
NORTHERN ADELAIDE PLAINS PWA

T1 AQUIFER

Groundwater Level and Salinity Status Report

2013



Government of South Australia
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Water and Natural Resources

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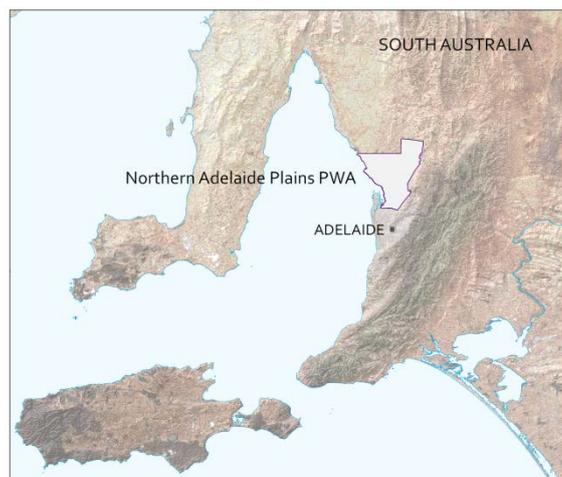
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2013 SUMMARY



The Northern Adelaide Plains Prescribed Wells Area (NAP PWA) is located immediately to the north of the Adelaide metropolitan area. It is prescribed under South Australia's *Natural Resources Management Act 2004* and a water allocation plan provides for the sustainable use of the groundwater resources.

The T1 aquifer is the main source of irrigation extraction in the area south of Waterloo Corner, and consists of several stratigraphic units varying in lithology and thickness. In the NAP PWA the T1 aquifer consists primarily of Hallett Cove Sandstone, Dry Creek Sand and limestone of the upper Port Willunga Formation. The T1 aquifer is absent in the north-east of the NAP PWA.

The main source of recharge to the system is from the Mt Lofty Ranges, which lie to the east of the NAP PWA. Rainfall events in the ranges recharge the fractured rock system and in turn, the water filters down-gradient towards the coast, recharging the aquifer systems on the plains.

Metered extractions from the T1 aquifer totalled 3318 ML* for 2012–13 (Fig. 1), which is 64 ML less than the previous water-use year. This volume of extraction equates to 13% of the 26 500 ML total allocation limit for the whole NAP PWA.

Although there is no direct recharge from rainfall to the confined T1 aquifer, there may be an indirect correlation between water levels and rainfall, as dry years will result in increased groundwater pumping, which in turn may lead to a lowering of groundwater levels. Conversely, groundwater levels may rise after a wet year due to reduced extractions. The Smithfield rainfall station (number 23025) is located in the centre of the NAP PWA and recorded 462 mm of rain in 2013. This is only slightly less than the long-term average annual rainfall of 476 mm for that station, and is comparable to the 452 mm of rainfall recorded in 2012. In 2013, the months of February, May, July and August recorded rainfall above their long-term average, while all other months, with the exception of April, recorded rainfall significantly below their long-term average (Fig. 2). 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 at www.longpaddock.qld.gov.au/silo.

Periods of rising and of declining groundwater levels have been observed over the last 50 years. Seasonal fluctuations are generally between 5 and 10 m and overall groundwater levels have been relatively stable over the last ten years. Pumping from the T1 aquifer for industrial purposes has formed a large long-standing cone of depression near the coast in the south-western corner of the NAP PWA that has been relatively stable over the last 20 years (Fig. 3).

In 2013, rises in the maximum recovered groundwater level ranging from 0.03 to 1.83 m were recorded in eleven observation wells (55%), when compared to 2012 groundwater level data. Declines ranging from 0.04 to 1.03 m were recorded in nine observation wells (45% of total), which primarily located south of the Little Para River (Fig. 4). The overall rise in groundwater levels since last year may be the result of the slight decrease in groundwater extractions. The observed fluctuations in the water level are within the natural, long-term variability of the resource (Fig. 4) and are linked to fluctuations in rainfall and extraction volumes.

** The licensed groundwater use for the 2012–13 water-use year is based on the best data available as of February 2014 and may be subject to change, as some extraction volumes are in the process of being verified*

Groundwater of the T1 aquifer is relatively fresh with most wells recording salinities of less than 1500 mg/L, however the salinity has been found reach up to nearly 8000 mg/L in some areas.

In 2013, salinity ranged between 400 and 3500 mg/L, with 81% of monitored wells recording a salinity of less than 1500 mg/L (Fig. 5). Of the wells with salinity records for both 2012 and 2013, the majority (60%) recorded a decrease in salinity in 2013 when compared to 2012 data. However, these changes were insignificant (less than a 5% change in salinity).

