Annual Report 2018/19

Murrayville Local Management Plan (Groundwater)

July 2018 - June 2019

Executive summary

GWMWater presents the annual report for the Murrayville Groundwater Management Area Local Management Plan (LMP) for the 2018/19 season. This report provides an overview of groundwater use and management activities in the Murrayville Groundwater Management Area (GMA) during 2018/19.

Metered extraction in the Murrayville GMA was 6,368 ML for the 2018/19 season, or 65 per cent of licence entitlement. This is a 20 per cent (approx.) decrease in extraction when compared with the previous season, potentially a result of above average rainfall during December 2018 and February 2019. Extractions volumes during the year were observed to have a greater distribution across the six zones of the GMA. Extraction is usually concentrated in Zones 10B-1 to 10B-3, however in 2018/19, the combined extraction within these zones was 2,400 ML less than the previous season.

The monitoring undertaken indicates that groundwater levels are recovering steadily across much of the GMA. This was particularly obvious in Zones 10B-1, 10B-2 and 10B-3 where the combined groundwater extraction in these zones was considerably less than average.

While the total volume of groundwater extraction was lower during 2018/19, there were 10 temporary trades of water entitlement during the season. There was one instance of unauthorised use (overuse) by a licensee.

Groundwater monitoring, metering and compliance programs continue to be undertaken to support the implementation of the Local Management Plan.

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1. Introduction

1.1 Purpose

This report has been prepared as required by the Murrayville Groundwater Management Area Local Management Plan, 2017. It provides an overview of groundwater management activities undertaken in the accordance with the LMP for the 2018/19 season.

1.2 Groundwater Management Area

The Murrayville Groundwater Management Area (GMA) is located in the Wimmera-Mallee Groundwater Catchment in northwest Victoria and is part of the Murray Darling Basin. The GMA covers 1,916km^2 and is centred on the town of Murrayville and abuts the South Australian border. Groundwater from the Upper Mid-Tertiary Limestone Aquifer (Murray Group Limestone) is the sole source of water for domestic and stock, town supplies and irrigation in the area.

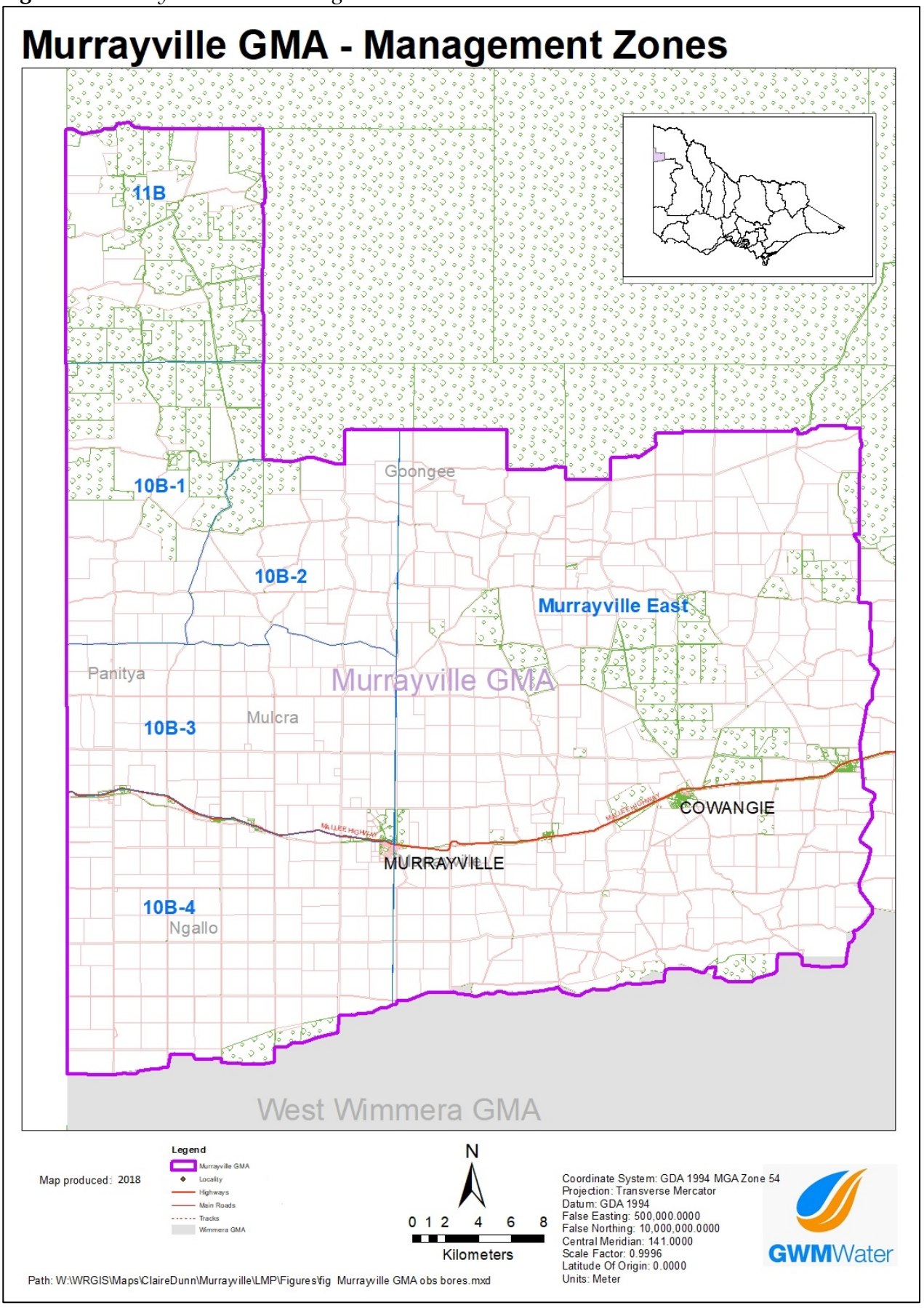
There are six management zones in the Murrayville GMA (Figure 1). Zones 10B-1, 10B-2, 10B-3 and 10B-4 of the Murrayville GMA combine to form Border Zone 10B; Zone 11B is within Border Zone 11B and Murrayville East zone is outside the Border Designated Area.

