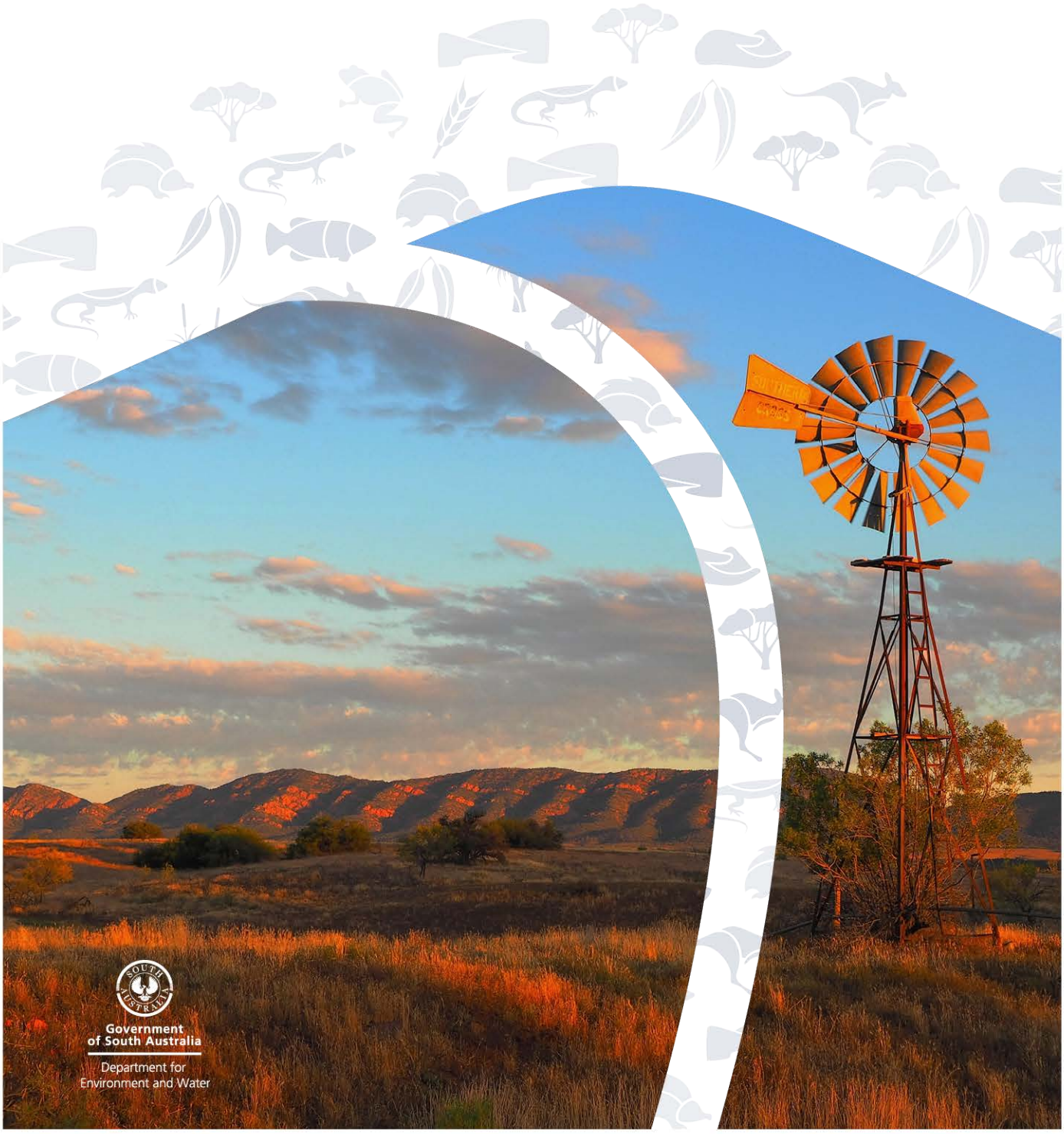
Musgrave PWA
Bramfield

2017 Groundwater level and salinity status report



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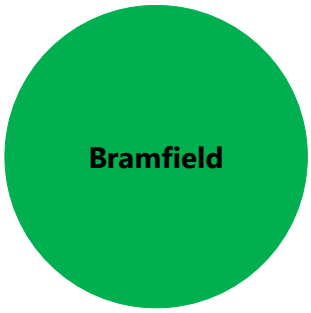
2017 Status summary
Musgrave PWA
Bramfield



