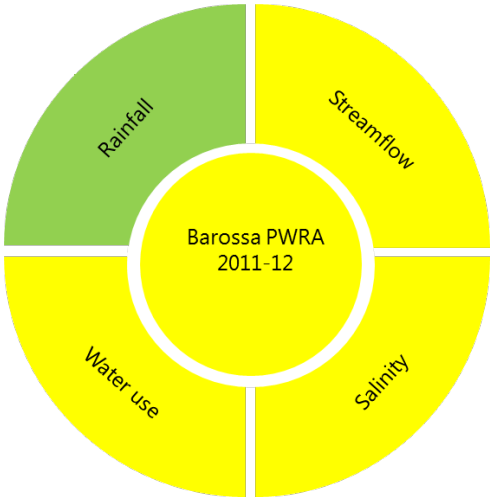
Barossa PWRA

Surface water status report

2011–12

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

2011–12 Summary



The Barossa Prescribed Water Resources Area (PWRA) has been assigned a yellow status for 2011–12:

Adverse trends indicating low risk to the resource in the short-term

This hydrological status for 2011–12 is supported by:

- Average or above average rainfall at all rainfall analysis sites
- below average streamflow at all streamflow analysis sites
- variable salinity
- moderate 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 2011–12. 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 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)

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. Data from three long-term meteorological stations were selected for analysis of rainfall trends; Angaston (M023300), Tanunda (M023318) and Williamstown (M023752) (Figure 1). Rainfall was average or above average at all analysis sites in 2011–12.

Data from 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 below average at all analysis sites in 2011–12.

Data from 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 variable in 2011–12 when compared to the range of salinity for the previous year.

Water use was moderate in 2011–12 when expressed as a percentage of the total available streamflow in 2011–12.

