

Water Allocation Plan for the Southern Basins and Musgrave Prescribed Wells Areas

Mid-term review

Summary of key monitoring findings

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Introduction

The Water Allocation Plan (WAP) for the Southern Basins and the Musgrave Prescribed Wells Areas (PWAs) was approved in June 2016. It sets out the rules for managing the take and use of groundwater from prescribed wells within the PWAs.

Accompanying the WAP is a Monitoring, Evaluation, Reporting and Improvement (MERI) Plan that presents a comprehensive program for measuring hydrogeological, climate, ecological and water use parameters in Eyre Peninsula's Prescribed Wells Areas. The MERI Plan outlines how the data collected is assessed to determine the condition of the prescribed water resources and the ecosystems they support, and hence inform annual allocations and the evaluation of the effectiveness of the WAP in meeting its objectives.

As part of the mid-term evaluation a survey of key stakeholders is being undertaken to determine their perception of the effectiveness of the WAP. This document presents a summary of key data collected for the period 2015 to 2020 under the MERI Plan, and is provided to inform participants in the mid-term evaluation survey. The number of the survey question(s) which each data set informs is indicated below.

Level of storage and proportion of water available

Relates to survey question 7 and 9.

The level of storage (the proportion of the maximum volume of water available for licensed use, ref. WAP section 6.1.2) is determined annually based on measured groundwater levels. The proportion of water available for licensed use is set according to rules outlined in the WAP (section 6.1.3 to 6.1.5) based on the level of storage. Data from Department for Environment and Water (DEW). Note, allocations under this WAP commenced in 2016-2017.

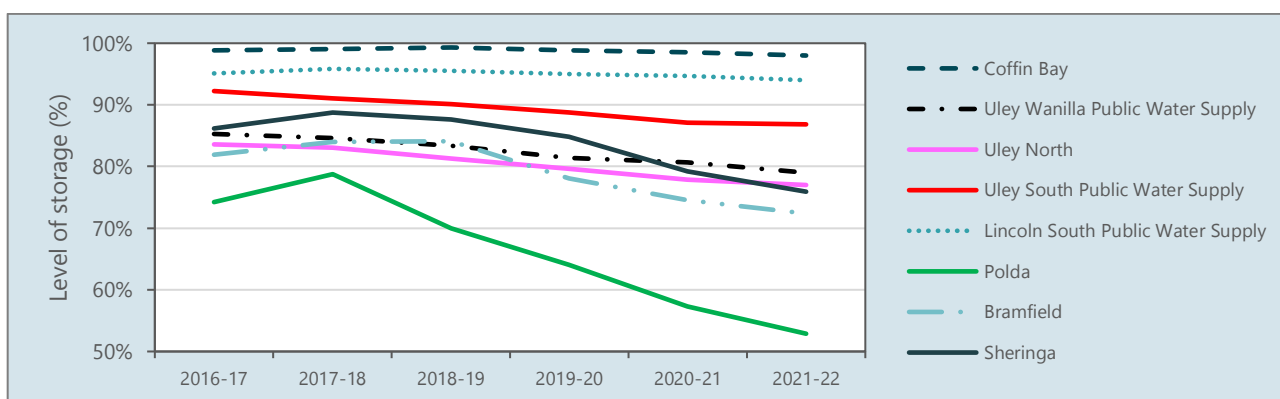


Figure 1: Level of storage (%) in different consumptive pools in the Southern Basins and Musgrave PWAs, 2015-2016 to 2021-2022.

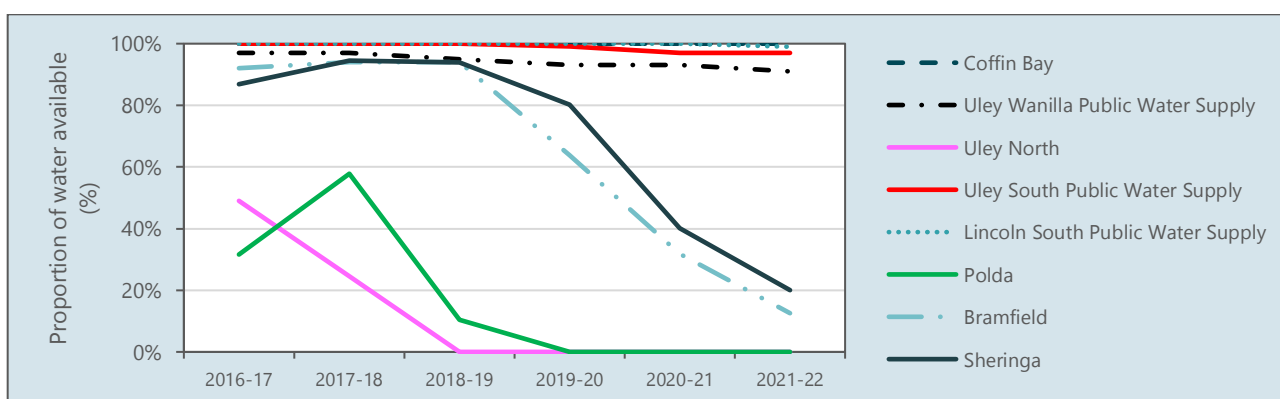


Figure 2: Proportion of water available for licensed use, 2015-2016 to 2021-2022.

