

# Mallee PWA

# Murray Group Limestone aquifer

## 2017 Groundwater level and salinity status report



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# 2017 Status summary

## Mallee PWA

### Murray Group Limestone aquifer



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

The status is based on five-year trends: over the period 2013–17, 79% of wells show rising or stable groundwater levels and 97% show stable 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	Pinnaroo Bureau of Meteorology (BoM) rainfall station 25015, located in the eastern part of the Mallee PWA
Annual total <sup>1</sup>	521 mm 191 mm (58%) greater than the five-year average of 330 mm 185 mm (55%) greater than the long-term average of 336 mm
Monthly summary	Well-above average rainfall recorded in September, January, February, April and May Well-below average rainfall recorded in June
Spatial distribution	Rainfall in 2016–17 was well-above average across the entire PWA

#### Water use

See Figure 3

Total allocated volume: 2016–17	61 300 ML
Licensed groundwater extractions*	26 018 ML <sup>2</sup> (42% of total allocations)
Extraction volume comparison	20% less than the previous year 19% less than the five-year average

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

<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](#)

## Groundwater pressure level

See Figure 4

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Five-year trend: 2013–17	40 out of 70 wells (57%) show a rising trend, at rates of 0.03–1.91 m/y (median of 0.22 m/y) 15 wells (21.5%) are stable 15 wells (21.5%) show a declining trend, at rates of 0.03–0.71 m/y (median of 0.09 m/y); five of these wells showing their lowest level on record
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## Groundwater salinity

See Figures 5 and 6

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2017 salinity	610–3782 mg/L 60 out of 97 wells (62%) show salinities less than 1500 mg/L, which is the salinity threshold for most crop types This low-salinity groundwater is located around Lameroo, Parilla, Pinnaroo and Peebinga
Five-year trend: 2013–17	37 out of 38 wells (97%) show stable salinities 1 well (3%) shows an increasing trend, at a rate of 99 mg/L/y
Citizen science	Since 2014, irrigators in the Mallee PWA have submitted salinity samples and once validated, these will augment the existing DEW monitoring network <sup>3</sup>

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## Groundwater condition limits

See Table 1 and Figure 7

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Definition	The water allocation plan (WAP) for the Mallee PWA has identified resource condition limits (RCLs) based on water level and salinity thresholds – these are designed to give early warning of adverse trends that may impact users of the resource
Groundwater pressure level condition indicators	Between 2015–17, more than 50% of wells in all zones showed recovery to within their threshold water pressure levels on the previous year
Groundwater pressure levels in 2016–17	RCLs have not been exceeded
Salinity condition indicators	The rate of increase in groundwater salinities in the MGL confined aquifer is greater than 2% /y for five consecutive years, across at least 50% of monitoring wells
Salinities in 2016–17	RCLs have not been exceeded

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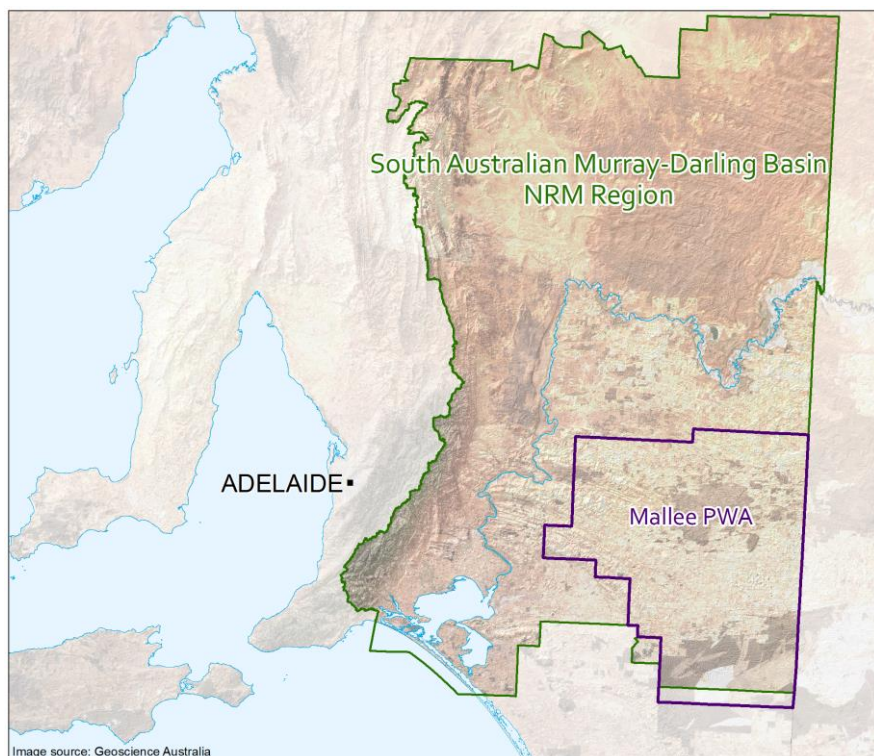
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<sup>3</sup> The salinity data collected from irrigation wells can be viewed at [WaterConnect](#)

