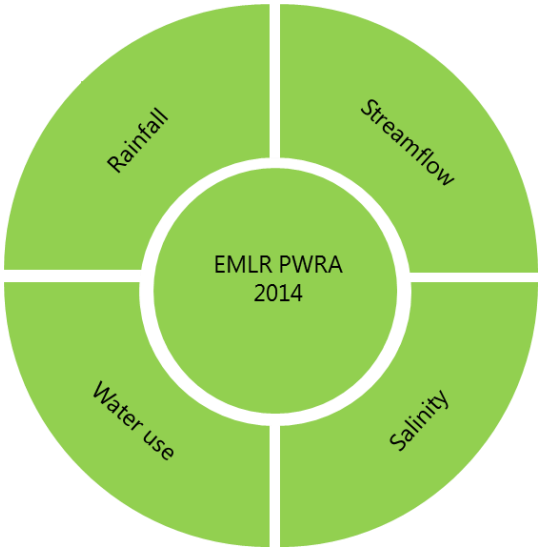
Eastern Mount Lofty Ranges PWRA

Surface water status report

2014

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

2014 Summary



The Eastern Mount Lofty Ranges 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, which is based at a whole prescribed area scale (and does not consider local scale impacts), is supported by:

- above average rainfall at 4 of 4 rainfall analysis sites
- above average streamflow at 4 of 4 streamflow analysis sites
- steady or freshening salinity at 5 salinity analysis sites
- low water use compared to resource capacity considered over the entire PWRA and not at a local scale.

This annual status report provides a snapshot of the surface water resources in the Eastern Mount Lofty Ranges (EMLR) PWRA for the financial year 2013–14. Surface water status reports are limited to reporting on the hydrological status of the PWRA on an annual basis and at a whole prescribed area scale. 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.

2012–13 Status (yellow)	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 such as prescription and water allocation planning.

The EMLR PWRA is located approximately 50 km 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 South Australian Murray-Darling Basin Natural Resources Management Board in 2013, which seeks to provide for sustainable management of water resources.

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.

Four long-term meteorological stations were selected for analysis of rainfall trends; Mount Barker (M023733), Finniss (M023714), Langhorne Creek (M024515) and Tepko (M024533) (Figure 1). Rainfall was above average at all analysis sites in 2013-14. This is the second consecutive year of above average rainfall in the winter months of June and July across all stations analysed.

Four long-term gauging stations were selected for analysis of streamflow trends: Angas River at Angas Weir (A4260503), Finniss River 4 km East of Yundi (A4260504), Currency Creek near Higgins (A4260530) and Bremer River near Hartley (A4260533) (Figure 1). Streamflow was above average at all analysis sites in 2013-14. All stations have recorded above average streamflow the past two years during the winter months of July and August. Conversely, streamflow has been below average the past two years at Angas, Finniss and Bremer River stations during the spring and summer months of September to January and the autumn months April and May.

Five gauging stations were selected for analysis of salinity trends: Angas River at Cheriton Road (A4261074), Finniss River at Ford Road (A4261075), Currency Creek near Higgins (A4260530), Bremer River near Hartley (A4260533) and Reedy Creek U/S Waterfall (A4261172) (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.