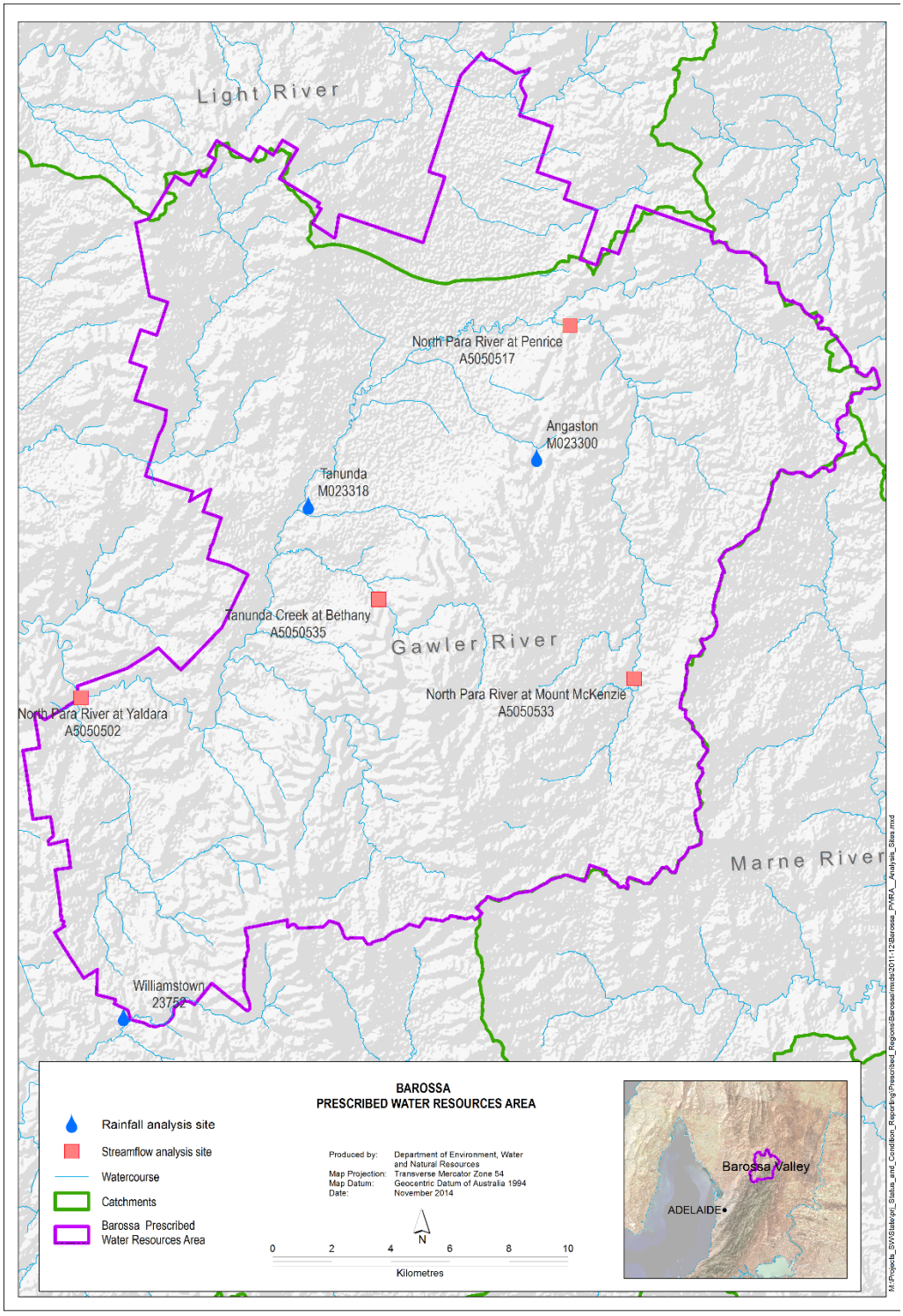


Figure 1. Monitoring analysis sites as used in the Barossa PWRA Surface water status report

Rainfall

Status	Degree of confidence	Comments on recent historical context
Average or above rainfall at all rainfall analysis sites	High: good coverage of rainfall stations representing the spatial rainfall variation across the region	Above average rainfall at Angaston and Tanunda stations after above average rainfall the previous year. Average rainfall at Williamstown after above average rainfall the previous year.

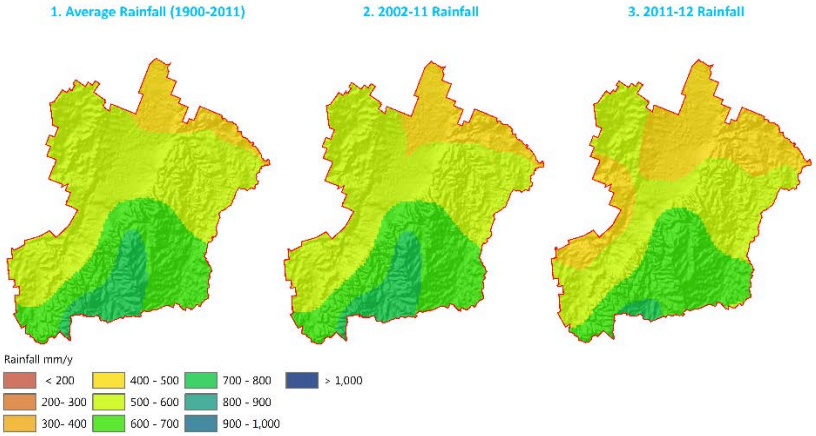


Figure 2. Annual rainfall distributions for the Barossa PWRA

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 lower rainfall was more widespread in the north and west of the PWRA for the year 2011–12 (panel 3) in comparison to the long–term and short–term averages (panels 1 and 2).

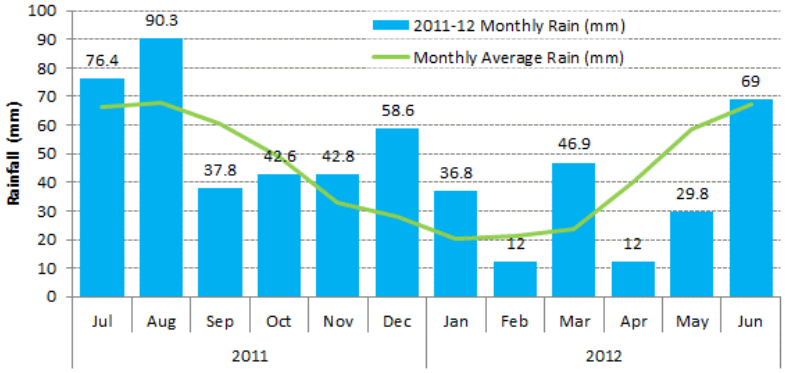


Figure 3. Monthly rainfalls at Angaston (M023300)

Angaston Bureau of Meteorology (BoM) rainfall station received an above average rainfall of 555 mm in 2011–12 in comparison to its long-term average of 535 mm (Figure 3). Above average rainfall was experienced in 7 months across 2011–12, including the late spring and summer months where December and March received double the monthly average rainfall.