**Table 1. Groundwater pressure levels condition limits for the Mallee PWA for 2015–16 and 2016–17**

Management Area or Border Zone	N° of obswells in 2016	2015–16		N° of obswells in 2017	2016–17	
		Did not recover to within threshold	Recovered to within threshold		Did not recover to within threshold	Recovered to within threshold
9A North	1	0%	100%	1	0%	100%
10A	22	5%	95%	21	14%	86%
11A-McGorrey	8	0%	100%	7	0%	100%
11A-Pebinga	10	10%	90%	9	44%	56%
Parilla Red	9	11%	89%	9	78%	22%

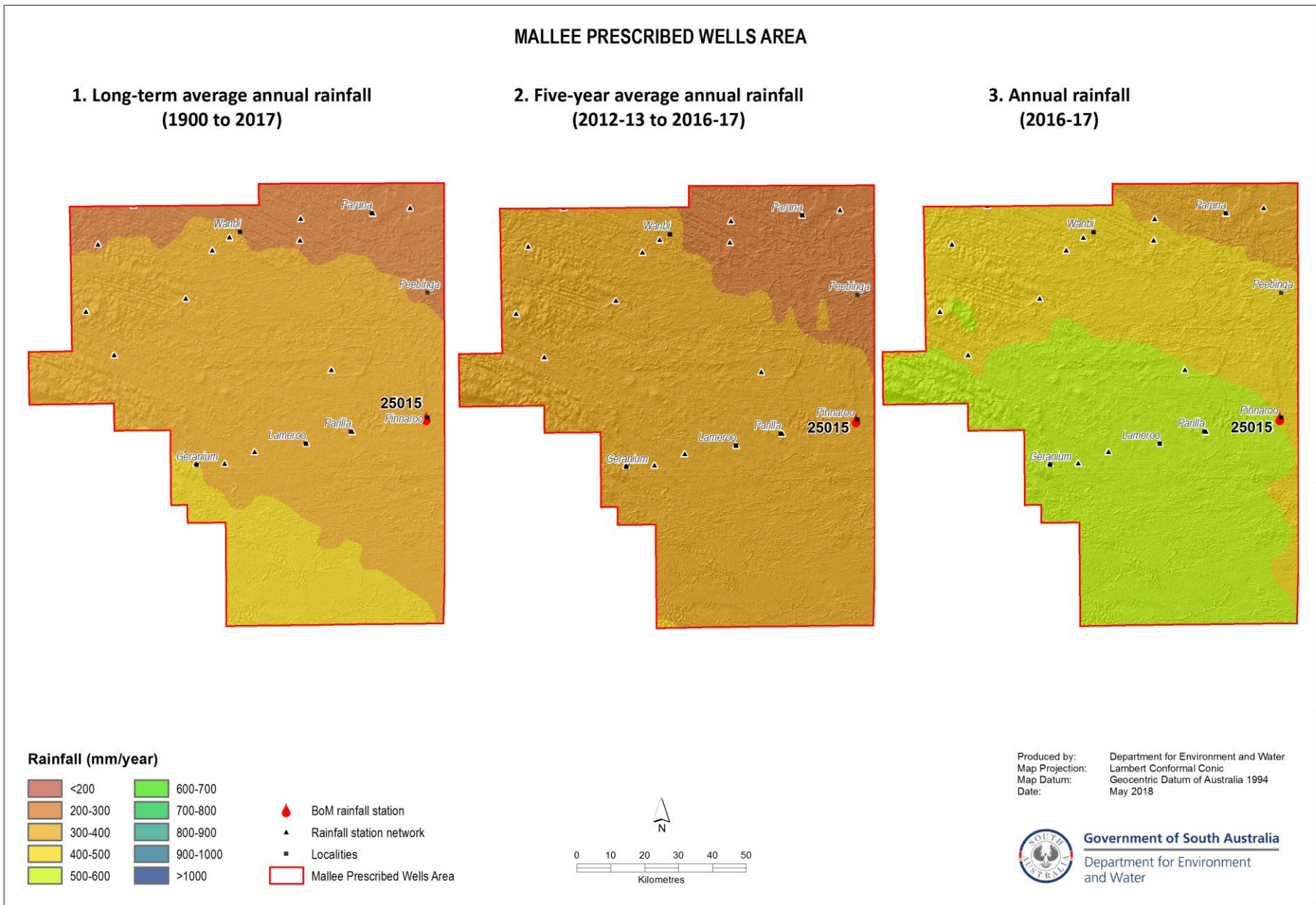
# Regional setting



The Mallee PWA is located around 150 km east of Adelaide in the South Australian Murray-Darling Basin Natural Resources Management Region, and is underlain by sediments of the Murray Basin. It is a regional-scale resource for which groundwater resources are prescribed under South Australia's *Natural Resources Management Act 2004*. A WAP provides for the sustainable management of the groundwater resources.

There are three main aquifers in the Mallee PWA, namely the confined Renmark Group aquifer, the semi-confined MGL aquifer and the unconfined Pliocene sands aquifer. The MGL aquifer, which is the focus of this report, comprises a consolidated, highly fossiliferous, fine to coarse, bioclastic limestone that has an average thickness of around 100 m. The MGL aquifer is recharged in south-west Victoria (broadly to the south-east of the Mallee PWA), with groundwater movement away from the recharge area in directions towards the north, north-west and west of the Mallee PWA. All licensed groundwater extractions in the Mallee PWA are from the MGL aquifer, with most pumping occurring towards the north-east of the PWA where the aquifer is confined.

The intensity and timing of rainfall and subsequent extraction practices can have an effect on groundwater levels and salinities in the MGL aquifer. For example, if the region experienced above-average rainfall during typically dry summer months, this could result in less groundwater being extracted from the aquifer for irrigation and therefore smaller declines (or possibly increases) in groundwater pressure levels and stable or decreasing salinities.



**Figure 1. Spatial distribution of (1) Long-term and (2) five-year average annual rainfall, and (3) annual rainfall<sup>4</sup>**

<sup>4</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](#)

