Angas Bremer Prescribed Wells Area Murray Group Limestone aquifer

2018 Groundwater level and salinity status report

Government of South Australia
Department for Environment and Water

2018 Status summary
Angas Bremer PWA
Murray Group Limestone aquifer

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 2018 because positive trends have been observed in the past five years.

The status is based on five-year trends: over the period 2014–18, all wells show rising or stable groundwater levels and stable or decreasing salinities.

The status is based on five-year trends. To view the *Angas Bremer PWA groundwater level and salinity status report 2009–10*, which includes long-term trends in rainfall, groundwater levels and salinity, please visit the Water Resource Assessments page on WaterConnect. To download the full record of groundwater level and salinity data for the Angas Bremer PWA, please visit the *Groundwater Data* page on WaterConnect.

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	The Langhorne Creek Bureau of Meteorology (BoM) rainfall station, number 24515, is located near the township of Langhorne Creek in the central part of the Angas Bremer PWA.
Annual total[1]	326 mm 58 mm (15%) less than the five-year average of 384 mm 61 mm (16%) less than the long-term (1900-2018) average of 387 mm

[1] For the water-use year 1 July 2017 to 30 June 2018

Groundwater extraction

See Figures 3 and 4

Allocated volume[1,2]	6534 ML
Licensed groundwater extractions[1,3]	1384 ML (includes extraction of rollover and recharge allocations)
Extraction volume comparison	461 ML (50%) greater than the previous year 137 ML (9%) less than the five-year average
Managed Aquifer Recharge (MAR) licensed groundwater injections[1,4]	945 ML
MAR volume comparison	30% less than the previous year 13% less than the five-year average

Groundwater level

See Figure 5

Five-year trend: 2014–18	33 out of 34 wells (97%) show rising trends, at rates of 0.02–0.34 m/y (median of 0.17 m/y) 1 well (3%) is stable

Groundwater salinity

See Figures 6 and 7

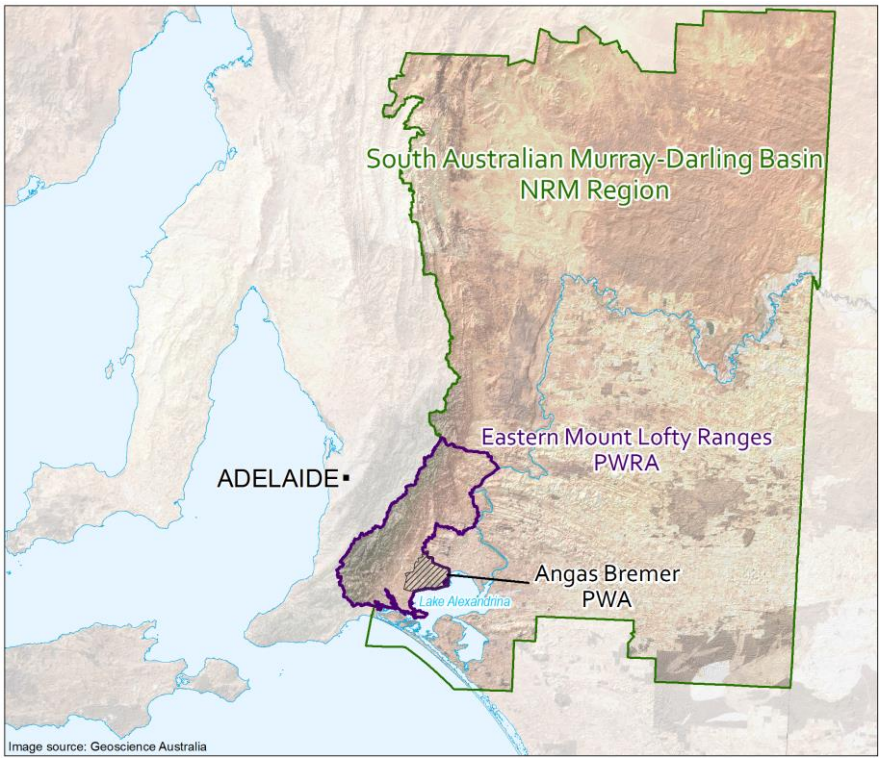
2018 salinity	567–5874 mg/L (25 wells; median of 1995 mg/L)
Five year trend: 2014–18	9 out of 10 wells (90%) show stable salinities 1 well (10%) shows decreasing trend, at a rate of 137 mg/L/y
Citizen science	Since 2014, irrigators in the Angas Bremer PWA have submitted groundwater samples that DEW have tested for salinity concentration. Data that have been validated are augmenting the existing DEW monitoring network.[5]

Groundwater condition limits

Definition	The water allocation plan for the Eastern Mount Lofty Ranges (EMLR) Prescribed Water Resources Area (PWRA) has identified resource condition limits 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 2017–18	Triggers have not been reached or exceeded (from 2015–16 to 2017–18).

