
EASTERN MOUNT LOFTY RANGES PWRA MURRAY GROUP LIMESTONE AQUIFER

Groundwater Level and Salinity Status Report
2012



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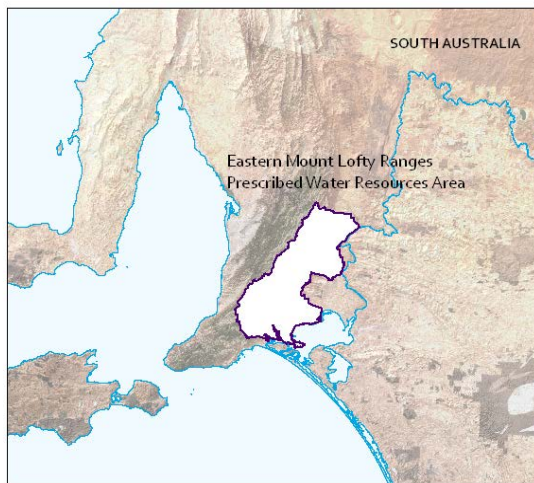
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2012 SUMMARY



The Eastern Mount Lofty Ranges (EMLR) Prescribed Water Resources Area (PWRA) is located 50 km east of Adelaide and covers an area of approximately 2845 km² incorporating the eastern slopes of the Mount Lofty Ranges and the Murray Plains. The EMLR PWRA forms part of the Murray–Darling Basin. It is a regional-scale resource for which groundwater, surface water and watercourse water are prescribed under South Australia's *Natural Resources Management Act 2004*. A water allocation plan for the EMLR PWRA is being finalised, with the draft provided to the public for consideration in 2011. As such, the groundwater resources of the EMLR PWRA are currently managed mainly through Notices of Prohibition that limit water to current use levels while the water allocation plan and existing user licensing processes are finalised. 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 the PWA and can be found on the [WaterConnect](#) website.

The EMLR PWRA is underlain by fractured rock and sedimentary aquifers of varying water quality and yields. Recharge occurs directly from the rainfall that percolates down to the watertable.

There are three types of sedimentary aquifers in the EMLR PWRA, namely the Permian Sand, Murray Group Limestone (MGL) and Quaternary aquifers. This report focuses on the MGL aquifer, in particular the MGL aquifer within the Currency Limestone underground water management zone (UWMZ), which has been defined through the water allocation planning process. The MGL aquifer predominantly consists of shallow marine fossiliferous limestone that was deposited approximately 50 million years ago. It is up to 100 m thick and overlies the Kanmantoo Group fractured rock aquifer and the Permian Sand aquifer in some areas. It is confined by the overlying Quaternary clay sediments to the southwest of Murray Bridge, including the area delineated by the Currency Limestone UWMZ. However, the MGL aquifer is unconfined in the northern area of the EMLR PWRA.

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 within the EMLR PWRA the estimated demand may exceed the calculated sustainable groundwater extraction limit, such as from the MGL aquifer within the Currency Limestone UWMZ.

The climate of the EMLR PWRA is characterised as Mediterranean with hot, dry summers and cool to cold, wet winters. The amount and timing of rainfall is a factor for consideration when assessing the status of a groundwater resource. For example, if the Currency Limestone UWMZ experienced below average rainfall during the irrigation season, this could result in more groundwater being extracted from the confined MGL aquifer within this zone. Data from the Finnis rainfall station (number 23714) was chosen for the analysis of rainfall in 2012 (Fig. 1). The long-term monthly average rainfall is graphed in orange against the total monthly rainfall recorded. The average annual rainfall recorded for this station is 498 mm. In 2012 the annual rainfall was above average at 661 mm, and this follows the slightly above average rainfall of 509 mm that was recorded in 2011. The monthly

rainfall data for 2012 indicates that while significantly above average rainfall was observed for May and June, there was below average rainfall for six out of the 12 months, with a period of below average rainfall from September to December.

