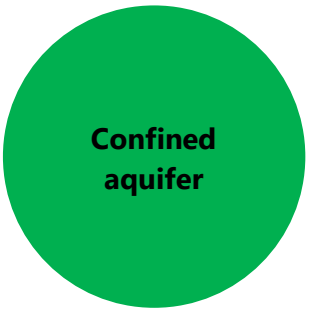
Peake, Roby and Sherlock Prescribed Wells Area Confined aquifer

2018 Groundwater level and salinity status report

Government of South Australia
Department for Environment and Water

2018 Status summary
Peake, Roby and Sherlock PWA
Confined aquifer



The confined aquifer of the Peake, Roby and Sherlock Prescribed Wells Area (PWA) has been assigned a ***green*** status for 2018 because positive trends have been observed over the past five years.

The status is based on five-year trends: over the period 2014–18, 77% of wells show rising groundwater levels and all show stable salinities.

The status is based on five-year trends. To view the *Peake, Roby and Sherlock PWA groundwater level and salinity status report 2011*, 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 Peake, Roby and Sherlock 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	Peake Bureau of Meteorology (BoM) rainfall station, number 25513, is located near the township of Peake in the western part of the Peake, Roby and Sherlock PWA.
Annual total[1]	308 mm 22 mm (7%) less than the five-year average of 330 mm 78 mm (20%) less than the long-term (1900–2018) average of 386 mm

Groundwater extraction

See Figure 3

Allocated volume[1,2]	1898 ML
Licensed groundwater extractions[1,3]	578 ML
Extraction volume comparison	1% greater than the previous year 36% greater than the five-year average

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

Groundwater level

See Figure 4

Five-year trend: 2014–18	10 out of 13 wells (77%) show a rising trend, at rates of 0.02–0.32 m/y (median of 0.15 m/y) 3 wells (23%) show declining trends, at rates of 0.07, 0.17 and 0.24 m/y

Groundwater salinity

See Figures 5 and 6

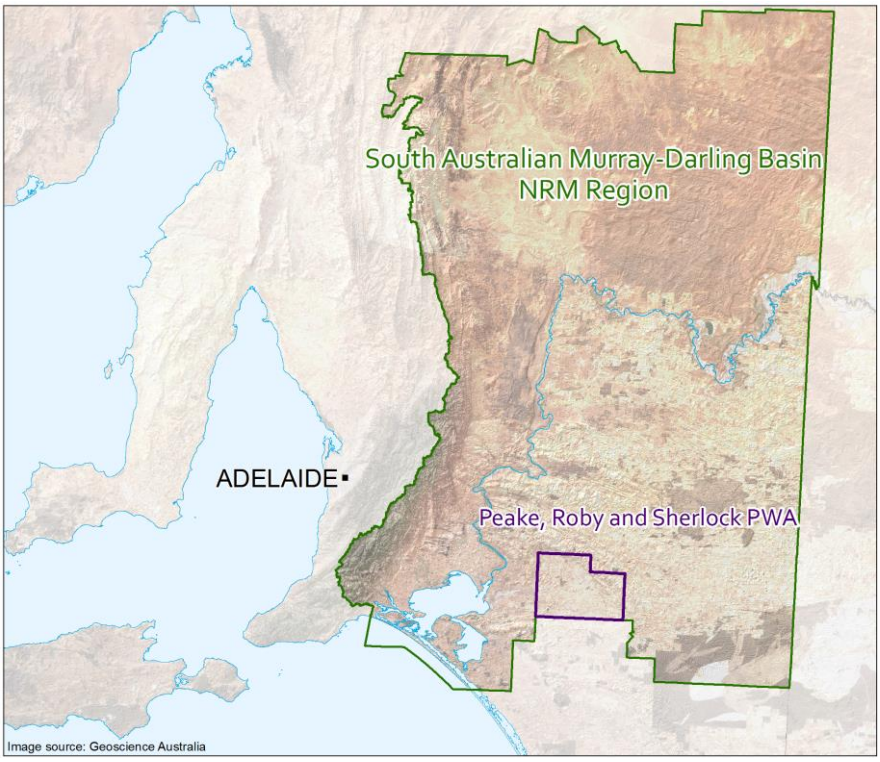
2018 salinity	2987–5150 mg/L (8 wells; median of 3464 mg/L)
Five-year trend: 2014–18	All 6 wells are stable

Groundwater resource condition limits

See Figures 7, 8 and 9

Definition	The water allocation plan for the Peake, Roby and Sherlock PWA has identified resource condition limits based on groundwater level and salinity thresholds—these are designed to give early warning of adverse trends that may impact users of the resource.
Water level thresholds definition	The rolling three-year average of the annual maximum drawdown and recovery levels, measured in at least 50% of designated wells, should not fall below the maximum drawdown or recovery thresholds.
Water level in 2017–18	Thresholds have not been reached or exceeded.
Salinity thresholds definition	The rolling three-year average of the maximum groundwater salinity, measured in at least 50% of the designated wells, should not rise more than 5% from the baseline salinity.
Salinity in 2017–18	Thresholds have not been reached or exceeded.

