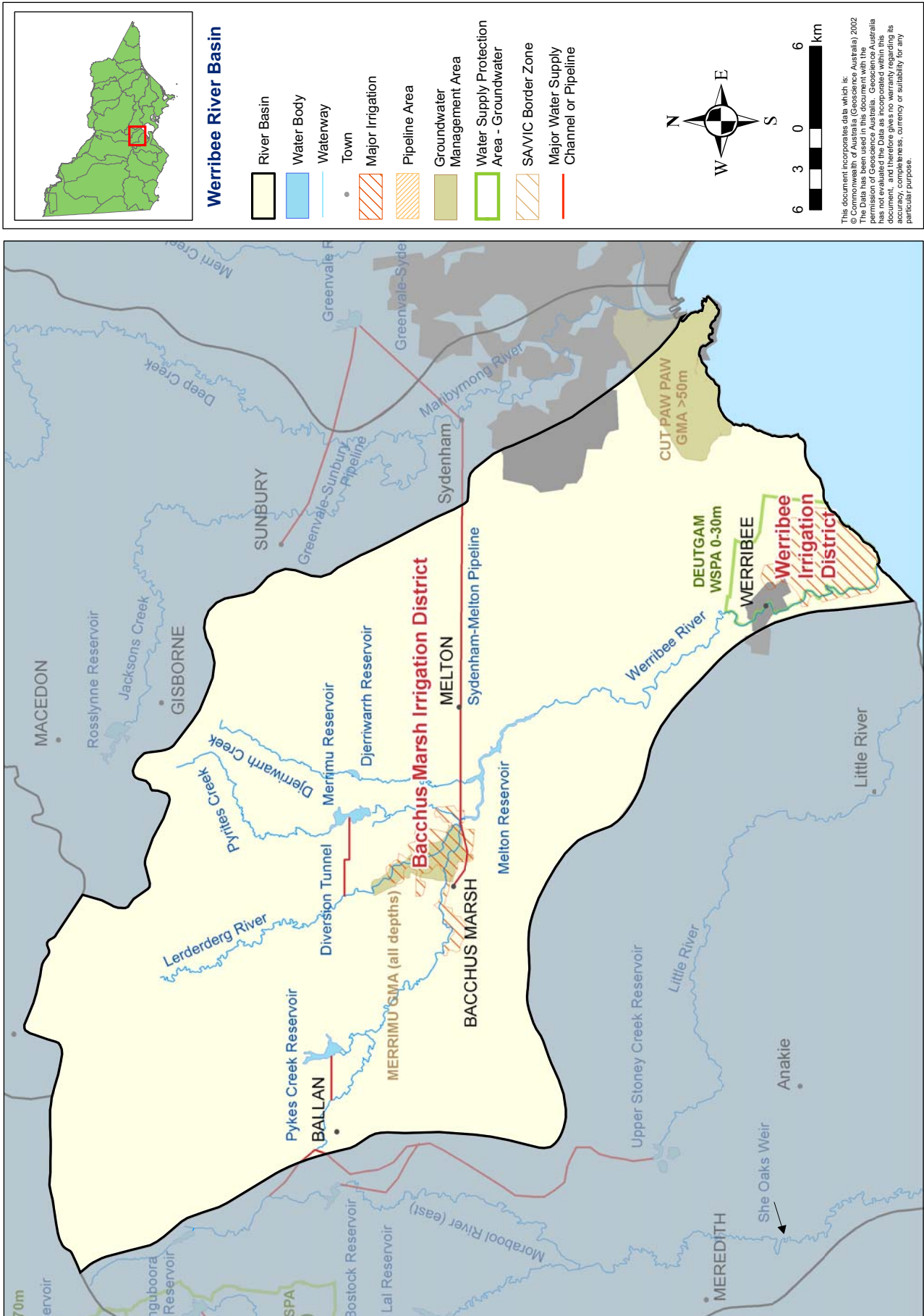
During 2003/04, rainfall in the Werribee river catchment was slightly lower than the long-term average. However the streamflows were well below average. Flows recorded in the upper reaches of the Lerderderg River (gauge 231213) were only 18 per cent of their long-term average. In Toolern Creek which flows near Melton recorded flows only 33 per cent of the long-term average (gauge 231231).

