

Tintinara–Coonalpyn PWA Unconfined aquifer

2017 Groundwater level and salinity status report



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of South Australia
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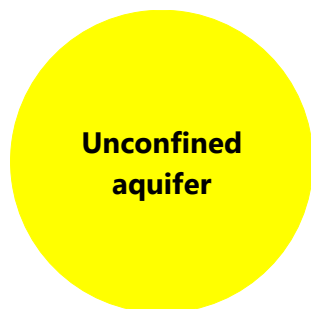
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2017 Status summary

Tintinara–Coonalpyn PWA

Unconfined aquifer



The unconfined aquifer of the Tintinara–Coonalpyn Prescribed Wells Area (PWA) has been assigned a **yellow** status for 2017 because minor adverse trends have been observed over the past five years.

The status is based on five-year trends: over the period 2013–17, 50% of wells show declining groundwater levels and all wells 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	Tintinara Bureau of Meteorology (BoM) rainfall station 25514, located in the township of Tintinara close to the centre of the PWA
Annual total ¹	557 mm 174 mm (46%) greater than the five-year average of 383 mm 101 mm (22%) greater than the long-term average of 456 mm
Monthly summary	Well above average rainfall recorded in July, September, December, January and April Well below average rainfall recorded in November and 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	63 795 ML
Licensed groundwater extractions*	21 392 ² ML (34% of total allocation)

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](#)

Extraction volume comparison	47% less than the previous year 30% less than the five-year average
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*Stock and domestic use is not included in licensed extractions

Groundwater level

See Figure 4

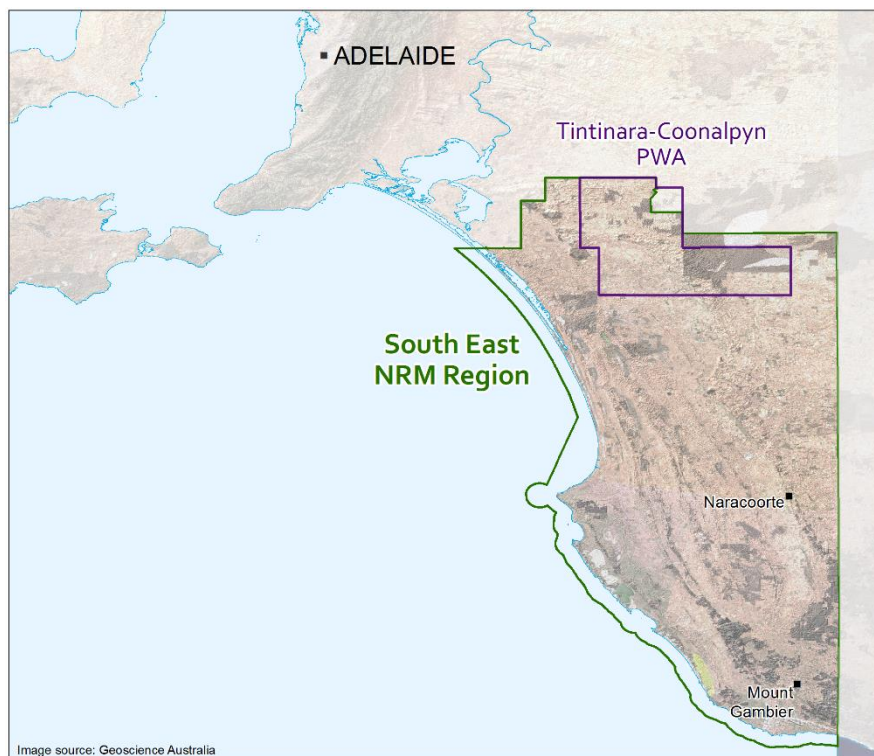
Five-year trend: 2013–17	10 out of 36 wells (28%) show rising trends, at rates of 0.02–0.1 m/y (median of 0.04 m/y) 8 wells (22%) are stable 18 wells (50%) show declining trends, at rates of 0.02–0.13 m/y (median of 0.04 m/y); three of these wells show their lowest levels on record
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Groundwater salinity

See Figures 5 and 6

2017 salinity	1320–2377 mg/L 4 out of 5 wells (80%) show salinities more than 1500 mg/L, which is the salinity threshold for the irrigation of most crop types
Five-year trend: 2013–17	All 5 wells (100%) are stable
Local observations	Historically, over large areas of the PWA, and particularly in the Plains, localised hotspots of increasing salinity have been observed in areas of intensive groundwater irrigation. This process has also been observed in areas where native vegetation has been cleared and salt, which was previously stored in the shallow root zone, is flushed by rainfall through to the unconfined aquifer. In the highlands, where the depth to the watertable is 40–50 m and the clay content in the soil profile is higher, the mobilised salt has not yet reached the watertable and increases in groundwater salinity have not been detected.

