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# FAR NORTH PWA

## GAB AQUIFER

Groundwater Level and Salinity Status Report

2012



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

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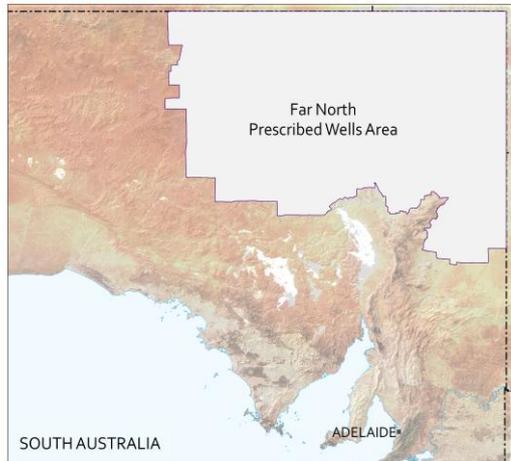
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# 2012 SUMMARY

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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 km<sup>2</sup> (~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.

Data from the Hamilton Station (number 16083) and McDouall Peak (number 16027) rainfall stations were chosen for the analysis of rainfall in the Western Recharge Zone in 2012 (Figs. 1 & 2). In 2012, the western region of the GAB received above-average rainfall between January and March and in November. From April to October, the region received very little rainfall, with most months recording no rainfall at all. Hamilton Station, which is situated in the north-west, recorded more rainfall than McDouall Peak in the south-west.

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 2012, increases in groundwater elevations ranging from 0.04 to 1.4 m were recorded in eight wells within the South West Springs groundwater management zone when compared to 2011 data (Fig. 3). Ten wells recorded decreases of less than 0.25 m. Salinity values from the sampled wells were generally between 600 and 5500 mg/L in 2012, with 70% of monitored wells recording a salinity of less than 3000 mg/L (Fig. 4). Minor increases in salinity were recorded in 2012.

The Great Artesian Basin aquifer 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 beneficial use (i.e. drinking water, irrigation, or stock watering). The 2012 status for Great Artesian Basin aquifer is supported by:

- an overall increase in groundwater elevations when compared to 2011 groundwater elevation data
- no significant change in groundwater salinity when compared to 2011 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, [visit WaterConnect](#).

To view descriptions of all status symbols, [click here](#).

For further details about the Far North PWA please see the [Water Allocation Plan for the Far North PWA](#).

