
PEAKE, ROBY AND SHERLOCK PWA

CONFINED AQUIFER

Groundwater Level and Salinity Status Report

2012



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Water and Natural Resources

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2012 SUMMARY



The Peake, Roby and Sherlock Prescribed Wells Area (PWA) is located about 120 km southeast of Adelaide and is underlain by sedimentary aquifers of the Murray Basin. It is a local-scale groundwater resource with a small number of irrigators. Groundwater is prescribed under South Australia's *Natural Resources Management Act 2004* and a Water Allocation Plan provides for the sustainable management of the groundwater resources.

The Peake, Roby and Sherlock PWA has two distinct aquifers – an unconfined aquifer and a confined aquifer. Almost all licensed groundwater extractions in the PWA are from the confined aquifer, as such it is the focus of this report.

The confined aquifer comprises the Buccleuch Group and Renmark Group formations. The Buccleuch Group consists of a consolidated bryozoal limestone or "coral" that lies at a depth of 90–100 m below the ground and varies in thickness from 5–25 m. This coral layer begins to merge laterally with the Renmark Group formation in the eastern area of the Peake, Roby and Sherlock PWA. The Renmark Group is made up of interbedded sands and clays and there are very few bores which extract from this aquifer in the PWA. As the Buccleuch and Renmark Group aquifers are confined, they are not recharged by local rainfall. The primary recharge source is the lateral inflow of groundwater into the Peake, Roby and Sherlock PWA from south-western Victoria.

Metered groundwater extractions from the confined aquifer (primarily from the Buccleuch Group) of the Peake, Roby and Sherlock PWA totalled 1242 ML in the 2011–12 water-use year, which represents a small 2% increase from the previous water-use year (Fig. 1). The volume of extraction from the confined aquifer during 2011–12 equates to 57% of the total allocation limit of 2168 ML for the Peake, Roby and Sherlock PWA.

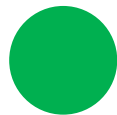
The climate of the Peake, Roby and Sherlock PWA is characterised by hot, dry summers and cool to cold, wet winters. Data from the Peake rainfall station (number 25513) was chosen for the analysis of rainfall in 2012 (Fig. 2). The long-term monthly average rainfall is graphed in orange against the total monthly rainfall recorded. The monthly rainfall data indicates that in 2012, there was below average rainfall for six out of the 12 months, with a period of below average rainfall from August to November.

Considerable seasonal variations in pressure levels of the confined aquifer have been observed since large-scale irrigation practices commenced in 2004. The degree of drawdown decreases with distance from the areas of irrigation. The level of drawdown increased from 2004 to 2010 and appeared to stabilise in 2011. A comparison of the maximum recovered groundwater elevations in 2011 to 2012 indicates that almost all observation wells (12 out of 15) experienced a rise in groundwater elevation ranging from <0.25–0.7 m. The decline recorded for three of the wells ranged from 0.3–1.7 m (Fig. 3). Groundwater elevation wells PEK 2, 5, 6, 7, 11 and 15 are located at the centre of the cone of depression observed in the confined aquifer in 2011. In comparison to 2011 groundwater elevations, all but one of these wells indicated a rise in the maximum recovered groundwater level.

Rising salinity in the western portion of the confined aquifer is identified as the greatest risk resulting from irrigation extraction. The latest salinity concentrations monitored in 2012 indicate that groundwater salinity is increasing overall compared to the latest salinity readings of 2011 (Fig. 4) and significant increases >100 mg/L were observed in 2 out of the 10 monitoring wells. However, there are considerable natural variations in salinity and insufficient time has passed for the establishment of long-term salinity trends.

The Peake, Roby and Sherlock PWA confined aquifer has been assigned a green status for 2012:

2012 STATUS



“No adverse trends, indicating negligible risk to the resource”

This means that groundwater status was observed to be stable (i.e. no significant change) or improving over the reporting period. Continuation of these trends favours a very low likelihood of negative impacts on beneficial use (i.e. drinking water, irrigation or stock watering) of the resource. The 2012 status for the confined aquifer is supported by:

- 80% of monitoring wells observed a rise in the maximum water level attained in 2012 when compared to data for 2011, with almost all of the observation wells at the centre of the cone of depression displaying such a rise.
- While nine of the ten salinity monitoring well, displayed an increase in salinity (from 24–215 mg/L), with two displaying significant increases (>100 mg/L) when compared to the 2011 data, these salinity increases are not expected to affect the current beneficial use of the resource for the next 10 to 20 years

To view the *Peake, Roby and Sherlock PWA Groundwater Level and Salinity Status Report 2011*, which includes background information on hydrogeology, location of rainfall stations and relevant groundwater dependent ecosystems, [visit WaterConnect](#).