1.3 Local Management Plan

The Murrayville GMA Local Management Plan (LMP) describes the framework to manage groundwater resources in the Murrayville GMA. The LMP documents rules and information relating to the take and use of groundwater in the Murrayville GMA. The LMP can be accessed via the GWMWater website https://www.gwmwater.org.au/ .

The key objective of the Murrayville LMP is to ensure the equitable sharing of available water between licenced users, while protecting the environment and acknowledging its non-renewable nature, ensuring as much as practicable, the long-term sustainability of the water resource.

***Figure 1**: Murrayville GMA Management Zones*



2. Groundwater Management

2.1 Licence entitlement

The Permissible Consumptive Volume for the Murrayville GMA is 11,005 ML/year. The current total licence entitlement volume in the GMA is 9,754.8 ML. The licence information is summarised in Table 1.

***Table 1**: Licence entitlement in the Murrayville GMA*

Zone	Number of Licences	Volume licensed ML	Zone limit ML
11B	3	1,600	1,720
10B-1	3	2,265	2,265
10B-2	2	1,120	1,370
10B-3	11	2,005*	2,140
10B-4	6	1,312.8*	2,830
Murrayville East	13	1,437	2,412
Total	**38**	**9,754.8**	

*There was a permanent trade of 15ML from Zone 10B-4 to 10B-3 during the year, the total volume licensed for the GMA has not altered as a result of the trade.

2.2 Groundwater use

Each irrigation bore and active commercial bore is fitted with an Authority approved meter to measure extraction. Meters in most cases are read mid-way through the irrigation season (around January) as well as at the end of the irrigation season. Licensees are provided with a mid-season water usage statement, which provides an opportunity for users to compare their records against data collected by GWMWater, and against their permitted volume of take. Groundwater users are encouraged to monitor their extraction volume throughout the season. To access additional water during the season, licensees must secure water from another licence holder by way of trade or transfer.

GWMWater uses metering data and extraction information for water resource management and licence compliance purposes. Annual extraction volumes are uploaded to the Victorian Water Register on 30 June each year.

In 2018/19, the total metered groundwater extraction in the Murrayville GMA was 6,368 ML or 65 percent of licence entitlement. While being considerably less than the previous year (particularly in Zones 10B-1, 10B-2 and 10B-3), the overall extraction volume was 1,300 ML above the annual average (calculated since 2001).

Total extraction across Zones 10B-1, 10B-2 and 10B-3 was 2,400ML less than 2017/18, while extraction was greater in Zones 11B, 10B-4 and Murrayville East. This saw a greater distribution of extraction volumes across the GMA.

Figure 2 illustrates the total extraction compared to previous years, while Table 2 provides a summary of extraction by zone for 2018/19.