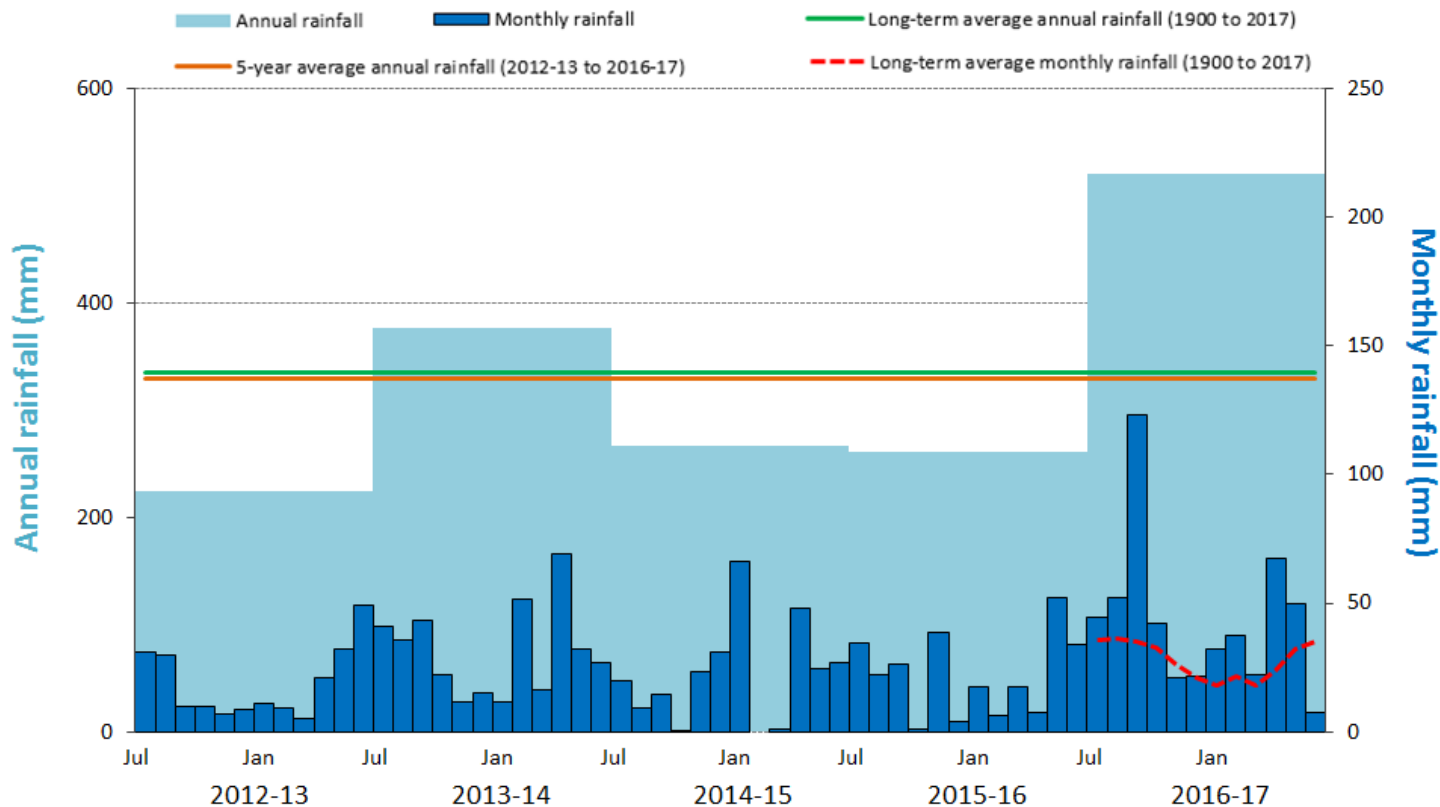


Figure 2. Annual and monthly rainfall for the past five water-use years recorded at Pinnaroo (BoM Station 25015)<sup>5</sup>

