BAROSSA PWRA

FRACTURED ROCK AQUIFER

Groundwater Level and Salinity Status Report

2013

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

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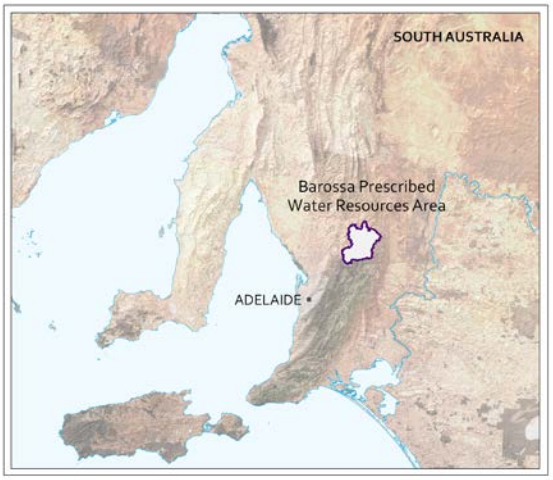
2013 SUMMARY



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 Fractured Rock Aquifer (FRA) of the Barossa PWRA.

Groundwater flow within the FRA generally follows the topography and flows from high points in the catchments to low points where groundwater discharges to streams. Groundwater moves westward from the ranges with some discharge to the sedimentary aquifers. Beneath the valley, the flow direction turns southwest. The groundwater salinity on aquifer varies from 450 to over 5 500 mg/L, with the more saline wells in the south–west of the Barossa PWRA.

The FRA is the main source of extraction in the Barossa PWRA, with 58 % of groundwater extracted in the area from this aquifer during 2013, which is generally used for the irrigation of vineyards. Metered extractions from the FRA totalled 1,970 ML* for 2012-13, a 48 % increase from the previous water-use year (Fig. 1). This volume of extraction equates to 28 % of the total groundwater allocation limit of 7,147 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 2013 (Fig. 2). The long-term monthly average rainfall is graphed in orange against the total monthly rainfall recorded. In 2013, the monthly rainfall data indicates that significantly below average rainfall was evident in January, March, October and November, however well above average rainfall occurred in May and July. The annual rainfall was 499 mm, slightly below the long-term (1889-2013) annual average of 535 mm.

Due to the slightly below average rainfall and increased volume of extractions in groundwater from the previous year, water levels in the Fractured Rock Aquifer have declined in 61 % of the 41 observation wells where data is available when compared with the maximum recovered water level observed in 2012 (Fig. 3). Ten wells, mostly located within the Barossa Valley, experienced decreases of between 1 and 3.5 m. Over a third of observation wells observed an increase in water level when compared with 2012, with three wells recording rises of between 1 and 2 m. The general regional decline is likely due to the gradual increase in extraction from 2010-11 to 2011-12 and below average rainfall.

Groundwater salinity in the FRA is highly variable due to the complex system of preferential flow paths affecting recharge and movement through the aquifer. Two wells have been selected to illustrate long-term salinity trends (Fig. 4). Well MOR 246 has experienced a significant rise (3,153 mg/L) in salinity over the past 10 years whilst well MOR 223 has shown little variability except during the drought period when decreased recharge is likely to have caused a peak in salinity. In October 2013, six wells were monitored for salinity which ranged from 801 to 5,557 mg/L (Fig. 4), with five wells having a salinity value higher than 1500 mg/L, the tolerance level for grape vines. Two of four observation wells with available data for both 2012 and 2013 show an increase in salinity in 2013 when compared to October 2012 salinity values.

** The licensed groundwater use for the 2012–13 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 Fractured Rock Aquifer of the Barossa PWRA has been assigned a yellow status for 2013:

2013 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 2013 status for Fractured Rock Aquifer is supported by:

- an overall decrease in the maximum recovered water level in 2013 when compared to 2012 water level data

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, www.waterconnect.sa.gov.au.

