PRESCRIBED WELLS AREAS OF THE SOUTH EAST

CONFINED AQUIFER

Groundwater Level and Salinity Status Report

2012

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Department of Environment, Water and Natural Resources

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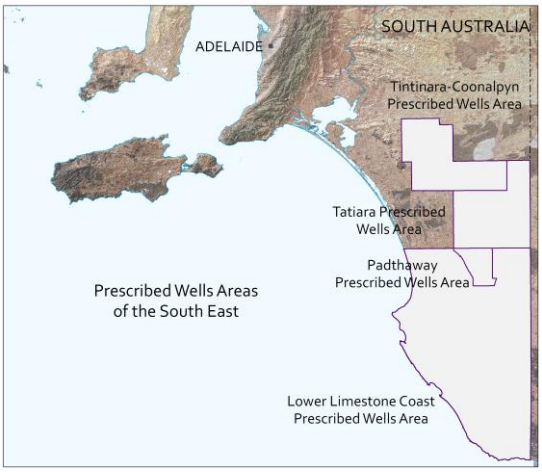
2012 SUMMARY



There are four prescribed wells areas in the South East of South Australia—Tintinara–Coonalpyn, Tatiara, Padthaway and Lower Limestone Coast. Groundwater in these areas is prescribed under South Australia's *Natural Resources Management Act 2004*. Water allocation plans for each PWA provide for the sustainable use of the groundwater resources.

The prescribed wells areas of the South East are underlain by sediments of the Murray and Gambier Basins that form two aquifer systems: an unconfined aquifer comprising various Quaternary and Tertiary limestones and an underlying Tertiary confined sand aquifer. In the Tintinara–Coonalpyn PWA, the confined aquifer consists of Murray Basin sediments; the Buccleuch Formation on the coastal plain and the Renmark Group in the highlands. The confined aquifer primarily consists of the Renmark Group across the Tatiara PWA 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, 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 flows from the topographic high of the Dundas Plateau in Victoria. From there, the groundwater flows radially westward and southward to the coast and northwards to the Murray River. Artesian conditions exist in the west; particularly in the Kingston wellfields and in the south along the coastal areas.

Verified metered groundwater extraction volumes for the 2011–12 water-use year were not available at the time of writing so are not included in this report.

Analysis of climatic trends in the South East has revealed a general drying trend since the early 1950s. This is reflected in most groundwater hydrographs and a strong relationship has been demonstrated between decreases in average annual rainfall and declining water levels measured in observation wells for both the confined and unconfined aquifers over the last 40 years. The Mount Gambier Aero rainfall station (number 26021) is located about 8 km north of Mount Gambier and recorded nearly 650 mm of rain in 2012. This is more than 70 mm below the long-term average annual rainfall for this station. The month of June received rainfall significantly above its long-term monthly average, but July and September through to December recorded well below-average rainfall, as did January and February (Fig. 1). The Keith rainfall station (number 25507) is located in the township of Keith and recorded 377 mm of rain in 2012. This is 90 mm less than the long-term average annual rainfall for this station. The month of May received rainfall significantly above its long-term monthly average, but January, February, April and September through to November recorded significantly below-average rainfall (Fig. 2).

Long-term observations of the confined aquifer indicate that the groundwater elevation is declining at variable rates. Some areas show signs of recovery, particularly the Kingston artesian wellfields. The decline in the groundwater elevation is higher in the areas along the South Australia – Victoria border and the Tintinara–Coonalpyn area.

In 2012, 102 observation wells (84%) recorded a decline in the maximum recovered groundwater elevation of up to 3.1 m when compared to 2011 data (Fig. 3). Nineteen observation wells displayed an increase of up to 2.8 m and one well recorded no overall change in groundwater elevation. The largest declines in groundwater elevations occurred predominantly around Tintinara.

Observation wells indicate no major changes in the groundwater salinity of the confined aquifer have occurred over the long term. In 2012, 75% of monitored wells recorded minor increases in salinity when compared to 2011 salinity data. The salinity

ranged between 550 and 5500 mg/L, with 80% of the 46 monitored wells recording salinity of less than 1500 mg/L (Fig. 4). The majority of wells with salinity greater than 1500 mg/L are found west of Tintinara.

The confined aquifer of the prescribed wells areas of the South East has been assigned a yellow status for 2012:

2012 STATUS "Adverse trends indicating low risk to the resource in the medium term"

This means that that observed adverse trends are gradual and if continued, will not lead to a change in the current beneficial uses of the groundwater resource for at least 15 years. The 2012 status for the confined aquifer of the prescribed wells areas of the South East is supported by:

- an overall decline in the maximum recovered groundwater elevation in 2012 when compared to 2011 data
- an overall increase in groundwater salinity in 2012 when compared to 2011 salinity data.