Figure 2 *Groundwater usage over time in the Murrayville GMA*

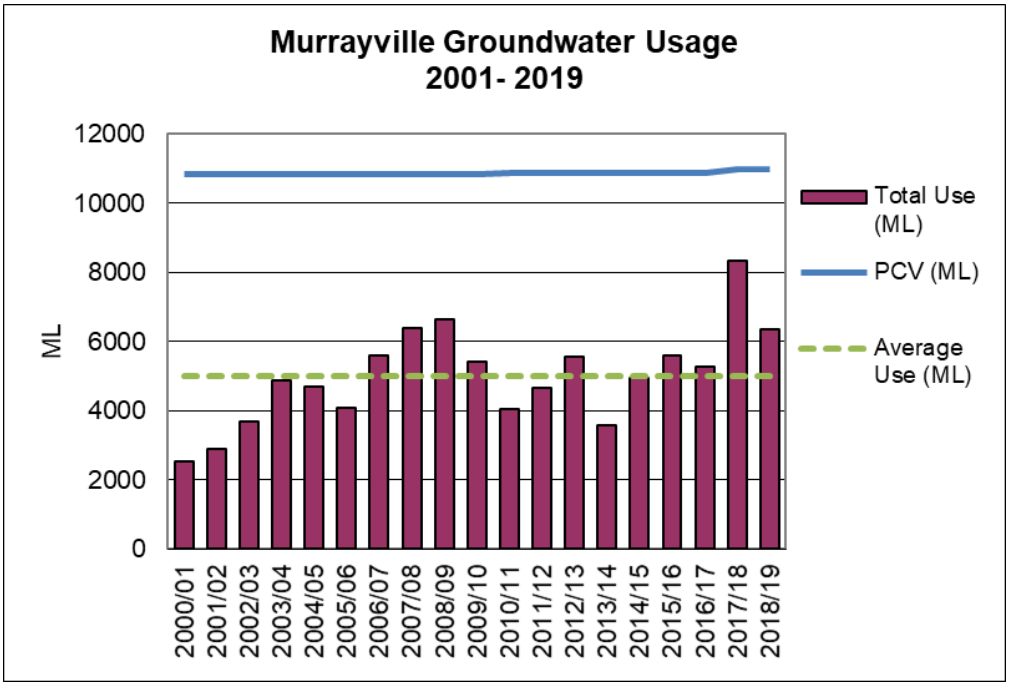


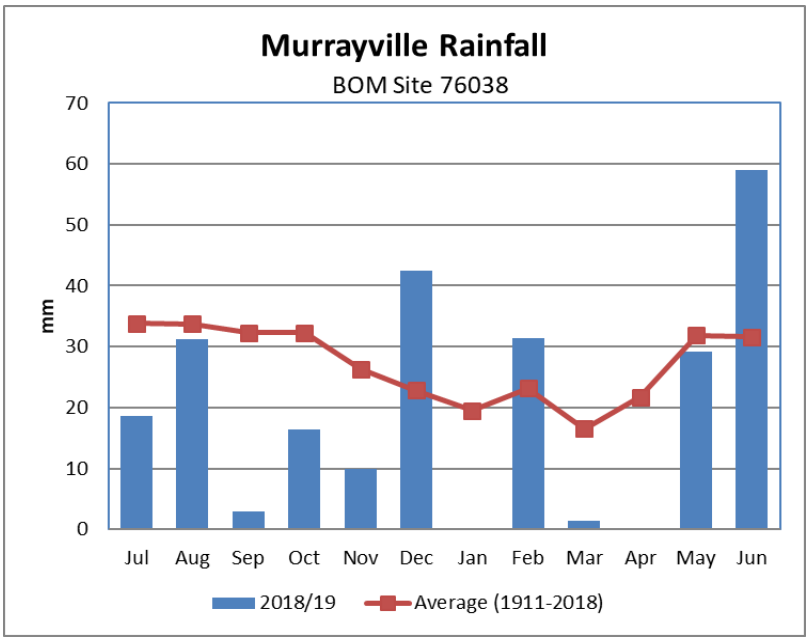
Table 2: *2018/19 Groundwater use by zone*

Zone	Use 2018/19 ML	Volume licenced (30 June 2019) ML	Zone limit ML
11B	1,215.4	1,600	1,720
10B-1	1,540.3	2,265	2,265
10B-2	688.2	1,120	1,370
10B-3	1,592.1	2,005	2,140
10B-4	552.4	1,312.8	2,830
Murrayville East	779.6	1,437	2,412
Total	**6,368**	**9,754.8**	

Figure 3 illustrates monthly rainfall recorded at Bureau of Meteorology site 76038 in Murrayville during the period July 2018 to June 2019. The recorded monthly rainfall as compared to average monthly rainfall provides an indication of the potential influence rainfall has had on groundwater extractions use during the year.

In 2018/19 above average rainfall during December and February may have reduced the need for irrigation during these months. However, a drier than average autumn (March-April) may have extend the irrigation season into May for some users. The latter is reflected through observed groundwater level trends, where the maximum seasonal drawdown was recorded in May, rather than March or April when it is usually observed to occur.

Figure 3 *Actual and average monthly rainfall for Murrayville*



2.3 Accessing additional water – temporary transfer and carryover

Licensees have the ability to apply for a temporary transfer (trade) from another licensee to secure additional water should they require it. Approval of temporary transfer applications is subject to assessment, trade rules and zone limits. Ten temporary transfers (trades) of licence entitlement were processed during 2018/19.

Carryover of unused water to the following season is permitted in the Murrayville GMA, up to a maximum of 30% of licenced entitlement. Carryover water is not transferrable to other licensees. A total of 1,700 ML of carryover water was available for use during 2018/19.

2.4 Licence Compliance

Meter reading and compliance checks conducted by GWMWater identified five potential instances of licensees failing to comply with licence conditions during the 2018/19 season.

Four instances were resolved prior to 30 June 2019, with no further action taken by GWMWater.

One Notice of Contravention was issued to a licence holder under Section 151 of the *Water Act 1989*. A Notice of Contravention specifies corrective action a licence holder must take, and any applicable timeframes for that action.

2.5 Domestic and stock bores

Landholders can apply for a licence to construct a domestic and stock bore via the Victorian Water Register (http://waterregister.vic.gov.au/).

There was one bore construction licence issued for the construction of a new domestic and stock bore in the Murrayville GMA in 2018/19.

2.5.1. Reimbursement for works to domestic and stock bores

The Murrayville Local Management Plan allows for landholders to apply to GWMWater for reimbursement for works required to domestic and stock bores, should they be affected by falling groundwater levels resulting from licenced groundwater extraction.

There were no instances of landholders seeking reimbursement for the lowering or deepening of domestic and stock pumps, mills or bores in 2018/19.

3. Monitoring Program

3.1 Groundwater quality monitoring

GWMWater undertakes water quality sampling of more than 40 domestic and stock bores located throughout the GMA. This sampling has been undertaken annually since 2008. A map illustrating the sampling data is illustrated in Appendix 1. Graphs of bores grouped by Parish are also illustrated. The salinity data is loaded into the Victorian Water Measurement Information System (WMIS) and is accessible to the public. There are also a number of observation bores that are sampled regularly for salinity, as part of the Victorian State Observation Bore Network; this data is also uploaded to WMIS.

Analysis of groundwater samples collected during 2018/19 showed no discernible increase in the salinity level of water in the bores tested.

3.2 Groundwater extraction monitoring

As discussed in Section 2.2, each commercial and irrigation bore is metered, and seasonal extraction volume is confirmed by GWMWater annually in June. The electronic nature of GWMWater's groundwater meter fleet provides high accuracy measurement, and enables data files to be downloaded and reviewed to identify any potential faults or discrepancies.

In 2018/19 the total volume of water extracted by licenced users in the Murrayville GMA was 6,368 ML.

3.3 Groundwater level monitoring

Water level monitoring is undertaken by a contractor on behalf of the Department of Environment, Land, Water and Planning (DELWP) and GWMWater. Data is transferred to the Victorian Water Measurement Information System (WMIS) which can be accessed at http://data.water.vic.gov.au/monitoring.htm. Observation bores are monitored on a quarterly basis. There are also a number of bores which have data loggers installed and can record and transmit data daily.

A map illustrating the locations of currently monitored observation bores is provided in Appendix 2. This illustrates the geographic extent of monitoring in the GMA, with particular concentration in areas where extraction is more intense.

3.4 Impact of use on observed groundwater levels

In 2017/18 (prior year), a considerable drawdown of up to 8.5m was observed in response to the above average extraction recorded during that season. The 2017/18 annual report for the Murrayville GMA flagged the potential for greater drawdown than previously observed should the aquifer not recover to its historical level prior to the commencement of groundwater extraction for the 2018/19 irrigation season. Fortunately the large seasonal drawdown of 2017/18 was not sustained into 2018/19.