To view descriptions of all status symbols, [click here](#).

For further details about the confined aquifer of the Peake, Roby and Sherlock PWA please see the [Water Allocation Plan for the Peake, Roby and Sherlock PWA](#).

Peake, Roby and Sherlock PWA Confined Aquifer Annual groundwater extraction

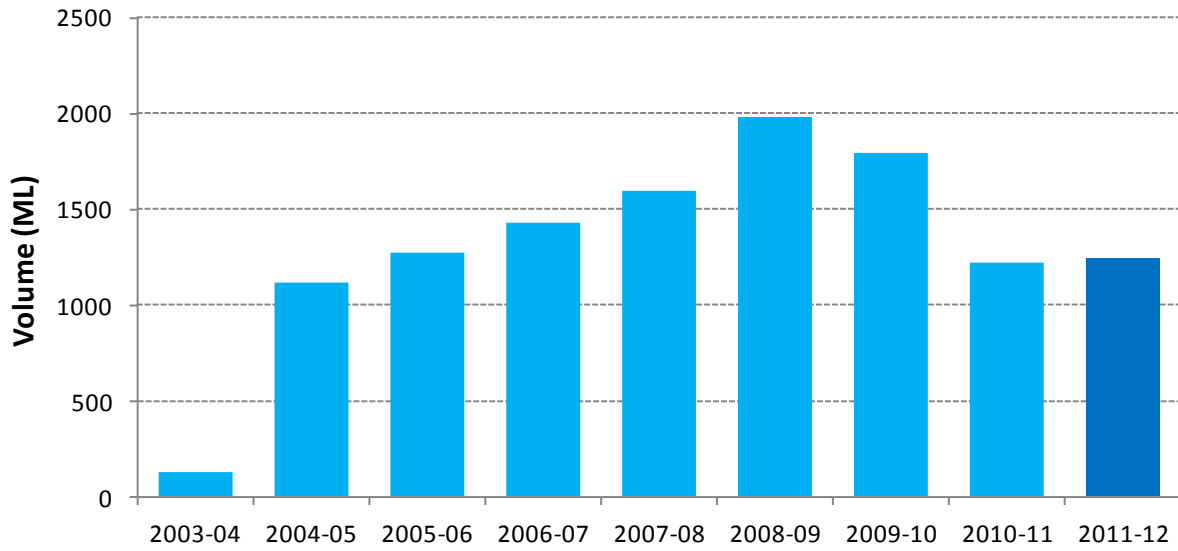


Figure 1. Historical licensed groundwater use for the confined aquifer of the Peake, Roby and Sherlock PWA

