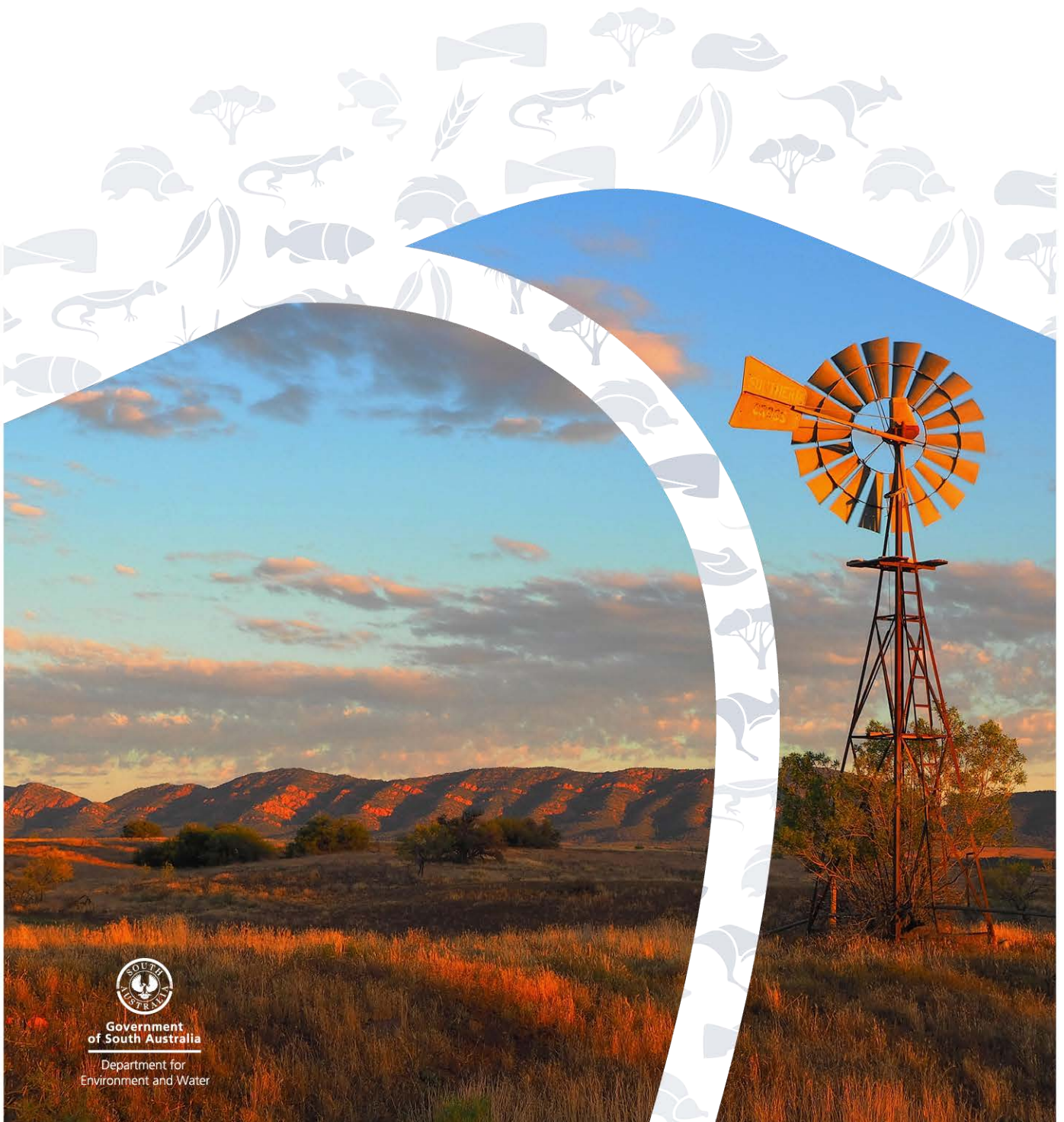


Western Mount Lofty Ranges PWRA Fractured rock aquifers

2017 Groundwater level and salinity status report



Government
of South Australia

Department for
Environment and Water

Department for Environment and Water
GPO Box 1047, Adelaide SA 5001

Telephone	National	(08) 8463 6946
	International	+61 8 8463 6946
Fax	National	(08) 8463 6999
	International	+61 8 8463 6999
Website	www.environment.sa.gov.au	

Disclaimer

The Department for Environment and Water and its employees do not warrant or make any representation regarding the use, or results of the use, of the information contained herein as regards to its correctness, accuracy, reliability, currency or otherwise. The Department for Environment and Water and its employees expressly disclaims all liability or responsibility to any person using the information or advice. Information contained in this document is correct at the time of writing.