Allocated volume and actual licensed extraction

Relates to survey questions 7 and 8.

Based on the proportion of water available for licensed use (see previous graphs), water allocations for the following year are calculated and licensees are advised of their share of the consumptive pool. The actual volume extracted by licensed users is monitored. The following graphs show annual allocated volumes and actual licensed extraction. Actual extraction data is not yet available for 2019-2020 through to 2021-2022.

Musgrave PWA

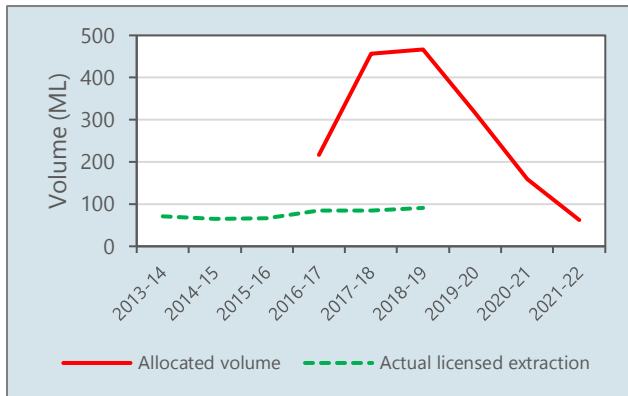


Figure 3: Allocated volume and actual extraction in Bramfield Consumptive Pool.

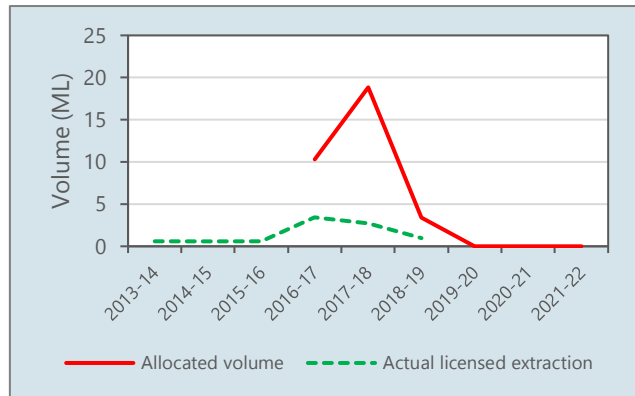


Figure 4: Allocated volume and actual extraction in Poldia Consumptive Pool.

Southern Basins PWA

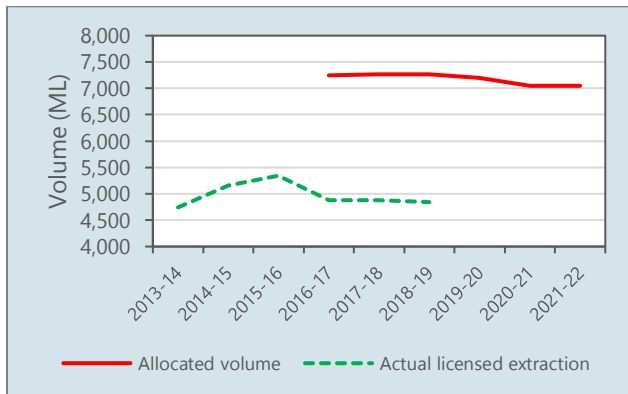


Figure 5: Allocated volume and actual extraction in Uley South Public Water Supply Pool.

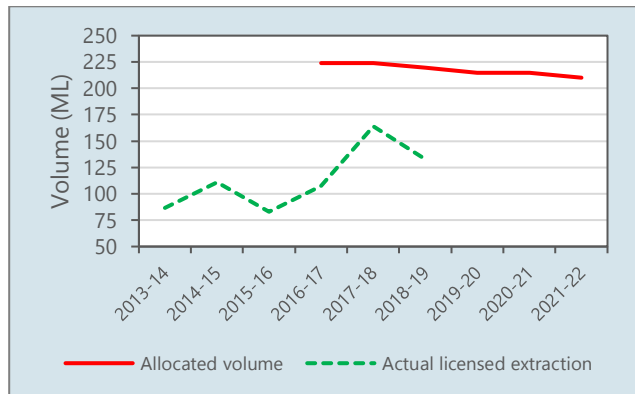


Figure 6: Allocated volume and actual extraction in Uley Wanilla Public Water Supply Consumptive Pool.

