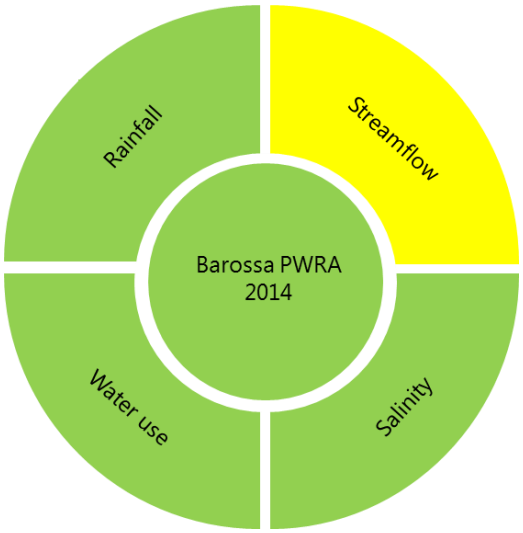
Barossa PWRA

Surface water status report

2014

Government of South Australia
Department of Environment,
Water and Natural Resources

2014 Summary



The Barossa Prescribed Water Resources Area (PWRA) has been assigned a green status for 2014:

No adverse trends, indicating a stable or improving situation

This hydrological status for 2014 is supported by:

- above average rainfall at 3 of 3 rainfall analysis sites
- average or above average streamflow at 3 of 4 streamflow analysis sites
- steady or freshening salinity at 3 salinity analysis sites
- low water use compared to annual streamflow.

This status report provides a snapshot of the surface water resources in the Barossa PWRA for the financial year 2013–14. Surface water status reports are limited to reporting on the hydrological status of the PWRA. Available data on climate, streamflow, salinity and water use is summarised and compared with recent and long-term data to provide an indication of the hydrological status of its water resources. Each element is discussed with reference to recent or more long-term trends where, if at all, they are present in the data. These status reports seek to support informed policy-development and management decisions by resource managers and those responsible for, or reliant on, the water resources. Status of the prescribed resource for the previous years is shown below.

2010–11 Status (green)	2011–12 Status (yellow)	2012–13 Status (amber)	2014 Status (green)

This status report does not seek to evaluate the sustainable limits of the resource, nor does it make any recommendations on management or monitoring of the resource. These actions are important, but occur through separate processes.

The Barossa PWRA is located approximately 60 km north-east of Adelaide (Figure 1). Surface water (including within watercourses) and groundwater resources in the PWRA have been prescribed under South Australia's *Natural Resources Management Act 2004*. A Water Allocation Plan (WAP) was developed by the Adelaide and Mount Lofty Ranges Natural Resources Management Board in 2009, which seeks to provide for sustainable management of water resources.

Status symbols

No adverse trends, indicating a stable or improving situation (green)

Trends are either stable (no significant change), or have improved over the reporting period, indicating that there is insignificant risk of impact to the beneficial use of the resource.

Adverse trends, indicating low risk to the resource in the short-term (1 to 3 years) (yellow)

Observed adverse trends are gradual and if continued, are unlikely to lead to a change in the current beneficial uses of the surface water resource in the short-term.

Adverse trends, indicating medium risk to the resource eventuating in the short-term (amber)

Observed adverse trends are significant and if continued, moderately likely to lead to a change in the current beneficial uses of the surface water resource in the short-term.

Adverse trends, indicating high risk to the resource within the short-term (red)

Trends indicate degradation of the resource is occurring. Degradation will very likely result in a change in the beneficial use (e.g. reduced ability to access surface water entitlements and/or decline in the condition of environmental assets).

Unclear (grey)

Trends are unable to be determined due to a lack of adequate information on which to base a sound judgement of status.

Data from the same stations summarised in previous reports are used in analysis, for comparison of annual trends. Three long-term meteorological stations were selected for analysis of rainfall trends: Angaston (M023300), Tanunda (M023318) and Williamstown (M023752) (Figure 1). Annual rainfall was above average at all analysis sites in 2013–14. The spring months of September and October recorded below average rainfall for the third consecutive year across all stations analysed. This is the second consecutive year of below average rainfall in September, October and November.

