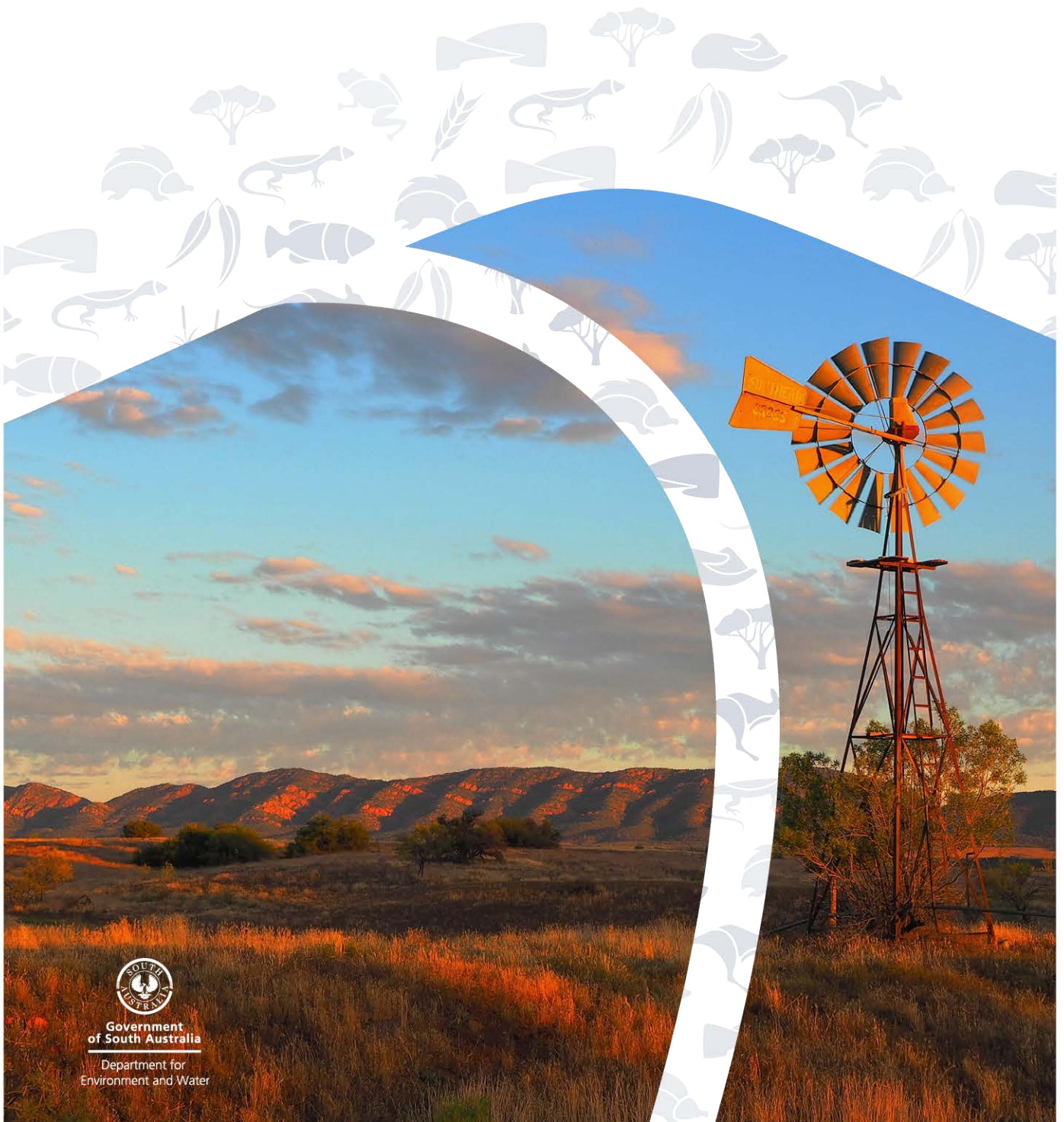


# Angas Bremer PWA

## Murray Group Limestone aquifer

**2017 Groundwater level and salinity status report**



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of South Australia

Department for  
Environment and Water

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# 2017 Status summary

## Angas Bremer PWA

### Murray Group Limestone aquifer



The Murray Group Limestone (MGL) aquifer of the Angas Bremer Prescribed Wells Area (PWA) has been assigned a **green** status for 2017 because positive trends have been observed in the past five years.

The status is based on five-year trends: over the period 2013–17, all wells show rising or stable groundwater pressure levels and stable or decreasing salinities.

