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# SOUTHERN BASINS PWA

## ULEY WANILLA LENS

Groundwater Level and Salinity Status Report

2012

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Water and Natural Resources

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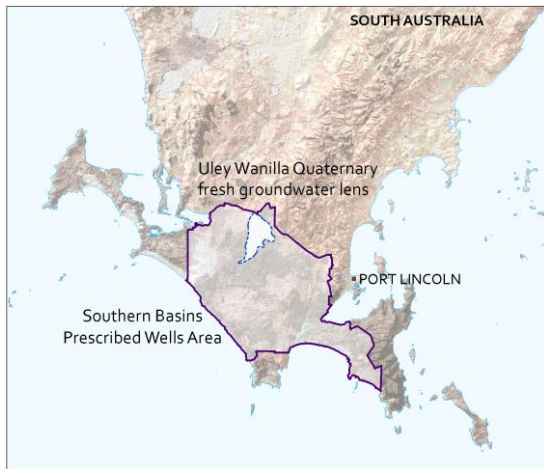
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# 2012 SUMMARY

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The Southern Basins Prescribed Wells Area (PWA) is located at the southern most part of the Eyre Peninsula, approximately 270 km west of Adelaide. 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 Uley Wanilla lens is located in the north of the Southern Basins PWA.

Within the Southern Basins PWA there are two main sedimentary sequences containing groundwater that overlie basement rocks: the Quaternary limestone aquifer and the underlying Tertiary sands aquifer. The Quaternary limestone aquifer comprises a generally thin veneer of aeolianite sediments of the Bridgewater Formation and is continuous across the PWA. Areas within the Quaternary limestone aquifer defined by salinity of less than

1000 mg/L, such as the Uley Wanilla lens, are described as a fresh groundwater lens in the current Water Allocation Plan. The main source of recharge to the Quaternary limestone aquifer is the direct infiltration of rainfall and groundwater flow is predominantly in a southerly direction towards the coast.

Licensed groundwater extractions occur predominantly from fresh groundwater lenses within the Quaternary limestone aquifer and in 1949 the Uley Wanilla lens was the first groundwater lens developed to augment the Tod River Reservoir. Extractions from Uley Wanilla have decreased steadily since 1993 in response to falling groundwater levels. Metered extractions from the Uley Wanilla lens totalled 66 ML\* in 2011–12, a 45% decrease from the previous water-use year (Fig. 1). This volume of extraction equates to 33% of the total allocation limit of 198 ML for the Uley Wanilla lens and is 1% of the total licensed extractions from the Southern Basins PWA.

The sustainability of the groundwater resources in the Southern Basins PWA is highly dependent on recharge from rainfall. Historical rainfall data has indicated that trends of above or below-average rainfall can last for up to 25 years and greater recharge responses have been observed when rainfall occurs in high-intensity events. The Big Swamp rainfall station (number 18017), located to the east of the Uley Wanilla lens, recorded 476 mm of rainfall in 2012. This is over 85 mm less than the long-term average annual rainfall for that station. The month of June received rainfall significantly above its long-term monthly average, but July and September through to December recorded significantly below-average rainfall (Fig. 2).

Long-term observation records show a positive correlation between groundwater levels and rainfall. A trend of declining groundwater levels between 1940 and 1963 coincides with a dominant below-average trend in rainfall recorded at the Big Swamp rainfall station for that period. Between 1963 and 1985 the observation records show an overall increase in groundwater levels; Big Swamp rainfall station recorded an overall trend of above-average rainfall for the same period. Since 1985 there has been an overall decline in groundwater levels of up to five metres. However, the trend of above-average rainfall recorded at Big Swamp rainfall station does not change to a trend of below-average rainfall until 1992. The rise in groundwater levels recorded in observation wells in 2009 and 2010 correlates with above-average rainfall received in those years, but levels are still well below those recorded before 1985. In 2012, five wells recorded a decrease in the maximum recovered groundwater level of up to 0.12 m; however, this is less than 5% of the known saturated thickness of the Uley Wanilla lens in these areas. Additionally, two wells recorded an increase of up to 0.05 m and three wells recorded no change when compared to 2011 water level data (Fig. 3).

\* The licensed groundwater use for the 2011–12 water use year is based on the best data available as of March 2013 and may be subject to change, as some extraction volumes are in the process of being verified

Groundwater salinities of the Quaternary limestone aquifer range from 400 to 800 mg/L (Fig. 4). Observation wells show a variety of salinity trends over the historical record—some are increasing, others are decreasing and some are stable. Regular salinity measurements taken from town water supply wells show salinities have stabilised since 2009 and salinities measured in 2012 are similar to 2011 values.

