Musgrave Prescribed Wells Area

2019–20 groundwater status overview

Musgrave PWA	Bramfield	
	Polda	

(2020 water level ranking for the median ranked well in each resource)

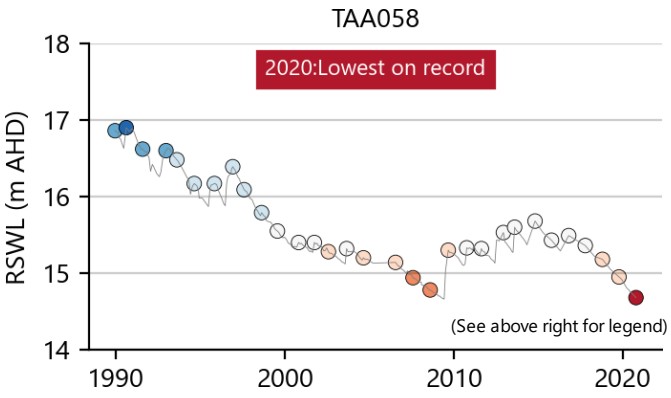
LEGEND (2020 water level ranked against historic variation)

- Highest on record
- Very much above average
- Above average
- Average
- Below average
- Very much below average
- Lowest on record
- Long-term trend

Groundwater levels in 2020

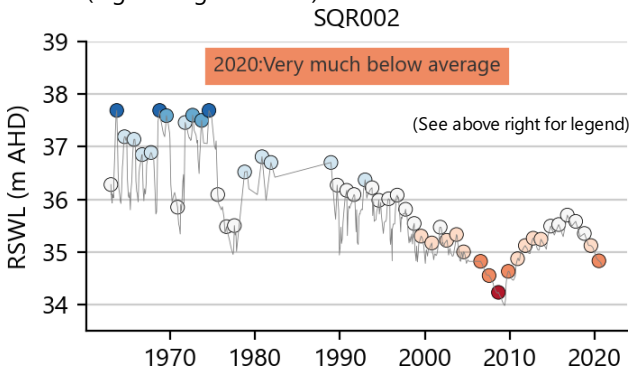
Water levels in Quaternary Limestone aquifer wells within the Bramfield consumptive pool are classified 'Very much below average' or 'Lowest on record'

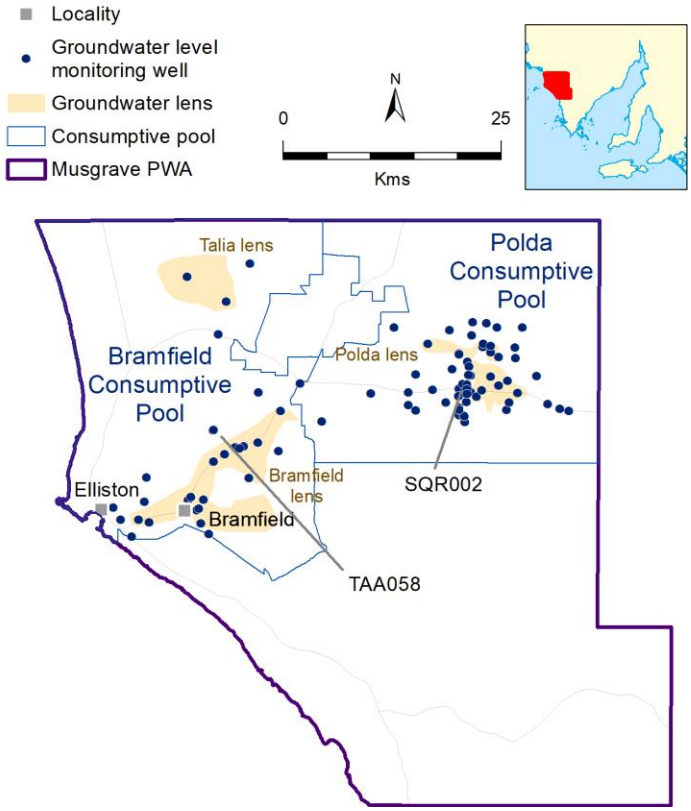
- The majority of wells (4 out of 7) are classified 'Lowest on record', and are lower than water levels measured at the end of the Millennium drought (2009)
- Between 2016–20, 92% of wells show a trend of declining water level
- The figure below shows the long-term water level record for an observation well located within the Bramfield consumptive pool.



