
FAR NORTH PWA

GAB AQUIFER

Groundwater Level and Salinity Status Report

2013



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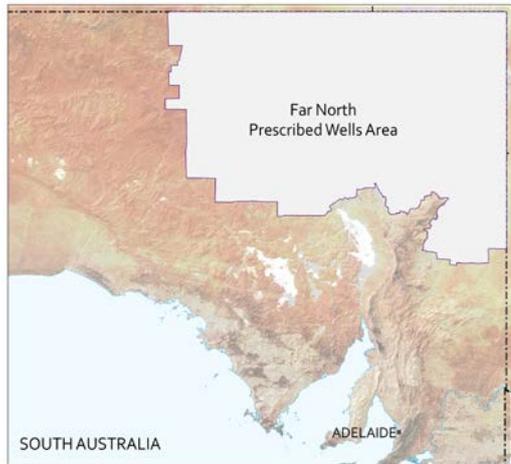
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2013 SUMMARY



The Far North Prescribed Wells Area (PWA) is located approximately 400 km north of Adelaide, South Australia and is bounded in the north and east by the State's shared borders with New South Wales, Queensland and the Northern Territory. The Far North PWA covers approximately 315 000 km² (~32% of the State) and is prescribed under South Australia's *Natural Resources Management Act 2004*. A water allocation plan provides for the sustainable use of the groundwater resources.

Groundwater extraction in the Far North PWA is predominately sourced from the Great Artesian Basin (GAB) aquifer, with the Cadna-owie Formation and Algebuckina Sandstone (and equivalents) forming the major water-bearing aquifer system. Aquifer thickness ranges from less than 50 m around the basin's western margin to greater than 500 m near the Poolowanna Trough. Depth to

the GAB aquifer is as much as 2400 m in the State's north-east but this decreases towards the basin margins, with the aquifer cropping out along the western and southern margins.

The dominant recharge mechanism of the GAB is the infiltration of rainfall along the western slopes of the Great Dividing Range in Queensland and New South Wales that provides lateral groundwater flow to the South Australian portion of the GAB. Recharge also occurs to a lesser extent where the aquifer crops out along the western margins of the basin in South Australia and Northern Territory, or where it is overlain by unconsolidated sediments and is unconfined. Upward leakage from the underlying Cooper Basin is also thought to contribute recharge to the GAB aquifer.

The Water Allocation Plan for the Far North PWA estimates groundwater extraction from the GAB aquifer is in the order of 33.5 ML/d for stock and domestic use and 4 ML/d for town water supply. Total groundwater discharge from springs has been estimated at 66 ML/d. This is a scalable estimate due to the inherent difficulties in measuring flows and the low number of spring flow measures. Petroleum operations have a current allocation volume of 60 ML/d for co-produced water. Mining operations have a current allocation volume of 44.6 ML/d. In addition to this volume, BHP Billiton's Olympic Dam has been granted a special water licence to extract water from the GAB aquifer. This licence was issued under the *Roxby Downs (Indenture Ratification) Act 1982* and permits BHP Billiton to extract up to an agreed volume of 42 ML/d from the GAB aquifer. Whilst the mine itself is located outside of the Far North PWA, the wellfields are located within the prescribed area.

As local rainfall has no influence on pressure levels or extraction from the GAB, no analysis is presented in this report. Overall, the groundwater elevation and salinity of the GAB aquifer in the Far North PWA have remained relatively stable over a long period of time. While there have been small fluctuations over the years, the latest values are similar to historical measurements. In 2013, water pressure data was recorded for only seven wells in the PWA GAB monitoring network and four of these wells, all located within the South West Springs groundwater management zone, had sufficient data to evaluate changes in groundwater pressures since 2012. The conclusions drawn in this status report are therefore cursory. Three wells recorded rises in groundwater elevations ranging from 0.06 to 1.67 m, and one well recorded a decline of less than 0.5 m (Fig. 1).

In 2013, 71% of the 21 monitored wells with sufficient data recorded increases in salinity when compared to 2012 salinity data. However salinity changes were generally minor (on average 3% of 2012 values), and were mostly within the historical range. The salinity ranged from 673 to 8029 mg/L, with 70% of the 43 wells monitored during the year recording levels of less than 3000 mg/L (Fig. 2).