The Uley Wanilla lens of the Southern Basins PWA 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 uses such as drinking water, irrigation or stock watering. The 2012 status for the Uley Wanilla lens is supported by:

- no significant change in the maximum recovered groundwater level when compared to 2011 water level data
- no significant change in salinity when compared to 2011 salinity data.

To view the *Southern Basins PWA groundwater level and salinity status report 2011*, which includes background information on hydrogeology, rainfall stations and relevant groundwater-dependent ecosystems, [visit WaterConnect](#).

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

For further details about the Uley Wanilla lens, please see the [Water Allocation Plan for the Southern Basins Prescribed Wells Area](#).

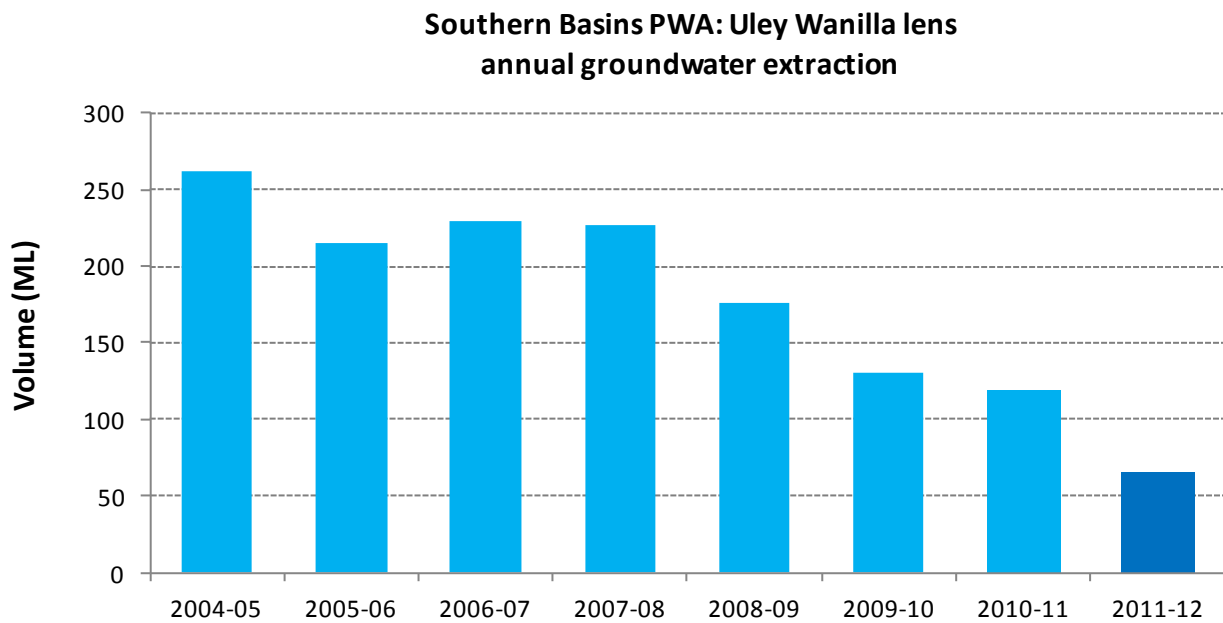


Figure 1. Historical licensed groundwater use\* for the Uley Wanilla lens of the Southern Basins Prescribed Wells Area