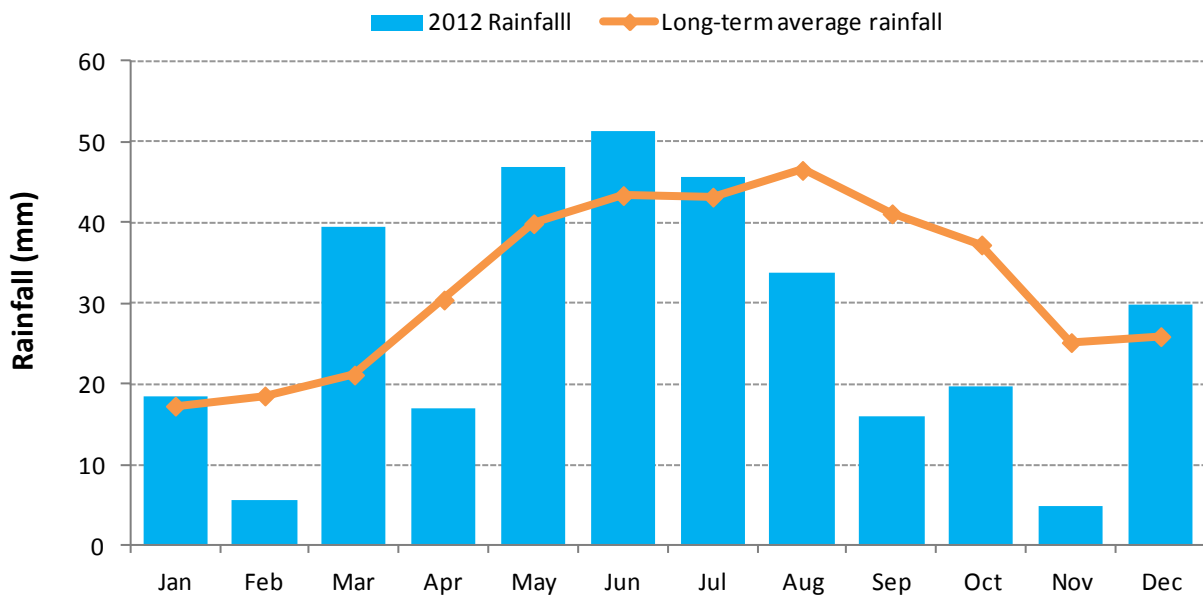


Figure 2. Monthly rainfall (mm) for 2012 and the long-term average monthly rainfall (mm) at the Peake rainfall station (number 25513) in the Peake, Roby and Sherlock PWRA

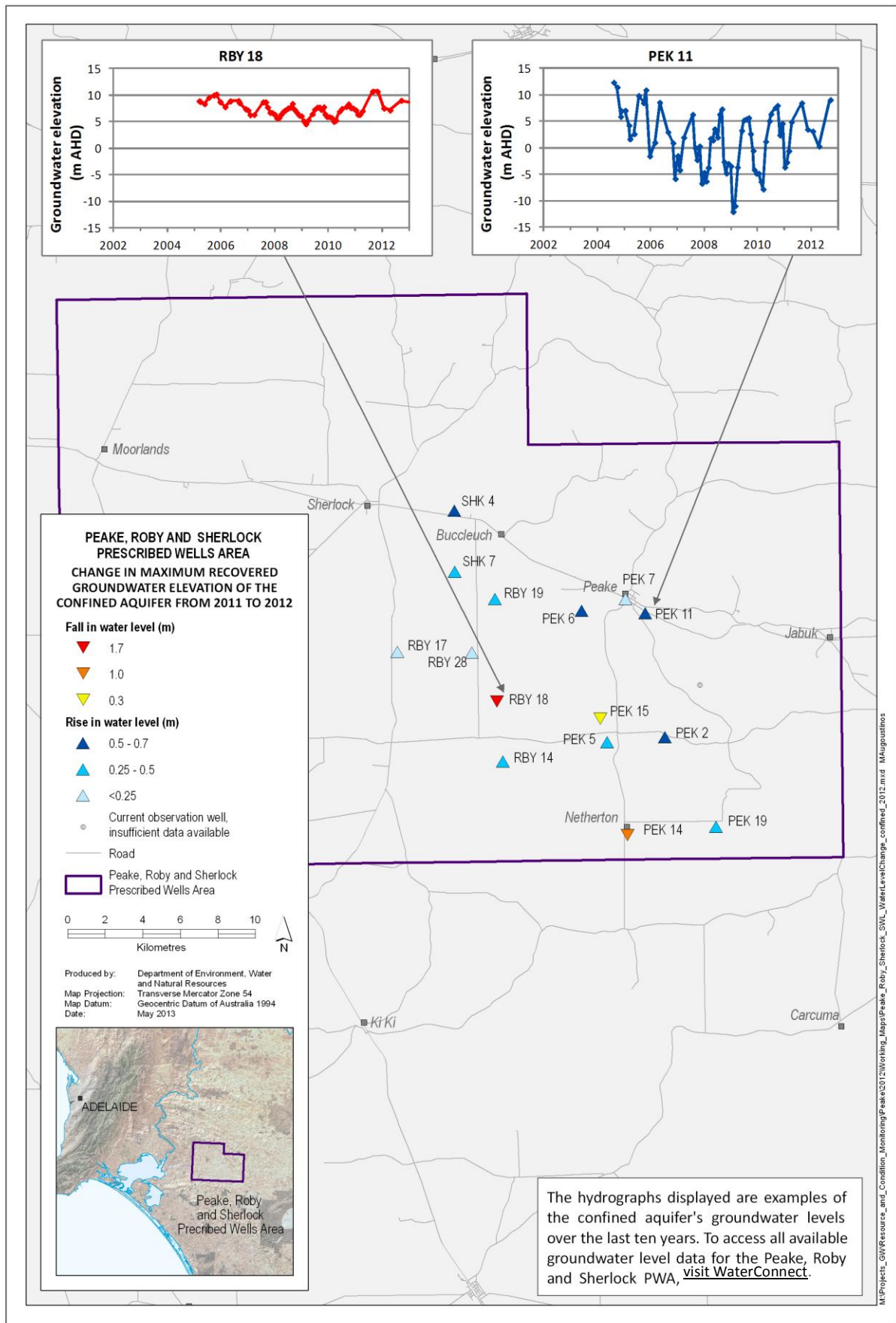


Figure 3. Overall changes in groundwater levels in the confined aquifer of the Peake, Roby and Sherlock PWA from 2011 to 2012