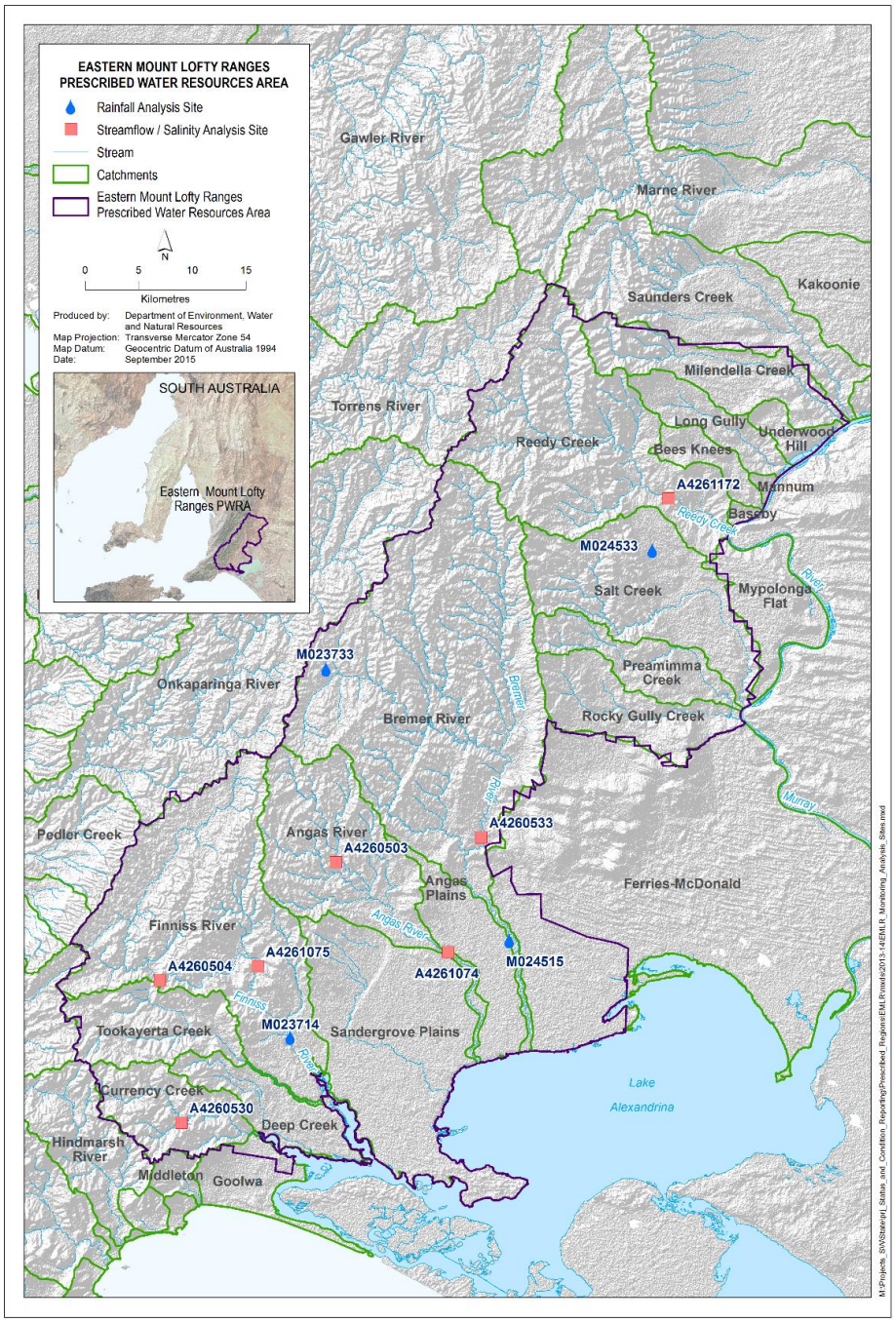


Figure 1. Monitoring analysis sites as used in the Eastern Mount Lofty Ranges PWRA Surface water status report

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 Mount Barker, Langhorne Creek and Tepko after below average rainfall the previous year. 2013–14 was the fifth consecutive year of above average rainfall at Finniss.

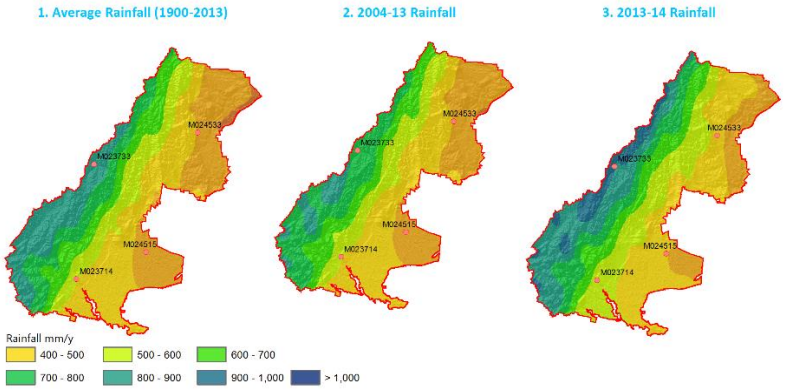


Figure 2. Annual rainfall distributions for the EMLR PWRA

Rainfall in the EMLR PWRA varies from 900 millimetres (mm) in the south-west to 300 mm in the north-east (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).

