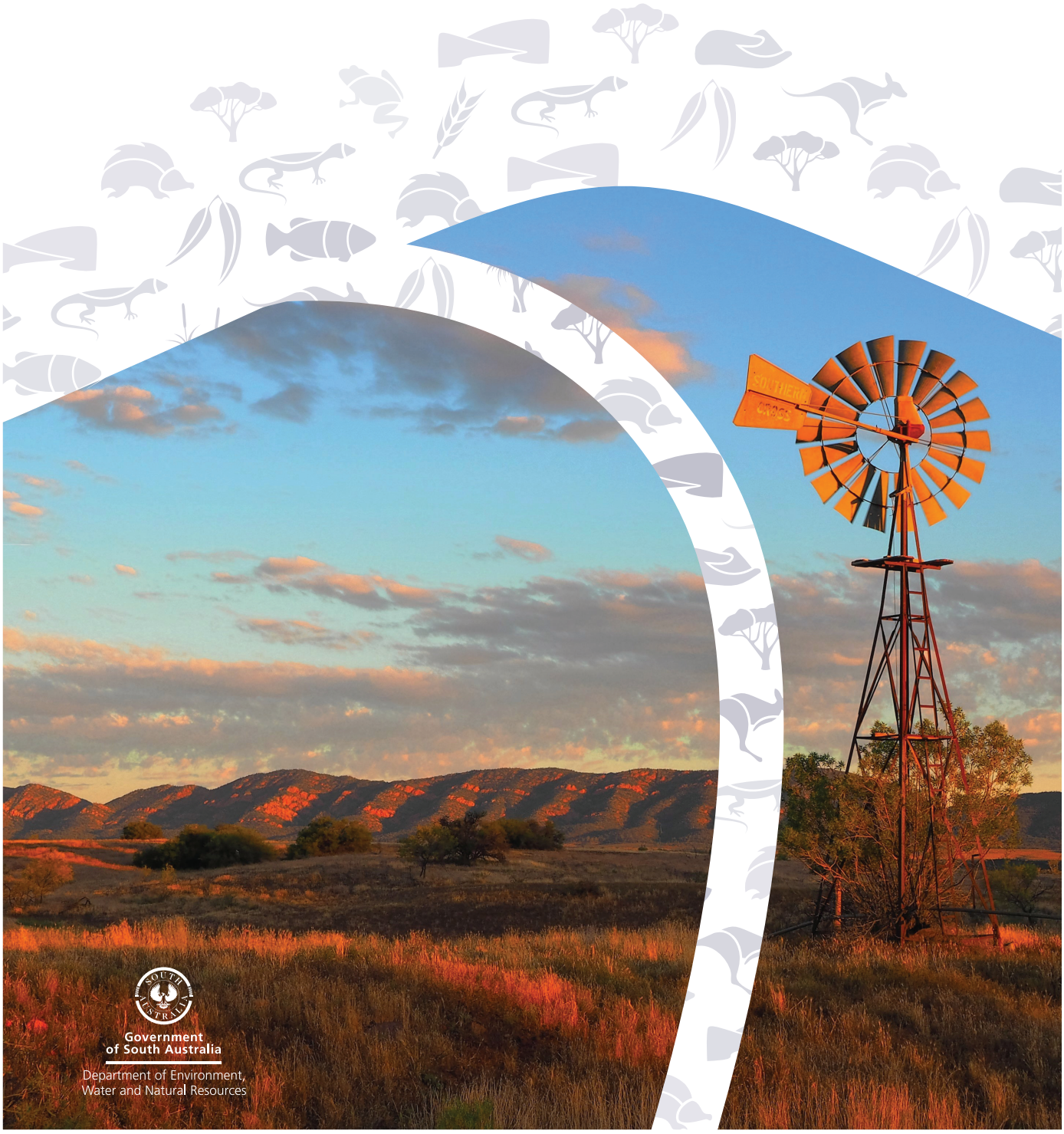
Barossa PWRA
Upper aquifer

2016 Groundwater level and salinity status report



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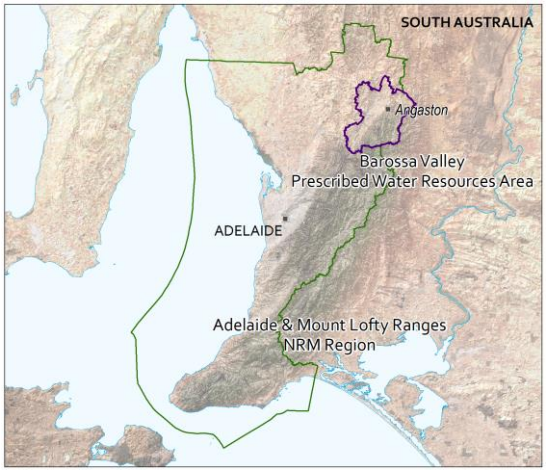
Regional setting



The Barossa Prescribed Water Resources Area (PWRA) encompasses both the highland areas of the Mount Lofty Ranges (MLR) and the Barossa Valley. It is located approximately 60 km north-east of Adelaide and lies within the Adelaide and Mount Lofty Ranges Natural Resources Management Region. Surface water and groundwater within the Barossa PWRA have been prescribed under South Australia's *Natural Resources Management Act 2004* and a water allocation plan provides for the sustainable management of these regional-scale water resources.

The Barossa PWRA consists of three major groundwater systems: two sedimentary aquifers (Upper and Lower) that are located within the region's largest valley, and fractured rock aquifers that underlie the sedimentary aquifers and also crop out in the MLR towards the eastern and western margins of the valley. The sedimentary Upper aquifer of the Barossa PWRA is the focus of this report.

Groundwater flow within the Upper aquifer is in a south-westerly direction in the northern part of the valley and in a northerly direction near Lyndoch (Fig. 4). Recharge to the Upper aquifer is from local rainfall, with contribution from streamflow in some areas.

Trends in groundwater levels and salinity in the Upper aquifer of the Barossa PWRA are primarily climate driven: below-average rainfall results in a reduction in recharge to the aquifers. Below-average summer rainfall can also result in increasing irrigation extractions, and these two elements can cause groundwater levels to fall and salinity to increase. Conversely, increases in rainfall results in increases in recharge, decreases in irrigation extractions and groundwater levels may rise and salinity may stabilise or decline. Seasonal responses to recharge are common, except where there is overlying Quaternary clay.

2016 Status

