McLaren Vale PWA

Maslin Sands aquifer

2015 Groundwater level and salinity status report

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

Department of Environment, Water and Natural Resources
GPO Box 1047, Adelaide SA 5001

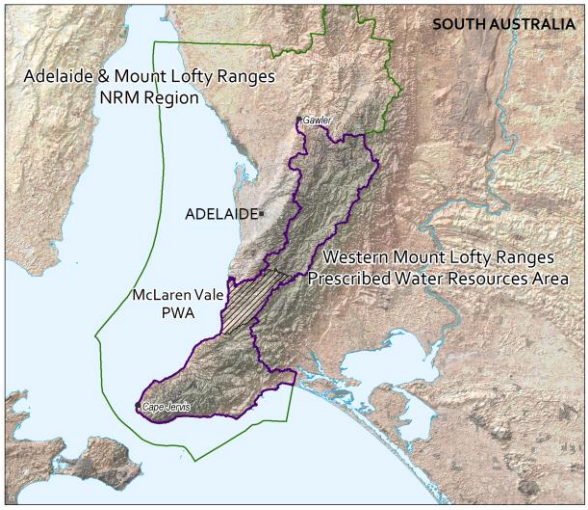
Telephone	National	(08) 8463 6946
	International	+61 8 8463 6946
Fax	National	(08) 8463 6999
	International	+61 8 8463 6999
Website	www.environment.sa.gov.au	

ISBN 978-1-925510-12-6

DEWNR, 2016, *McLaren Vale PWA Maslin Sands aquifer 2015 Groundwater level and salinity status report,* Government of South Australia, through the Department of Environment, Water and Natural Resources, Adelaide

Download this document at www.waterconnect.sa.gov.au

2015 Summary



The McLaren Vale Prescribed Wells Area (PWA) is located approximately 35 km south of Adelaide. It lies within the Adelaide and Mount Lofty Ranges Natural Resources Management Region (location map left). For those groundwater resources located within the WMLR PWRA, but outside the McLaren Vale PWA, a separate groundwater level and salinity status report has been prepared and it can be found on the *Water Resource Assessments* page of WaterConnect. Both the McLaren Vale PWA and WMLR PWRA comprise regional-scale groundwater resources, for which groundwater has been prescribed under South Australia's *Natural Resources Management Act 2004*, and in each of these two areas a water allocation plan provides for the sustainable management of the water resources.

Underlying the McLaren Vale PWA is the Willunga Embayment, a structurally controlled trough containing sedimentary aquifers of Quaternary and Tertiary age that is bounded in the south-east by the Willunga Fault and to the north by basement outcrop. This report focuses on the Tertiary-aged Maslin Sands aquifer that comprises fine to coarse sands and clays. It is unconfined in the north-east of the PWA, and crops out to the north and north-east of McLaren Vale. Further to the south-west, it becomes confined and is separated from the overlying Port Willunga Formation aquifer by the Blanche Point Formation confining layer that comprises low-permeability marine mudstones and limestones. Groundwater flows from the elevated recharge areas in the north-east, toward the south-west. Recharge to the Maslin Sand aquifer is thought to occur where it is unconfined, via infiltration through the soil or by percolation of streamflow in drainage lines.

Rainfall and groundwater extractions are important factors that govern changes in groundwater level and salinity of the Maslin Sands aquifer. Below-average rainfall results in a reduction in recharge to the aquifer. Below-average rainfall can also result in increased irrigation extraction, which may cause the groundwater level to fall and salinity to increase. Conversely, increased rainfall may result in increased recharge and decreased irrigation extraction. This may cause groundwater levels to rise, and salinity to stabilise or decline.

The Willunga rainfall station (BoM Station 23753) recorded 414 mm in the 2014–15 water-use year, 227 mm less than the long-term average annual rainfall of 641 mm (1900–2015) and 178 mm less than the five-year average of 592 mm (Figs. 1 and 2). Although there has been above-average rainfall in three of the past five years, a five-year trend of declining rainfall is evident (Fig. 2).

Licensed groundwater extractions from the Maslin Sands aquifer totalled 690 ML[1] in 2014–15, an increase of 15% on the previous water-use year (Fig. 3). Over the past five water-use years, groundwater extractions have increased as rainfall has declined (Figs 2 and 3).