The seasonal allocation for irrigators in the Werribee and Bacchus Marsh Irrigation Districts was only 40 per cent of entitlement, the lowest seasonal allocation since the 1940s. A total of 38.5 per cent of entitlement was actually delivered from the Werribee River to irrigators in the Werribee Irrigation Area and 34.5 per cent was delivered in Bacchus Marsh Irrigation Area.

Stage 1 restrictions were in place for Myrning during July 2003 to September 2003, were increased to Stage 3 in October 2003 and then increased to Stage 4 in December 2003, which continued for the rest of 2003/04. Myrning's supply was augmented by tankered water for some 80 per cent of the year due to low supply levels in Pykes Reservoir and the consequent poor water quality. Stage 2 restrictions in Bacchus Marsh, Melton, Rockbank, Long Forest and Toolern Vale were increased to Stage 3 during July 2003 and continued until they were increased to Stage 4 in December 2003 and eased to Stage 2 in May 2004 when water from the Melbourne system became available to the area.

A water shortage was declared for the Werribee River in March 2004 lasting until June 2004. Irrigation bans were in place for Lerderderg River and Koroit Creek over November 2003 to June 2004. In July 2003, there was also a ban in the Lerderderg River and Stage 1 restrictions in Koroit Creek.

Figure 23-1 Map of the Werribee Basin



23.4 Summary of the Total Water Resources in the Basin

The total volume of water available and supplied from water resources in the Werribee Basin is shown in Table 23-1. City West Water transfers approximately 54,770 ML from the Yarra Basin to supply the Melbourne urban demand. Melbourne Water also transfers 1,816 ML to Western Water for the supply of Bacchus Marsh and Melton. Central Highlands Water supplies 341 ML to a number of towns from Lal Lal Reservoir located in the Moorabool Basin. The largest of these towns is Ballan, which is located in the Werribee Basin. These volumes are not included in the water accounts for the Werribee Basin because they are diverted from adjacent river basins.

Table 23-1 Summary of total water resource and water use in Werribee Basin 2003/04

Water source	Total Water Resource (ML)	Total Extraction (ML)
Surface water	43,650	22,360
Groundwater ⁽¹⁾	Not available	Not available
Recycled water	148,430	22,160

(1) The total resource and use is not stated because not all GMAs or WSPAs in this basin have more than 90 per cent of their surface area within the river basin boundary.

23.5 Environmental Water Reserve

In 2003/04 there was no formal environmental water reserve established in the Werribee Basin. The water available to the environment at the basin outlet was 10,970 ML, which is about 25 per cent of the catchment inflows in the basin. This amount consists of environmental flows required under bulk entitlements in the basin, and all other water flowing in the basin which was not taken out of the streams for consumptive uses.

23.6 Surface Water Resources

23.6.1 Water Balance

A surface water balance for the Werribee Basin is shown in Table 23-2. Southern Rural Water and Western Water operate storages within the basin, including Pykes Creek Reservoir, Melton Reservoir, Merrimu Reservoir and Western Water operates Djerriwarrh Reservoir. At the start of the year the storages were very low at only 12 per cent of capacity. Throughout the year the inflows to the basin were extremely low, only 32 per cent of the long-term average. This resulted in a further drop in the storage volumes to only seven per cent at the end of June 2004.

The estimate of in-stream losses to groundwater and evaporation is the volume of unaccounted for water after separately estimating inflows, outflows, change in storage and consumptive use. The losses accounted for in the water balance do not include losses occurring between the point of water diversions and the point of use.

