Barossa Prescribed Water Resources Area

2016 Surface water status report

Government of South Australia
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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.

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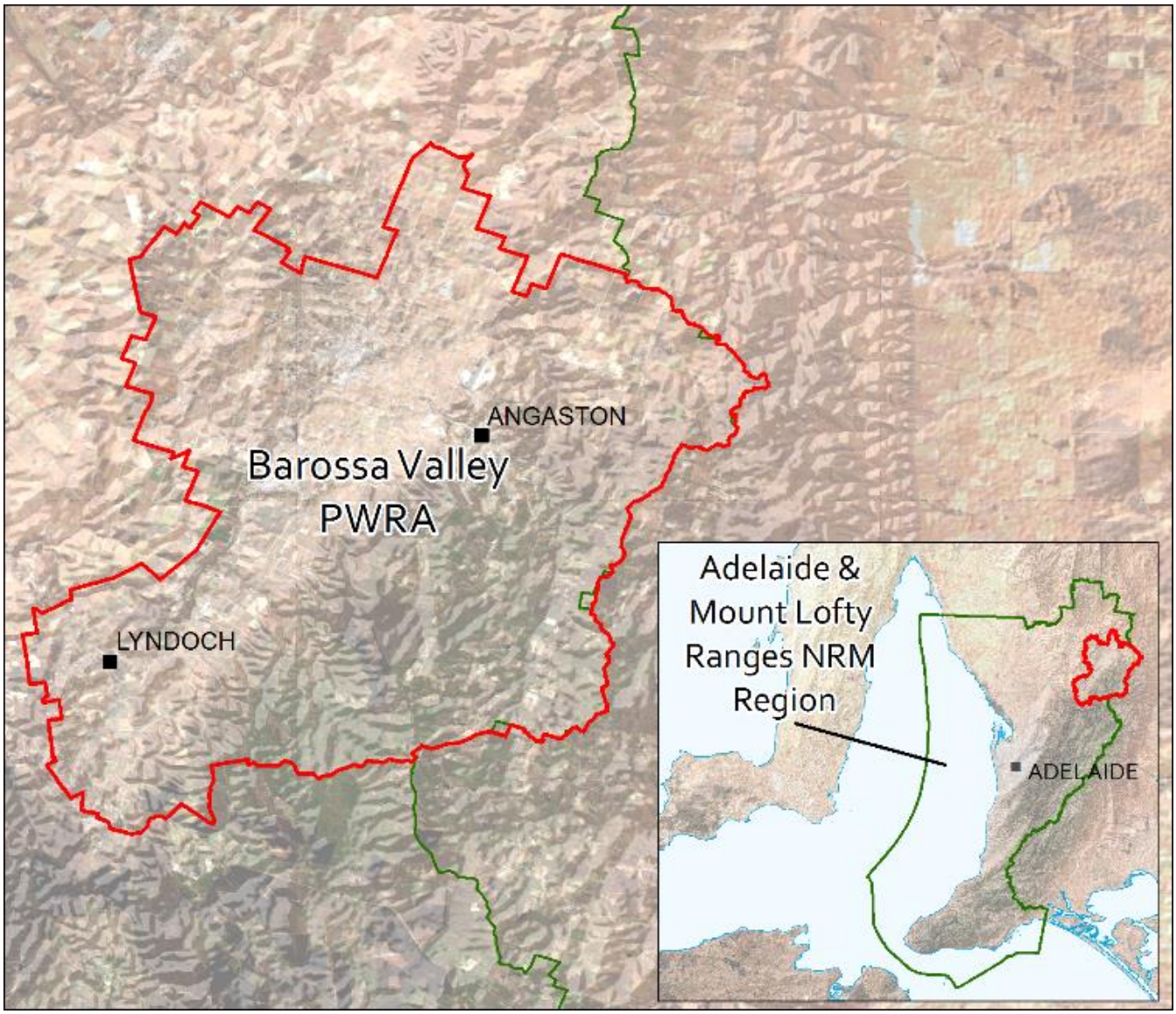
To view descriptions for all status symbols, please visit WaterConnect.