Groundwater levels in the confined MGL aquifer are monitored in a network of observation wells including 15 located within the Currency Limestone management zone. Declining groundwater levels were observed in the period from 2004 to 2009 which may have been the result of increased extraction activities during years of below-average rainfall. Since 2009 the groundwater levels have gradually recovered possibly in response to reduced extraction in periods of higher rainfall. A comparison of the maximum recovered water levels determined for 2011 and 2012 was possible for 13 of the observation wells within the management zone (Fig. 2). The results indicate that 10 wells (80%) recorded a rise in water level of up to 0.31 m, whilst three wells had a reduction in groundwater levels of up to 0.25 m.

Across the EMLR PWRA the groundwater salinity of the MGL aquifer ranges from less than 1000 mg/L to more than 8000 mg/L, and is currently monitored by 12 observation wells. In the centre of Currency Limestone UWMZ, there is an area within the MGL aquifer where groundwater salinity is typically less than 1500 mg/L. Ten wells were sampled for salinity during 2012, with most of them recording salinity values less than 1000 mg/L (Fig. 3). The area of lower salinity groundwater within the MGL does not appear to be changing significantly compared with previous years. There was sufficient data for four wells to assess the change in salinity from 2011 to 2012. Two wells in the fresher area within the Currency Limestone management zone recorded minor decreases in salinity, while two wells located in more saline parts of the MGL aquifer recorded minor increases.

The Murray Group Limestone aquifer in the Eastern Mount Lofty Ranges Prescribed Water Resources Area has been assigned a green status for 2012:

2012 STATUS



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

This means 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 (drinking water, irrigation or stock watering). The 2012 status for the Murray Group Limestone aquifer is supported by:

- an overall increase in maximum recovered water levels in 2012 when compared to 2011.

To view the *Eastern Mount Lofty Ranges PWRA 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 Eastern Mount Lofty Ranges PWRA please see the [Water Allocation Plan for the Eastern Mount Lofty Ranges Prescribed Water Resources Area](#).

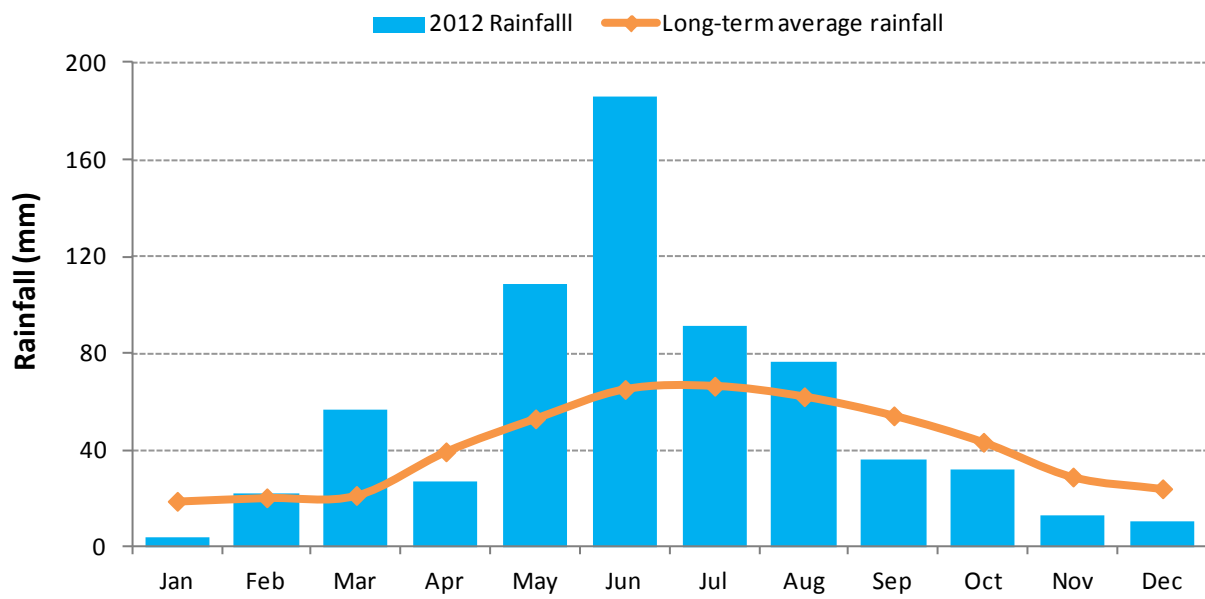


Figure 1. Monthly rainfall (mm) for 2012 and the long-term average monthly rainfall (mm) at the Finniss rainfall station (23714) in the Eastern Mount Lofty Ranges Prescribed Water Resources Area

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.