[2] Allocated volume does not include rollover, carry over or recharge allocations
[3] Total licensed extractions are subject to change as extraction data have not yet been verified in full – see More information
[4] Total MAR volumes are subject to change as injection data have not yet been verified in full – see More information
[5] The salinity data collected from irrigation wells can be viewed at Groundwater Data or via 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 EMLR PWRA, 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 water allocation plan provides for their sustainable management.

There are three aquifers underlying the Angas Bremer PWA: the Quaternary aquifer; the confined MGL 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 the confined nature of the MGL aquifer, which does not receive direct recharge from incident rainfall, the intensity and timing of rainfall (and related variations in groundwater extraction rates) can have an effect on groundwater levels and salinities. For example, if the area experiences above-average rainfall, this could result in less groundwater being extracted from the MGL aquifer for irrigation, which can cause groundwater levels to rise and salinities to stabilise or decrease. Conversely, below-average rainfall may result in increased rates of groundwater extraction and groundwater levels may decline and salinities increase.

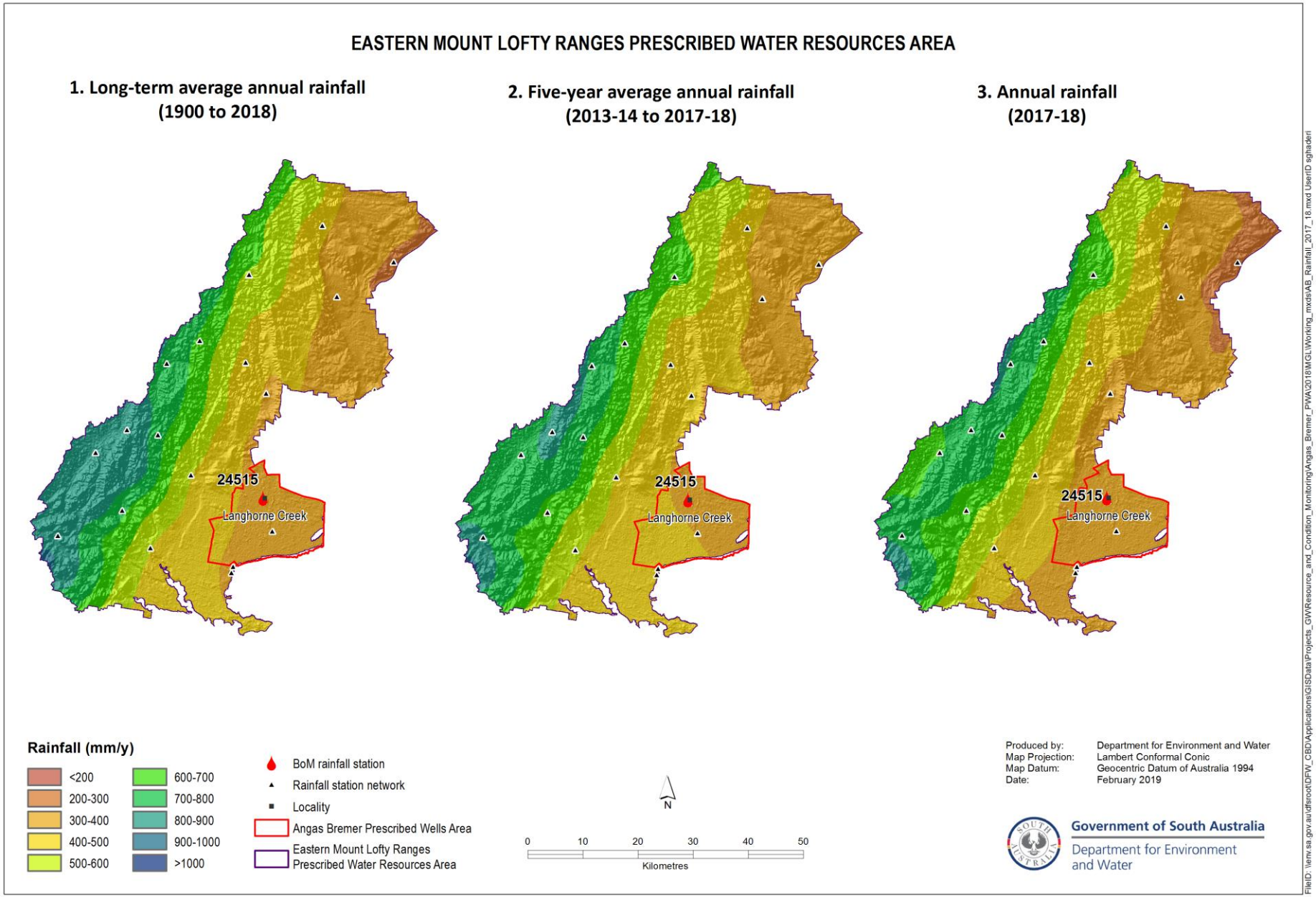


Figure 1. Spatial distribution of (1) long-term and (2) five-year average annual rainfall, and (3) annual rainfall[6]

[6] Data sources: SILO interpolated point and gridded datasets available at https://legacy.longpaddock.qld.gov.au/silo/ – see More information