BAROSSA PWRA



The Barossa Prescribed Water Resources Area (PWRA) is located approximately 60 km north-east of Adelaide. Surface water, 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 in the northern part of the Adelaide and Mount Lofty Ranges NRM Region and is characterised by rolling hills and valleys, extending into localised flat plains in the north west of the region. The North Para River is the region's main watercourse and flows south to north in the eastern side of the Mount Lofty Ranges range before swinging back to the south near Penrice. Major tributaries include Tanunda and Jacobs Creek. All streams are ephemeral and feature seasonal disconnected permanent pools, fed predominantly by groundwater.

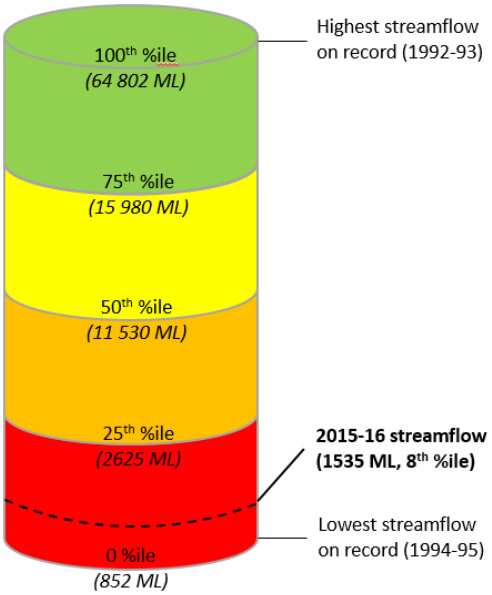
Surface water resources are highly dependent on rainfall, with trends in streamflow and salinity primarily climate driven, i.e. below-average winter rainfall results in a reduction in annual streamflow volumes. Below-average summer rainfall can also result in increased irrigation extractions, and these 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.

2016 Status

The Barossa as a whole PWRA scale is assigned a ***red*** surface water status for 2016 based on the status of streamflow at the Yaldara gauging station:

Annual streamflow was below the 25th percentile (%ile) 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.



Rainfall

Annual rainfall for the 2015/16 period was well below the long-term average for the region, as indicated in Figure 1, Angaston rainfall station, which is representative of the region. Drier than average conditions were recorded during the early spring months of 2015, while above average monthly rainfall was experienced in January, March, May and June, with the latter two months accounting for approximately 40% of the total rainfall during the 2015/16 period. These trends are consistent with data from neighbouring rainfall stations Tanunda (M023318) and Williamstown (M023752) for the 2015/16 period.

The spatial distribution of rainfall for the past five-years (Figure 5-2) indicates a deviation from the long-term average (Figure 5-1) rainfall across the Barossa PWRA, with decreases in average rainfall occurring along the northern boundary of the region. The spatial distribution of rainfall during 2015/16 is more consistent with the 5-year average pattern than with the long-term pattern (Figure 5-3).

Streamflow

Four long-term streamflow gauging stations were used for analysis in the Barossa PWRA. The Mt McKenzie, Penrice and Yaldara gauging stations are located along the North Para River, while the Tanunda Creek gauging station is situated in Bethany and measures flow from an adjoining sub-catchment. The Yaldara gauging station is located at the bottom of the Barossa PWRA, capturing majority of flows draining the region (Figure 6). All gauging stations analysed within the Barossa PWRA recorded streamflow below the long-term average in 2015/16, with data for the individual catchments presented in Table 1.

Table 1: Barossa PWRA streamflow statistics

	Mt McKenzie	Penrice	Yaldara	Tanunda Creek
2015/16 streamflow (ML)	14	117	1536	448
Long-term average streamflow (ML)	1,718	4,699	12,898	1,874
Percentile Rank (%ile)	13th	5th	8th	26th

Monthly streamflow was also below average at all surface water monitoring stations in the region. No flow was recorded between January to April at the Yaldara gauging station, while upstream monitoring stations experienced longer periods of no streamflow between December and May. The annual streamflow volume recorded at the Yaldara gauging station from 1977–2016 (Figure 2) indicates a long-term declining trend, with similar trends being observed at both the Penrice and Mt McKenzie gauging stations.