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

See Figures 1 and 2

|                           |   |
|---------------------------|---|
| Rainfall station          | Langhorne Creek Bureau of Meteorology (BoM) rainfall station 24515, located in the central part of the Angas Bremer PWA                         |
| Annual total <sup>1</sup> | 512 mm<br>127 mm (33%) greater than the five-year average of 385 mm<br>124 mm (32%) greater than the long-term average of 388 mm                |
| Monthly summary           | Well-above average rainfall recorded in July, September, December, January and April<br>Well-below average rainfall recorded in August and June |
| Spatial distribution      | Rainfall in 2016–17 was well-above average across the entire PWA  |

#### Water use

See Figures 3 and 4

|                                   |   |
|-----------------------------------|---|
| Total allocated volume: 2016–17   | 6500 ML   |
| Licensed groundwater extractions* | 922 ML <sup>2</sup> (14% of total allocations)            |
| Extraction volume comparison      | 44% less than the previous year and the five-year average |

<sup>1</sup> For the water-use year 1 July 2016 to 30 June 2017

<sup>2</sup> Total licensed extractions are subject to change as extraction data have not yet been verified in full – see [More information](#)

|   |  |
|---|--|
| Managed Aquifer Recharge (MAR)<br>licensed groundwater injections | 1343 ML <sup>3</sup>   |
| MAR volume comparison   | 31% greater than the previous year<br>12% greater than the five-year average |

\*Stock and domestic use is not included in licensed extractions

## Groundwater pressure level

See Figure 5

|                          |  |
|--------------------------|--|
| Five-year trend: 2013–17 | 30 out of 34 wells (88%) show rising trends, at rates of 0.03–0.36 m/y<br>(median of 0.19 m/y)<br>4 wells (12%) are stable |
|--------------------------|--|

## Groundwater salinity

See Figures 6 and 7

|                          |  |
|--------------------------|--|
| 2017 salinity            | 211–8706 mg/L<br>44 out of 63 wells (70%) show salinities more than 1500 mg/L, which is typical for the MGL aquifer in this region                                     |
| Five year trend: 2013–17 | 32 out of 40 wells (80%) show stable salinities<br>8 wells (20%) show decreasing trends, at rates of 44–212 mg/L/y<br>(median of 78 mg/L/y)                            |
| Citizen science          | Since 2014, irrigators in the Angas Bremer PWA have submitted salinity samples and once validated, these will augment the existing DEW monitoring network <sup>4</sup> |

## Groundwater condition limits

See Figure 6

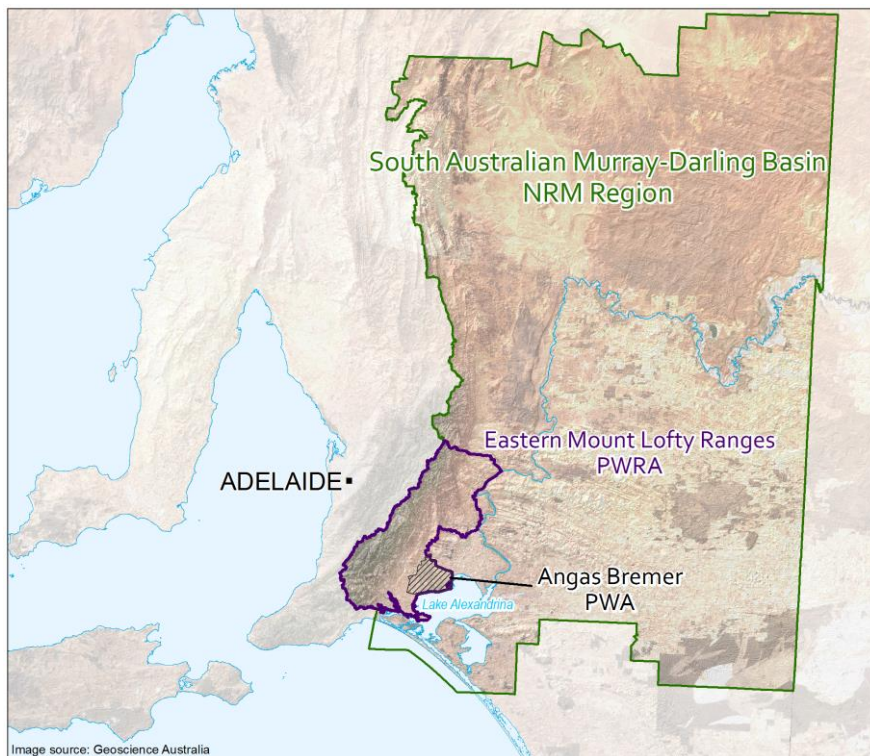
|  |   |
|--|---|
| Definition                               | The water allocation plan (WAP) for the Angas Bremer PWA has identified resource condition limits (RCLs) based on salinity thresholds – these are designed to give early warning of trends that may adversely impact on users of the resource |
| Management zone                          | Zone A and Zone B   |
| Groundwater salinity triggers definition | An increase in groundwater salinity of 1.5% or more per year for three consecutive years across at least 50% of monitoring wells  |
| Salinity triggers in 2016–17             | Triggers have not been reached or exceeded (from 2014–15 to 2016–17)  |

<sup>3</sup> Total MAR volumes are subject to change as injection data have not yet been verified in full – see [More information](#)

<sup>4</sup> The salinity data collected from irrigation wells can be viewed at [WaterConnect](#)