The T1 aquifer of the Northern Adelaide Plains Prescribed Wells Area 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 reporting period. Continuation of these trends favours a very low likelihood of negative impacts on beneficial uses such as drinking water, irrigation or stock watering. The 2013 status for the T1 aquifer is supported by:

- an overall increase in the maximum recovered groundwater level when compared to 2012 groundwater level data
- no significant change in groundwater salinity when compared to 2012 salinity data.

To view the *Northern Adelaide Plains PWA groundwater level and salinity status report 2009–10*, which includes background information on hydrogeology, rainfall and relevant groundwater-dependent ecosystems, and to view the descriptions of all status symbols, please visit the *Water Resources* page on [WaterConnect](#).

For further details about the Northern Adelaide Plains PWA, please see the *Adelaide Plains Water Allocation Plan* on the Adelaide and Mt Lofty Ranges Natural Resources Management [website](#).

Northern Adelaide Plains PWA: T1 aquifer annual groundwater extraction

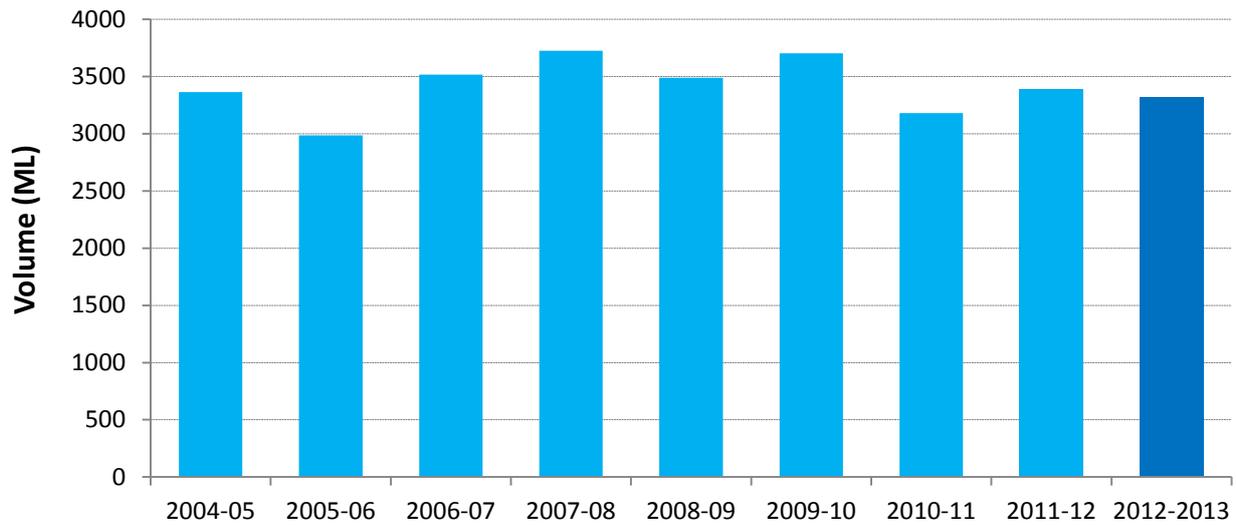


Figure 1. Historical licensed groundwater use* for the T1 aquifer of the Northern Adelaide Plains Prescribed Wells Area

* The licensed groundwater use for the 2012–13 water use year is based on the best data available as of February 2014 and may be subject to change, as some extraction volumes are in the process of being verified