This work is licensed under the Creative Commons Attribution 4.0 International License.

To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/>

© Crown in right of the State of South Australia, through the Department for Environment and Water 2018

ISBN 978-1-925805-23-9

Preferred way to cite this publication

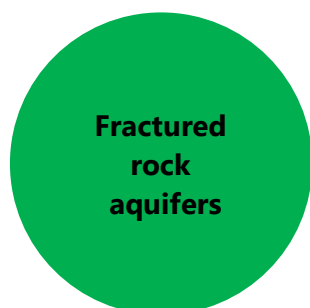
DEW (2018). *Western Mount Lofty Ranges PWRA fractured rock aquifers 2017 Groundwater level and salinity status report*, Government of South Australia, Department for Environment and Water, Adelaide.

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

2017 Status summary

Western Mount Lofty Ranges PWRA

Fractured rock aquifers



The fractured rock aquifers of the Western Mount Lofty Ranges (WMLR) Prescribed Water Resources Area (PWRA) have 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, 73% of wells show rising or stable groundwater levels and 88% show decreasing or 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	Uraidla Bureau of Meteorology (BoM) rainfall station 23750, located in the central part of the PWRA
Annual total ¹	1485 mm 361 mm (32%) greater than the five-year average of 1124 mm 399 mm (37%) greater than the long-term average of 1086 mm
Monthly summary	Well-above average rainfall recorded in July, September, October, December and January Well-below average rainfall recorded in June
Spatial distribution	Rainfall in 2016–17 was well above average across the entire PWRA

Water use

Total allocated volume: 2016–17	50 241 ML across the entire WMLR PWRA
Licensed groundwater extractions*	5635 ML ² (11% of total allocations of the entire PWRA)

*Stock and domestic use is not included in licensed extractions

¹ For the water-use year 1 July 2016 to 30 June 2017

² 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 WMLR PWRA (by 2016–17, 57% of licensees have installed meters) – see [More information](#)

Groundwater level

See Figure 3

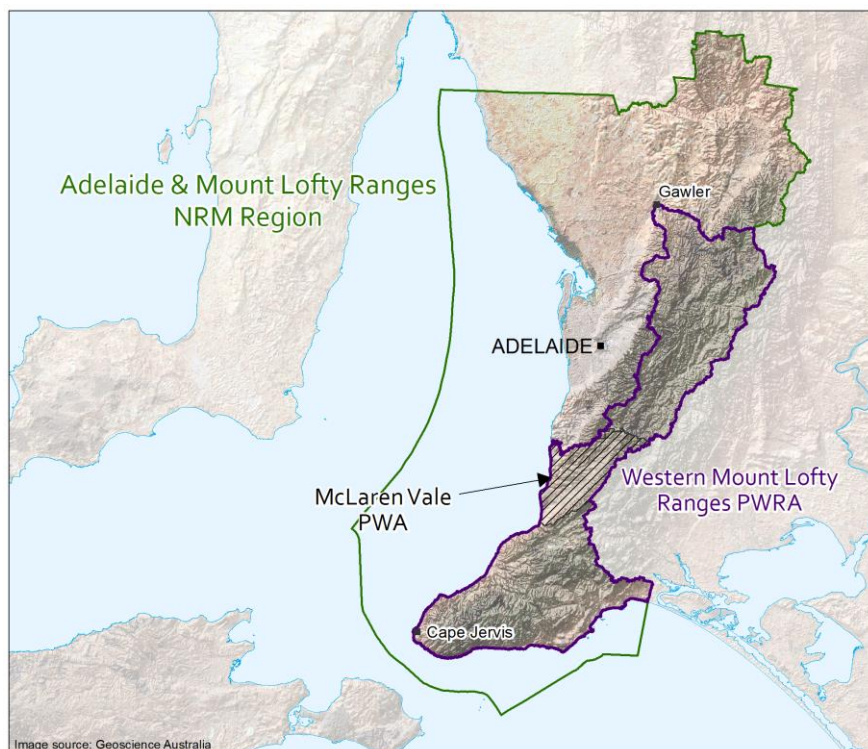
Five-year trend: 2013–17	69 out of 102 wells (68%) show rising trends, at rates of 0.01–2.90 m/y (median of 0.35 m/y) 5 wells (5%) are stable; one of these wells shows its lowest level on record 28 wells (27%) show declining trends, at rates of 0.01–0.57 m/y (median of 0.09 m/y); three of these wells show their lowest level on record
--------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Groundwater salinity