Water use

Surface water use in the Barossa PWRA includes allocated volumes for licensed extractions from dams and watercourses, estimated demand from non-licensed activities (generally stock and domestic dams), and metered data the Barossa Infrastructure Limited (BIL) Scheme. The latter is operated by SA Water and transfers treated water from the River Murray for the specific purpose of grape vine irrigation. During 2015/16 the volume of imported water totalled 10,262 ML (9,047 ML BIL Scheme + 1215 ML SA Water), while water use from licensed surface water sources totalled 1,431 ML in 2015/16 (Figure 3). The decrease in surface water extractions

from licenced surface water sources, and an increase in the volume of imported water from the BIL scheme is consistent with a reduced surface water availability as a result of drier than average conditions.

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 2015/16 was 1535 ML (at Yaldara gauging station), with approximately 2531 ML (sum of licensed and non-licensed extraction) recorded or estimated as being extracted. As such, of the 4066 ML (1535 plus 2531 ML) total estimated resource capacity for 2015/16 (not including evaporation from farm dams), it is estimated that 62% was extracted for use (21% in 2014/15).

Salinity

The seasonal pattern of regional variation in salinity is shown in Figure 4, represented by the Yaldara and Tanunda gauging stations. Salinity increases during sustained summer events, while decreasing throughout the winter months as a result of higher diluting flow levels.

In general, salinities in the North Para River are generally greater than 1000 mg/L, increasing further down the catchment and peaking at the Yaldara gauging station where approximately a third of salinity data recorded exceeds 2500 mg/L. Salinities at the Tanunda Creek gauging station were comparatively less saline, with 82% of data being less than 1000 mg/L.

Background information

The status of the Barossa was determined by expressing the annual Yaldara streamflow for 2015/2016 as a percentile of the total annual streamflow for the period (1977/78 to 2015/16).

The total 2015/16 streamflow from the Yaldara gauging station (1536 ML) represents the 8th percentile, i.e. only 8% of the long-term historic annual streamflow totals were less than the streamflow observed in 2015/16.

Further information may be found among the Frequently Asked Questions on the *Water Resource Assessments* page of www.waterconnect.sa.gov.au.