Four long-term gauging stations were selected for analysis of streamflow trends: North Para River at Yaldara (A5050502), North Para River at Penrice (A5070517), North Para River at Mt McKenzie (A5050533) and Tanunda Creek (A5050535) (Figure 1). Streamflow was average or above average at 3 of 4 analysis sites in 2013–14.

Three long-term gauging stations were selected for analysis of salinity trends: North Para River at Yaldara (A5050502), North Para River at Penrice (A5070517) and Tanunda Creek (A5050535) (Figure 1). Salinity was steady or freshening in 2013–14 when compared to the range of salinity for the previous year.

Water use was low in 2013–14 when expressed as a percentage of the total available streamflow in 2013–14.

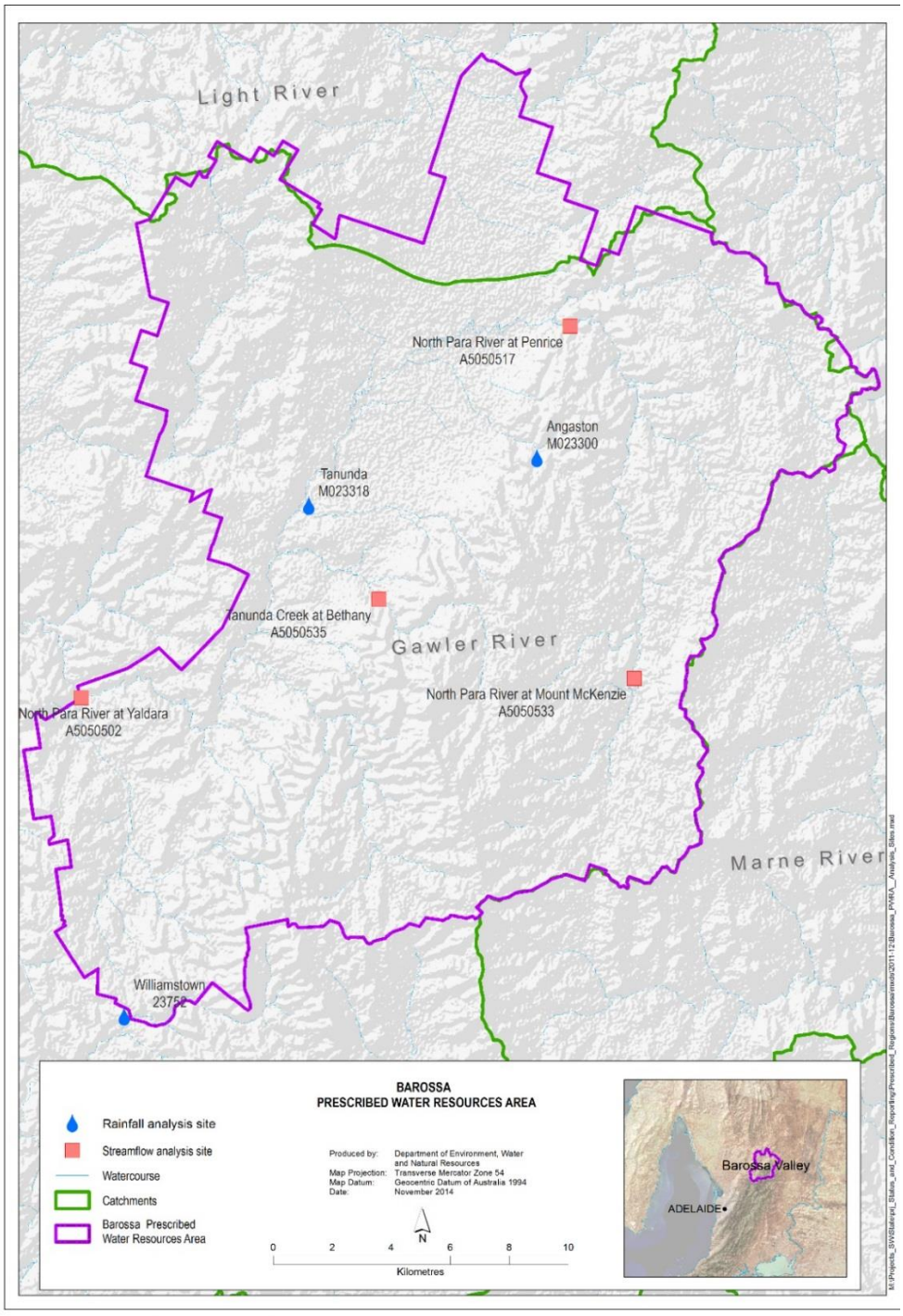


Figure 1. Monitoring analysis sites as used in the Barossa PWRA Surface water status report

