
BAROSSA PWRA

UPPER AQUIFER

Groundwater Level and Salinity Status Report

2012



Government of South Australia
Department of Environment,
Water and Natural Resources

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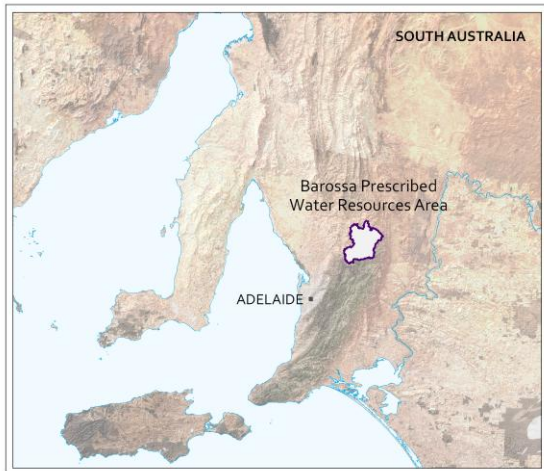
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2012 SUMMARY



The Barossa Prescribed Water Resources Area (PWRA) encompasses both the highland areas of the Mount Lofty Ranges and the Barossa Valley, approximately 60 km north-east of Adelaide. It is a regional scale resource for which surface water and groundwater have been prescribed under South Australia's *Natural Resources Management Act 2004*. A Water Allocation Plan provides for sustainable management of the groundwater resources.

Barossa PWRA consists of three major aquifers; two sedimentary aquifers (Upper and Lower), which are located within the valley and a Fractured Rock Aquifer which outcrops in the ranges to the east and west of the valley and underlies the sedimentary aquifers. This report focuses on the Upper aquifer of the Barossa PWRA.

Groundwater flow within the Upper aquifer is in a south-westerly direction in the valley and to the north near Lyndoch. Recharge to the Upper aquifer of the Barossa PWRA originates from rainfall. Seasonal responses to recharge are common, except where there is overlying Quaternary clay. Groundwater salinities are highly variable, from 960 to 12 000 mg/L. However, the majority of wells have salinities below 3000 mg/L. The more saline wells are located in the northern extent of the aquifer.

Metered extractions from the Upper aquifer totalled 233 ML* for 2011–12, representing 11% of the total extraction within the Barossa PWRA and is a 47% increase in extraction from this aquifer when compared to the previous water-use year (Fig. 1). This volume of extraction equates to 3.3% of the total allocation limit of 7147 ML for the Barossa PWRA.

The climate of the Barossa PWRA is characterised as Mediterranean with hot dry, dry summers and cool, wet winters. Data from the Angaston rainfall station (number 23300) were chosen for analysis of rainfall in 2012 (Fig. 2). The long-term monthly average rainfall is graphed in orange against the total monthly rainfall recorded. In 2012, the monthly rainfall data indicates that significantly above average rainfall occurred in January and March, however well below average rainfall was evident from July through December. The total annual rainfall was 370 mm, significantly below the long-term (1889–2012) annual average of 535 mm.

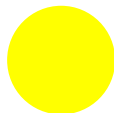
Due to the significantly below average rainfall and increased groundwater extractions, water levels in the Upper aquifer have declined in 75% of observation wells by up to 1.46 m when compared with the maximum water level observed in 2011 (Fig. 3). Despite the general regional decline in water level, seven wells observed an increase in maximum recovered water level of up to 0.52 m and one well showed no change in the maximum recovered water level when compared with 2011. The decline is likely due to the increase in extraction from 2010–11 to 2011–12 and below average rainfall.

Groundwater salinity in the Upper aquifer is highly variable. Long-term salinity trends indicate that well MOR 273 has experienced significant variations in salinity (895–5109 mg/L) in salinity over the past 10 years whilst well NTP 11 has shown little variability. In October 2012 nine wells were monitored for salinity which ranged from 1057 to 11611 mg/L with the more saline groundwater found in the northern portion of the aquifer (Fig. 4). Eight out of nine monitored wells have salinity values higher than 1500 mg/L, the tolerance level for grape vines. Five of the nine observation wells show an increase in salinity when compared to October/November 2011 salinity values.

* The licensed groundwater use for the 2011–12 water-use year is based on the best data available as of March 2013 and may be subject to change, as some extraction volumes are in the process of being verified.