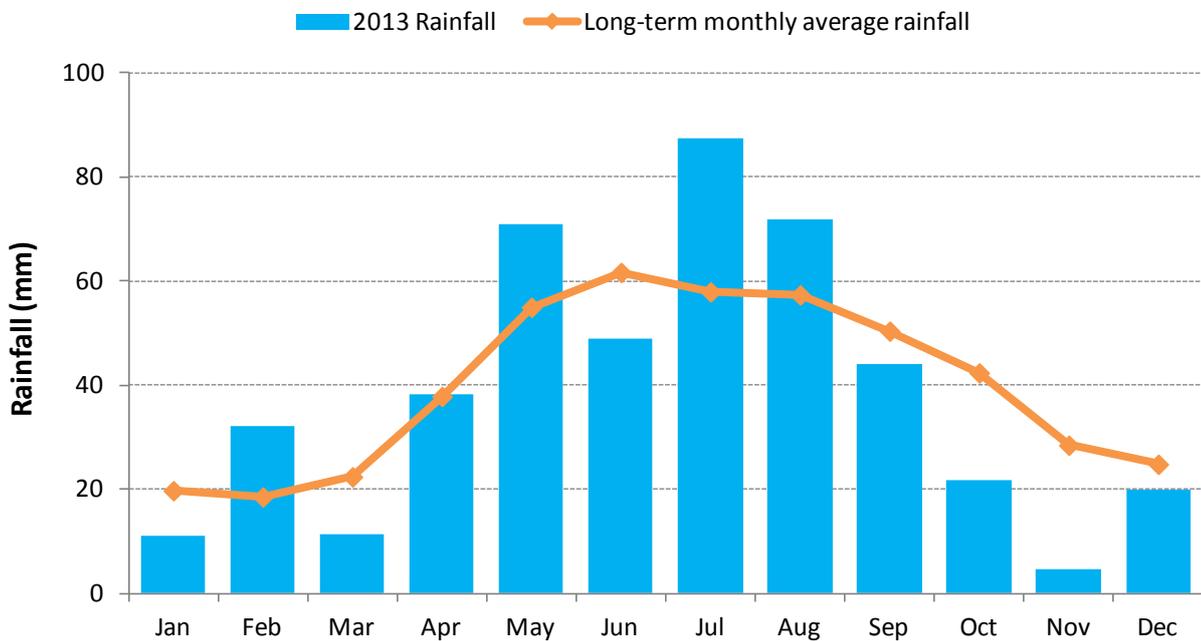


Figure 2. Monthly rainfall (mm) for 2013 and the long-term average monthly rainfall (mm) at the Smithfield rainfall station (number 23025) in the Northern Adelaide Plains Prescribed Wells Area

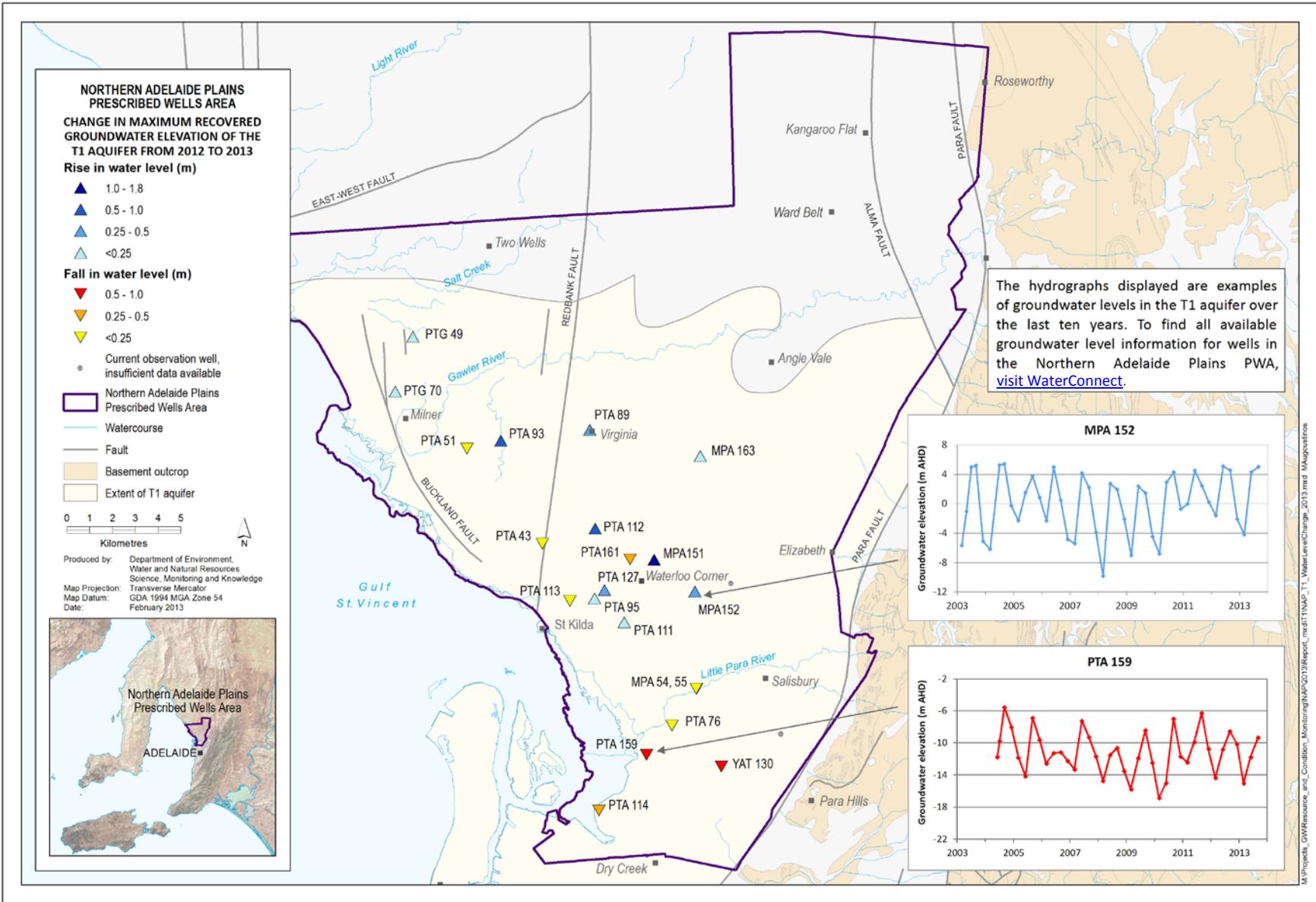


Figure 4. Overall changes in maximum recovered groundwater levels in the T1 aquifer of the Northern Adelaide Plains Prescribed Wells Area