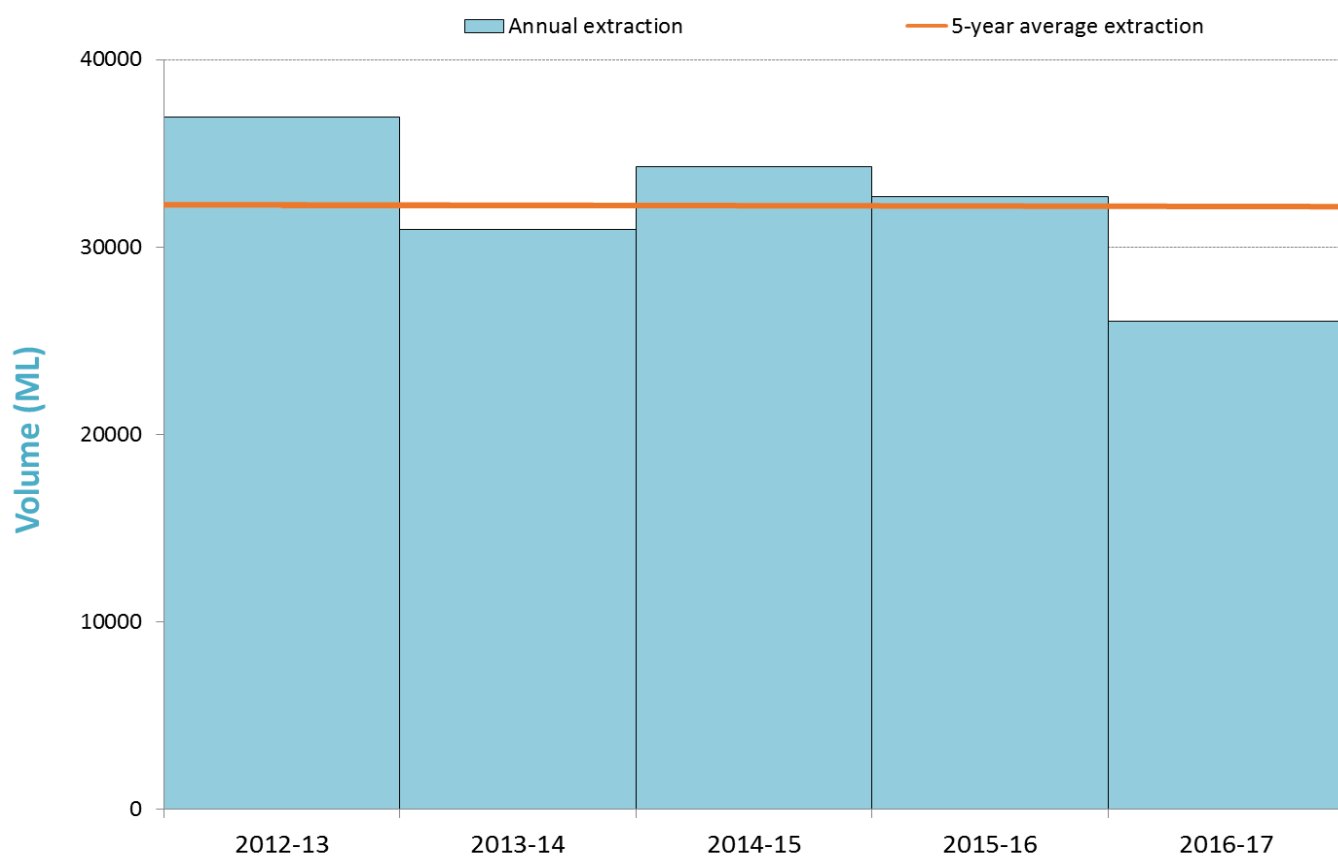


Figure 3. Licensed groundwater extraction volumes<sup>6</sup> for the past five water-use years

<sup>5</sup> Data source: SILO Patched Point Dataset, available <https://silo.longpaddock.qld.gov.au/> – see [More information](#)

<sup>6</sup> Total licensed extractions are subject to change as extraction data have not yet been verified in full – see [More information](#)