Rainfall

Status	Degree of confidence	Comments on recent historical context
Above average rainfall at all rainfall analysis sites	High: good coverage of rainfall stations representing rainfall variation across the region	Above average rainfall at all stations after below average rainfall the previous year

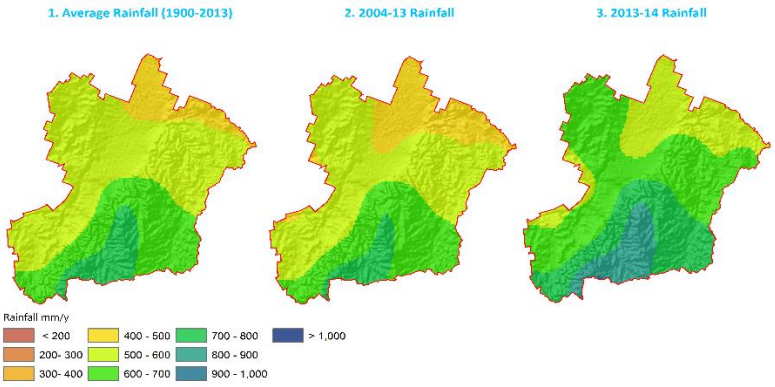


Figure 2. Annual rainfall distributions for the Barossa PWRA

Rainfall in the Barossa PWRA typically varies from 300 millimetres (mm) in the north to over 750 mm in the south (Figure 2). The three panels of Figure 2 indicate that rainfall was higher across the entire PWRA for the year 2013–14 (Panel 3) in comparison to the long–term and short-term averages (Panels 1 and 2).

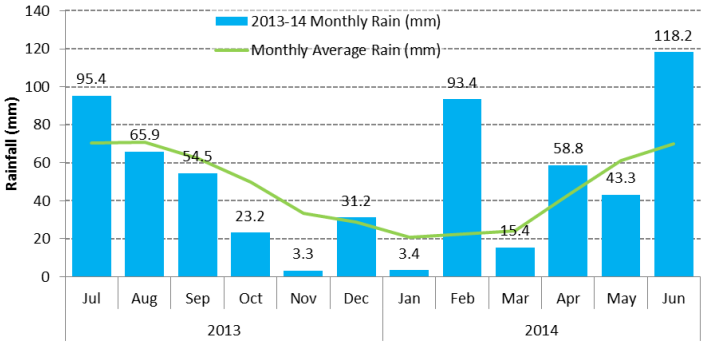


Figure 3. Monthly rainfalls at Angaston (M023300)

Angaston Bureau of Meteorology (BoM) rainfall station received an above average rainfall of 606 mm in 2013–14 in comparison to its long-term average of 557 mm (Figure 3). Above average rainfall was experienced predominantly in the late summer, autumn and winter months across 2013–14. The months of August to November all received below average rainfall.

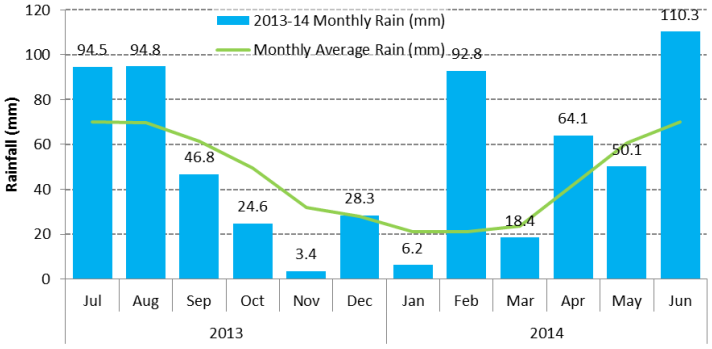


Figure 4. Monthly rainfalls at Tanunda (M023318)

Tanunda BoM rainfall station received an above average rainfall of 634 mm in 2013–14 in comparison to its long-term average of 549 mm (Figure 4). As was recorded at Angaston BoM rainfall station, above average rainfall was experienced predominantly in the late summer, autumn and winter months across 2013–14.

