

# **Yarram WSPA Groundwater Management Plan Annual Report**

**2019-20**

## Foreword

This report is submitted to the Minister for Water and West Gippsland Catchment Management Authority in accordance with s32C *Water Act 1989*. A copy of this report is available by contacting the Authority at [srw@srw.com.au](mailto:srw@srw.com.au) or by calling 1300 139 510. A notice of report availability of the report will be published as required by s32D of the *Water Act 1989*.

The purpose of this report is to detail Authority activities administering and enforcing the management plan, and provide information that is required to be reported under the Plan.

## Area Summary

<b>Area</b>	Yarram Water Supply Protection Area
<b>Segment</b>	Groundwater
<b>Area Declared</b>	4 November 2002
<b>Plan Approved</b>	14 October 2010
<b>Permissible Consumptive Volume</b>	25,690 ML
<b>Scheduled Plan Review</b>	A review commenced in 2017 and remains underway.
<b>Implementation Authority</b>	Southern Rural Water
<b>Relevant CMA</b>	West Gippsland Catchment Management Authority
<b>Report Period</b>	1 July 2019 – 30 June 2020

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## 1 Executive Summary

The Yarram Groundwater Management Plan (GMP) was prepared under Division 3 Part 3 of the *Water Act 1989* for the Yarram Water Supply Protection Area (WSPA) and relates to the groundwater resources of the protection area. The Yarram GMP was approved by the Minister for Water in October 2010.

The objective of the management plan is to make sure that the water resources of the area are managed in an equitable manner so as to ensure the long-term sustainability of those resources.

Southern Rural Water (SRW) is the authority responsible for managing and administering the plan, which includes the preparation of an annual report to demonstrate compliance. The annual report summarises licence information, metered usage and monitoring data collected for the reporting period in accordance with the requirements of the Yarram GMP.

The Yarram GMP Annual Report for 2019-20 demonstrates that SRW has complied with the requirements of the plan.

Monitoring and metering indicate no significant changes in the condition of the resource or water usage patterns, therefore, it is considered that the groundwater resources of the Yarram WSPA are being managed sustainably.

SRW is currently undertaking a review of the GMP. In order to inform this review SRW has undertaken a survey of groundwater licence holders in the Yarram WSPA and adjacent areas. The survey results confirm that the current GMP is working well, however some licence holders would like greater trading opportunities, including between the adjacent Stratford groundwater management area. Future opportunities to improve trade will continue to be considered by SRW, including as part of the review process.



HUGH CHRISTIE  
Manager Groundwater & Rivers

## 2 Introduction

This report summarises licence information, metered usage and monitoring data collected for the period between 1 July 2019 and 30 June 2020 in accordance with the requirements of the Yarram GMP.

The Yarram WSPA is located south of the Strzelecki Ranges and includes the on-shore area of the Gippsland Basin. This is a relatively small component of the whole Gippsland Basin but covers an area where groundwater is extracted primarily for irrigating pasture in Yarram and surrounding districts. The Yarram WSPA also incorporates forested areas along the Strzelecki Ranges comprising State Parks or plantation forestry.

The WSPA includes the aquifers in the Latrobe Group and the shallower Balook Formation which are the main sources of water used for irrigation. The Latrobe Group and Balook Formations are in hydraulic connection. From Woodside to Golden Beach, the Latrobe Group is much deeper, underlying the Gippsland Limestone and Boisdale Formations. These aquifers are overlain by the Haunted Hills Formation: a shallow unconfined aquifer, incised by local streams. It is low yielding and generally poorer quality than the other aquifers and is typically suitable for stock watering and dairy wash purposes.

SRW has the duty of administering and enforcing the management plan.

The objective of a management plan, as set out in the Act, is to make sure that the *water resources of the area are managed in an equitable manner to ensure the long-term sustainability of those resources*.

The management plan includes measures to ensure the long-term sustainability of groundwater resources by setting limits on licensed entitlements and by defining trading rules.

The plan requires SRW to:

- Coordinate groundwater level monitoring and metering programs;
- Review monitoring and metering data;
- Administer groundwater licensing within the prescriptions of the plan;
- Review and report annually to the Minister administering the Water Act 1989 on the implementation of the plan; and
- Undertake a review of the plan after 5 years and if, in its opinion, amendments are necessary or desirable, make recommendations to the Minister accordingly.

The success of the Yarram GMP is measured through a number of licensing, metering and monitoring objectives. These include:

- All consumptive use to be metered and recorded in line with both State Government and Corporation metering policies;
- Groundwater usage is to be maintained within licence volumes;
- Water levels and water quality (salinity) is to be monitored to maintain acceptable levels and to ensure the long term sustainable use of the aquifer(s);
- Transfer of existing licences occurs in accordance with all relevant provisions of the Water Act 1989 and/or any supplementary rules adopted for the Yarram WSPA; and
- No new groundwater licences will be issued if the total of all groundwater licence entitlements would exceed the PCV declared for the Yarram WSPA, unless in accordance with prescriptions 3 & 4.

Further information can be obtained from the Yarram WSPA Groundwater Management Plan. A copy can be found on Southern Rural Water's website: [www.srw.com.au](http://www.srw.com.au).

### **3 Key Observations**

#### **3.1 Rainfall**

Rainfall during the reporting period was 680mm (measured at Yarram Airport).