# Regional setting

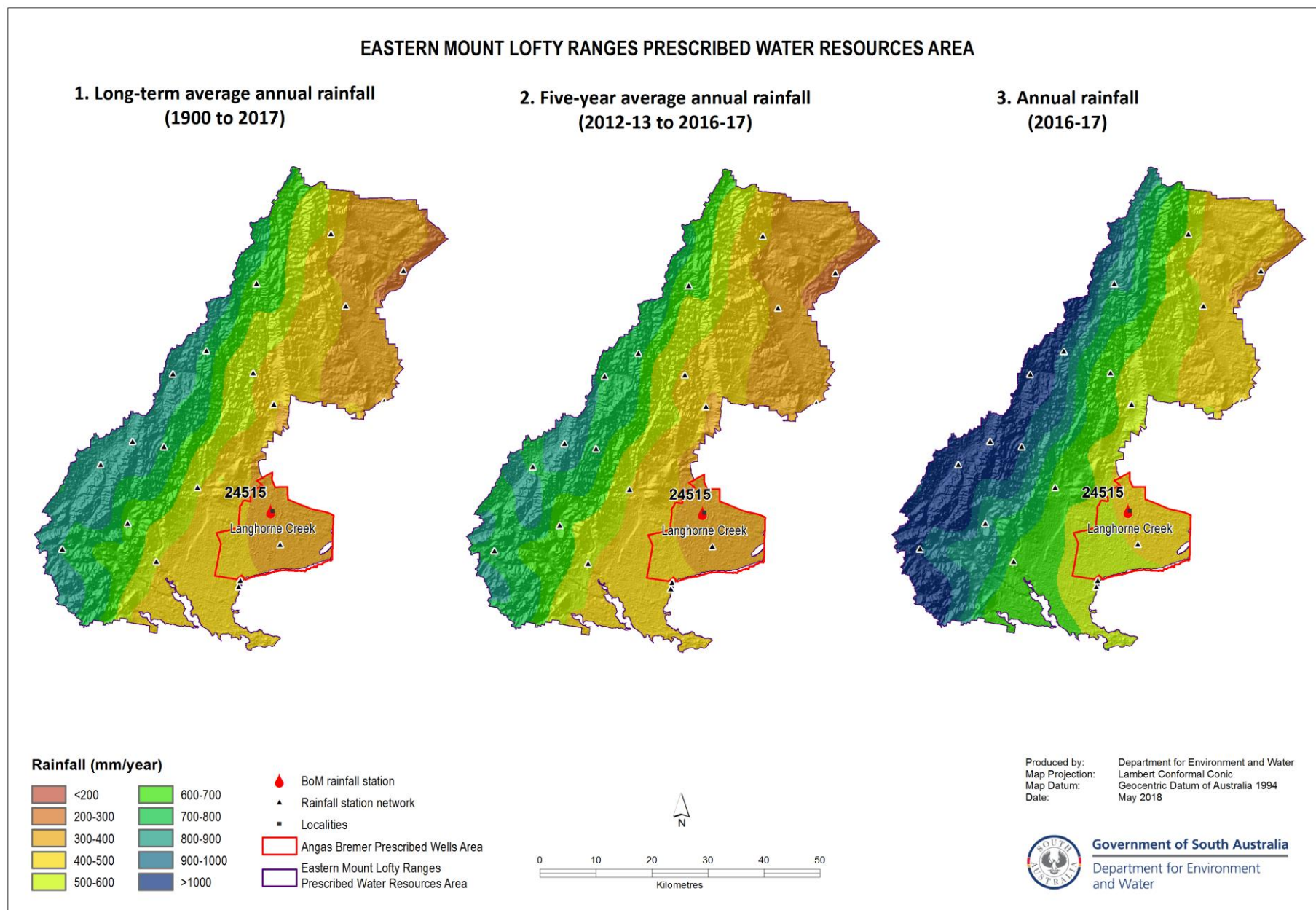


The Angas Bremer PWA is located on the western side of Lake Alexandrina, approximately 60 km south-east of Adelaide. It is located within the boundary of the Eastern Mount Lofty Ranges Prescribed Water Resources Area, which lies within the South Australian Murray-Darling Basin Natural Resources Management Region. It is a regional-scale resource for which groundwater resources are prescribed under South Australia's *Natural Resources Management Act 2004*, and a WAP provides for the sustainable management of the groundwater resources.

There are three aquifers underlying the Angas Bremer PWA, namely: the Quaternary aquifer; the confined Murray Group Limestone aquifer; and the Renmark Group confined aquifer. All licensed groundwater extractions occur from the MGL aquifer, which is the focus of this report.