Regional setting



The Peake, Roby and Sherlock PWA is located around 120 km south-east of Adelaide in the South Australian Murray-Darling Basin Natural Resources Management Region. It is underlain by sedimentary aquifers of the Murray Basin and is a local-scale groundwater resource mainly used for public water supply, feedlots and by a small number of irrigators. Groundwater is prescribed under South Australia's *Natural Resources Management Act 2004* and a water allocation plan provides for the sustainable management.

The Peake, Roby and Sherlock PWA has two distinct aquifers—an unconfined aquifer and a confined aquifer. Almost all licensed groundwater extractions are taken from the confined aquifer and as such, it is the focus of this report.

The confined aquifer comprises the Buccleuch Group and Renmark Group formations. The Buccleuch Group consists of a consolidated bryozoal limestone or 'coral' that lies at a depth of 90–100 m below the ground and varies in thickness from 5–25 m. This coral layer begins to merge laterally with the Renmark Group in the eastern area of the PWA. The Renmark Group comprises interbedded sands and clays, and there are very few wells that extract from this aquifer. As the Buccleuch and Renmark Group aquifers are confined, they are not recharged by local rainfall. The primary source of recharge is the lateral inflow of groundwater from aquifers located in south-western Victoria.

Despite the confined nature of the aquifer, which does not receive direct recharge from incident rainfall, the intensity and timing of local 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 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.

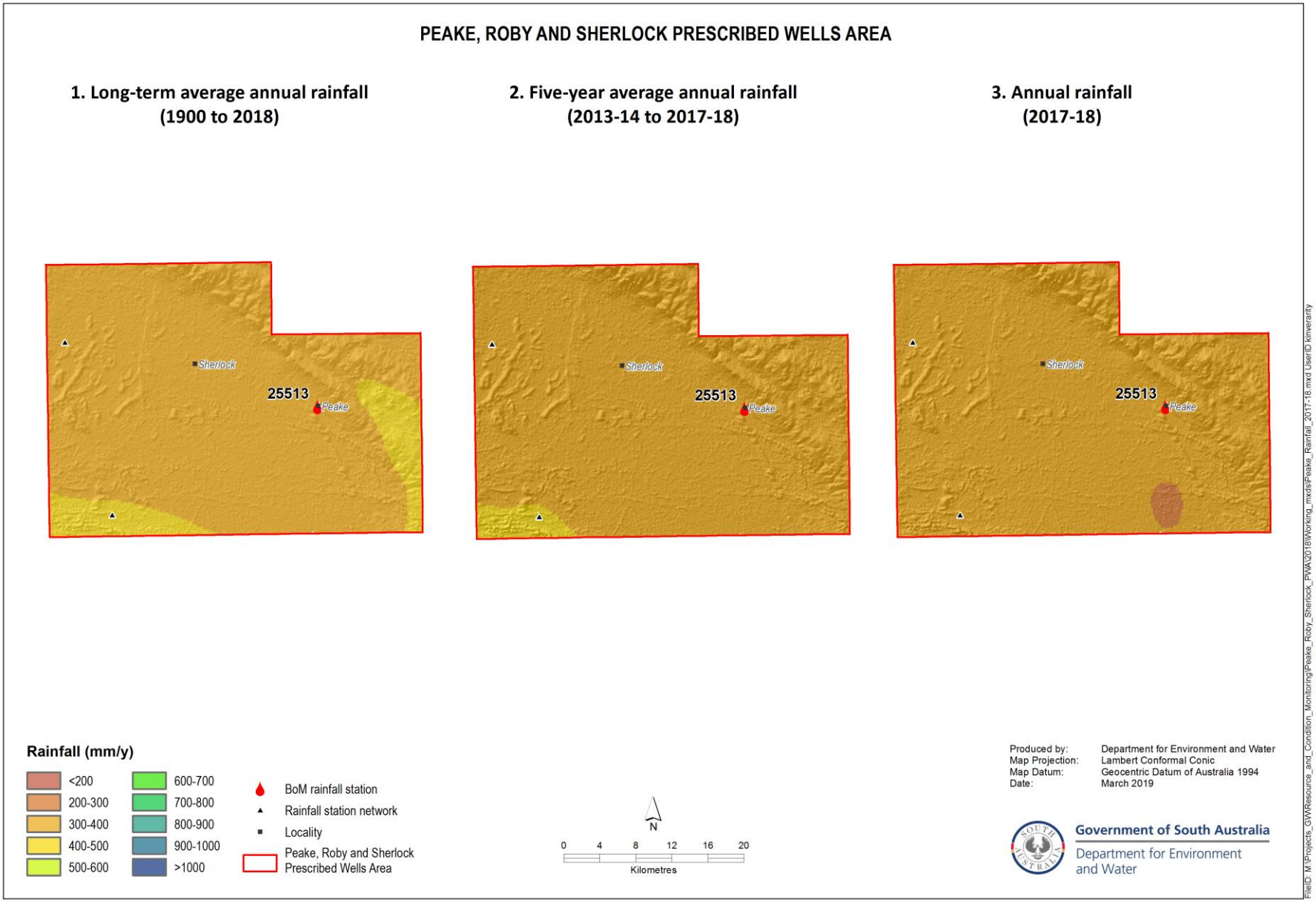


Figure 1. Spatial distribution of (1) Long-term and (2) five-year average annual rainfall, and (3) annual rainfall[4]