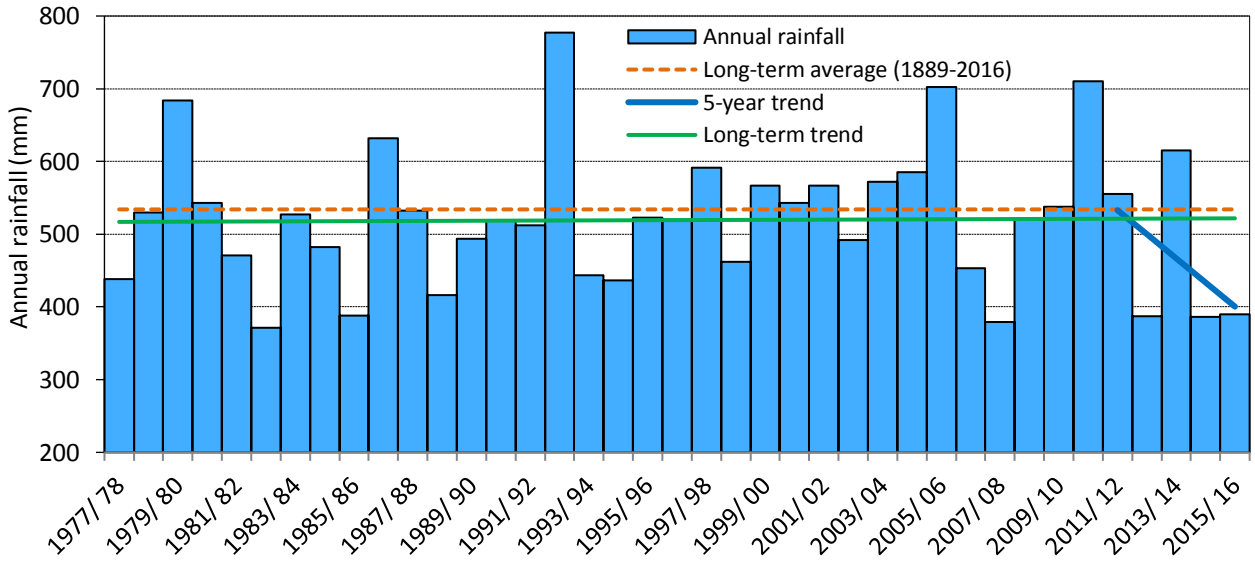


Figure 1: Annual rainfall (mm) for the 1977/78 to 2015/16 water-use years (July–June) at the Angaston rainfall station (M023300)

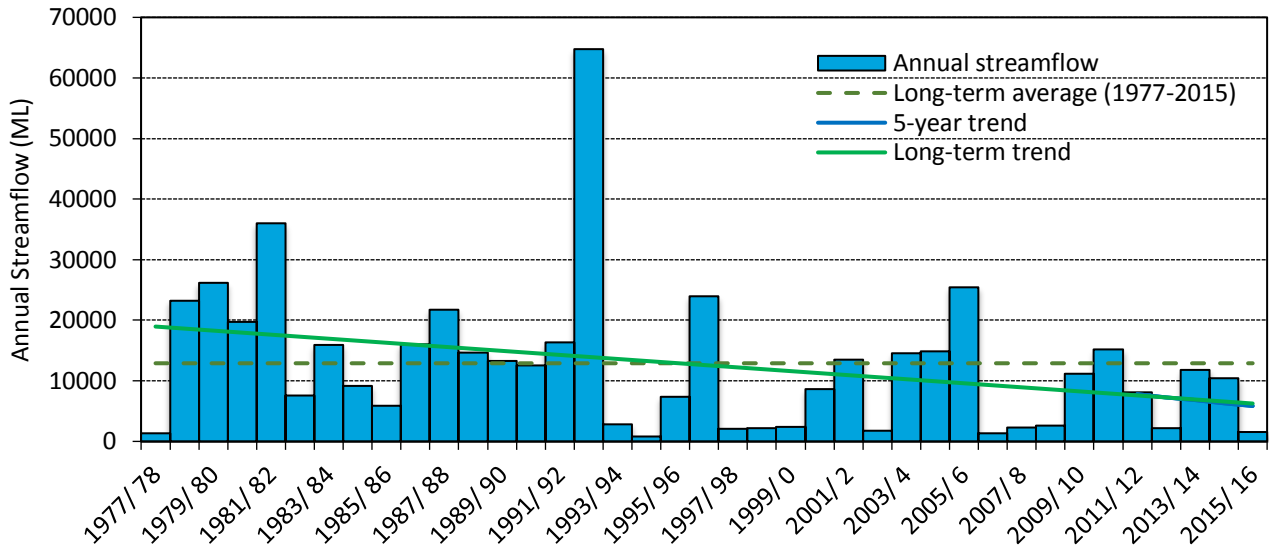


Figure 2: Annual streamflow (ML) for the 1977/78 to 2015/16 water-use years (July–June) at the Yaldara gauging station (A5050502)