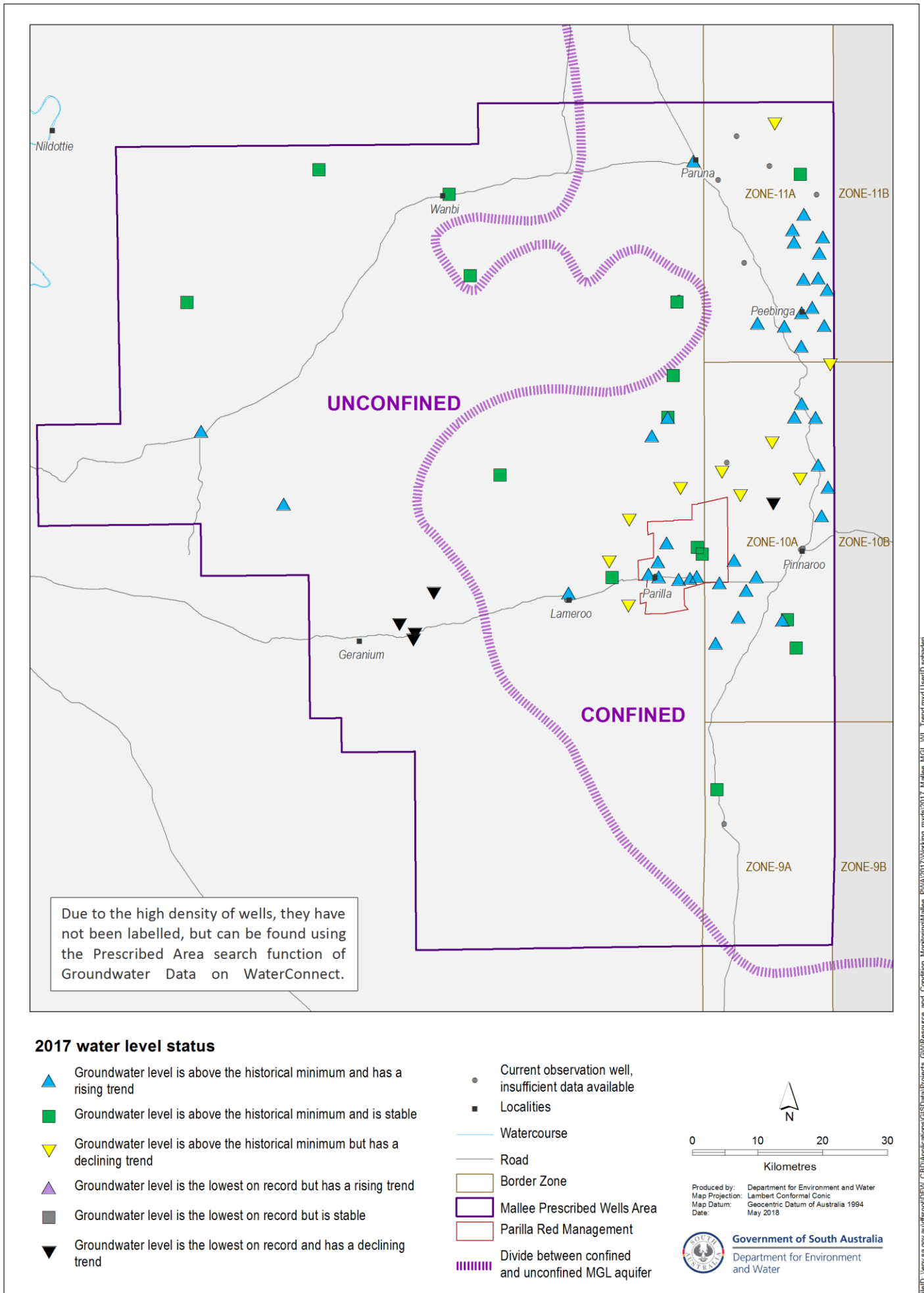