See Figures 4 and 5

2017 salinity	163–1743 mg/L 20 out of 23 wells (87%) show salinities less than 1500 mg/L, which is the salinity threshold for most crop types
Five-year trend: 2013–17	2 out of 8 wells (25%) show decreasing trends, at rates of 23 and 93 mg/L/y 5 wells (63%) show stable salinities 1 well (12%) shows an increasing trend, at a rate of 32 mg/L/y

Regional setting



The WMLR PWRA is located within the Adelaide and Mount Lofty Ranges Natural Resources Management Region and covers an area of approximately 2750 km², stretching from Cape Jervis on the south coast to Gawler in the north. 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*. A water allocation plan (WAP) provides for the sustainable use of the water resources.

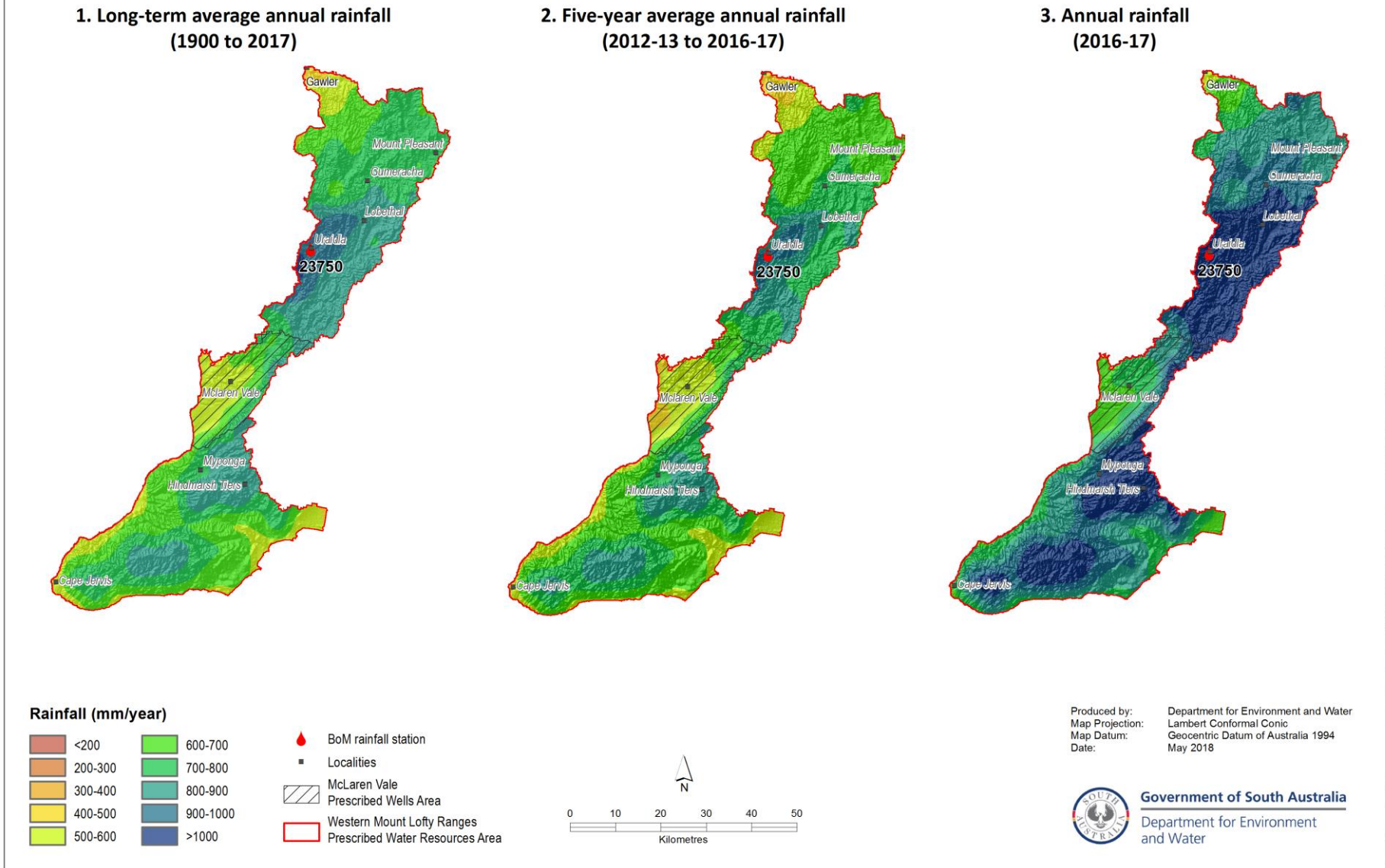
The McLaren Vale Prescribed Wells Area (PWA), located within the boundaries of the WMLR PWRA, is managed separately and dedicated groundwater level and salinity status reports have been prepared for the aquifers in this PWA. These reports can be found on the [WaterConnect](#) website.

