
MCLAREN VALE PWA

PORT WILLUNGA FORMATION AQUIFER

Groundwater Level and Salinity Status Report

2013



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Water and Natural Resources

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2013 SUMMARY



The McLaren Vale Prescribed Wells Area (PWA) is located approximately 35 km south of Adelaide. It is a regional-scale resource for which groundwater has been prescribed under South Australia's *Natural Resources Management Act 2004*. A Water Allocation Plan provides for sustainable management of the water resources.

The Willunga Basin, within the McLaren Vale PWA, is a structurally controlled trough, bounded in the south-east by the Willunga Fault and to the north by basement outcrop. The basin contains sedimentary aquifers of Quaternary and Tertiary age and a fractured rock aquifer which forms the hills to the east of the Willunga Fault and outcrops to the north. There are four aquifer systems recognised within the Willunga Embayment; the Quaternary aquifer, Port Willunga Formation aquifer, Maslin Sands aquifer and the Fractured Rock aquifer. The confined Port

Willunga Formation aquifer is a coarse-grained limestone overlain by younger Quaternary aquifers and underlain by the Maslin Sands and Fractured Rock aquifers. Groundwater movement within the Port Willunga Formation typically flows from the higher north-eastern part of the basin towards the coast in a south-westerly direction.

Groundwater extractions (excluding stock and domestic use) from the Port Willunga Formation aquifer in the McLaren Vale PWA totalled 2822 ML in 2012-13 which represents a 311 ML (12 %) increase in groundwater extraction from the previous year (Fig. 1). This increase was smaller, however, when compared with the 835 ML increase in groundwater extraction which occurred from 2011 to 2012. Groundwater extraction from the Port Willunga Formation aquifer accounted for 66 % of the total groundwater used within the McLaren Vale PWA, with the primary use for this groundwater being viticulture.

The climate of the McLaren Vale PWA is characterised as Mediterranean with hot, dry summers and mild, wet winters. Rainfall is the primary source of recharge as the aquifer is replenished by infiltration through the soil or by percolation as a result of streamflow in drainage lines at or near the Willunga Fault. Data from the Willunga rainfall station (23753) was chosen for the analysis of rainfall trends. In Figure 2, the long-term monthly average rainfall is graphed in orange with the total monthly rainfall graphed in blue. In 2013, the total annual rainfall was 665.5 mm, slightly above the annual average of 643 mm. The notable feature of this graph is high rainfall that occurred in June and July, where rainfall was up to 60 mm above the average monthly rainfall amount.

Groundwater levels in the Port Willunga Formation aquifer have shown widespread declines of up to 5 m since 1993. However, since 2010, most observation wells show stable conditions or a reduced rate of decline most likely in response to reduced extraction in 2010-11 and above average rainfall in 2012. In 2013, 22 observation wells located within the Port Willunga Formation had sufficient records to compare the maximum recovered water levels with those recorded in 2012 (Fig. 3). The groundwater levels were found to decline in 68% of the wells, by up to 0.5 m. (Fig. 3). The median change in maximum levels from 2012 and 2013 was a decline of 0.15 m. In light of the higher than average rainfall in the 2013 winter/spring, the overall decline in the groundwater levels can be attributed to the increased rate of extraction over the 2012-13 period.

The groundwater salinity observation network for the McLaren Vale PWA Port Willunga Formation aquifer is shown in Figure 4. During the past 10 years from 2003 to 2013, several wells showed an increasing trend. In 2013, all but 15 wells recorded salinities of less than 1500 mg/L. However, as only 6 wells were sampled in 2012, it is not possible to draw conclusions regarding general trends in aquifer salinity over the course of the reporting period.

The Port Willunga Formation aquifer in the McLaren Vale PWA 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 the resource status have been observed over the reporting period. Continuation of these trends is unlikely to negatively impact the beneficial use (i.e. drinking water, irrigation or stock watering) of the resource for at least 15 years. The 2013 status for the Maslin Sands aquifer is supported by:

- an overall decline in the maximum recovered water level for 2013 when compared to 2012 data.

There was insufficient data available to allow an assessment of salinity trends within the resource, however most wells that were monitored in 2013 continued to indicate salinity levels of less than 1500 mg/L.

To view the *McLaren Vale Prescribed Wells Area 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 details about the relevant prescribed resource please see the Water Allocation Plan for the [McLaren Vale Prescribed Wells Area](#).