The observed groundwater level response corresponds to the reduced volume of groundwater extraction in the GMA, particularly in the more intensively irrigated zones of 10B-1, 10B-2, and 10B-3. Total extraction in the GMA was approximately 2,000 ML less than 2017-18, with extraction in the most intensively irrigated areas being 2,400ML less than 2017-18. Increased extraction was recorded in Zone 11B, and the Murrayville East Zone. The wider geographical distribution of extraction across the zones was reflected in the observed groundwater levels.

Groundwater hydrographs indicate that in most cases, groundwater levels did not appear to fully recover to historical levels prior to the onset of pumping for the 2018/19 irrigation season. However, the maximum drawdown level during 2018/19 was less than that recorded in the previous year, and was not observed to reach any new maximum drawdown levels.

3.5 Resource condition threshold

The Murrayville LMP outlines the means of assessing drawdown against the resource condition threshold (0.65m/year). The assessment examines the average annual change in groundwater level and applies a five year rolling average. The five year average avoids any overly reactive response due to seasonal factors and averaging bores removes bias which may arise from using a single bore.

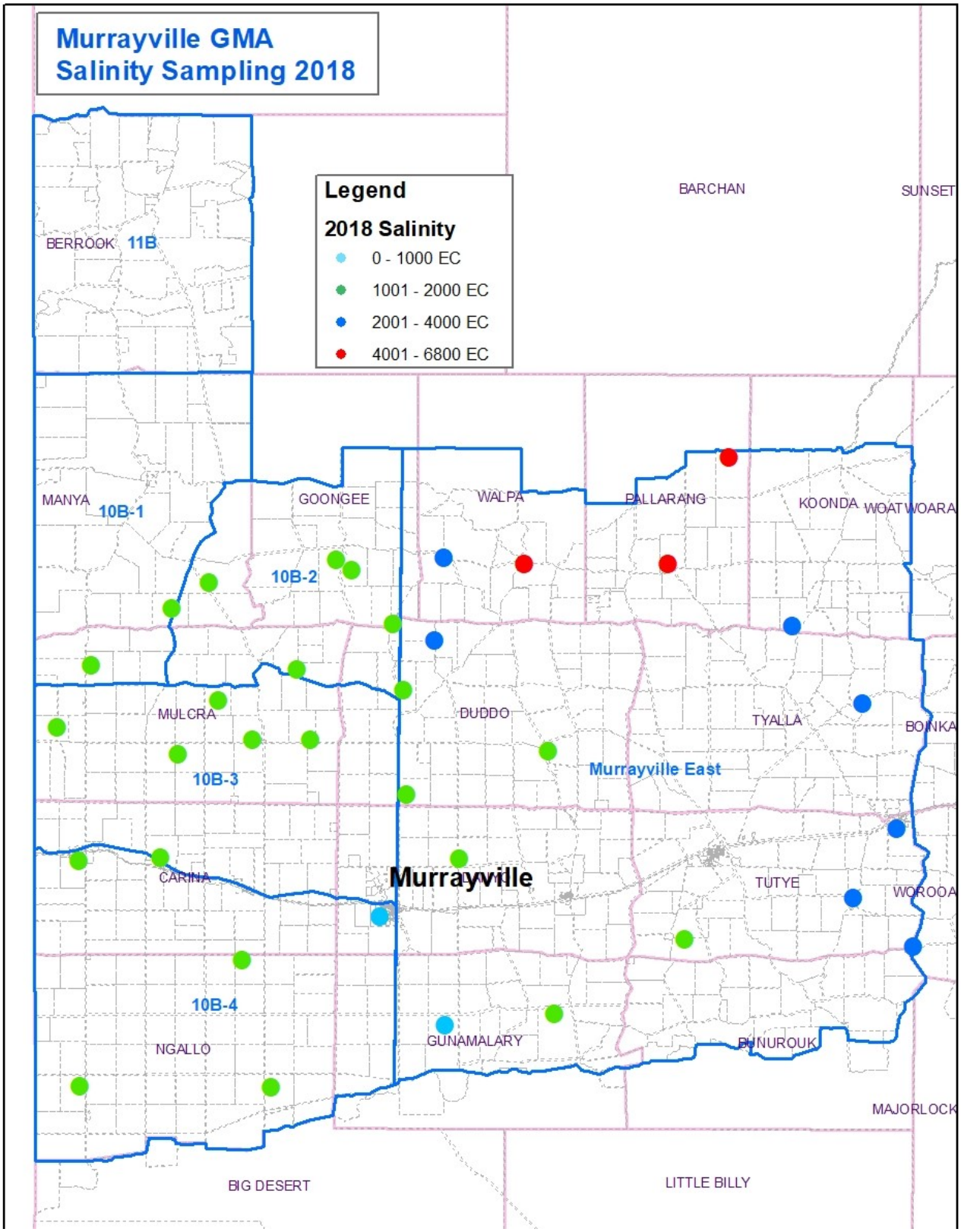
To comply with the resource condition threshold, the annual change in groundwater level should not show a decline of more than 0.65m/year for more than two consecutive years (based on the five year rolling average). The annual groundwater decline is determined from the level to which groundwater levels recover prior to the irrigation season (usually in September-October), and this is compared with the groundwater recovery level in the prior year. For this reason, the recovery level in response to extraction during the 2017/18 is used for the current assessment of resource condition, as data is not yet available for 2018/19.

As illustrated by the a*verage change in groundwater level* graphs in Appendix 3, the 0.65m threshold has not been approached in recent years in any of the assessment areas. The Panitya North (Zone 10B-1) area was the only area, where based on the 5 year rolling average, a decline in groundwater level was observed (0.31m). This decline remains well within the permitted drawdown limit.