The Upper aquifer of the Barossa PWRA has been assigned a yellow status for 2012:

2012 STATUS



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

This means that gradual adverse trends in resource status have been observed over the reporting period. Continuation of these trends is unlikely to negatively impact the beneficial use (may include drinking water, irrigation or stock watering) of the resource for at least 15 years. The 2012 status for Upper aquifer is supported by:

- an overall decrease in the maximum recovered water level in 75% of observation wells when compared to 2011 water level data
- salinity in 55% of wells monitored was higher than that recorded at the same time in 2011, and 89% of wells monitored recorded salinities higher than 1500 mg/L which is the tolerance level for grape vines

To view the *Barossa 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 Barossa PWRA please see the [Water Allocation Plan for the Barossa Prescribed Water Resources Area](#)

Barossa PWRA: Upper aquifer annual groundwater extraction

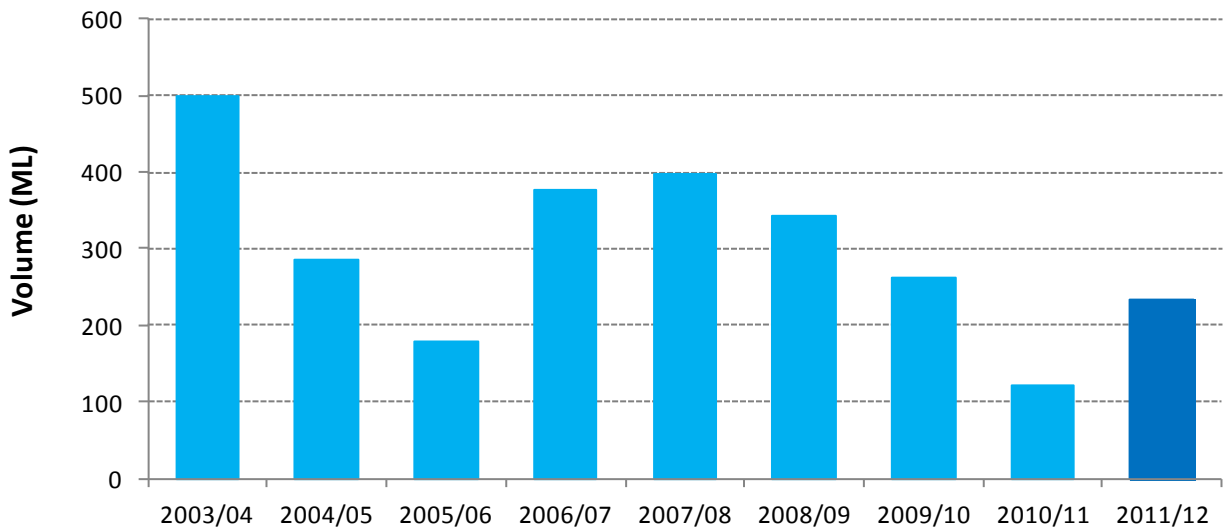


Figure 1. Historical licensed groundwater use for the Upper aquifer in the Barossa Prescribed Water Resources Area

