
EASTERN MOUNT LOFTY RANGES PWRA PERMIAN SAND AQUIFER

Groundwater Level and Salinity Status Report

2013



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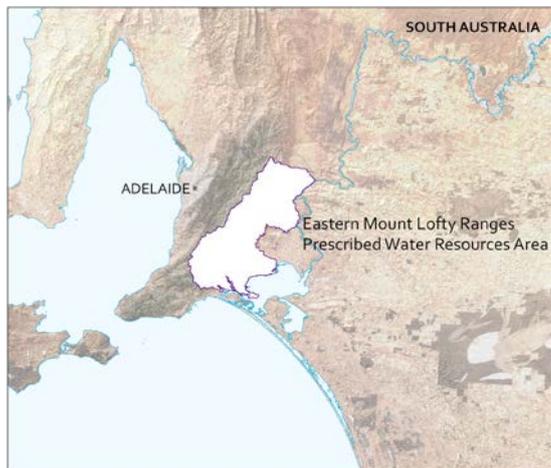
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2013 SUMMARY



The Eastern Mount Lofty Ranges Prescribed Water Resources Area (EMLR PWRA) is located about 50 km east of Adelaide and covers an area of approximately 2845 km². It incorporates the Murray Plains and eastern slopes of the Mount Lofty Ranges and lies within the Murray-Darling Basin. It is a regional-scale prescribed resource for which groundwater is protected and managed under South Australia's *Natural Resources Management Act 2004*. A water allocation plan provides for the sustainable use of the water resources. The Angus Bremer Prescribed Wells Area (PWA) is located within the boundaries of the EMLR PWRA and a separate groundwater level and salinity status report has been prepared for this PWA and can be found on the [WaterConnect](#) website.

There are two different types of aquifers in the EMLR PWRA. The fractured rock aquifers occur where groundwater is stored and moves through joints and fractures in the basement rocks. Sedimentary aquifers occur in the valleys where groundwater flows through the pore spaces within the sediments. Recharge to both of these aquifer types occurs directly from the portion of rainfall that percolates down to the water table through the soil profile or, in the case of the sedimentary aquifers, indirectly by throughflow from adjacent aquifers.

There are four fractured rock aquifers and three sedimentary aquifers in the EMLR PWRA. The Barossa Complex, Adelaidean sediments and the Kanmantoo and Normanville Groups form the fractured rock aquifers. The Permian sand, Murray Group limestone and Quaternary alluvium form the sedimentary aquifers.

The Permian Sand aquifer, also known as the Cape Jervis formation, can be found in several U-shaped valleys carved into the Kanmantoo Group. It comprises glacial deposits of unconsolidated sands, silts and clays with occasional gravel beds. The Permian Sand aquifer forms part of the eastern slopes of the Mount Lofty Ranges and underlies the Tertiary Murray Group limestone and Quaternary sediments on the Murray Plains. The aquifer can be highly permeable resulting in high yields and low salinities. However, in some areas where there is high clay content the aquifer is low yielding and high in salinity. Despite this variability, the Permian Sand aquifer is widely developed for localised irrigation and town water supply.

Extensive metered groundwater extraction data is not yet available, however it is estimated that approximately 32,100 ML is required each year from the aquifers of the EMLR PWRA (excluding the Angus Bremer Prescribed Wells Area). This estimation is based on land and water use surveys of agricultural properties and the theoretical irrigation requirements for various crops. It should be noted that this is an estimation and that actual current groundwater extraction may be different. The estimated demand is below the calculated sustainable yield of 38,757 ML/y for the EMLR PWRA, excluding the Angus Bremer PWA. However, at a local scale the estimated demand may exceed the sustainable yield in some areas, such as from the Permian Sand aquifer within the Tookayerta Creek catchment.

In 2013, the Ashbourne rainfall station (number 23701) recorded 671 mm, which is more than 20 mm above the long-term average. Almost double the long-term average rainfall was recorded in June, with July and August also receiving above the long-term average monthly rainfall (Fig. 1). In comparison to rainfall data collected in 2012, Ashbourne recorded 25 mm less than the previous year.

In the Tookayerta Permian Management Zone, there was sufficient data from 21 observation wells to assess the annual trend in maximum recovered groundwater levels from 2012 to 2013. Twenty of these wells recorded increases of up to 1.96 m (Fig. 2). The

median change from 2012 to 2013 was an increase of 0.24 m. The overall increase is attributable to the continued above average rainfall conditions.

