

# Eastern Mount Lofty Ranges PWRA Murray Group Limestone aquifer

2017 Groundwater level and salinity status report



Government  
of South Australia

Department for  
Environment and Water

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# 2017 Status summary

## Eastern Mount Lofty Ranges PWRA

### Murray Group Limestone aquifer



The Murray Group Limestone aquifer (MGL) in the Currency Limestone Underground Water Management Zone of the Eastern Mount Lofty Ranges (EMLR) Prescribed Water Resources Area (PWRA) 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 groundwater pressure levels and 75% of wells show 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	Finniss Bureau of Meteorology (BoM) rainfall station 23714, located to the north of the Currency Limestone Underground Water Management Zone
Annual total <sup>1</sup>	698 mm 178 mm (34%) greater than the five-year average of 520 mm 203 mm (41%) greater than the long-term average of 495 mm
Monthly summary	Well-above average rainfall recorded in July, September, October and December Well-below average rainfall recorded in May and June
Spatial distribution	Rainfall in 2016–17 was well above average across the entire PWRA

#### Water use

Total allocated volume: 2016–17	31 248 ML (all aquifers of the EMLR PWRA)
Licensed groundwater extractions*	840 ML <sup>2</sup> (Currency Limestone Underground Water Management Zone)

\*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; installation of water meters by licensed users is still in progress across the EMLR PWRA (by 2016–17, 66% of licensees have installed their meters) – see [More information](#)

## Groundwater pressure level

See Figure 3

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Five-year trend: 2013–17	All 15 wells show a rising trend, at rates of 0.05–0.52 m/y (median of 0.27 m/y)
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## Groundwater salinity

See Figures 4 and 5

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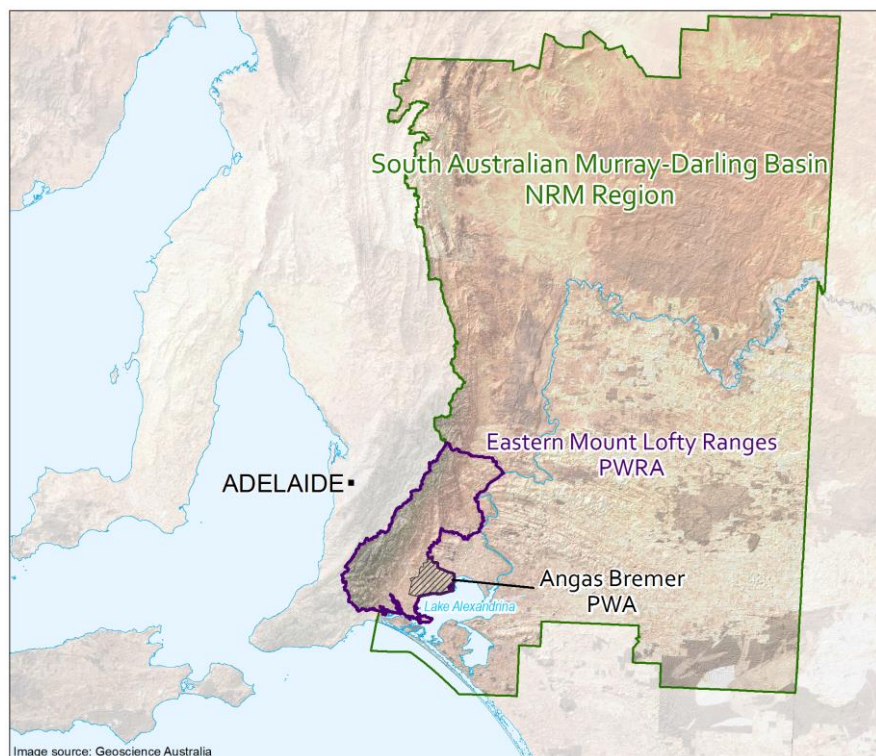
2017 salinity	669–2872 mg/L 8 out of 14 wells (57%) recorded salinities less than 1500 mg/L, which is the salinity threshold for most crop types
Five-year trend: 2013–17	2 out of 4 wells (50%) show stable salinities 1 well (25%) shows a decreasing trend, at a rate of 47 mg/L/y 1 wells (25%) shows an increasing trend, at a rate of 89 mg/L/y
Citizen science	Since 2014, irrigators in the EMLR PWRA have submitted salinity samples and once validated, these will augment the existing DEW monitoring network <sup>3</sup>