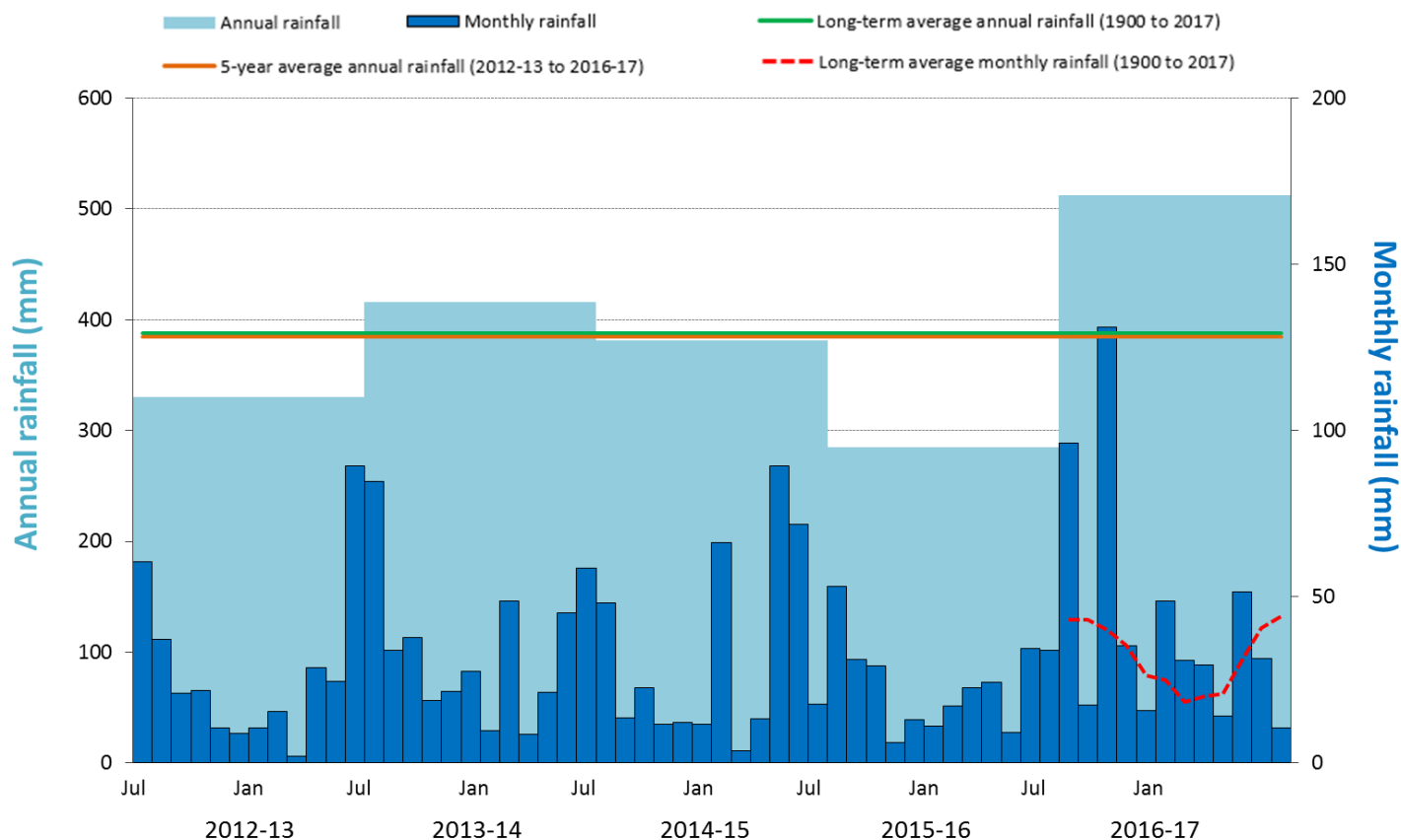
The MGL aquifer is up to 100 m thick and varies in composition with layers of soft clayey limestone, hard sandy limestone and soft bryozoal limestone. The direction of groundwater flow is generally south-east towards Lake Alexandrina. Irrigation water is obtained mainly from the fossiliferous limestone member, which can be cavernous in some areas. Well yields vary from around 5 L/s in the north to over 15 L/s in the south, with yields up to 40 L/s in some places.

Despite being a confined aquifer that does not receive direct recharge from rainfall, the intensity and timing of rainfall and subsequent extraction practices can have an effect on groundwater pressure levels and salinities in the MGL aquifer. For example, if the region experiences above-average rainfall during typically dry summer months, this could result in less groundwater being extracted, and consequently there may be smaller seasonal declines (or possibly rises) in groundwater pressure levels and salinities may stabilise or decrease.