Regional setting



The Tintinara–Coonalpyn PWA is located approximately 175 km south-east of Adelaide, in the (upper) South East Natural Resources Management Region. It is a regional-scale resource for which groundwater 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 Tintinara–Coonalpyn PWA is underlain by an unconfined aquifer and a deeper confined Tertiary sand aquifer. The unconfined aquifer comprises sediments of the Murray Basin: various Quaternary and Tertiary limestones, sands and sandstones.

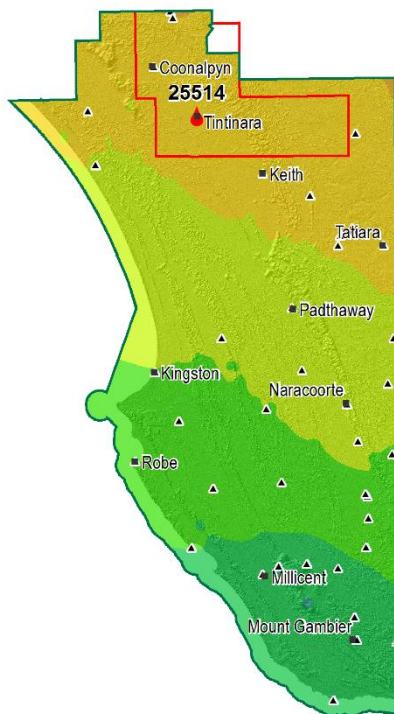
On the plains, the Quaternary-aged Padthaway, Coomandook and Bridgewater Formations form the unconfined aquifer. In the highlands, the Tertiary-aged Murray Group Limestone forms the unconfined aquifer. The main source of recharge to the unconfined aquifer is the direct infiltration of local rainfall and the direction of groundwater flow is generally from east to west.

Trends in groundwater levels and salinities in the Tintinara–Coonalpyn PWA are primarily climate driven: below-average rainfall results in a reduction in recharge to the aquifers. Below-average summer rainfall can also result in increased irrigation extraction, and these two elements may cause groundwater levels to decline and salinities to increase. Conversely, increased rainfall may result in increased recharge, decreased irrigation extraction and a rise in groundwater levels, which may cause salinities to stabilise or decrease.

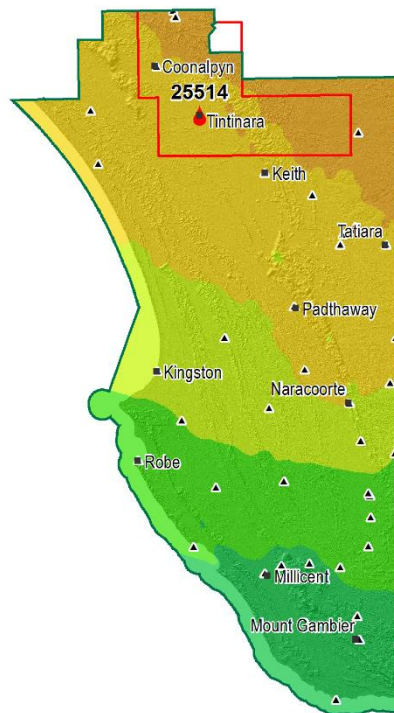
Groundwater levels and salinities on the low-lying plains are more responsive to variations in rainfall and extraction, and to the recycling of irrigation drainage water because the depth of the watertable is shallow. In the highlands, the watertable can be greater than 10 m below ground surface resulting in water levels showing a delayed response to variations in rainfall, with a time lag dependent on the depth to the watertable, permeability of the sediments (which is governed by mainly clay content), land use and the type of irrigated crop.