McLaren Vale PWA: Pt. Willunga Formation annual groundwater extraction

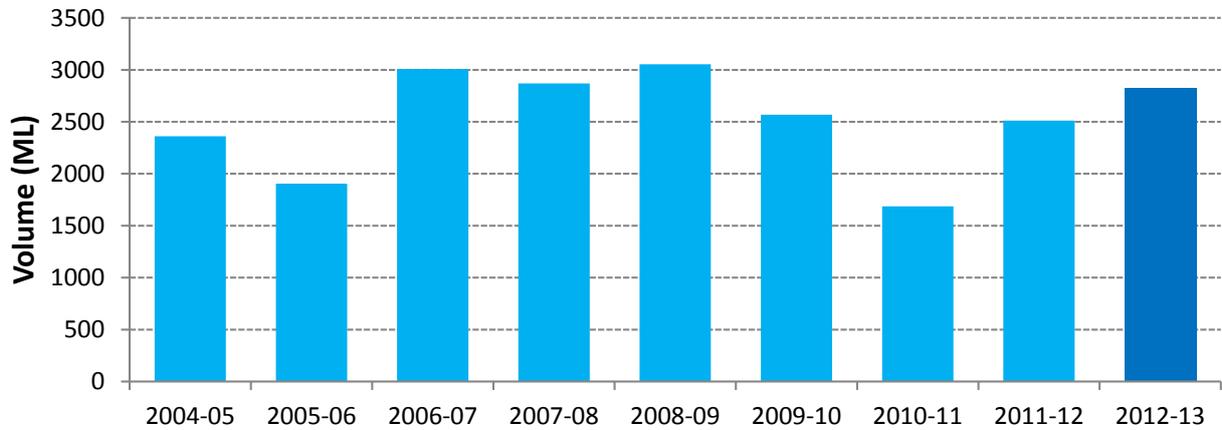


Figure 1. Historical licensed groundwater use for the Port Willunga Formation in the McLaren Vale Prescribed Wells Area

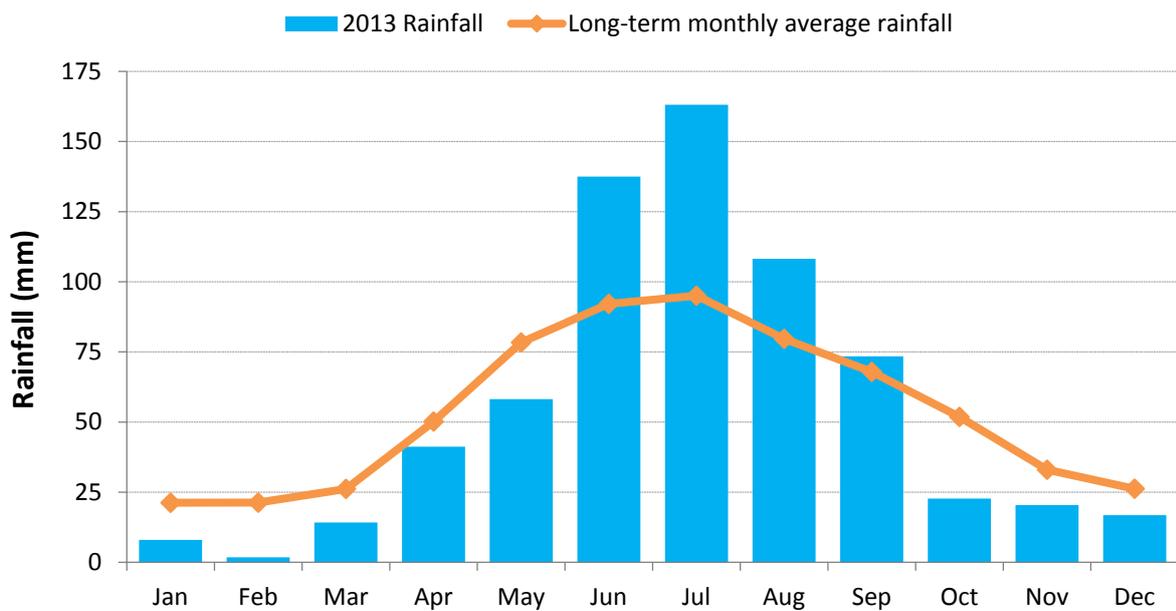


Figure 2. Monthly rainfall (mm) for 2013 and the long-term average monthly rainfall (mm) at the Willunga rainfall station (23753) in the McLaren Vale Prescribed Wells Area