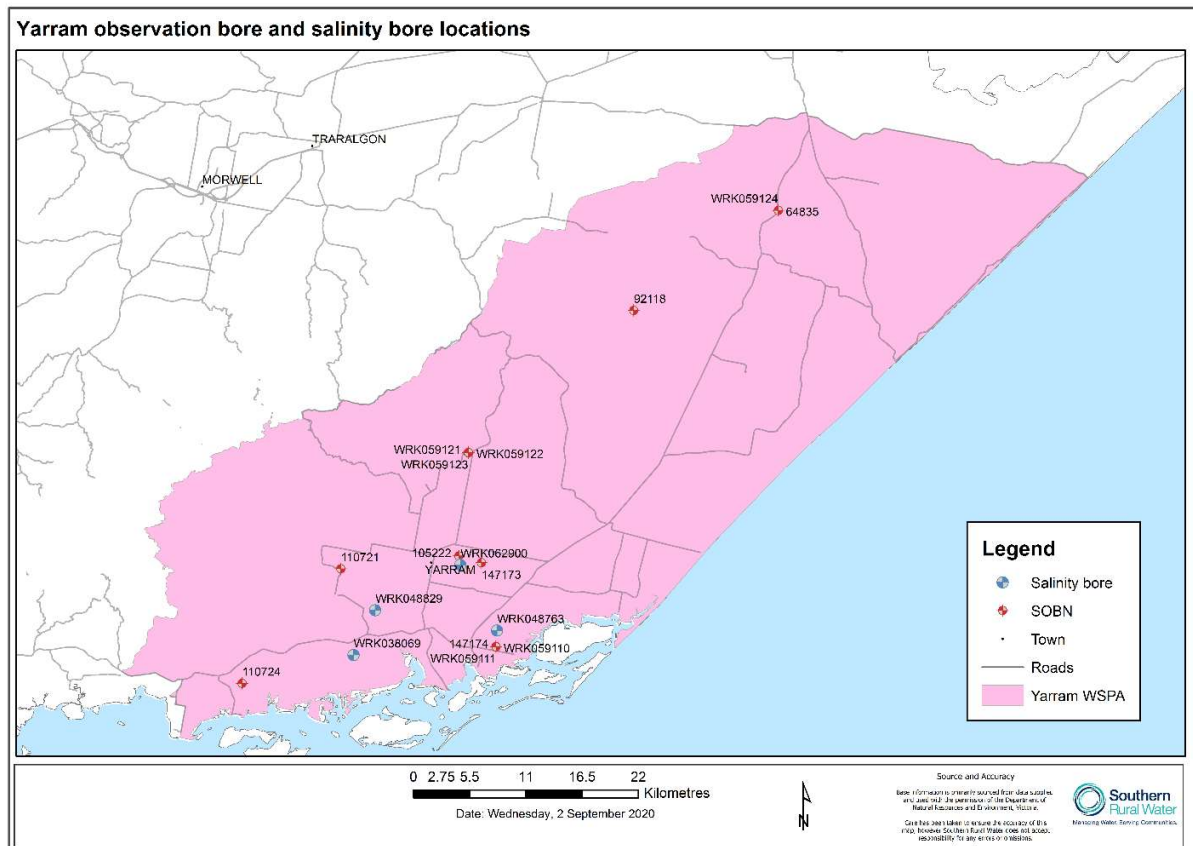
The average rainfall for this area is 732mm per year (measured at Yarram).

This area received approximately 50mm below the average for the reporting year.

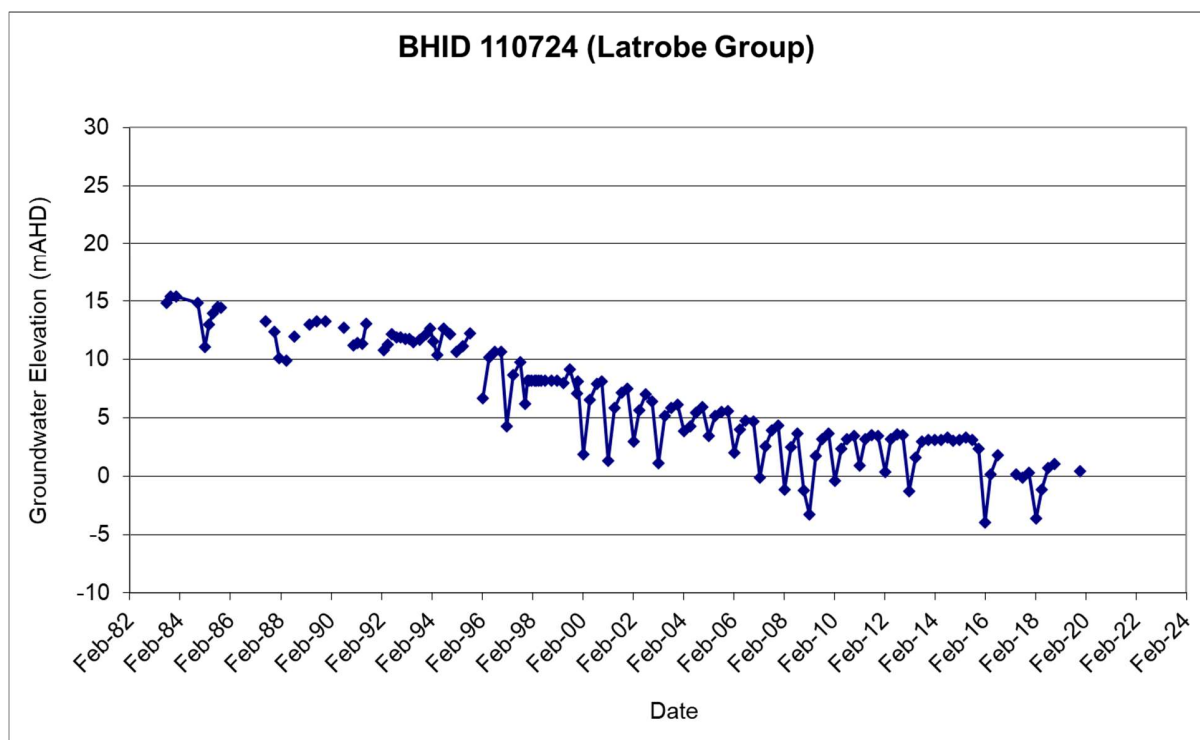
#### **3.2 Water Levels/flows**

Groundwater levels are measured in thirteen (13) bores, monitoring the Haunted Hills, Latrobe Valley Coal Measures, Balook Formation and Latrobe aquifers (Lower Tertiary Aquifer).