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

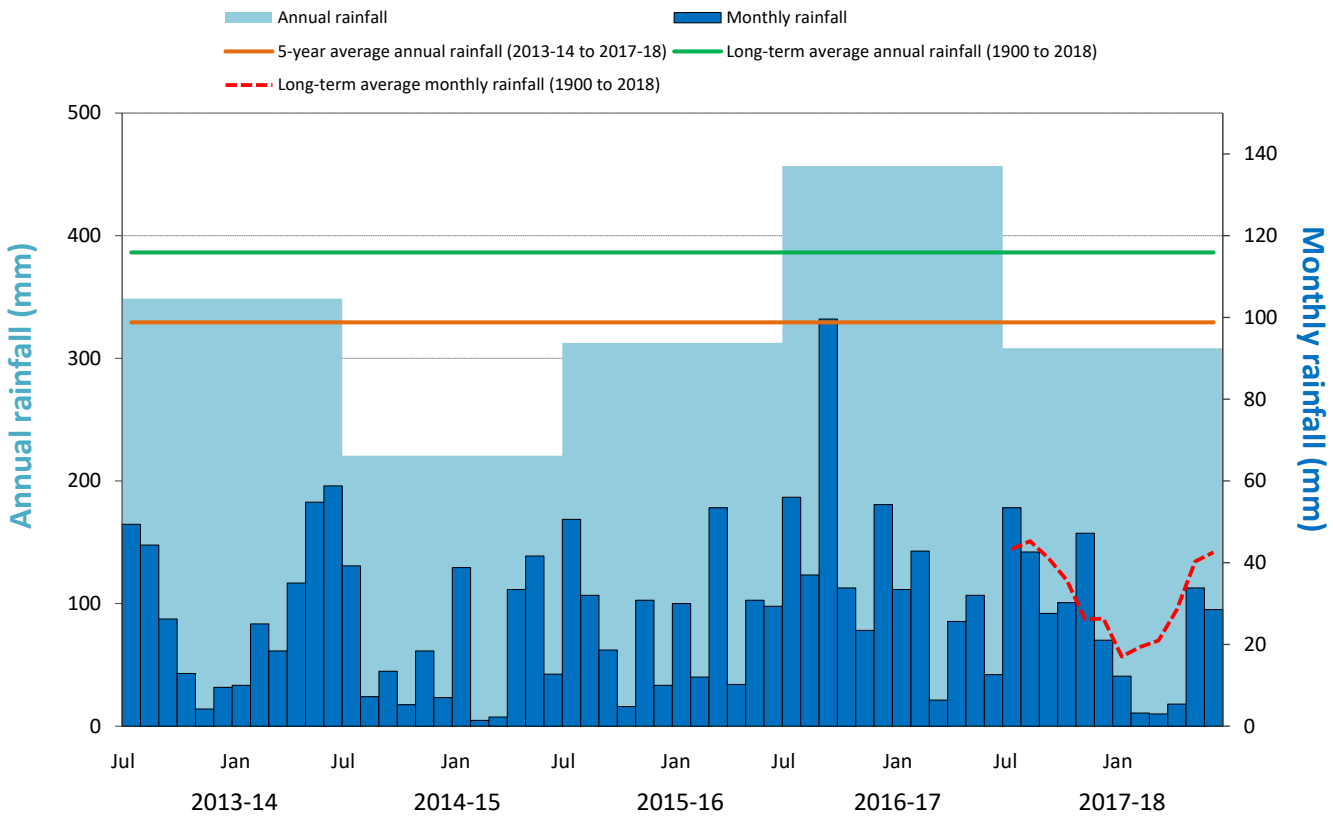


Figure 2. Annual and monthly rainfall for the past five water-use years recorded at Peake (BoM Station 25513)[5]