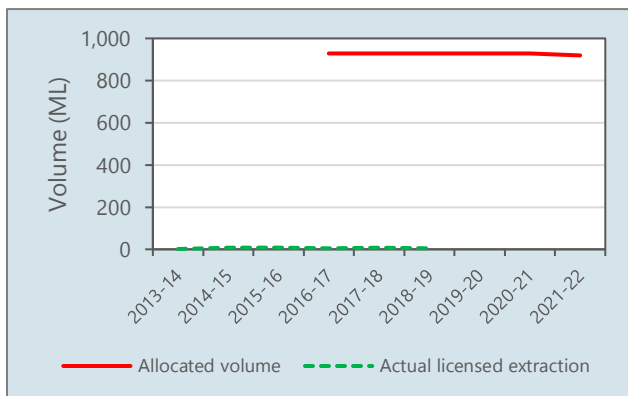


Figure 7: Allocated volume and actual extraction in Lincoln South Public Water Supply Consumptive Pool.

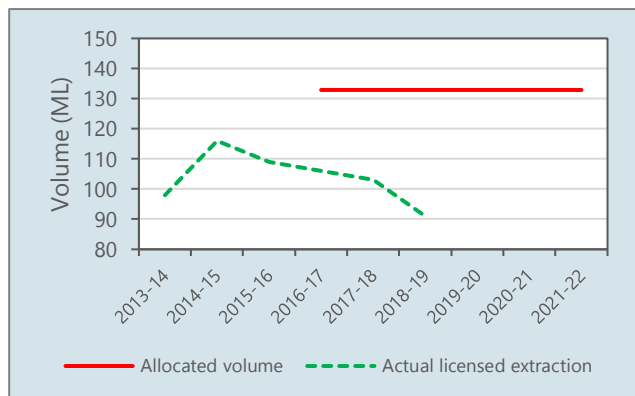


Figure 8: Allocated volume and actual extraction in Coffin Bay Consumptive Pool.

Climate data

Relates to survey questions 9 and 12.

Climate variability can have significant impacts on the prescribed water resources. This is especially true for changes in rainfall volume, intensity and seasonality; as well as changes in maximum temperatures. Decreasing total annual rainfall, lower winter rainfall, and increasing maximum temperatures can all contribute to reduced groundwater recharge, and associated reduction in groundwater levels. All data in this report must therefore be read in the context of the climate data below.

Musgrave PWA

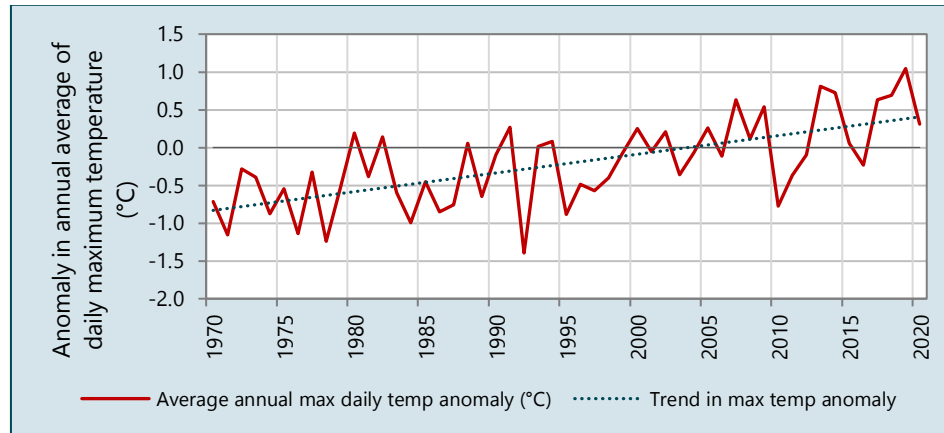


Figure 9: Anomaly in annual average of daily maximum temperature (°C) at **Elliston** (station 18069), 1970 - 2020. Values above zero indicate years hotter than the average. The upward trend indicates that the climate is becoming progressively hotter.

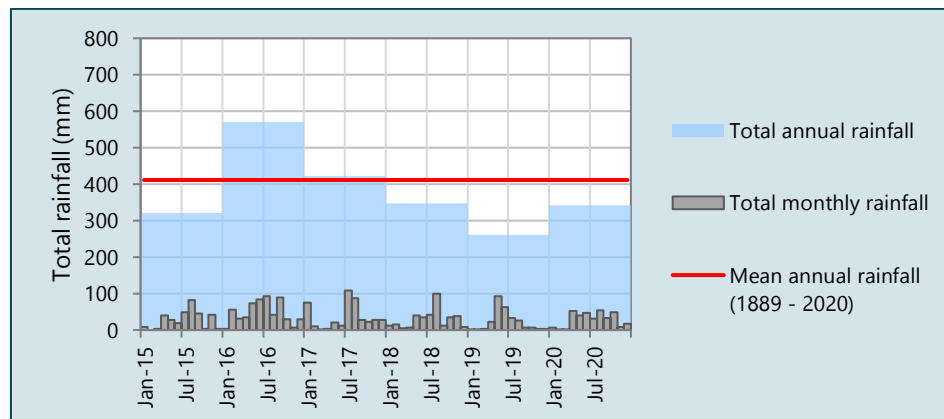


Figure 10: Total annual and total monthly rainfall (mm) at **Elliston** (station 18069), 2015 to 2020.