The location of observation bores in the area are shown below in Figure 1, and a sample hydrograph in Figure 2.



**Figure 1: Map showing State Observation Bore and Salinity Bore locations.**



**Figure 2: Example hydrograph**

All hydrographs are presented in appendix 1.

The groundwater level data indicates that:

- Groundwater levels in the Latrobe aquifer (Lower Tertiary Aquifer) are primarily influenced by offshore extraction, with a secondary influence from localised groundwater pumping. Levels have been falling steadily by up to 1 meter per year since at least the early 1980's. The impacts of this on users will continue to be monitored.
- Some seasonal variance can be seen in bores 105222 and 110724, where groundwater extraction is concentrated. Onshore extraction does not seem to influence the overall behavior of the aquifer.

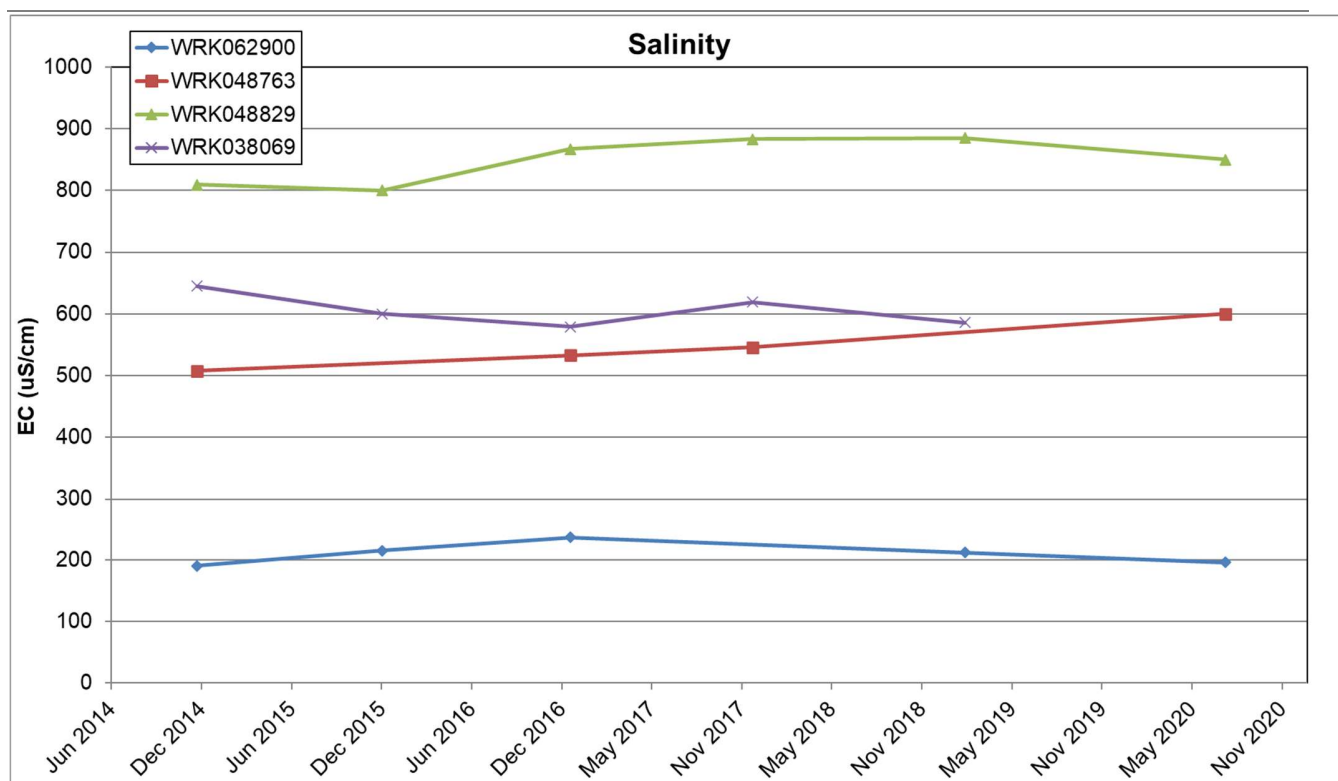
### 3.3 Salinity / Water Quality

One of the key drivers for monitoring salinity in the plan was the potential of saline intrusion into the aquifer, as well as broader resource management issues.

A monitoring program was set up in 2014 to take salinity measurements every twelve months from the same four private irrigation bores in Yarram. Bore locations are shown in Figure 1.

Salinity is stable in three of the four bores. The salinity in Bore WRK048763 demonstrates an increasing trend over time, however the quality of this water is still very good, with no indication of issues from saline intrusion. Bore WRK038069 was not sampled due to COVID-19 restrictions.