The Bramfield lens of the Musgrave Prescribed Wells Area (PWA) 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, 86% of wells show rising or stable groundwater levels and all wells 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	Elliston Bureau of Meteorology (BoM) rainfall station 18069, located in the township of Elliston
Annual total[1]	424 mm 27 mm (6%) greater than the five-year average of 397 mm 7 mm (2%) less than the long-term average of 431 mm
Monthly summary	Well-above average rainfall recorded in July, September and January Well-below average rainfall recorded in November and March through to June
Spatial distribution	Rainfall in 2016–17 was consistent with past years over the entire PWA

Water use

See Figure 3

Total allocated volume	226 ML
Licensed groundwater extractions*	85.5 ML[2] (38% of total allocations)
Extraction volume comparison	30% greater than the previous year 19% greater than the five-year average

*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 – see More information

Groundwater level

See Figure 4

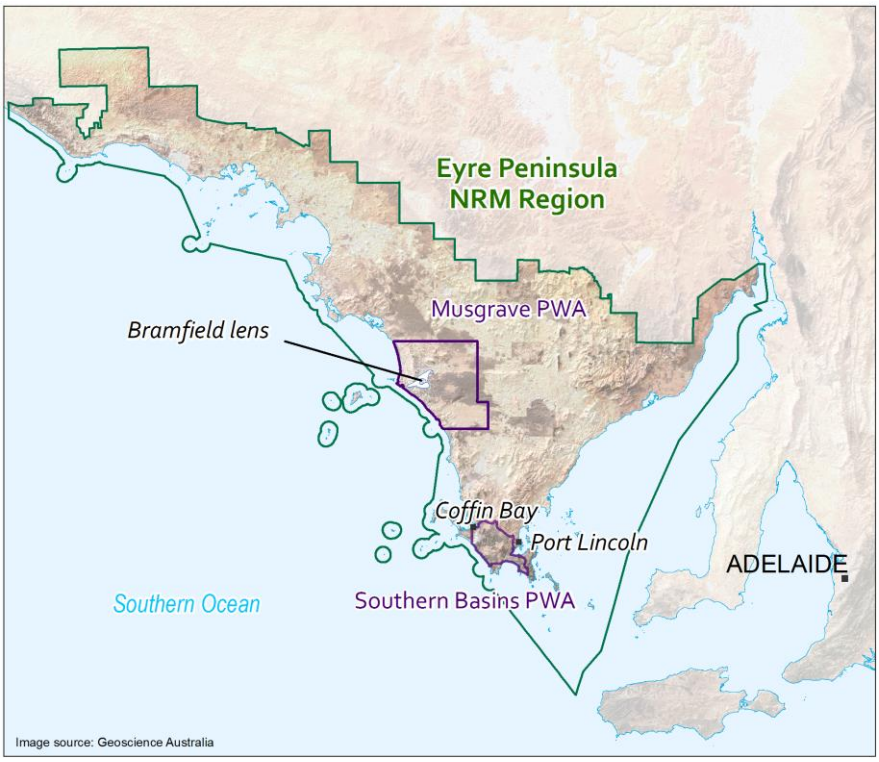
Five-year trend: 2013–17	6 out of 7 wells (86%) show rising trends, at rates of 0.01–0.19 m/y (median of 0.05 m/y) 1 well (14%) shows a declining trend at a rate of 0.05 m/y

Groundwater salinity

See Figures 5 and 6

2017 salinity	451–1530 mg/L 9 out of 13 wells (69%) show salinities less than 1000 mg/L
Five-year trend: 2013–17	1 out of 6 wells (17%) shows a decreasing trend, at a rate of 18 mg/L/y 5 wells (83%) are stable

Regional setting



The Musgrave PWA is located within the Eyre Peninsula Natural Resources Management Region, on the west coast of the Eyre Peninsula approximately 120 km north-west of Port Lincoln. The groundwater resources are prescribed under South Australia's *Natural Resources Management Act 2004,* and a water allocation plan (WAP) provides for their sustainable use. The Bramfield lens is situated in the north-west of the Southern Basins PWA.