The WMLR PWRA is characterised by fractured rock aquifers and sedimentary aquifers that are of varying age, water quality and yield. Recharge to these aquifers occurs directly from rainfall that percolates down to the watertable through the soil profile or indirectly via throughflow from adjacent aquifers.

The fractured rock aquifers of the WMLR PWRA comprise three major geological provinces: the Barossa Complex, Adelaidean sediments and the Kanmantoo Group. Generally, the Adelaidean sedimentary rocks are more favourable in terms of recharge, salinity and yields, while the Barossa Complex and Kanmantoo Group generally provide groundwater of poorer quality at low yields. Groundwater flow generally follows the topography, flowing from higher points in the landscape towards lower areas where typically it discharges into rivers and streams.

Trends in groundwater levels and salinities in the fractured rock aquifers of the WMLR are primarily climate driven: below-average rainfall results in a reduction in recharge to the aquifers. Below-average summer rainfall can also result in increasing irrigation extractions, and these two elements can cause the groundwater levels to decline and salinities to increase. Conversely, increases in rainfall can result in increases in recharge, decreases in irrigation extractions and groundwater levels may rise and salinities may stabilise or decrease.

WESTERN MOUNT LOFTY RANGES PRESCRIBED WATER RESOURCES AREA



FileID:M:\Projects_GWRResource_and_Condition_Monitoring\WMLR_PWRA2017\FRAworking_mxd\WMLR_FRA_Rainfall_2016-17.mxd user:DPokely

Figure 1. Spatial distribution of (1) Long-term and (2) five-year average annual rainfall, and (3) annual rainfall³

³ 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](#)