### 3.4 Water Use

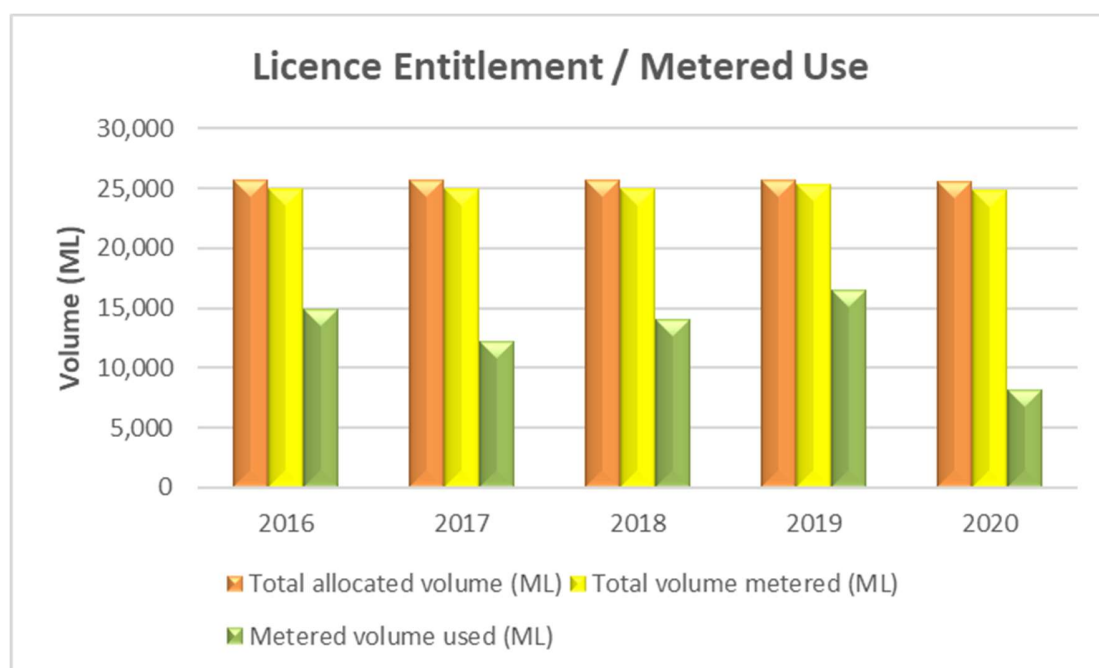
The following table provides detail on water use in the 2019-20 year as compared to four previous years.

At 30 June	2016	2017	2018	2019	2020
No. of licences	87	86	89	83	84
Total allocated volume (ML)	25,688.8	25,688.8	25,688.8	25,687.6	25,627
No. of metered licences	57	55	56	56	56
Total allocated volume metered (ML)	25,038	25,022	25,034.2	25,304.2	24,914.20
Metered volume used (ML)	14,941	12,246.4	14,074.9	16,557.1	8,194.1
Use of allocation (%)	58%	48%	55%	64%	32%
No. of licences with use greater than allocation (refer to section 3.5)	3	1	1	1	0
Permissible Consumptive Volume (PCV)	25,690	25,690	25,690	25,690	25,690
Use as a % of PCV	58%	48%	55%	64%	32%
No. of D&S bores <sup>1</sup>	285	231	272	272	258

D & S bores estimated use <sup>1</sup>	428.0	347	408	408	387
Estimated D & S use from licenced bores <sup>2</sup>	130.5	127.5	133.5	124.5	126

<sup>1</sup>Taken from the Victorian Water Accounts

<sup>2</sup>Estimated 1.5ML per licence 2013 onwards



**Figure 3: Licence allocation compared to metered volume and usage.**

### 3.5 Non Compliance

No compliance issues were identified in the Yarram WSPA during 2019-20.

SRW investigates all compliance issues and considers several factors such as the seriousness of the breach and impact on the resource and other users, prior to deciding on the most appropriate action. The action taken by SRW can include the use of direction notices, warning letters and prosecution

## 4 Plan Implementation

### 4.1 Monitoring

#### 4.1.1 Prescriptions

The following table details the requirements of the management plan in relation to monitoring.

Plan Requirement:	Activity / Reference	Complies
9. The Department must ensure that monitoring bores are properly maintained and replaced if necessary; and	The monitoring bores are owned and managed by the Department of Environment Land Water and Planning (DELWP)	Yes
10. The Department and the Corporation must ensure that data collected from monitoring bores is entered into the groundwater management system.	<p>All bores have minor maintenance carried out annually which includes site clearance, rust removal, painting, and ensuring the bore is secure and safe.</p> <p>The DELWP carries out maintenance on bores that have been identified as needing maintenance following field inspections.</p>	Yes
<p>11. The Department and the Corporation must ensure that water level monitoring and investigations are carried out at appropriate locations throughout the Yarram WSPA to:</p> <p>a) assess annual and long term impact on water levels from groundwater pumping;</p> <p>b) monitor saline intrusion</p> <p>c) monitor regional and local seasonal drawdown;</p> <p>d) examine interaction between groundwater, surface water and groundwater dependent ecosystems;</p> <p>e) provide information for future resource assessments; and</p> <p>f) monitor the impacts of groundwater pumping generally across the Yarram WSPA and in areas of intensive groundwater pumping.</p>	<p>SRW works closely with the DELWP to ensure that the monitoring program meets the requirements of the Plan.</p> <p>SRW regularly reviews the groundwater level program. (Covers section a, c, e and f)</p> <p>If SRW identifies bores of greater interest, monitoring may be undertaken in addition to the DELWP's monitoring program.</p> <p>Refer to section 3.3 for further information on points 11b.</p>	Yes

### 4.2 Metering

#### 4.2.1 Prescriptions

The plan does not have specific prescriptions relating to metering.

