Barossa PWRA

2015 Surface water status report

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Water and Natural Resources

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This document is available online at www.waterconnect.sa.gov.au/Systems/GSR/Pages.

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

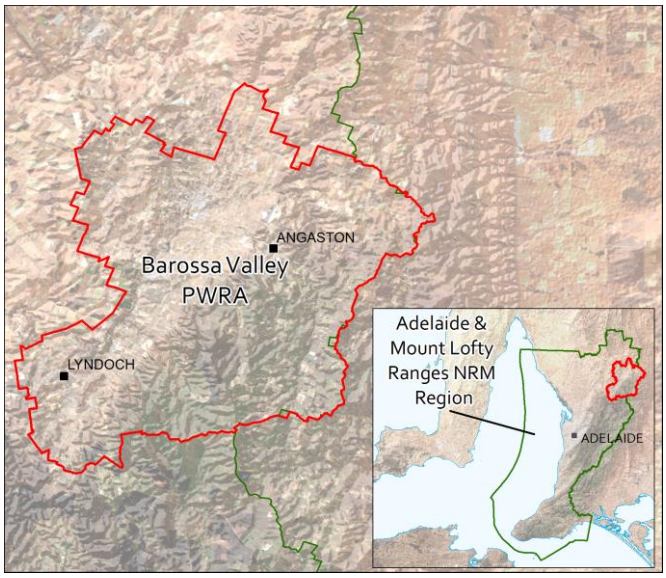
For further details about the *Barossa PWRA*, please see the *Water Allocation Plan* for the Barossa PWRA on the Natural Resources Adelaide and Mount Lofty Ranges website.

Gridded rainfall data was sourced from the Bureau of Meteorology (BoM). Station rainfall data was sourced from the Scientific Information for Land Owners database (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.

To view descriptions for all status symbols, please visit WaterConnect.

2015 Summary



Description of the Prescribed Area

The Barossa Prescribed Water Resources Area (PWRA) is located approximately 60 km north-east of Adelaide. 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) developed by the Adelaide and Mount Lofty Ranges Natural Resources Management Board and adopted in 2009, seeks to provide for sustainable management of these water resources.

The Barossa PWRA is situated along the northern extent of the Adelaide and Mount Lofty Ranges NRM Region and is characterised by hills and valleys, extending into localised flat plains in the north west of the region. The main watercourses that flow through the Barossa PWRA are the ephemeral Tanunda and Jacobs Creeks, while the North Para River is the main ephemeral watercourse draining to the west. Many permanent pools, fed by groundwater, occur along these ephemeral watercourses.

Surface water resources are highly dependent on rainfall, with trends in streamflow and salinity primarily climate driven, i.e. below-average winter rainfall results in a reduction in annual streamflow volumes. Below-average summer rainfall can also result in increased irrigation extractions, and these two elements can cause salinities to increase by reducing the amount of streamflow available to dilute salts. Conversely, increased rainfall results in increased surface water availability, decreased irrigation extractions, with potential decline or stabilisation of salinity.

Rainfall summary

The Angaston rainfall station (M023300) is located on the outskirts of the township of Angaston (Fig. 4), where annual rainfall totalled 386 mm during the 2014–15 water-use year, 147 mm below the long-term average (Fig. 1). Last year's rainfall was also the third lowest of the past 38 years of rainfall records at the Angaston rainfall station (for the period 1977-2015, to align with the period of available streamflow data). During the 12 months to June 2015, only four months (July, November, January and April) had above average rainfall, while the late winter and early spring months of August to October received below average rainfall during the last three consecutive years. A similar trend of months with predominantly below average rainfall during August to October was experienced at the Tanunda (M023318) and Williamstown (M023752) rainfall stations that represent the western and southern reaches of the Barossa PWRA respectively. The spatial distribution of rainfall for the past five-years shows little deviation from the long-term average across the Barossa PWRA, with a slight decrease in the amount of rainfall received along the northern boundary (Fig. 4, 2nd panel). By comparison, the spatial distribution of rainfall for 2014–15 indicates a well below average rainfall in comparison to the long-term average across the entire PWRA.