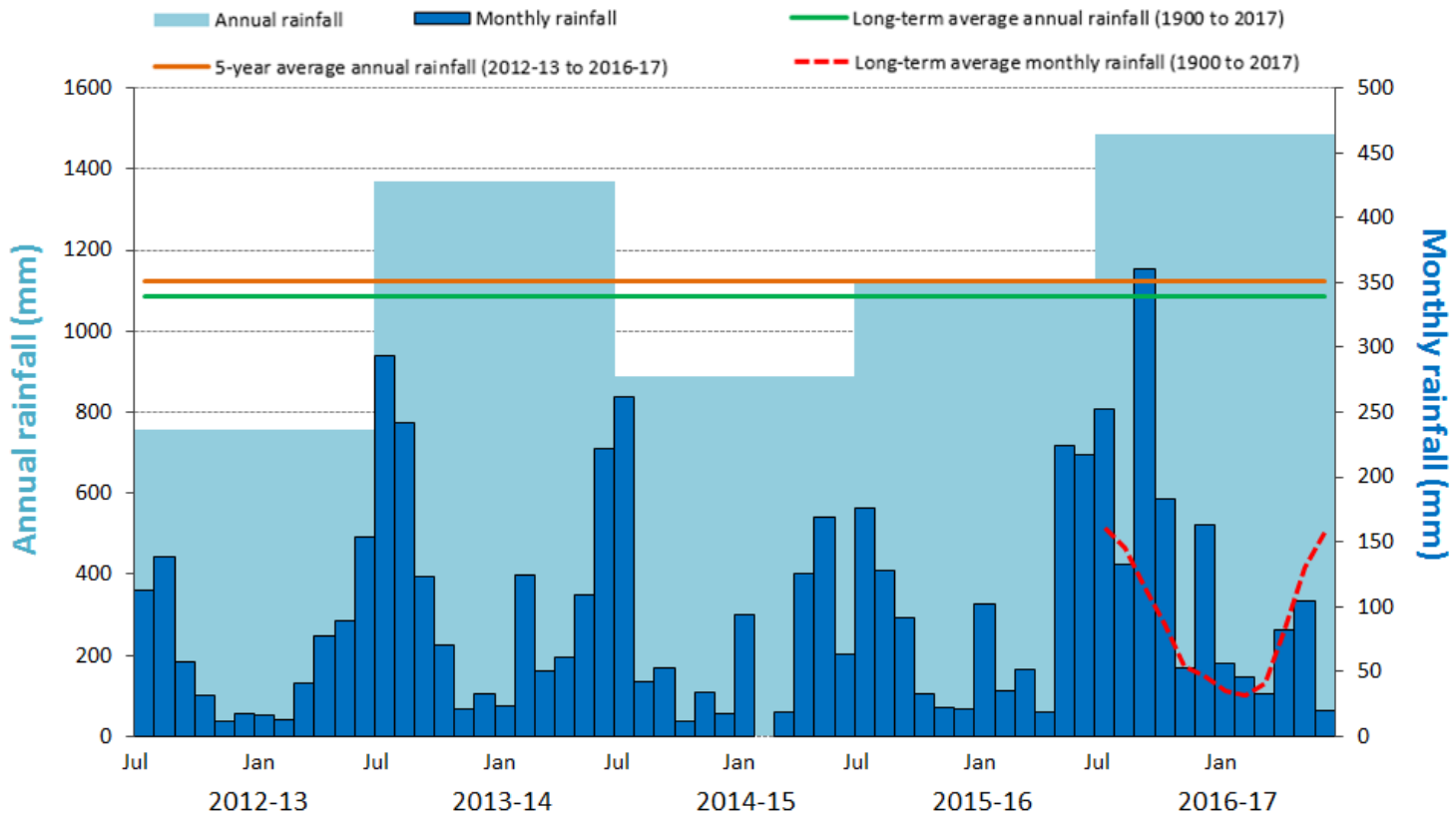