Southern Basins PWA

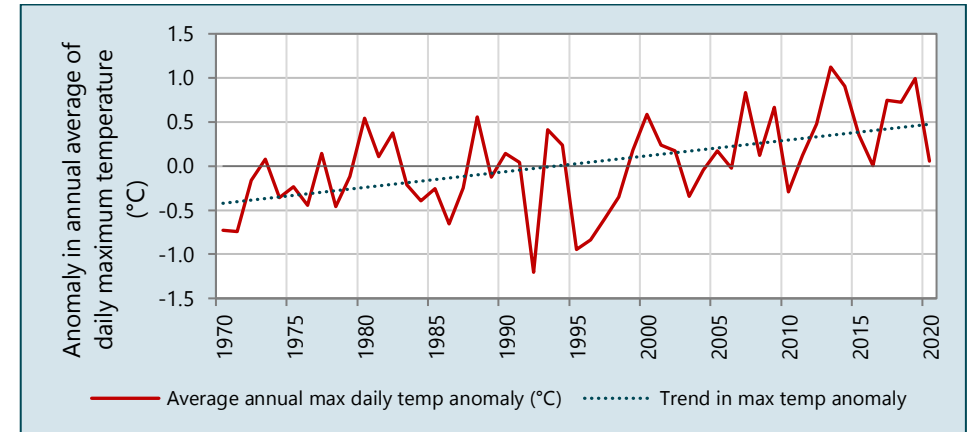


Figure 11: Anomaly in annual average of daily maximum temperature (°C) at **Big Swamp** (station 18017), 1970 - 2020. Values above zero indicate years hotter than the average. The upward trend indicates that the climate is becoming progressively hotter.

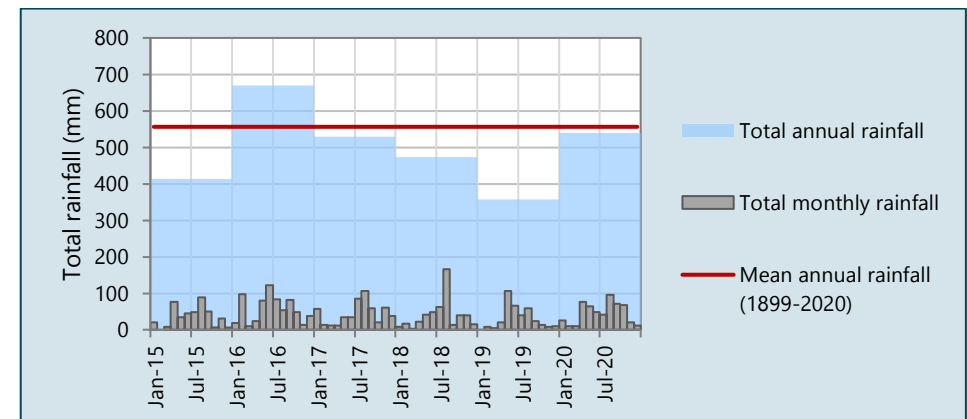


Figure 12: Total annual and total monthly rainfall (mm) at **Big Swamp** (station 18017), 2015 to 2020.

Groundwater Status Reports – Summary Information

Relates to survey questions 7, 9 and 11

DEW is responsible for monitoring and reporting annually on the status of prescribed groundwater resources. They collect water resources data regularly, analyse and report on it in a series of annual reports (available [here](#)).

The following graphs summarise key data from these reports. For each key groundwater lens in the PWAs they show:

- the percentage of monitored wells with stable, rising or declining **water levels** (data not yet available 2019-22),
- the percentage of monitored wells with stable, rising or declining **salinity levels** (data not yet available 2019-22),
- the **allocated volume** (the volume allocated for all licensed use, based on the rules set in the WAP and gazetted annually),
- the **actual licensed extraction** (the actual volume extracted by licensees) (data not yet available 2019-22).

Note: Water is considered drinkable with salinity $\leq 1,000$ mg/L.