Within the Musgrave PWA, there are three main sedimentary sequences containing groundwater that overlie basement rocks: the Quaternary limestone aquifer, the underlying Tertiary sands aquifer and deeper Jurassic sediments that occur only within the Polda Trough. The Quaternary limestone aquifer, which is the focus of this report, comprises a generally thin veneer of aeolianite sediments of the Bridgewater Formation and is continuous across the PWA. The main source of recharge to the Quaternary limestone aquifer is the direct infiltration of rainfall, and groundwater flow is predominantly in a westerly to south-westerly direction toward the Southern Ocean.

Groundwater levels and salinities in the Musgrave PWA are highly responsive to recharge from rainfall, and trends in groundwater level or salinity 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 extractions, and both elements can cause the groundwater levels to decline and salinities to increase. Conversely, above-average rainfall can result in increases in recharge, decreases in extractions and groundwater levels may rise and salinities may stabilise or decrease. Historical rainfall data indicate that trends of above or below-average rainfall can last for up to 25 years, and that high-intensity rainfall events can result in rapid groundwater level responses (i.e. recharge).

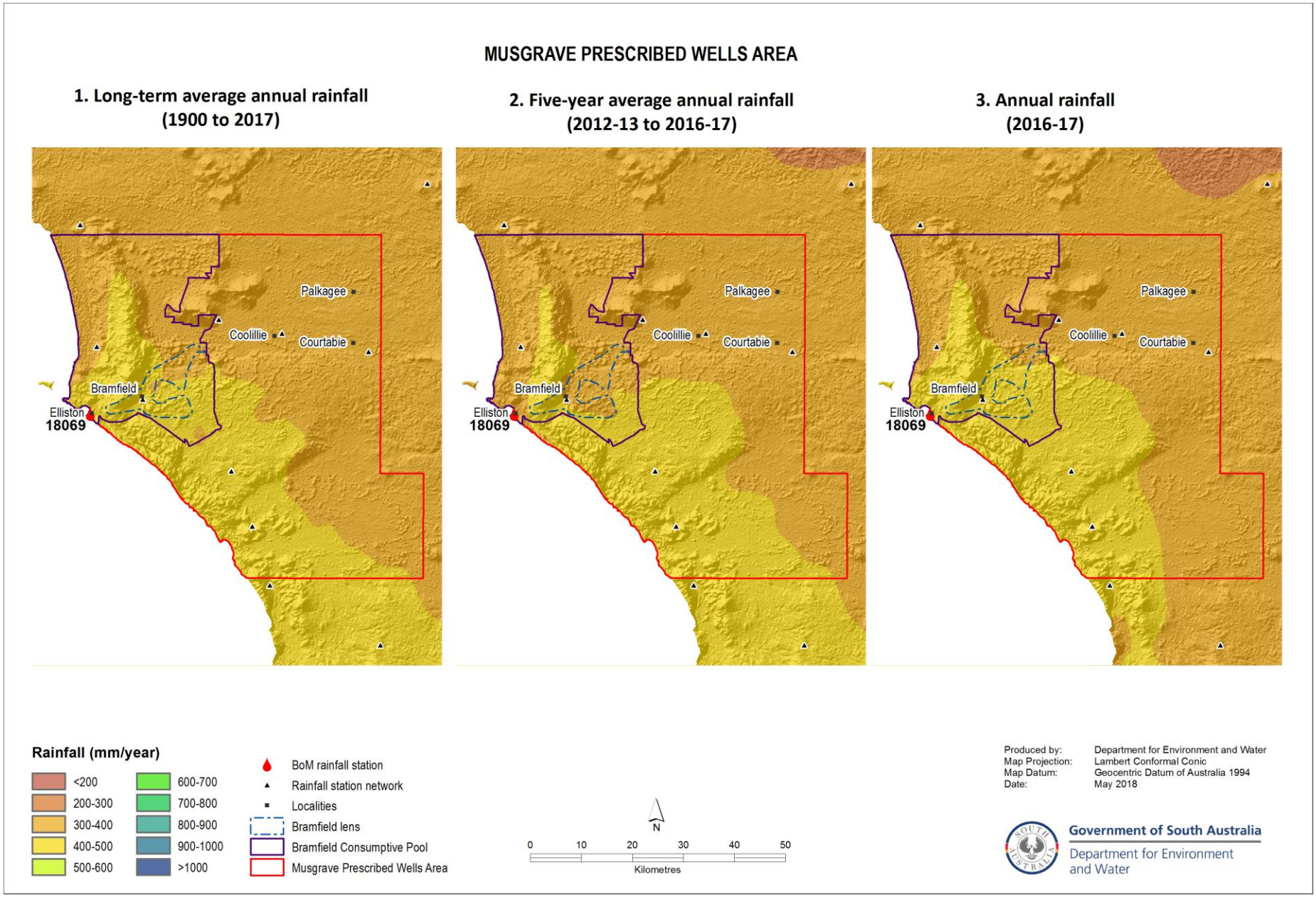


Figure 1. Spatial distribution of (1) Long-term and (2) five-year average annual rainfall, and (3) annual rainfall[3]

[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

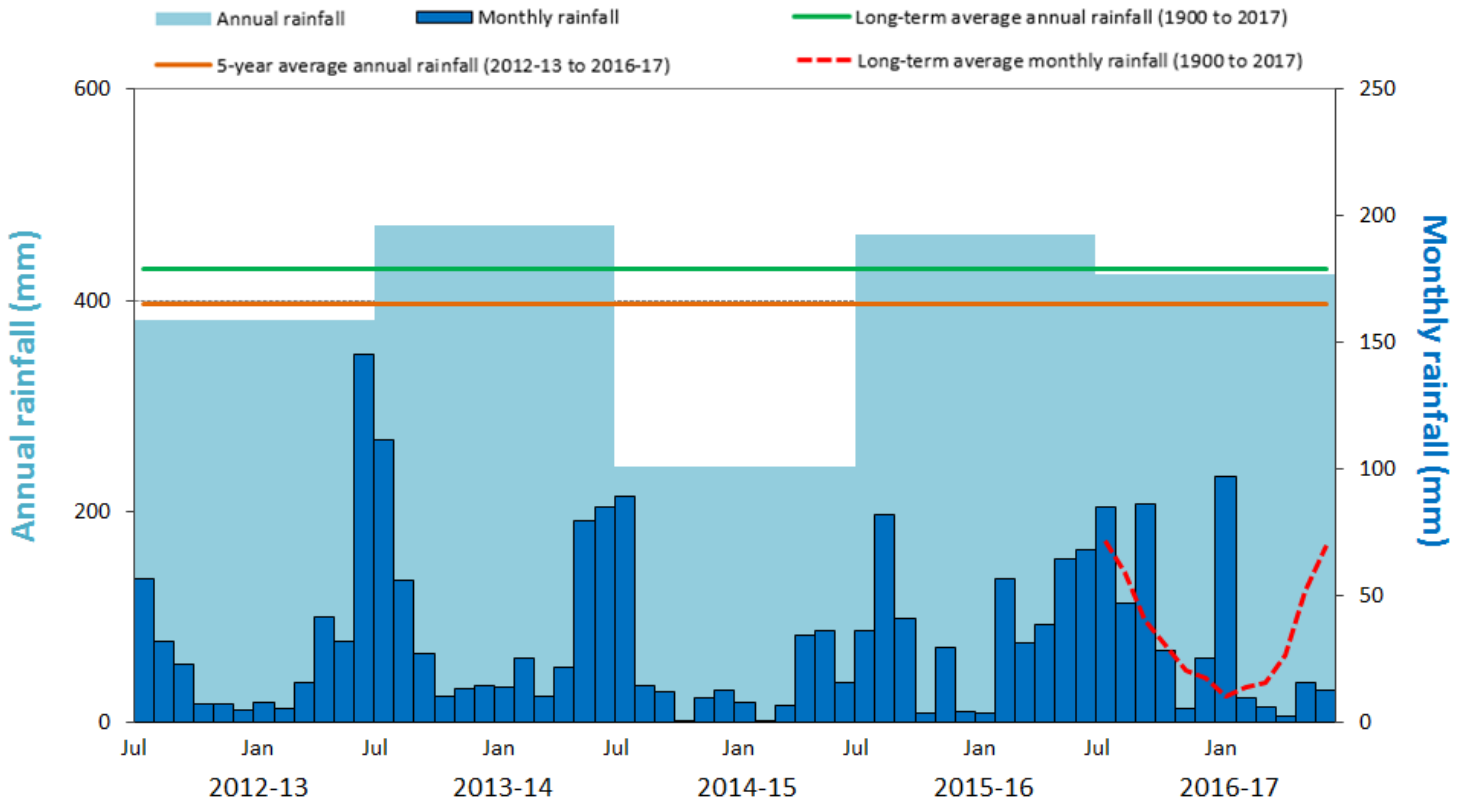


Figure 2. Annual and monthly rainfall for the past five water-use years recorded at Elliston (BoM Station 18069)[4]