Groundwater levels in the Maslin Sands aquifer have generally been stable or slowly declining since monitoring began in 1987. Water levels declined by up to 1.5 m following the 2006 drought; however, higher rainfall in recent years has produced a recovery in groundwater levels in some monitoring wells, showing a correlation between wet months (winter/spring) and groundwater levels recovery. In the five years to 2015, just over half of wells show a declining trend in groundwater levels (Fig. 4). Rates of decline ranged between 0.02 and 0.8 m/y, with a median of 0.42 m/y, with the greatest rates of decline observed towards the north-east where the aquifer is unconfined. Forty-four per cent of monitoring wells show either stable water levels or a five-year trend of rising groundwater levels. In 2015, 31% of wells show their lowest groundwater level on record, and these wells are distributed throughout the PWA (Fig. 4).

Due to a paucity of salinity monitoring data in 2015, analyses of data for the five-year period 2010–14 have been used in this report. In 2014, 85% of wells recorded salinity below 1500 mg/L and these are located predominantly in the north-eastern extent of the

[1] The licenced groundwater use for the 2014–15 water-use year is based on the best data available as of March 2016 and could be subject to change, as some extraction volumes may be in the verification process.

Maslin Sands aquifer (Fig. 5). In the five years to 2014, 85% of wells show either stable salinity or a declining trend in groundwater salinity (Fig. 6). The remaining 15% show a trend of rising salinity.

To determine the status of the Maslin Sands aquifer for 2015, the trends in groundwater levels and salinities over the past five years (2011 to 2015, inclusive) were analysed, in contrast to the year-to-year assessments that have been used in past *Groundwater level and salinity status reports*. Please visit the Frequently Asked Questions on the *Water Resource Assessments* page on WaterConnect for more detail on the current method of evaluating the status of groundwater resources.

The Maslin Sands aquifer of the McLaren Vale PWA has been assigned a yellow status for 2015:

2015 Status Minor adverse trends have been observed over the past five years

The 2015 status for the Maslin Sands aquifer is based on:

- most monitoring wells (56%) showing a a five-year declining trend in groundwater levels.

Although just over half of wells show a five-year trend of declining groundwater levels, it should be noted that the median rate of decline across the whole PWA is low (0.42 m/y). The five-year trends of declining salinity, or stable salinity, that are observed in most of the monitoring wells is also acknowledged.

To view descriptions for all status symbols, please visit the *Water Resource Assessments* page on WaterConnect.

To view the *McLaren Vale PWA Groundwater Level and Salinity Status Report 2009–10*, which includes background information on hydrogeology, rainfall and relevant groundwater-dependent ecosystems, please visit the *Water Resource Assessments* page on WaterConnect.

To view or download groundwater level and salinity data from wells within the McLaren Vale PWA, please visit Groundwater Data on WaterConnect.

For further details about the McLaren Vale PWA, please see the *Water Allocation Plan for the McLaren Vale Prescribed Wells Area* on the Natural Resources Adelaide and Mount Lofty Ranges website.

