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# MARNE SAUNDERS PWRA

## MURRAY GROUP LIMESTONE AQUIFER

Groundwater Level and Salinity Status Report

2012

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Water and Natural Resources

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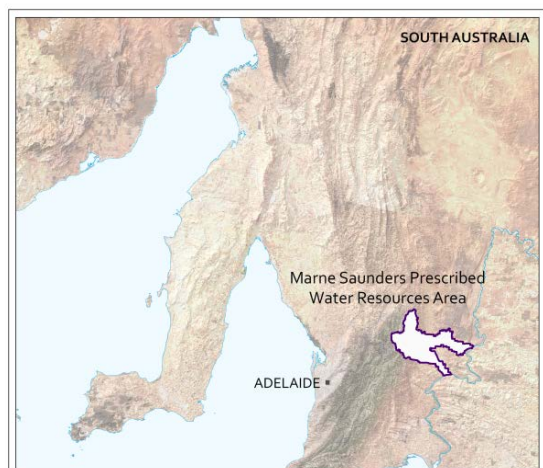
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# 2012 SUMMARY

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The Marne Saunders Prescribed Water Resources Area is located on the eastern side of the Mount Lofty Ranges about 60 km northeast of Adelaide. It is a regional scale resource for which surface water and groundwater are prescribed under South Australia's *Natural Resources Management Act 2004*. A Water Allocation Plan provides for sustainable management of the water resources.

The Marne Saunders Prescribed Water Resources Area consists of two tributary catchments for the River Murray which can be divided into two distinct groundwater regions: the Hills Zone and the Plains Zone. The Plains Zone is underlain by unconsolidated sediments of the Murray Basin consisting of limestone, sand and clay layers up to 80 m thick which overlie basement rocks exposed in the Hills Zone to the west. The Murray Basin sediments consist of four layers; Quaternary sediments, Murray Group Limestone, Ettrick Formation and the Renmark Group. The Murray Group Limestone is highly fossiliferous and sandy with solution cavities present. This aquifer is confined in the east where it is overlain by the Pooraka Formation and unconfined to the west. In general the Murray Group Limestone is overlain by Quaternary sediments and underlain by the Ettrick Formation and the Renmark Group. In the Plains Zone irrigation supplies are obtained from the Murray Group Limestone aquifer, predominantly along the Marne River valley.

Metered extractions for 2011–12 totalled 1129 ML, an increase of 23 percent from the previous year (Fig.1). Groundwater extraction from the Murray Group Limestone accounts for 79 percent of the total groundwater used in the Marne Saunders Prescribed Water Resources Area.

The climate of the Marne Saunders Prescribed Water Resources Area is characterised as Mediterranean with warm to hot, dry summers and mild, wet winters. Rainfall is highest in the Hills Zone at the western edge of the Prescribed Water Resources Area declining rapidly towards the east in the rain shadow of the Mount Lofty Ranges. Data from the Kongolia (24513) rainfall station was chosen for the analysis of rainfall trends (Fig.2). In Figure 2 the long-term monthly average rainfall is graphed in orange with the total monthly rainfall graphed in blue. In 2012, the total annual rainfall was 271 mm, below the long-term (1889-2012) annual average of 291 mm and despite significantly above average rainfall in March.

Groundwater level monitoring in the limestone aquifer shows a strong relationship with rainfall and river flow. Below average rainfall in the Hills Zone has resulted in little stream flow and consequently only minor recharge to the limestone aquifer where it is unconfined downstream of Cambrai. Groundwater levels show the stable to declining trends for most wells over the past 10 years (2003–2012). These trends are consistent during 2012 with seven out of 16 observation wells monitored showed an rising trend while eight of them displayed declines in groundwater level (Fig. 3).

The groundwater salinity observation network for Murray Group Limestone in the Marne Saunders Prescribed Water Resources Area is shown in Figure 4. Over the past 10 years from 2003 to 2012, five out of eight monitoring wells showed an increasing trend. In 2012 there have been some decreases in salinity levels, possibly due to reduced leaching of salts from soils following below average rainfall during 2012.

The Murray Group Limestone aquifer in the Marne Saunders 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 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 the beneficial use (i.e. drinking water, irrigation or stock watering) of the resource. The 2012 status for the Murray Group Limestone aquifer is supported by:

- 56% of water level monitoring wells displayed a decrease in water levels when compared with 2011 data. However, gradual water level declines are not concerning in the areas where the aquifer is unconfined because they respond rapidly to occasional floods in the Marne River.
- 57% of salinity observation wells displayed a decrease in salinity ranging from 50 to 230 mg/L when compared to the last recorded data.