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

- Water levels in 52% of wells are classified 'Very much below average', and 27% of wells show their lowest water level on record
- Between 2016–20, all wells show a trend of declining water level (e.g. see figure 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, the majority of use is for stock and domestic supply and is mostly sourced from brackish groundwater that resides within the Quaternary Limestone aquifer between the fresh lenses.

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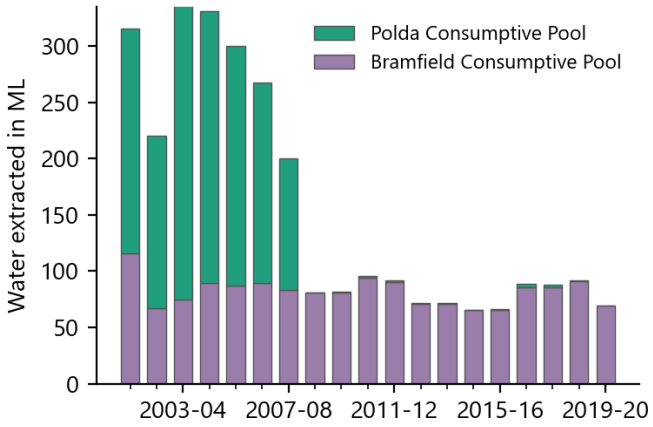
Musgrave Prescribed Wells Area 2019–20 groundwater status overview

Water extraction in 2019–20

Licensed extractions from the Bramfield consumptive pool are 70 ML

- Groundwater is used for a variety of purposes, but mainly for town water supply and stock and domestic use
- Licensed groundwater extractions from the Bramfield consumptive pool are 70 ML, which is a decrease of 23% compared to 2018–19
- Licensed extractions from the Polda consumptive pool are nil, due to very low groundwater storages
- The figure below shows the past 18 years of extraction.



Salinity in 2020

Groundwater samples from five Quaternary Limestone aquifer wells within the Bramfield consumptive pool show a median salinity of 509 mg/L

- Salinity ranges between 458–1010 mg/L
- Ten-year trends in two of four wells show gradually increasing salinity, at rates between 0.39–0.58% per year.

Groundwater samples collected from 14 Quaternary Limestone aquifer wells within the Polda consumptive pool show a median salinity of 887 mg/L

- Salinity ranges between 498–3392 mg/L
- Ten-year trends show salinity is increasing in the majority of wells (53%), at rates between 5.70–2.15% per year (median rate of 0.30% increase per year).

More Information

This fact sheet is a high level summary of information provided in the 2019–20 Water Resources Assessment for the Musgrave and Southern Basins PWAs. Full details of the assessment can be found at: https://www.waterconnect.sa.gov.au

Climate

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.

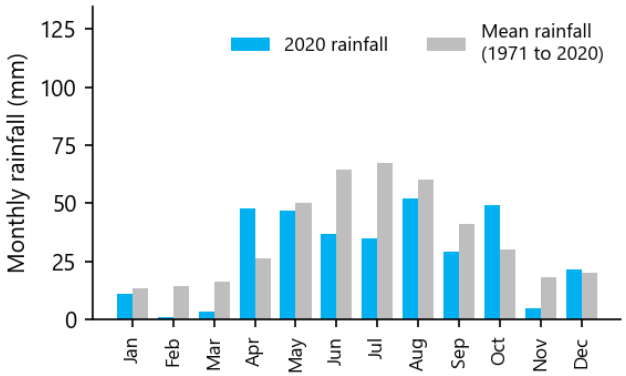
In the Musgrave PWA, climate is the main driver of changes in groundwater levels and salinity. In particular, water levels are highly responsive to recharge from incident rainfall, due to the nature of the PWA's surface and subsurface geology.

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).

Rainfall in 2020

In 2020, annual rainfall was below-average at Elliston and average at Terrah Winds

- In 2020, total annual rainfall at Elliston (Bom Station 18169) is 339 mm, which is 20% below the long-term average (1971-2020)
- In 2020, total annual rainfall at Terrah Winds (BoM Station 18165) is 384 mm, which is 4% above the long-term average (1971-2020)
- At both rainfall stations, monthly rainfall was below average during the winter recharge season of May through September
- Above–average rainfall occurred at both stations in April and October
- Long-term rainfall data (1971-2020) at both stations indicate that total annual rainfall is declining
- The figure below shows monthly rainfall (blue) for 2020 at Elliston compared to monthly averages (grey).



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