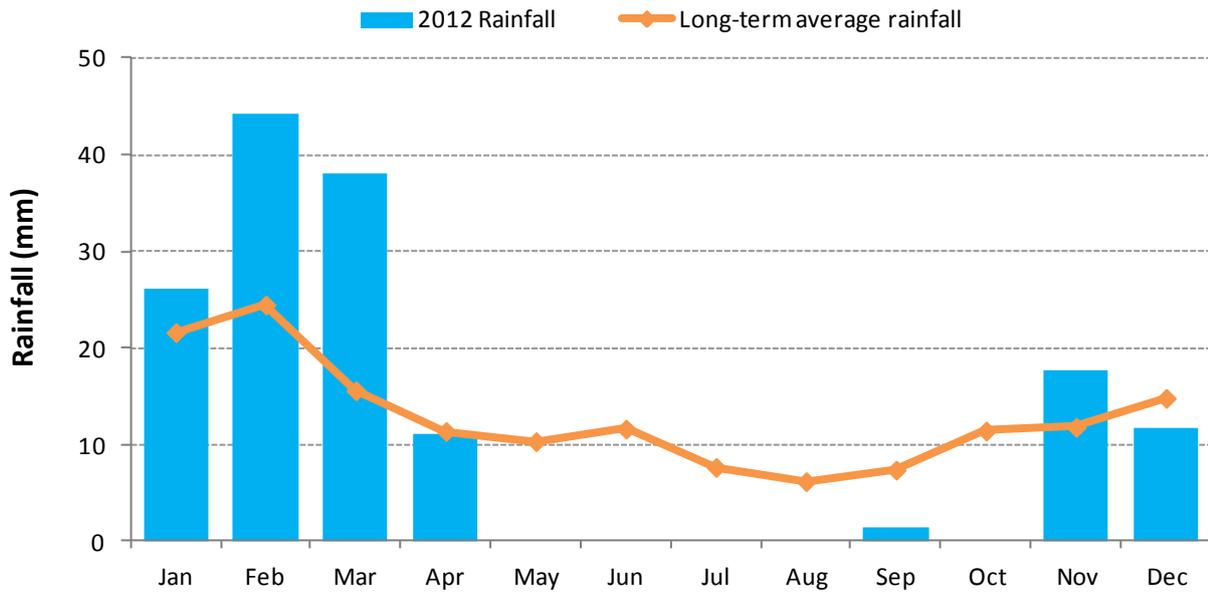


Figure 1. Monthly rainfall (mm) for 2012 and the long-term average monthly rainfall (mm) at the Hamilton Station rainfall station (number 16083) in the Far North Prescribed Wells Area

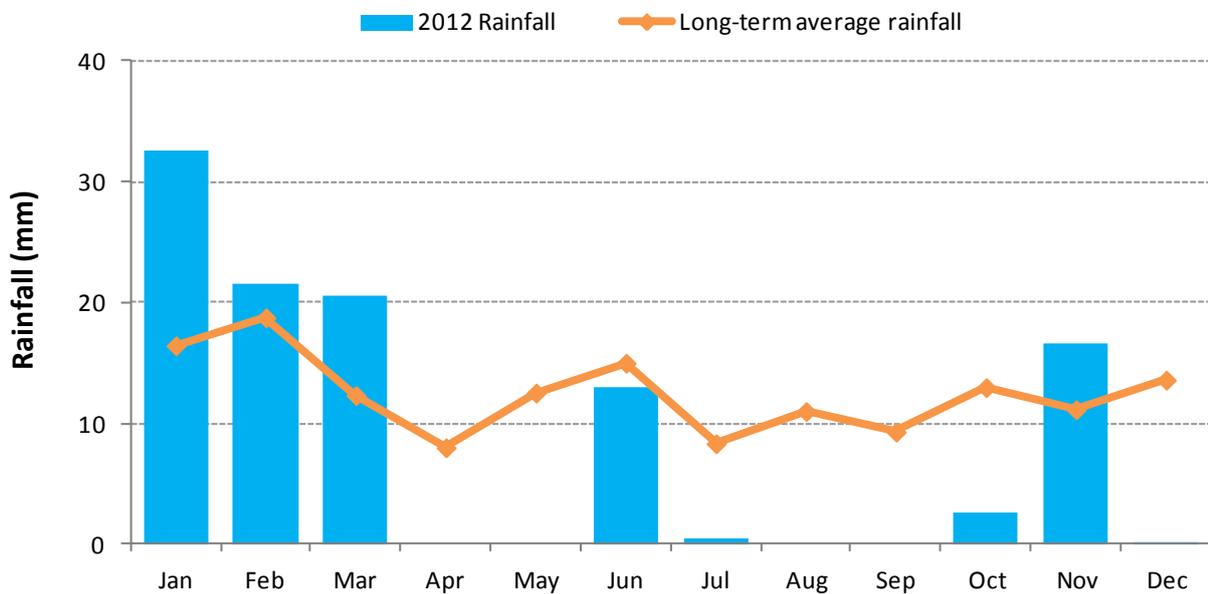


Figure 2. Monthly rainfall (mm) for 2012 and the long-term average monthly rainfall (mm) at the McDouall Peak rainfall station (number 16027) in the Far North Prescribed Wells Area