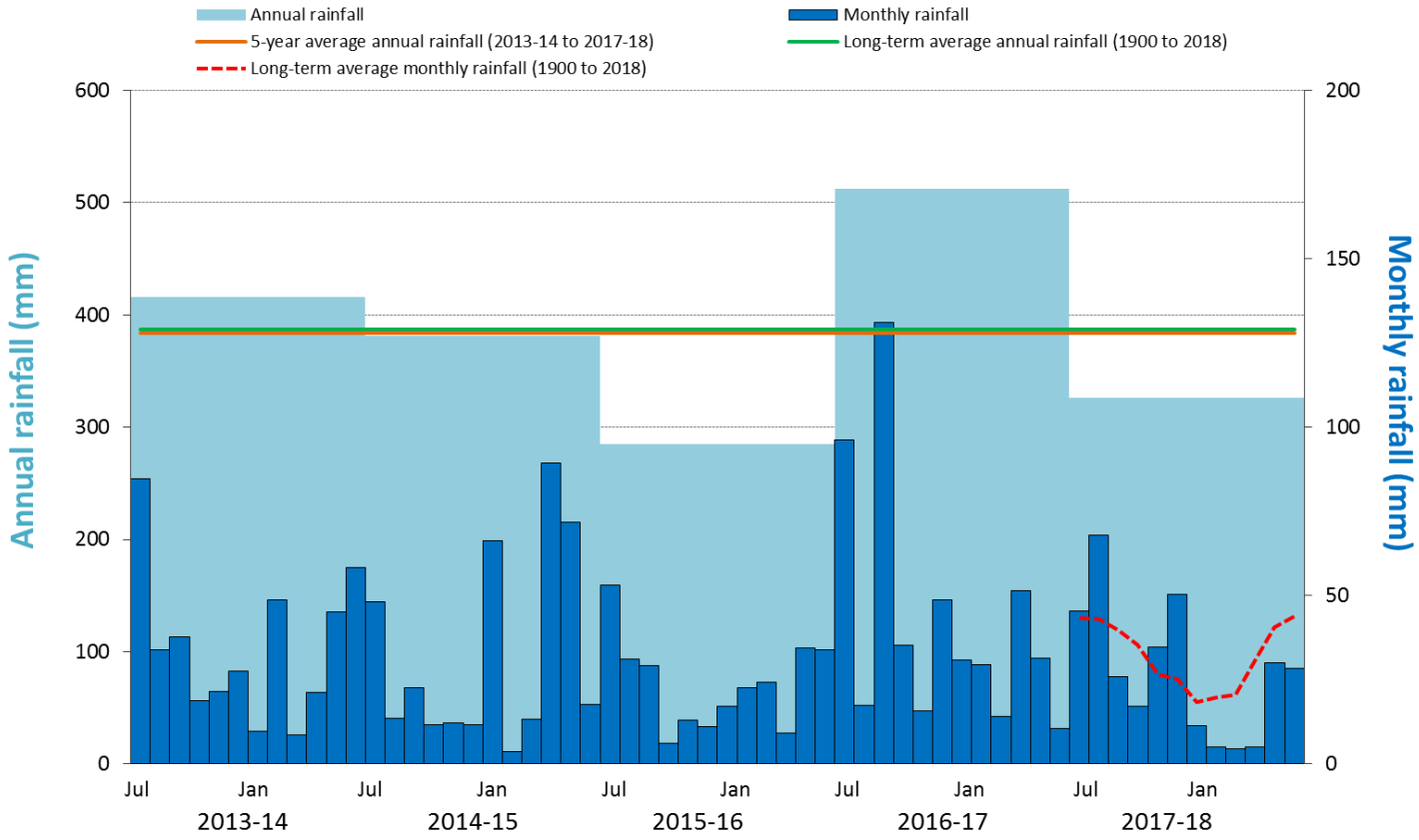


Figure 2. Annual and monthly rainfall in the past five water-use years recorded at Langhorne Creek (BoM Station 24515)[7]