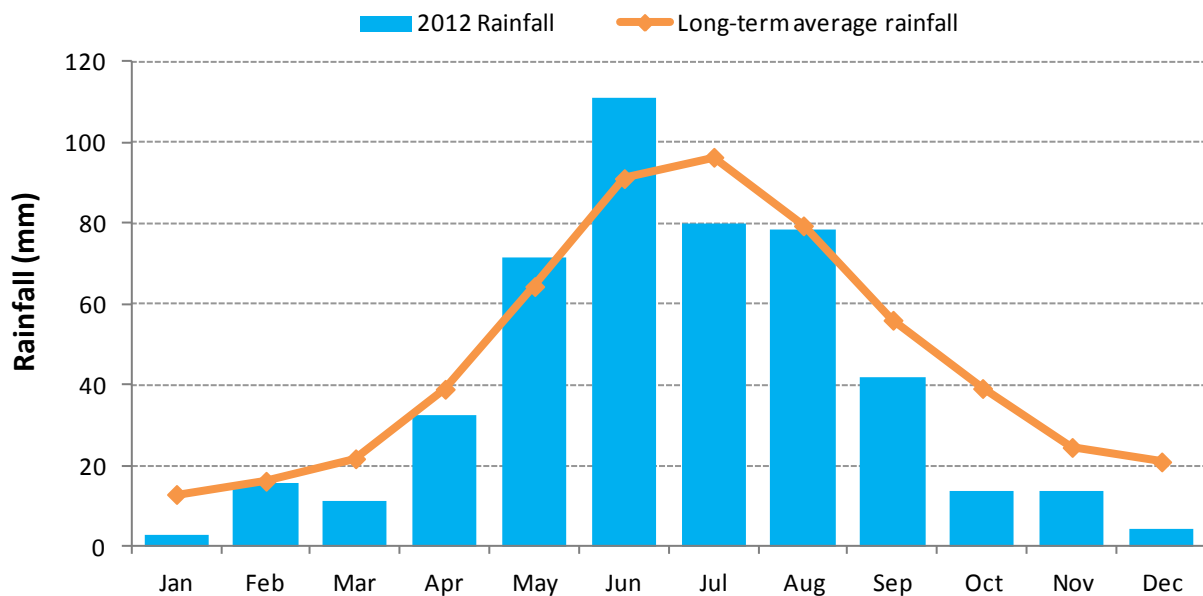


Figure 2. Monthly rainfall (mm) for 2012 and the long-term average monthly rainfall (mm) at the Big Swamp rainfall station (number 18017) in the Southern Basins Prescribed Wells Area

\* The licensed groundwater use for the 2011–12 water use year is based on the best data available as of March 2013 and may be subject to change, as some extraction volumes are in the process of being verified.

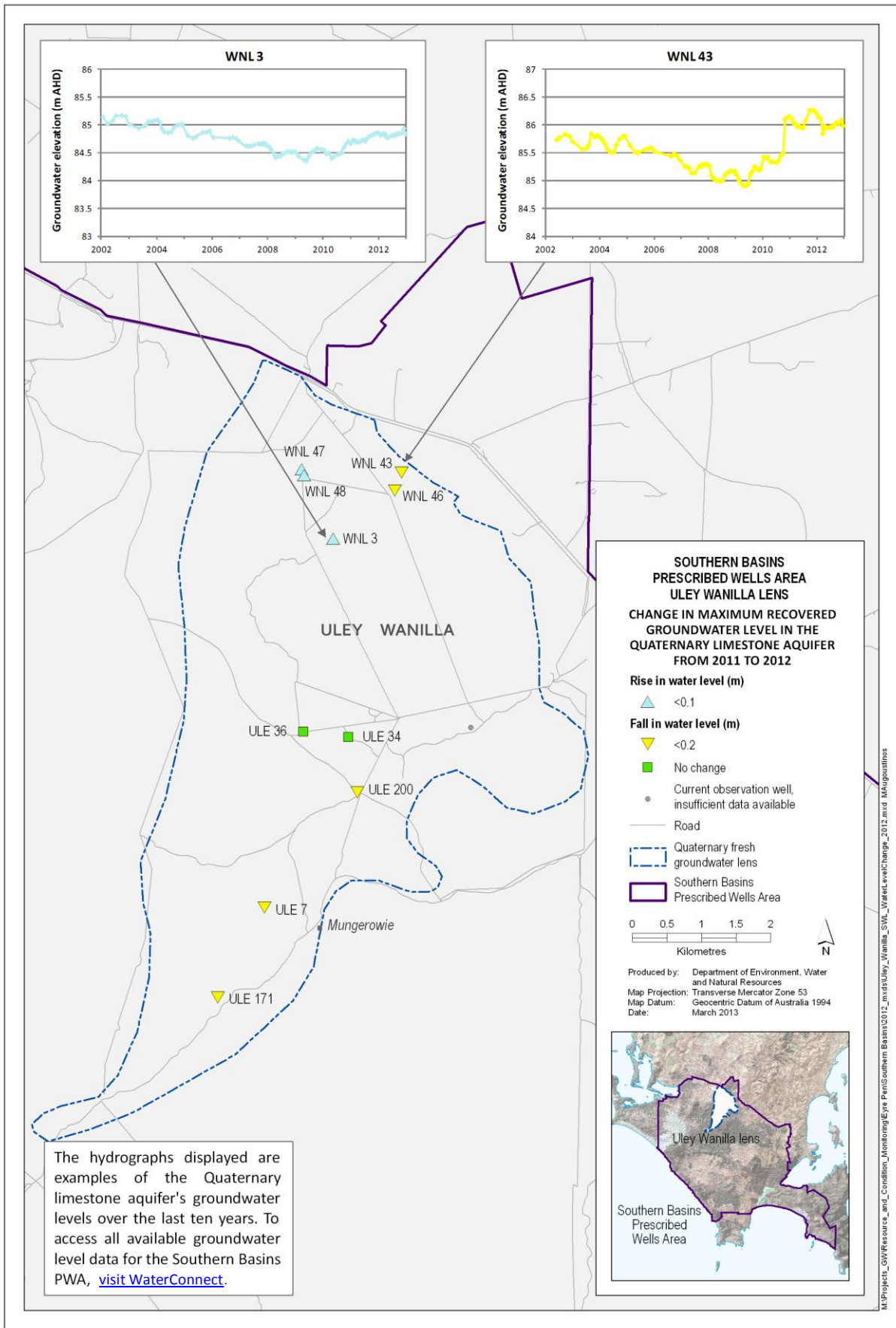


Figure 3. Overall changes in maximum recovered groundwater levels in the Uley Wanilla lens of the Southern Basins Prescribed Wells Area from 2011 to 2012