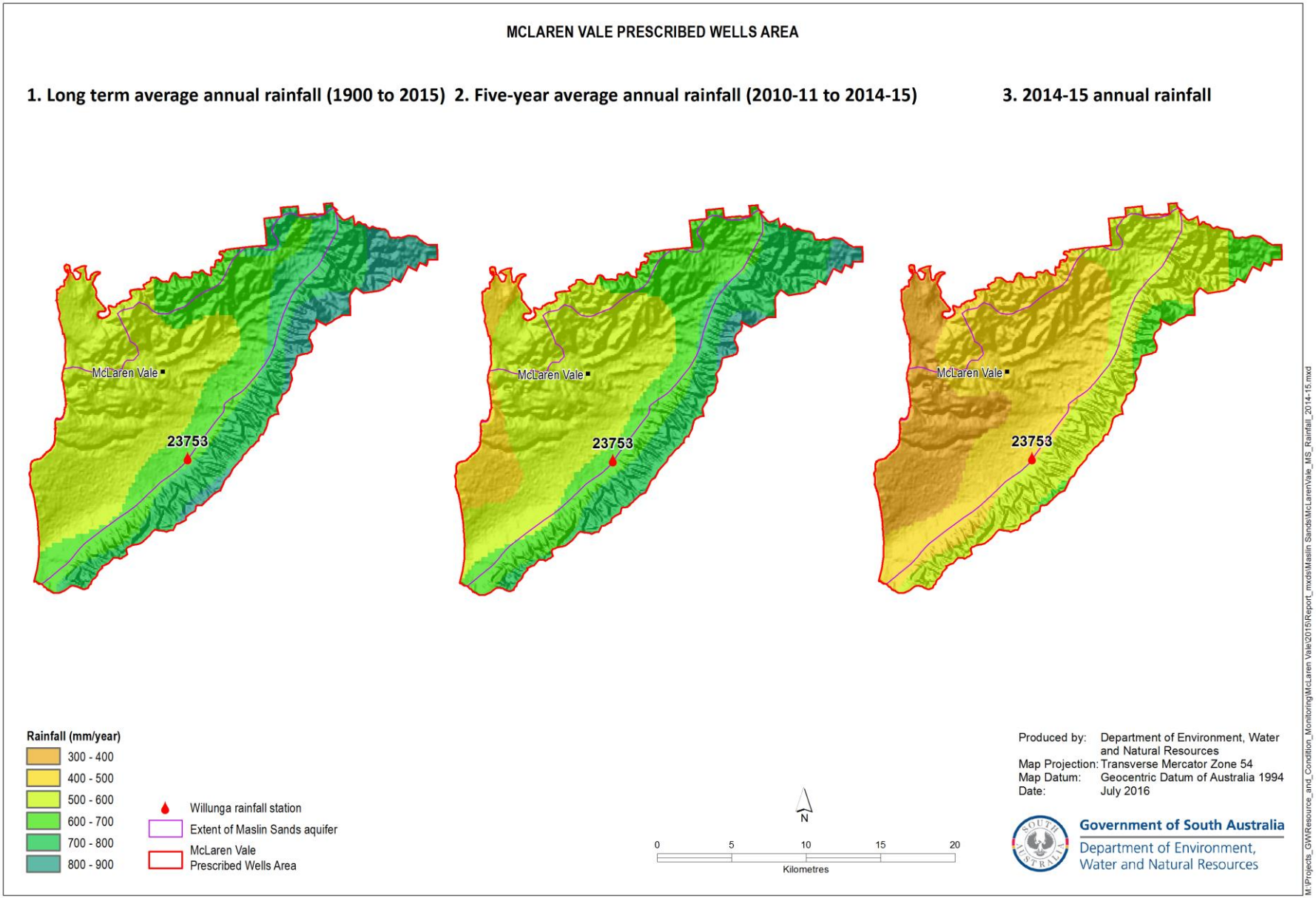


Figure 1. (1) Long-term and (2) five-year average annual rainfall and (3) annual rainfall for the 2014–15 water-use year in the McLaren Vale Prescribed Wells Area[2]

[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.