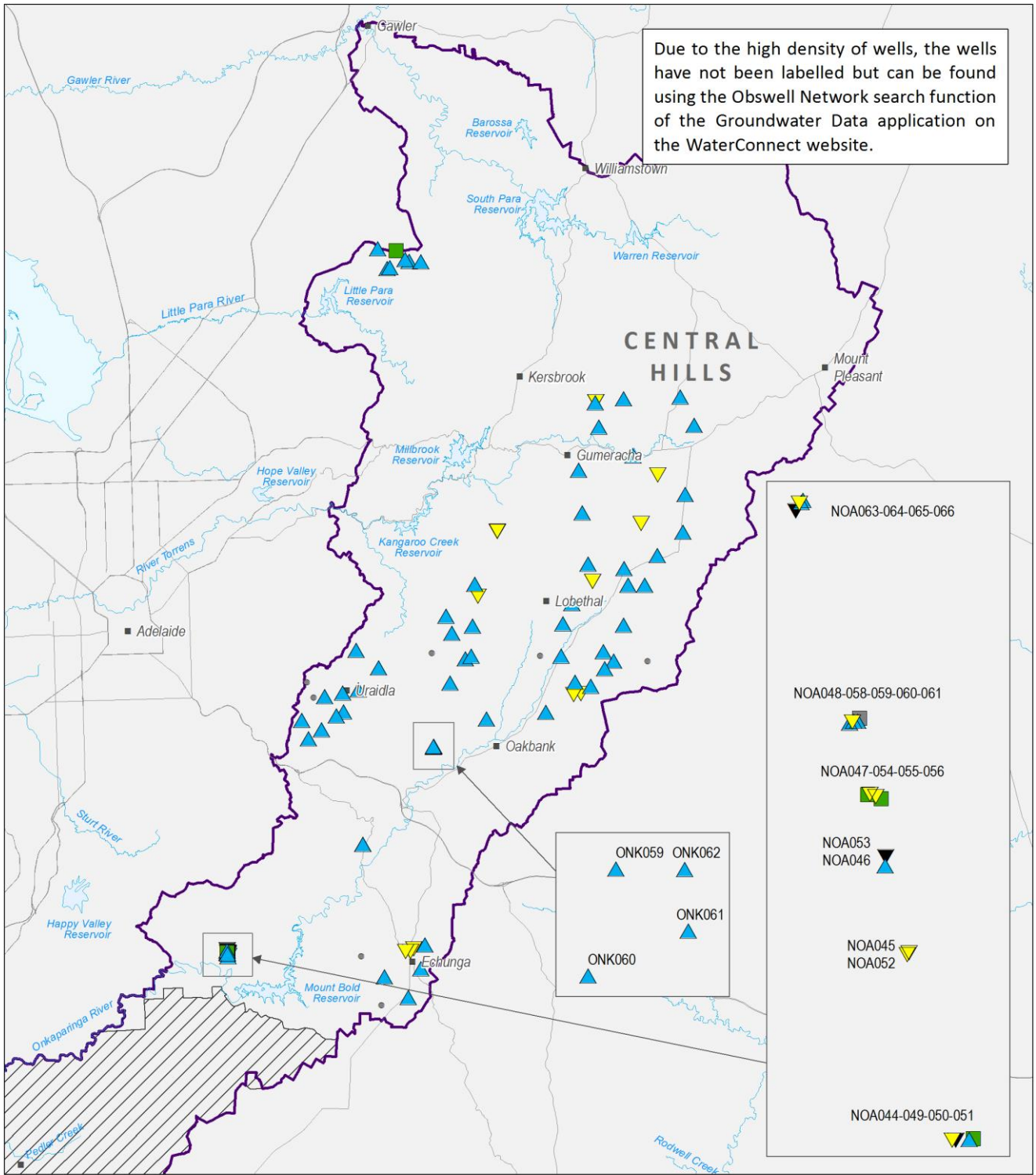


