

Prescribed Wells Areas of the South East confined aquifer

2017 Groundwater level and salinity status report



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Environment and Water

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2017 Status summary

South East PWAs

South East confined aquifer



The South East confined aquifer of the South East Prescribed Wells Areas (PWAs) 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, 67% of wells show rising or stable groundwater pressure levels and 98% 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, 2 and 3

Rainfall station	Mount Gambier Aero Bureau of Meteorology (BoM) rainfall station 26021, located approximately 8 km north of Mt Gambier
Annual total ¹	885 mm 164 mm (23%) greater than the five-year and the long-term averages of 721 mm
Monthly summary	Well-above average rainfall recorded in July, September January and March Well-below average rainfall recorded in June
Rainfall station	Keith BoM rainfall station 25507, located in the west of the Tatiara PWA
Annual total ¹	591 mm 183 mm (45%) greater than the five-year average of 408 mm 129 mm (28%) greater than the long-term average of 462 mm
Monthly summary	Well-above average rainfall recorded in July, September, October, December, March and April Well-below average rainfall recorded in November, February, March and June
Spatial distribution	Rainfall in 2016–17 was well above average across all PWAs

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

Water use

See Figure 4

Total allocated volume: 2016–17	68 952 ML
Licensed groundwater extractions*	21 077 ML ² (31% of total allocation) Lower Limestone Coast, Tatiara and Tintinara–Coonalpyn PWAs totalled 15 051 ML (71%), 315 ML (1%) and 5711 ML (28%), respectively
Extraction volume comparison	25% less than the previous year 9% less than the five-year average

*Stock and domestic use is not included in licensed extractions. No licensed allocations for the confined aquifer of the Padthaway PWA.

Groundwater pressure level

See Figure 5

Five-year trend: 2013–17	
Lower Limestone Coast PWA	56 out of 95 wells (59%) show rising trends, at rates of 0.02–1.0 m/y (median of 0.18 m/y) 11 wells (12%) are stable; one of these wells shows its lowest level on record 28 wells (29%) show declining trends, at rates of 0.02–0.52 m/y (median of 0.04 m/y); two of these wells show their lowest levels on record
Tintinara–Coonalpyn PWA	17 out of 33 wells (52%) show rising trends, at rates of 0.06–1.3 m/y (median of 0.27 m/y) 4 wells (12%) are stable 12 wells (36%) show declining trends, at rates of 0.07–1.3 m/y (median of 0.19 m/y); one of these wells shows its lowest level on record
Padthaway PWA	1 out of 2 wells (50%) shows a rising trend, at a rate of 0.1 m/y 1 well (50%) is stable
Tatiara PWA	4 out of 5 wells (80%) show declining trends, at rates of 0.07–0.1 m/y (median of 0.08 m/y); one of these wells shows its lowest level on record 1 well (20%) is stable

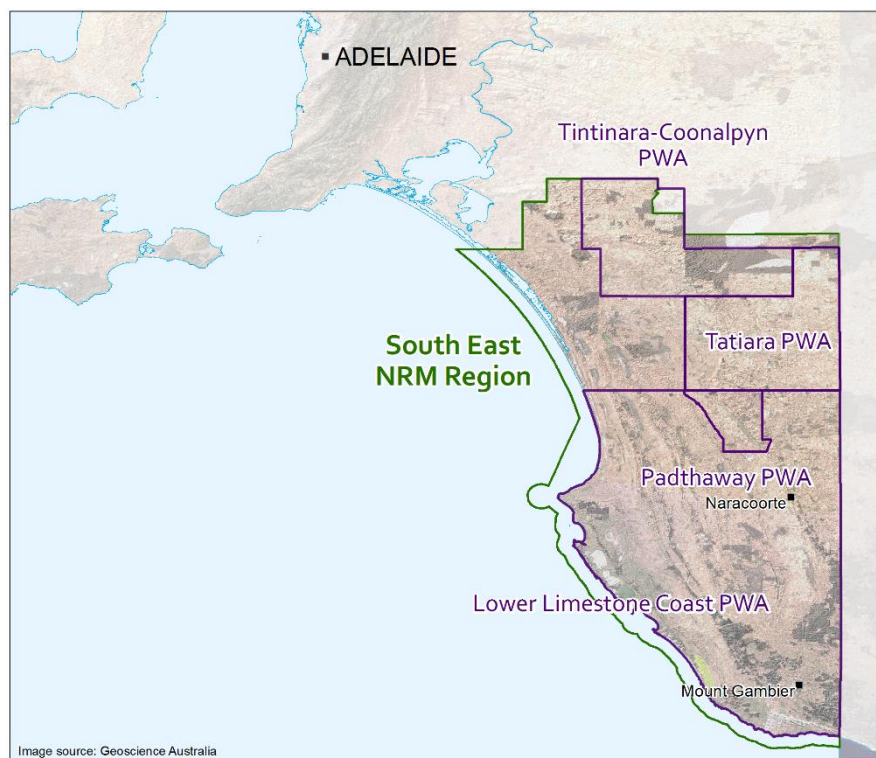
Groundwater salinity

See Figures 6 and 7

2017 salinity	550–4025 mg/L 45 out of 53 wells (85%) show salinities less than 1500 mg/L
Five-year trend: 2013–17	41 out of 42 wells (98%) are stable 1 well shows an increasing trend, at a rate of 84 mg/L/y