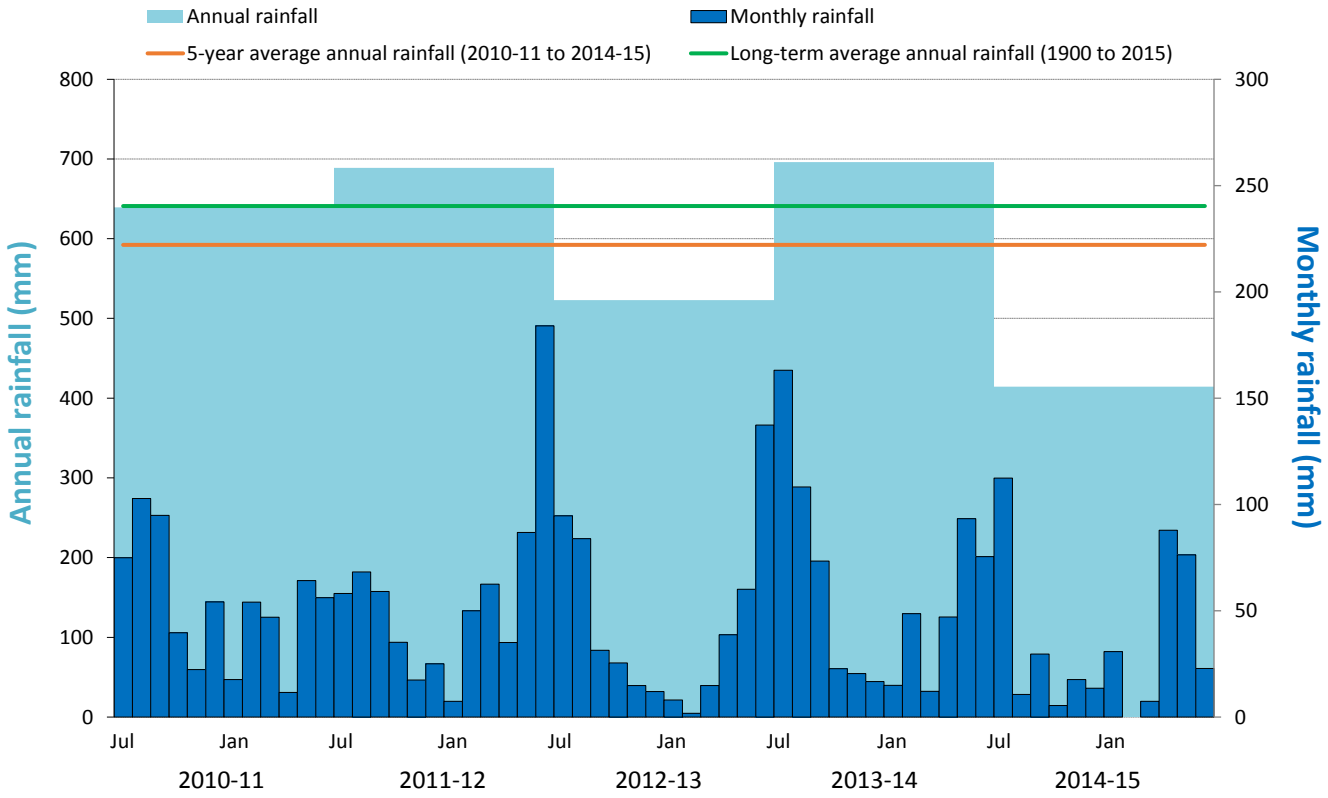


Figure 2. Annual (July–June) and monthly rainfall for the past five water-use years, and the five-year and long-term average annual rainfall recorded at Willunga (BoM Station 23753)[3]

