

Musgrave Prescribed Wells Area

2021–22 Groundwater status overview



Musgrave PWA

Bramfield



Polda



LEGEND

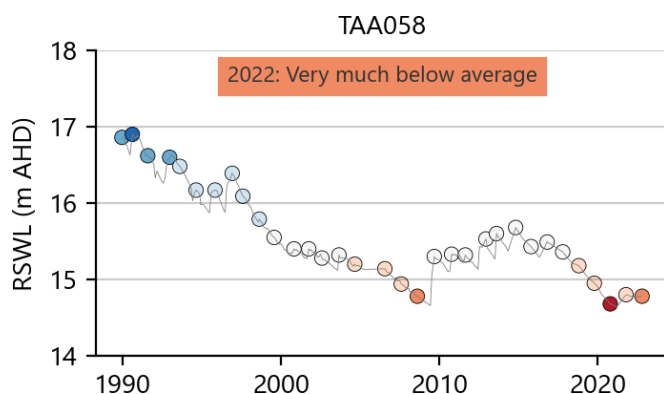
- Highest on record
- Very much above average
- Above average
- Average

- Below average
- Very much below average
- Lowest on record
- Long-term trend

Groundwater levels

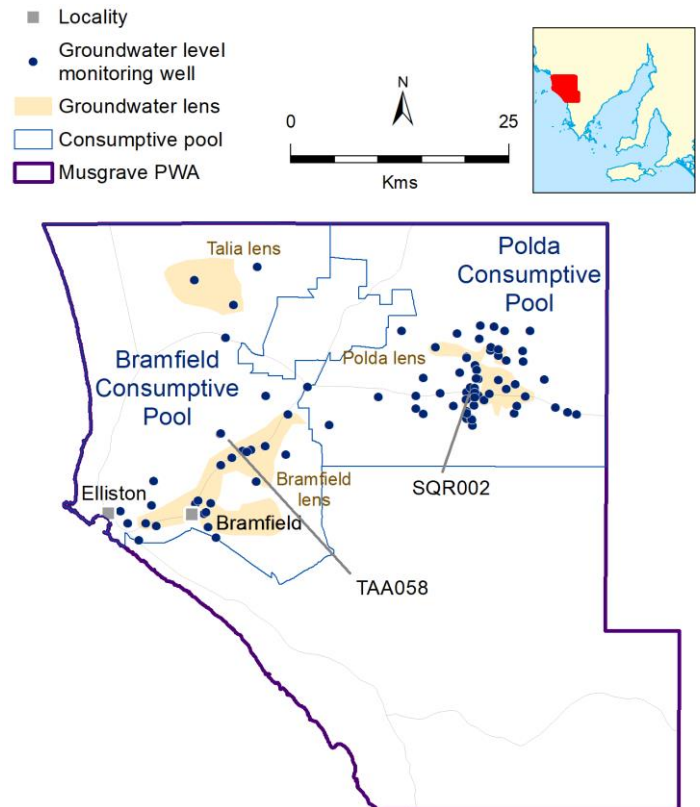
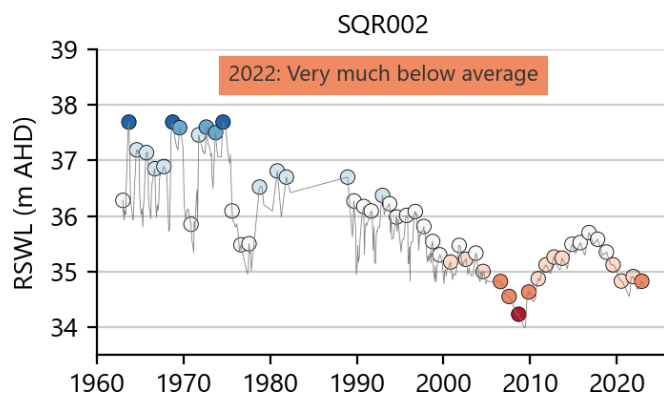
Groundwater levels in Quaternary Limestone aquifer wells within the Bramfield consumptive pool are classified 'Very much below average'.

- All wells have water levels classified 'Below average' or lower.
- Five-year trends (2018 to 2022) show groundwater levels are declining in 57% of wells.
- The figure below shows the long-term water level record for an indicative observation well located within the Bramfield consumptive pool.



Groundwater levels in all Quaternary Limestone aquifer wells in the Polda consumptive pool are classified 'Below average' or lower.

- Groundwater levels in 33% of wells are classified 'Very much below average', or lower.
- Five-year trends (2018 to 2022) show groundwater levels are declining in 85% of wells (see indicative hydrograph below).