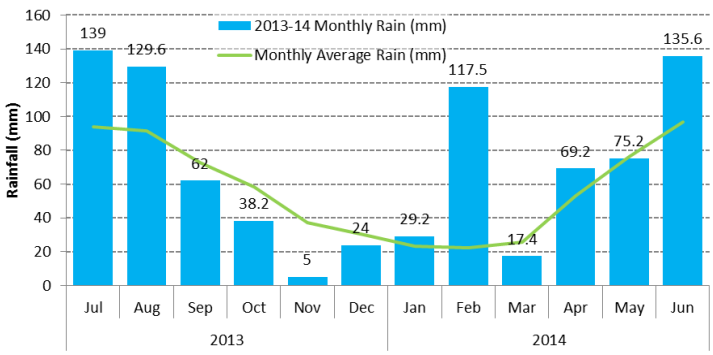


Figure 5. Monthly rainfalls at Williamstown (M023752)

Williamstown BoM rainfall station received an above average rainfall of 842 mm in 2013–14 in comparison to its long-term average of 681 mm (Figure 5). Above average rainfall was experienced in 6 months across 2013–14. The months of September to December all received below average rainfall.

Streamflow

Status	Degree of confidence	Comments on recent historical context
Average or above average streamflow at 3 of 4 streamflow analysis sites	High: data derived from long-term gauging stations	Average or above average streamflow at Yaldara, Mt McKenzie and Bethany after consecutive years of below average streamflow and third consecutive year of below average streamflow at Penrice after well above average streamflow recorded in 2010–11

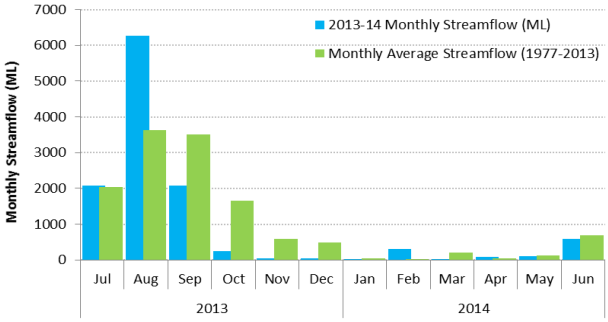


Figure 6. Monthly streamflow at Yaldara (A5050502)

North Para River at Yaldara gauging station (A5050502) experienced an around average annual streamflow of 11 841 megalitres (ML) for 2013–14 (9% lower than the 13 015 ML long-term average). The monthly breakdown of streamflow for 2013–14 (Figure 6) highlights that 4 months received above average streamflow. Streamflow reductions ranged from 10% during May to 94% during November.

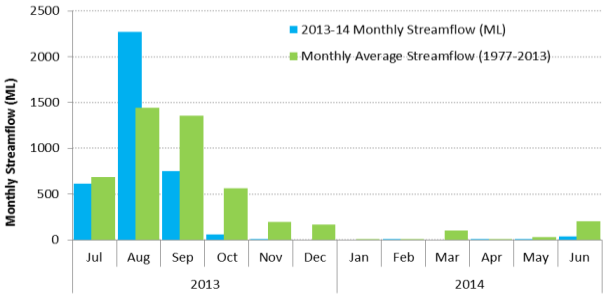


Figure 7. Monthly streamflow at Penrice (A5050517)

North Para River at Penrice gauging station (A5050517) experienced a below average annual streamflow of 3743 ML for 2013–14 (21% lower than the 4755 ML long-term average). The monthly breakdown of streamflow for 2013-14 (Figure 7), highlights that the months of August and February received above average streamflow. 97% of the total streamflow was received during July to September with no streamflow recorded in December, January and March.