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

# Regional setting



The EMLR PWRA lies within the South Australian Murray-Darling Basin Natural Resources Management Region and is located about 50 km east of Adelaide. It is a regional-scale resource for which groundwater, surface water and watercourse water are prescribed under South Australia's *Natural Resources Management Act 2004*, and a water allocation plan (WAP) provides for the sustainable use of the region's water resources. The Angas Bremer Prescribed Wells Area is located within the boundaries of the EMLR PWRA and a stand-alone groundwater level and salinity status report has been prepared for this area (please visit the *Water Resource Assessments* page on [WaterConnect](#)).

There are three sedimentary aquifers in the EMLR PWRA, namely the Permian Sand, Murray Group Limestone and Quaternary. This report focuses on the MGL aquifer, in particular within the Currency Limestone Underground Water Management Zone (Fig. 1), which is defined in the EMLR WAP. The MGL aquifer consists predominantly of a shallow marine fossiliferous limestone that was deposited approximately 50 million years ago. The aquifer is up to 100 m thick and overlies the Kanmantoo Group fractured rock aquifer and the Permian Sand aquifer in some areas. It is confined by overlying Quaternary clay sediments to the south-west of Murray Bridge, but it is unconfined to the north. The primary recharge mechanisms are lateral throughflow mainly from the Permian Sand aquifer, and downward leakage from the overlying Quaternary aquifer.

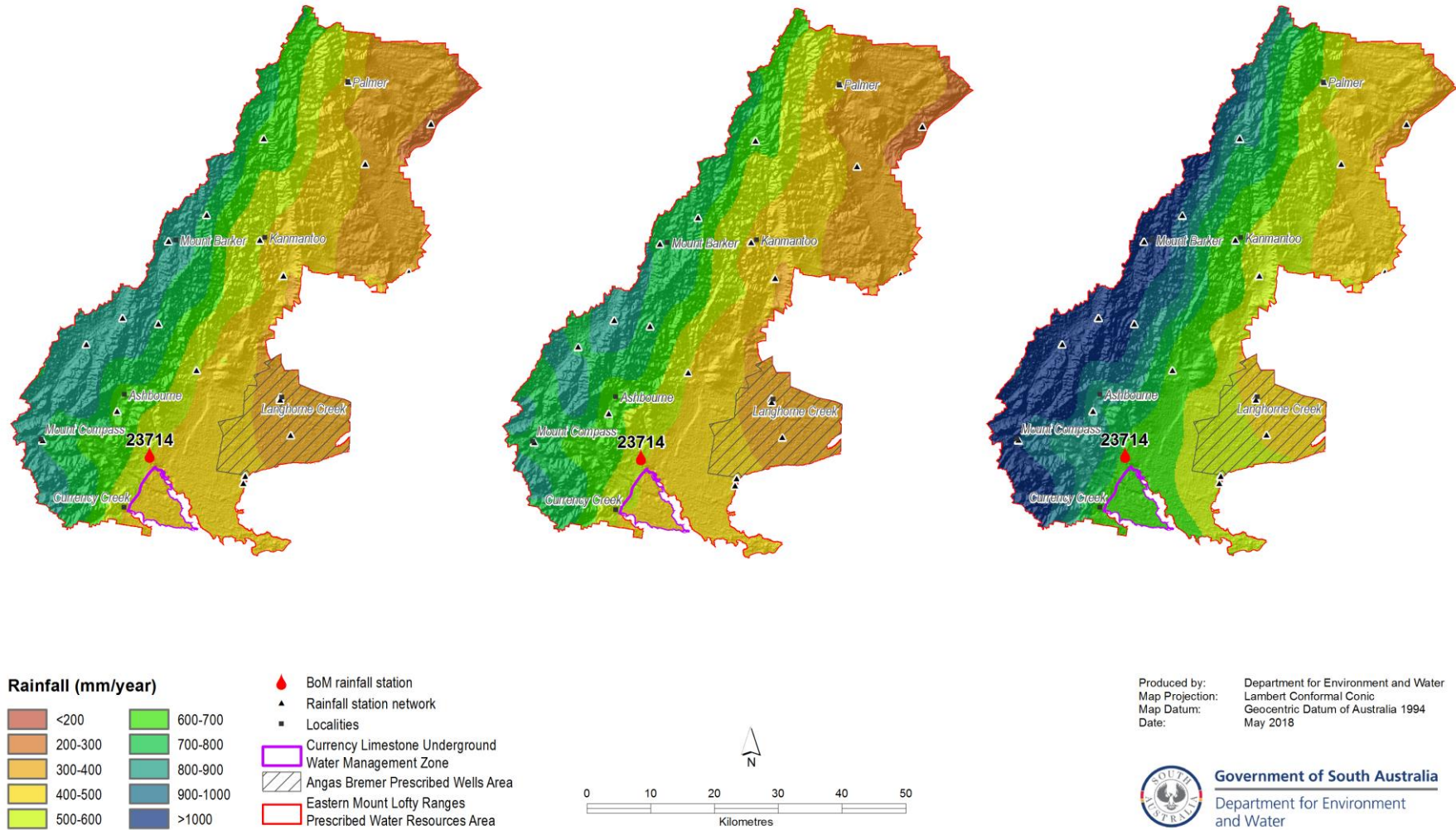
Despite the confined nature of the MGL in the Currency Limestone Underground Water Management Zone, which does not receive direct recharge from incident rainfall, the intensity and timing of rainfall and subsequent extraction practices can have an effect on groundwater pressure levels and salinities. For example, if the PWRA experiences above-average rainfall during typically dry summer months, this could result in decreases in irrigation extraction. This may cause groundwater pressure levels to rise and salinities may stabilise or decrease.