SOUTH EAST NATURAL RESOURCES MANAGEMENT REGION

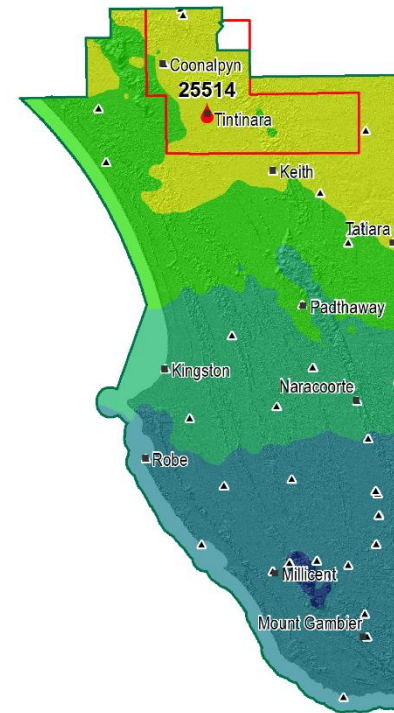
**1. Long-term average annual rainfall
(1900 to 2017)**



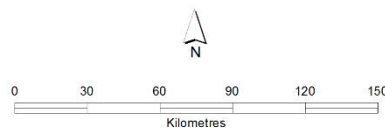
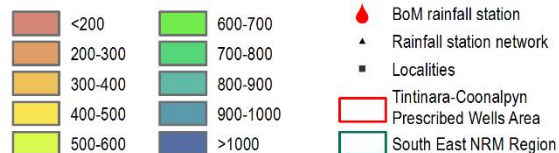
**2. Five-year average annual rainfall
(2012-13 to 2016-17)**