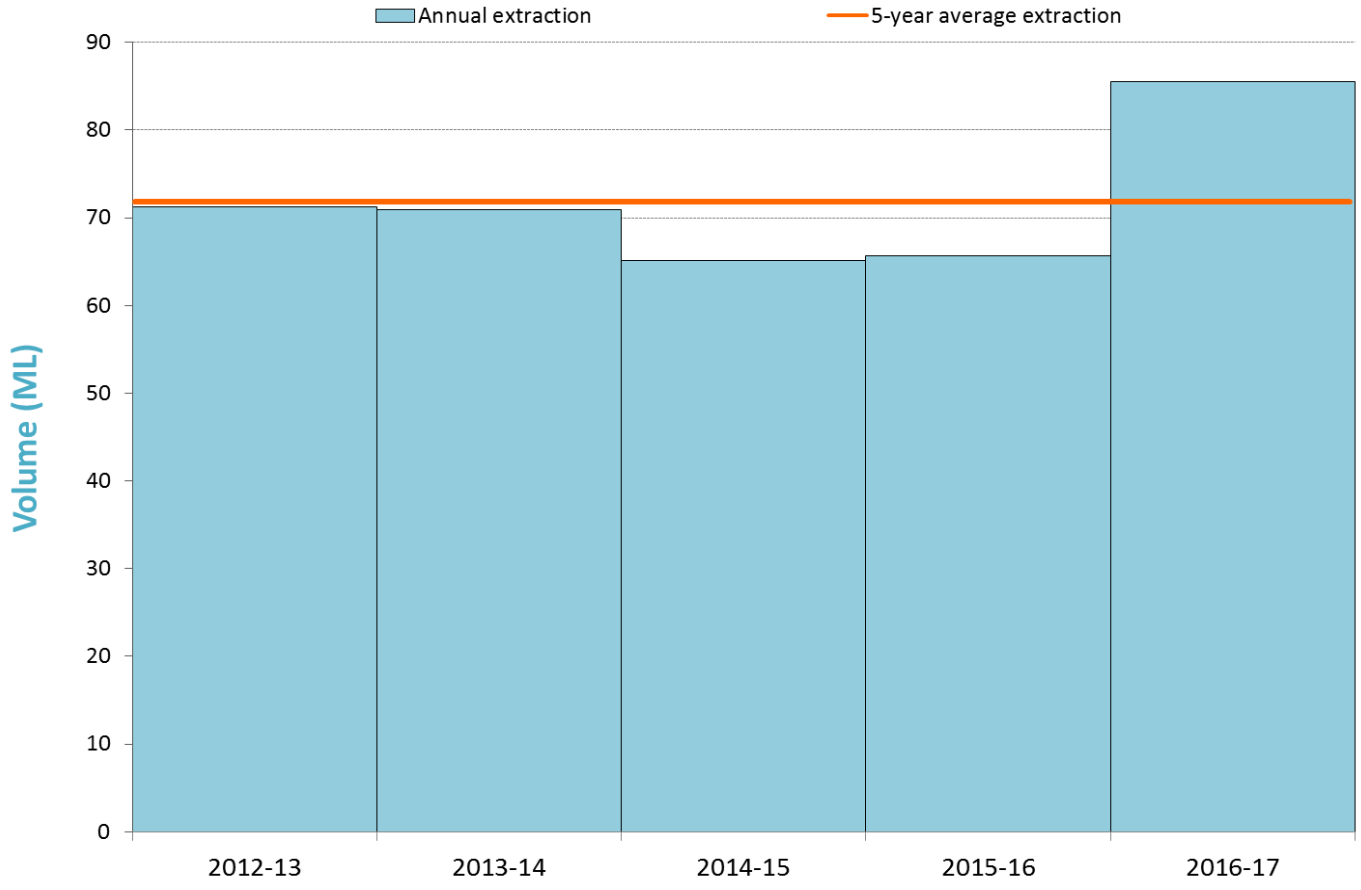


Figure 3. Licensed groundwater extraction volumes[5] for the past five water-use years