Active licence holders in the Yarram WSPA are metered in accordance with State Government policy and SRW requirements. The continual rollout of automated meter read technology adds to the ability to actively manage the resource throughout the year.

All meters are read at least twice per year in December/January and May/June. The meter readings and usage data are recorded and stored in SRW's metering system and reported into the Victorian Water Register.

#### 4.2.2 Metering activities

	<b>Year to 30 June 2020</b>	<b>Total for WSPA at 30 June 2020</b>
Number of licences issued	0	84
Number of meters installed	0	90
Meters requiring maintenance	25 0 removed	
Meters replaced	3	
Meters read (1 – date)	Jan/Feb 2020	
Meters read (2 – date)	Jun 2020	
Number of estimated readings	0	

### 4.3 Restrictions on Licensing and Licence Transfers

#### 4.3.1 Prescriptions

The following table details the requirements of the management plan in relation to licensing

<b>Plan Requirement:</b>	<b>Activity/Reference</b>	<b>Complies</b>
1. The Corporation must not approve an application for the permanent or temporary transfer of a licence under section 62 of the Act into the Coastal Zone.	No transfers were processed into the Coastal Zone.	Yes
2. The Corporation must not approve an application for the permanent transfer of a licence under section 62 of the Act into the Central Zone.	No permanent transfers were processed into the Central Zone.	Yes
3. A new licence may be issued to overcome an administrative oversight or other anomaly or through a transfer of entitlement provided the PCV is not exceeded.	No activity to report.	Yes

4. The Corporation may issue or amend a groundwater licence in accordance with any state-wide policy and the PCV (by application to the Minister) will be adjusted accordingly.	No New licences have been issued	Yes
5. The volume of any groundwater licence that is surrendered, revoked or not renewed, cannot be reallocated other than for the purposes of Prescriptions 3 and 4.	No activity to report	Yes
6. No new licences are permitted in the Haunted Hills Formation. This applies to any applications to transfer into or within the Haunted Hills Formation. Exceptions may apply in accordance with Prescriptions 3 and 4.	No activity to report.	Yes
7. All groundwater licences within the Yarram WSPA will be migrated to the State Water Register within 6 months of ministerial approval of the Management Plan.	All licences are in the Water Register.	Yes
8. The Corporation must report the details of any licence referred to in Prescriptions 3 to 5 in the annual report on the administration and enforcement of the management plan required under section 32 of the Act.	No activity to report	Yes

#### 4.4 Licensing Activities

The following table provides summary details of licensing activities.

<b>Year to 30 June 2018</b>	<b>No.</b>	<b>Volume ML</b>
New licences issued	0	0
Additional volumes on existing licences	0	0
Licences revoked	0	0
Permanent transfers	1	240
Temporary transfers	0	0
D&S Bores notifying use	0	0

##### 4.4.1 Compliance and Exceptions

Activities undertaken during the reporting period comply with the requirements of the Plan.

##### 4.4.2 Issues Affecting Implementation

No issues to report.

## 5 Conclusions

The objective of a management plan, as set out in the Act, is to make sure that the *water resources of the area are managed in an equitable manner as to ensure the long-term sustainability of those resources*.

Monitoring and metering indicate no significant changes in the condition of the resource or water usage patterns compared to previous years. The steady decline in pressures resulting from offshore extraction is continuing, however there are no reports of bore or groundwater access issues.

SRW is currently undertaking a review of the GMP. In order to inform this review SRW has undertaken a survey of groundwater licence holders in the Yarram WSPA and in adjacent areas. The survey results confirm that the current GMP is working well, however some licence holders would like greater trading opportunities, including between the adjacent Stratford groundwater management area. Future opportunities to improve trade will continue to be considered by SRW, including as part of the review process. A review of the survey has been included as Appendix 2.