**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](#)

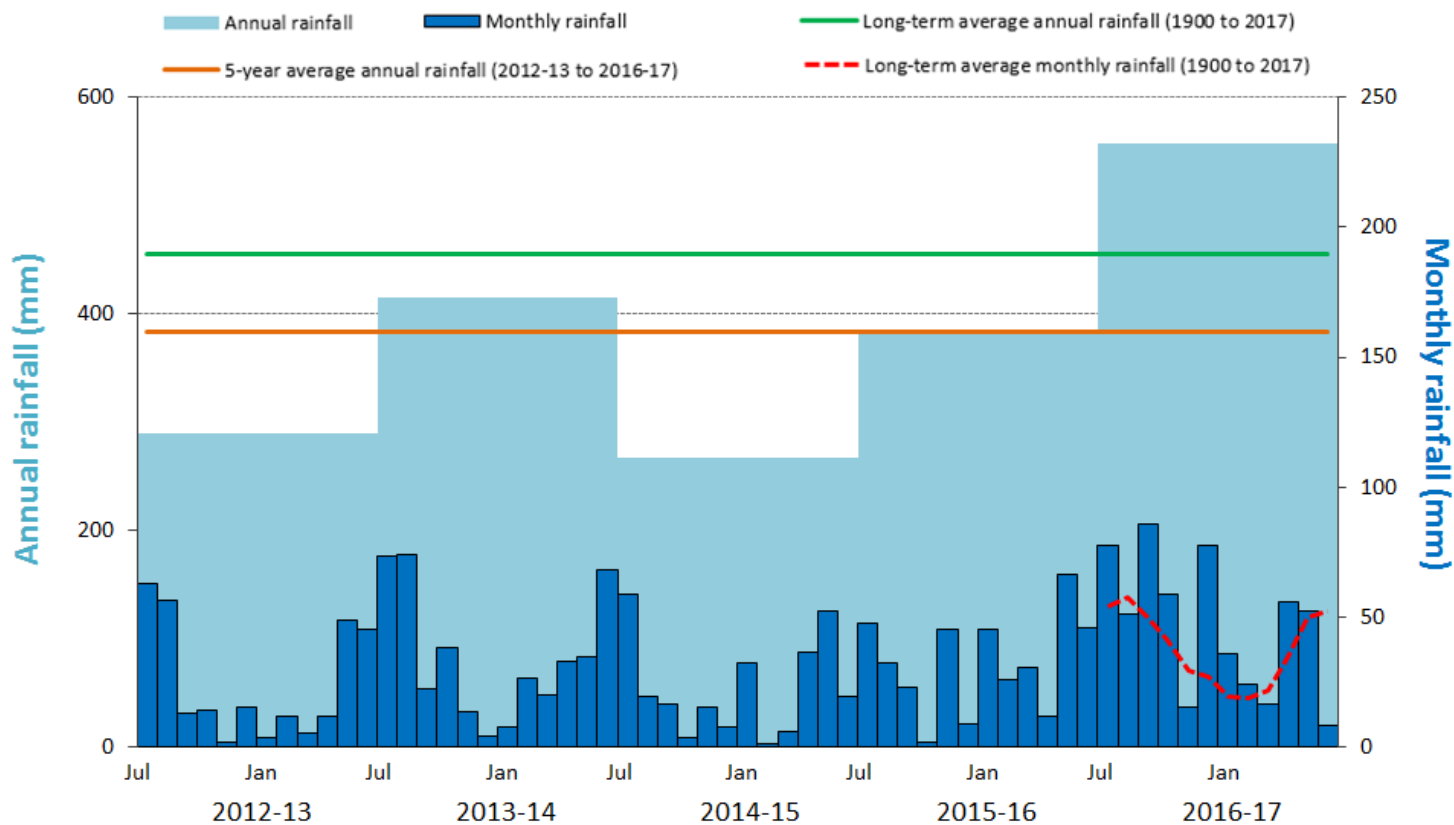


Figure 2. Annual and monthly rainfall for the past five water-use years