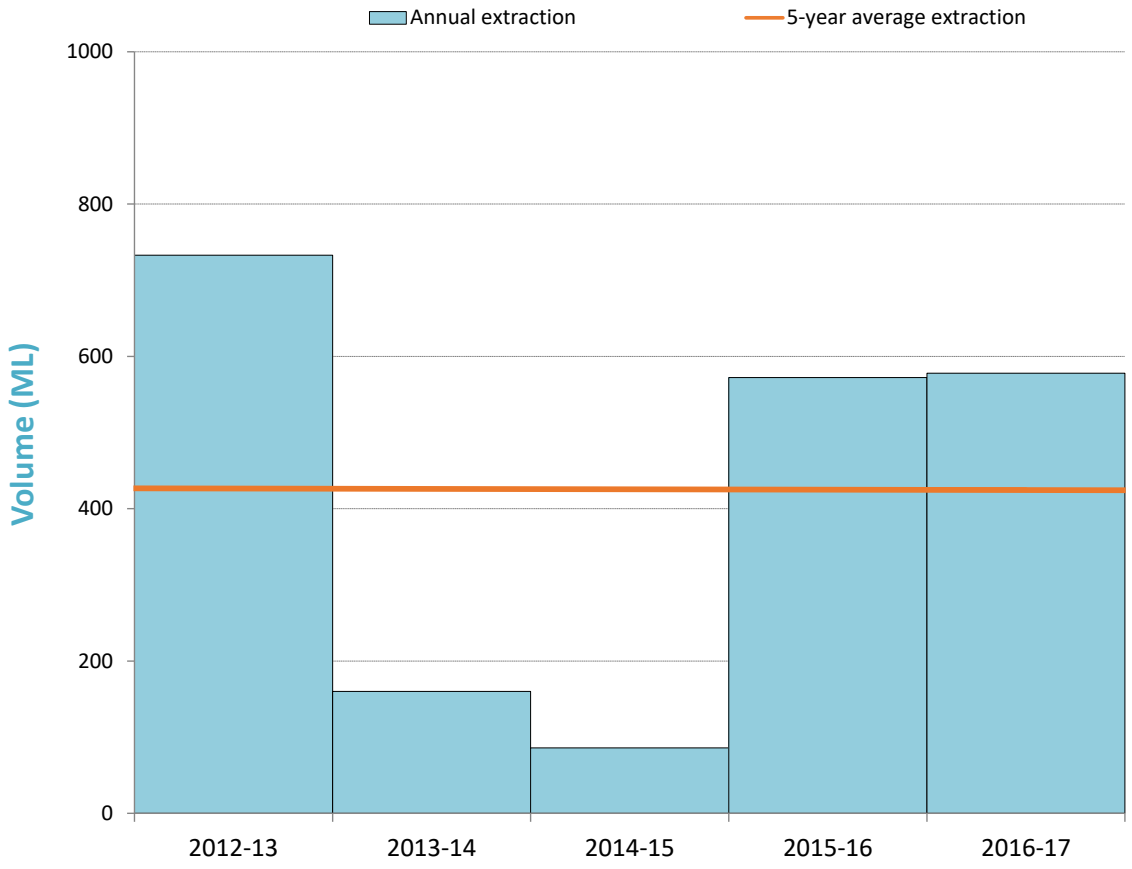


Figure 3. Licensed groundwater extraction volumes[6] for the past five water-use years