To view the previous Marne-Saunders Prescribed Water Resources Area groundwater water status report, 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 Murray Group Limestone aquifer please see the [Water Allocation Plan for the Marne Saunders Prescribed Water Resources Area](#).

**Marne Saunders Prescribed Water Resources Area: Murray Group  
Limestone aquifer groundwater extraction**

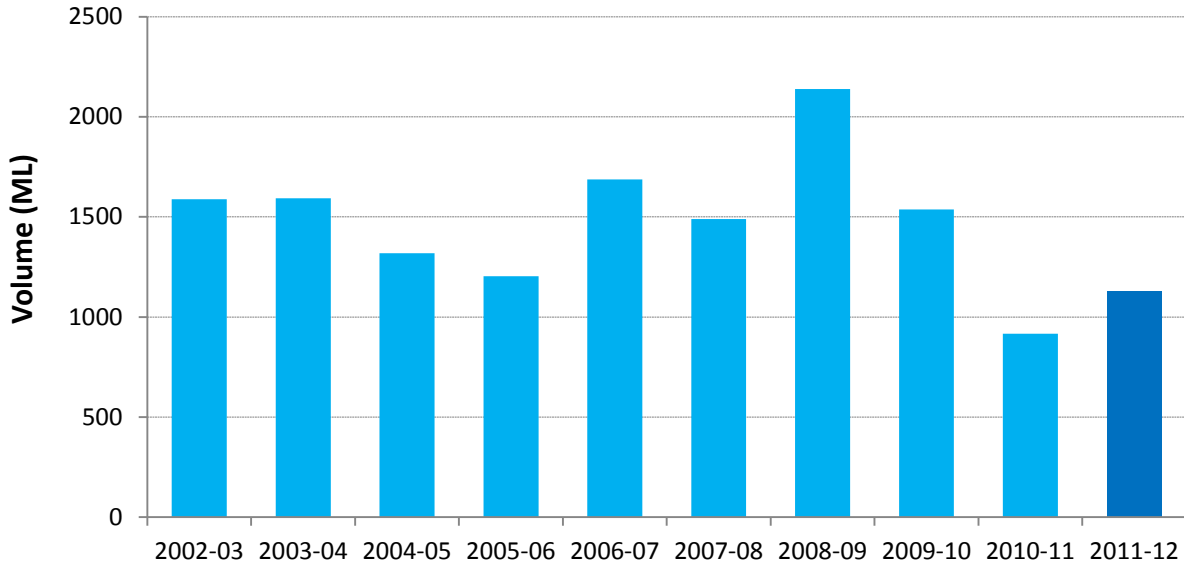


Figure 1. Historical licensed groundwater use for the Murray Group Limestone aquifer of the Marne Saunders Prescribed Water Resources Area