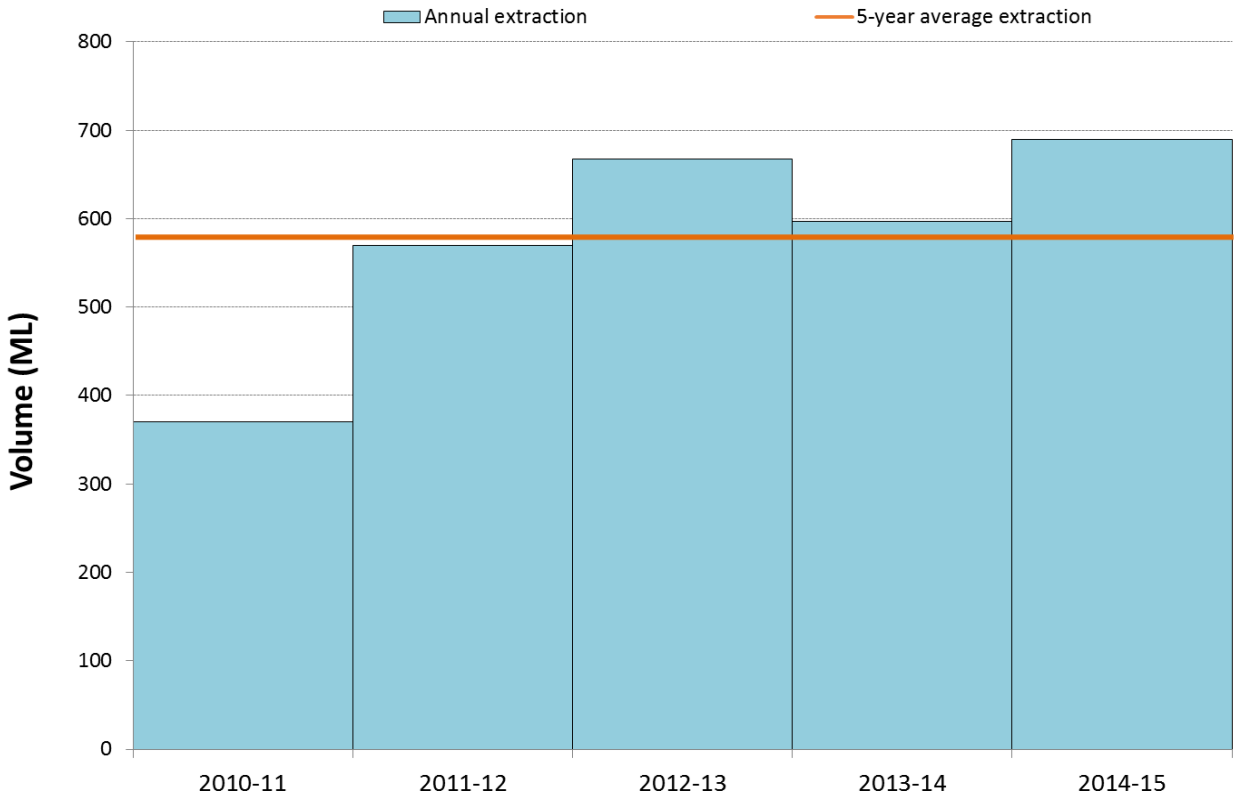


Figure 3. Licensed groundwater extraction volumes[4] for the past five water-use years, for the Maslin Sands aquifer

[3] 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.

[4] The licenced groundwater use for the 2014–15 water-use year is based on the best data available as of March 2016 and could be subject to change, as some extraction volumes may be in the verification process.