Streamflow summary

Four long-term streamflow gauging stations are located within the Barossa PWRA. Mt McKenzie, Penrice and Yaldara gauging stations are located along the North Para River, with Mt McKenzie located at the top of the catchment and Yaldara capturing the flows draining the Barossa PWRA. The Tanunda Creek gauging station is located in Bethany, measuring flow from an adjoining sub-catchment, with its confluence with the North Para River upstream of the Yaldara gauging station. The Yaldara gauging station recorded annual streamflow of 10 454 ML in the 2014–15 water-use year (46th percentile), lower than the long-term average annual streamflow of 12 964 ML and ranks in the 25th–50th percentile (%ile) range of streamflow over the period of record (Fig. 2). However, only one month (7644 ML in July 2014) had above average streamflow, with the late winter and spring months recording below average or no streamflow during the 2014–15 water year at all gauging stations within the Barossa PWRA. The annual streamflow volume recorded at the Yaldara gauging station from 1977–2015 (Fig. 2) indicates a long-term declining trend, with similar trends being observed at the Penrice and Mt McKenzie gauging stations. This long-term declining trend in streamflow is in contrast with a slight increase in the long-term rainfall recorded at rainfall stations within the Barossa PWRA during the same period.

Water use summary

Surface water use in the Barossa PWRA includes licensed extractions from dams and watercourses that are metered, estimated demand from non-licensed farm dams (generally stock and domestic), and the Barossa Infrastructure Limited (BIL) Scheme. The latter brings treated water from the River Murray by SA Water for the purpose of municipal water supply and irrigation of high value crops, including wine grapes. During 2014–15 the volume of imported water totalled 9279 ML (7545 ML BIL Scheme + 1734 ML SA Water), with the previous year's total being 8427 ML. Water use from licensed surface water sources totalled 1661 ML in 2014-15, with the previous year's total being 1390 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. Estimated non-licensed water demand is 1100 ML and this volume equates to approximately 30% of the existing stock and domestic dam capacity. Recorded streamflow for the Barossa PWRA in 2014–15 was 10 454 ML (at Yaldara gauging station), with approximately 2761 ML (sum of licensed and non-licensed extraction) recorded or estimated as being extracted. As such, of the 13 215 ML (10 454 plus 2761 ML) total estimated resource capacity for 2014–15 (not including evaporation from farm dams), it is estimated that 21% was extracted for use (17% in 2013–14).

Salinity summary

Despite gaps with no recorded information, the Yaldara and Penrice gauging stations along the North Para River, as well as the Tanunda Creek gauging station at Bethany provide a good indication of salinity (measured as Total Dissolved Solids) within the Barossa PWRA (Fig. 5). A clear pattern of increasing salinity in the spring and summer months and decreasing salinity in the autumn and winter months is shown in Figure 5, highlighting the effects of climatic influence. In the North Para River, approximately 20% of salinity data is less than 1000 mg/L at both the Yaldara and Penrice gauging stations. However, Yaldara experiences the highest salinities in the PWRA with 34 % of data recorded being greater than 2500 mg/L compared to only 2 % at Penrice. Salinities at the Tanunda Creek gauging station were comparatively less saline, with 82 % of recorded salinity data being less than 1000 mg/L.