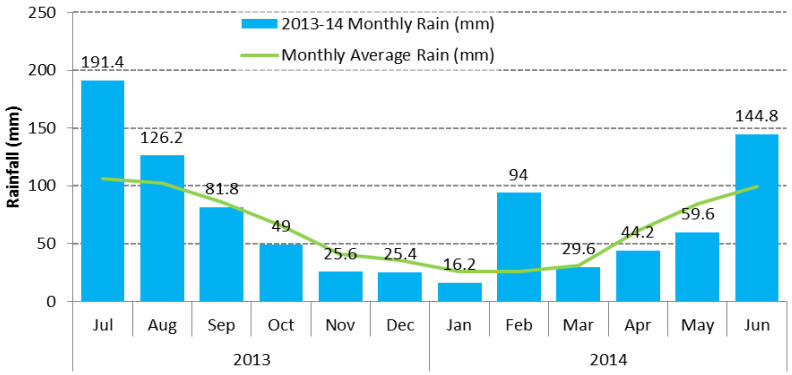


Figure 3. Monthly rainfalls at Mount Barker (M023733)

Mount Barker Bureau of Meteorology (BoM) rainfall station received an above average rainfall of 888 mm in 2013–14 in comparison to its long-term average of 766 mm (Figure 3). Above average rainfall was experienced predominantly in the late summer and all winter months across 2013–14. 2013–14 was the third successive year of below average rainfall in the spring and summer months of September to January and the second successive year in the autumn months of March to May.

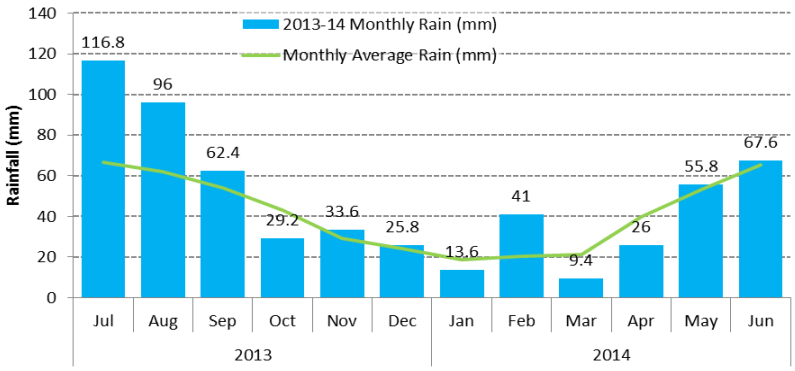


Figure 4. Monthly rainfalls at Finniss (M023714)

Finniss BoM rainfall station received an above average rainfall of 577 mm in 2013–14 in comparison to its long-term average of 497 mm (Figure 4). Above average rainfall was experienced in eight months across 2013–14, with well above average rainfall predominantly in the late winter months and also February. 2013–14 was the third successive year of below average rainfall in the months of October, January and April.