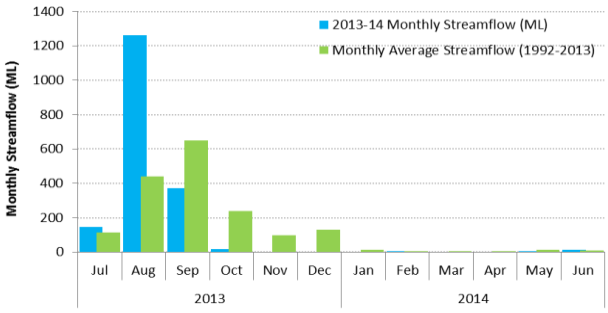


Figure 8. Monthly streamflow at Mt McKenzie (A5050533)

North Para River at Mt McKenzie gauging station (A5050533) experienced an above average annual streamflow of 1807 ML for 2013–14 (6% higher than the 1706 ML long-term average). The monthly breakdown of streamflow for 2013–14 (Figure 8) highlights that 4 months received above average streamflow. August alone received 70% of the annual total while no streamflow was recorded from November to January and March to April.

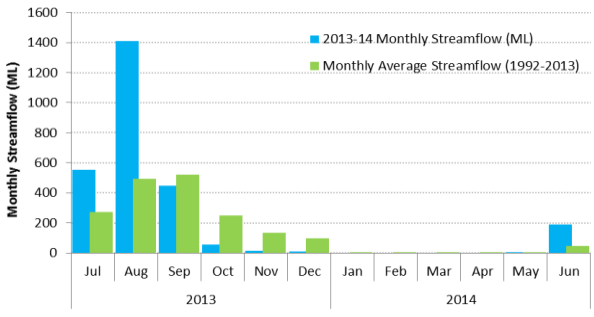


Figure 9. Monthly streamflow at Bethany (A5050535)

Tanunda Creek at Bethany gauging station (A5050535) experienced an above average annual streamflow of 2684 ML for 2013–14 (47% higher than the 1827 ML long-term average). The monthly breakdown of streamflow for 2013–14 (Figure 9) highlights that July, August and June were the months to receive above average streamflow. 80% of the annual total was received in these months. No streamflow was recorded from January to April.

Salinity

Status	Degree of confidence	Comments on recent historical context
Steady or freshening at all salinity analysis sites	High: data derived from long-term salinity monitoring	Salinity trends show the high range of salinity in 2013–14 being less than 2012–13 at the Penrice and Bethany stations. The salinity trend at Yaldara is steady compared to the previous year

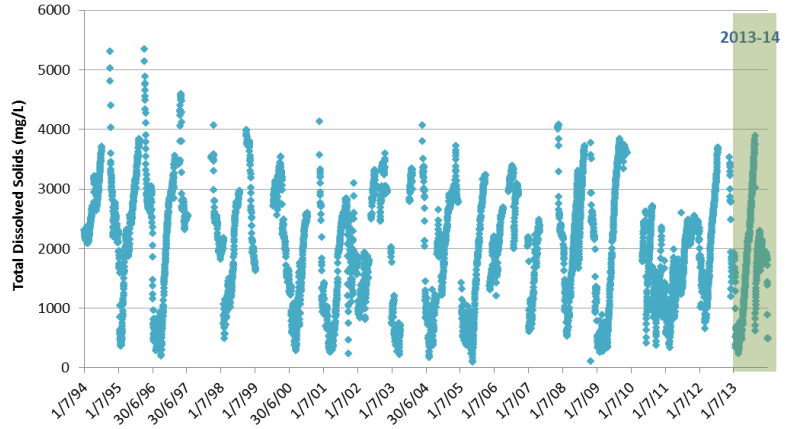


Figure 10. Salinity data at North Para River at Yaldara from 1994–2014

Of the total record for North Para River at Yaldara, 20% was recorded as <1000 mg/L, 47% of the record was between 1000–2500 mg/L, 32% between 2500–4000 mg/L and 1% was >4000 mg/L. The salinity range in 2013–14 is steady compared to the previous year but less than the high salinity levels recorded around 1995–96.