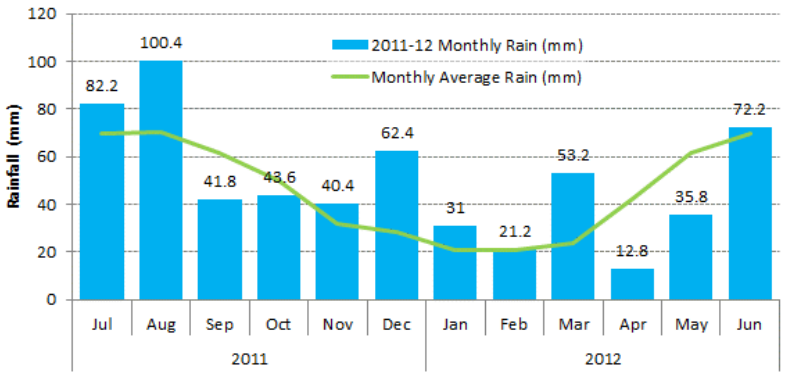


Figure 4. Monthly rainfalls at Tanunda (M023318)

Tanunda BoM rainfall station received an above average rainfall of 597 mm in 2011–12 in comparison to its long-term average of 552 mm (Figure 4). Above average rainfall was experienced in 8 months across 2011–12. As was recorded at Angaston BoM rainfall station, the months of December and March received double the monthly average rainfall.

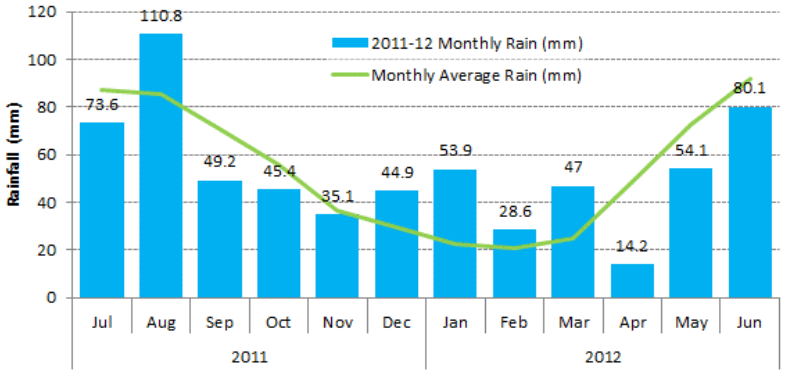


Figure 5. Monthly rainfalls at Williamstown (M023752)

Williamstown BoM rainfall station received an average rainfall of 637 mm in 2011–12, 2% below in comparison to its long-term average of 647 mm (Figure 5). Above average rainfall was experienced predominantly in the summer months across 2011–12. The months of September, April and May were consistently below average across all rainfall stations summarised.

Streamflow

Status	Degree of confidence	Comments on recent historical context
Below average streamflow at all streamflow analysis sites	High: data derived from long-term gauging stations	Below average streamflow at all streamflow analysis sites after well above average streamflow recorded at all sites in 2010–11

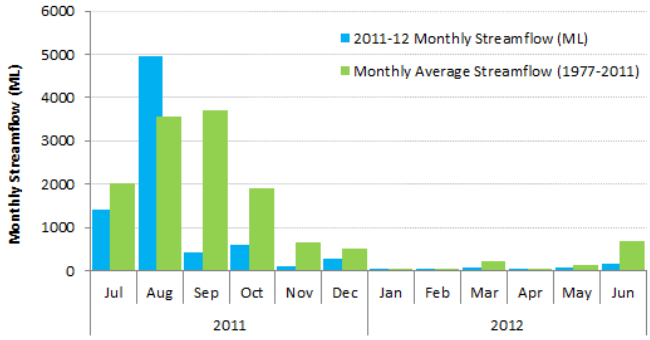


Figure 6. Monthly streamflow at Yaldara (A5050502)

North Para River at Yaldara gauging station (A5050502) experienced a below average annual streamflow of 8101 megalitres (ML) for 2011–12 (40% lower than the 13480 ML long-term average). The monthly breakdown of streamflow for 2011–12 (Figure 6) highlights that August was the only month to receive well above average streamflow. August alone received 61% of the annual total with all other months receiving below average streamflow.