## EASTERN MOUNT LOFTY RANGES PRESCRIBED WATER RESOURCES AREA

**1. Long-term average annual rainfall  
(1900 to 2017)**

**2. Five-year average annual rainfall  
(2012-13 to 2016-17)**

**3. Annual rainfall  
(2016-17)**



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**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](#)

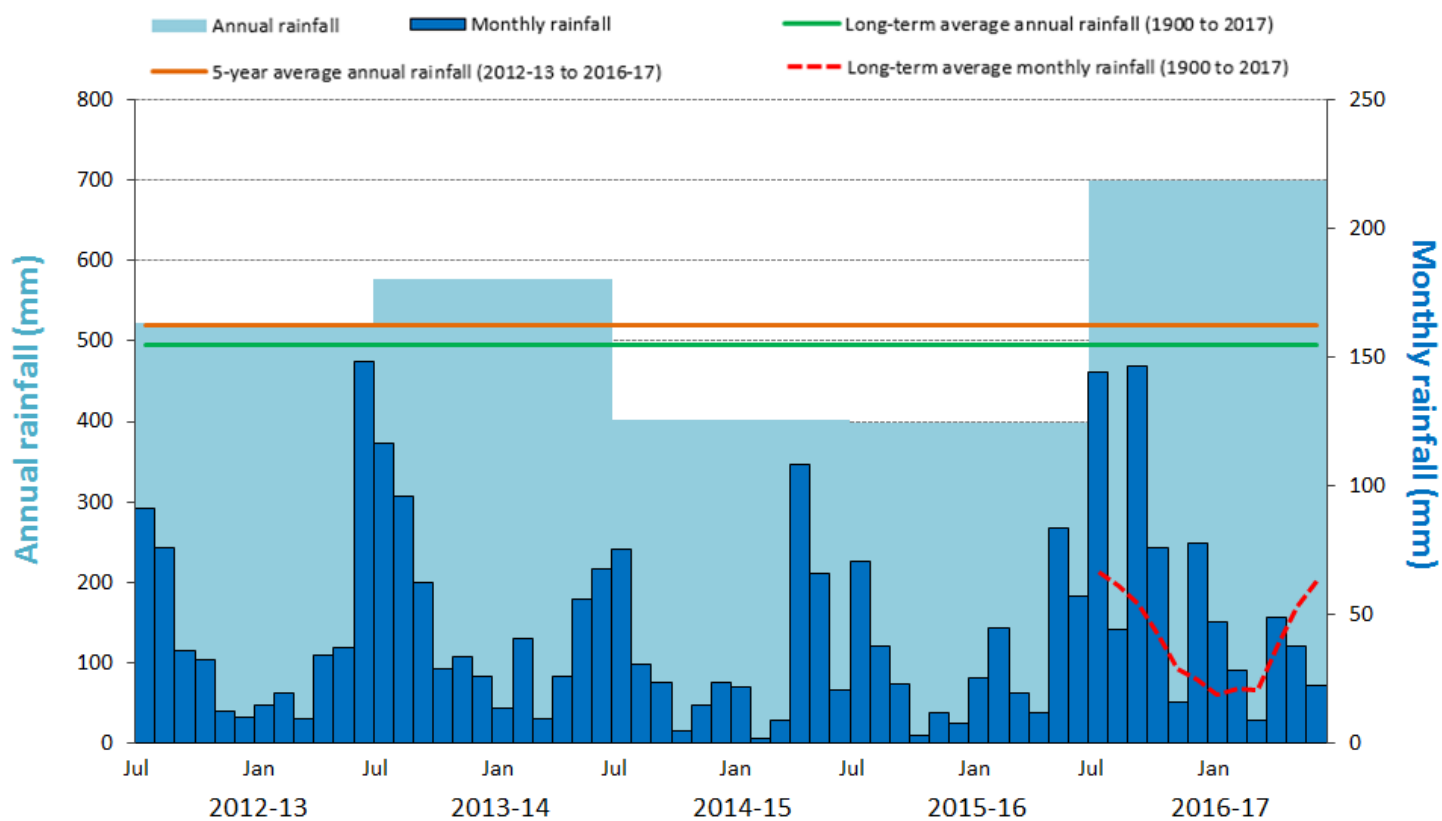
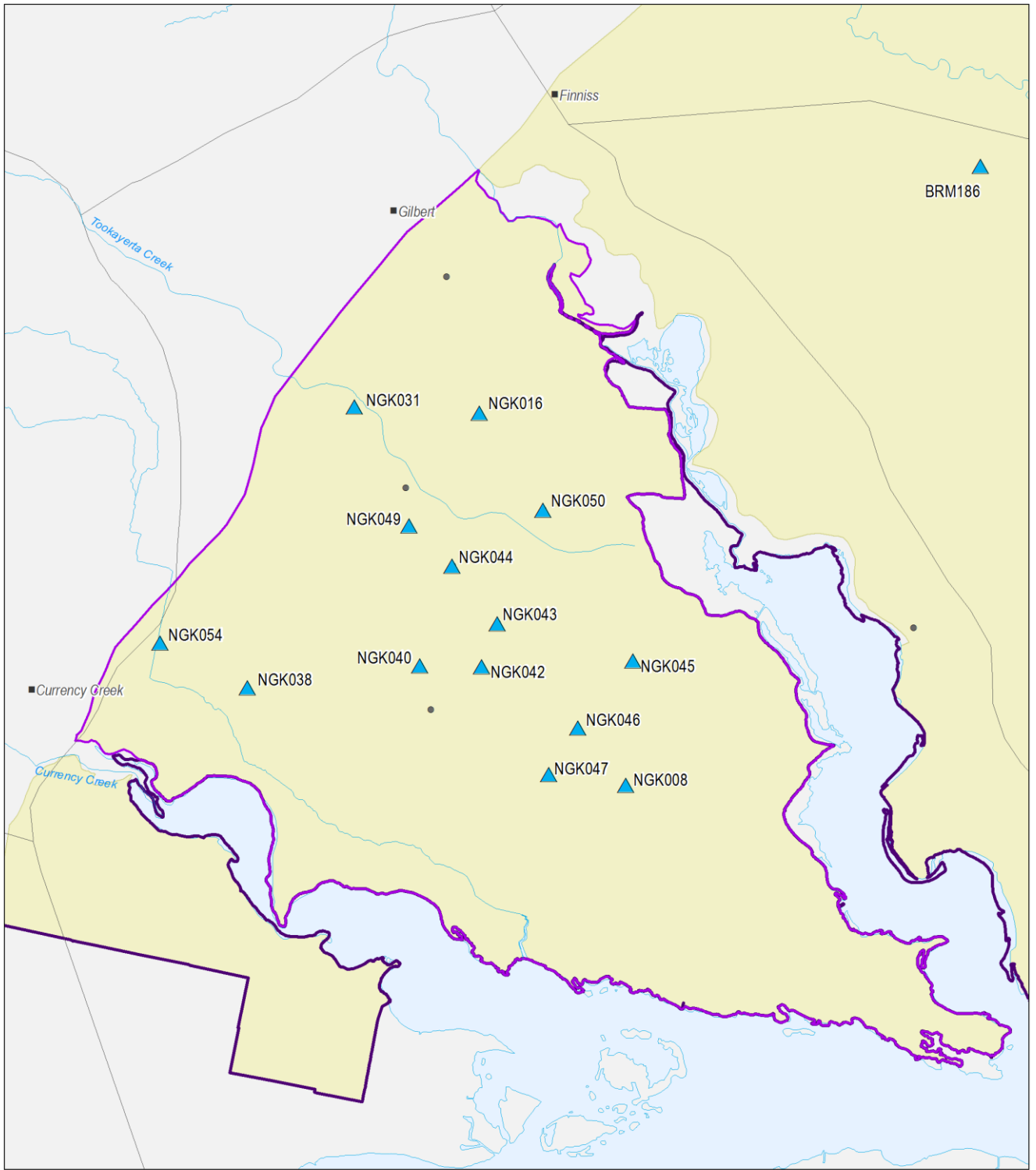