² Total licensed extractions are subject to change as extraction data have not yet been verified in full – see [More information](#)

Regional setting



There are four PWAs in the South East Natural Resources Management Region: Tintinara–Coonalpyn, Tatiara, Padthaway and Lower Limestone Coast. Groundwater in these PWAs is prescribed under South Australia’s *Natural Resources Management Act 2004*. A water allocation plan (WAP) provides for the sustainable management of the groundwater resources.

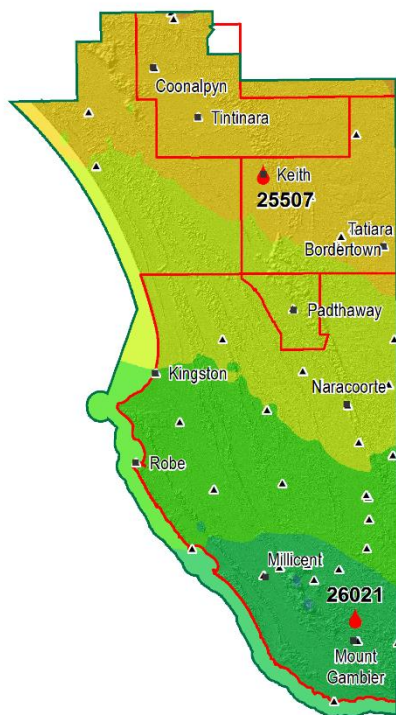
The PWAs of the South East are underlain by sediments of the Murray and Gambier Basins that form: (1) an unconfined aquifer comprising various Quaternary and Tertiary calcareous sandstones and limestones; and (2) an underlying confined Tertiary aquifer comprising non-calcareous quartz sand. In the Tintinara–Coonalpyn PWA, the confined aquifer consists of Murray Basin sediments—the fossiliferous limestone and marl of the Buccleuch Formation on the coastal plain, and the Renmark Group in the highlands. Across the Tatiara PWA, the confined aquifer primarily consists of the Renmark Group, as the Buccleuch Formation is relatively thin. In the Lower Limestone Coast PWA, the confined aquifer is comprised of the Dilwyn Formation of the Gambier Basin, which is the equivalent of the Renmark Group in the Murray Basin. The Dilwyn Formation is generally thin or absent in the Padthaway PWA.

Groundwater in the confined aquifer is recharged around the topographic highs of the Dundas Plateau in Victoria. From there, the groundwater flows radially westward and southward to the coast and northward to the Murray River. Artesian conditions exist in the west, particularly in the Kingston area, and along the southern coast (Fig. 5).

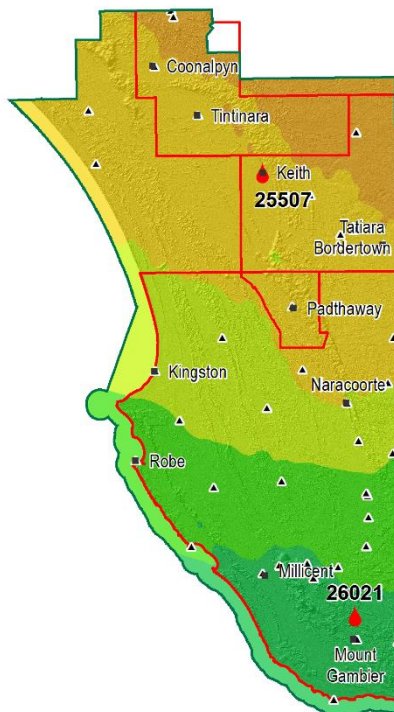
Although the confined aquifer does not receive direct recharge from local rainfall, the intensity and timing of rainfall and related variations in rates of groundwater extraction may have an effect on groundwater pressure levels in the confined aquifer. For example, if the South East NRM Region experiences above-average rainfall during the irrigation season, this may result in less groundwater being extracted from the confined aquifer, and therefore groundwater pressure levels may rise. Conversely, below-average rainfall may result in increased rates of groundwater extraction and groundwater pressure levels may decline to lower levels.