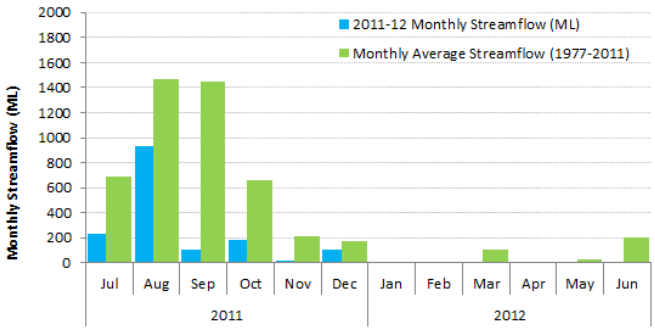


Figure 7. Monthly streamflow at Penrice (A5050517)

North Para River at Penrice gauging station (A5050517) experienced a below average annual streamflow of 1573 ML for 2011–12 (69% lower than the 5019 ML long-term average). The monthly breakdown of streamflow for 2011–12 (Figure 7), highlights that all months received below average streamflow. 75% of the total streamflow was received during July and August with no streamflow recorded from February to May.

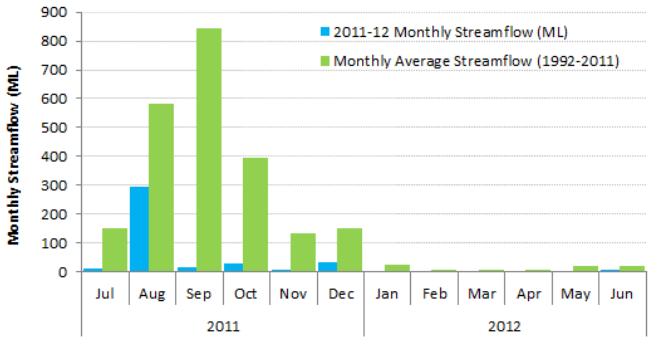


Figure 8. Monthly streamflow at Mt McKenzie (A5050533)

North Para River at Mt McKenzie gauging station (A5050533) experienced a below average annual streamflow of 381 ML for 2011–12 (84% lower than the 2319 ML long-term average). The monthly breakdown of streamflow for 2011–12 (Figure 8) highlights that all months received well below average streamflows. August alone received 77% of the annual total. No streamflow was recorded from January to May.

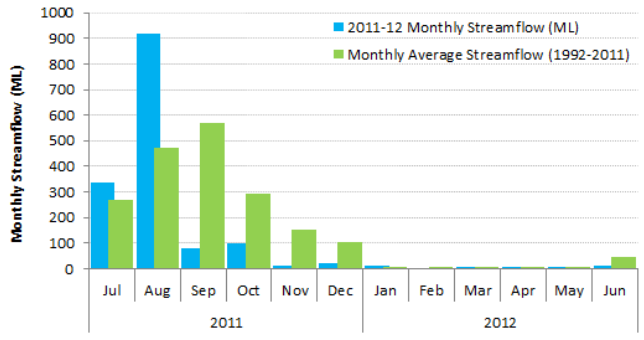


Figure 9. Monthly streamflow at Bethany (A5050535)

Tanunda Creek at Bethany gauging station (A5050535) experienced a below average annual streamflow of 1504 ML for 2011–12 (22% lower than the 1918 ML long-term average). The monthly breakdown of streamflow for 2011–12 (Figure 9) highlights that above average streamflow was experienced in 5 months across 2011–12 with July and August receiving 84% of the annual total. No streamflow was recorded in the month of February.

Salinity

Status	Degree of confidence	Comments on recent historical context
Variable	High: Data derived from long-term salinity monitoring	Salinity trends show the high range of salinity in 2011–12 being less than 2010–11 at Yaldara and steady at Penrice. The salinity trend at the Bethany station is higher compared to the previous year.