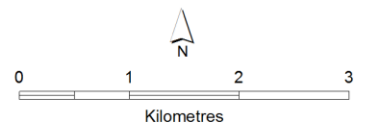
Figure 2. Annual and monthly rainfall for the past five water-use years recorded at Finniss (BoM Station 23714)<sup>5</sup>

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



**2017 water level status**

- ▲ Groundwater level is above the historical minimum and has a rising trend
  - Groundwater level is above the historical minimum and is stable
  - ▼ Groundwater level is above the historical minimum but has a declining trend
  - ▲ Groundwater level is the lowest on record but has a rising trend
  - Groundwater level is the lowest on record but is stable
  - ▼ Groundwater level is the lowest on record and has a declining trend
- Current monitoring well, insufficient data available
  - Localities
  - Watercourse
  - Road
  - Murray Group Limestone Management Zones
  - Currency Limestone Underground Water Management Zone
  - Eastern Mount Lofty Ranges Prescribed Water Resources Area



Produced by: Department for Environment and Water  
 Map Projection: Lambert Conformal Conic  
 Map Datum: Geocentric Datum of Australia 1994  
 Date: May 2018

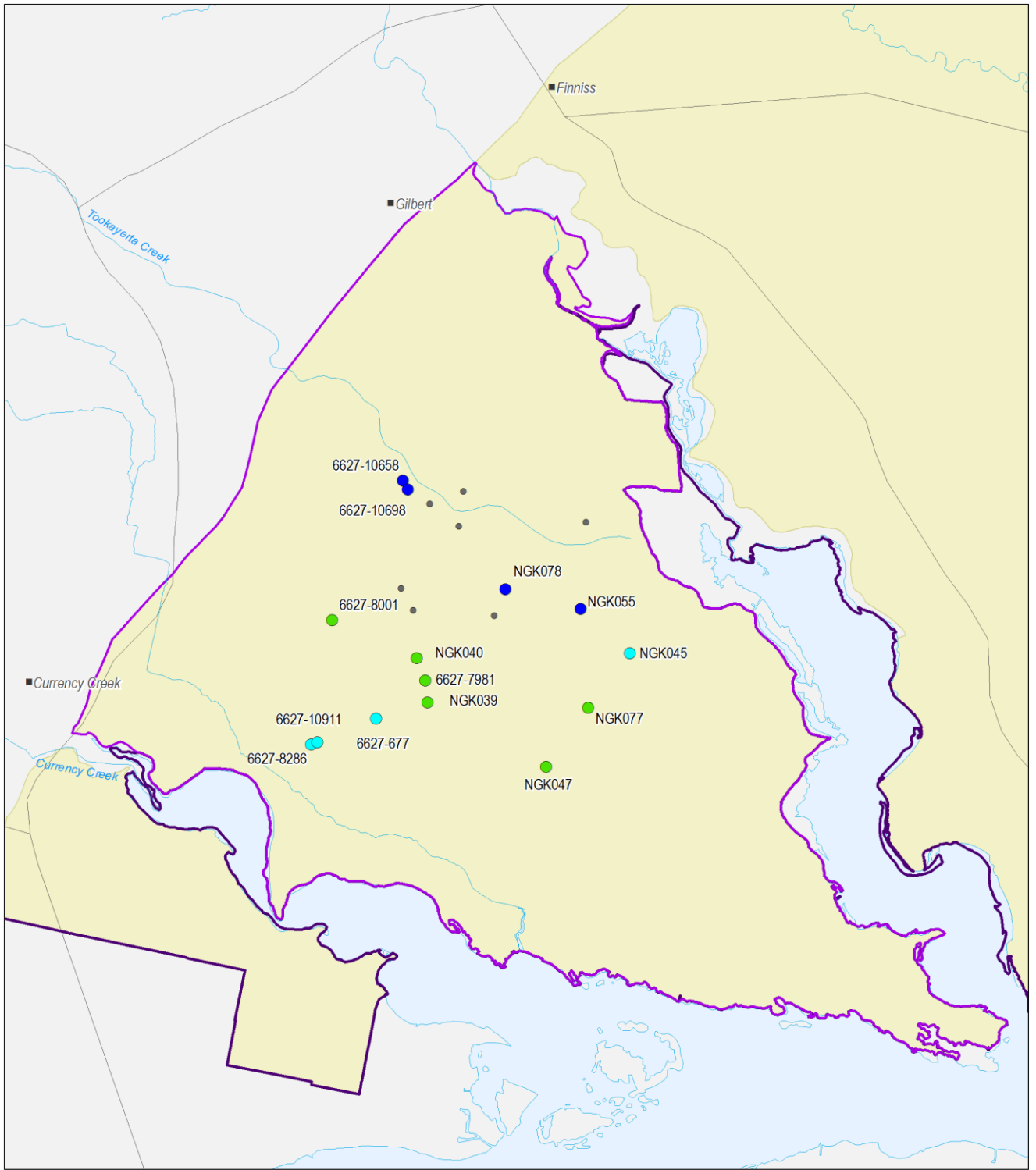


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**Figure 3. Five-year trends (2013–17) in groundwater pressure levels: Murray Group Limestone aquifer**

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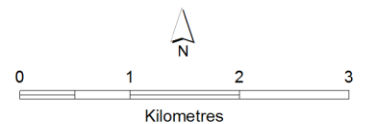




**2017 salinity (mg/L)**

- < 1000
- 1000 - 1500
- 1500 - 3000
- 3000 - 5000
- 5000 - 8000
- > 8000
- Current monitoring well, insufficient data available

- Localities
- Watercourse
- Road
- Murray Group Limestone Management Zones
- Currency Limestone Underground Water Management Zone
- Eastern Mount Lofty Ranges Prescribed Water Resources Area