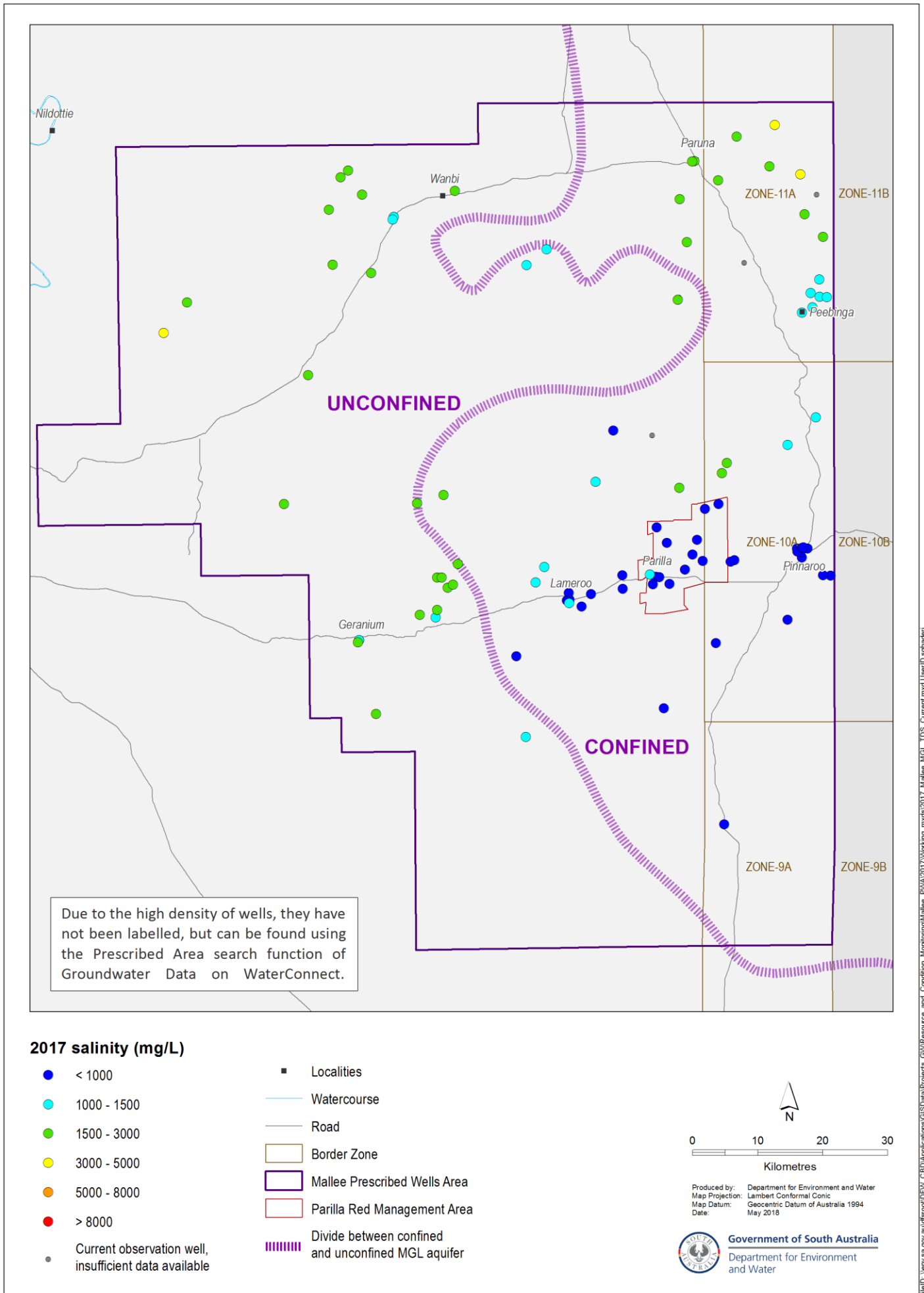