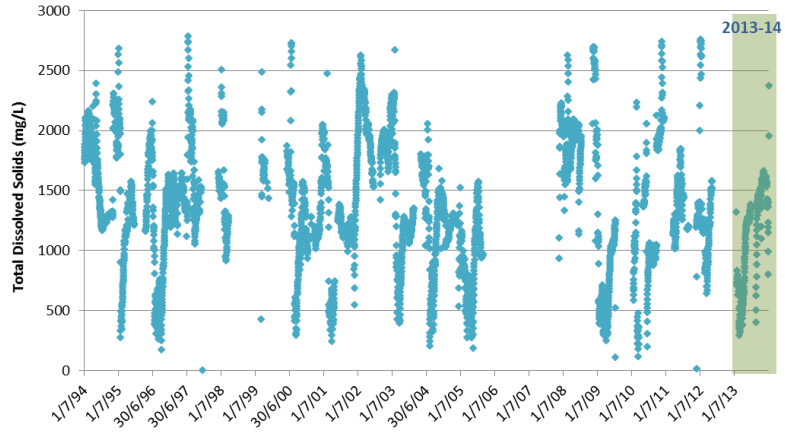


Figure 11. Salinity data at North Para River at Penrice from 1994–2014

For North Para River at Penrice, 21% was recorded as <1000 mg/L, 77% was between 1000-2500 mg/L and 2% of the record was >2500 mg/L. The salinity range in 2013–14 is lower compared to the previous year.

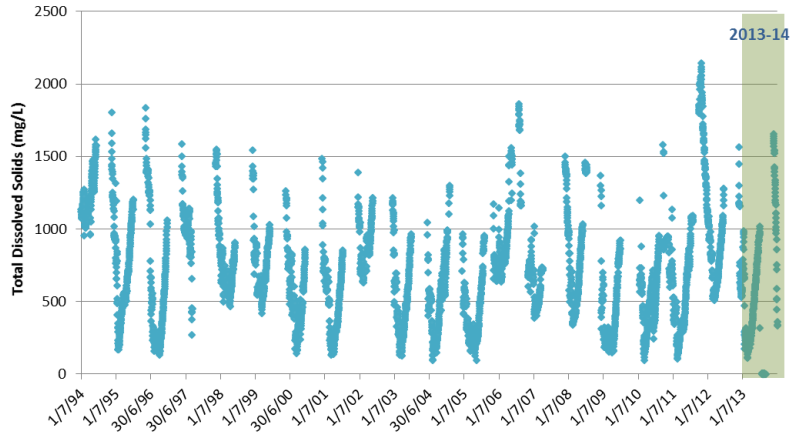


Figure 12. Salinity data at Tanunda Creek at Bethany from 1994–2014

For Tanunda Creek at Bethany, 82% of the total record was recorded as <1000 mg/L and 18% was between 1000–2500 mg/L. The salinity range in 2013–14 is lower compared to the previous year.

Surface water use

Status	Degree of confidence	Comments on recent historical context
Low use compared to annual streamflow	High to medium: high confidence in metered data, medium confidence in estimated data	Water use as a % of annual streamflow has decreased during 2013–14

Surface water use is summarised by licensed extractions and estimated non-licensed demand, together with supply from outside of the PWRA (Table 1). Imported water brings water from the River Murray for the purpose of municipal water supply and irrigation of high value crops, including wine grapes.

Table 1. Summary of surface water use in the Barossa PWRA

Barossa PWRA surface water use (ML)		Licensed surface water extractions (dams)	447
		Licensed watercourse extractions	943
		Estimated non-licensed water demand	1100
Imported Water (ML)		Barossa Infrastructure Ltd	6481
		SA Water mains (off-peak supply only)	1946
Total water extractions (ML)			**10917**

Water usage from licensed surface water sources in 2013–14 totalled approximately 1390 ML (447 + 943), which is down from the previous year's total of 1474 ML. Imported water use is down to 8427 ML (6481 + 1946) from the previous year's total of 8953 ML.