SOUTH EAST NATURAL RESOURCES MANAGEMENT REGION

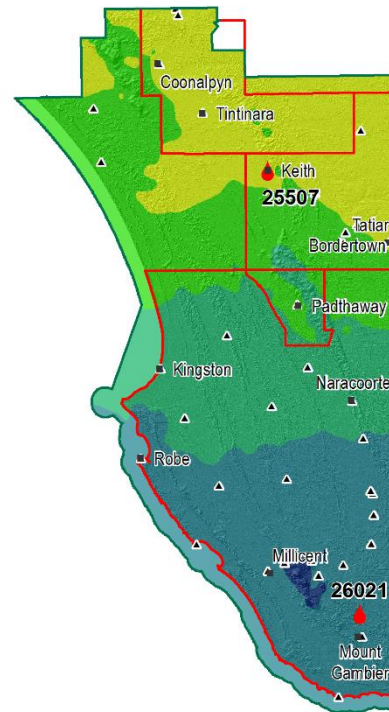
**1. Long-term average annual rainfall
(1900 to 2017)**



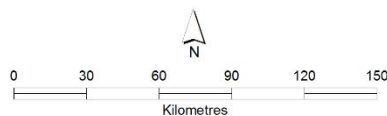
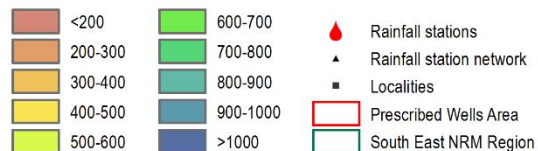
**2. Five-year average annual rainfall
(2012-13 to 2016-17)**



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



Rainfall (mm/year)



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 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](#)