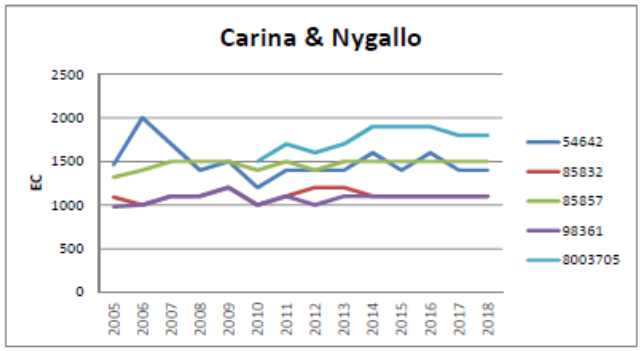
Consistent with the Murrayville LMP, groundwater level trends have been assessed against the resource condition threshold. As none of the assessment areas are approaching or have exceeded the threshold, there is no need for GWMWater to consider any form of seasonal restriction for 2019-20 or 2020-21.

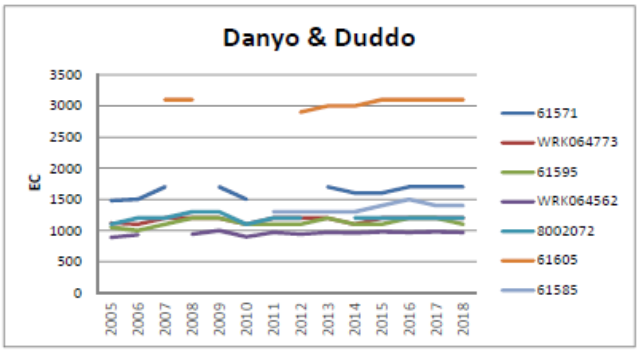
Appendix 1 – Water Quality Monitoring

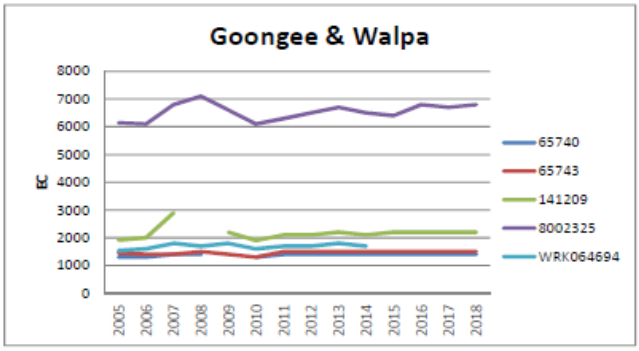
Annual water quality sampling of D&S bores - Spring 2018

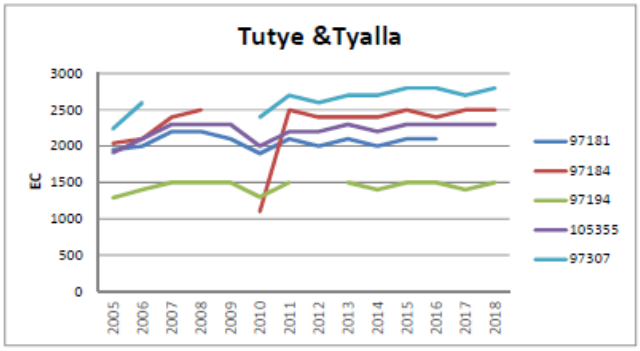


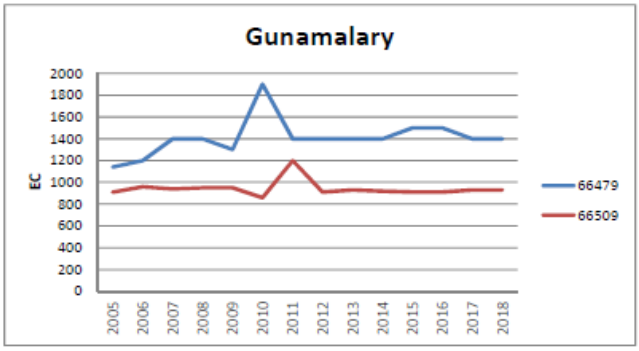
D&S annual sampling salinity data (graphed by parish)