The Upper aquifer of the Barossa PWRA has been assigned an orange status for 2016:

2016 Status  Moderate adverse trends have been observed over the past five years

The 2016 status of the Upper aquifer is based on:

- most monitoring wells (97%) showing a five-year trend of declining groundwater levels.

Rainfall

In 2015–16, the Angaston rainfall station (BoM Station 23300) recorded 390 mm, which is 145 mm below the long-term average of 535 mm (1900–2016) and 77 mm below the five-year average of 467 mm (Figs 1 and 2). A trend of declining rainfall is evident over the long term (1900–2016) (Fig. 1) and three of the past five years show rainfall below the long-term average (Fig. 2). Monthly rainfall data show January, March, May and June recording above-average monthly rainfall, with the remaining months below their long-term average at a median reduction of 26 mm/month.

Water use

Licensed groundwater extractions from the Upper aquifer totalled 409 ML[1] in 2015–16, an 8% increase from the previous water-use year of 377 ML and 9% greater than the five-year average of 375 ML (Fig. 3). The Upper aquifer accounted 11% of the groundwater extracted from the Barossa PWRA in 2015–16.

Groundwater levels

In the five years to 2016, 30 out of 31 of monitoring wells (97%) have shown a five-year trend of declining groundwater levels. In 2016, 15 of these wells (50%) show their lowest level on record (Fig. 4). Declines ranged between 0.03 and 0.42 m/y, with a median of 0.15 m/y. The majority of these wells are located in the northern half area of the PWRA with a small cluster also around the town of Lyndoch. Only one well shows a rising trend in groundwater level, at a rate of 0.06 m/y.

Groundwater salinity

The groundwater salinity of the Upper aquifer was not monitored in 2016 and as such, salinity has not been used in the assessment of the status of the resource in this report.

[1] The licenced groundwater use for the 2015–16 water-use year is based on the best data available as of February 2017 and could be subject to change, as some extraction volumes may be in the process of being verified.