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

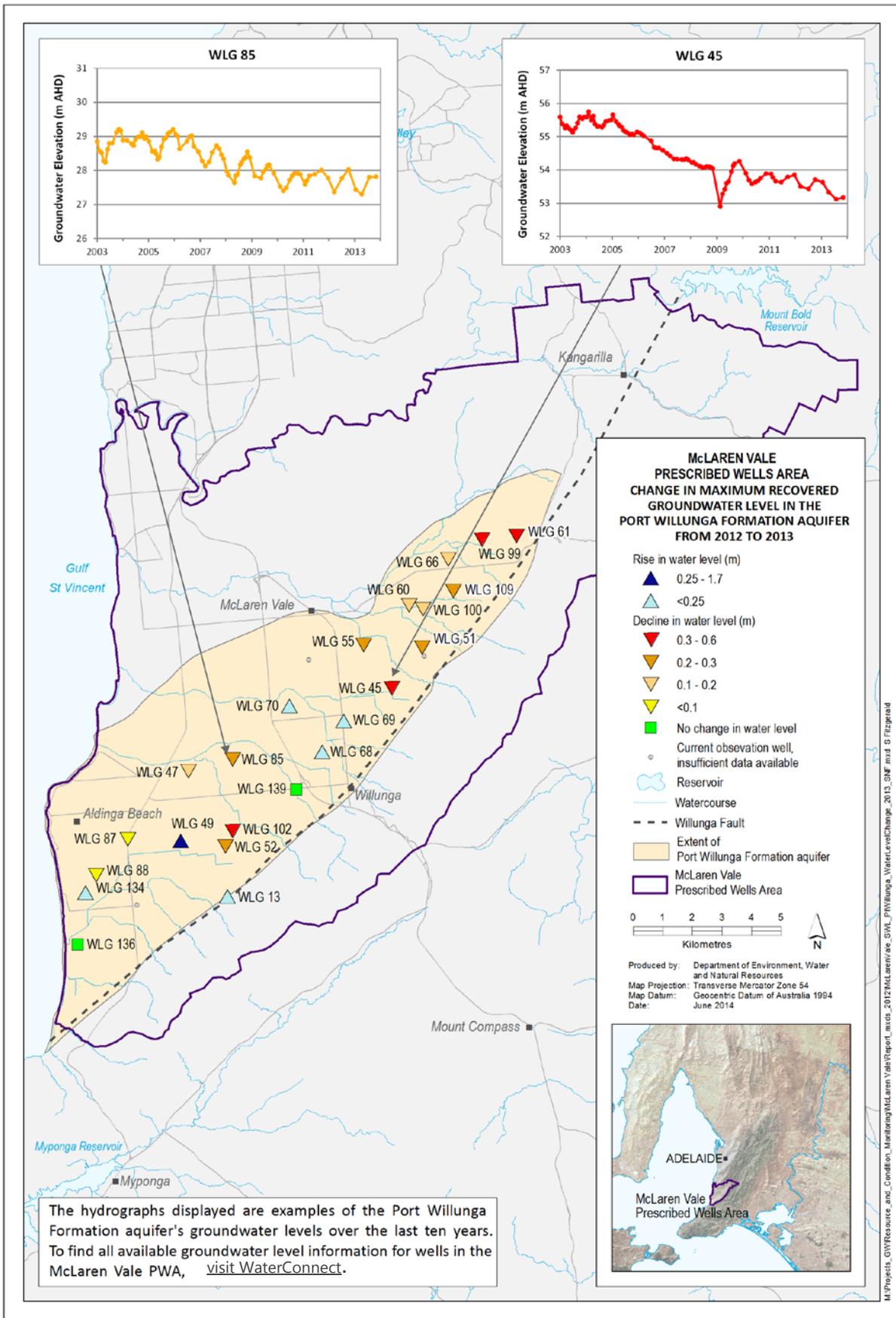


Figure 3. Overall changes in maximum groundwater levels in Port Willunga Formation Aquifer in the McLaren Vale Prescribed Wells Area from 2012 to 2013