Peake, Roby and Sherlock PWA

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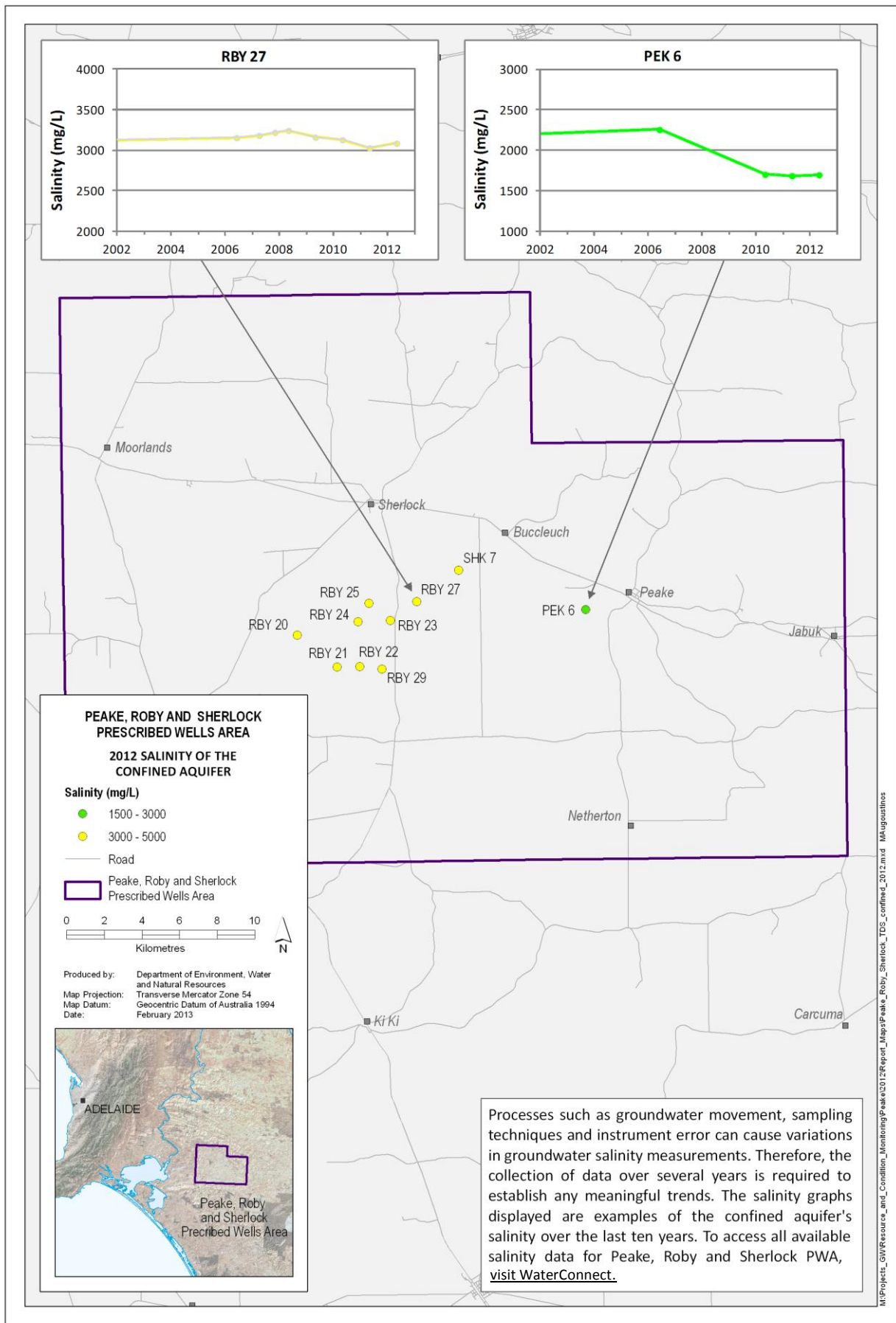


Figure 4. Groundwater salinity of the confined aquifer of the Peake, Roby and Sherlock PWA for 2012

Peake, Roby and Sherlock PWA

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