In the Finniss Permian 1 Management Zone, the change in maximum recovered groundwater levels from 2012 to 2013 was determined for 18 wells. Nine observation wells recorded an increase in maximum recovered groundwater levels, which was generally under 0.3 m, though one well registered an increase of 1.6 m. Decreases were observed in nine wells, generally less than 0.35 m, with one well recording a fall in levels of 1.1 m. Declining groundwater levels were mostly concentrated in the Ashbourne area (Fig. 2). The median change in groundwater levels from 2012 to 2013 for wells in this management zone was a decrease of 0.03 m. While groundwater levels in the south of the management zone increased as would be expected from the continued wetter than average conditions, the declines in the Ashbourne area may relate to increased groundwater extraction.

Groundwater salinity of the Permian Sand aquifer is not monitored, but is typically less than 1000 mg/L.

Tookayerta Permian Management Zone

The Permian Sand aquifer in the Tookayerta Permian Management Zone of the Eastern Mount Lofty Ranges PWRA has been assigned a green status for 2013:

2013 STATUS



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

This means that the 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 uses such as drinking water, irrigation or stock watering. The 2013 status for the Permian Sand aquifer in this Water Management Zone of the Eastern Mount Lofty Ranges PWRA is supported by:

- an overall rise in the maximum recovered groundwater level when compared to 2012 water level data.

Finniss Permian 1 Management Zone

The Permian Sand aquifer in the Finniss Permian 1 Management Zone of the Eastern Mount Lofty Ranges PWRA has been assigned a yellow status for 2013:

2013 STATUS



“Gradual adverse trends, indicating low risk to the resource in the medium term”

This means that gradual adverse trends in the resource status have been observed over the reporting period. Continuation of these trends is unlikely to negatively impact the beneficial use of the resource for at least 15 years. The 2013 status for the Permian Sand aquifer in this Water Management Zone of the Eastern Mount Lofty Ranges PWRA is supported by:

- a localised declining trend in maximum recovered groundwater levels in the Ashbourne area even though there was not a significant overall decline across the management zone when compared to 2012 water level data.

To view the *Eastern Mount Lofty Ranges PWRA groundwater level and salinity status report 2011*, which includes background information on hydrogeology, rainfall and relevant groundwater-dependent ecosystems, and the descriptions of all status symbols, please visit the *Water Resources* page on [WaterConnect](#).

For further details about the Eastern Mount Lofty Ranges PWRA, please see the *Eastern Mount Lofty Ranges Water Allocation Plan* on the SA Murray-Darling Basin Natural Resources Management [website](#).

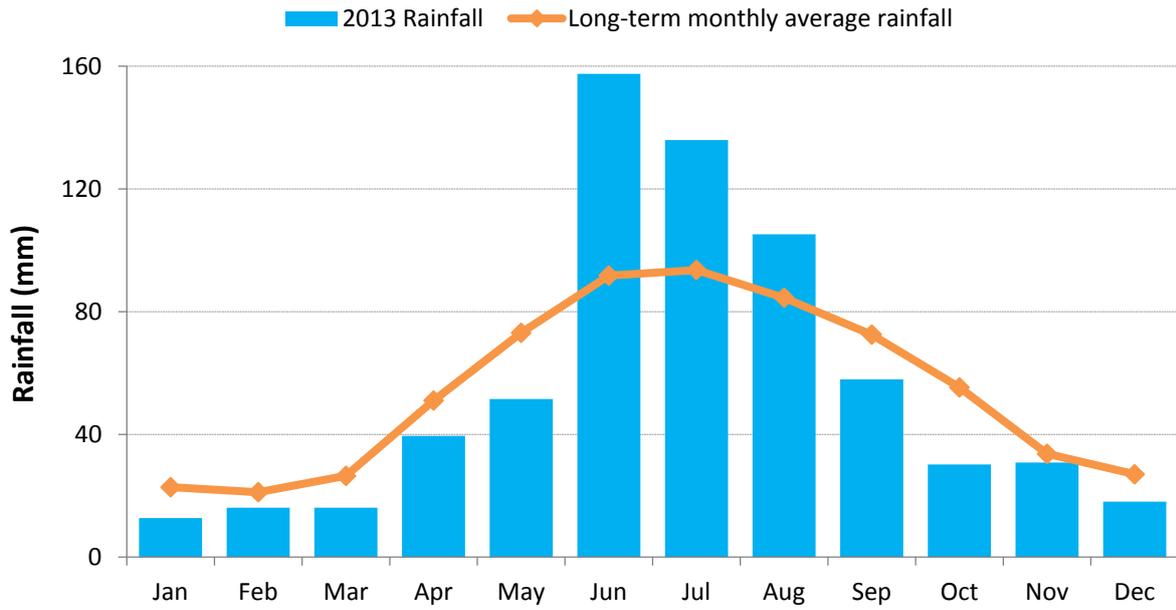


Figure 1. Monthly rainfall (mm) for 2013 and the long-term average monthly rainfall (mm) at the Ashbourne rainfall station (number 23701) in the Eastern Mount Lofty Ranges Prescribed Water Resources Area