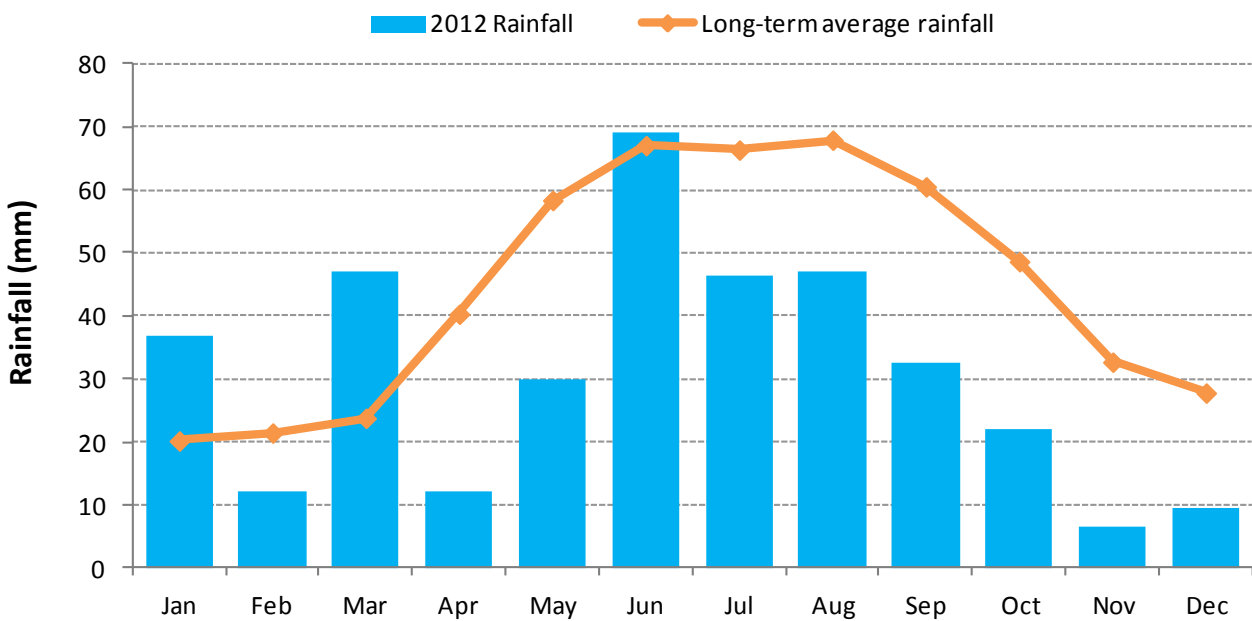


Figure 2. Monthly rainfall (mm) for 2012 and the long-term average monthly rainfall (mm) at the Angaston rainfall station (number 23300) in the Barossa Prescribed Water Resources Area

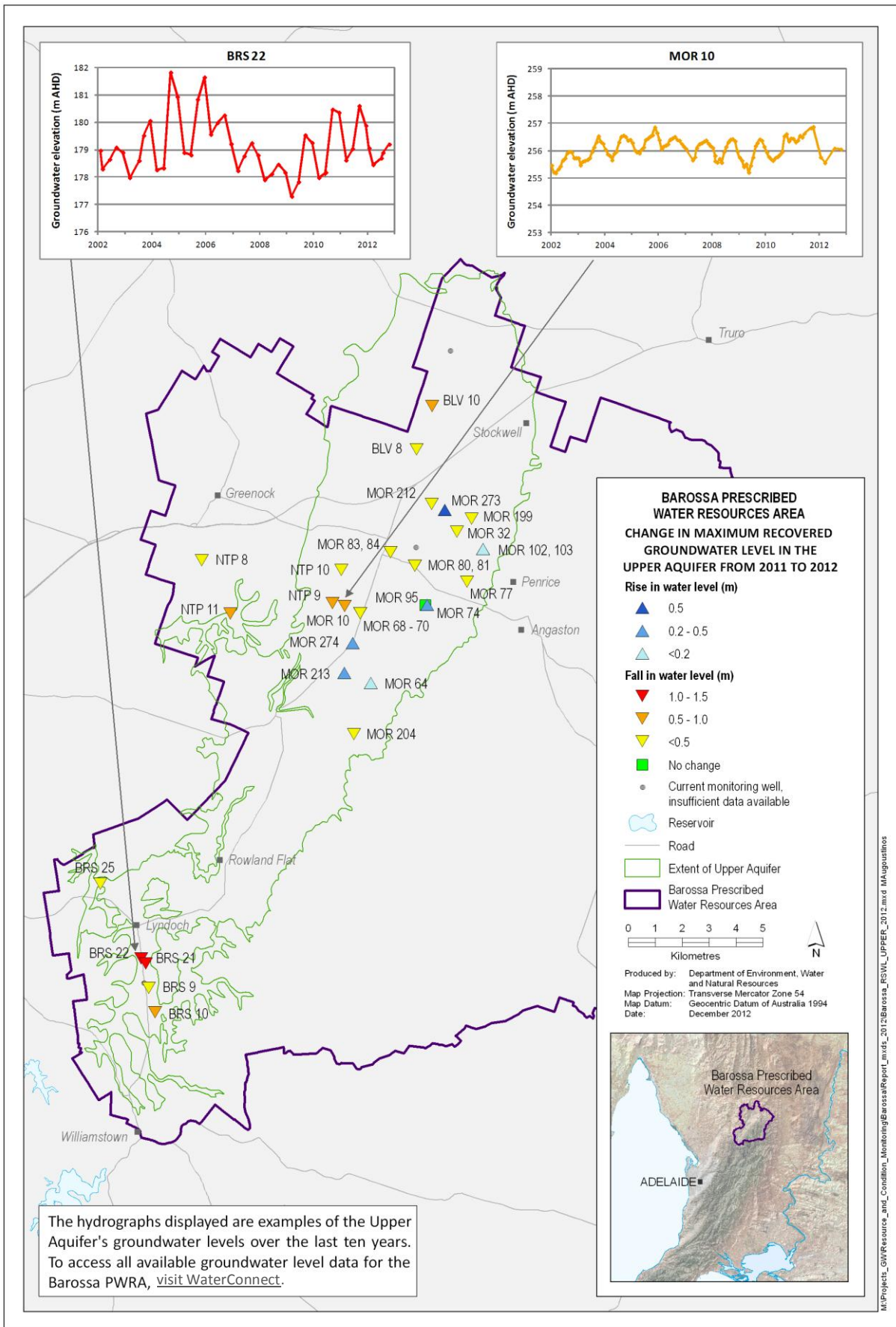


Figure 3. Overall changes in maximum groundwater levels in the Upper aquifer of the Barossa Prescribed Water Resources Area from 2011 to 2012