Musgrave PWA

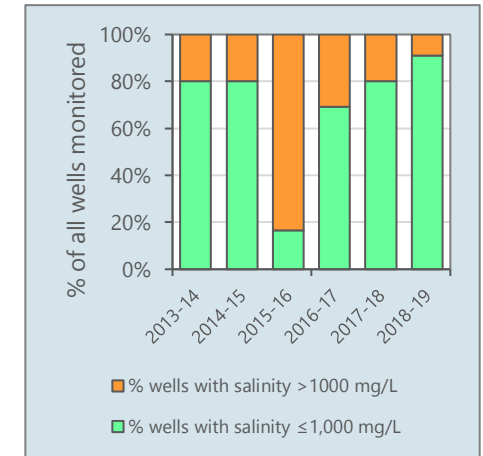
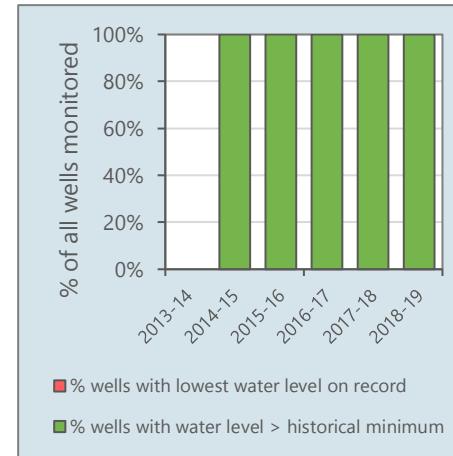
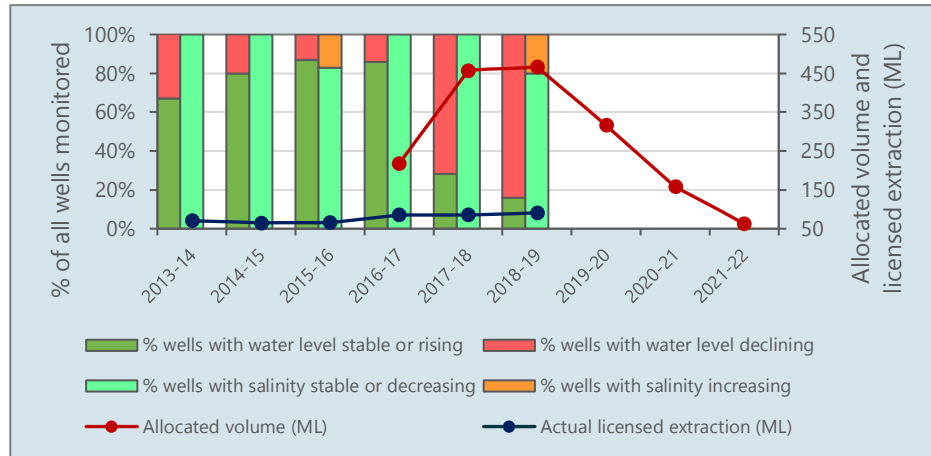


Figure 13: Groundwater status in **Bramfield Lens**, 2013-14 to 2018-19.

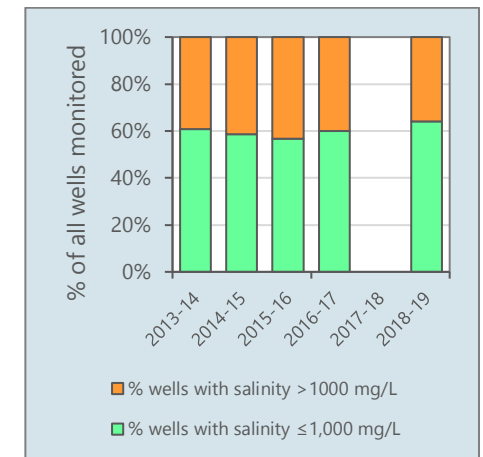
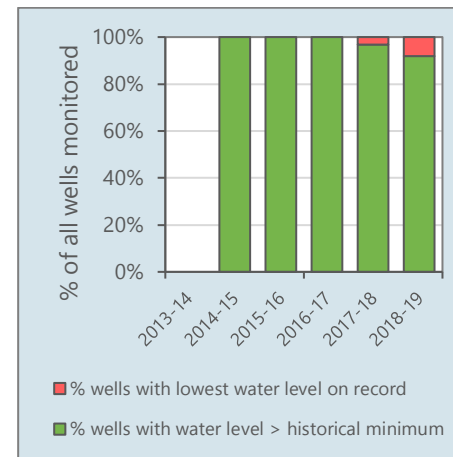
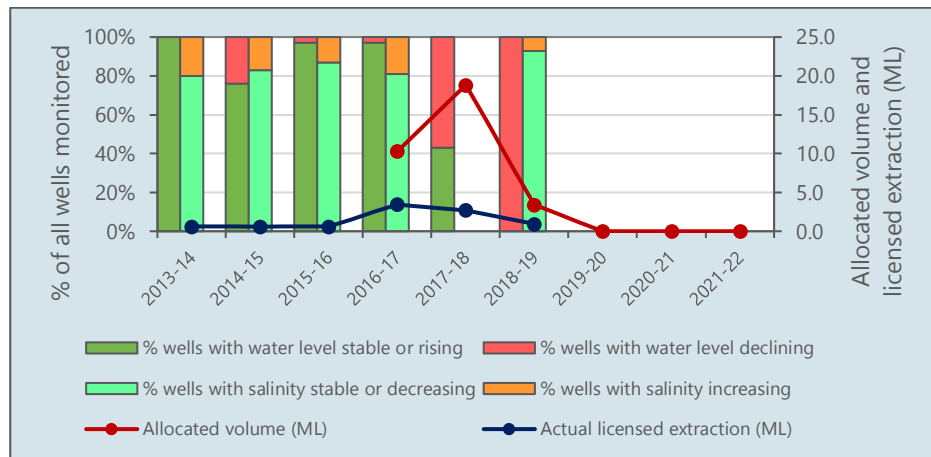


Figure 14: Groundwater status in **Polda Lens**, 2013-14 to 2018-19.