Rainfall data used in this report is sourced from the SILO Patched Point Dataset, which uses original Bureau of Meteorology daily rainfall measurements and is available online at www.longpaddock.qld.gov.au/silo

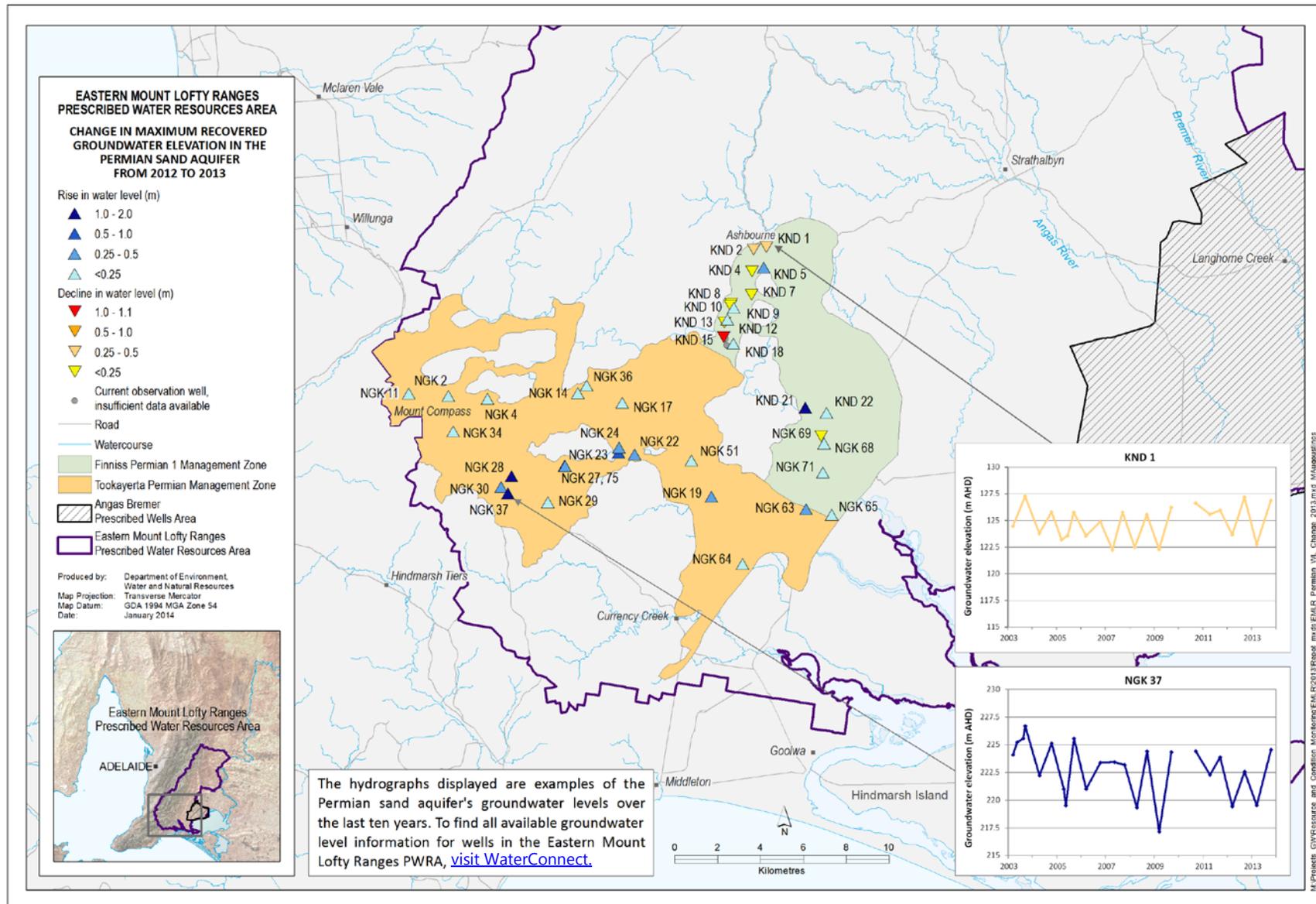


Figure 2. Overall changes in maximum groundwater levels in the Permian Sand aquifer of the Eastern Mount Lofty Ranges Prescribed Water Resources Area from 2012 to 2013

Eastern Mount Lofty Ranges PWRA

Permian Sand Aquifer Groundwater Status Report 2013

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