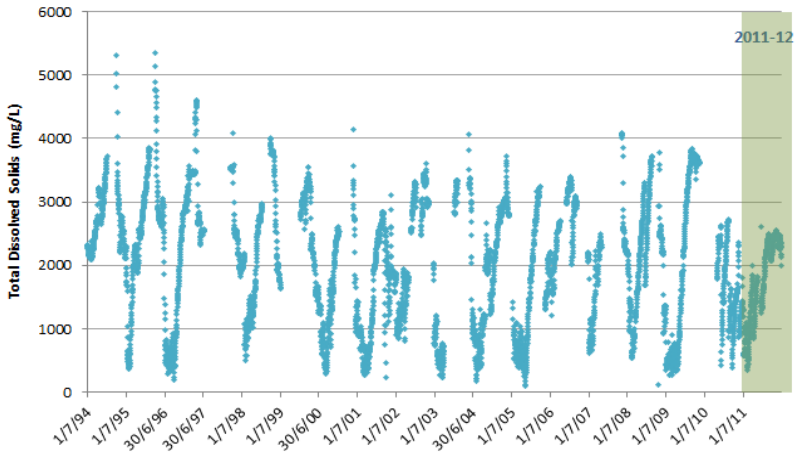


Figure 10. Salinity data at North Para River at Yaldara from 1994–2012

Of the total record for North Para River at Yaldara, 21% was recorded as <1000 mg/L, 45% of the record was between 1000–2500 mg/L, 33% between 2500–4000 mg/L and 1% was >4000 mg/L. The salinity range in 2011–12 is less than the previous year, and less than the high salinity levels recorded around 1995–96.

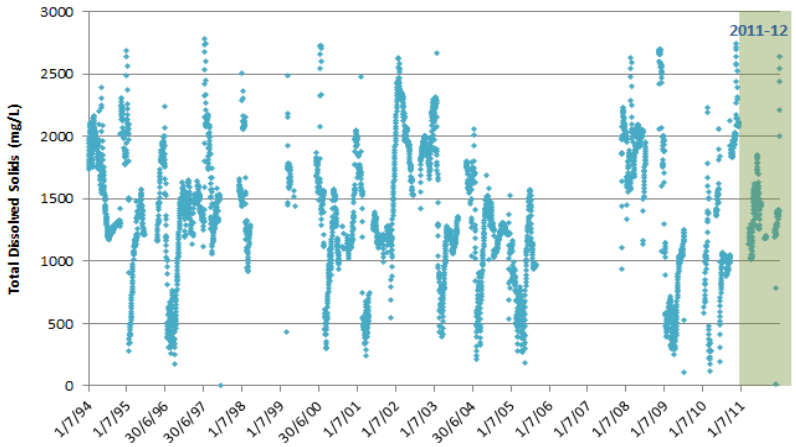


Figure 11. Salinity data at North Para River at Penrice from 1994–2012

For North Para River at Penrice, 20% was recorded as <1000 mg/L, 79% was between 1000–2500 mg/L and 2% of the record was >2500 mg/L. The salinity range in 2011–12 is comparable to the previous year and comparable to the high salinity levels recorded throughout the period of record.

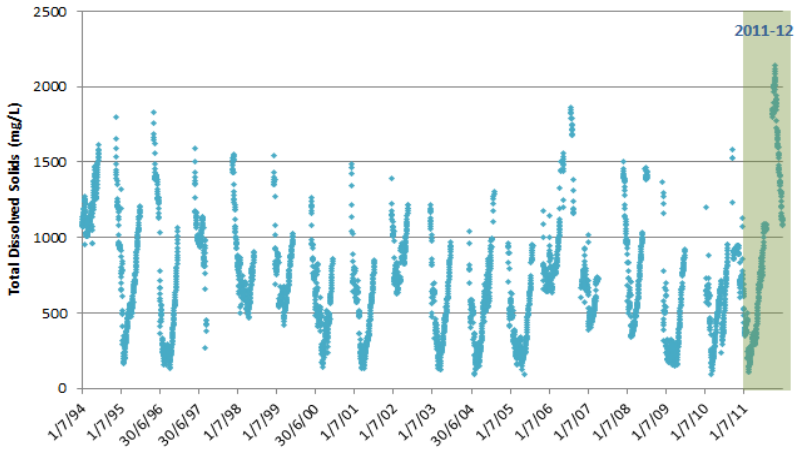


Figure 12. Salinity data at Tanunda Creek at Bethany from 1994–2012

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 2011–12 is higher compared to the previous year and are the highest levels recorded.