recorded at Tintinara (BoM Station 25514)⁴

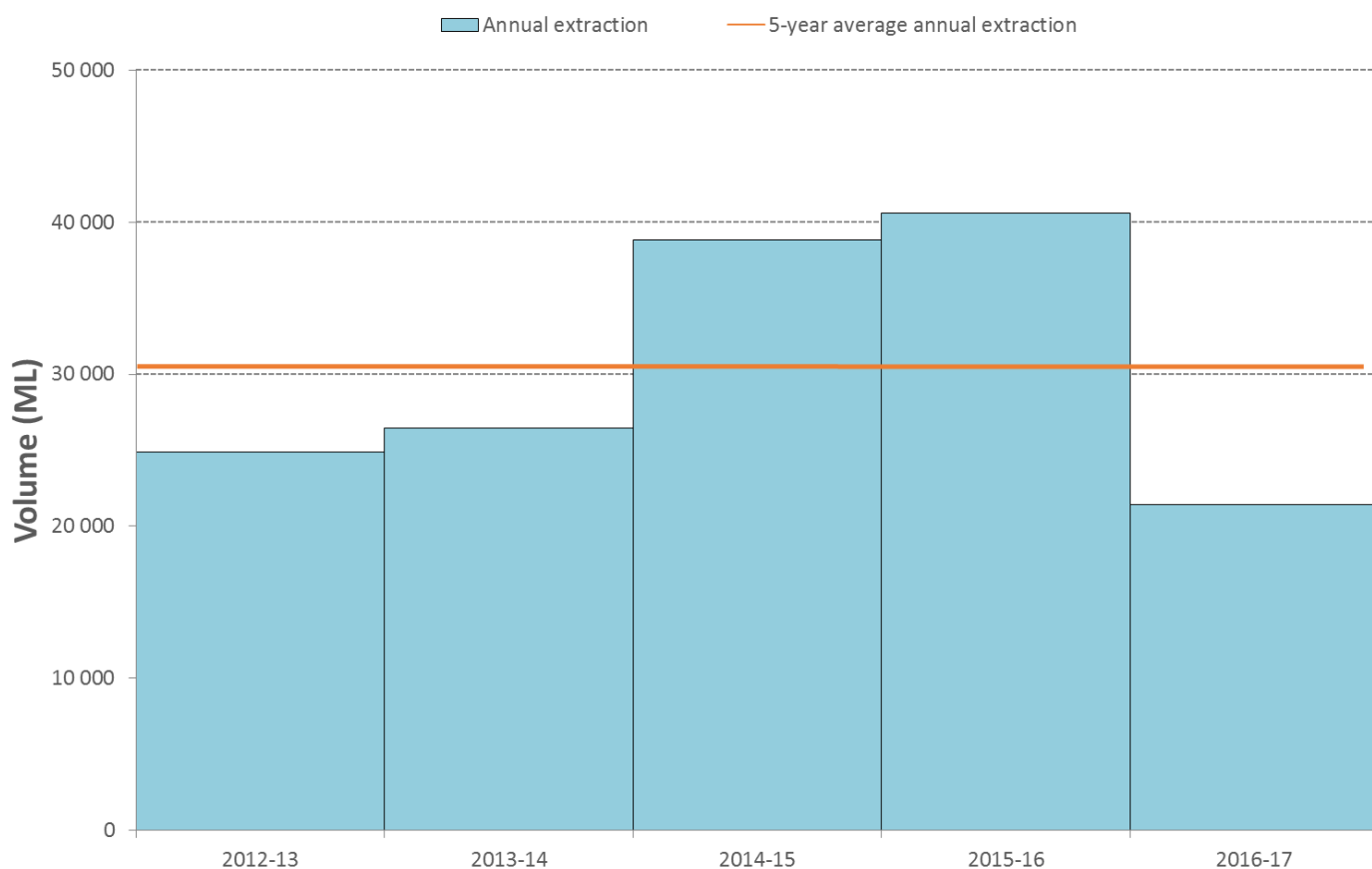


Figure 3. Licensed groundwater extraction volumes⁵ for the past five water-use years