To view the 2011 groundwater level and salinity status reports for the Tintinara–Coonalpyn, Tatiara, Lower Limestone Coast and Padthaway Prescribed Wells Areas, which include background information on hydrogeology, rainfall and relevant groundwater-dependent ecosystems, visit WaterConnect.

To view descriptions of all status symbols, click here.

For further details about the prescribed wells areas of the South East, please see the water allocation plans.

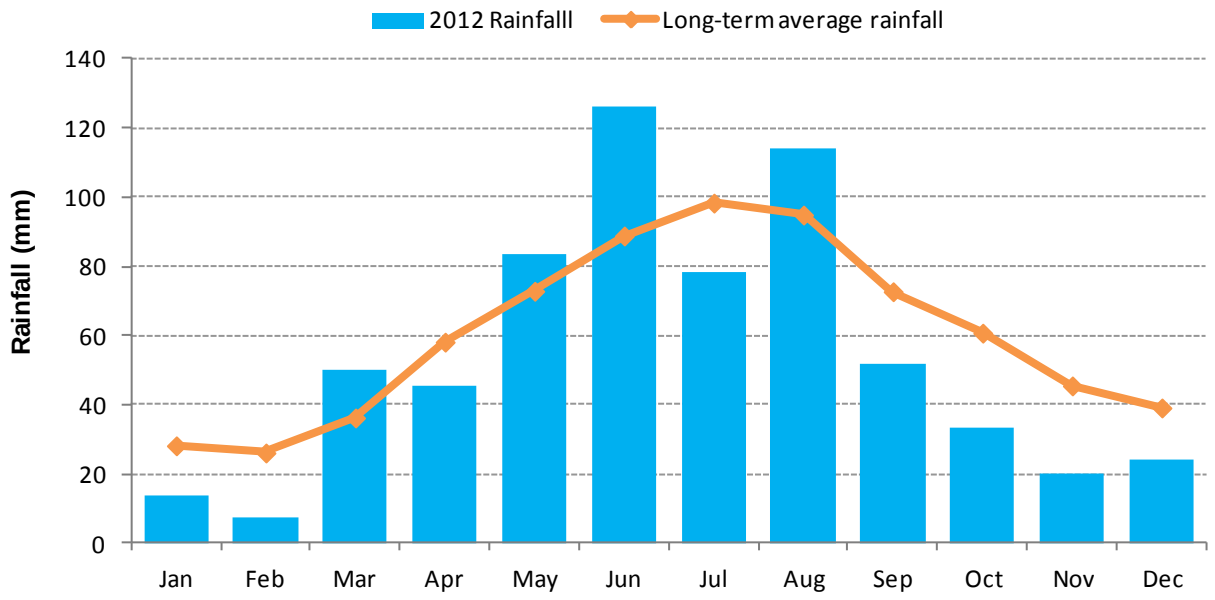


Figure 1. Monthly rainfall (mm) for 2012 and the long-term average monthly rainfall (mm) at the Mt Gambier Aero rainfall station (number 26021) in the prescribed wells areas of the South East