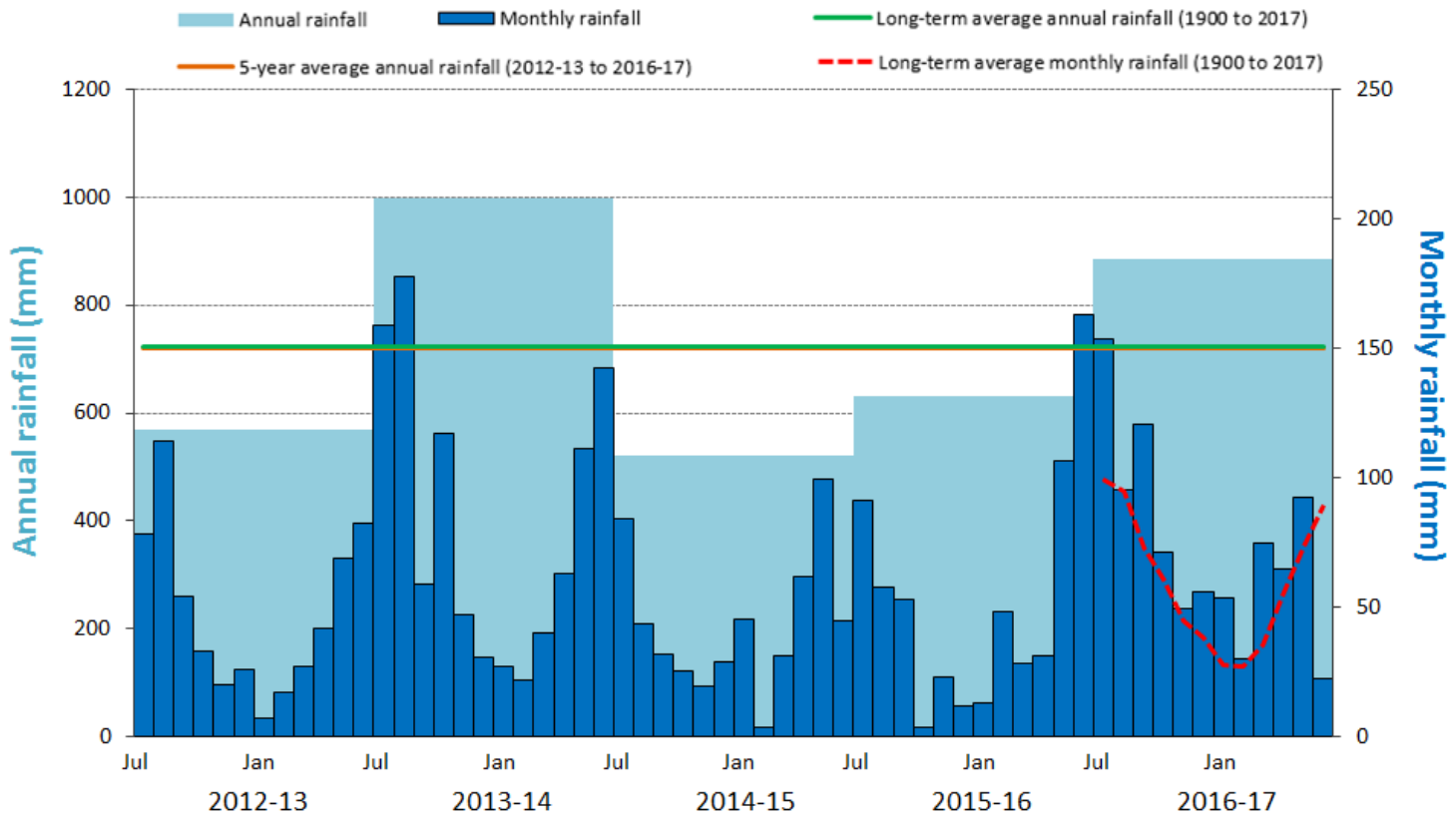


Figure 2. Annual and monthly rainfall for the past five water-use years recorded at Mount Gambier (BoM Station 26021)⁴

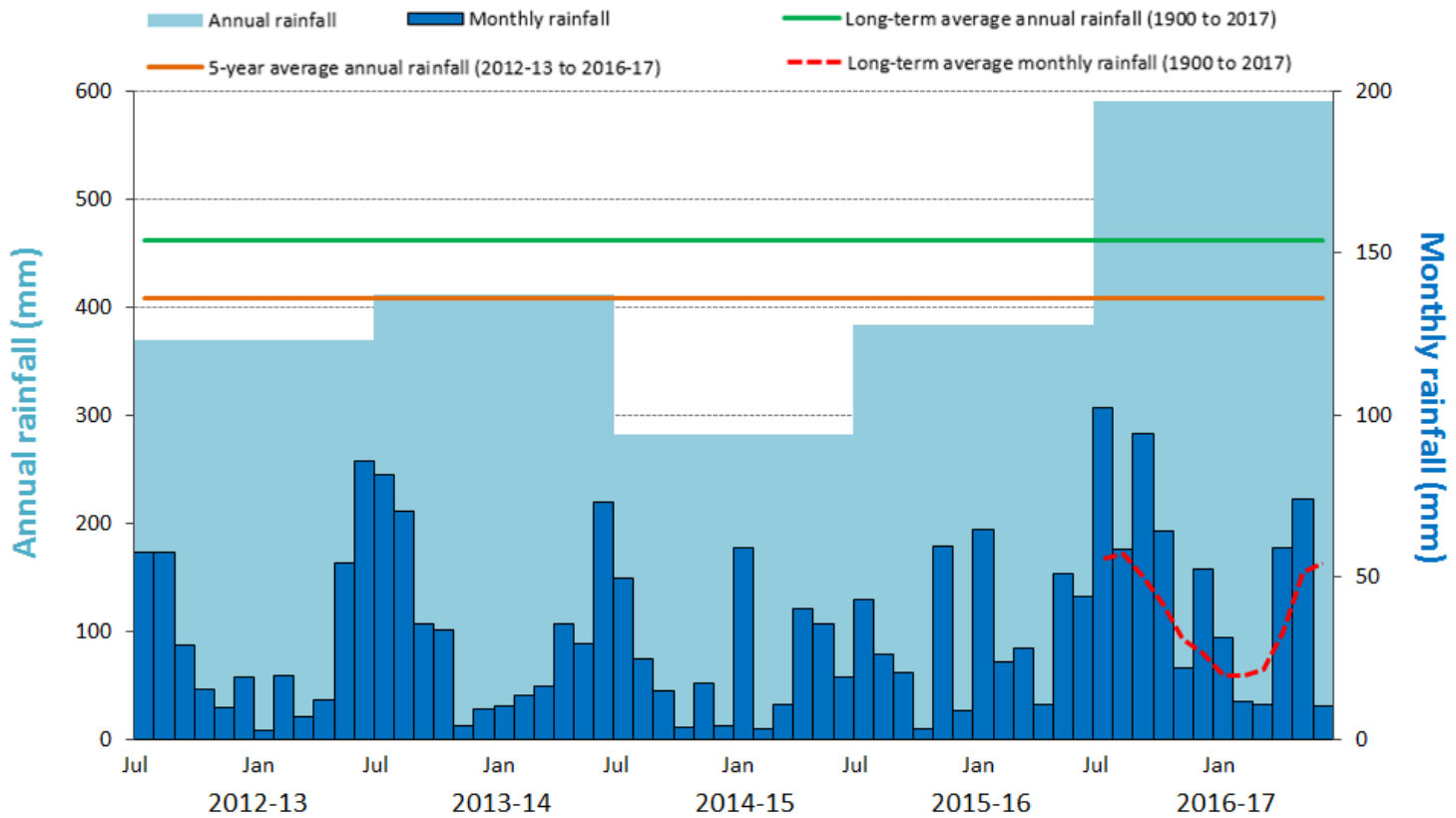


Figure 3. Annual and monthly rainfall for the past five water-use years recorded at Keith (BoM Station 25507)⁴