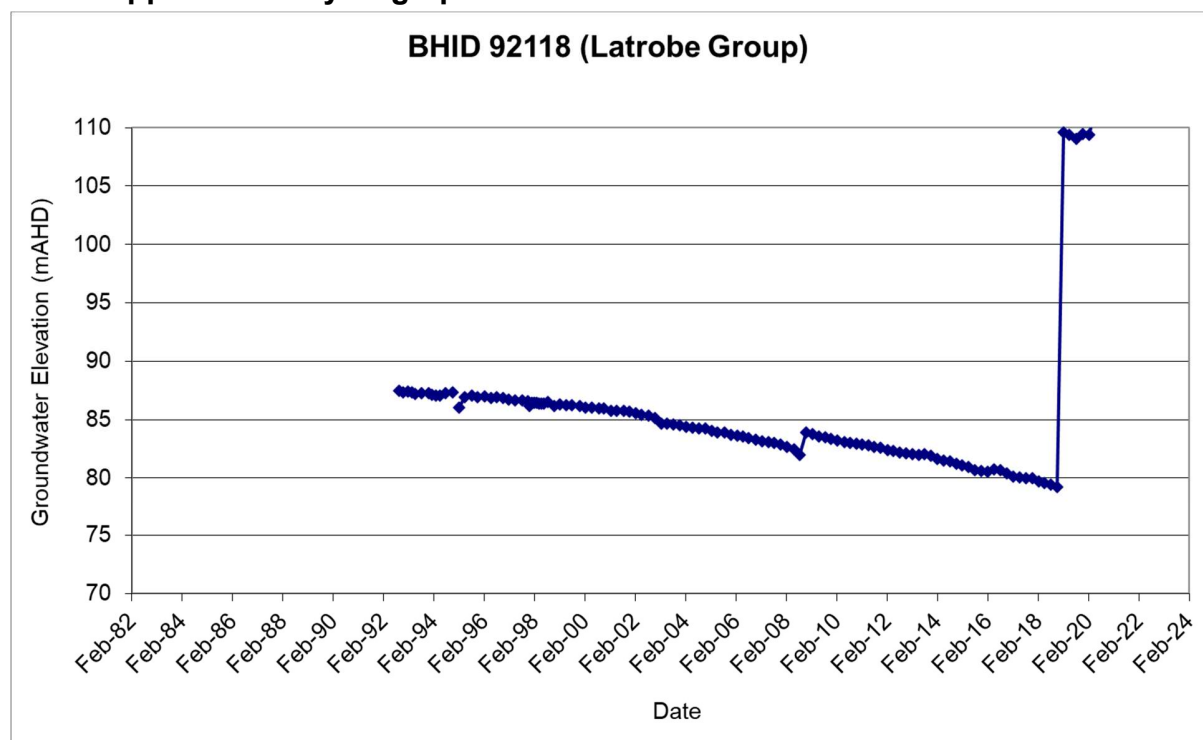
## 6 Appendices

### 6.1 Licence Details

Water Trade details for the 2019-20 season can be found at:

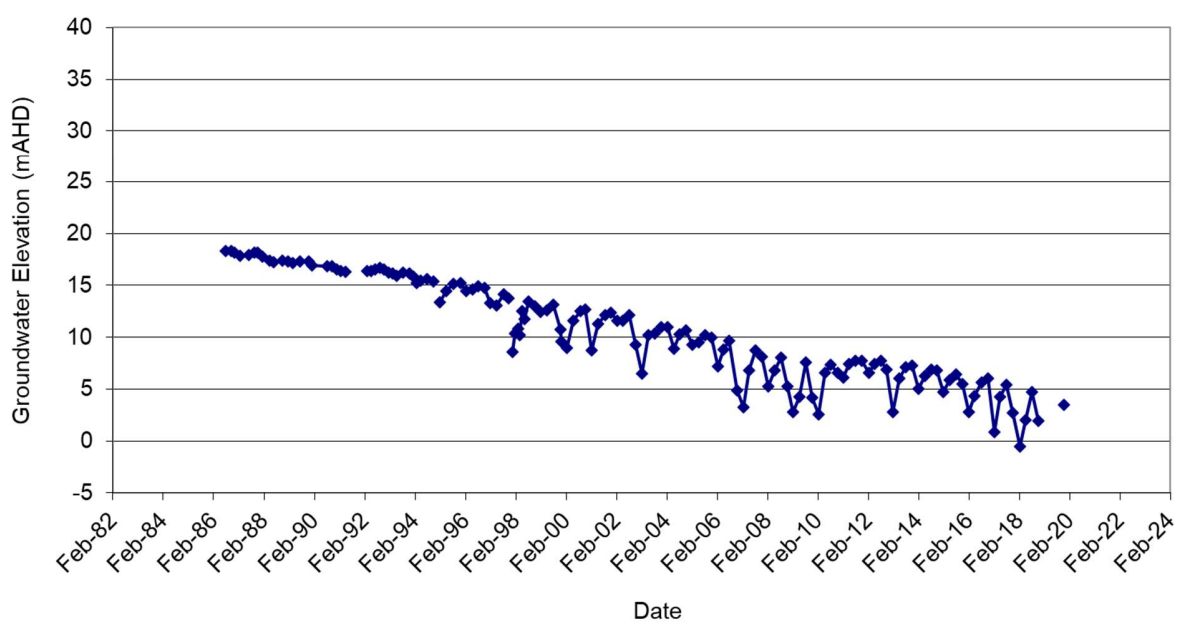
<http://waterregister.vic.gov.au/water-trading/take-and-use-licence-trading>