The Great Artesian Basin aquifer 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 12 month reporting period. Continuation of these trends favours a very low likelihood of negative impacts on the beneficial use (e.g. drinking water, irrigation or stock watering) of the resource. The 2013 status for Great Artesian Basin aquifer is supported by:

- no significant change in groundwater elevations in 2013 when compared to 2012 groundwater elevation data, noting that this assessment was based on a small number of monitoring wells
- no significant change in groundwater salinity in 2013 when compared to 2012 salinity data.

To view the *Far North PWA Groundwater level and salinity Status Report 2011*, which includes background information on hydrogeology, location of rainfall stations and relevant groundwater dependent ecosystems, and to view descriptions for all status symbols, please see the Water Resources page on [WaterConnect](#).

For further information about the Far North PWA, please see the *Far North Water Allocation Plan* on the SA Arid Lands Natural Resources Management [website](#).

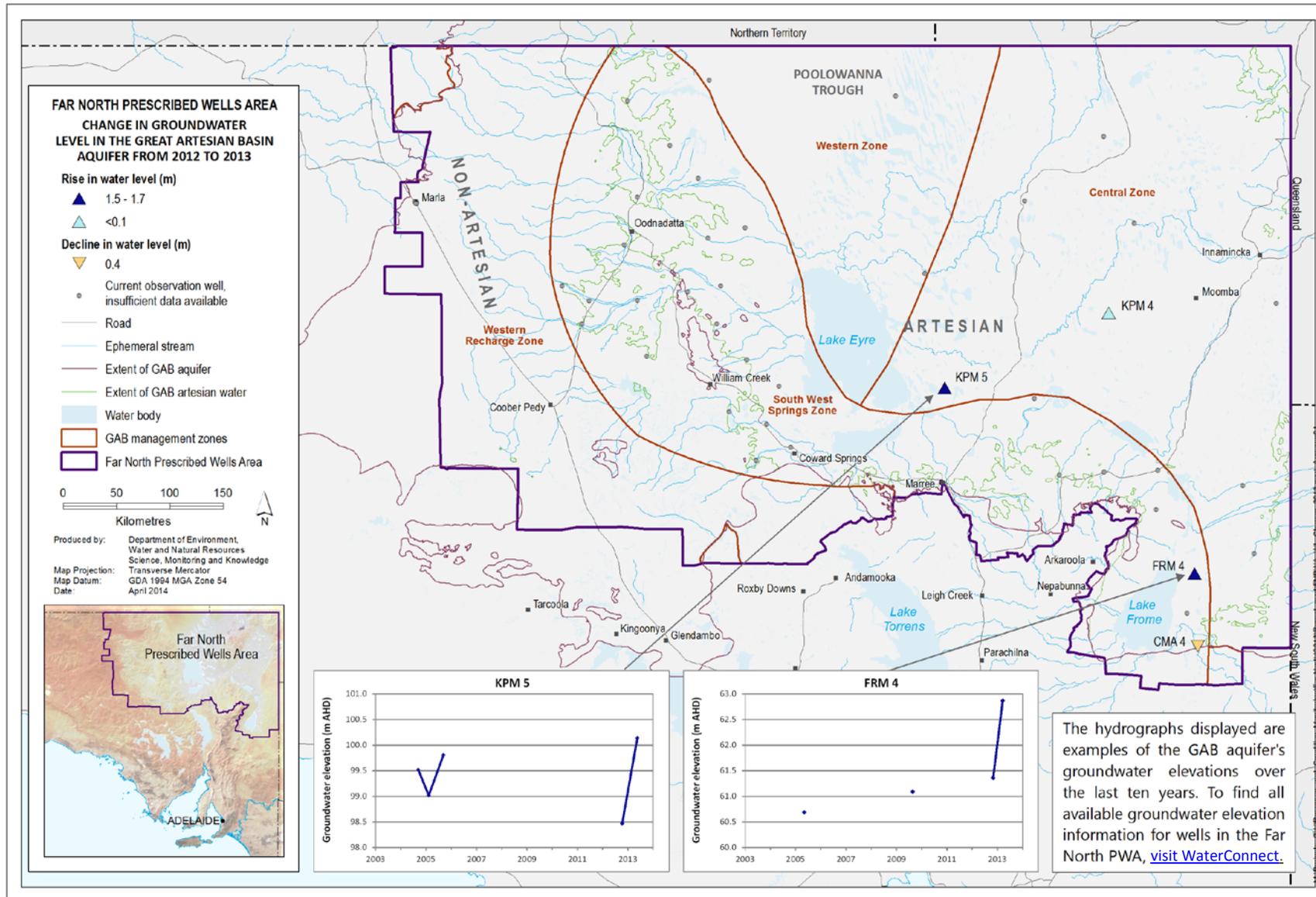


Figure 1. Overall change in groundwater elevation in the Great Artesian Basin aquifer of the Far North Prescribed Wells Area from 2012 to 2013

