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# WILLOCHRA BASIN

## GROUNDWATER LEVEL AND SALINITY STATUS REPORT

2011

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Water and Natural Resources

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## 2011 SUMMARY



The Willochra Basin is situated approximately 50 km east of Port Augusta and 350 km north of Adelaide in the Mid-North of South Australia. It is a local-scale groundwater resource which is not prescribed under South Australia's *Natural Resources Management Act 2004*.

The Willochra Basin consists of an inter-montane valley about 80 km long orientated in a north-south direction, flanked by Adelaidean fractured rocks (B). The valley is filled with fluvial and lacustrine Tertiary sediments (T) which are up to 150 m thick. These sediments are overlain by alluvial outwash sediments of Quaternary to Recent age (Q) up to 50 m thick.

Groundwater is the only source of water in the basin and is used for town water supplies, the irrigation of lucerne, stock supplies and domestic use. Because the Willochra Basin is not prescribed under the *Natural Resource Management Act 2004*, there is no licensing of groundwater extractions and no metering of extraction volumes (apart from town water supplies). In 2010–11, the town water supply use for Melrose was 44.45 ML which was obtained from two wells completed in the Tertiary confined aquifer and fractured rock aquifer, located about 5 km northeast of the town. This amount represents a decrease of 26% when compared to the previous year. The town water usage for Willowie which is located inside the Basin was 31.43 ML for 2010–11.

The climate of the Willochra Basin is characterised by hot, dry summers and cool to cold, wet winters. The long-term average annual rainfall in Melrose rainfall station (19024) for 1925–2011 is 576 mm. Annual average rainfall for Bruce (19008) and Wilmington (19048) are 269 mm and 425.7 mm respectively. Below average rainfall was observed at Melrose between 2002 and 2007, with above average rainfall recorded in 2009 and 2010. The 2011 rainfall was 545.9 mm which is slightly below average (Fig. 1).

Groundwater levels have shown a declining trend for the majority of wells (15 out of 18 wells) over the past 30 years due to a prolonged period of below-average rainfall. Higher rainfall in 2009 and 2010 led to a stabilisation of the declining trend or a rise in level in some cases. In 2011 the majority of observation wells show a rise in the maximum water level attained in comparison to the maximum water level observed in 2010. Of the seven (out of 18) wells which show slight declines (up to 0.24 m) on the maximum water level from 2010, all but two are located in the Quaternary aquifer indicating that this is in response to the lower rainfall over that period. The location and the changes in groundwater level for the recent year are presented in Figure 2.

The groundwater salinity observation network for the Willochra Basin is shown in Figure 3. Over the past 30 years the salinity trend for the majority of observation wells (six out of eight wells) was rising in response to below-average rainfall. In 2011 three out of nine wells showed a significant decline in salinity (up to 2773 mg/L) on the previously recorded reading, whilst six wells showed a slight increase in salinity of 11 to 168 mg/L from that previously recorded.

The groundwater resource has been assigned a green status for 2011:

## 2011 STATUS

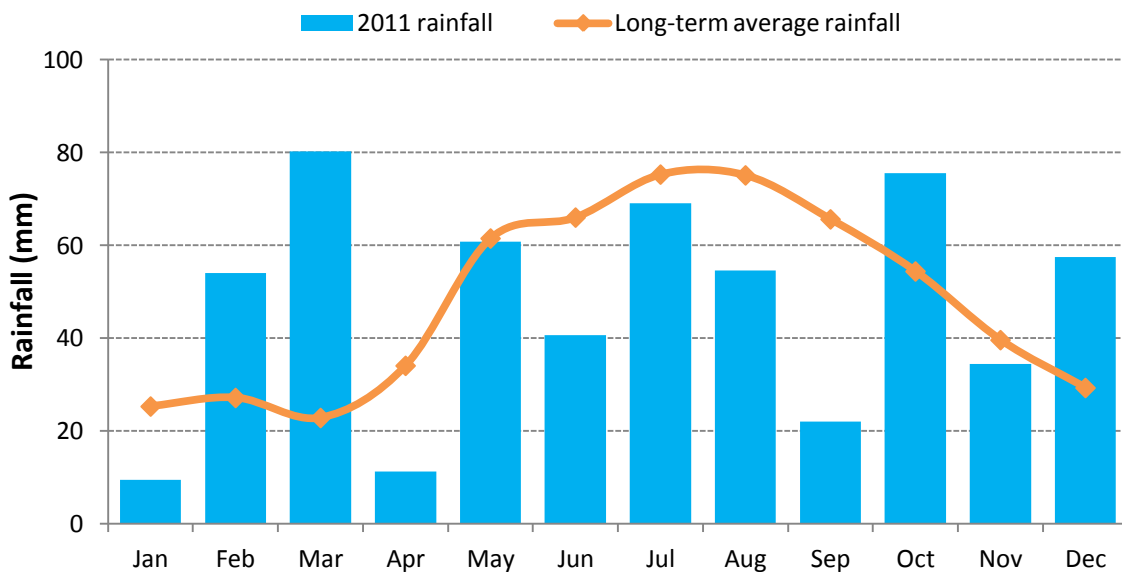
“No adverse trends, indicating a stable or improving situation”