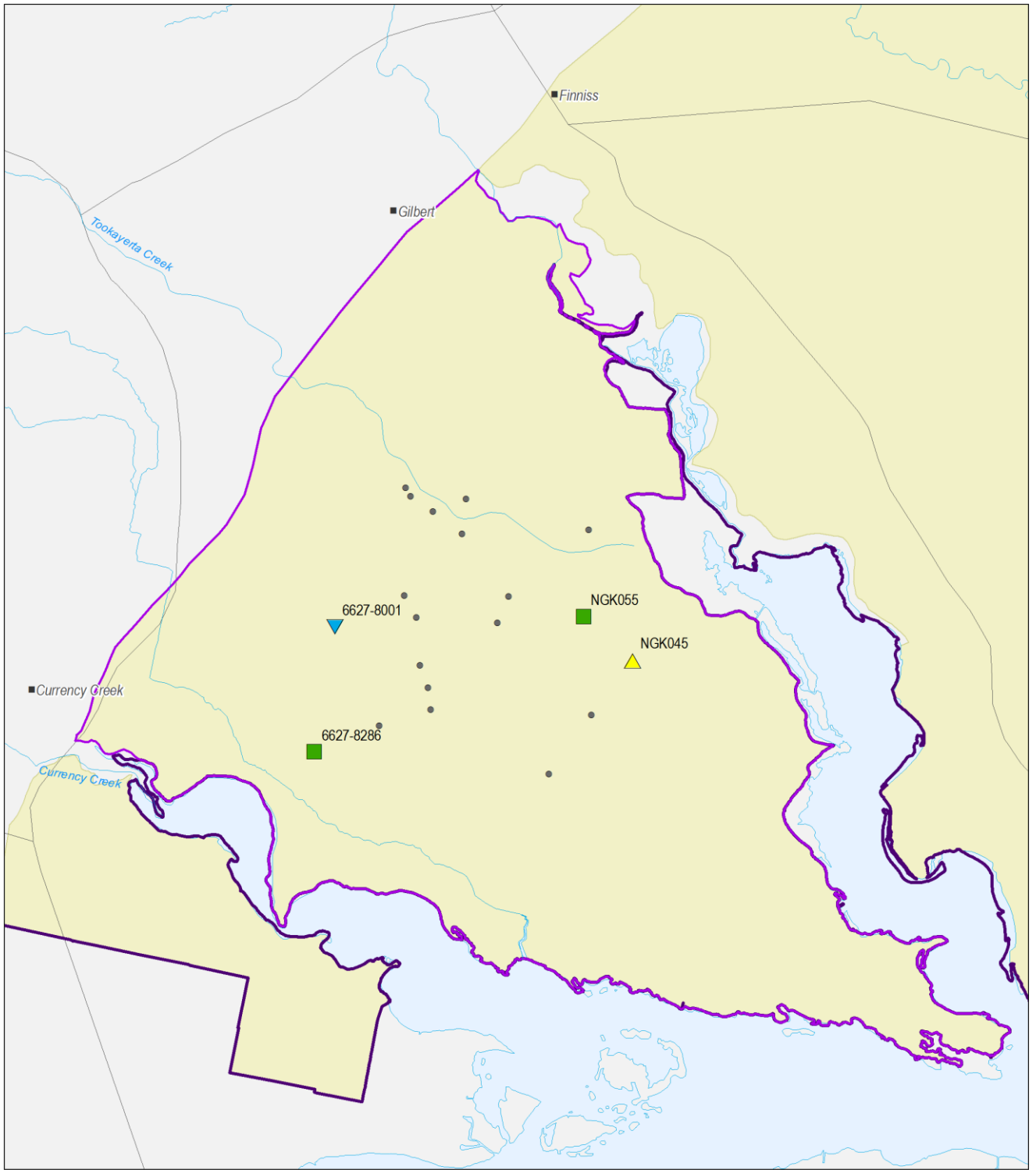
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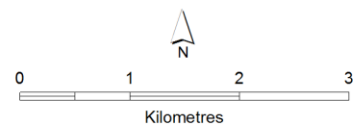
**Figure 4. 2017 groundwater salinities: Murray Group Limestone aquifer**

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**2017 salinity status**

- ▼ Decreasing salinity trend
- Stable salinity
- ▲ Increasing salinity trend
- Current monitoring well, insufficient data available
- Localities
- Watercourse
- Road
- Murray Group Limestone Management Zones
- Currency Limestone Underground Water Management Zone
- Eastern Mount Lofty Ranges Prescribed Water Resources Area



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 Map Projection: Lambert Conformal Conic  
 Map Datum: Geocentric Datum of Australia 1994  
 Date: May 2018



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**Figure 5. 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 licensed groundwater use 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 volumes may be in the process of being verified; installation of water meters is still in progress across the EMLR PWRA.

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 *Eastern Mount Lofty Ranges PWRA 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 Eastern Mount Lofty Ranges PWRA, please visit the *Groundwater Data* page under the Data Systems tab on [WaterConnect](#).

For further details about the Eastern Mount Lofty Ranges PWRA, 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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