⁴ Data source: SILO Patched Point Dataset, available <https://silo.longpaddock.qld.gov.au/> – see [More information](#)

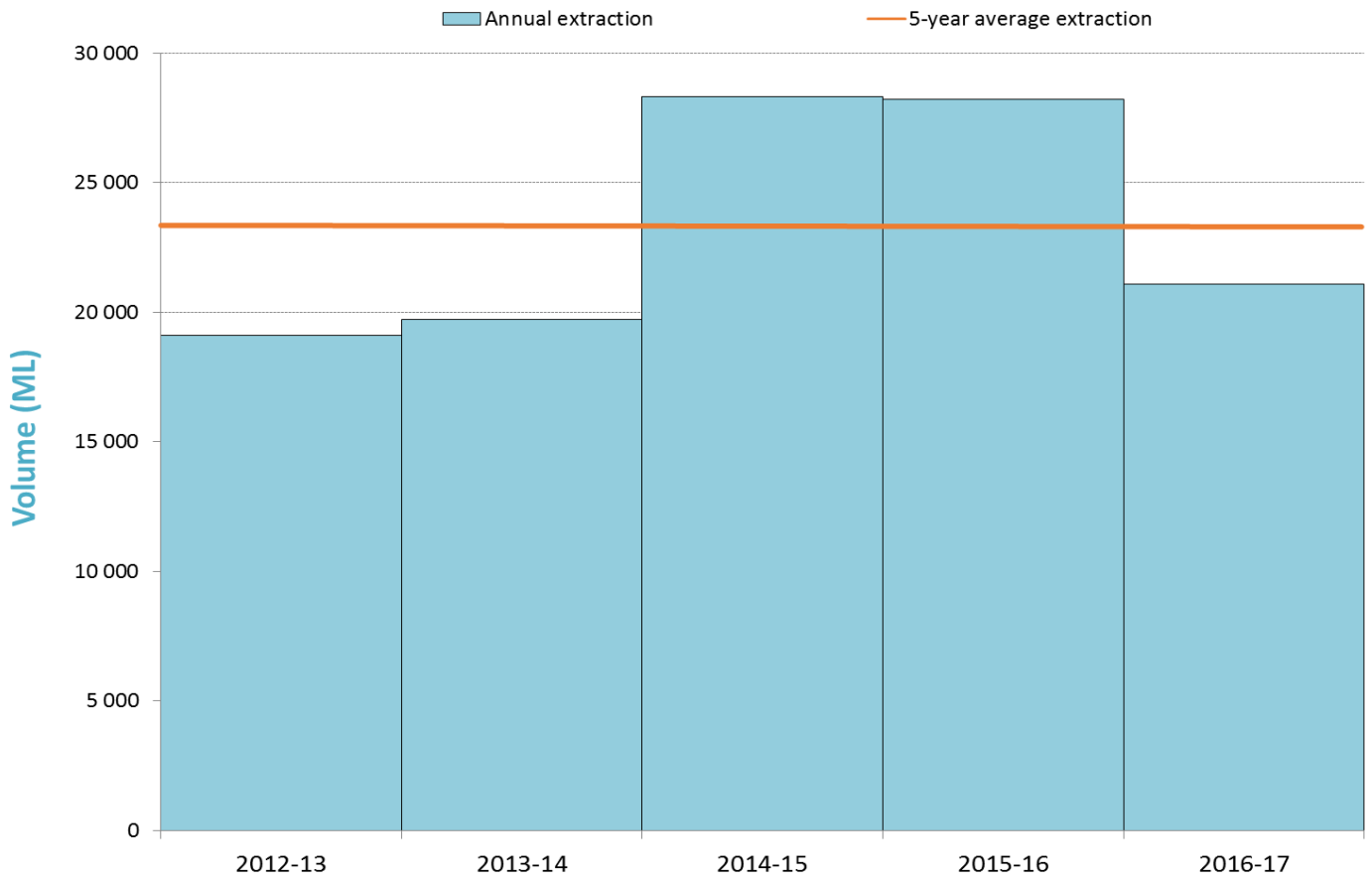
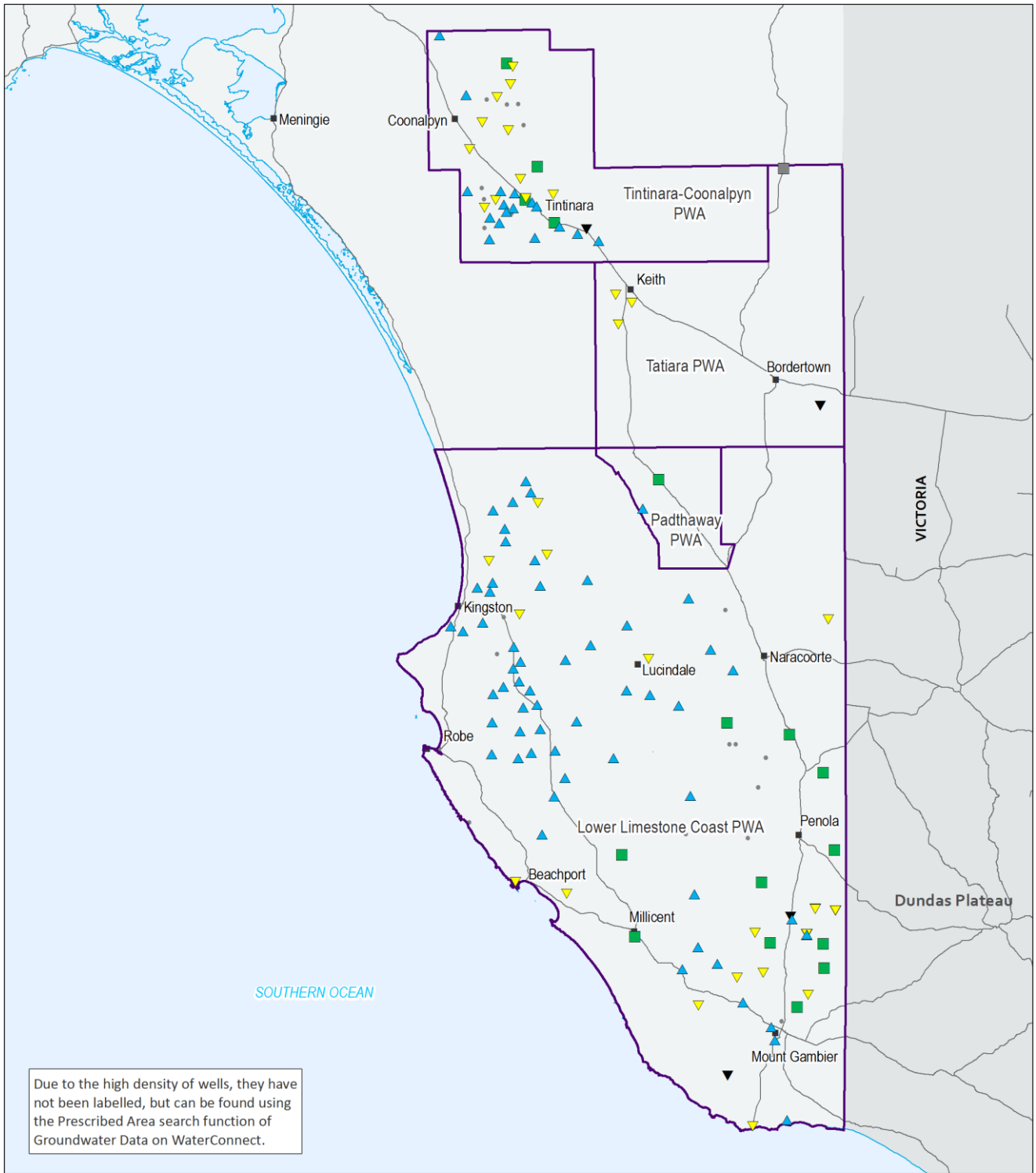