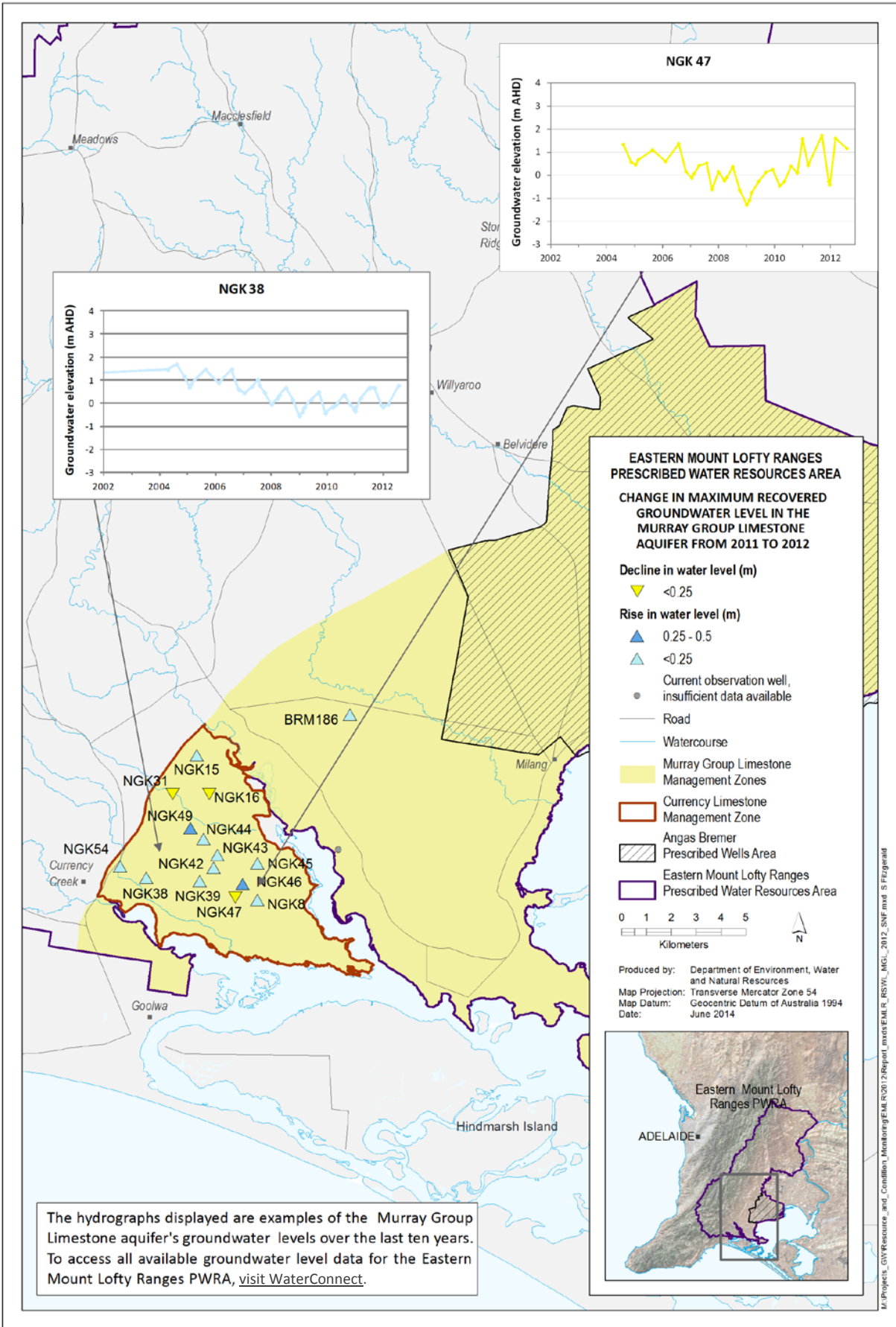


Figure 2. Overall changes in maximum groundwater levels in Murray Group Limestone aquifer of the Eastern Mount Lofty Ranges Prescribed Water Resources Area from 2011 to 2012