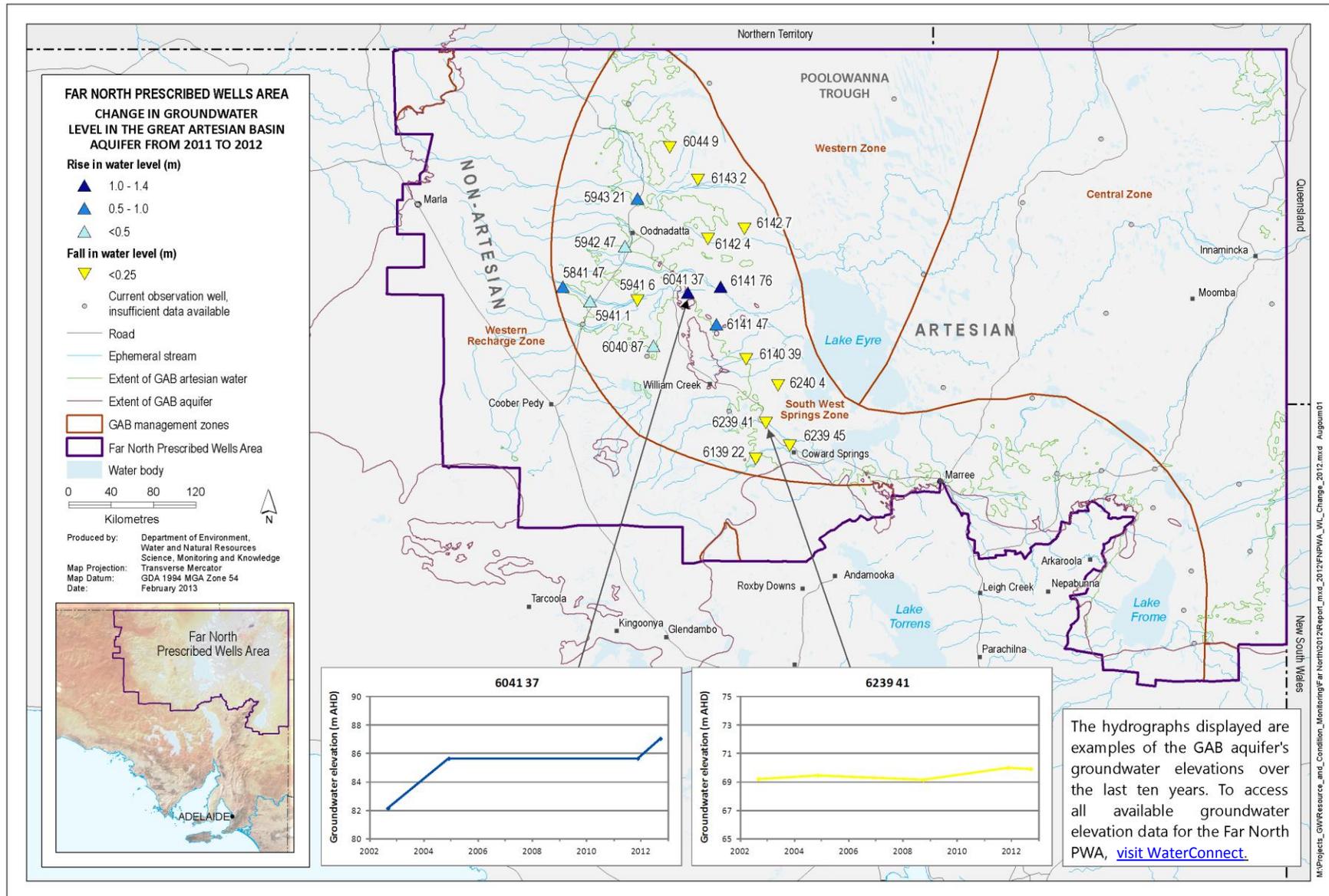


Figure 3. Overall change in groundwater elevation in the Great Artesian Basin aquifer of the Far North Prescribed Wells Area from 2011 to 2012