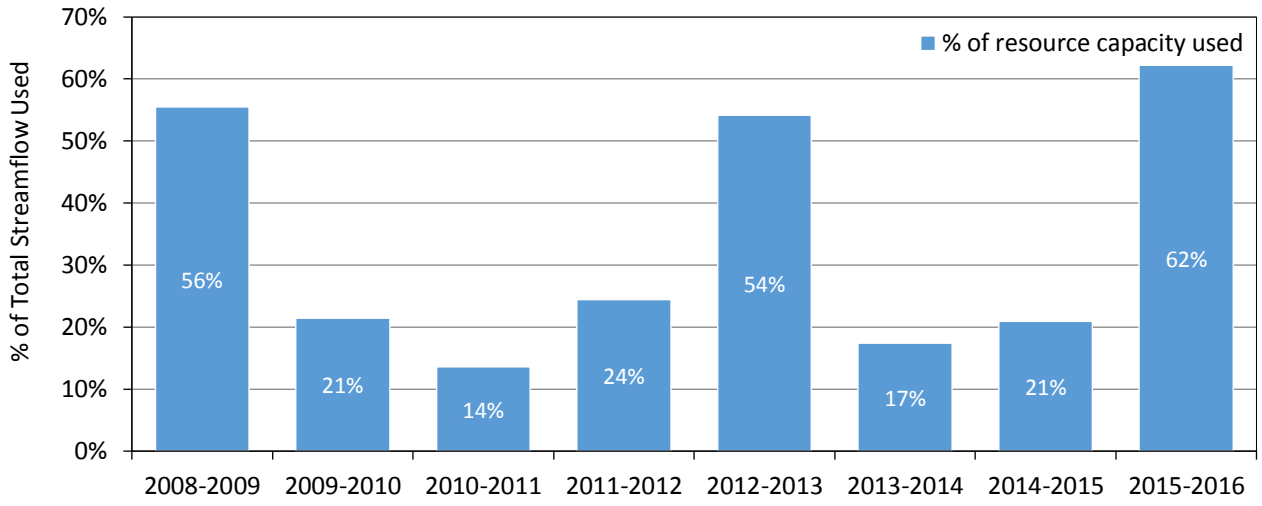


Figure 3: Surface water use as a percentage of total resource capacity available for the 2008/09 to 2015/16 water-use years for the Barossa PWRA

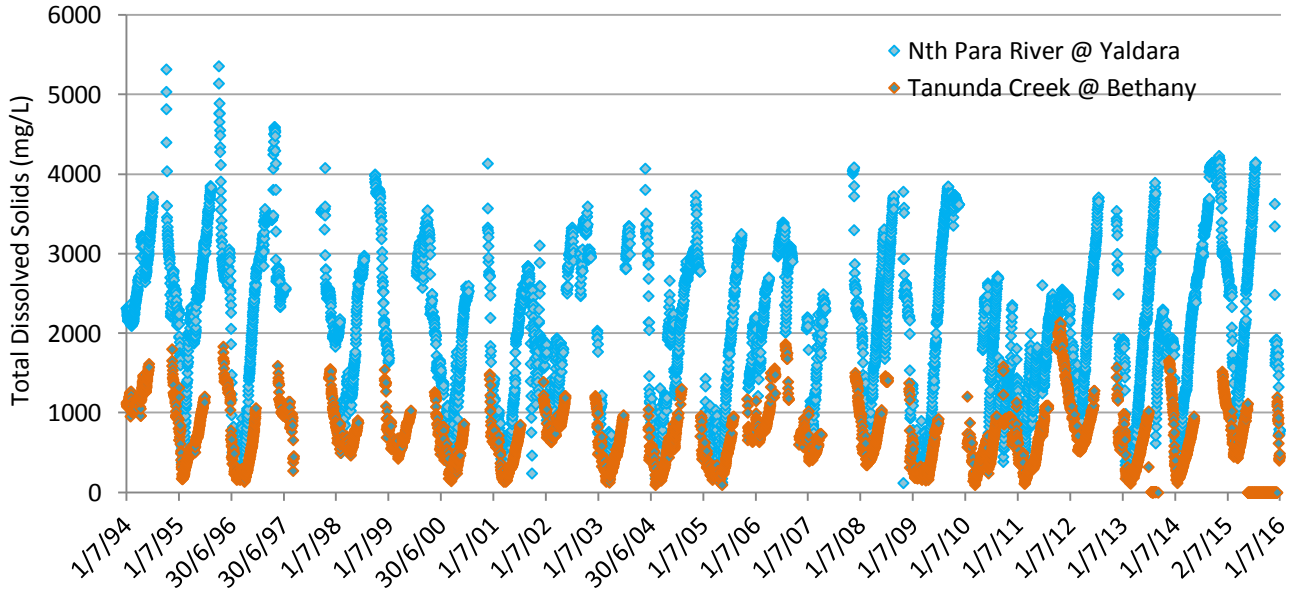


Figure 4: Salinity data (TDS mg/L) for the 1994/95 to 2015/16 water use years at the Yaldara (A5050502) gauging station on the North Para River, and the Tanunda Creek at Bethany gauging station (A5050535)