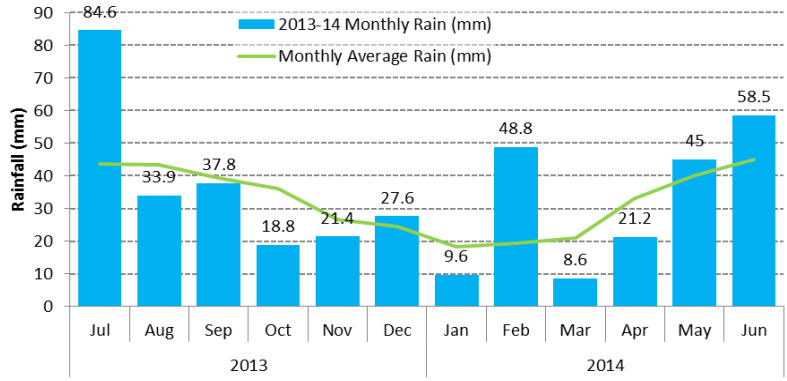


Figure 5. Monthly rainfalls at Langhorne Creek (M024515)

Langhorne Creek BoM rainfall station received an above average rainfall of 416 mm in 2013–14 in comparison to its long-term average of 390 mm (Figure 5). Above average rainfall was experienced predominantly in the late summer and winter months across 2013–14. The spring months of September to November all received below average rainfall. 2013–14 was the third successive year of below average rainfall in the late winter and spring months of August to November and the autumn month of April.

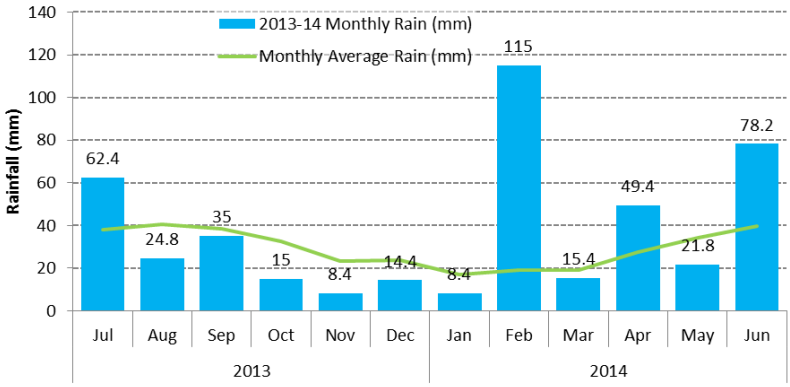


Figure 6. Monthly rainfalls at Tepko (M024533)

Tepko BoM rainfall station received an above average rainfall of 448 mm in 2013–14 in comparison to its long-term average of 353 mm (Figure 6). Above average rainfall was experienced in four months across 2013–14. The months of August to January all received below average rainfall. As was observed across all previous rainfall analysis sites, the month of February received well above average rainfall. 2013–14 was the third successive year of below average rainfall in the late winter and spring months of August to November and the summer month of January.

Streamflow

Status	Degree of confidence	Comments on recent historical context
Above average streamflow at all streamflow analysis sites	High: data derived from long-term gauging stations for Angas River, Finniss River and Bremer River Medium: data for Currency Creek is a combination of gauging station and modelled streamflow data	Second consecutive year of above average streamflow at Angas River, Currency Creek and Bremer River after below average streamflow in 2011-12. Above average streamflow at Finniss River after two consecutive years of below average streamflow.

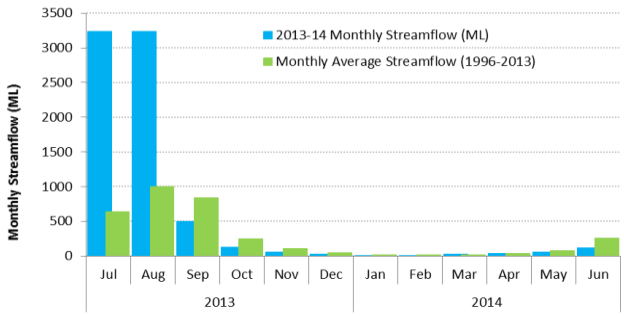


Figure 7. Monthly streamflow at Angas River (A4260503)

Angas River at Angas Weir (A4260503) experienced an above average annual streamflow of 7415 megalitres (ML) for 2013–14 (126% higher than the 3284 ML long-term average). The monthly breakdown of streamflow for 2013-14 (Figure 7) highlights that three months received above average streamflow, with the late winter months of July and August receiving well above the monthly average streamflow.