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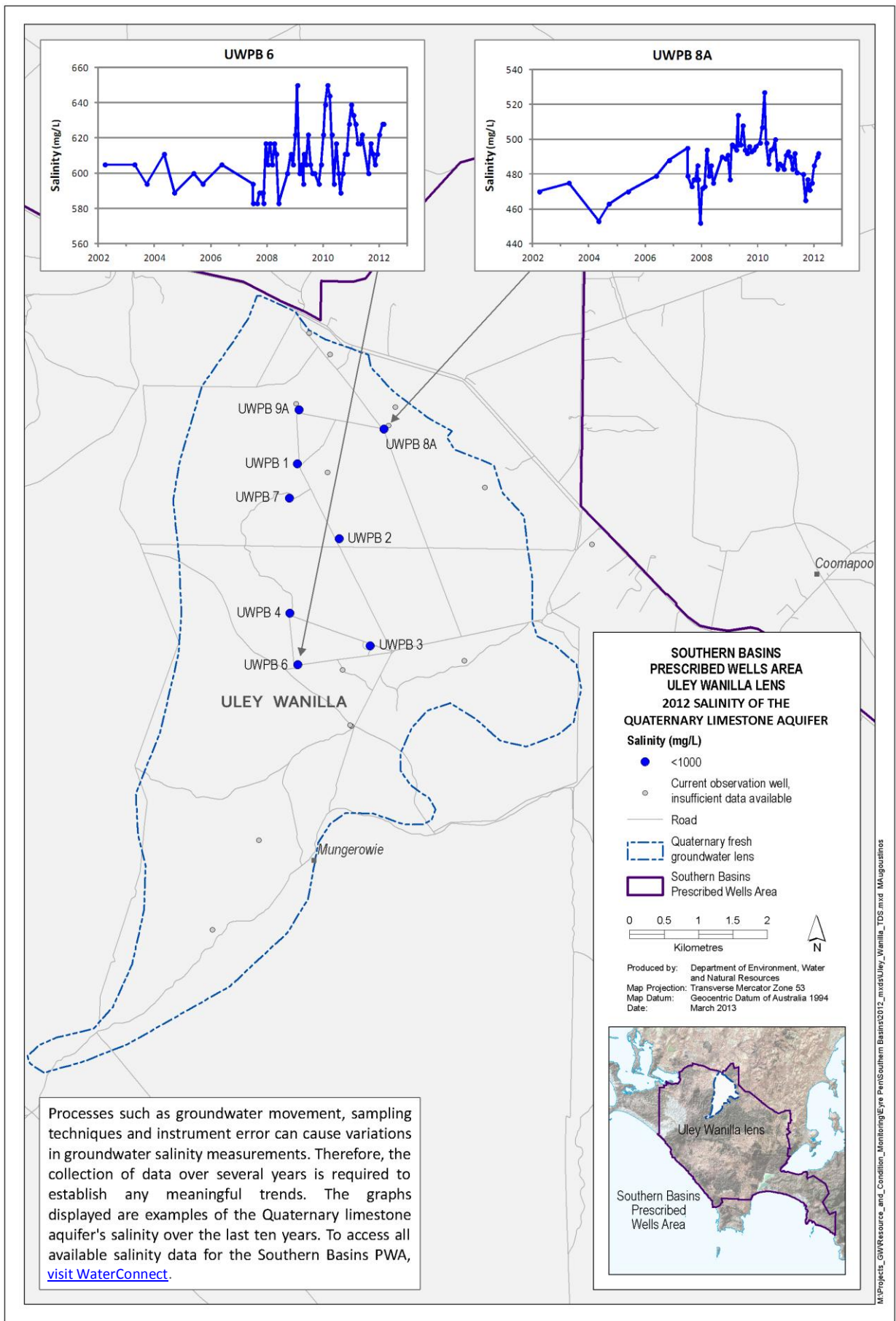


Figure 4. Groundwater salinity of the Uley Wanilla lens in the Southern Basins Prescribed Wells Area for 2012

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