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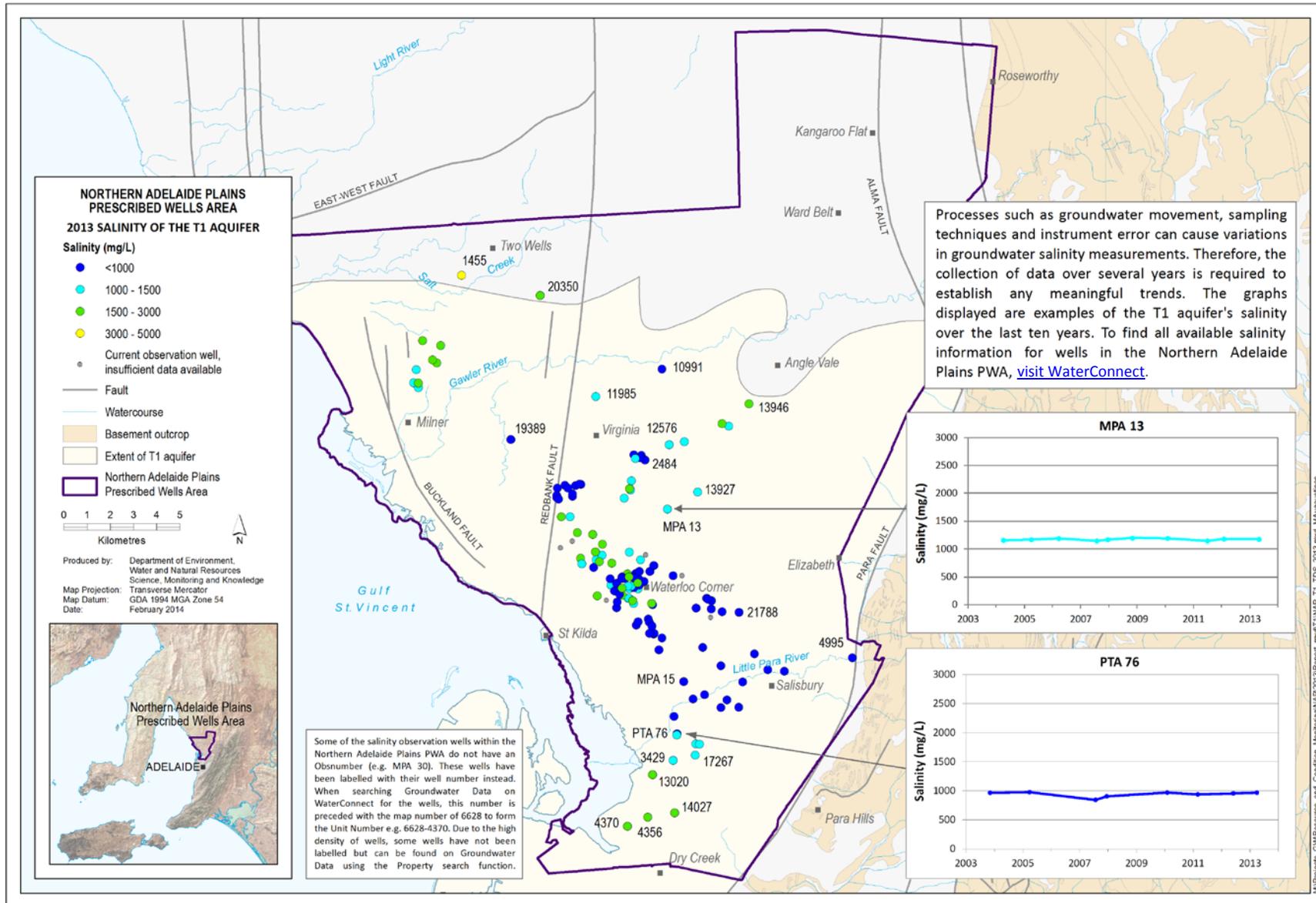


Figure 5. Groundwater salinity of the T1 aquifer of the Northern Adelaide Plains Prescribed Wells Area for 2013

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