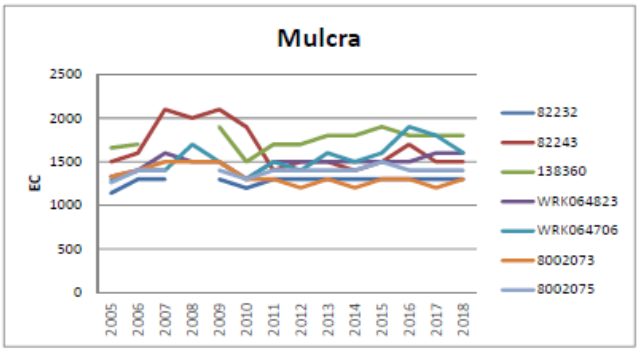


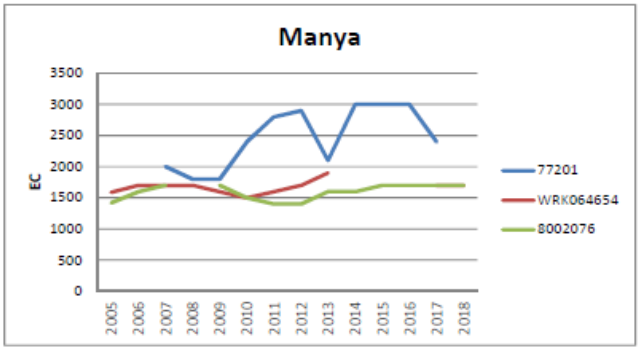


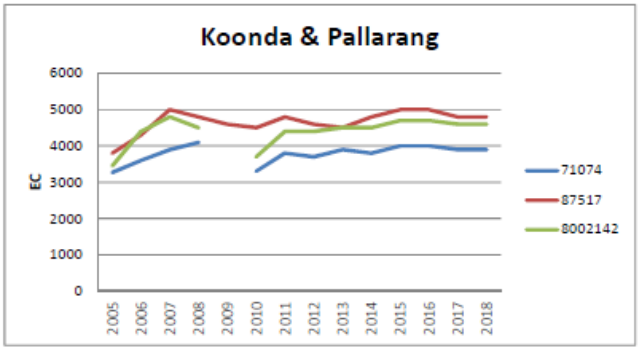




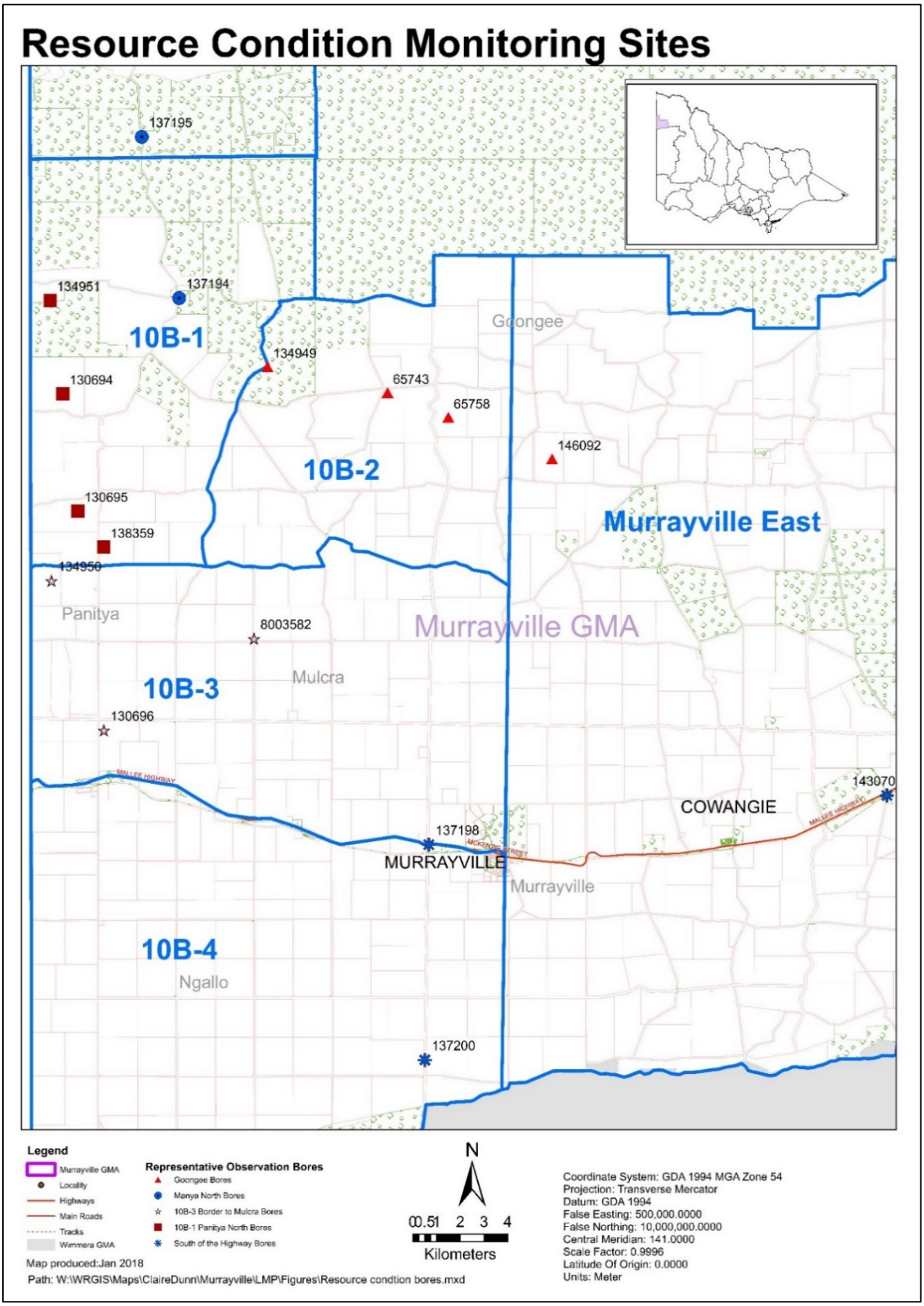






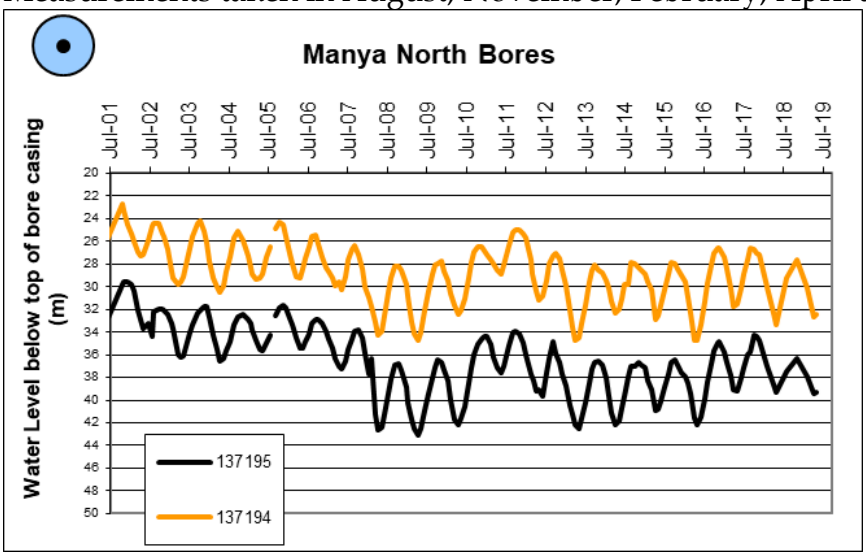


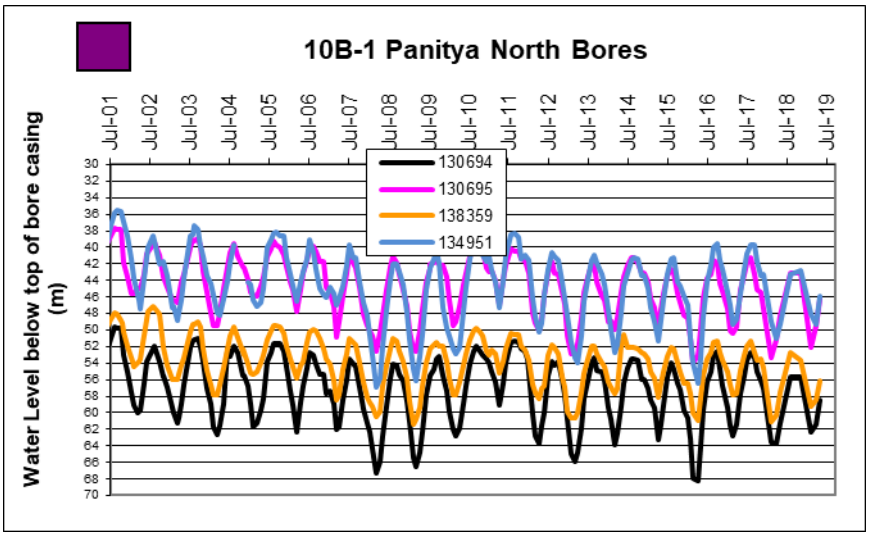
Appendix 2 – Water level monitoring

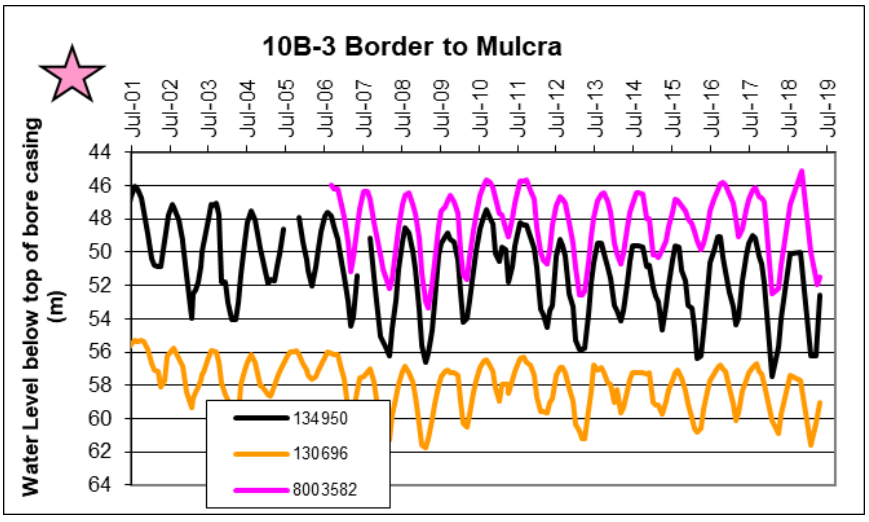


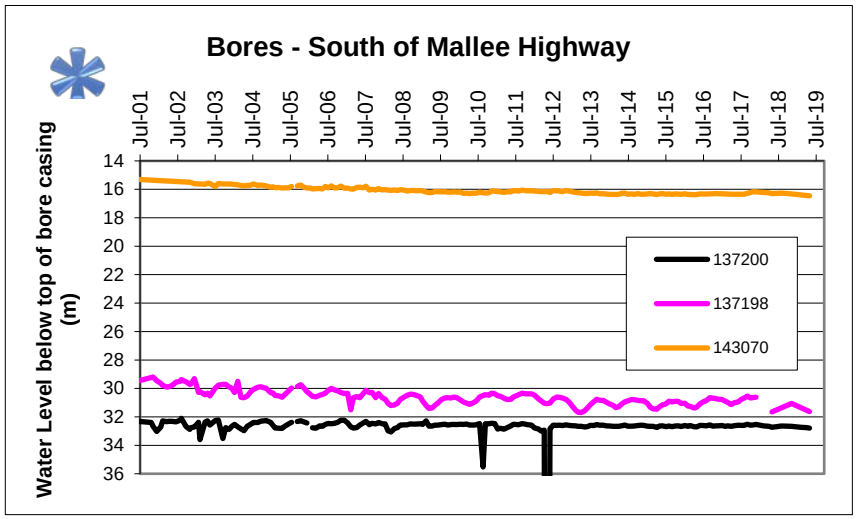