This means that observed groundwater level and salinity trends are either stable (no significant change) or improving (i.e. decreasing salinity or rising water levels). The 2011 status for the Willochra Basin is supported by:

- 11 out of 18 wells showed a rise in maximum groundwater level from 2010 readings
- Three out of nine wells showed a significant decline in salinity of up to 2773 mg/L.
- Whilst six wells displayed a slight rise in salinity on that previously recorded, the increase for 5 of the wells was to a maximum of 37 mg/L whilst the maximum salinity increase was 168 mg/L
- Monthly rainfalls were below the long-term average for Melrose and Wilmington and above average in Bruce rainfall station.

To view the *Willochra Basin Groundwater Level and Salinity Status Report 2009–10*, 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](#).



**Figure 1. Monthly rainfalls (mm) for 2011 and the long-term average monthly rainfall (mm) at the Melrose rainfall station (19024) in the Willochra Basin**

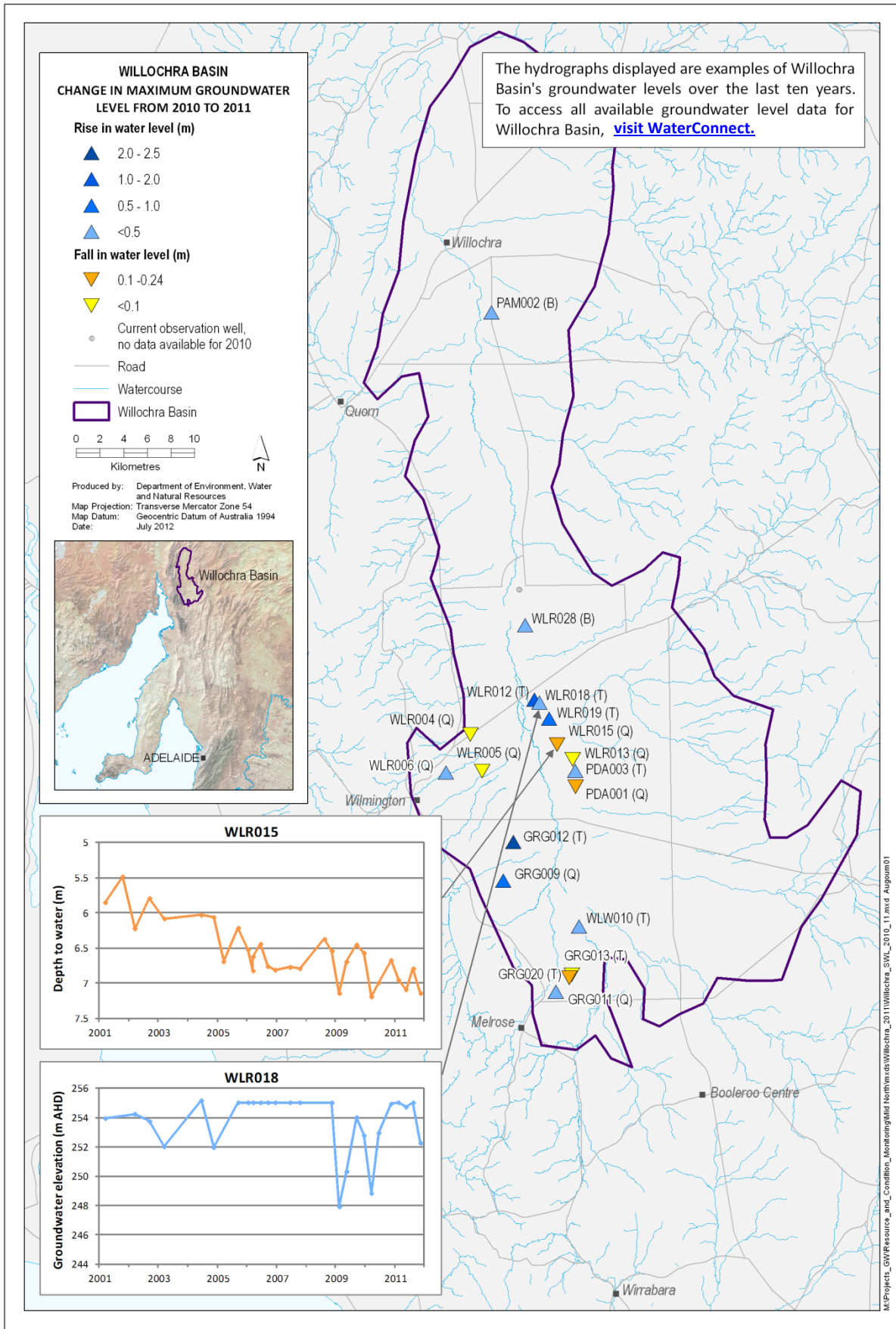


Figure 2. Overall changes in maximum groundwater levels in Willochra Basin from 2010 to 2011

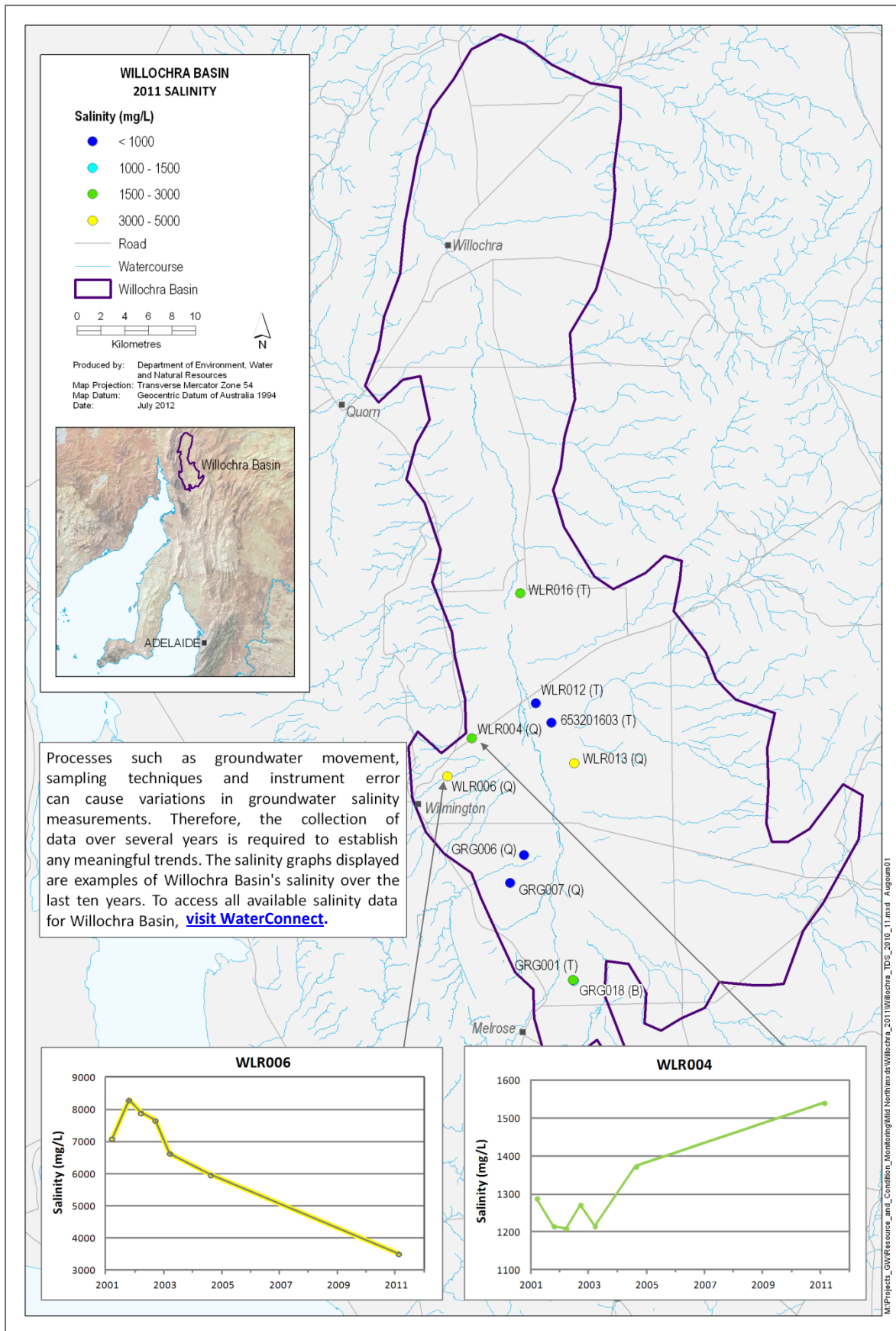


Figure 3. Groundwater salinity of the Willochra Basin for 2011