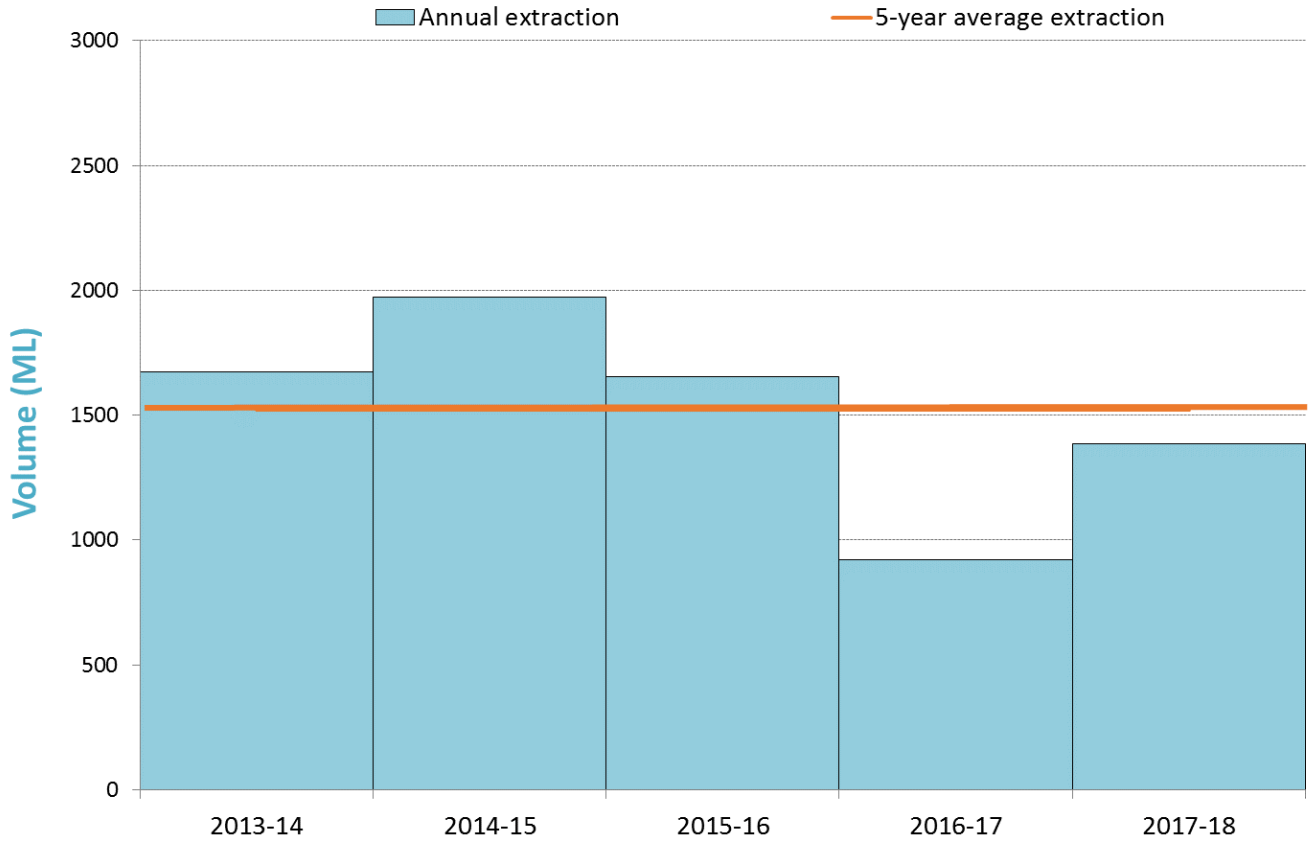


Figure 3. Licensed groundwater extraction volumes[8] for the past five water-use years