Table 23-2 Balance of surface water in the Werribee Basin

Water Account Component	Volume (ML)
Storage Volume	
Volume in storage at start of year	8,330
Volume in storage at end of year	4,751
Change in storage	-3,579
Inflows	
Catchment inflow	43,650
Irrigation return flow	400
Treated effluent discharge back to river ⁽¹⁾	5,680
Subtotal	49,730
Diversions	
Urban diversions	3,780
Irrigation district diversions	8,830
Unregulated licensed private diversions	400
Catchment farm dams	9,350
Subtotal	22,360
Losses	
Evaporation losses from major storages	4,230
Losses from catchment farm dams	5,320
In-stream losses to groundwater and evaporation	10,410
Subtotal	19,960
Water passed at outlet of basin	
River outflows to Port Phillip Bay	10,970
Volume available to the environment in the Werribee Basin	10,970

(1) Assumes non-reused water is discharged to waterways, excluding the Western Treatment Plant

23.6.2 Catchment Farm Dams

The capacity of catchment farm dams in the Werribee Basin is estimated to be around 13,500 ML (Table 23-3). Average annual usage from the dams is estimated to be 9,300 ML, and after allowing for losses, the total catchment runoff that is harvested by the dams is estimated to be 14,700 ML. Specific information on catchment farm dam behaviour for 2003/04 was not readily available and the values provided in the table below are based on estimates of the average annual impact.

Catchment farm dams used for irrigation and commercial use are in the process of being licensed, and when the licences have been processed, the relevant volume will be accounted for under licensed diversions.

Table 23-3 Catchment Farm Dam Information

Type of catchment farm dam	Capacity (ML)	Usage (ML)	Total water harvested (ML)
Stock and domestic	5,870	2,930	n/a
Irrigation	7,630	6,410	n/a
TOTAL	13,500	9,340	14,670

n/a = information not available

23.6.3 Water Entitlement Transfers

The following transfers of water entitlement occurred with water users within the Werribee Basin in 2003/04:

- 0.8 ML of permanent transfer within the Werribee Irrigation District (WID)
- 42 ML of temporary transfer from the Bacchus Marsh Irrigation District to the WID
- 57 ML of temporary transfer from the Bacchus Marsh Irrigation District to the Werribee River
- A net 7 ML of temporary transfer from the WID to the Werribee River
- 628 ML of temporary transfer within the WID
- 23 ML of temporary transfer along the Werribee River
- 576 ML of temporary transfer within the Bacchus Marsh Irrigation District.

Overall there was one permanent transfer of water for a volume of 0.8 ML within the basin and 164 temporary transfers totalling 1,384 ML.

23.6.4 Volume Diverted

The volume of water diverted under each water authority's bulk entitlement is shown in Table 23-4. Compliance with individual bulk entitlement volumes is deemed to occur if water use is not more than the maximum volume that could have been diverted in 2003/04. It should be noted that not all of the bulk entitlements for the Werribee Basin were completed by the start of 2003/04 and values are not reported against those bulk entitlements. Licences on unregulated streams are not currently metered and hence compliance has not been assessed.

Central Highlands Water did not use any water from their Ballan bulk entitlement because the demand was supplied from Lal Lal Reservoir in the Moorabool Basin.

Table 23-4 Volume of water diverted under surface water entitlements in the Werribee Basin

Entitlement	Bulk entitlement (ML)	Net transfer of entitlement (ML)	Maximum volume divertible in 2003/04 (ML) ⁽¹⁾	Amount diverted (ML)	Complied?
<i>Central Highlands Water</i>					
Ballan	451	0	451	0	Yes
Blackwood & Barry's Reef	140	0	140	56	Yes
<i>Southern Rural Water</i>					
Werribee System - Irrigation	27,040	0	73,627 ⁽²⁾	8,833	Yes
<i>Western Water</i>					
Myrniong	n/a	0	58	5	Yes
Werribee System	n/a	0	n/a	1,816	n/a
Total volume of bulk entitlements	27,631	0	649	10,710	
<i>Unregulated licensed diverters</i>	910	0	910	403	

(1) Refers to the volume that could be diverted under the bulk entitlement cap, however, the volume of water may not be physically available for extraction.

n/a indicates that the bulk entitlement conversion order was not finalised at the start of 2003/04

23.6.5 Compliance with Passing and Environmental Flow Obligations in Bulk Entitlements

All passing and environmental flow obligations associated with bulk entitlements in the basin were complied with during 2003/04.