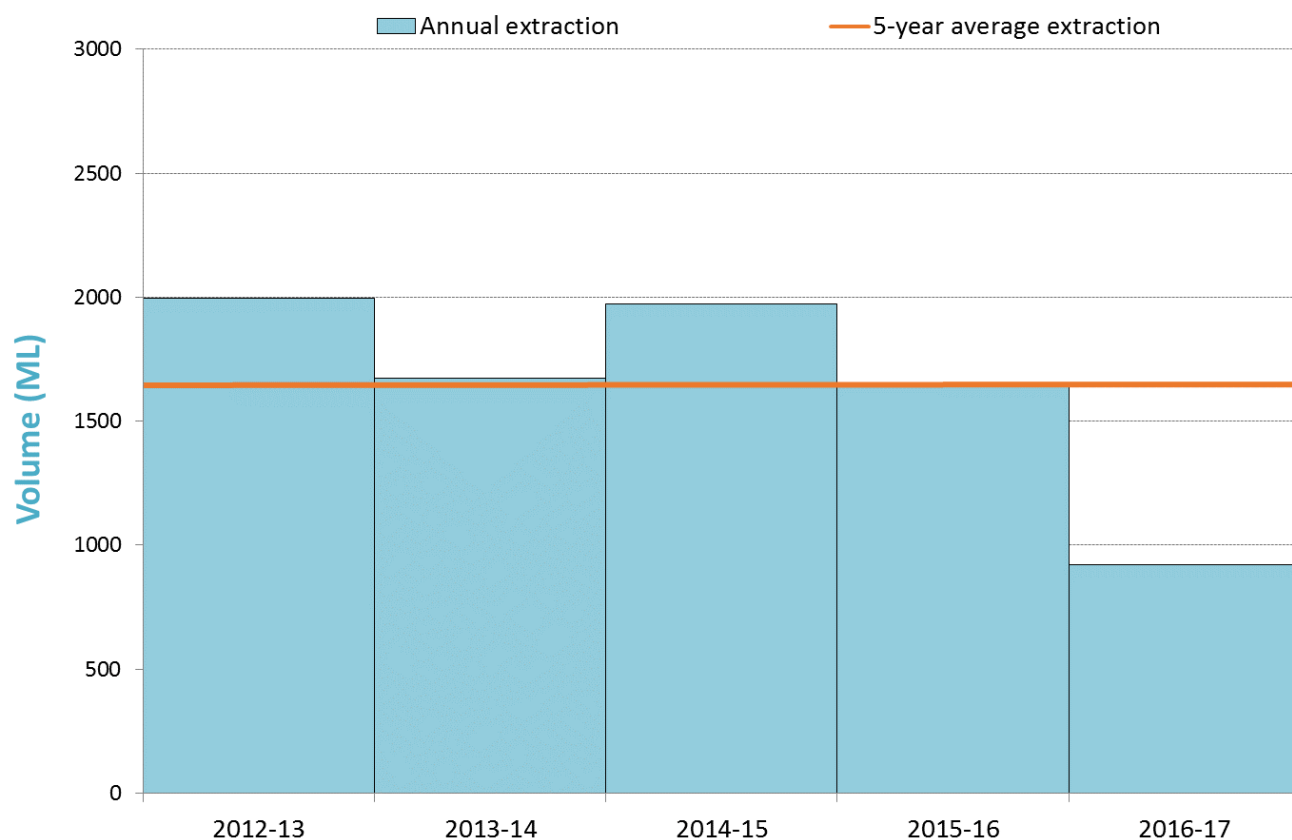


**Figure 1. Spatial distribution of (1) Long-term and (2) five-year average annual rainfall, and (3) annual rainfall<sup>5</sup>**

<sup>5</sup> Data sources: SILO Patched Point Dataset <https://silo.longpaddock.qld.gov.au/> and BoM Australian Water Availability Project (<http://www.bom.gov.au/jsp/awap/>) – see [More information](#)



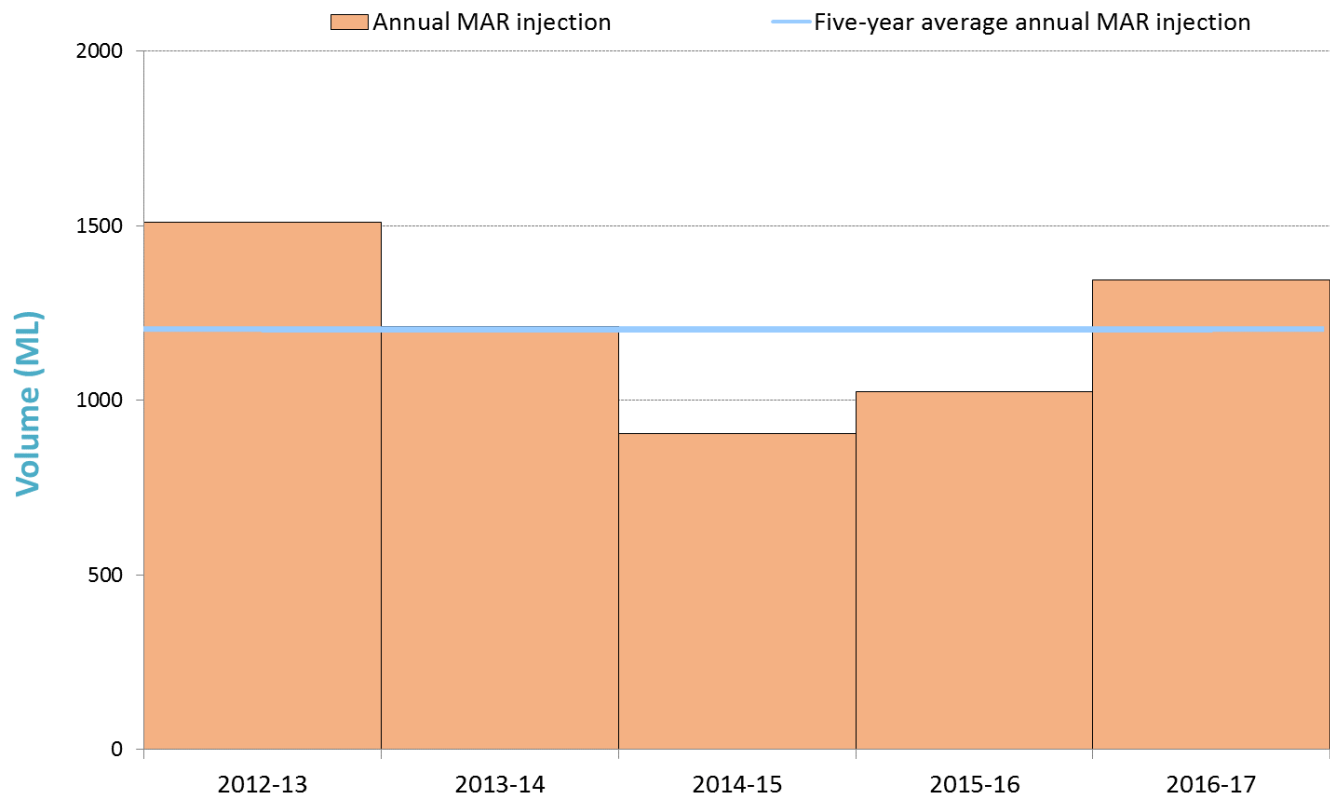
**Figure 2. Annual and monthly rainfall for the past five water-use years recorded at Langhorne Creek (BoM Station 24515)<sup>6</sup>**