Figure 4. Licensed groundwater extraction volumes⁵ for the past five water-use years

⁵ Total licensed extractions are subject to change as extraction data have not yet been verified in full – see [More information](#)

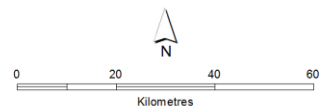


Due to the high density of wells, they have not been labelled, but can be found using the Prescribed Area search function of Groundwater Data on WaterConnect.

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 and is stable
- ▼ Groundwater level is the lowest on record and has a declining trend

- Current monitoring well, insufficient data available
- Localities
- Road
- ▭ South East Prescribed Wells Areas



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 Map Projection: Transverse Mercator Zone 54
 Map Datum: Geocentric Datum of Australia 1994
 Date: May 2018



Figure 5. Five-year trends (2013–17) in groundwater pressure levels: South East confined aquifer

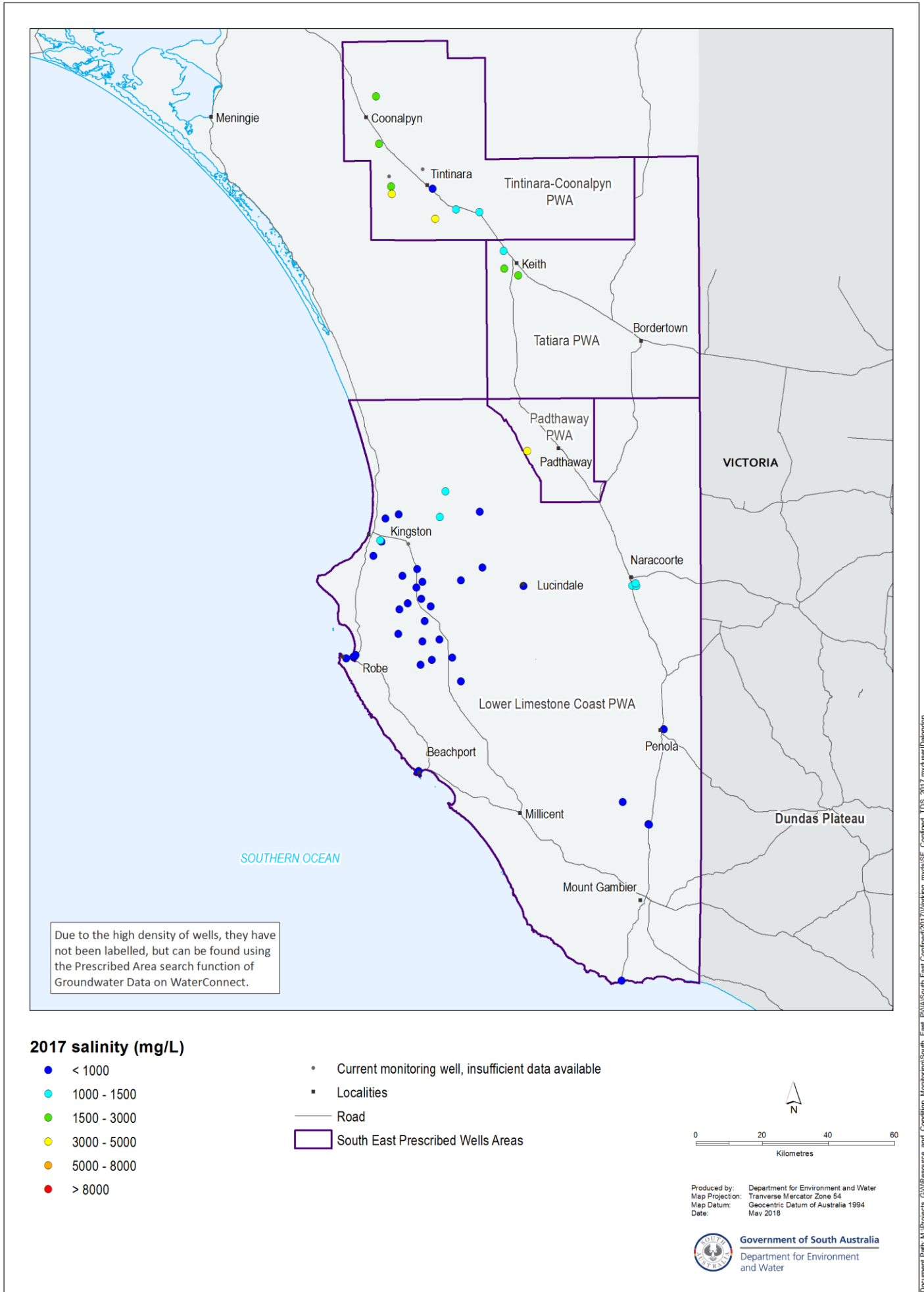
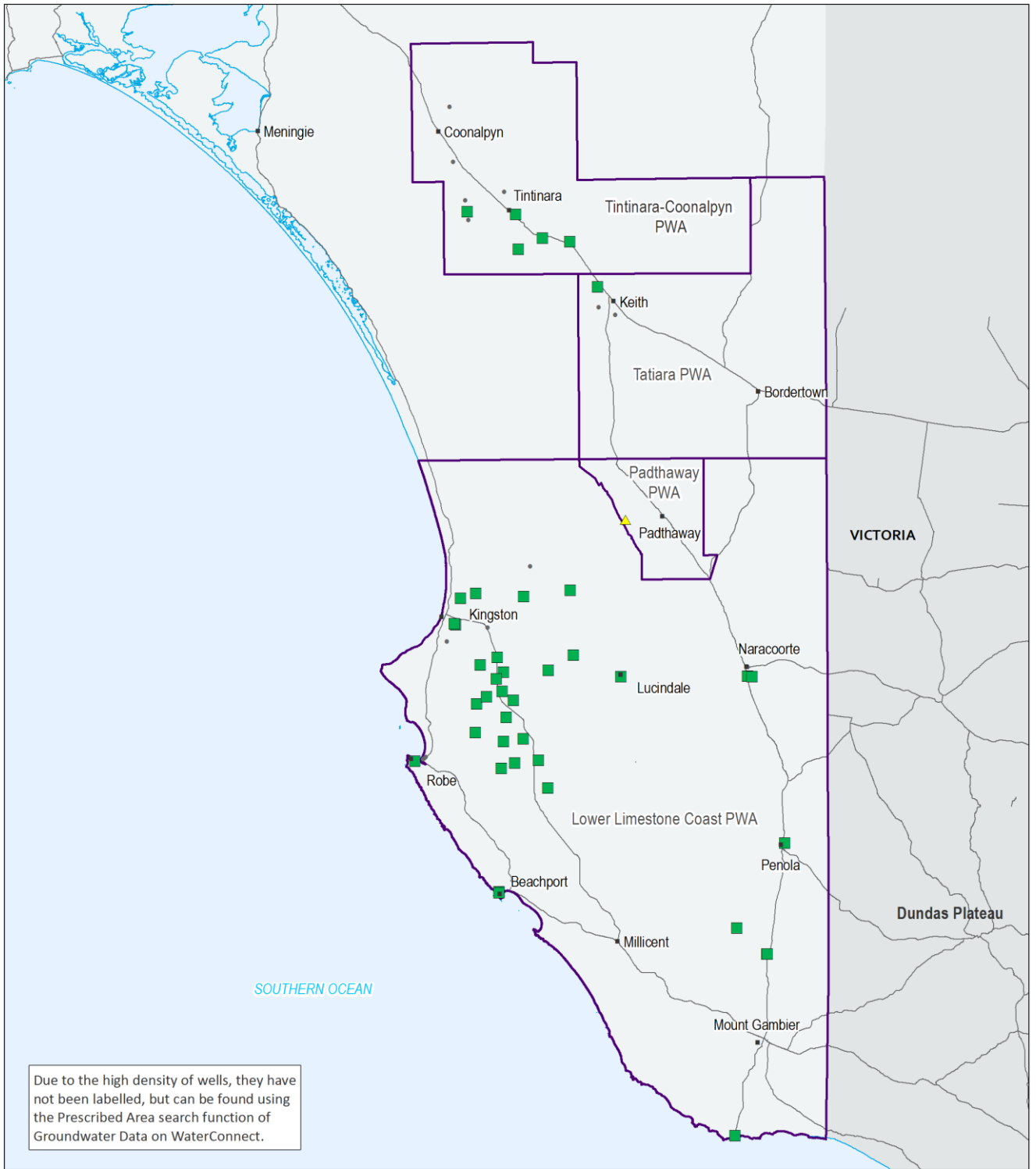