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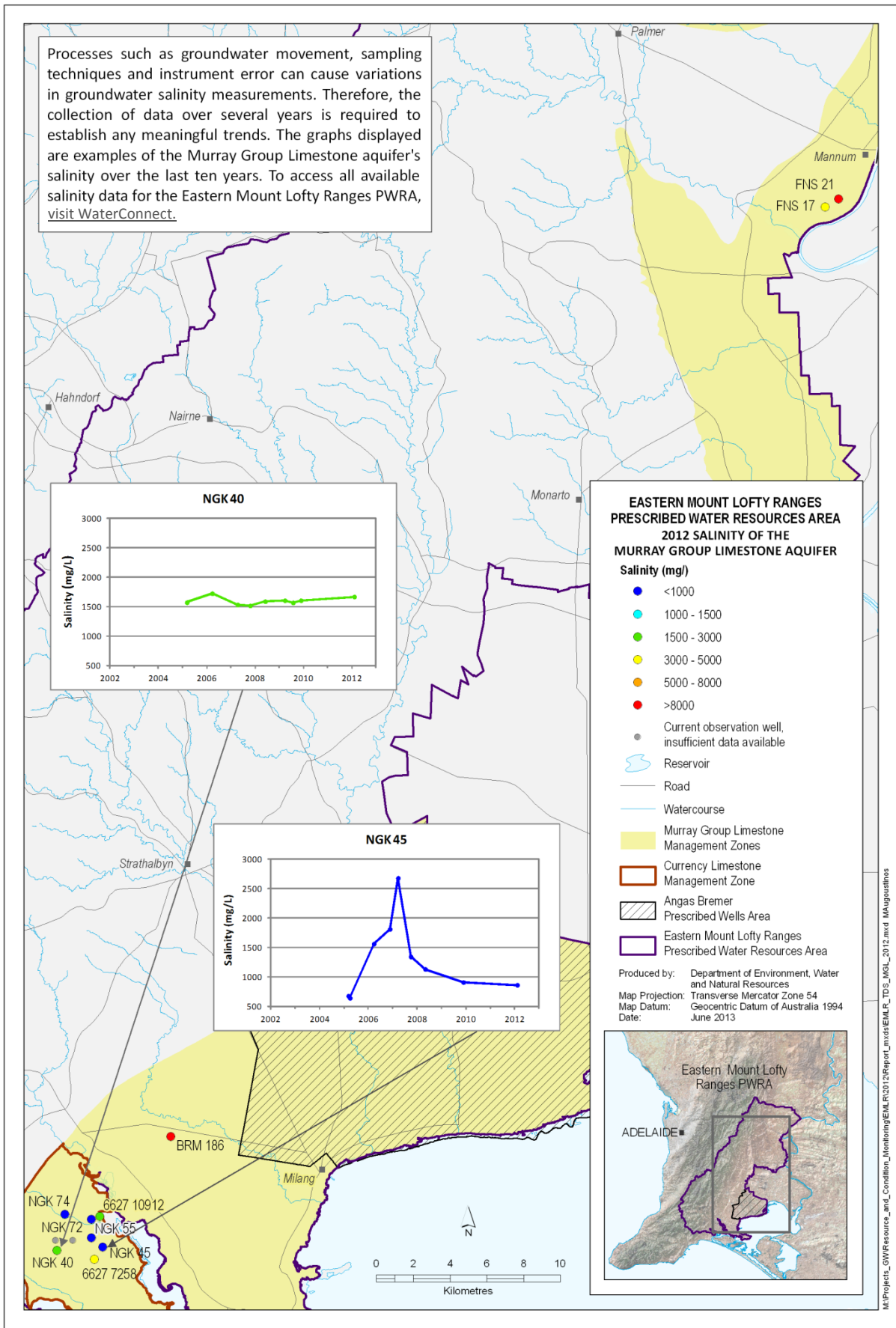


Figure 3. Groundwater salinity of the Murray Group Limestone aquifer of the Eastern Mount Lofty Ranges Prescribed Water Resources Area for 2012

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