Regional context

The Musgrave Prescribed Wells Area (PWA) is located within the Eyre Peninsula Landscape region. Groundwater is the main source of water resource across the PWA and is mainly used for town water supply and stock and domestic purposes.

There are four main groundwater systems located in the region: the uppermost unconfined Quaternary Limestone aquifer, a confined aquifer in underlying Tertiary sediments, a high-salinity aquifer in Jurassic sediments and a fractured rock aquifer that occurs in basement rocks. The only supplies of potable groundwater are found in the Quaternary Limestone aquifer and these are known as fresh groundwater lenses.

The resources are divided into management zones – the zone with the highest licensed use is the Bramfield consumptive pool. However, most of the use is for stock and domestic supply and is mainly sourced from brackish groundwater that resides within the Quaternary Limestone aquifer between the Talia and Bramfield fresh lenses.



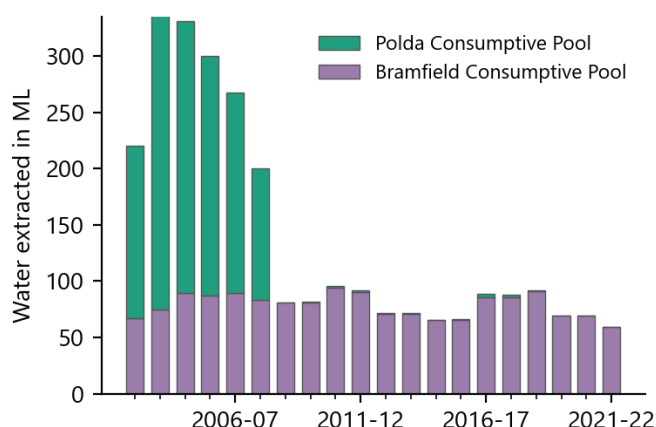
Government of South Australia
Department for Environment
and Water

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Groundwater use

Licensed extractions from the Musgrave Prescribed Wells Area total 60 ML.

- Groundwater is used for a variety of purposes but mainly for town water supply and stock and domestic use.
- Licensed groundwater extraction from the Bramfield consumptive pool of 60 ML was a slight decrease from the 2020–21 amount of 69 ML.
- Licensed extractions from the Poldia consumptive pool are nil due to very low groundwater storages.
- The figure below shows the past 20 years of extraction.



Salinity

Groundwater samples from 7 Quaternary Limestone aquifer wells in the Bramfield consumptive pool show a median salinity of 581 mg/L.

- Salinity ranges between 491 and 1,002 mg/L.
- Ten-year trends in all (3) wells show gradually increasing salinity at rates of 0.3 to 0.6% per year.

Groundwater samples collected from 18 Quaternary Limestone aquifer wells within the Poldia consumptive pool show a median salinity of 886 mg/L.

- Salinity ranged between 586 and 3,528 mg/L.
- Ten-year trends show salinity is increasing in the majority of wells (72%) with rates ranging from a decrease of 1.6% per year to an increase of 2.2% per year (median rate of 0.8% increase per year).

More Information

This fact sheet is a high-level summary. More information (including metadata) is available in the suite of Water Resource Assessments for the Musgrave and Southern Basins Prescribed Area, available at:

<https://www.waterconnect.sa.gov.au/Systems/GSR/Pages/Default.aspx>.

Rainfall

In general, below-average rainfall results in a reduction in groundwater recharge. Furthermore, below-average rainfall can result in increasing extractions and together both elements can cause groundwater levels to decline and salinities to increase. Conversely, above-average rainfall can result in increases in recharge, decreases in extractions and groundwater levels may rise and salinities may stabilise or decrease.

In the Musgrave PWA, rainfall is the main driver of changes in groundwater levels and salinity. In particular, groundwater levels are highly responsive to recharge from incident rainfall due to the nature of the PWA's surface and subsurface geology.

Historical rainfall data indicate that trends of above or below-average rainfall can last for up to 25 years and suggest that, when matched with groundwater level data, high-intensity rainfall events can result in rapid groundwater level responses (i.e., groundwater recharge).

In 2022, annual rainfall is above average at Elliston and Terrah Winds.

- In 2022, total annual rainfall at Elliston (BoM Station 18169) is 571 mm, which is 34% above the long-term average.
- In 2022, total annual rainfall at Terrah Winds (BoM Station 18165) is 523 mm which is 40% above the long-term average.
- At both rainfall stations, monthly rainfall was below average in July but above average in January, August, September, October and November.
- The long-term trend in annual rainfall (1971 to 2022) is declining at Elliston but relatively stable at Terrah Winds station.
- The figure below shows monthly rainfall (blue) for 2022 at Elliston compared to monthly averages (grey).