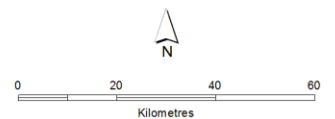
Figure 6. 2017 groundwater salinities: South East confined aquifer



Due to the high density of wells, they have not been labelled, but can be found using the Prescribed Area search function of Groundwater Data on WaterConnect.

2017 salinity status

- ▼ Decreasing salinity trend
- Stable salinity
- ▲ Increasing salinity trend
- Current monitoring well, insufficient data available
- Localities
- Road
- ▭ South East Prescribed Wells Area



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 Map Projection: Transverse Mercator Zone 54
 Map Datum: Geocentric Datum of Australia 1994
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Figure 7. Five-year trends (2013–17) in groundwater salinities: South East confined aquifer

More information

To determine the status of the South East confined 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 and unique code, 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 April 2018 and may be subject to change, as some extraction volumes may be in the process of verification.

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/).

To view the *Tintinara–Coonalpyn, Tatiara, Lower Limestone Coast and Padthaway PWAs Groundwater Level and Salinity Status Reports 2011*, which includes background information on hydrogeology, rainfall and relevant groundwater-dependent ecosystems, please visit [WaterConnect](#).

To download groundwater level and salinity data from monitoring wells within the South East PWAs, please visit the *Groundwater Data* page under the Data Systems tab on [WaterConnect](#). To view all past published *Groundwater level and salinity status reports*, please visit the [Water Resource Assessments](#) page on WaterConnect.

For further details on the South East PWAs, please see the relevant *Water Allocation Plans* available on the Natural Resources South East [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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