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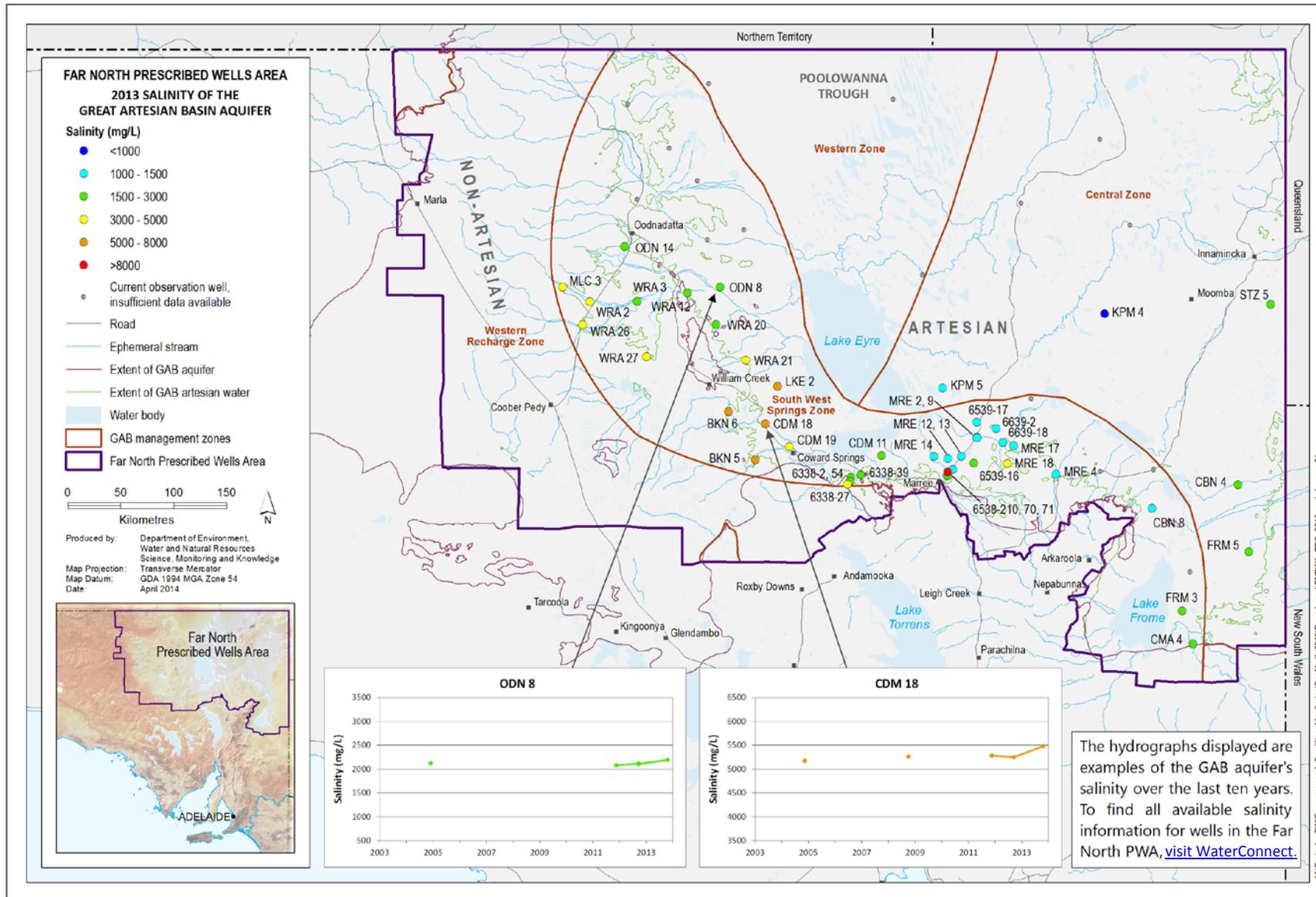


Figure 2. Groundwater salinity of the Great Artesian Basin aquifer of the Far North Prescribed Wells Area for 2013

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