[7] Data source: SILO Patched Point Dataset, available https://legacy.longpaddock.qld.gov.au/silo/ – see More information
[8] Total licensed extractions are subject to change as extraction data have not yet been verified in full – see More information

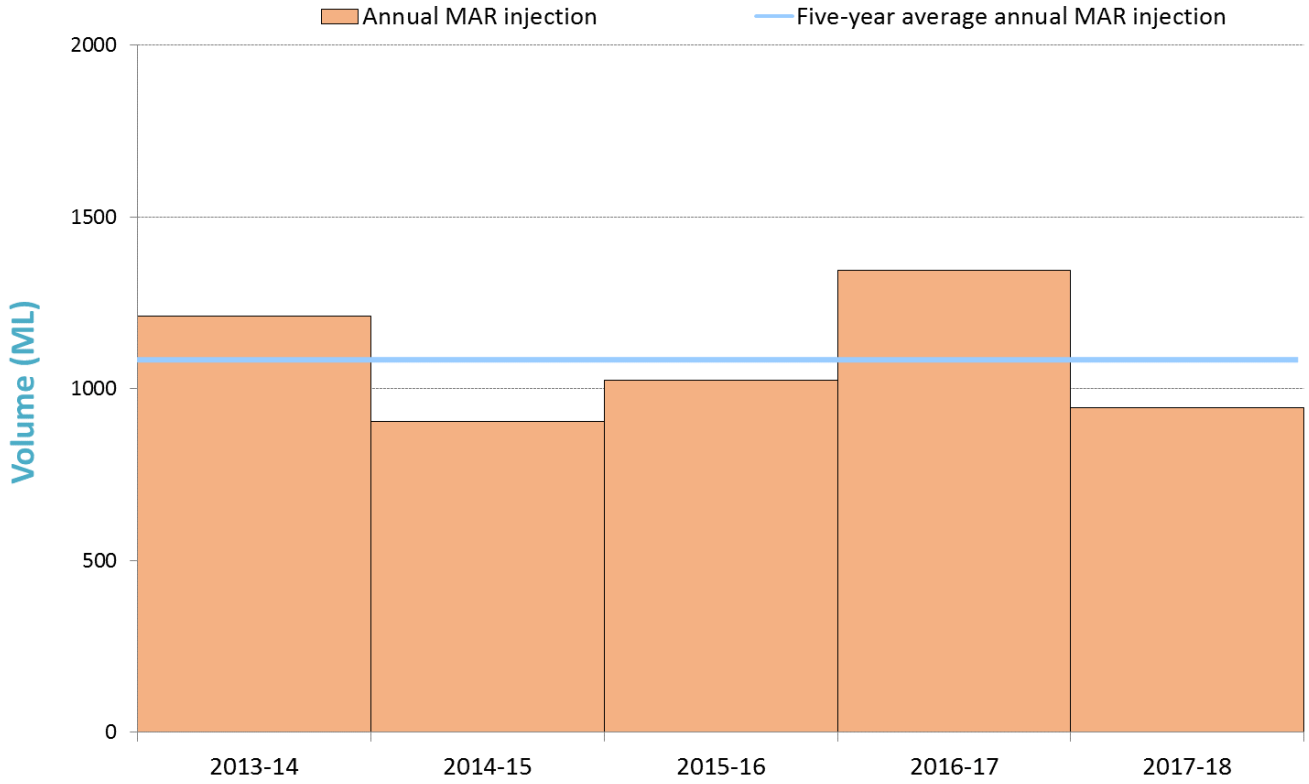


Figure 4. Managed Aquifer Recharge injection volumes[9] for the past five water-use years

[9] Total licensed MAR injections are subject to change as injection data have not yet been verified in full – see More information