McLaren Vale Prescribed Wells Area

Port Willunga Formation aquifer Groundwater Status Report 2013

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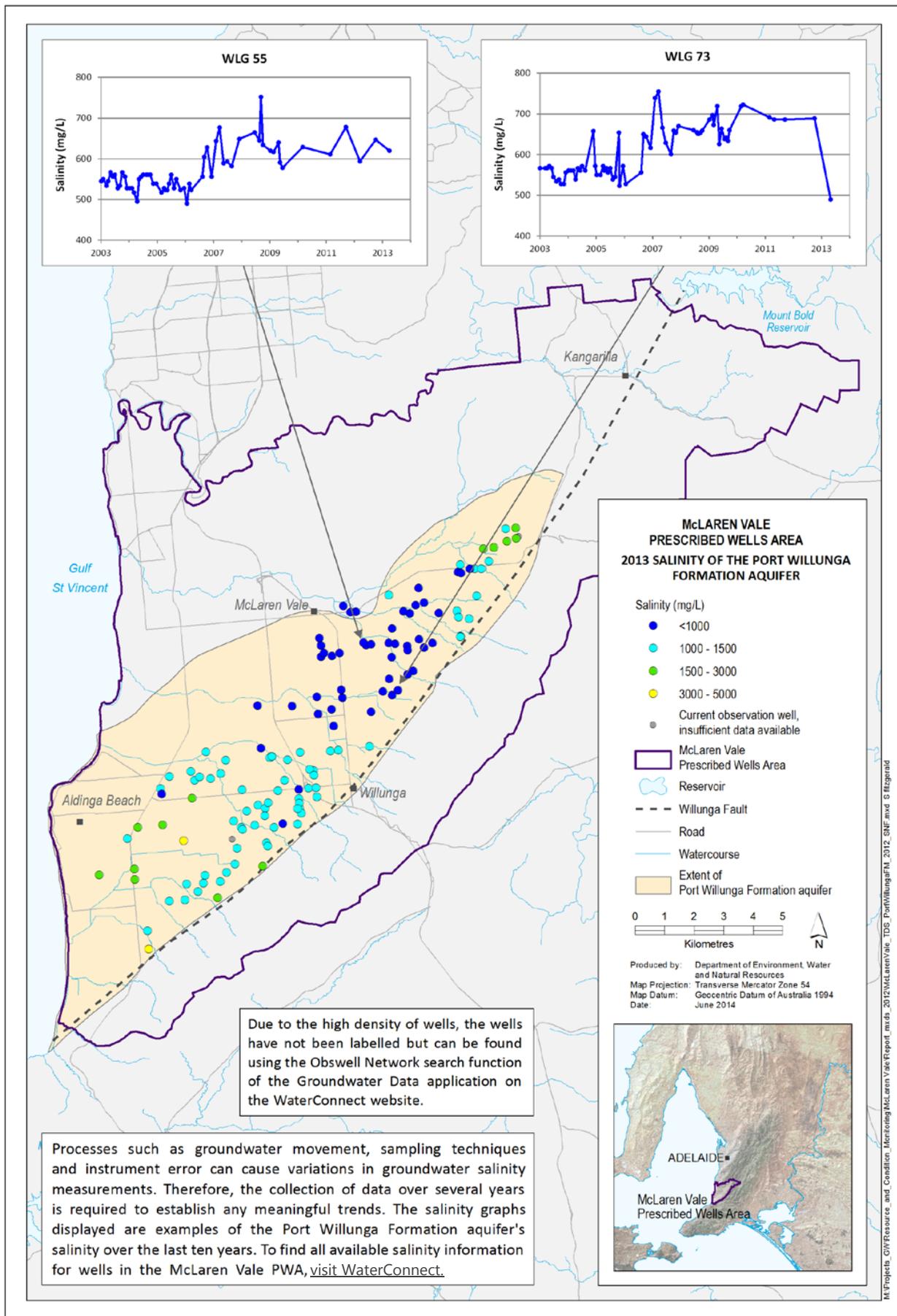


Figure 4. Groundwater salinity of the Port Willunga Formation aquifer in the McLaren Vale Prescribed Wells Area for 2013. McLaren Vale Prescribed Wells Area Port Willunga Formation aquifer Groundwater Status Report 2013 Department of Water, Environment and Natural Resources | 5 |