**Figure 3. Licensed groundwater extraction volumes<sup>7</sup> for the past five water-use years**

<sup>6</sup> Data source: SILO Patched Point Dataset, available <https://silo.longpaddock.qld.gov.au/> – see [More information](#)

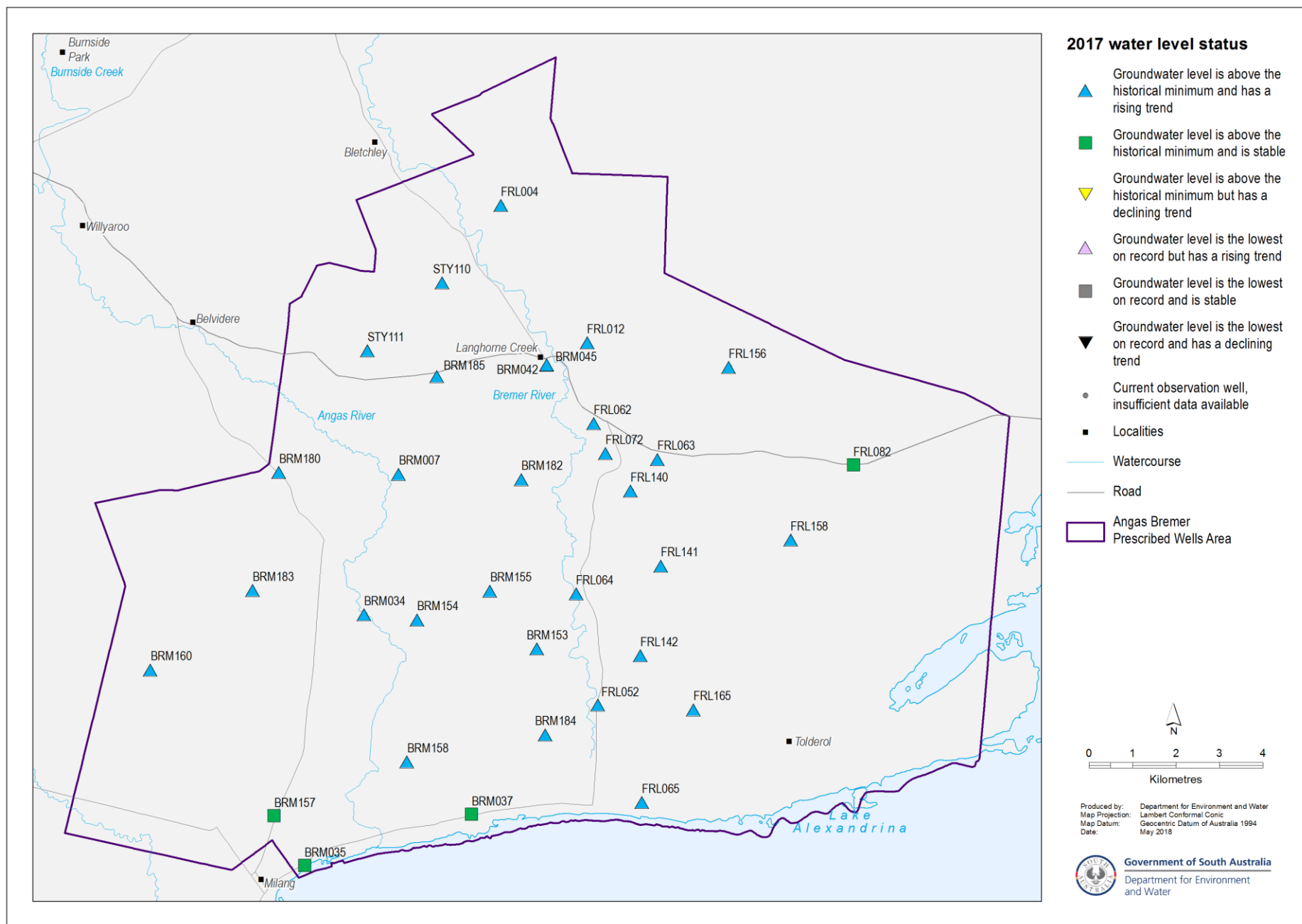
<sup>7</sup> Total licensed extractions are subject to change as extraction data have not yet been verified in full – see [More information](#)