#### 6.1.1 Appendix 1 - Hydrographs

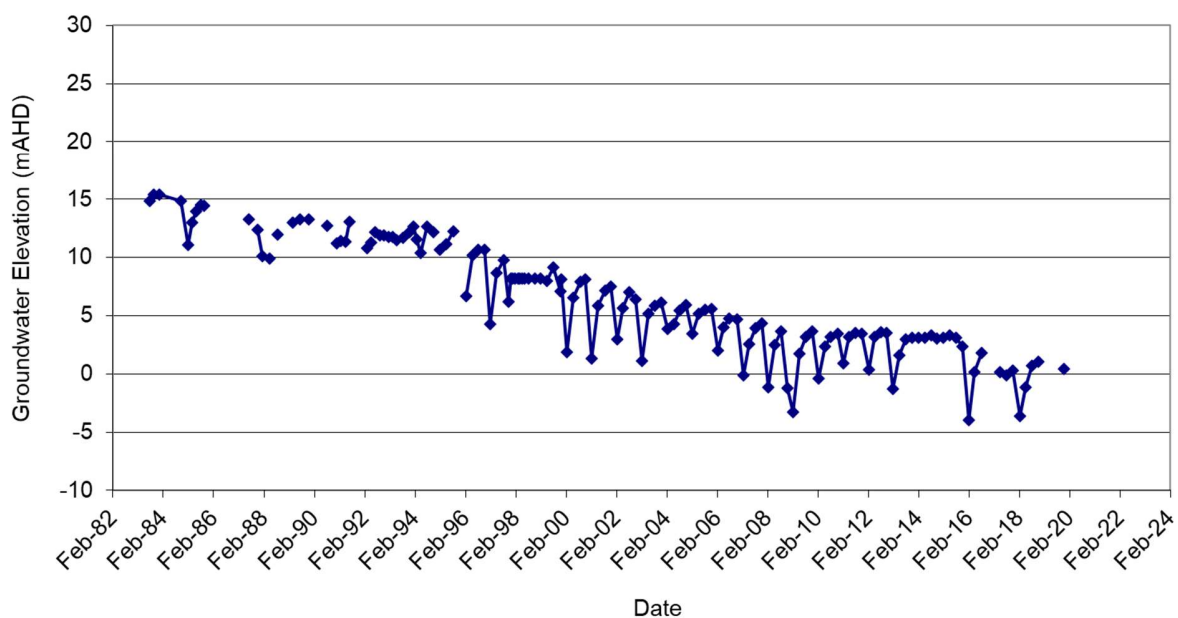


Note : the increase in pressures have been recorded following observation bore refurbishment. Reasons for the change in water levels are being investigated.