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

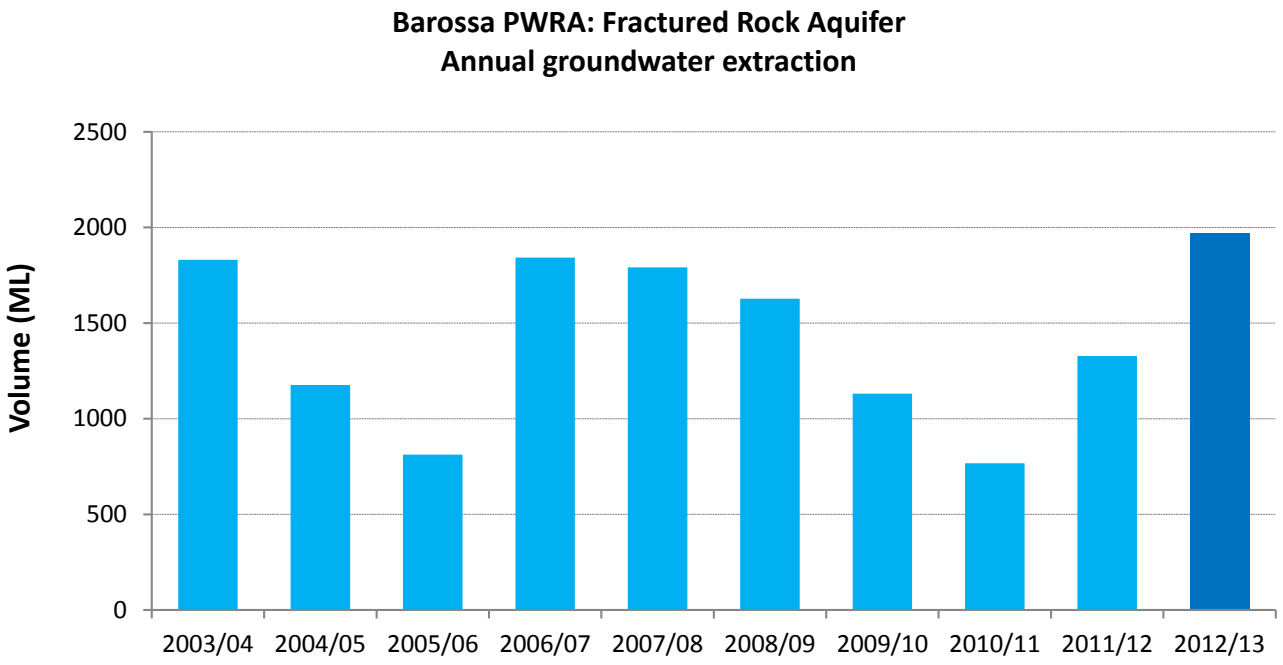


Figure 1. Historical licensed groundwater use for the Fractured Rock Aquifer in the Barossa Prescribed Water Resources Area