Status summary

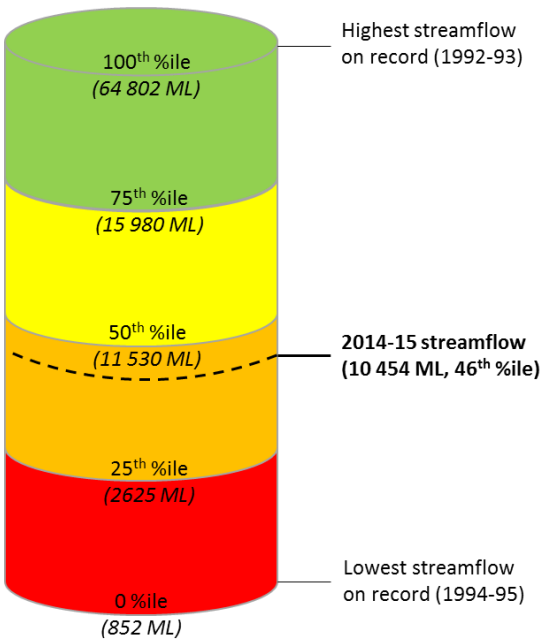
To determine the status of the Barossa PWRA for 2015, the total streamflow at Yaldara for the water use period July 2014 – June 2015 (2014-15) is expressed as a percentile by comparing it to the annual streamflow data measured over the entire period of record (1977-78 to 2014-15). The percentile value indicates the percentage of records in the dataset that are equal to or below that streamflow. For example, if the 90th percentile annual streamflow is 100 ML, this indicates that 90 percent of the annual streamflow values over the entire period or record were equal to or lower than 100 ML/y. The 2014-15 annual streamflow is the 46th percentile, which means 46% of the annual streamflow values during the period 1977-78 to 2014-15 were equal to or below than the 2014-15 annual streamflow. Status is defined based on which percentile grouping the current year's streamflow percentile value occurs within (shown in the image below). This is a new approach, compared to assessments used in past *Surface water status reports*. Please visit the Frequently Asked Questions on the *Water Resource Assessments* page on WaterConnect for more detail on the current method of evaluating the status of surface water resources.

2015 Status

The Barossa at a whole PWRA scale is assigned an amber surface water status for 2015 based on the status of streamflow at the Yaldara gauging station:

'Annual streamflow was between the 25th-50th percentile of the period of record'

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.



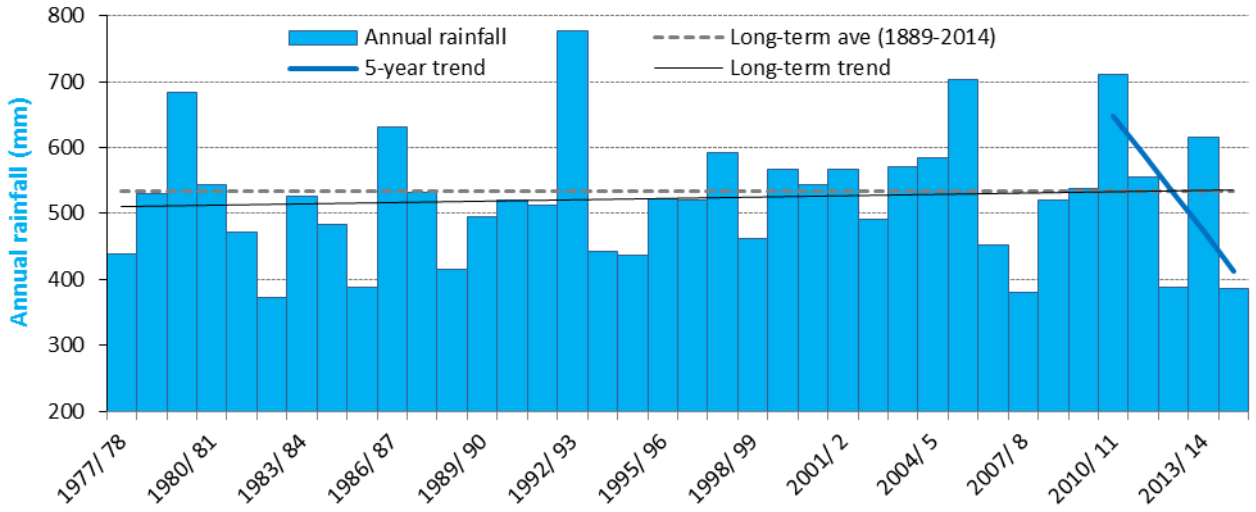


Figure 1. Annual rainfall (mm) for the 1977–78 to 2014–15 water-use years (July–June), the long-term trend and long-term average annual rainfall, and the short-term trend for the past five-years recorded at Angaston rainfall station (M023300)