Water levels in both the Polda and Bramfield Lens have been declining since 2016-2017. There is negligible licensed take from the Polda lens, indicating this decline in both lenses is likely caused by climate factors rather than over extraction.

The allocated volume from both Bramfield and Polda has been reduced in response to decreasing groundwater levels. All actual licensed extraction is less than the allocated volume, showing all licensees are compliant, extracting their licensed volume or less.

Southern Basins PWA

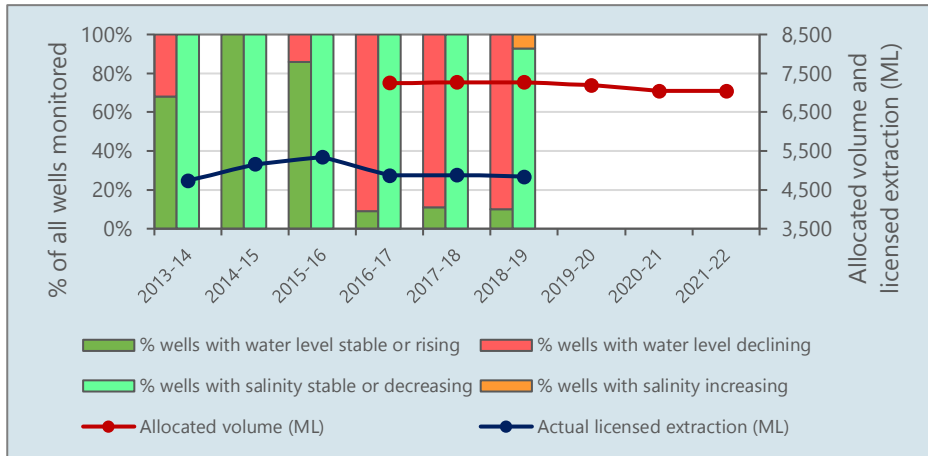


Figure 15: Groundwater status in Uley South Lens, 2013-14 to 2018-19.

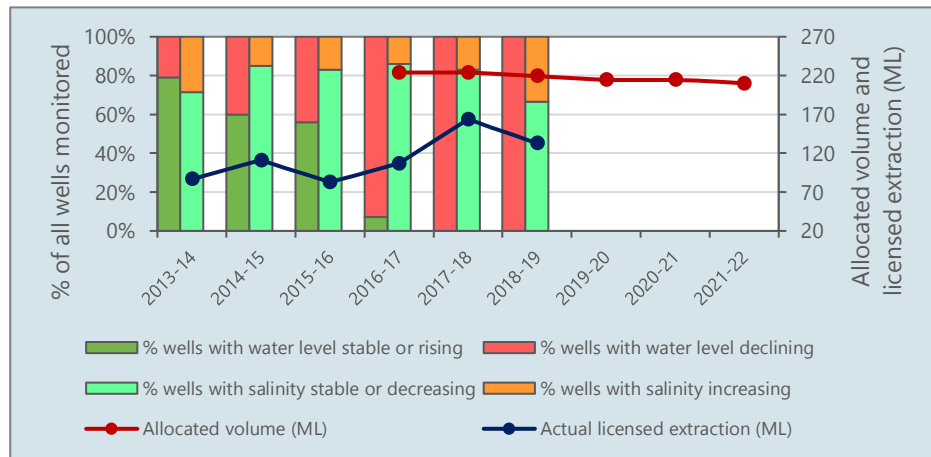
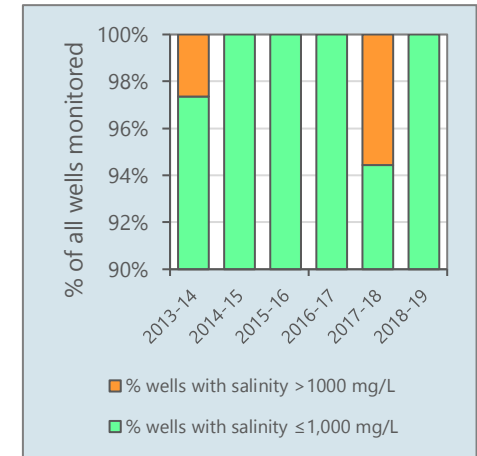
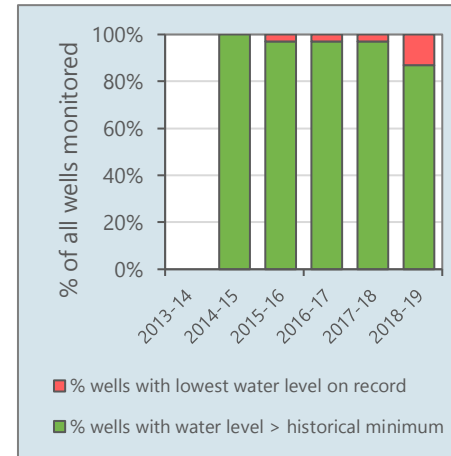
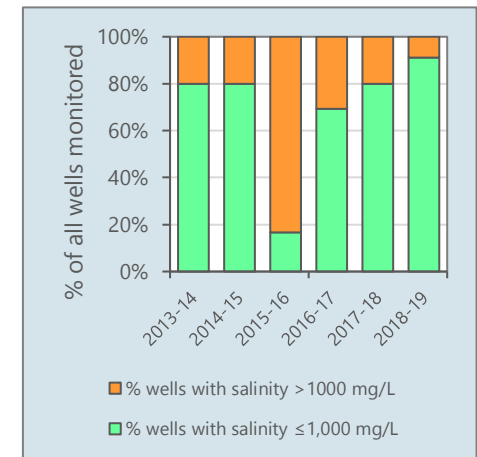
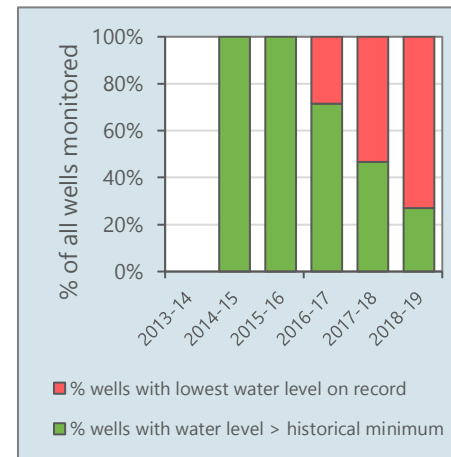