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

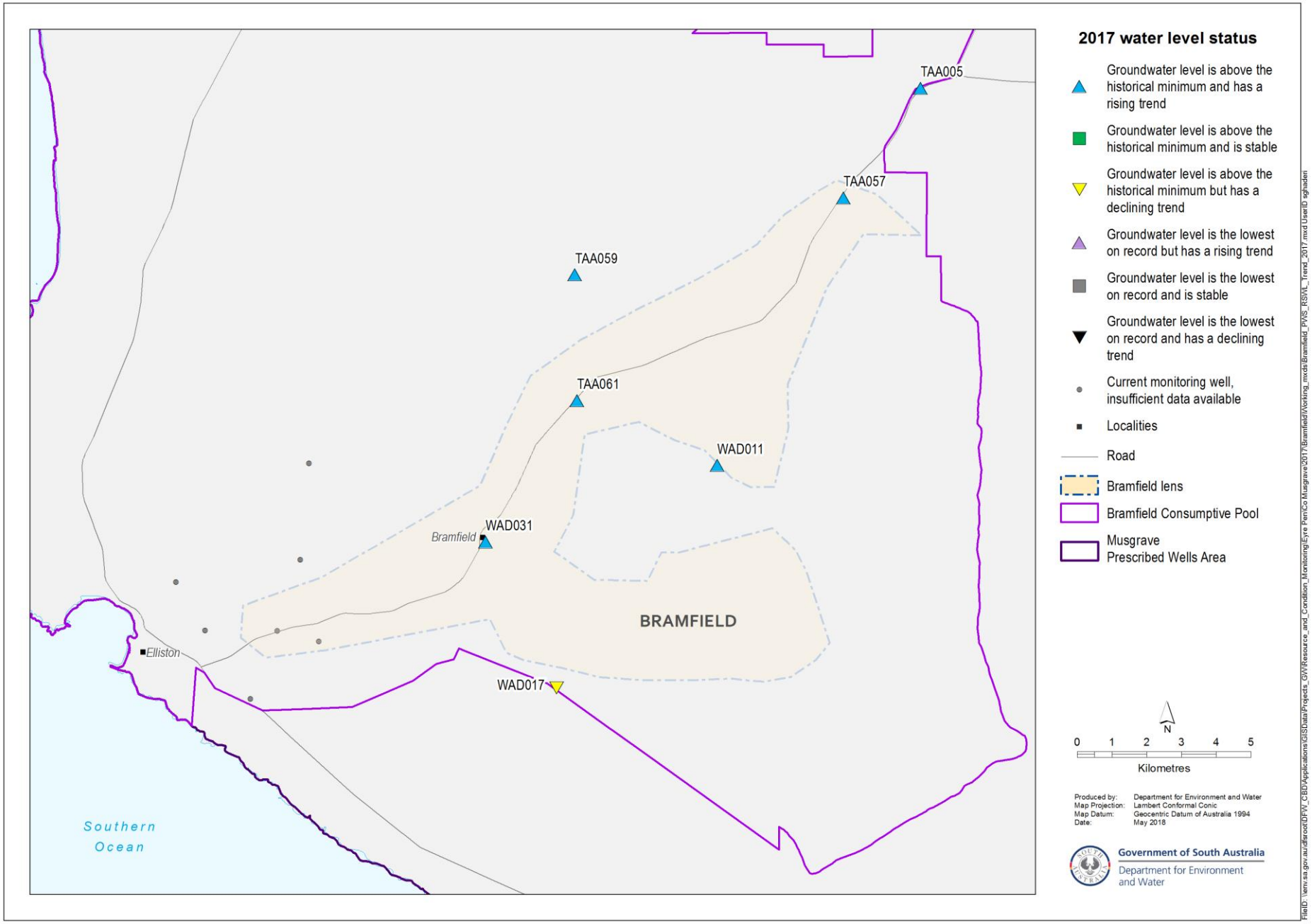


Figure 4. Five-year trends (2013–17) in groundwater levels: Bramfield lens

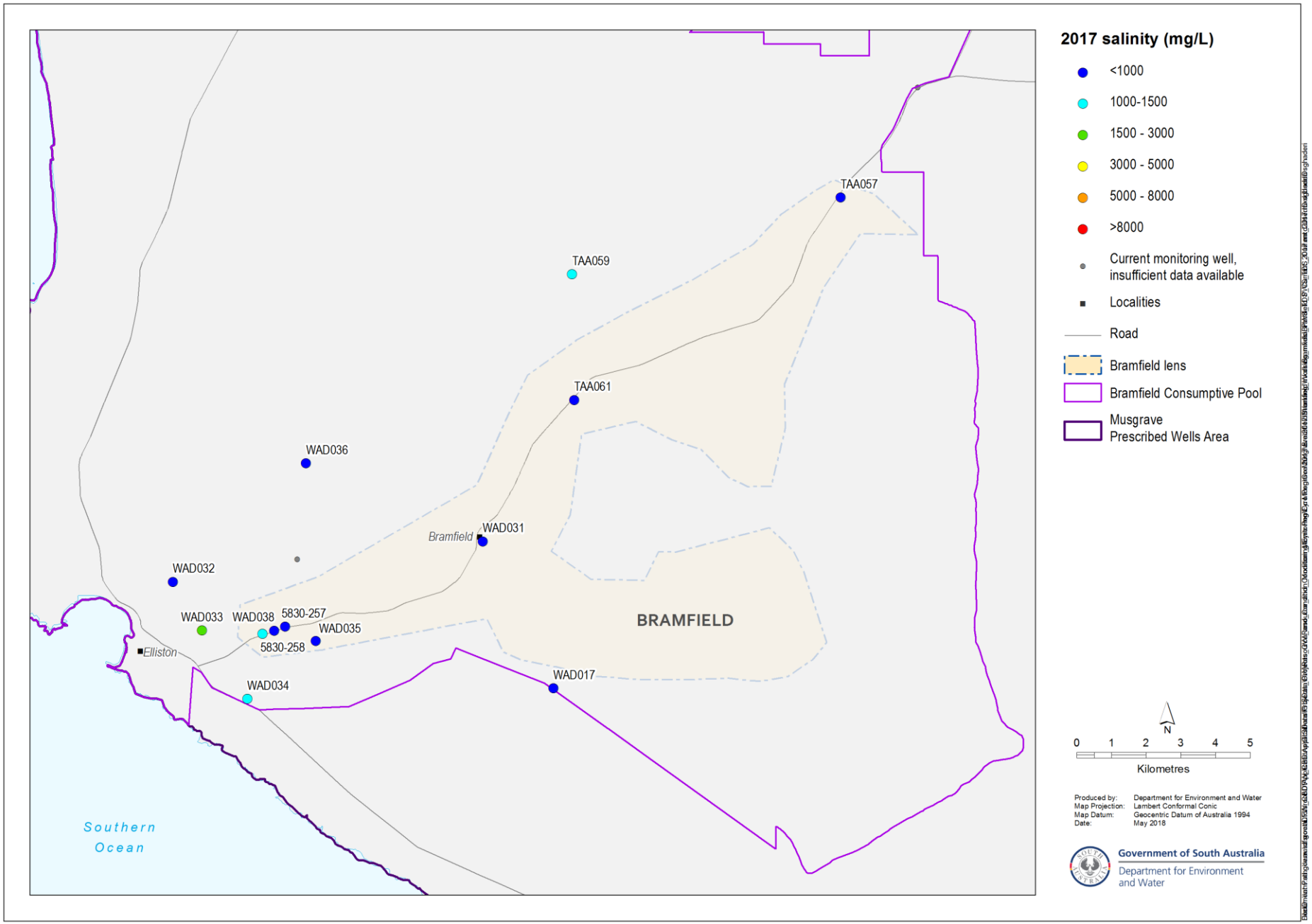


Figure 5. 2017 groundwater salinities: Bramfield lens

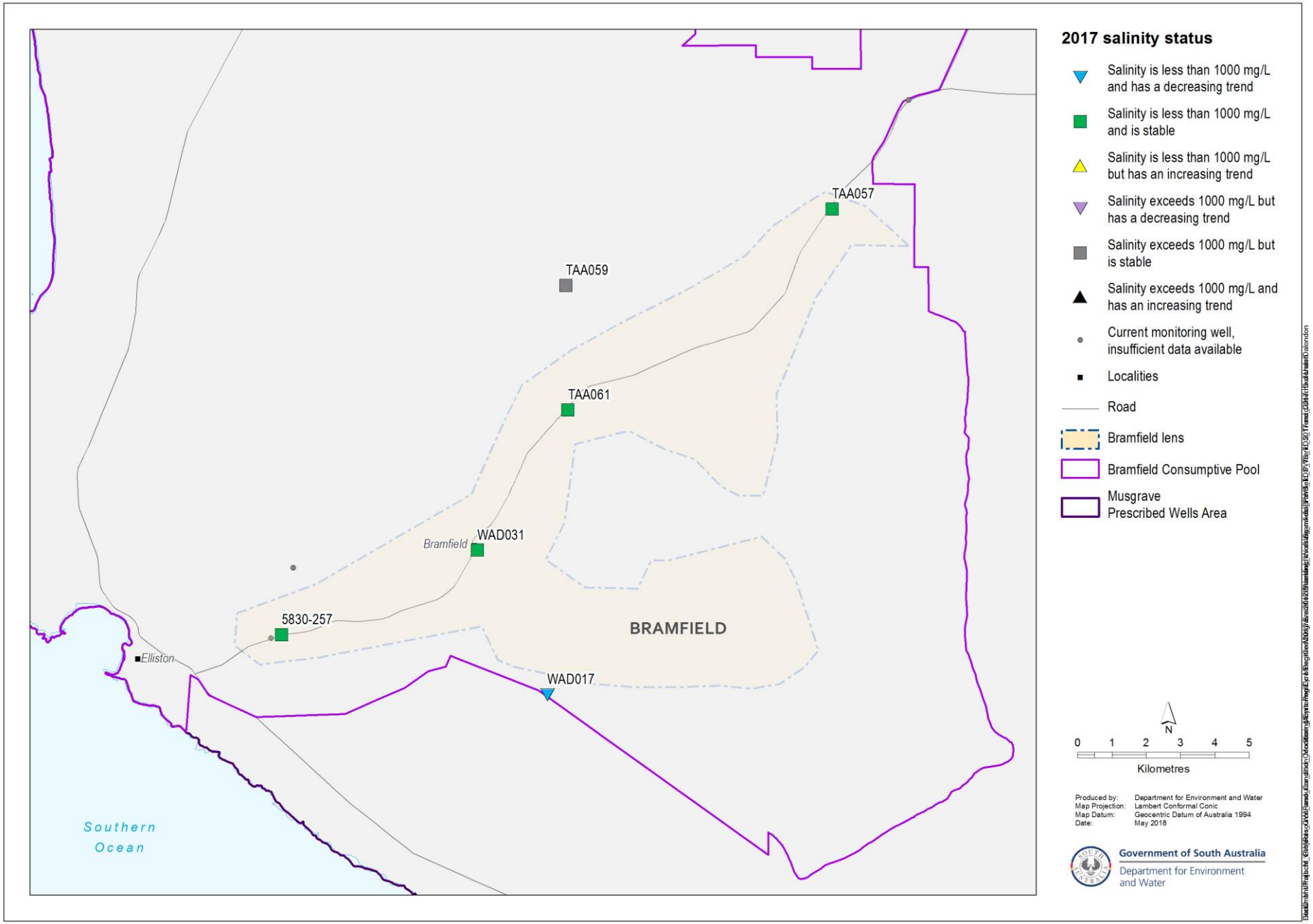


Figure 6. Five-year trends (2013–17) in groundwater salinities: Bramfield lens

More information

To determine the status of the Bramfield lens 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.

Consumptive pool is defined as the water that will, from time to time, be taken to constitute the resource within a particular part of a prescribed water resource. For further information please see the *Water Allocation Plan for the Southern Basins and Musgrave Prescribed Wells Areas* on the Natural Resources Eyre Peninsula website.

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 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 *Musgrave 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 Musgrave PWA, please visit the *Groundwater Data* page under the Data Systems tab on WaterConnect.

For further details about the Musgrave PWA, please see the *Water Allocation Plan for the Southern Basins and Musgrave Prescribed Wells Areas* on the Natural Resources Eyre Peninsula 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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