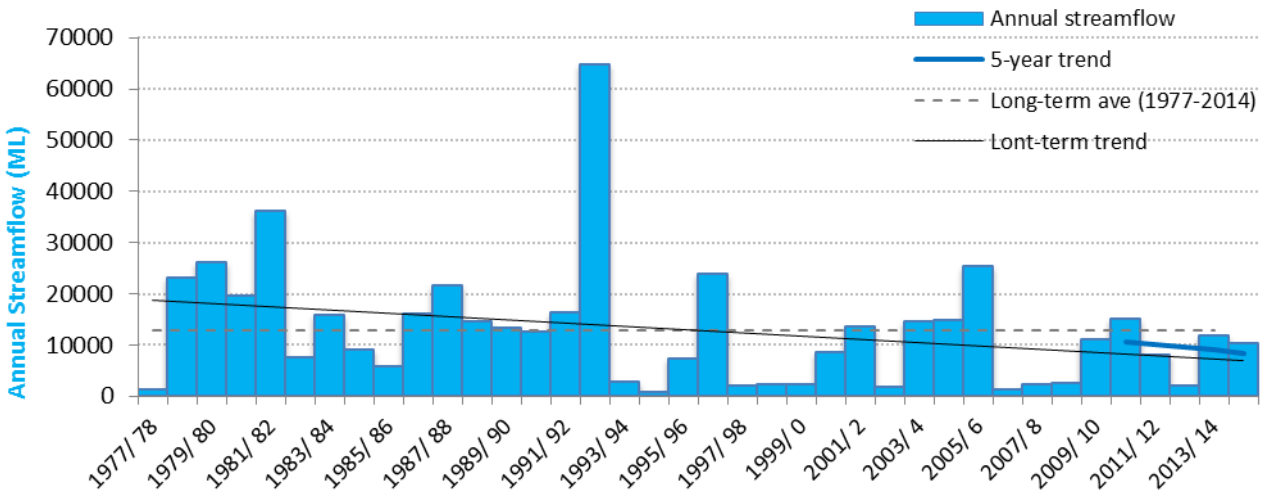


Figure 2. Annual streamflow (ML) for the 1977–78 to 2014–15 water-use years (July–June), the long-term trend and long-term average annual streamflow, and the short-term trend for the past five-years recorded at the Yaldara gauging station (A5050502)

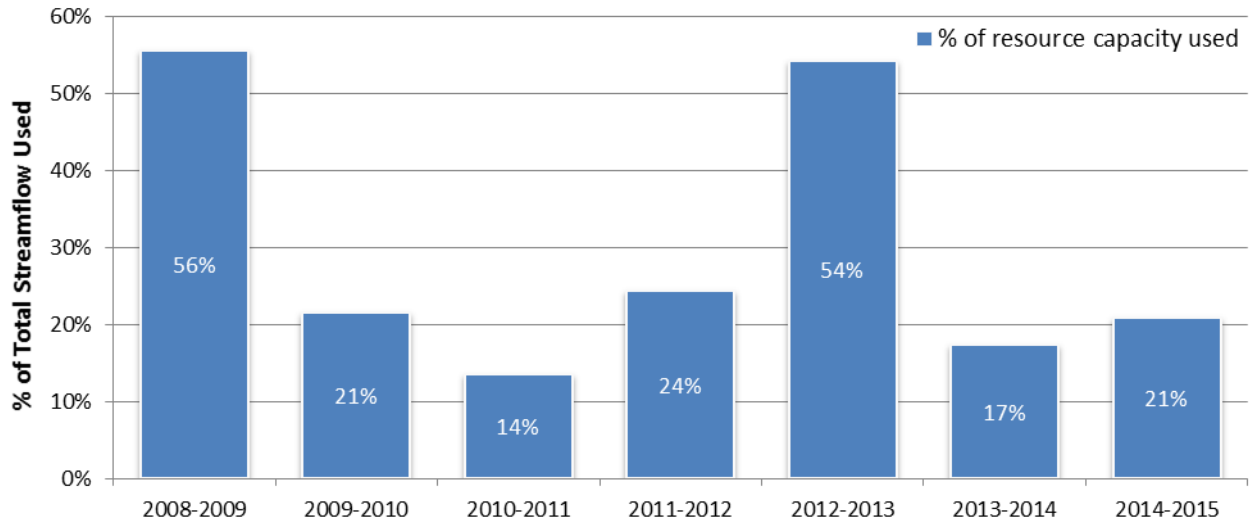


Figure 3. Surface water use as a percentage of total resource capacity available for the 2008–09 to 2014–15 water-use years for the Barossa PWRA