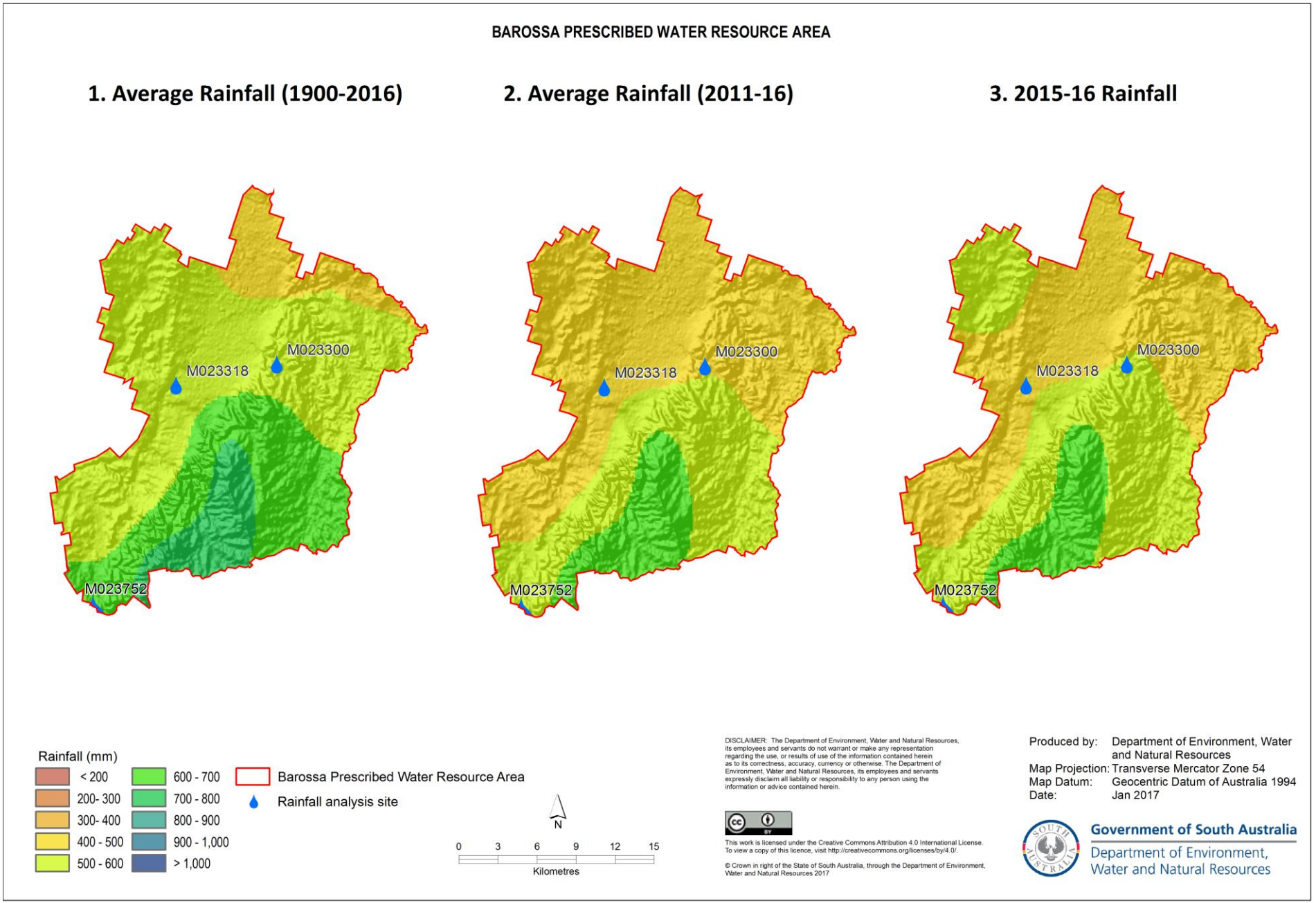


Figure 5: (1) Long-term, (2) five-year average annual rainfall, and (3) annual rainfall for the 2015/16 water-use year in the Barossa PWRA