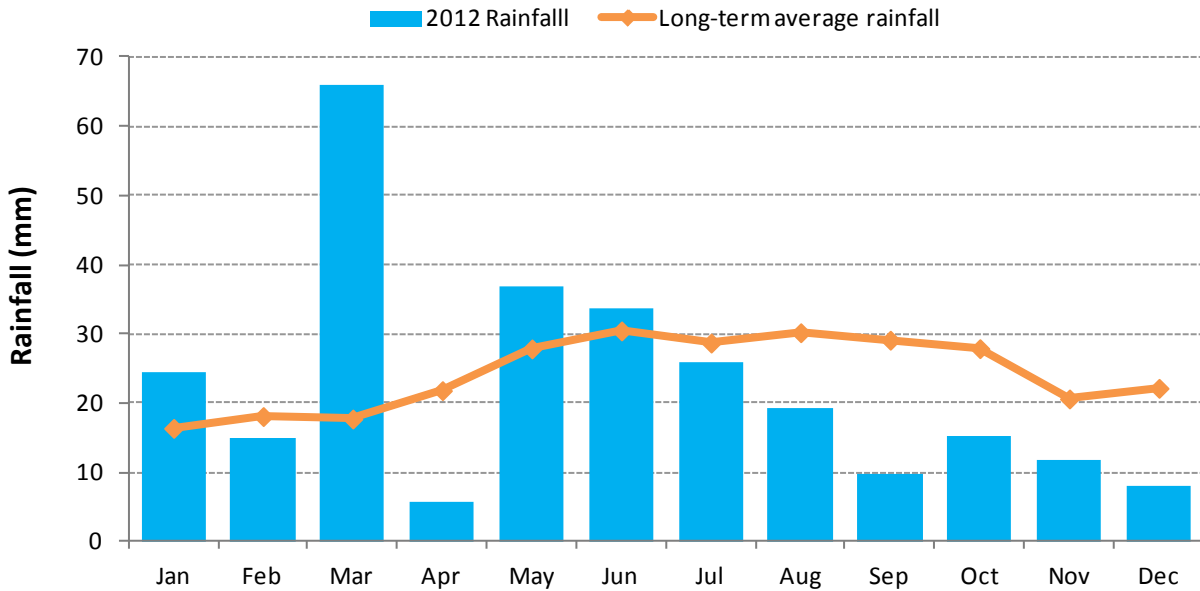


Figure 2. Monthly rainfall (mm) for 2012 and the long-term average monthly rainfall (mm) at the Kongolia rainfall station (number 24513) in the Marne Saunders Prescribed Water Resources Area

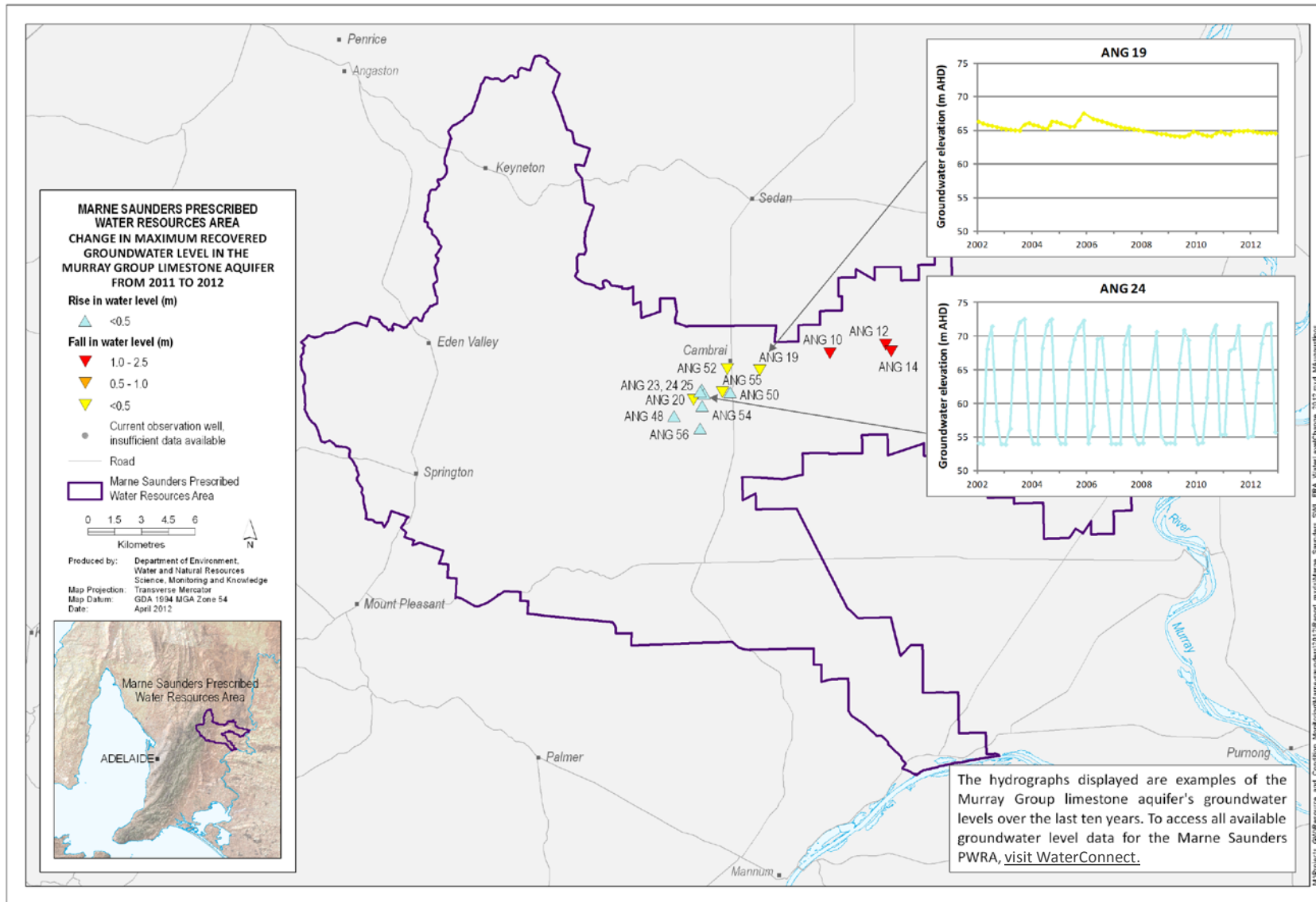


Figure 3. Overall changes in maximum groundwater levels in the Murray Group Limestone aquifer of the Marne Saunders Prescribed Water Resources Area from 2011 to 2012