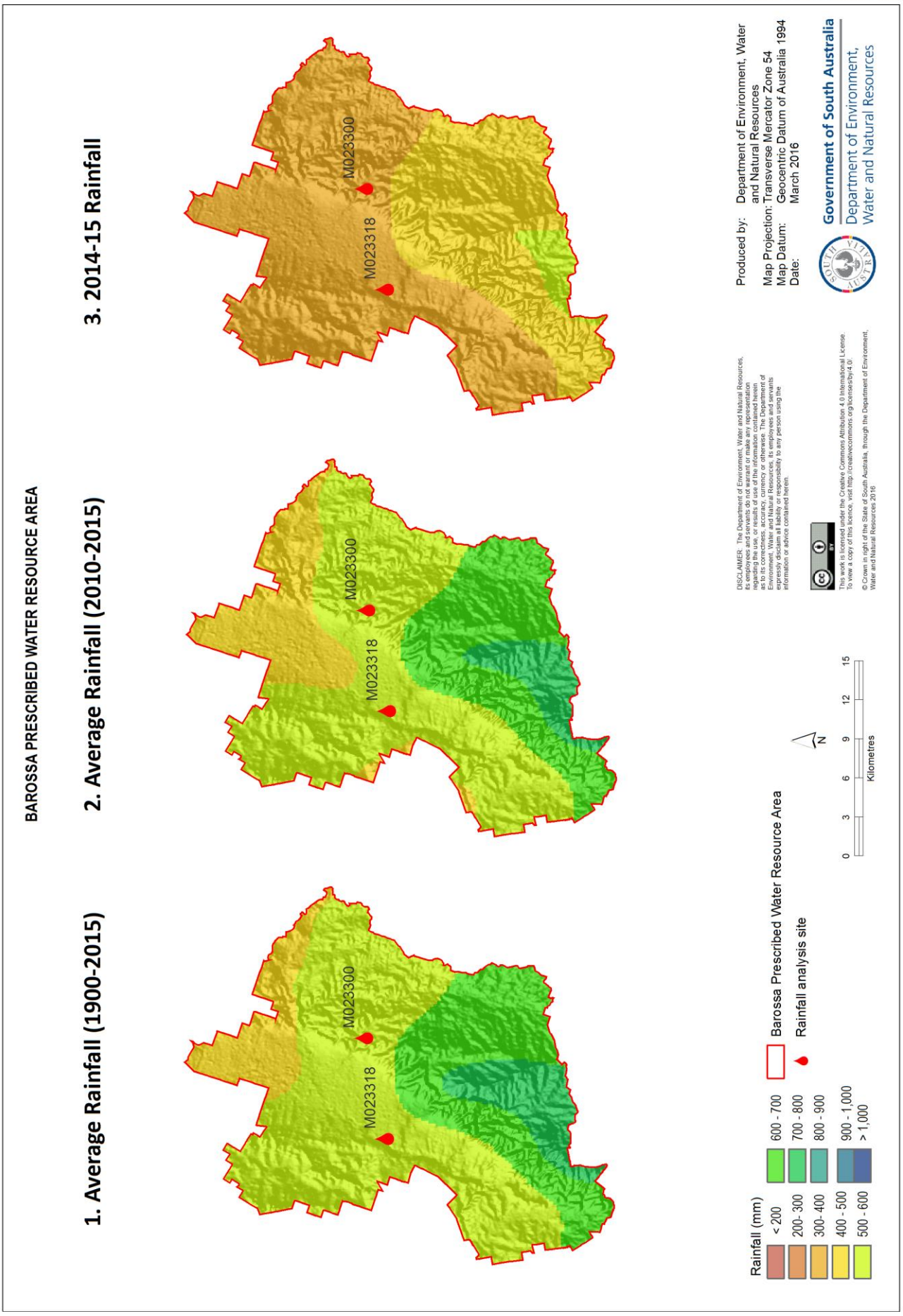


Figure 4. (1) Long-term and (2) five-year average annual rainfall and (3) annual rainfall for the 2014–15 water-use year in the Barossa PWRA