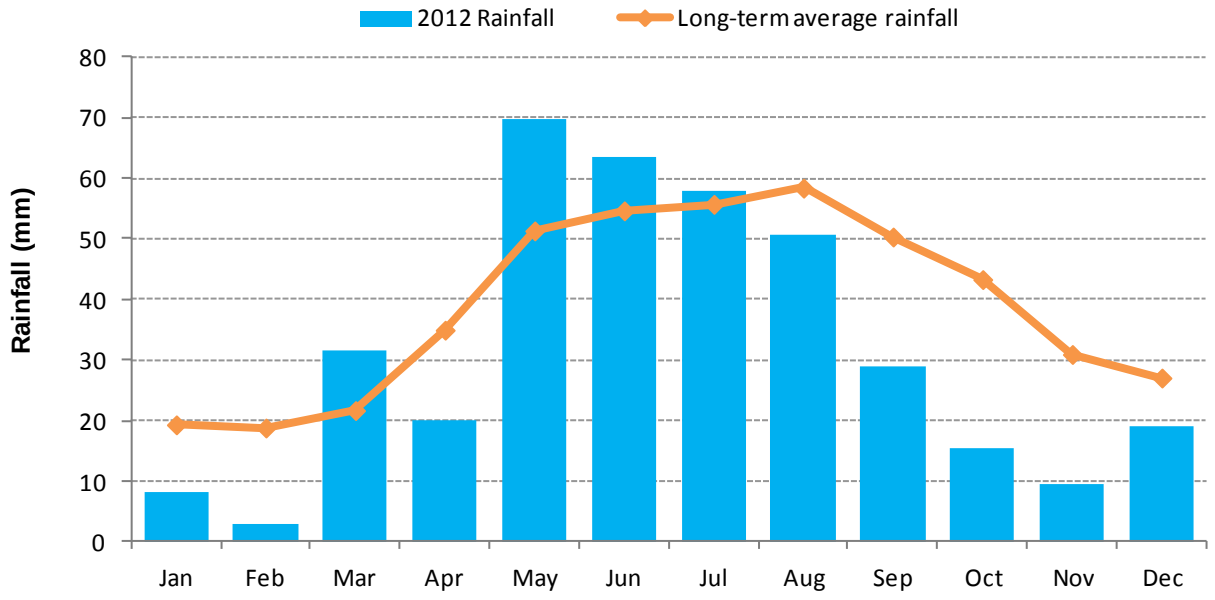


Figure 2. Monthly rainfall (mm) for 2012 and the long-term average monthly rainfall (mm) at the Keith rainfall station (number 25507) in the prescribed wells areas of the South East

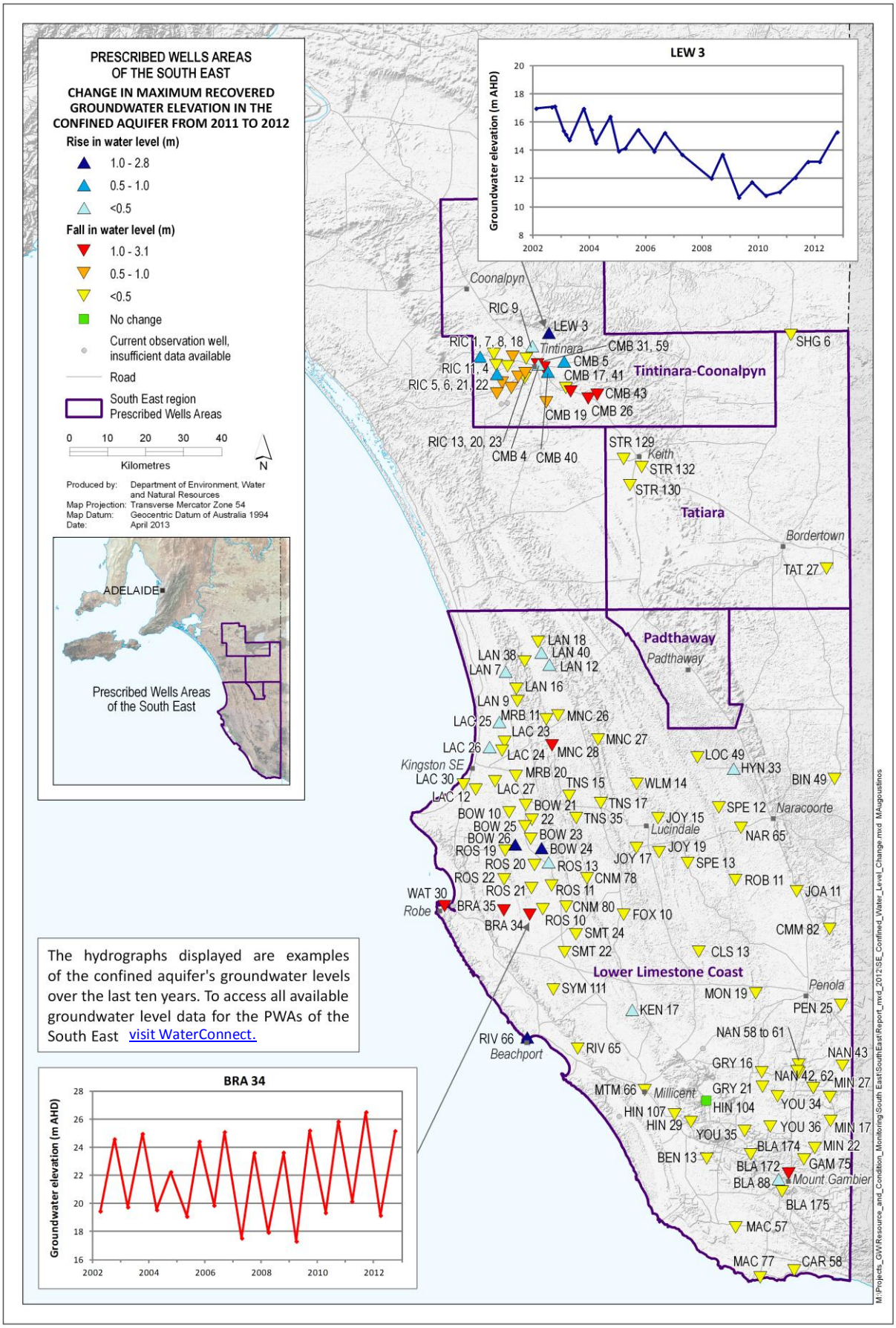


Figure 3. Overall changes in maximum groundwater levels in the confined aquifer of the prescribed wells areas of the South East from 2011 to 2012