Marne Saunders Prescribed Water Resources Area

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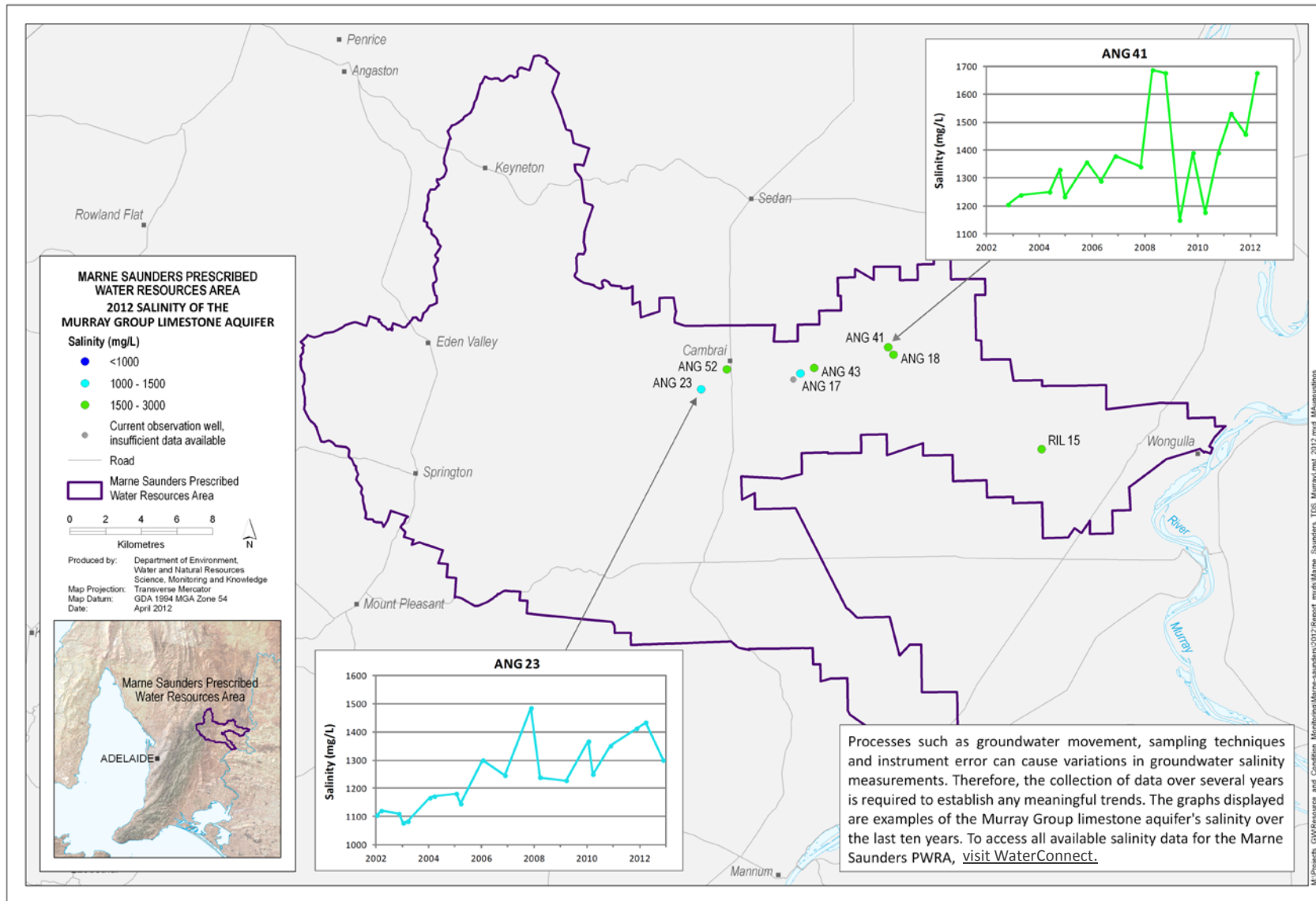


Figure 4. Groundwater salinity of the Murray Group Limestone aquifer of the Marne Saunders Prescribed Water Resources Area for 2012

Marne Saunders Prescribed Water Resources Area

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