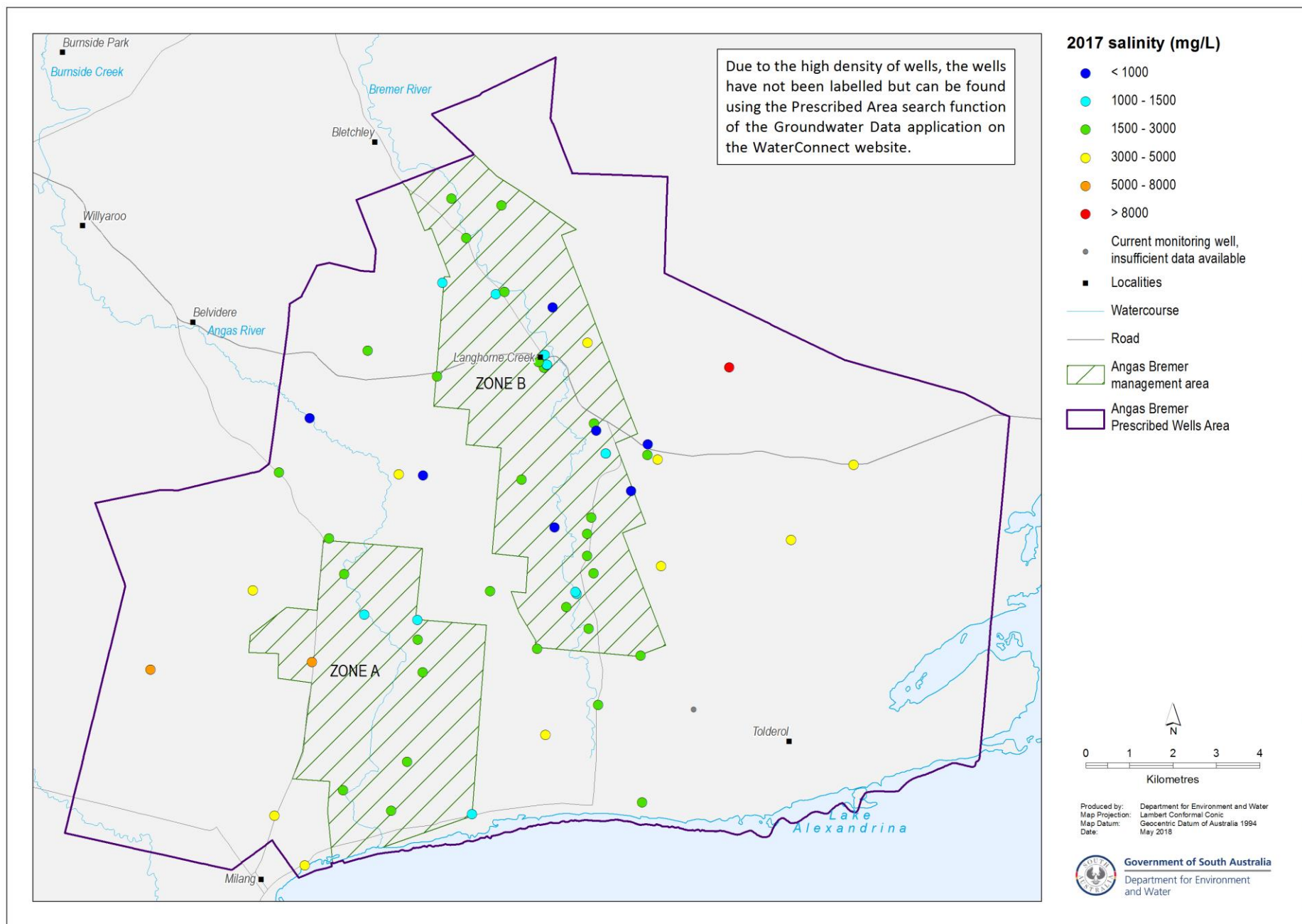
**Figure 4. Managed Aquifer Recharge injection volumes<sup>8</sup> for the past five water-use years**

<sup>8</sup> Total licensed MAR injections are subject to change as injection data have not yet been verified in full – see [More information](#)