Figure 16: Groundwater status in Uley Vanilla Lens, 2013-14 to 2018-19.



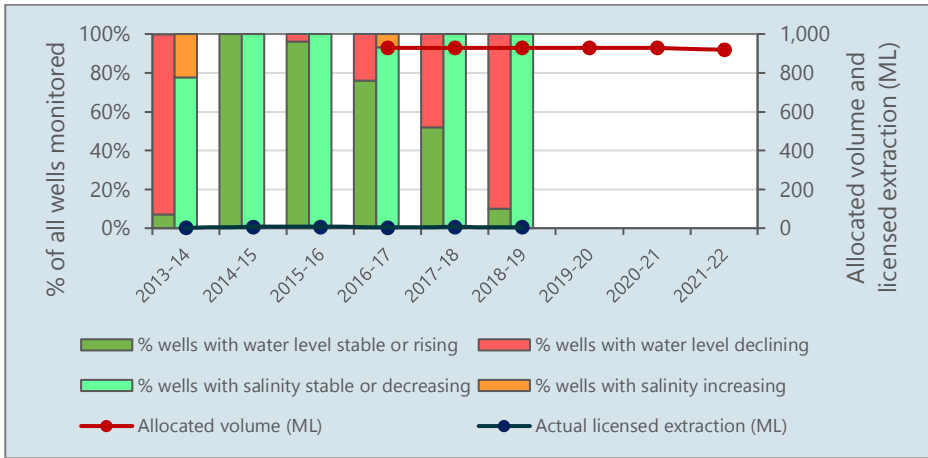


Figure 17: Groundwater status in Lincoln South Lenses, 2013-14 to 2018-19.