Figure 4. Five-year trends (2013–17) in groundwater pressure levels: Murray Group Limestone aquifer



**Figure 5. 2017 groundwater salinities: Murray Group Limestone aquifer**

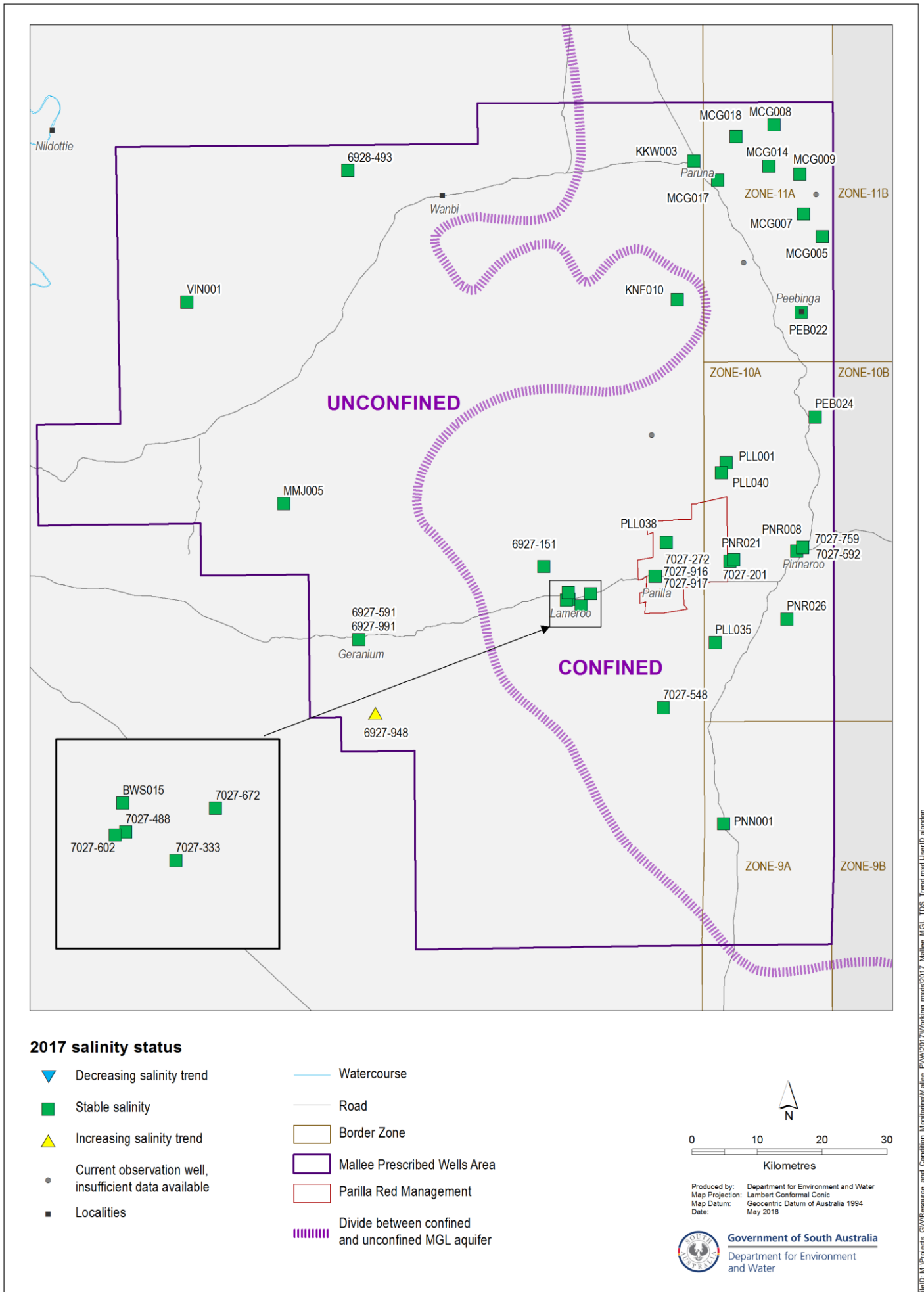


Figure 6. Five-year trends (2013–17) in groundwater salinities: Murray Group Limestone aquifer

# 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 *Well Details* page on [WaterConnect](#).

The licensed groundwater use 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 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://silo.longpaddock.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 *Mallee 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 download groundwater level and salinity data from monitoring wells within the Mallee PWA, please visit the *Groundwater Data* page under the *Data Systems* tab on [WaterConnect](#).

For further details on the Mallee PWA, please see the *Water Allocation Plan for the Mallee 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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