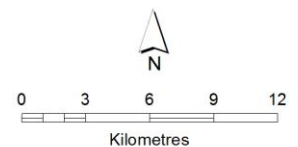
Figure 2. Annual and monthly rainfall for the past five water-use years recorded at Uraidla (BoM Station 23750)⁴

⁴ 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
- Reservoir
- ▨ McLaren Vale Prescribed Wells Area
- ▭ Western Mount Lofty Ranges Prescribed Water Resources Area

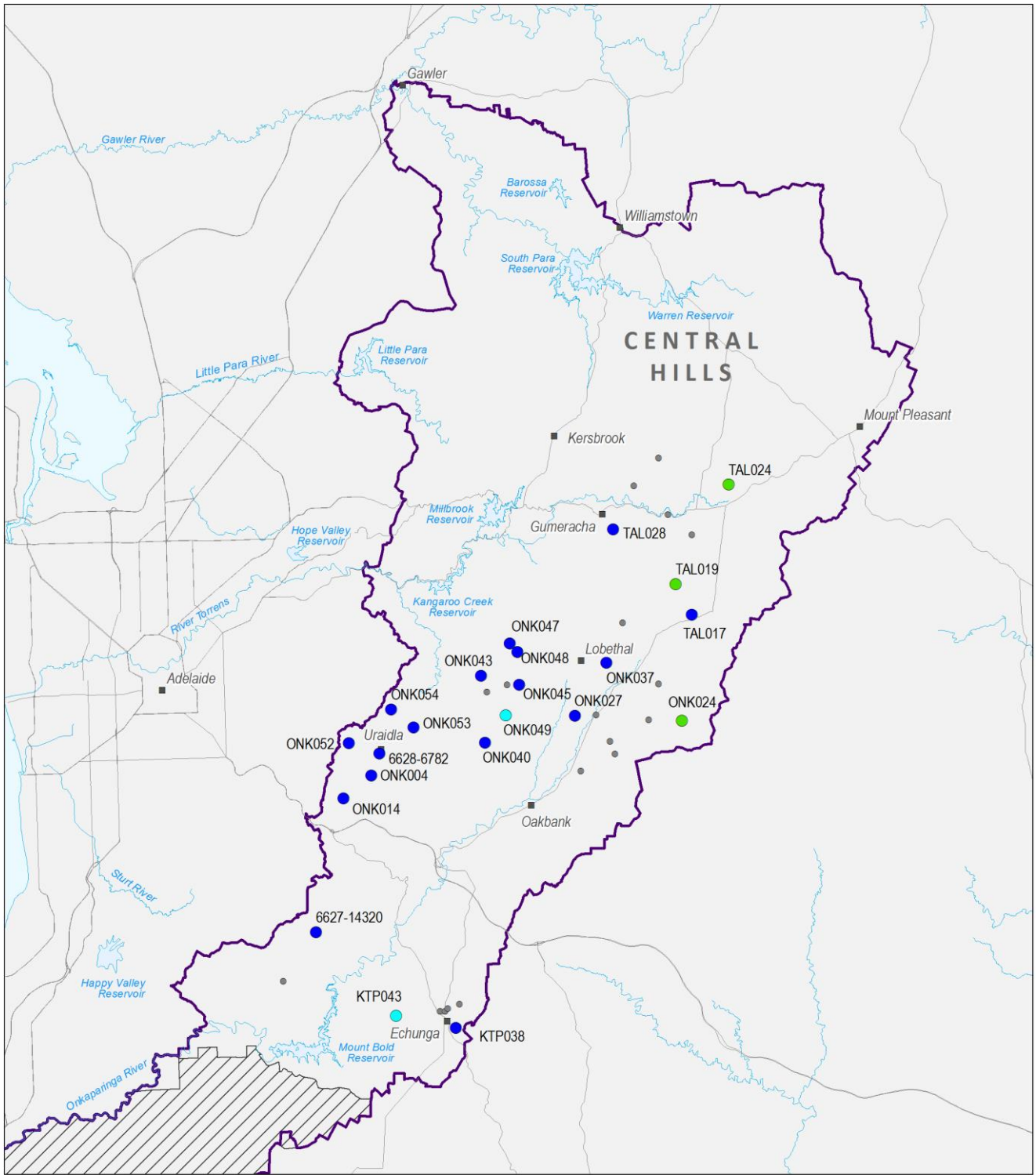


Produced by: Department for Environment and Water
 Map Projection: Lambert Conformal Conic
 Map Datum: Geocentric Datum of Australia 1994
 Date: May 2018



Figure 3. Five-year trends (2013–17) in groundwater levels: fractured rock aquifers

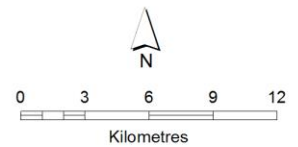
FileID: P:\Projects_GW\StateWAP_support_NRM\IEP\Licensing\SAW\Bramfield\Working_mscde\2013_17_WMLO_FRM_FRA_RS\WLFR_trend_v2.mxd UserID: pokely



2017 salinity (mg/L)

- < 1000
- 1000 - 1500
- 1500 - 3000
- 3000 - 5000
- 5000 - 8000
- > 8000

- Current monitoring well, insufficient data available
- Localities
- Watercourse
- Road
- Reservoir
- ▨ McLaren Vale Prescribed Wells Area
- ▭ Western Mount Lofty Ranges Prescribed Water Resources Area