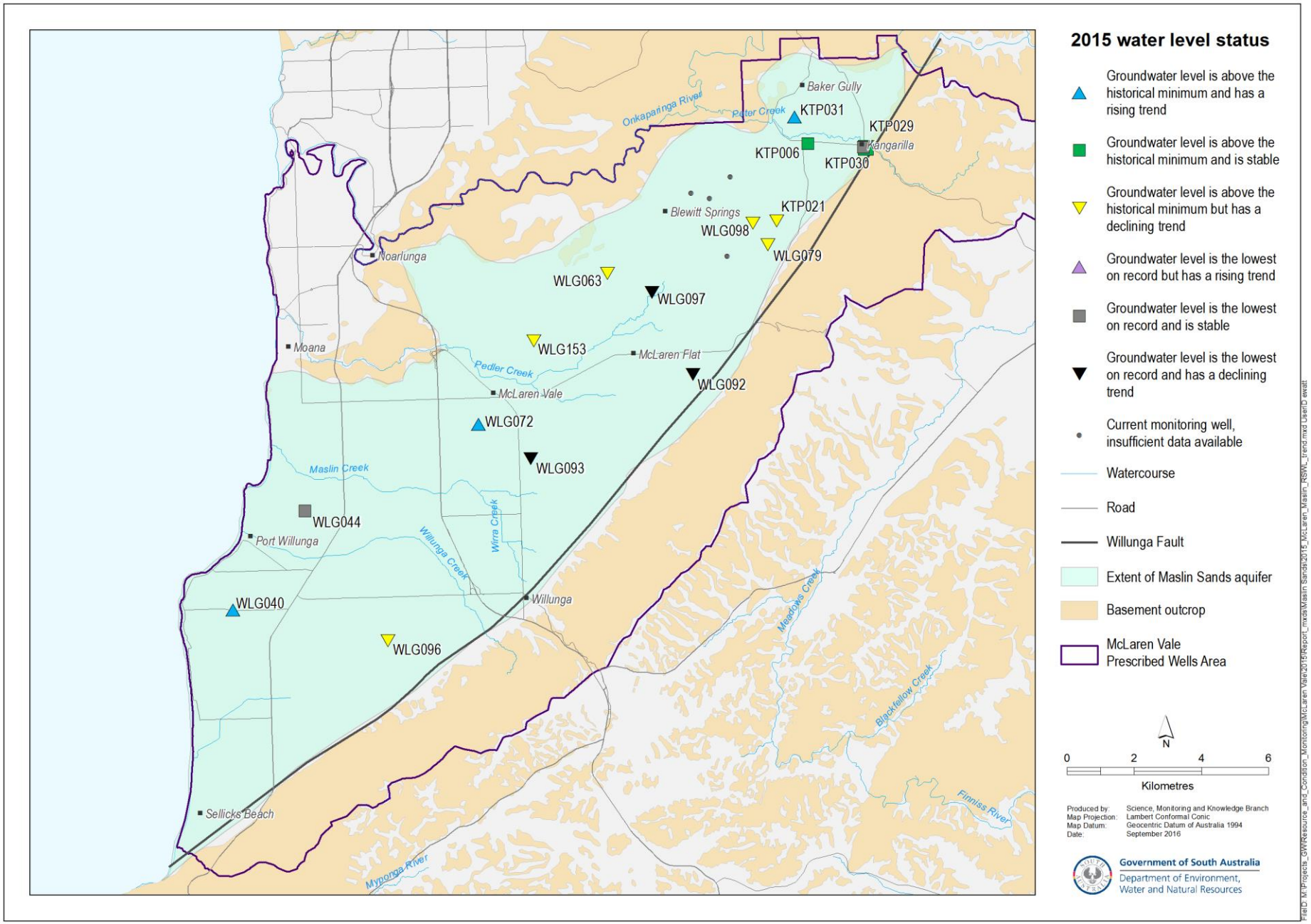


Figure 4. 2015 status of groundwater levels in the Maslin Sands aquifer of the McLaren Vale Prescribed Wells Area, based on five-year trends from 2011 to 2015

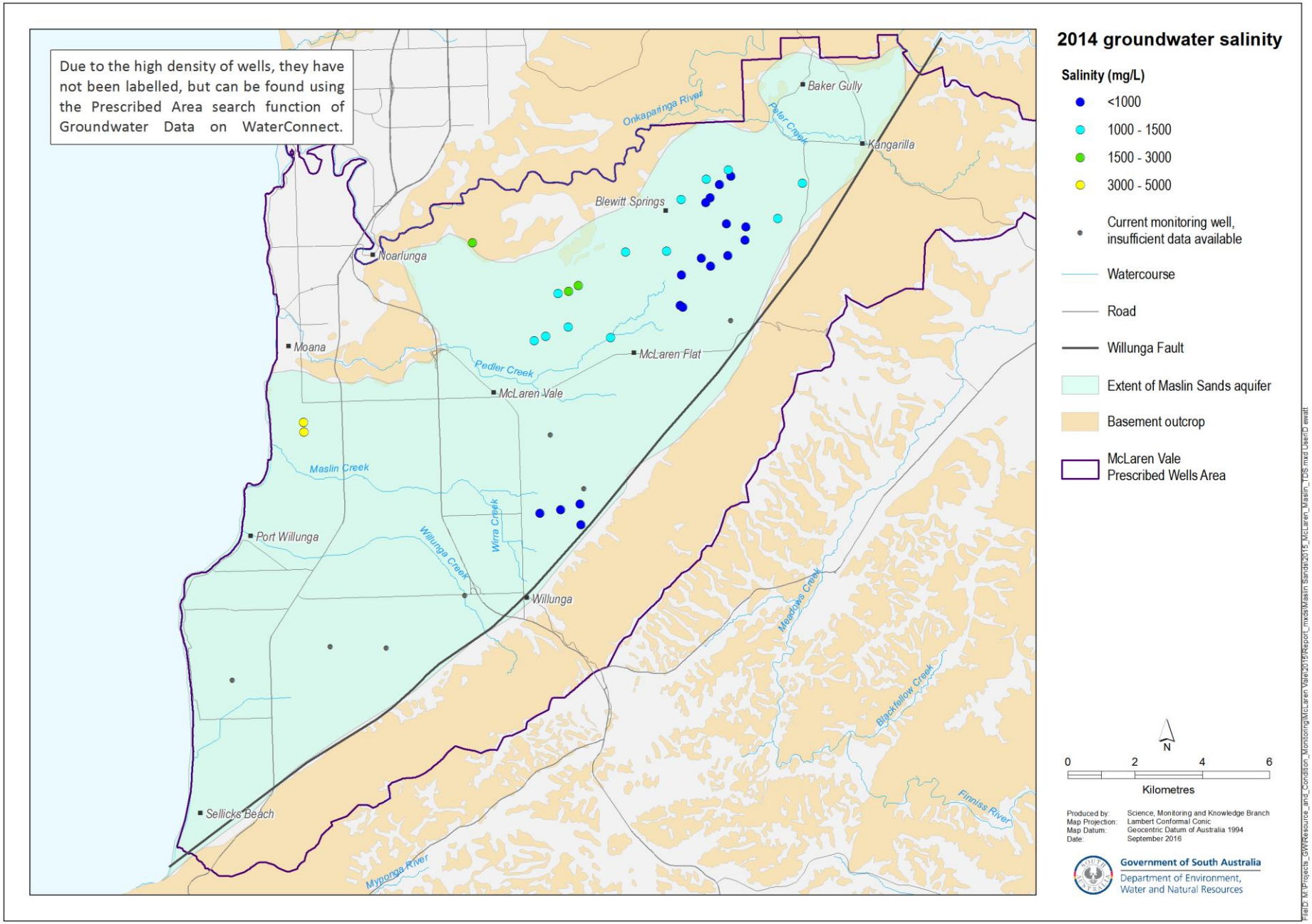


Figure 5. 2014 groundwater salinity in the Maslin Sands aquifer of the McLaren Vale Prescribed Wells Area