Existing stock and domestic dams are not managed through the Barossa WAP (i.e. the volume taken from them is not limited to an allocated volume and they are not metered) therefore an estimate is used to report on non-licensed water demand. The estimated non-licensed water demand is 1100 ML and this volume equates to approximately 30% of the existing stock and domestic dam capacity. As long as the estimated non-licensed dam capacity remains unchanged from one year to the next, so too will the estimated non-licensed surface water demand, irrespective of variations in annual rainfall and streamflow. As such, the limitations of this estimation method should be kept in mind when considering estimated non-licensed surface water demand.

The distribution of water use across the PWRA from 2008–14 is shown in Figure 13.

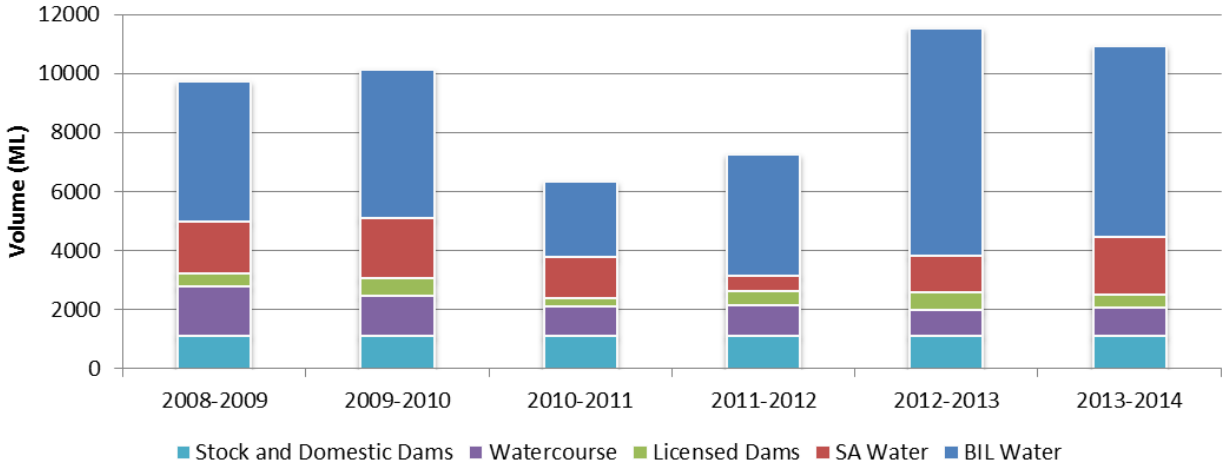


Figure 13. Surface water use in the Barossa PWRA from 2008–14

Recorded streamflow for the PWRA in 2013–14 was approximately 11 841 ML (at Yaldara), with approximately 2490 ML (sum of licensed and non-licensed extraction) recorded or estimated as being extracted. As such, of the 14 331 ML (11 841 plus 2490 ML) total estimated PWRA streamflow volume for 2013–14 (not including evaporation from farm dams), it is estimated that 17% was extracted for use (54% in 2012–13).

The PWRA has been assigned a use rating of 2 (Low use) for 2013–14.

Table 2. Use rating system

Rating	% of resource capacity used in current year	Description
1	0 – 10 %	Negligible use
2	11 – 20 %	Low use
3	21 – 30 %	Moderate use
4	31 – 40 %	High use
5	41 – 50 %	Very high use
6	Greater than 50 %	Extremely high use

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This Surface water status report is available online at http://www.waterconnect.sa.gov.au

To view the *Barossa PWRA Surface water status report 2010–11*, which includes background information on location, rainfall, streamflow, salinity, water use and relevant water dependent ecosystems, please visit the Water Resource Assessments page on WaterConnect.

For further details about the Barossa PWRA please see the *Water Allocation Plan for the Barossa PWRA* on the Natural Resources Adelaide and Mount Lofty Ranges website.

Gridded rainfall data was sourced from the Bureau of Meteorology (BoM). Station rainfall data was sourced from SILO and is Patched Point Data. Further information on SILO climate data is available at: http://www.longpaddock.qld.gov.au/silo/index.html.

Streamflow and salinity data are available via WaterConnect: http://www.waterconnect.sa.gov.au.

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