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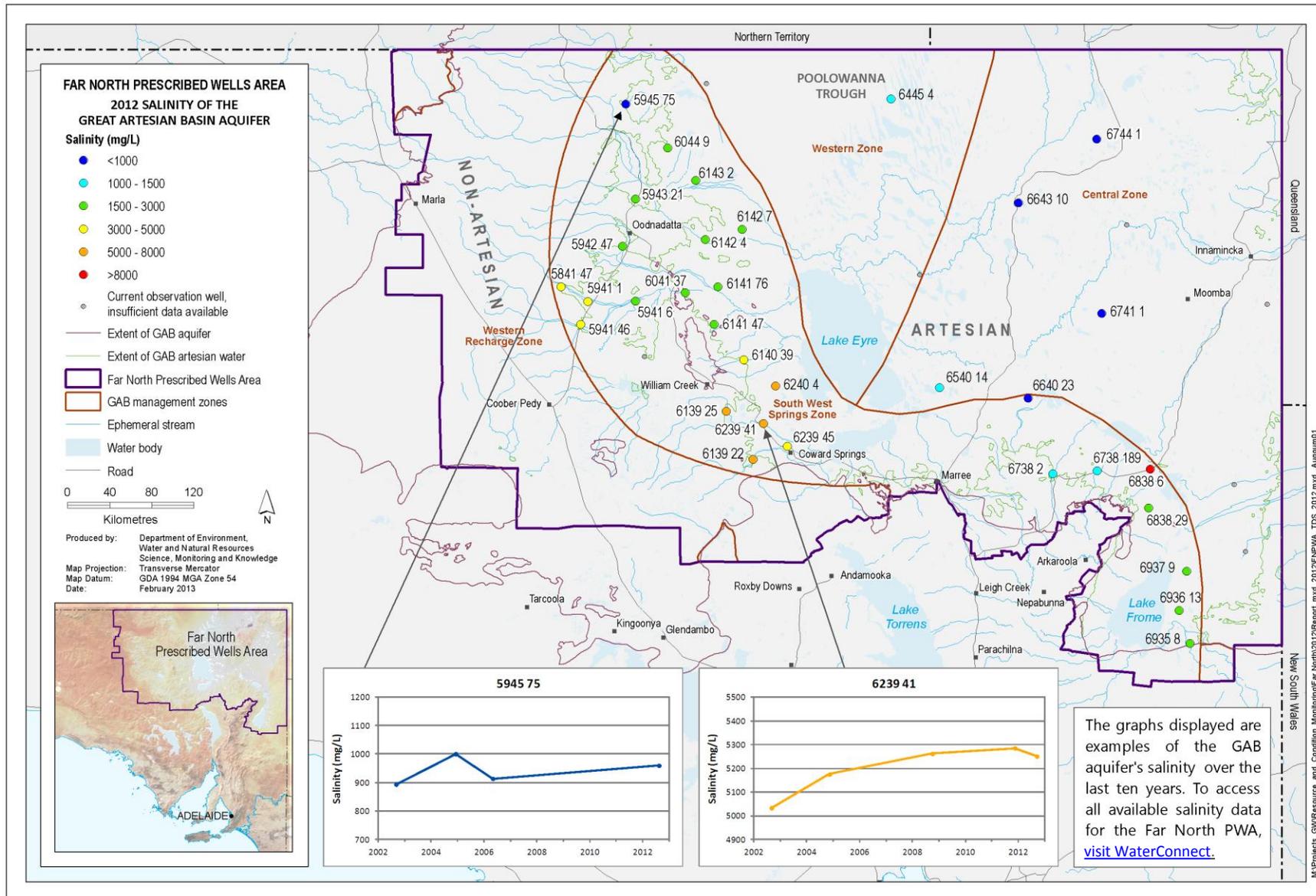


Figure 4. Groundwater salinity of the Great Artesian Basin aquifer of the Far North Prescribed Wells Area for 2012

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