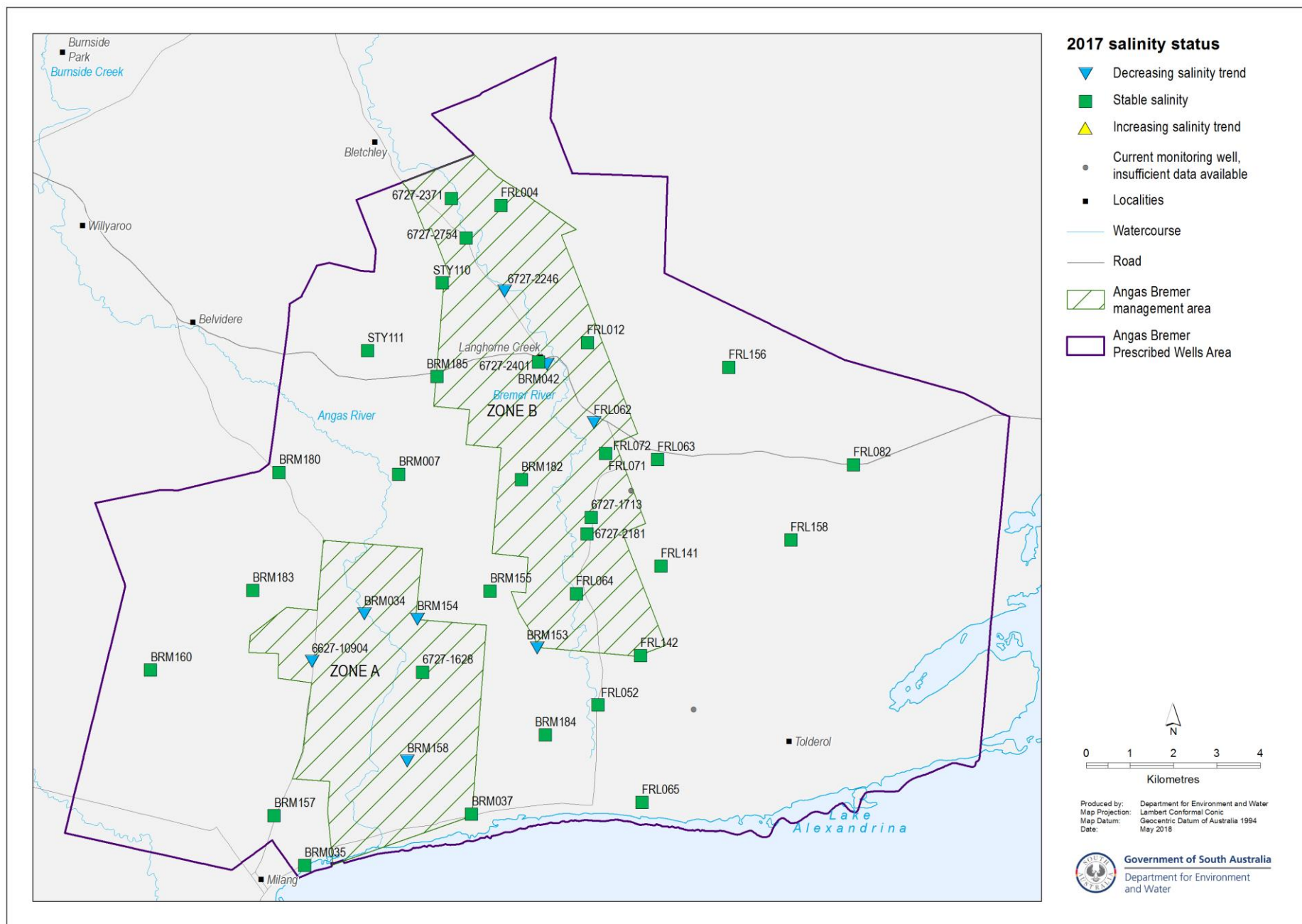




**Figure 5 Five-year trends (2013–17) in groundwater pressure levels: Murray Group Limestone aquifer**



**Figure 6. 2017 groundwater salinities: Murray Group Limestone aquifer**



**Figure 7. Five-year trends (2013–17) in groundwater salinities: Murray Group Limestone aquifer**

# More information

To determine the status of the MGL aquifer for 2017, the trends in groundwater levels and salinities over the past five years (2013 to 2017, inclusive) were analysed, in contrast to the year-to-year assessments that have been used in *Groundwater level and salinity status reports* published prior to 2015. 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 groundwater resources.

To view descriptions for all status symbols, and to review the full historical record of the monitoring wells, please visit the *Water Resource Assessments* page on [WaterConnect](#).

For additional information related to monitoring wells nomenclature, please refer to the *Wells Details* page on [WaterConnect](#).

The licenced groundwater use and MAR injection volumes for the 2016–17 water-use year is based on the best data available as of January 2018 and may be subject to change, as some extraction and injection volumes may be in the process of being verified.

For information completeness and consistency across all the groundwater and salinity status reports, the legend on each map herein shows the full range of water level and salinity status that could possibly be reported. However, the measured data that appear on each map may not span this full range.

Rainfall data used in this report is sourced from the SILO Patched Point Dataset, which uses original BoM daily rainfall measurements and is available online at <https://silolongpaddock.qld.gov.au/>. Rainfall maps have been compiled using daily gridded data produced by the BoM Australian Water Availability Project ([www.bom.gov.au/jsp/awap/](http://www.bom.gov.au/jsp/awap/)).

To view the *Angas Bremer PWA Groundwater Level and Salinity Status Report 2009–10*, which includes background information on hydrogeology, rainfall and relevant groundwater-dependent ecosystems, please visit [WaterConnect](#). To view all past published *Groundwater level and salinity status reports*, please visit the [Water Resource Assessments](#) page on WaterConnect.

To view or download groundwater level and salinity data from monitoring wells within the Angas Bremer PWA, please visit the *Groundwater Data* page under the *Data Systems* tab on [WaterConnect](#).

For further details about the Angas Bremer PWA, please see the *Water Allocation Plan for the Eastern Mount Lofty Ranges* on the Natural Resources South Australian Murray-Darling Basin [website](#).

## Units of Measurement

|        |                               |
|--------|-------------------------------|
| mm     | millimetre                    |
| ML     | megalitre                     |
| m/y    | metres per year               |
| mg/L   | milligrams per litre          |
| mg/L/y | milligrams per litre per year |
| mm/y   | millimetres per year          |



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