More information

To determine the status of the Upper aquifer for 2016, the trends in groundwater levels over five years (2012 to 2016, inclusive) were analysed, in contrast to the year-to-year assessments that have been used in past *Groundwater level and salinity status reports*. Please visit the Frequently Asked Questions on the *Water Resource Assessments* page on WaterConnect for a detailed explanation of the new method of status assessment.

To view descriptions for all status symbols, please visit the *Water Resource Assessments* page on WaterConnect.

To view the *Barossa PWRA Groundwater Level and Salinity Status Report 2011*, which includes background information on hydrogeology, rainfall and relevant groundwater-dependent ecosystems, please visit the *Water Resource Assessments* page on WaterConnect.

To view or download groundwater level and salinity data from monitoring wells within the Barossa PWRA, please visit Groundwater Data on WaterConnect.

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

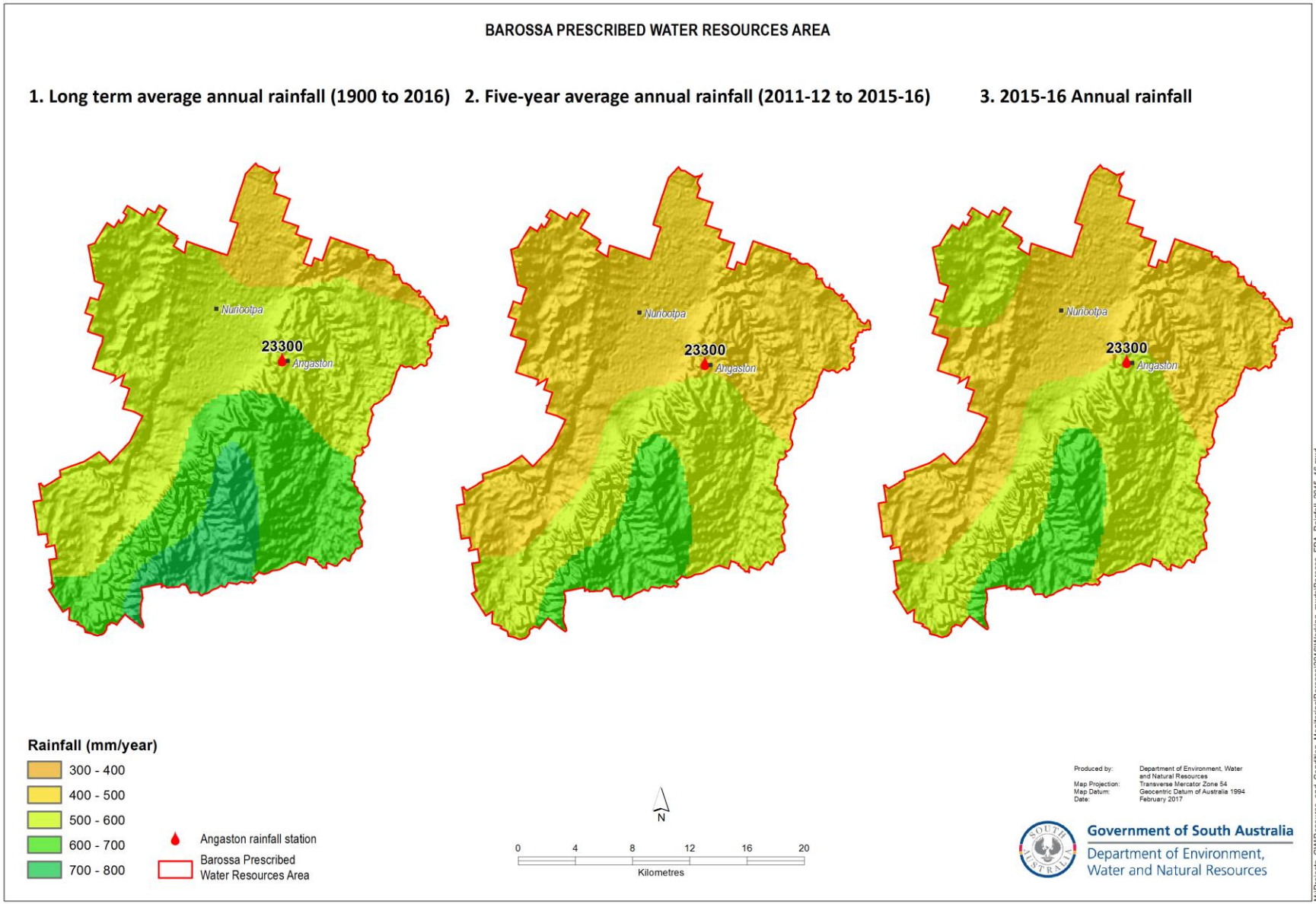


Figure 1. (1) Long-term and (2) five-year average annual rainfall, and (3) annual rainfall for the 2015–16 water-use year in the Barossa PWRA[2]

[2] Rainfall data used in this report is sourced from the SILO Patched Point Dataset, which uses original Bureau of Meteorology daily rainfall measurements and is available online at www.longpaddock.qld.gov.au/silo.

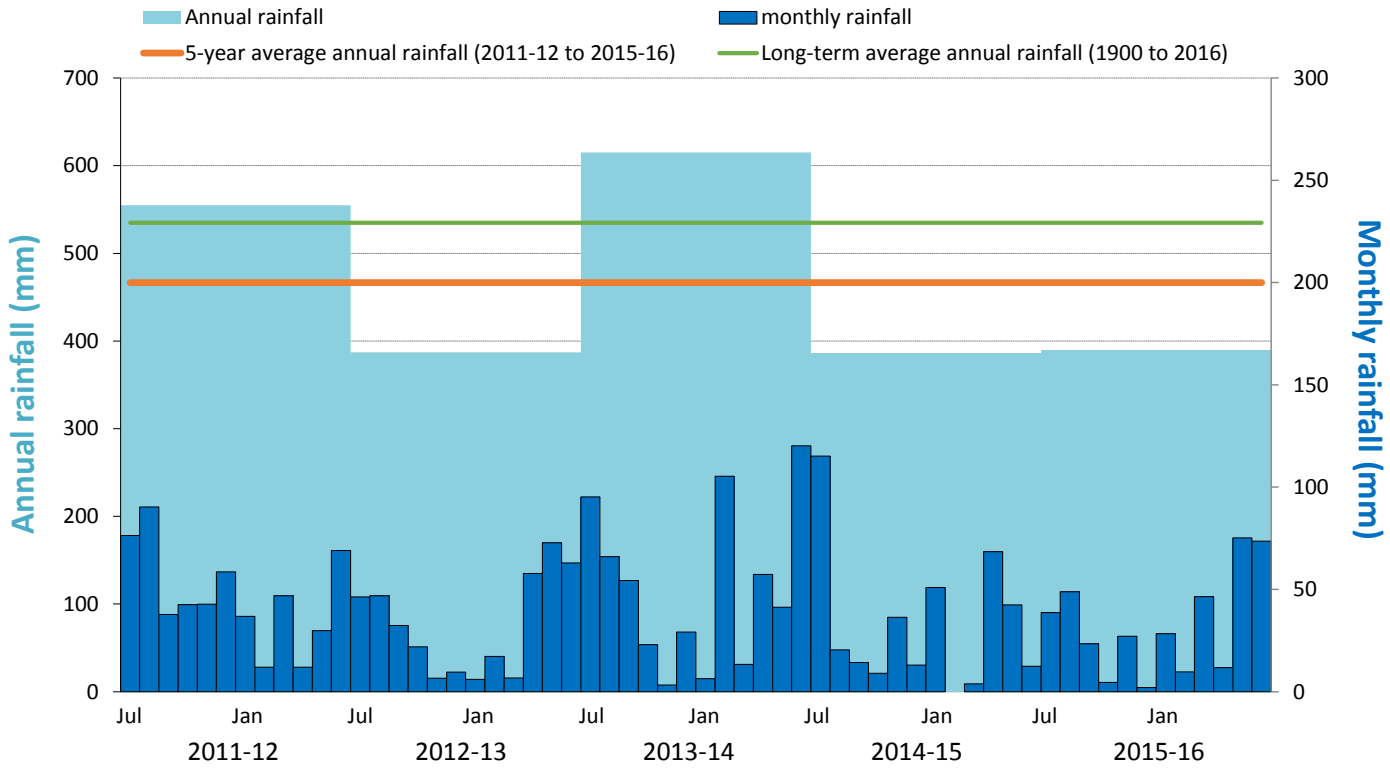


Figure 2. Annual (July–June) and monthly rainfall for the past five water-use years, and the five-year and long-term average annual rainfall recorded at Angaston (BoM Station 23300)[3]