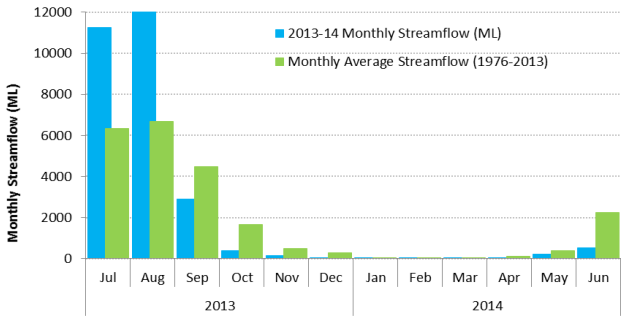


Figure 8. Monthly streamflow at Finniss River (A4260504)

Finniss River 4 km East of Yundi (A4260504) experienced an above average annual streamflow of 27 691 ML for 2013–14 (21% higher than the 22 798 ML long-term average). The monthly breakdown of streamflow for 2013-14 (Figure 8), highlights the late winter months of July and August received well above the monthly average streamflow. 84% of the total streamflow was received during July and August.

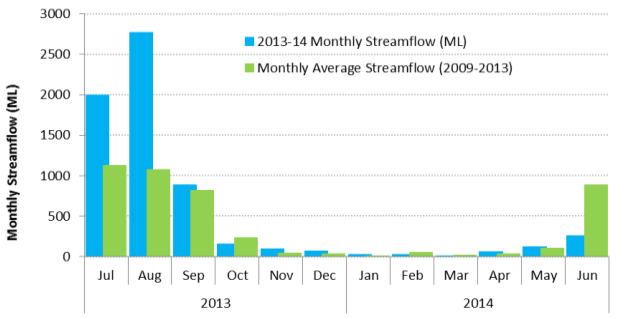


Figure 9. Monthly streamflow at Currency Creek (A4260530)

Currency Creek near Higgins (A4260530) experienced an above average annual streamflow of 6474 ML for 2013–14 (46% higher than the 4430 ML long-term average). The monthly breakdown of streamflow for 2013-14 (Figure 9) highlights that eight months received above the monthly average streamflow, the majority received in the late winter and early spring months.

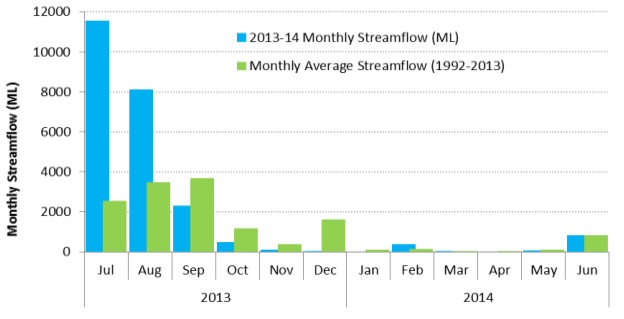


Figure 10. Monthly streamflow at Bremer River (A4260533)

Bremer River near Hartley (A4260533) experienced an above average annual streamflow of 23 761 ML for 2013–14 (71% higher than the 13 877 ML long-term average). The monthly breakdown of streamflow for 2013-14 (Figure 10) highlights that July, August and February were the months to receive above average streamflow. As was observed across all previous streamflow analysis sites, the months of July and August received the majority of the total streamflow.