23.6.6 Compliance with Streamflow Management Plans

There is no Streamflow Management Plan (SFMP) currently in operation in the Werribee Basin.

23.7 Groundwater Resources

A summary of licensed volume and use in Groundwater Management Areas that overlap the Werribee Basin, excluding stock and domestic use, is shown in Table 23-5. An estimate of stock and domestic use within these management areas is provided in Table 23-6.

The Werribee Basin contains all of the Deutgam WSPA and Merrimu GMA and part of the Cut Paw Paw GMA. The volumes described in Table 23-5 are totals for the management areas and include the area that falls outside the Werribee Basin. Groundwater allocation and use for unincorporated areas has not been included in the 2003/04 water accounts.

The Deutgam WSPA has been subject to a groundwater pumping moratorium. This was due to sharply declining groundwater levels from intensive pumping for irrigation across the region. It is considered that over pumping may change the location and dynamics of the freshwater-seawater interface in the aquifer, leading to irreversible impacts on the groundwater resource. Groundwater levels appear to be stabilising, with monitoring of groundwater levels and salinity continuing.

Table 23-5 Compliance with Licensed Groundwater Volumes

Water Supply Protection Area/Groundwater Management Area ⁽¹⁾	GMA/WSPA Depth Limits ⁽²⁾	PAV (ML/yr)	Licensed Allocation ⁽³⁾ (ML)	Metered Use (ML)	Estimated Use in Unmetered Areas ⁽⁴⁾ (ML)	Total Water Resource ⁽⁵⁾ (ML)
Deutgam WSPA	0 - 30	2,400	5,535	547 (part) ⁽⁶⁾	Not applicable	5,535
Merrimu GMA	All Depths	450	421	74	Not applicable	450
Cut Paw Paw GMA (79%)	> 50	3,650	511	Not available	245	Not available ⁽⁷⁾

(1) The percentage of the GMA/WSPA by surface area within the river basin is given in the parentheses; where there is no percentage given, the entire management area falls within the river basin. Those GMA/WSPA with < five per cent surface area within the basin have not been included.

(2) This column indicates the aquifer depth limits for which the GMA/WSPA applies.

(3) Allocated volume includes domestic and stock usage.

(4) In non-metered areas estimate of use is based on the State average use for metered areas ('State Average' meaning the average percentage metered use versus PAV) equalling 48 per cent.

(5) The sum of PAVs or licensed volume, whichever is greater.

(6) Meters were installed in the Deutgam WSPA in February 2004 and were read in May of 2004.

(7) No estimate of Total Water Resource is applicable as >10 per cent GMA/WSPA is located outside the river basin.

Table 23-6 Number of Stock and Domestic Bores and Estimated Use

Water Supply Protection Area/Groundwater Management Area	No. of Stock and Domestic Bores ⁽¹⁾	Estimated Stock and Domestic Use (assuming 2ML/bore) ⁽¹⁾
Deulgam WSPA	257	514
Merrimu GMA	13	26
Cut Paw Paw GMA	2	4

(1) There are a number of licensed bores that also incorporate stock and domestic use. The estimated use for these bores is not included in the above table.

23.8 Recycled Water

The volume of water recycled in the Werribee Basin in 2003/04 is shown in Table 23-7. Five sewage treatment plants operate within the Werribee River. Overall 15 per cent of effluent is reused. Melbourne Water operates the largest STP, the Western Treatment Plant. The volume reused at the Western Treatment Plant includes on-site recycling of 17,945 ML. Other recycled water was used at the National Equestrian Centre and the Werribee Park Golf Course. A larger volume of treated effluent will be available for reuse after a major upgrade, and the treatment plant will be capable of supplying recycled water to the Werribee Irrigation District.

Table 23-7 Volume of recycled water

Sewage Treatment Plant	Water Authority	Total volume of effluent (ML)	Volume reused (ML)
Altona	City West Water	5,676	0
Western Treatment Plant	Melbourne Water	138,668	18,075
Ballan	Central Highlands Water	85	85
Melton	Western Water	3,105	3,105
Parwan South	Western Water	891	891
TOTAL		148,425	22,156