Surface water use

Status	Degree of confidence	Comments on recent historical context
Moderate use compared to annual streamflow	High to medium: high confidence in metered data, medium confidence in estimated data	Water use from licensed surface water resources and imported water has risen during 2011–12

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)	461
		Licensed watercourse extractions	1055
		Estimated non-licensed water demand	1100
Imported Water (ML)		Barossa Infrastructure Ltd	4128
		SA Water mains (off-peak supply only)	525
Total water extractions (ML)			**7269**

Water usage from licensed surface water sources in 2011–12 totalled approximately 1516 ML (461 + 1055), which is up from the previous year's total of 1279 ML. Imported water use is up to 4653 ML (4128 + 525) from the previous year's total of 3950 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 2008-2012 is shown in Figure 13.

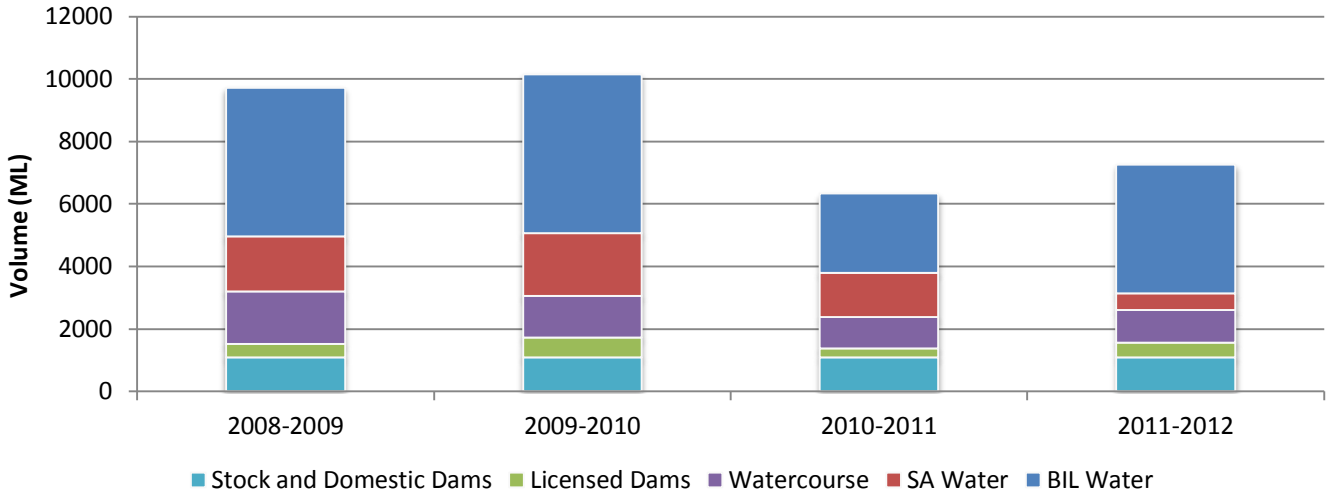


Figure 13. Surface water use in the Barossa PWRA from 2008–12

Recorded streamflow for the PWRA in 2011–12 was approximately 8101 ML (at Yaldara), with approximately 2616 ML (sum of licensed and non-licensed extraction) recorded or estimated as being extracted. As such, of the 10717 ML (8101 plus 2616 ML) total estimated PWRA surface water volume for 2011–12 (not including evaporation from farm dams), it is estimated that 24% was extracted for use (14% in 2010–11).

The PWRA has been assigned a use rating of 3 (Moderate use) for 2011–12.

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

Department of Environment, Water and Natural Resources

25 Grenfell Street, Adelaide

GPO Box 1047, Adelaide SA 5001

Telephone	National	(08) 8463 6946
	International	+61 8 8463 6946
Fax	National	(08) 8463 6999
	International	+61 8 8463 6999
Website	www.environment.sa.gov.au	

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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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