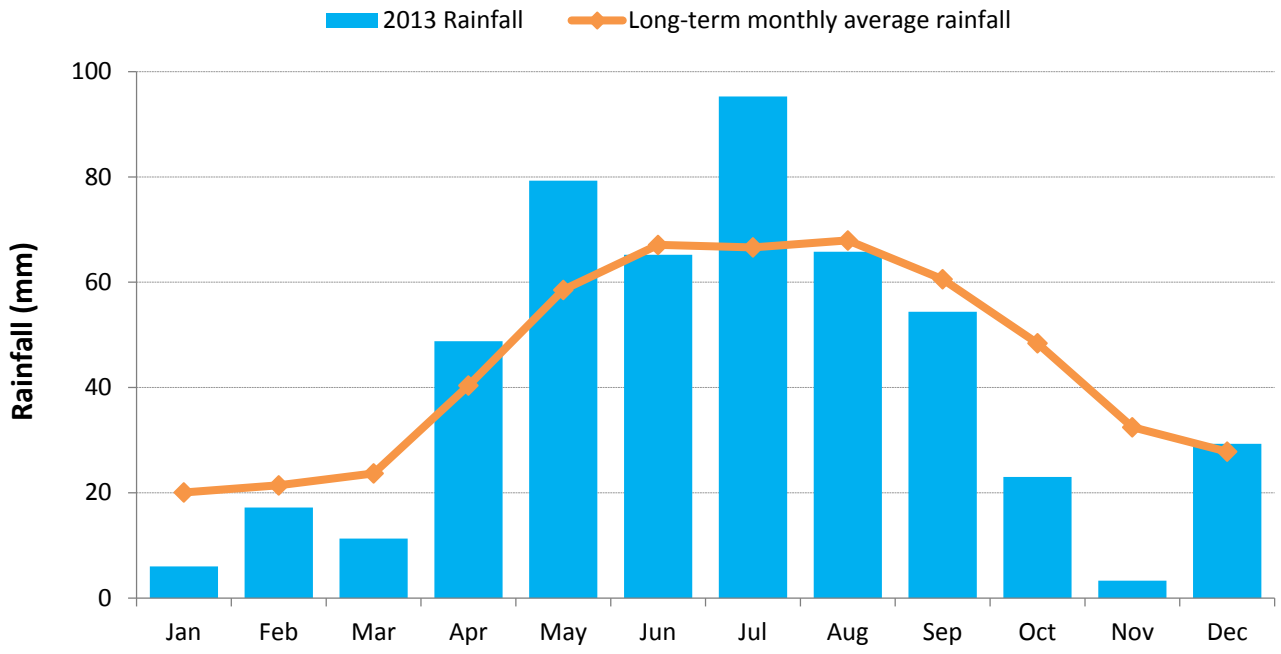


Figure 2. Monthly rainfall (mm) for 2013 and the long-term average monthly rainfall (mm) at the Angaston rainfall station (number 23300) in the Barossa Prescribed Water Resources Area

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 as www.longpaddock.qld.gov.au/silo.

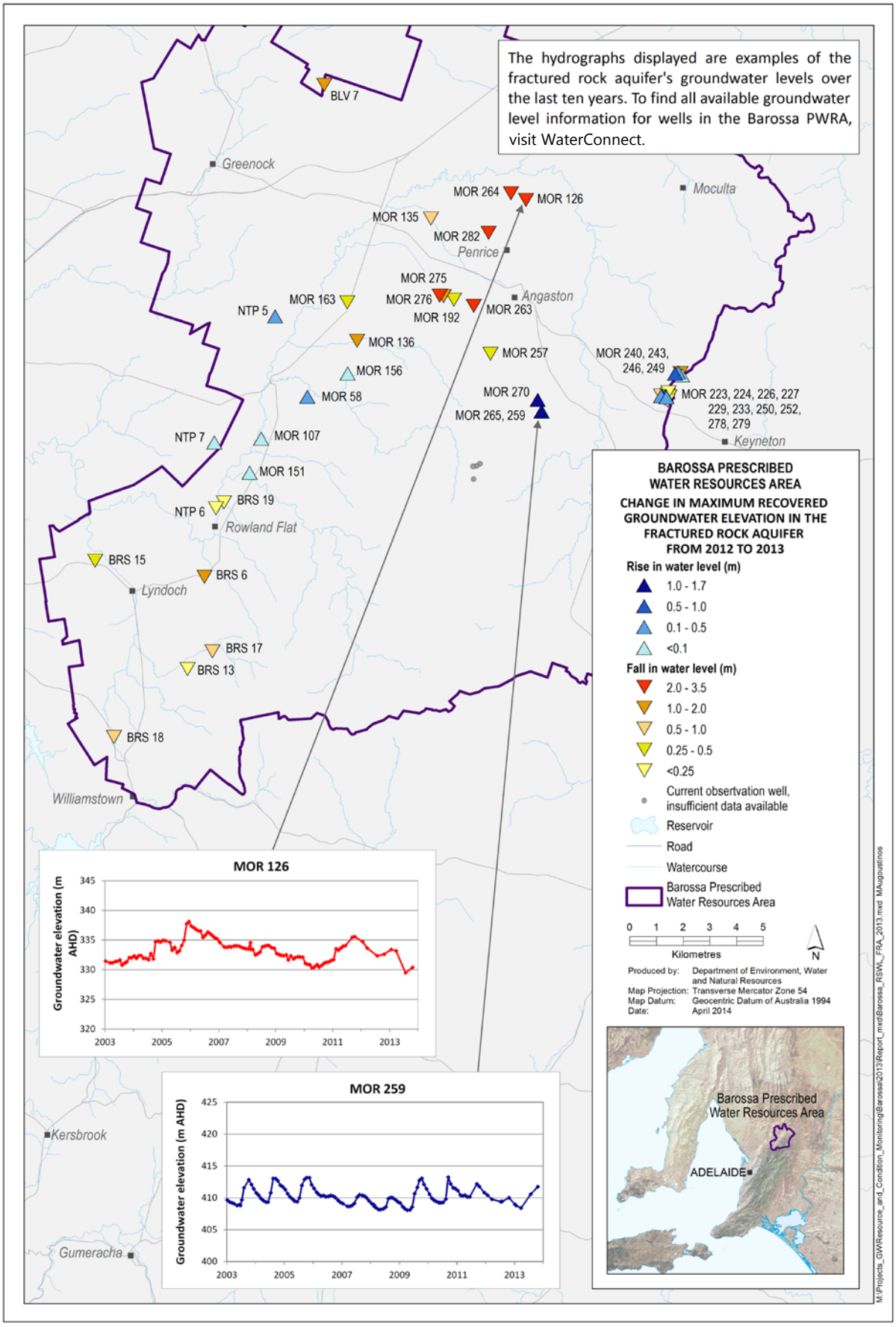


Figure 3. Overall changes in maximum groundwater levels in the Fractured Rock Aquifer of the Barossa Prescribed Water Resources Area from 2012 to 2013