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](#)

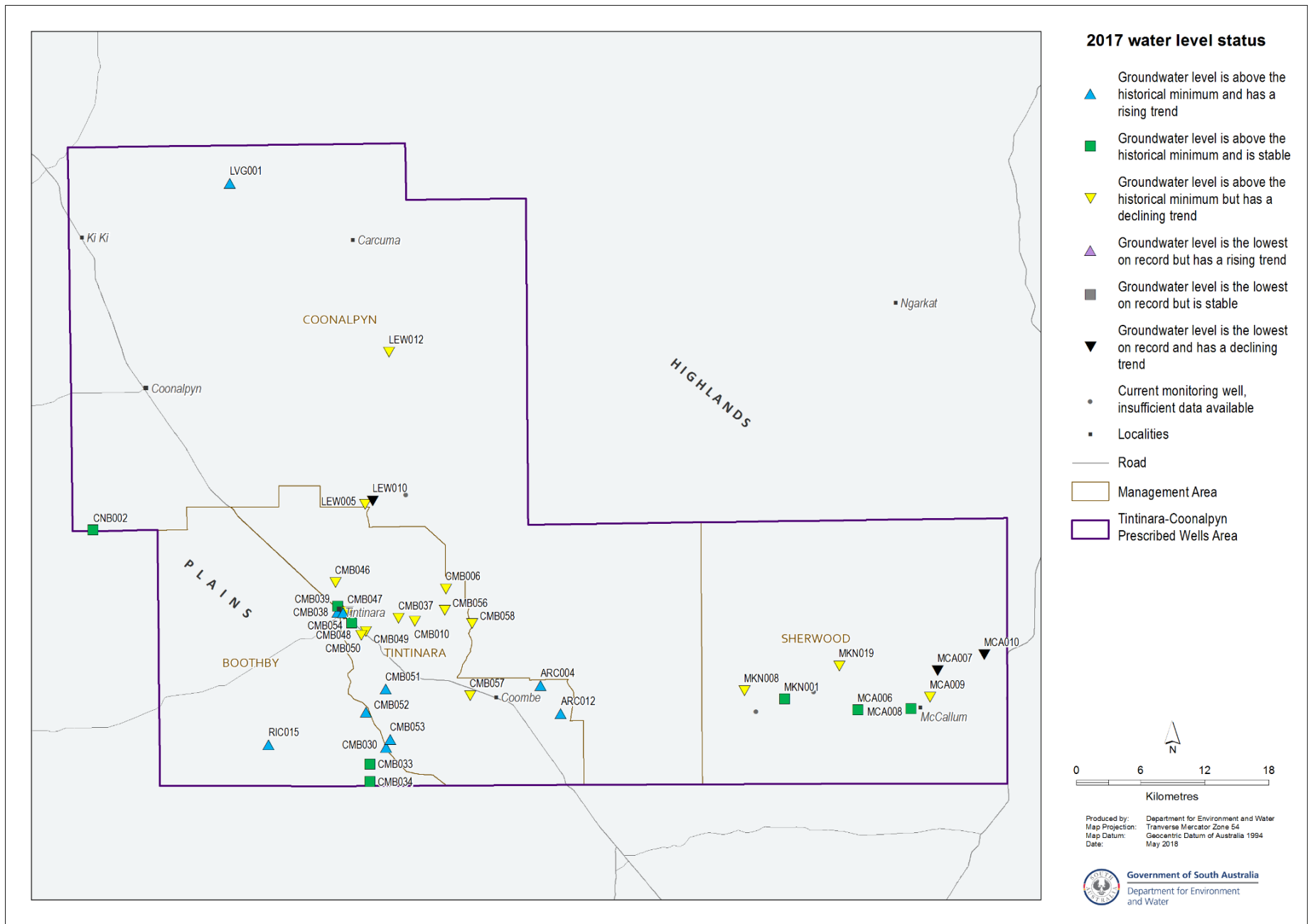
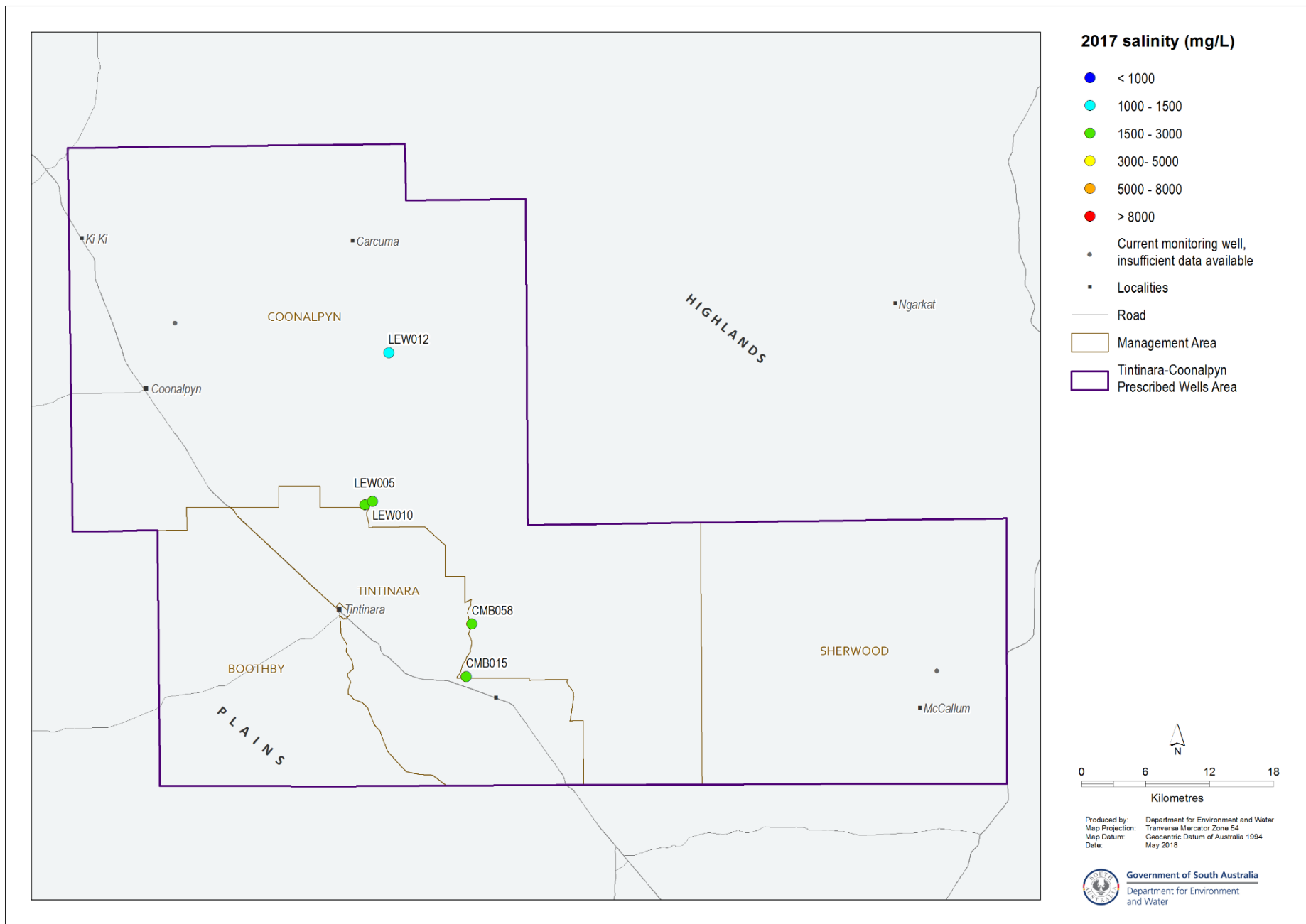


Figure 4. Five-year trends (2013–17) in groundwater levels: unconfined aquifer



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Figure 5. 2017 groundwater salinities: unconfined aquifer