Groundwater levels as measured in observation bores.

Measurements taken in August, November, February, April and May.








Bores - South of Mallee Highway
Water Level below top of bore casing (m)
Jul-01
Jul-02
Jul-03
Jul-04
Jul-05
Jul-06
Jul-07
Jul-08
Jul-09
Jul-10
Jul-11
Jul-12
Jul-13
Jul-14
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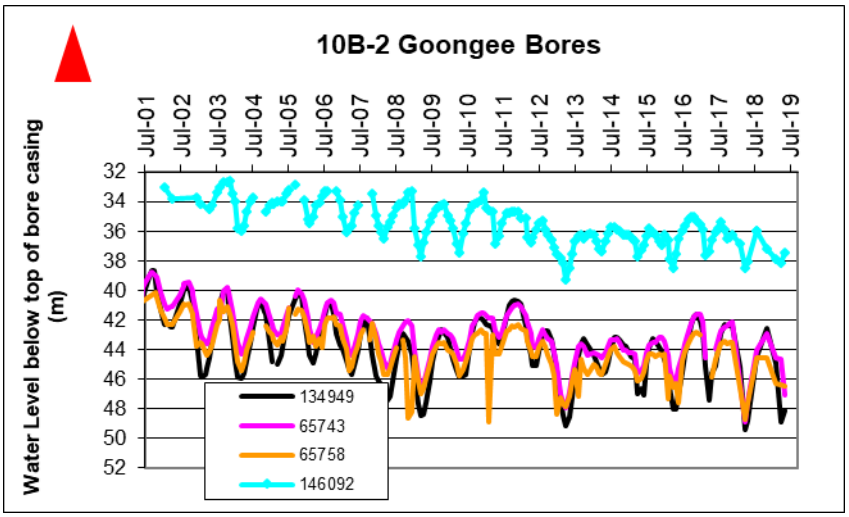
137200
137198
143070