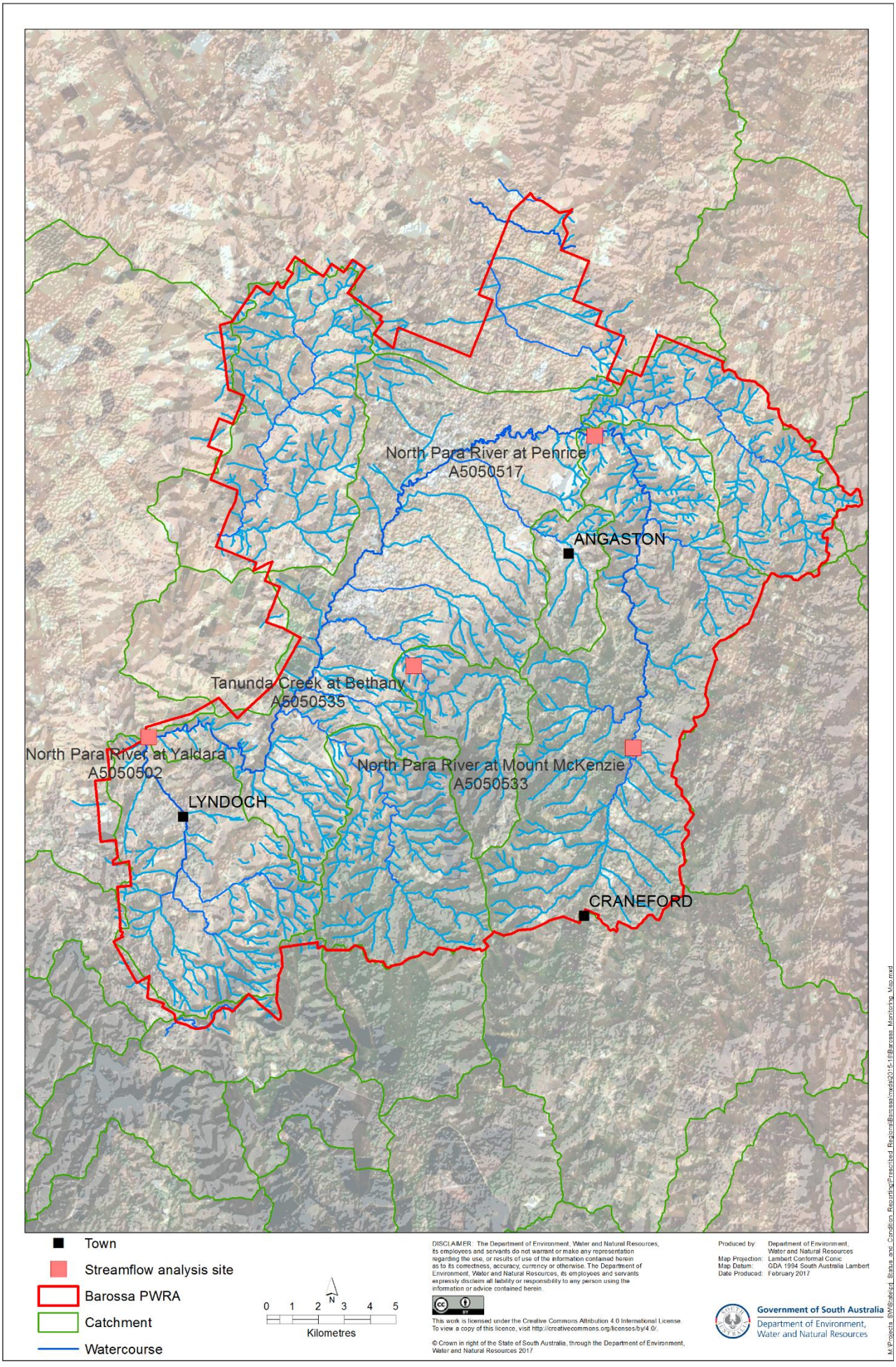


Figure 6: Surface water gauging stations in the Barossa PWRA

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