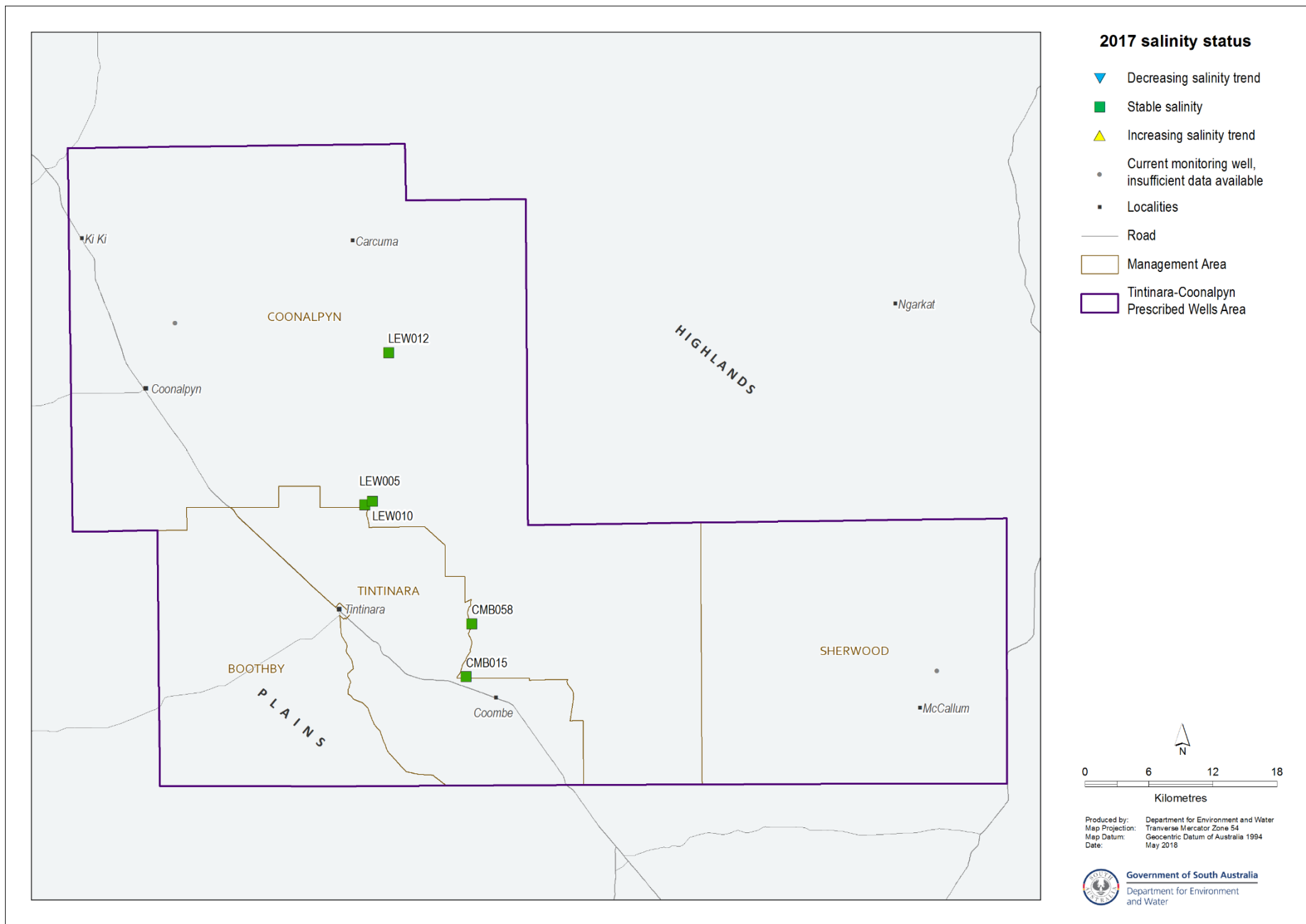


Figure 6. Five-year trends (2013–17) in groundwater salinities: unconfined aquifer

More information

To determine the status of the unconfined aquifer of the Tintinara–Coonalpyn PWA 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/).

The status of the confined groundwater resource is published in a separate report *Prescribed Wells Areas of the South East confined aquifer 2017 Groundwater level and salinity status report*. Please visit the *Water Resource Assessments* page on [WaterConnect](#) to view this report.

To view the *Tintinara–Coonalpyn 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 Tintinara–Coonalpyn PWA, please visit the *Groundwater Data* page under the Data Systems tab on [WaterConnect](#).

For further details on the Tintinara–Coonalpyn PWA, please see the *Tintinara–Coonalpyn Water Allocation Plan* 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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