Barossa PWRA

Upper aquifer Groundwater Status Report 2012

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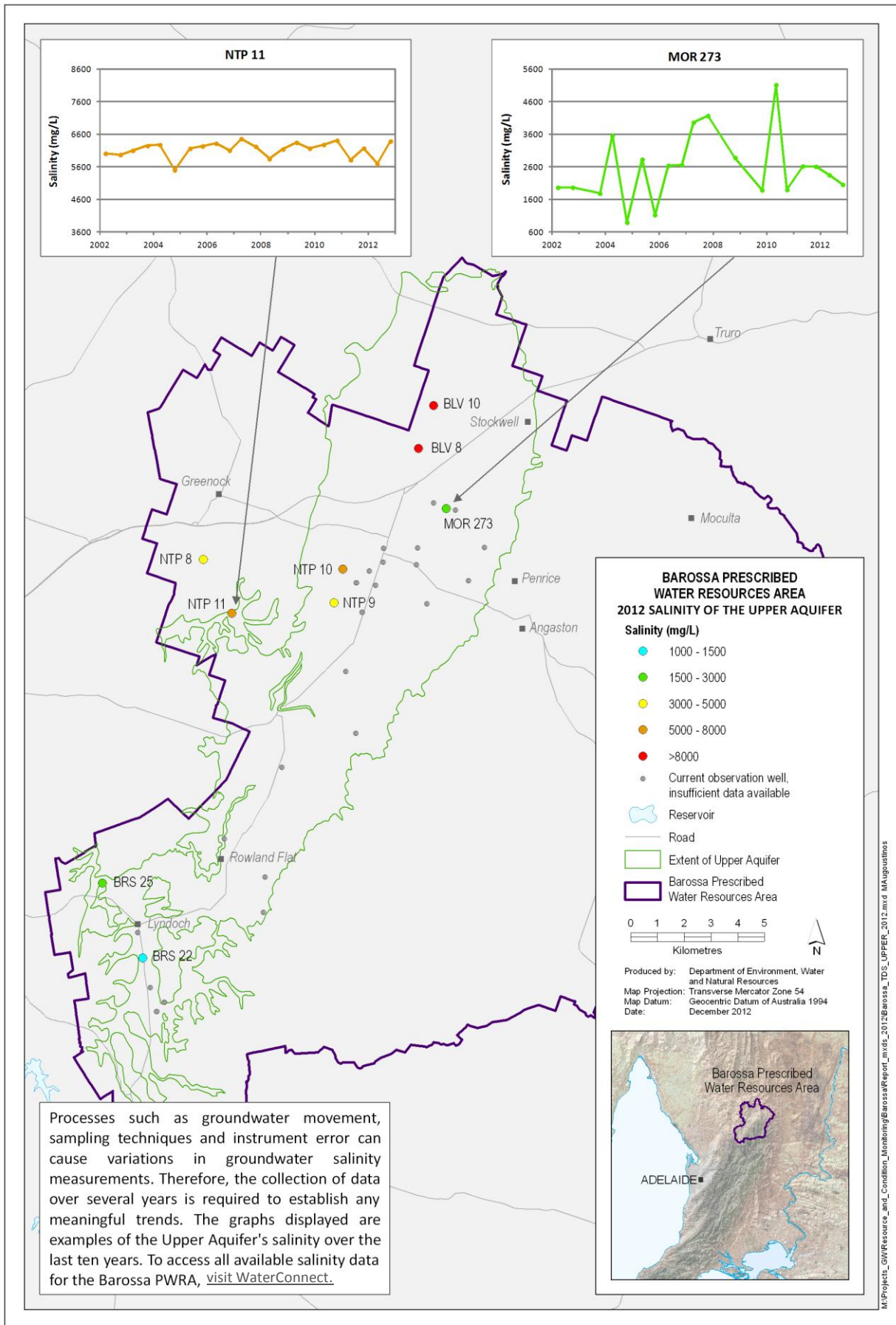


Figure 4. Groundwater salinity of the Upper aquifer in the Barossa Prescribed Water Resources Area for October 2012