10B-2 Goongee Bores
Water Level below top of bore casing (m)
Jul-01
Jul-02
Jul-03
Jul-04
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Jul-08
Jul-09
Jul-10
Jul-11
Jul-12
Jul-13
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Jul-18
Jul-19
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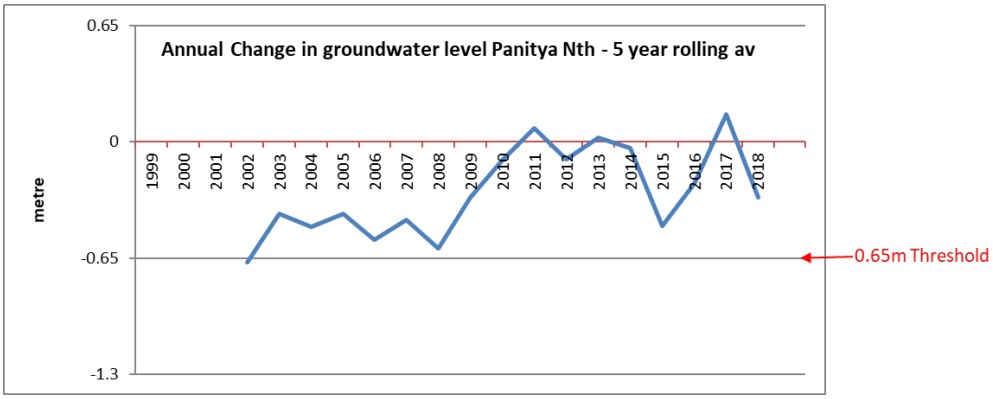
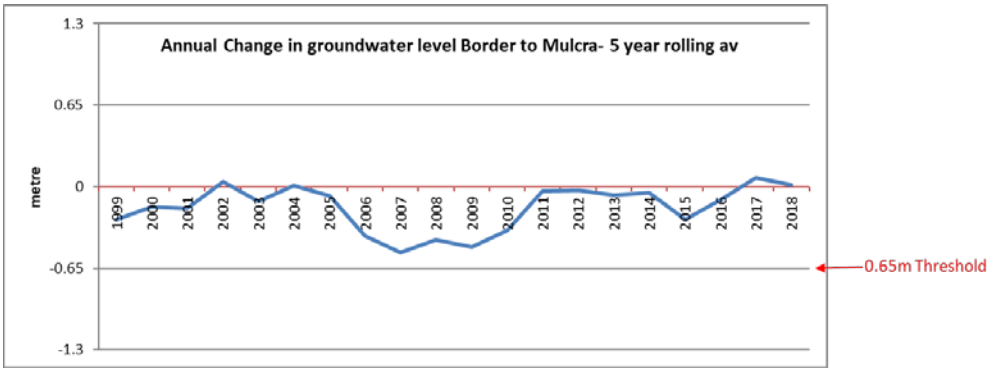
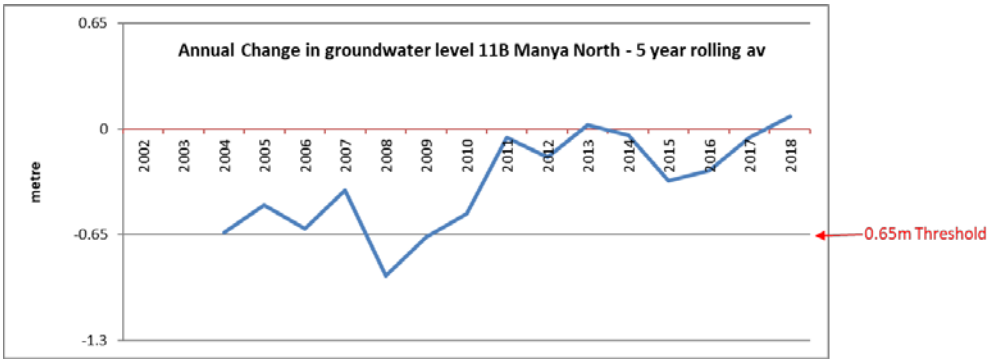
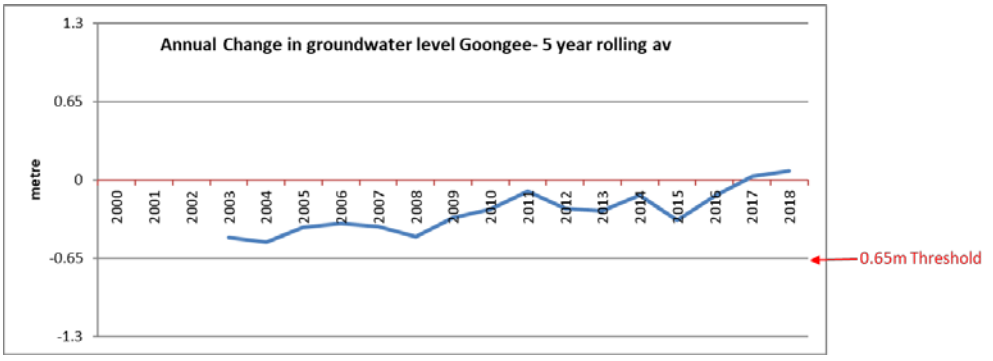
134949
65743
65758
146092

Appendix 3 – Resource Condition Threshold

Average change in groundwater level graphs.
The 0.65m threshold has not been reached in any of the resource condition assessment areas in recent years.