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

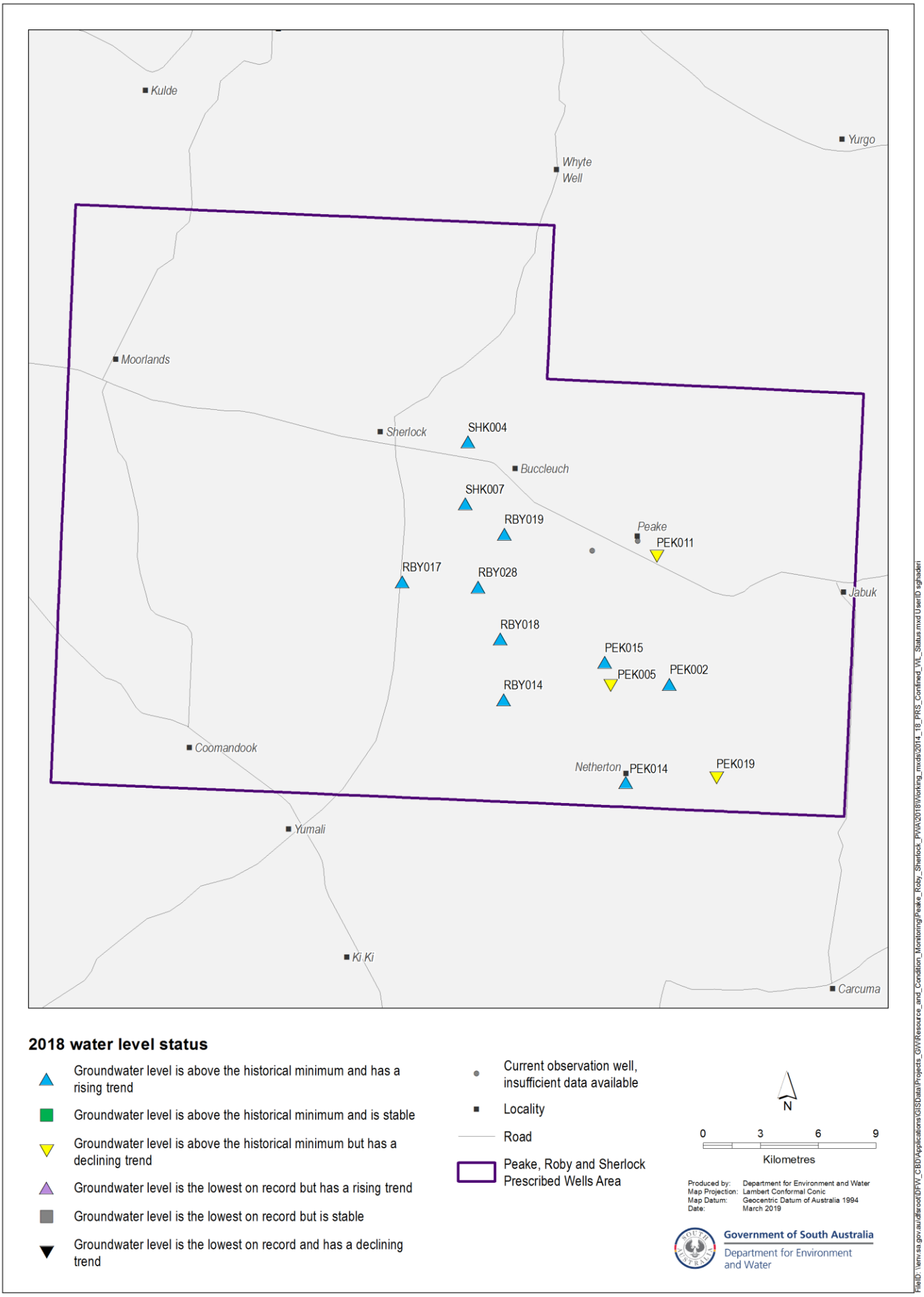


Figure 4. Five-year trends (2014–18) in groundwater levels: confined aquifer

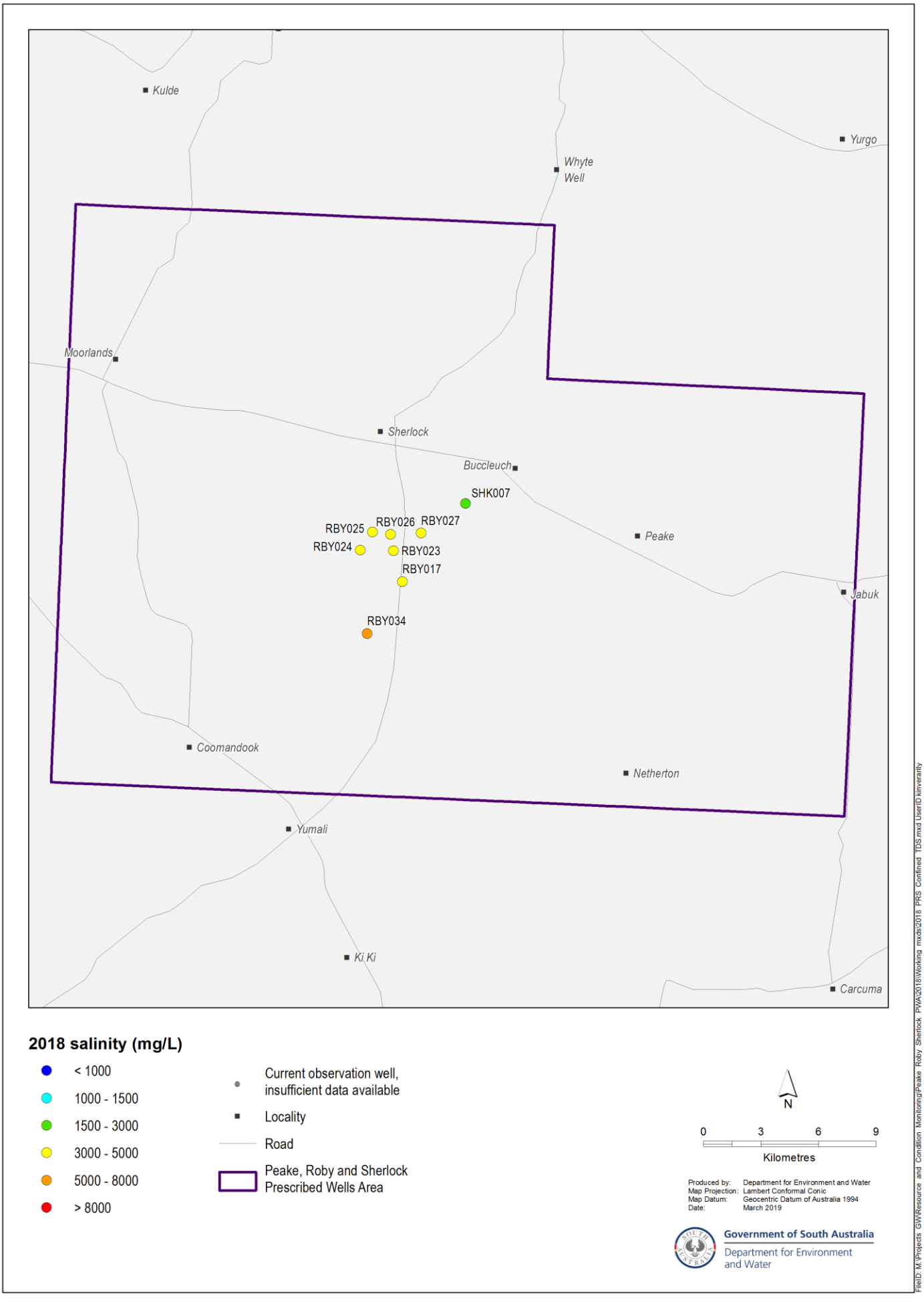