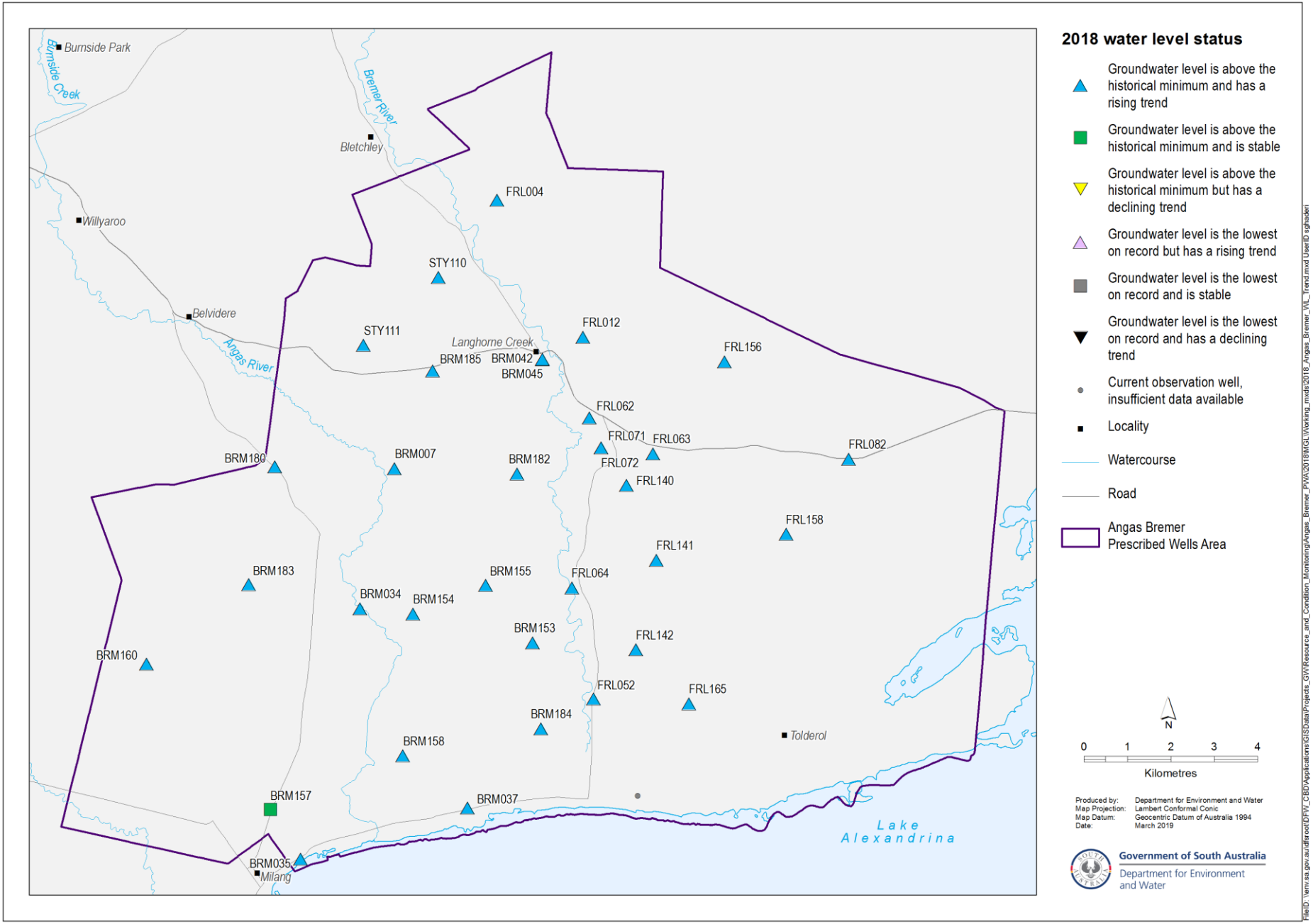


Figure 5. Five-year trends (2014–18) in groundwater levels: Murray Group Limestone aquifer