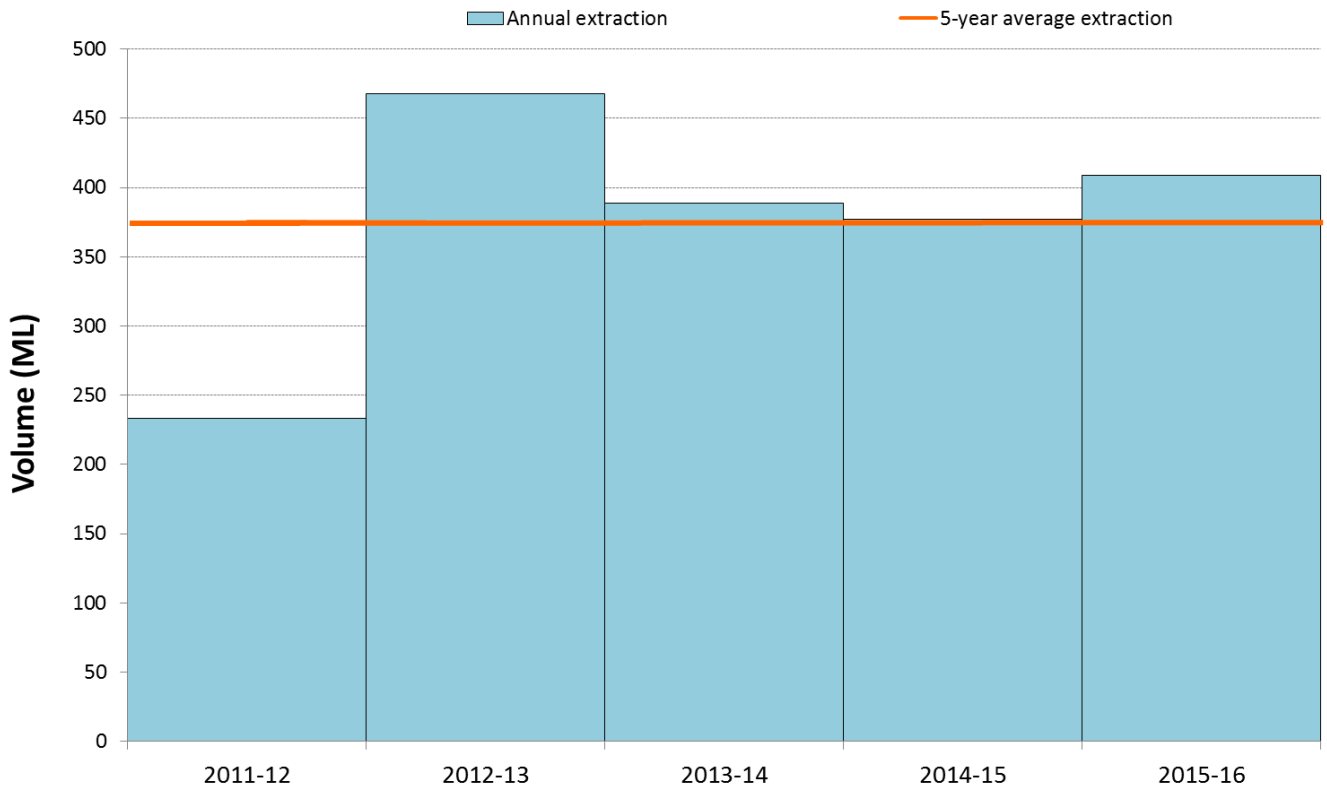


Figure 3. Licensed groundwater extraction volumes[4] for the past five water-use years, for the Upper aquifer

[3] Rainfall data used in this report is sourced from the SILO Patched Point Dataset, which uses original Bureau of Meteorology daily rainfall measurements and is available online at www.longpaddock.qld.gov.au/silo

[4] The licenced groundwater use for the 2015–16 water-use year is based on the best data available as of February 2017 and could be subject to change, as some extraction volumes may be in the process of being verified.