Figure 5. 2018 groundwater salinities: confined aquifer

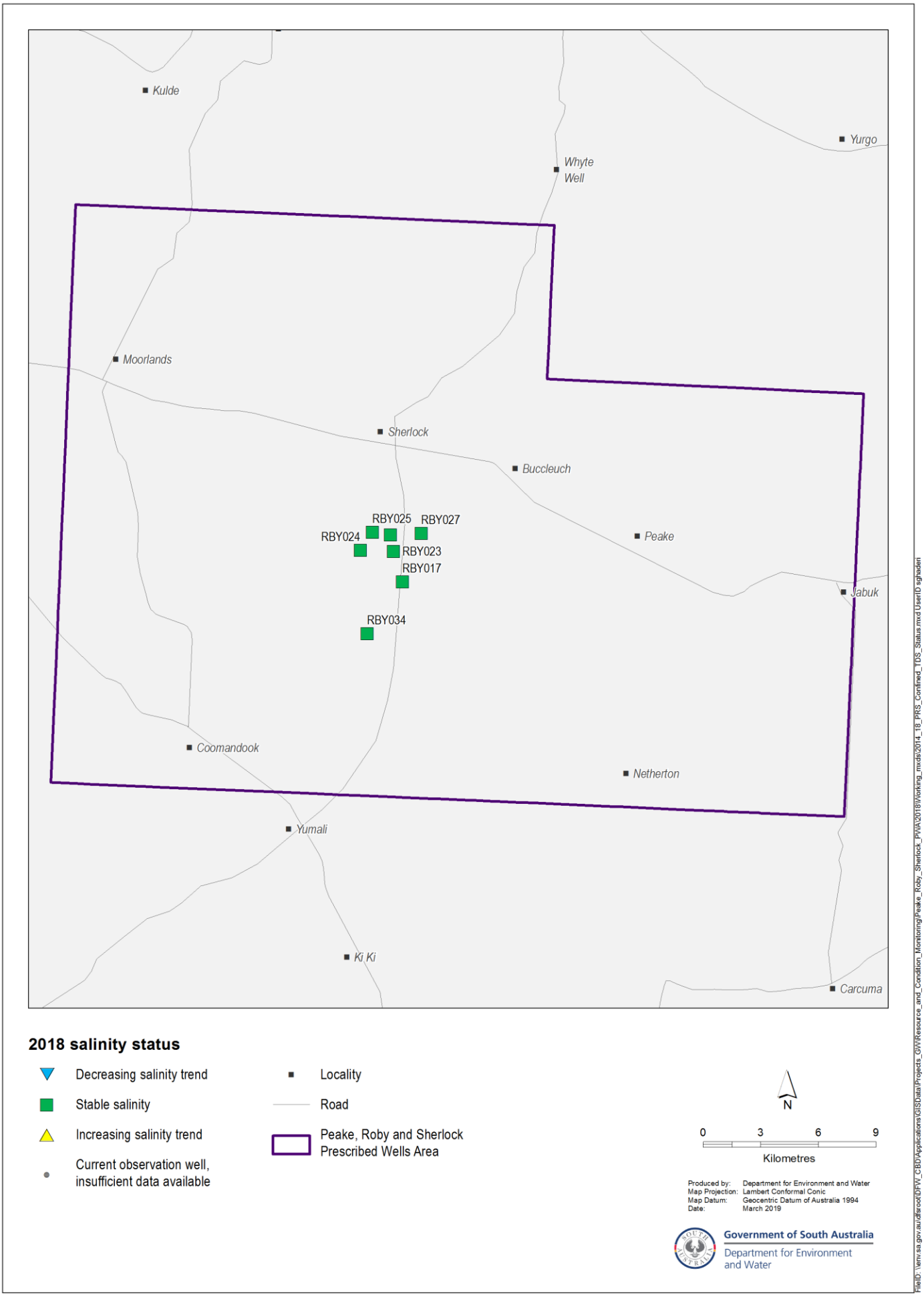


Figure 6. Five-year trends (2014–18) in groundwater salinities: confined aquifer

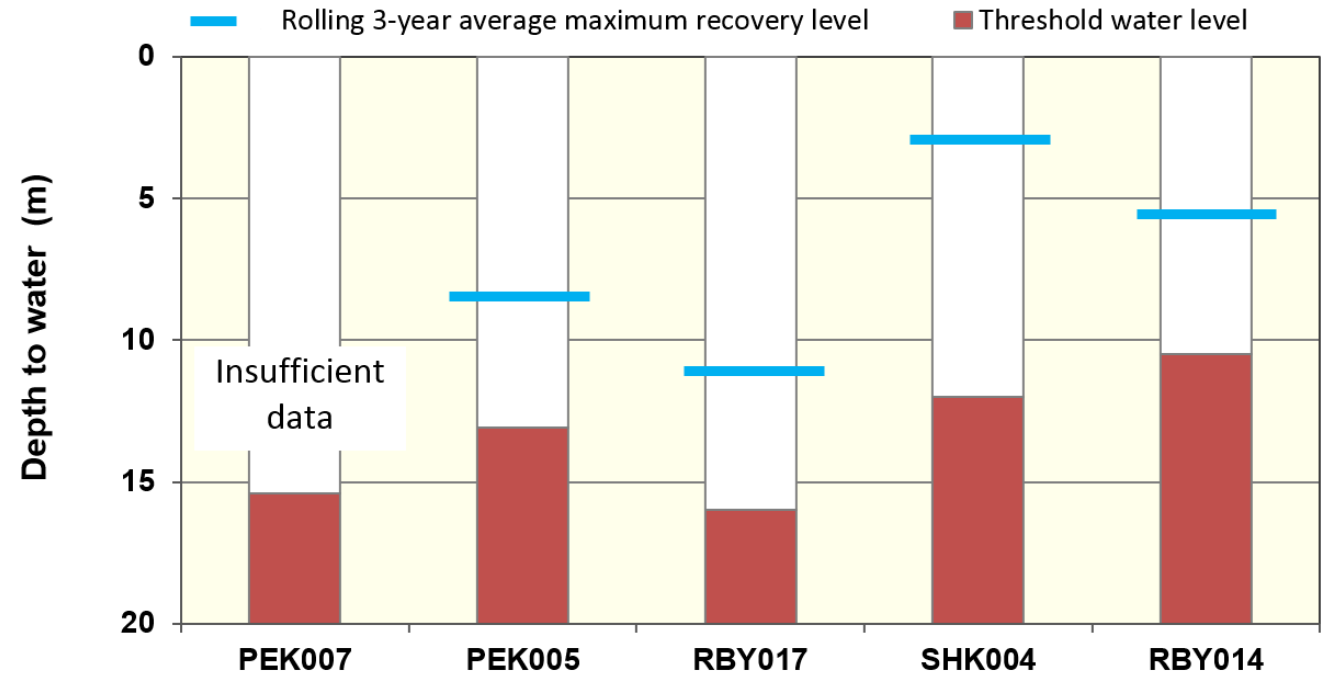


Figure 7. **Maximum recovery level condition indicator thresholds of the Peake, Roby and Sherlock PWA as defined in the WAP and rolling three-year average maximum recovery level (from 2016 to 2018)**