Salinity

Status	Degree of confidence	Comments on recent historical context
Steady or freshening at all salinity analysis sites	Fair: apart from Bremer River near Hartley, data is derived from short-term monitoring stations	Stations show the high range of salinity being steady or lower when compared to the previous year

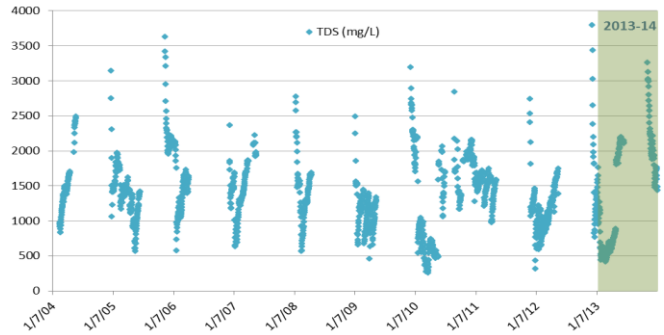


Figure 11. Salinity at Angas River (A4261074) from 2004–14

Of the total record for Angas River at Cheriton Road, 25% was recorded as <1000 mg/L, 72% of the record was between 1000-2500 mg/L and 3% between 2500-4000 mg/L. The salinity range in 2013-14 is lower compared to the previous year.

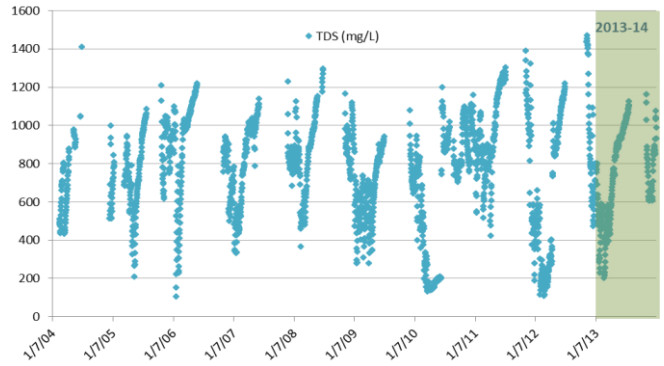


Figure 12. Salinity at Finniss River (A4261075) from 2004–14

Of the total record for Finniss River at Ford Road, 81% was recorded as <1000 mg/L and 19% of the record was between 1000-2500 mg/L. The salinity range in 2013-14 is lower compared to the previous year.

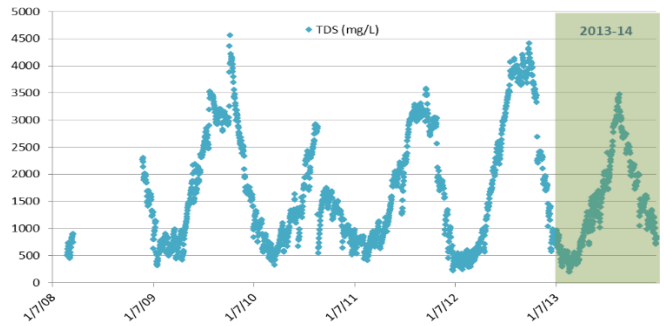


Figure 13. Salinity at Currency Creek (A4260530) from 2008–14

Of the total record for Currency Creek near Higgins, 35% was recorded as <1000 mg/L, 41% of the record was between 1000-2500 mg/L, 22% between 2500-4000 mg/L and 2% was >4000 mg/L. The salinity range in 2013-14 is lower compared to the previous year and less than the high salinity levels recorded around 2009-10.

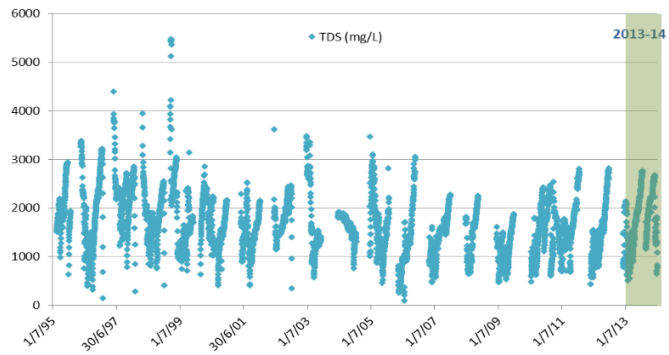


Figure 14. Salinity at Bremer River (A4260533) from 1995–2014

Of the total record for Bremer River near Hartley, 13% was recorded as <1000 mg/L, 78% of the record was between 1000–2500 mg/L, 9% between 2500–4000 mg/L and less than 1% was >4000 mg/L. The salinity range in 2013–14 is steady compared to the previous year and less than the high salinity levels recorded around 1998–99.