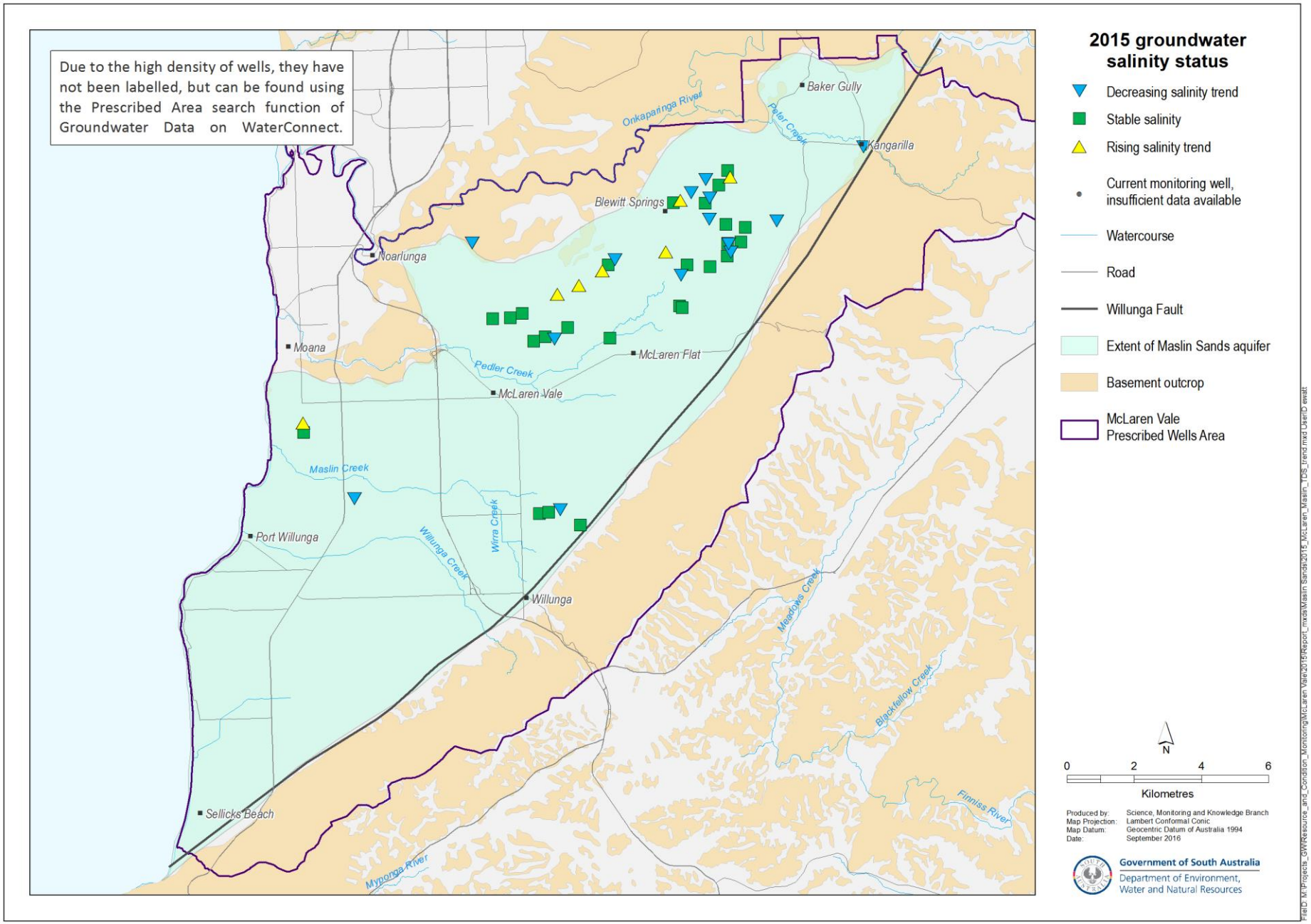


Figure 6. 2015 status of groundwater salinity in the Maslin Sands aquifer of the McLaren Vale Prescribed Wells Area, based on the five-year trends from 2010 to 2014

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