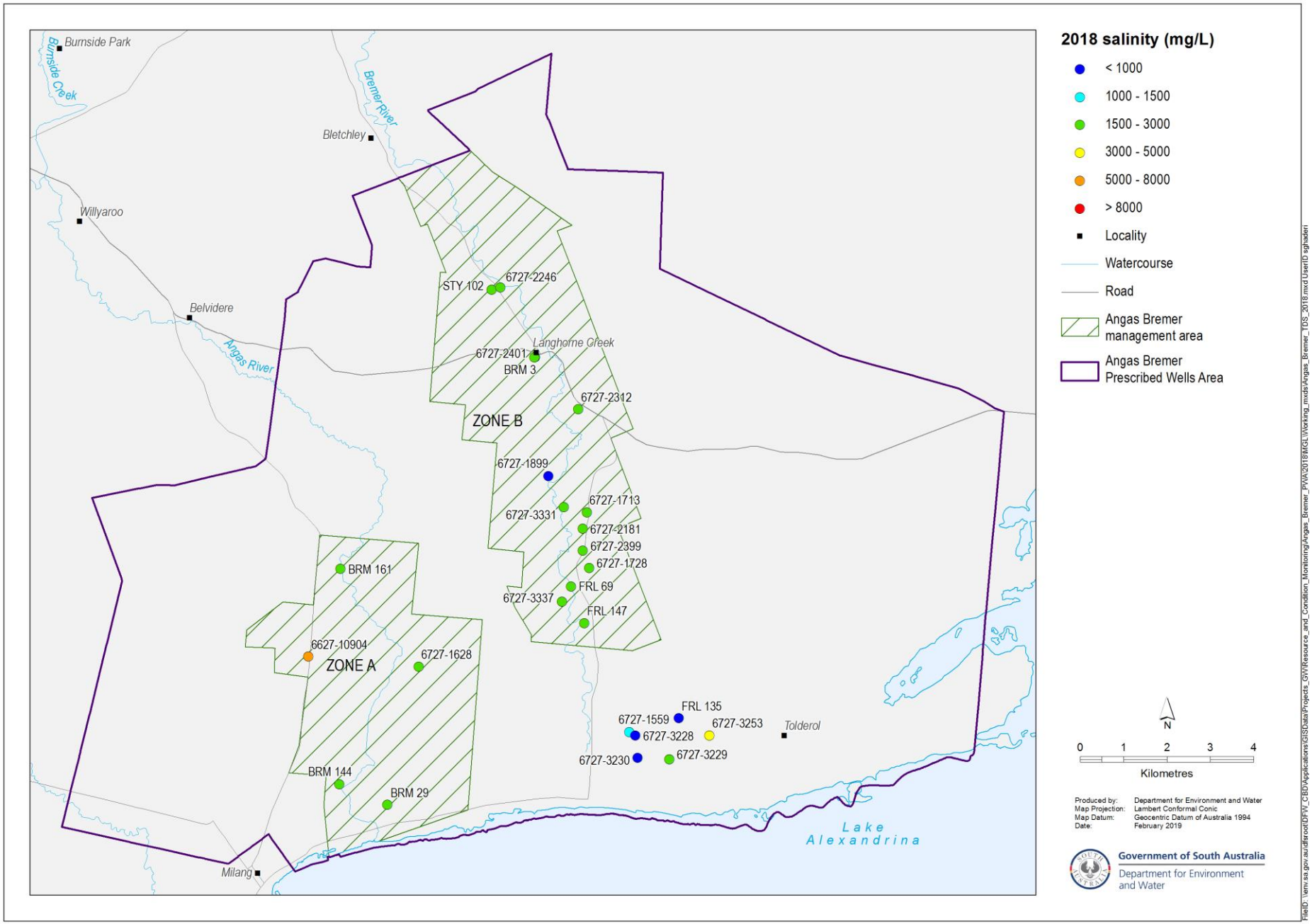


Figure 6. 2018 groundwater salinities: Murray Group Limestone aquifer

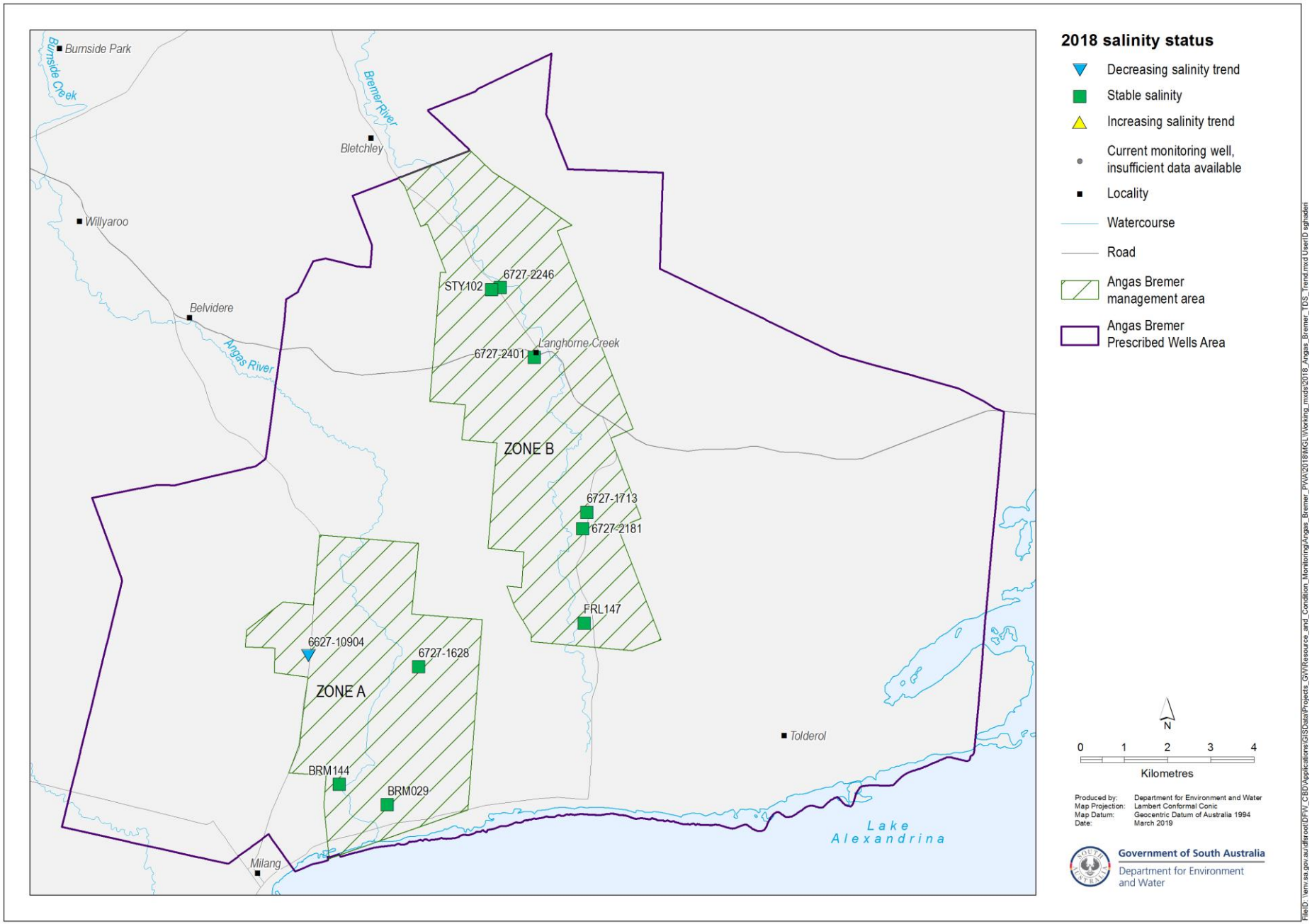


Figure 7. Five-year trends (2014–18) in groundwater salinities: Murray Group Limestone aquifer

More information

To determine the status of the MGL aquifer for 2018, the trends in groundwater levels and salinities over the past five years (2014 to 2018, 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, 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 licensed groundwater extraction for the 2017–18 water-use year is based on the best data available as of February 2019 and could be subject to change, as some extraction 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 are sourced from the SILO interpolated point and gridded datasets, which are calculated from BoM daily and monthly rainfall measurements and are available online at https://legacy.longpaddock.qld.gov.au/silo/.

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

Published by the Department for Environment and Water.
Government of South Australia
16 July 2019

Head Office
81-95 Waymouth St
ADELAIDE SA 5000

Telephone +61 (8) 8463 6946
Facsimile +61 (8) 8463 6999

ABN 36702093234
ISBN 978-1-925805-66-6

Report prepared by:
Department for Environment and Water
Water Science and Monitoring Branch
Strategy, Science and Corporate Services Directorate

www.environment.sa.gov.au

Preferred way to cite this publication

DEW 2019. *Angas Bremer PWA Murray Group Limestone aquifer 2018 groundwater level and salinity status report,* Government of South Australia, Department for Environment and Water, Adelaide.

Download this document at www.waterconnect.sa.gov.au

Government of South Australia

Department for Environment and Water