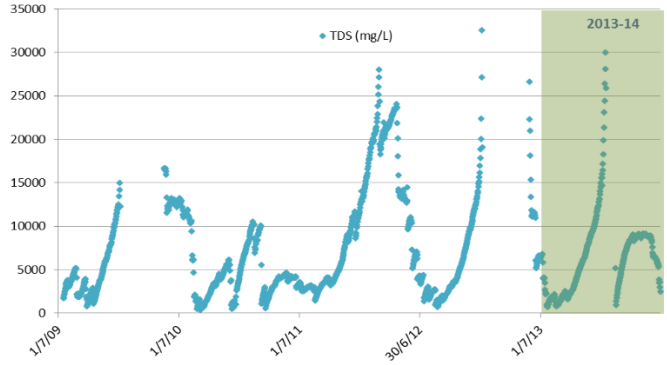


Figure 15. Salinity at Reedy Creek (A4261172) from 2009–14

The high range of salinity levels for Reedy Creek, located in the north of the PWRA, are much higher than the previous stations summarised, which are located in the south. Of the total record for Reedy Creek U/S Waterfall, 49% was recorded as <5000 mg/L, 42% of the record was between 5000-15 000 mg/L, 8% between 15 000-25 000 mg/L and less than 1% was >25 000 mg/L. The salinity range in 2013-14 is slightly lower compared to the previous year.

Surface water use

Status	Degree of confidence	Comments on recent historical context
Low use compared to annual streamflow	Fair: licensed water use is based on estimates as roll-out of water licenses is being finalised	Water use as a % of annual streamflow has decreased during 2013–14

This section includes a description and estimates of surface water use at a whole prescribed area scale. As such, this may not represent the spatial variability of water use across the EMLR PWRA. Surface water use is summarised by estimated non-licensed demand, licensed surface water demand, Lower Angas Bremer flood diversion, and plantation forestry (Table 1).

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

EMLR PWRA surface water use (ML)	Estimated non-licensed water demand	3483
	Licensed surface water demand	4043
	Lower Angas Bremer flood diversion	4786
	Plantation forestry	3191
Total water extractions (ML)		**15 503**

In order to determine the impact of water use, a comparison of estimated water use and resource capacity is provided below.

Water use for the EMLR PWRA in 2013-14 was estimated to be 15 503 ML. The resource capacity of the PWRA as stated in the EMLR PWRA WAP is 107 753 ML, which is based on the long-term (1971-2006) mean annual runoff, adjusted to remove the impacts of farm dams, watercourse diversions, urban runoff and plantation forestry. To make the resource capacity more relevant to the 2013-14 reporting year, it has been scaled. This was achieved by taking into account the streamflow recorded in 2013-14 and the long–term resource capacity of surface water management zones upstream of the gauging stations, as outlined in the EMLR PWRA WAP. Finniss River gauging station, which received above average streamflow in 2013-14, was weighted higher due to the catchment's contribution percentage to the total resource capacity of the EMLR PWRA. As a result, the total scaled resource capacity for the EMLR PWRA is equal to 128 506 ML, higher than the long-term average resource capacity. In 2013-14 it is estimated that 12% of the scaled resource capacity was used (20% in 2012-13). In terms of the rating system described by Table 2, the EMLR PWRA has been assigned a use rating of 2 (Low use) for 2013-14. The assessed 'low use' rating is based at a whole prescribed area scale but it is acknowledged that high demand zones have been identified at finer scales and other projects are working to address this issue.

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 *Eastern Mount Lofty Ranges PWRA Surface water status report 2012–13*, 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 Eastern Mount Lofty Ranges PWRA please see the *Water Allocation Plan for the Eastern Mount Lofty Ranges PWRA* on the Natural Resources South Australian Murray-Darling Basin 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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