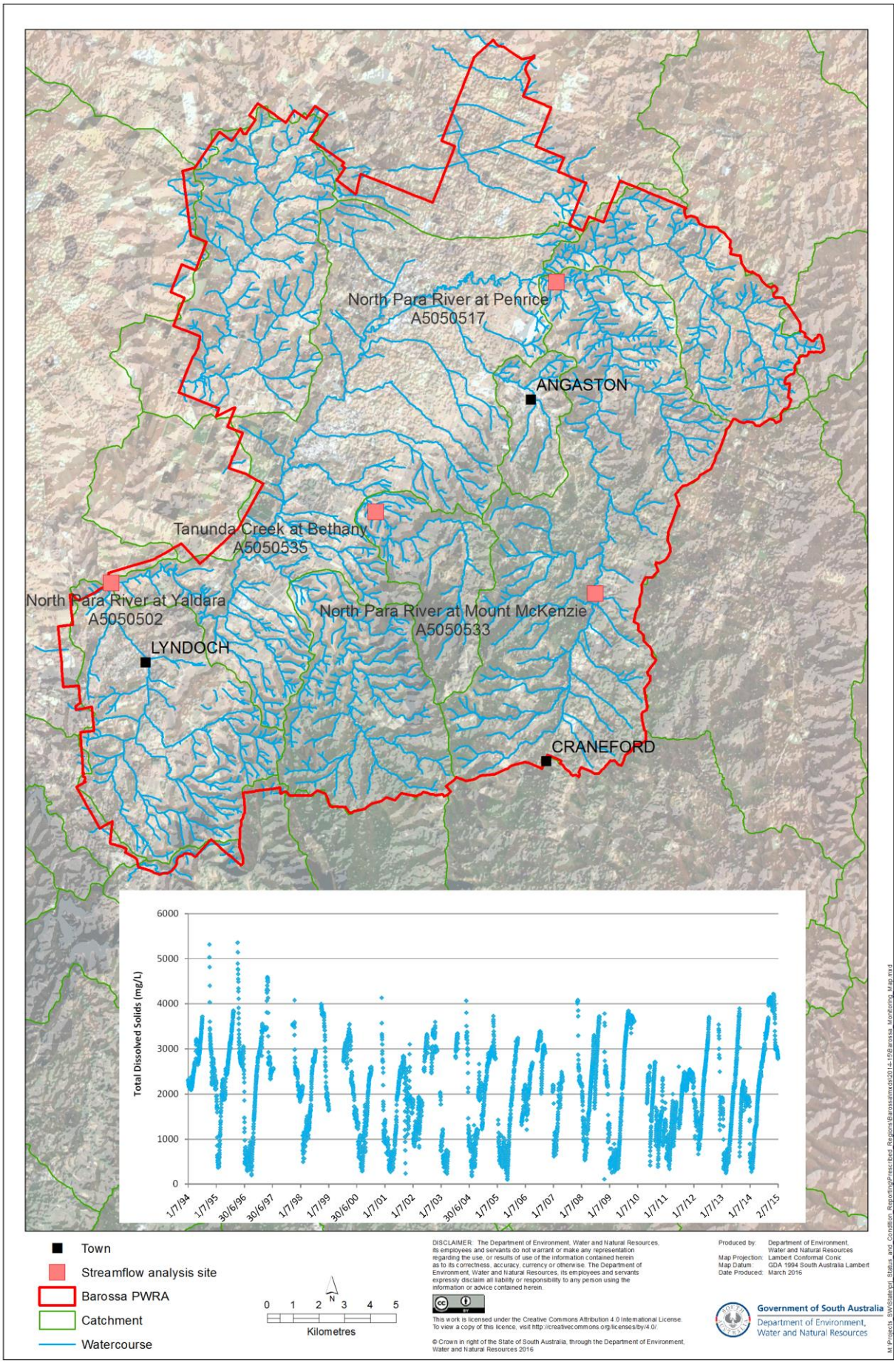


Figure 5. Surface water gauging stations in the Barossa PWRA and salinity data (TDS mg/L) for the 1994–95 to 2014–15 water use years at the Yaldara (A5050502) gauging station on the North Para River