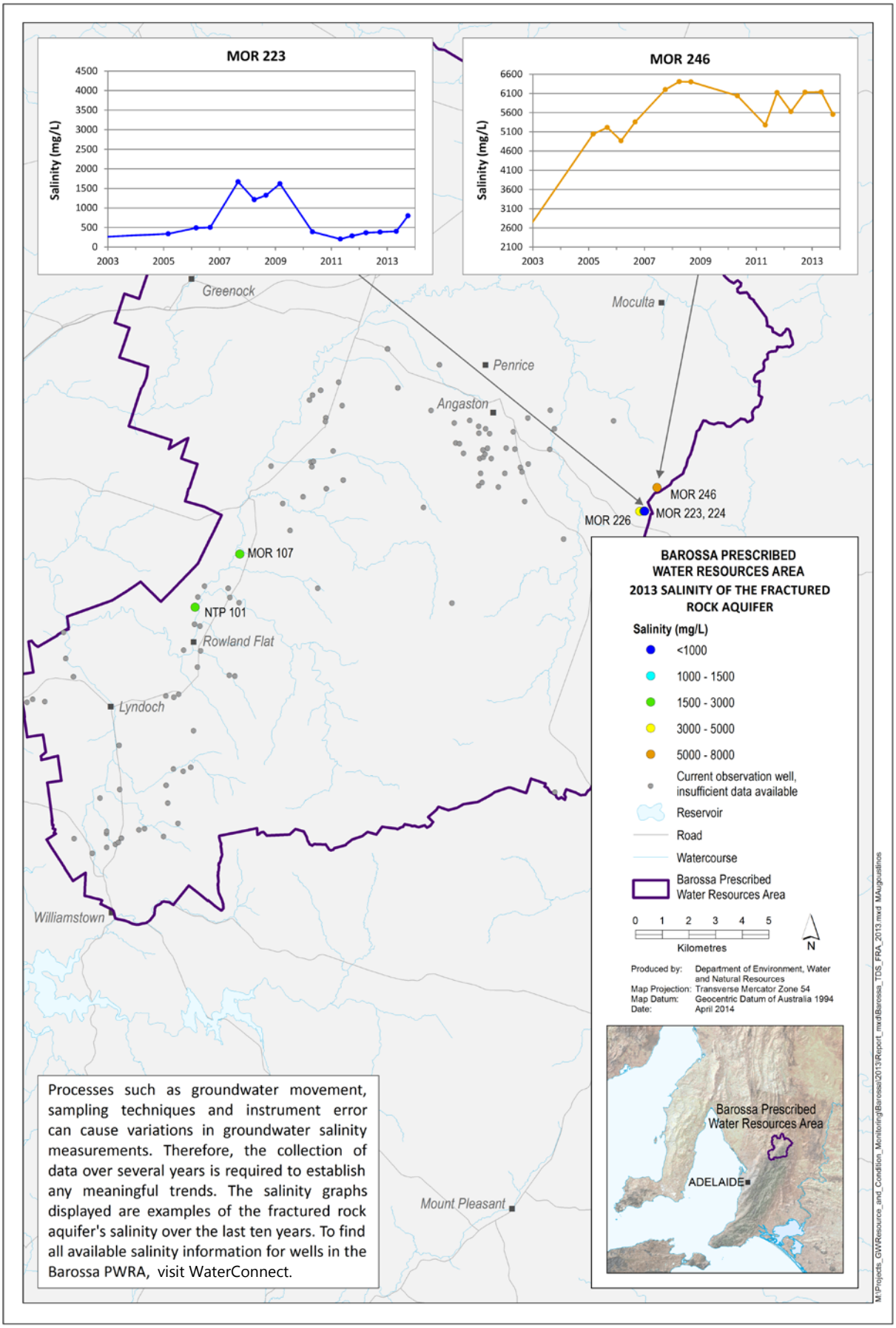


Figure 4. Groundwater salinity of the Fractured Rock Aquifer in the Barossa Prescribed Water Resources Area for October 2013