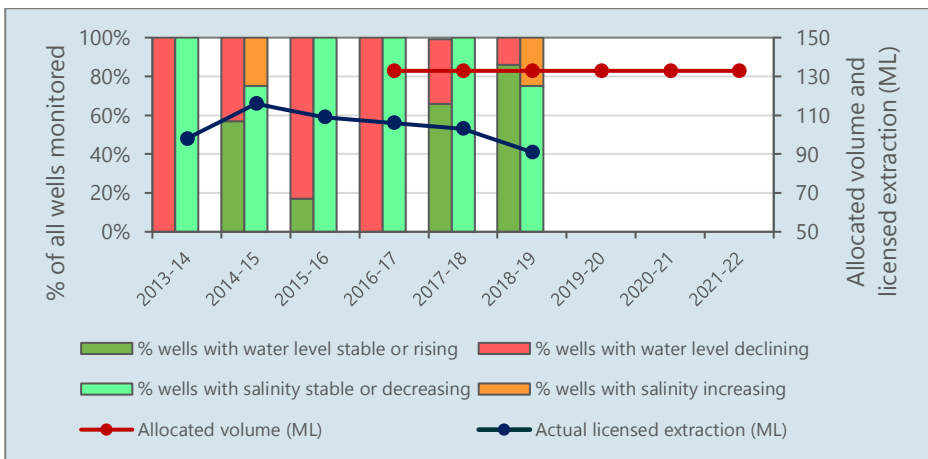
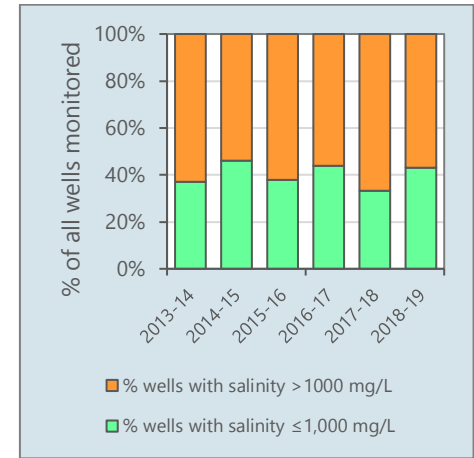
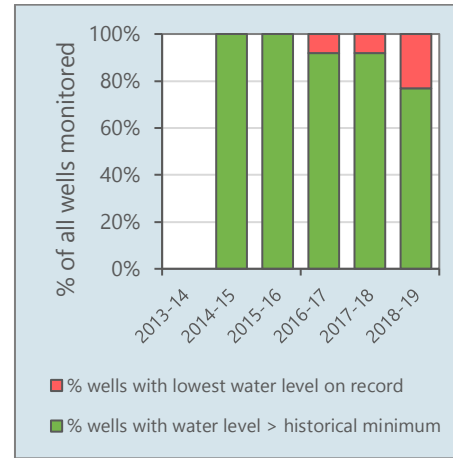
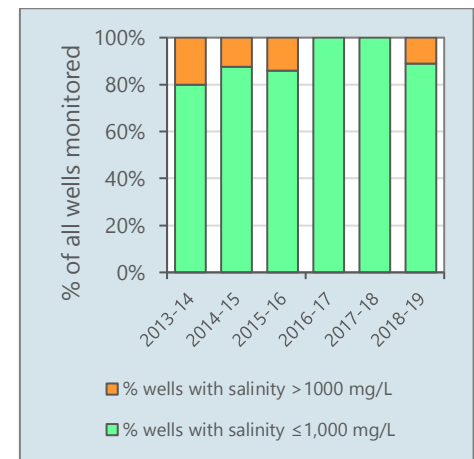
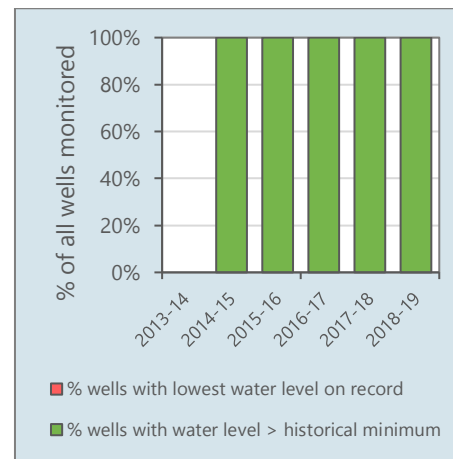


Figure 18: Groundwater status in Coffin Bay Lenses, 2013-14 to 2018-19.



Water levels in three of the four lenses in the Southern Basins PWA have been declining since 2016-2017. There is very little licensed take from the Lincoln South lens, indicating this decline is likely caused by climate factors rather than over extraction.

All actual licensed extraction is less than the allocated volume, showing all licensees are compliant, extracting their licensed volume or less.

Groundwater Dependent Ecosystems

Relates to survey question 12

To monitor the impact of licensed water use in the PWAs on Groundwater Dependent Ecosystems (GDEs), the Eyre Peninsula Landscape Board has a program to monitor changes in flora condition, groundwater level and salinity, at a group of GDEs, within the PWAs. The GDEs monitored include Red Gum (*Eucalyptus camaldulensis*) woodlands and wetlands at the sites shown in the map adjacent.

Results from the Red Gum woodland monitoring program are published in a set of GDE report cards (available [here](#)). Results from the wetland monitoring program have not yet been published, but monitoring is ongoing and a report card should be available by June 2022.

The results of the Red Gum monitoring show that in both the Musgrave and Southern Basin PWAs there has been no negative impact of licensed groundwater extraction on the Red Gum GDEs between 2016 and 2020. There has been an increase in the average condition of Red Gums at both the control and extraction sites during this period.



Figure 19: Location of GDE sites.

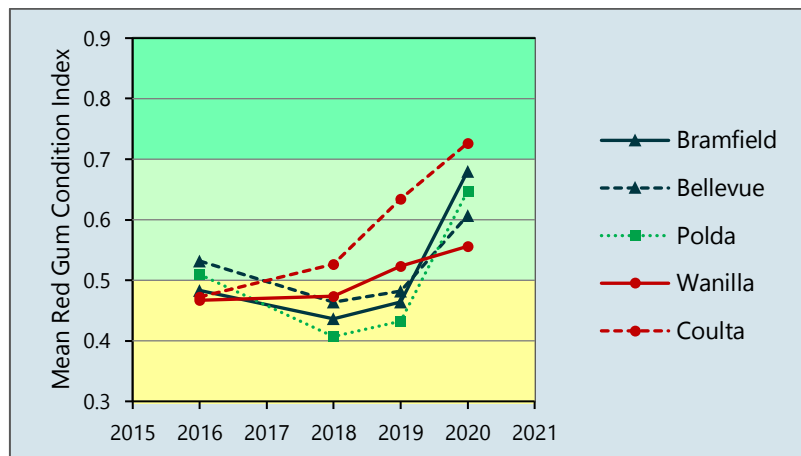


Figure 20: Change in Red Gum Condition Index, 2016 to 2020, at all monitored Red Gum GDE sites

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