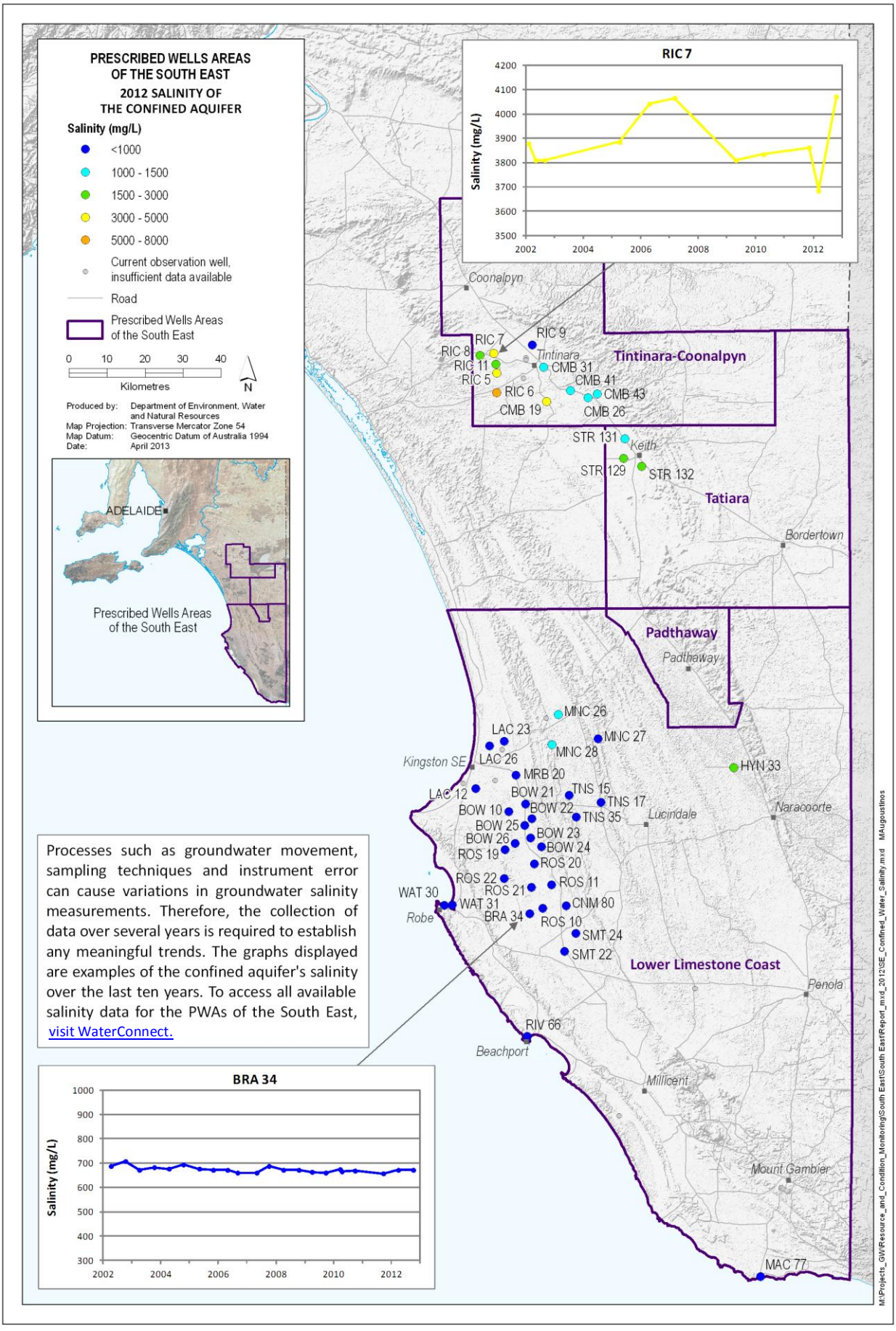


Figure 4. Groundwater salinity of the confined aquifer of the prescribed wells areas of the South East for 2012