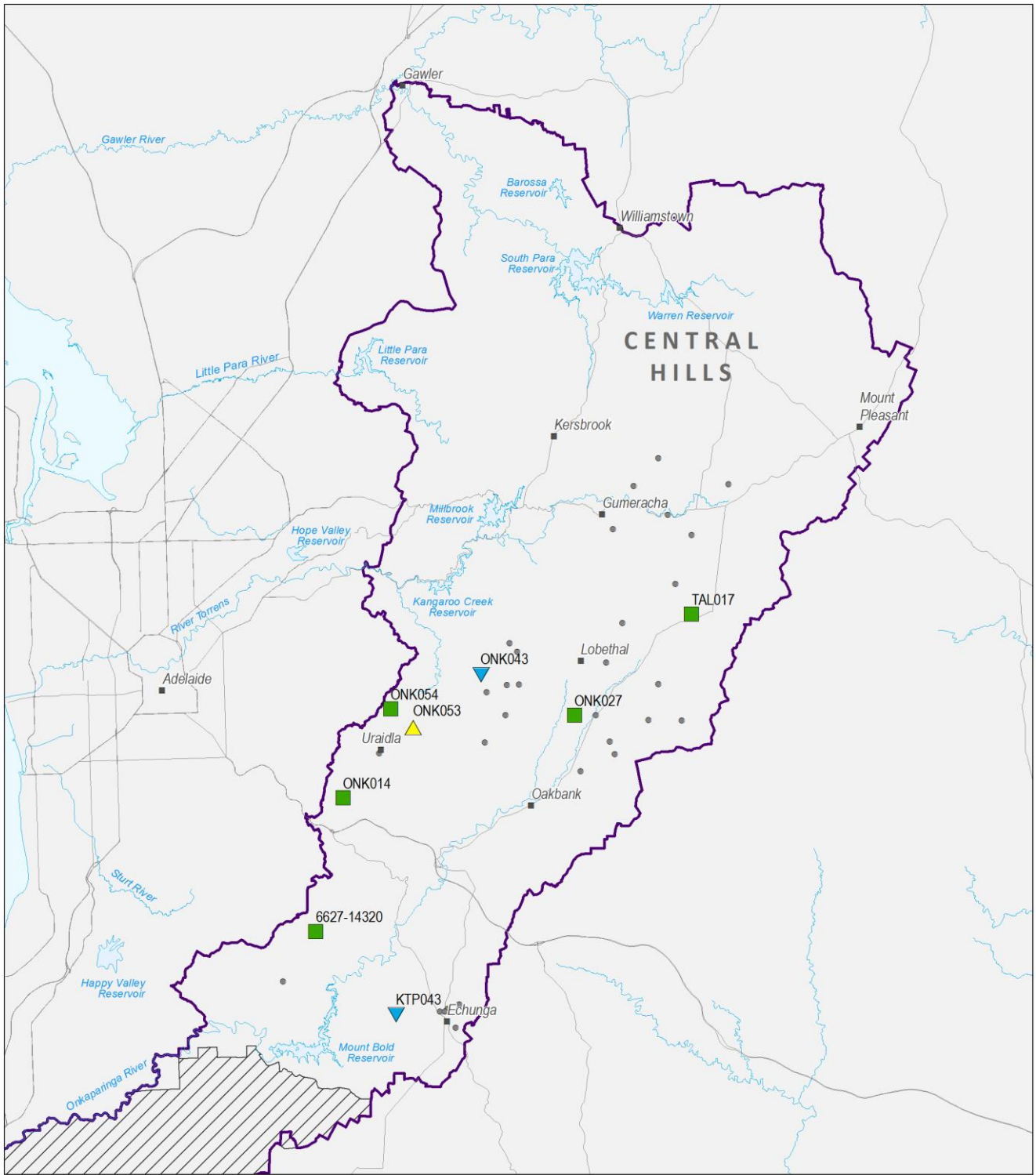


Produced by: Department for Environment and Water
 Map Projection: Lambert Conformal Conic
 Map Datum: Geocentric Datum of Australia 1994
 Date: May 2018



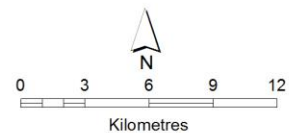
Government of South Australia
 Department for Environment and Water

Figure 4. 2017 groundwater salinities: fractured rock aquifers



2017 salinity status

- ▼ Decreasing salinity trend
- Stable salinity
- ▲ Increasing salinity trend
- Current monitoring well, insufficient data available
- Localities
- Watercourse
- Road
- Reservoir
- ▨ McLaren Vale Prescribed Wells Area
- ▭ Western 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



Government of South Australia
 Department for Environment and Water

Figure 5. Five-year trends (2013–17) in groundwater salinities: fractured rock aquifers

More information

To determine the status of the fractured rock aquifers 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; installation of water meters is still in progress across the WMLR PWRA.

For information completeness and consistency across all the groundwater level 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/).

To view the *Western 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 WMLR PWRA, please visit the *Groundwater Data* page under the Data Systems tab on [WaterConnect](#).

For further details about the WMLR PWRA, please see the *Water Allocation Plan for the Western Mount Lofty Ranges* on the Natural Resources Adelaide and Mount Lofty Ranges [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



Government
of South Australia

Department for
Environment and Water

Front Cover © Graham Green, Principal Hydrogeologist, DEW

2018 © Department for Environment and Water

Published 2018

www.environment.sa.gov.au