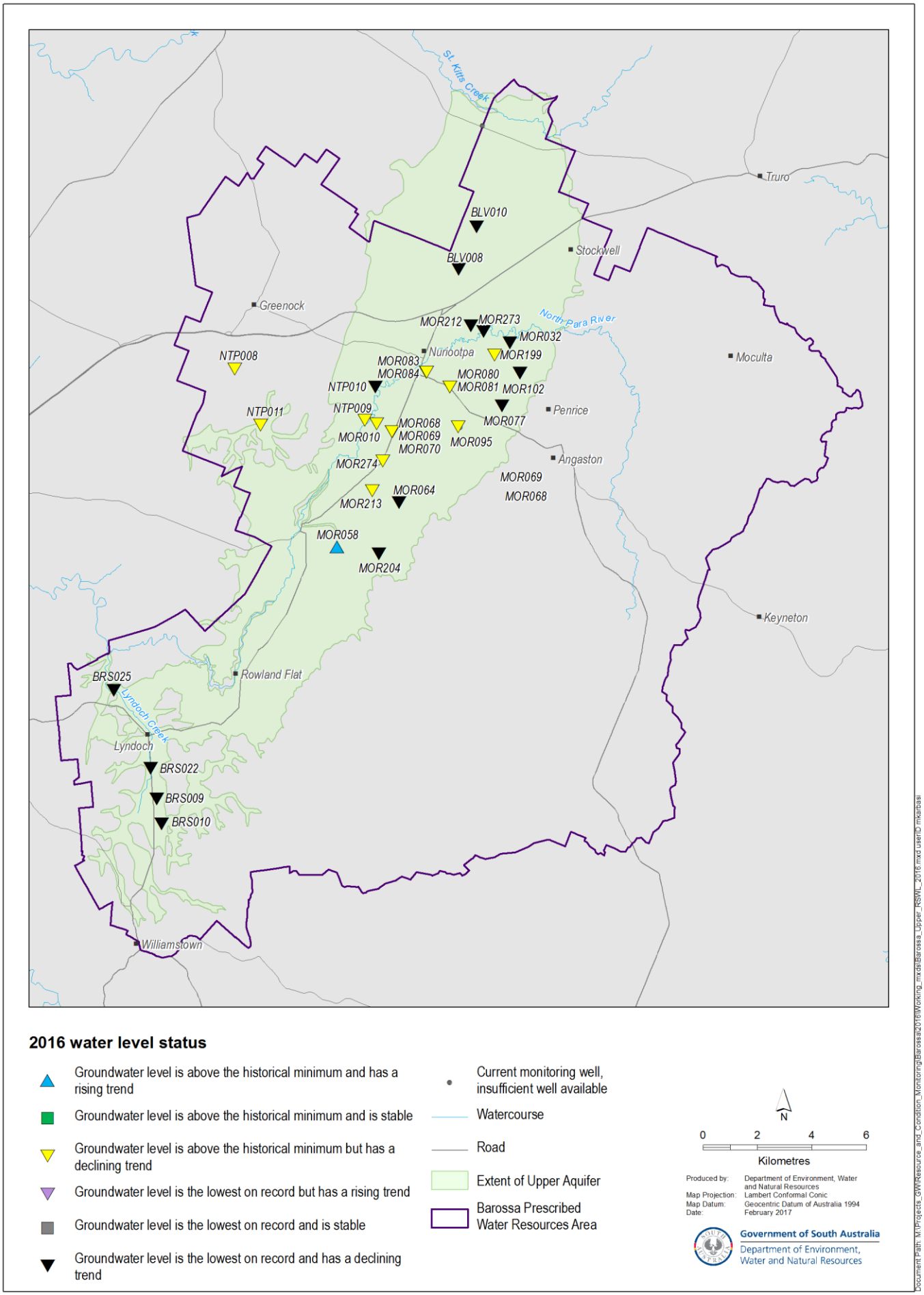


Figure 4. 2016 status of the groundwater levels in the Upper aquifer (Barossa PWRA), based on five-year trends from 2012 to 2016

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