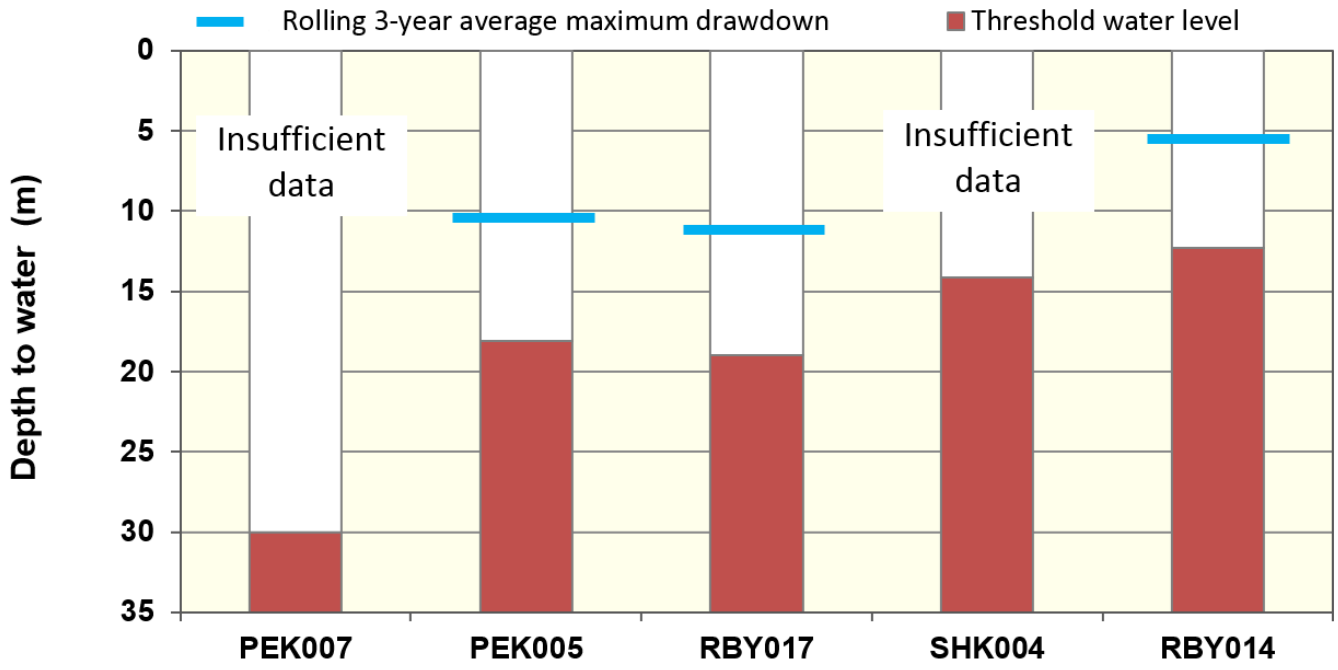


Figure 8. **Maximum drawdown condition indicator thresholds of the Peake, Roby and Sherlock PWA as defined in the WAP and rolling three-year average maximum drawdown (from 2016 to 2018)**

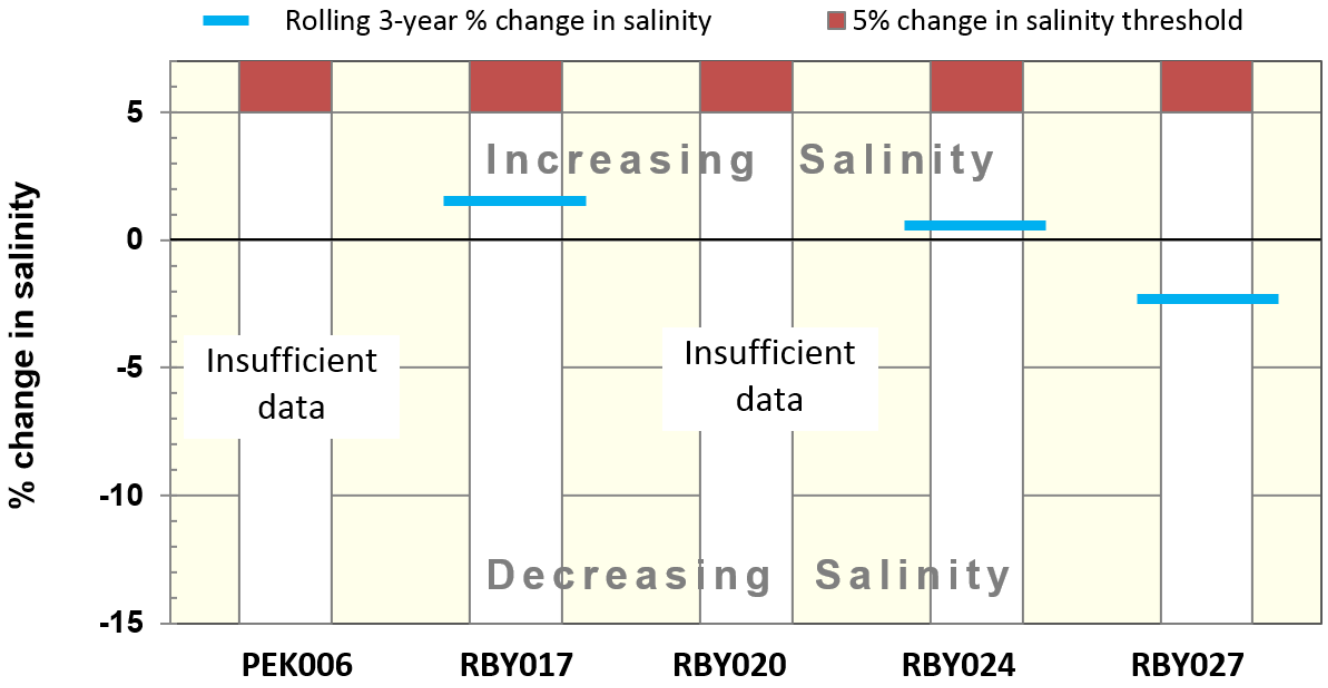


Figure 9. **Salinity condition indicator thresholds of the Peake, Roby and Sherlock PWA as defined in the WAP and rolling three-year change in salinity (from 2016 to 2018)**

More information

To determine the status of the confined 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 *Well 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 *Peake, Roby and Sherlock PWA groundwater level and salinity status report 2011*, 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 download groundwater level and salinity data from monitoring wells within the Peake, Roby and Sherlock PWA, please visit the *Groundwater Data* page under the *Data Systems* tab on WaterConnect.

For further information about the Peake, Roby and Sherlock PWA, please see the *Water Allocation Plan for the Peake, Roby and Sherlock Prescribed Wells Area* on the Natural Resources SA 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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