**BHID 105222 (Balook Fm)**

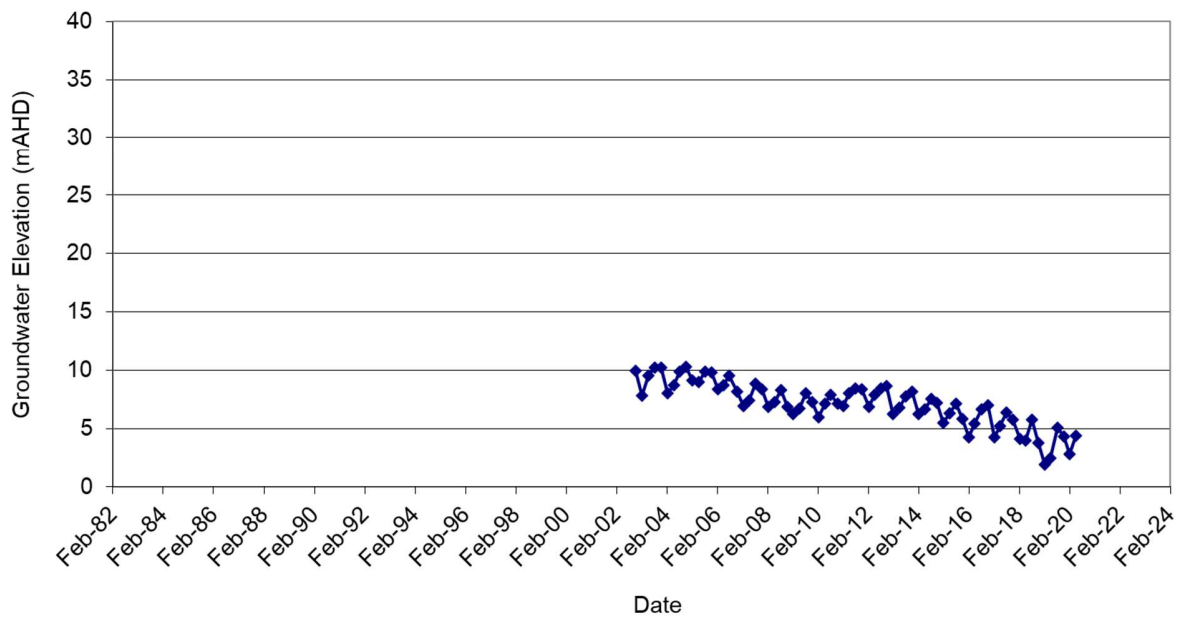


**BHID 110724 (Latrobe Group)**

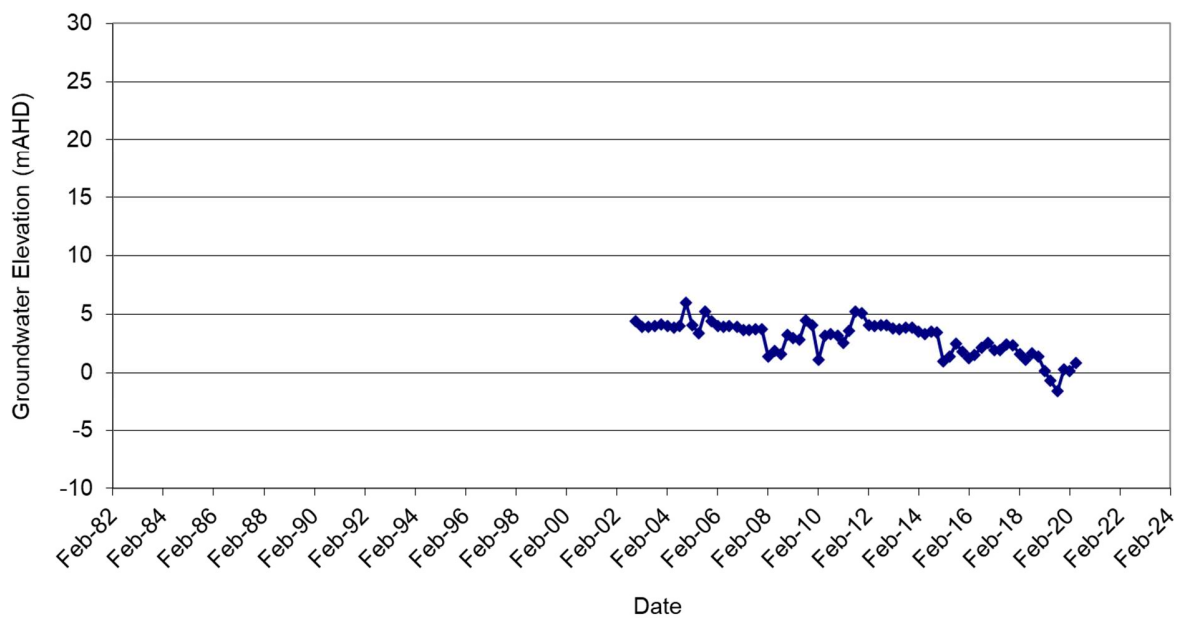




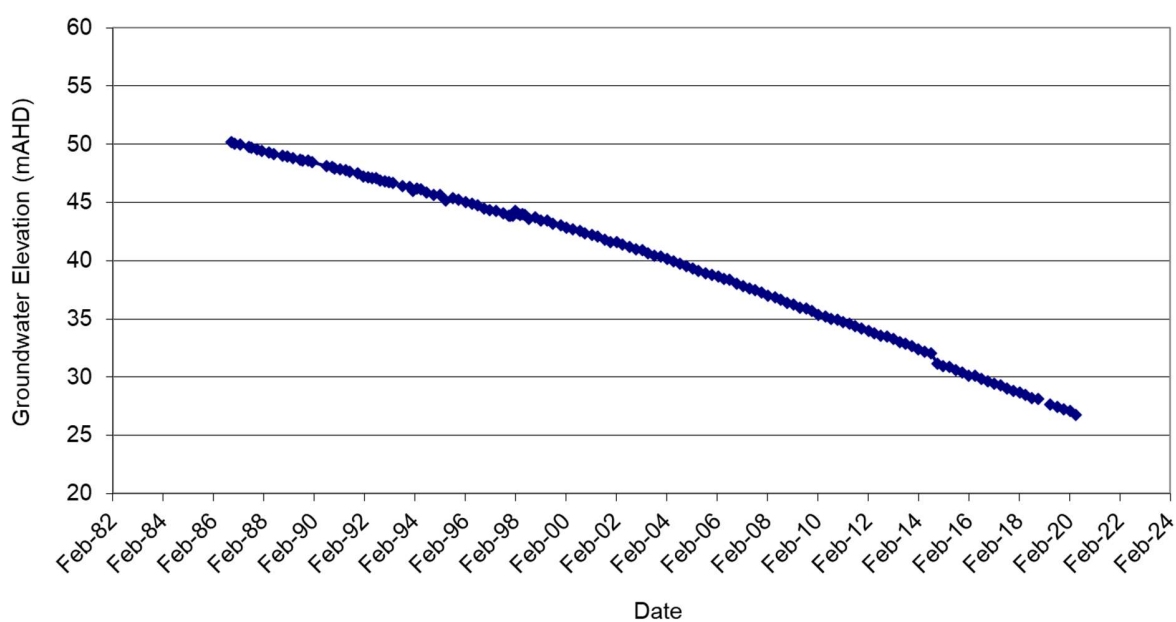
**BHID 147173 (Balook Fm)**



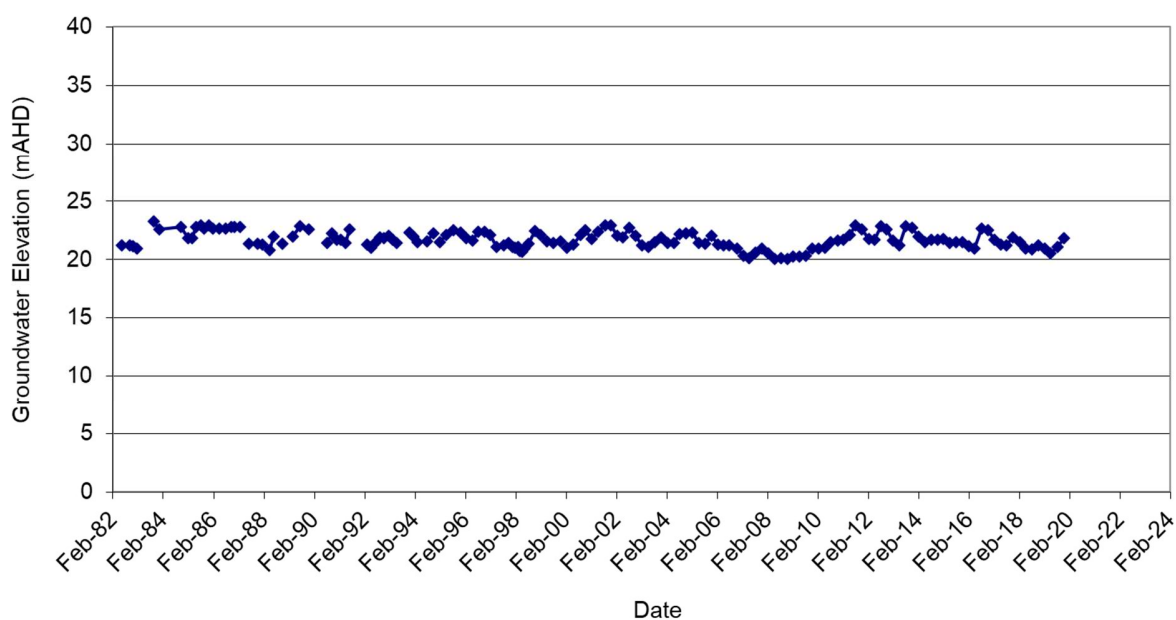
**BHID 147174 (Balook Fm)**



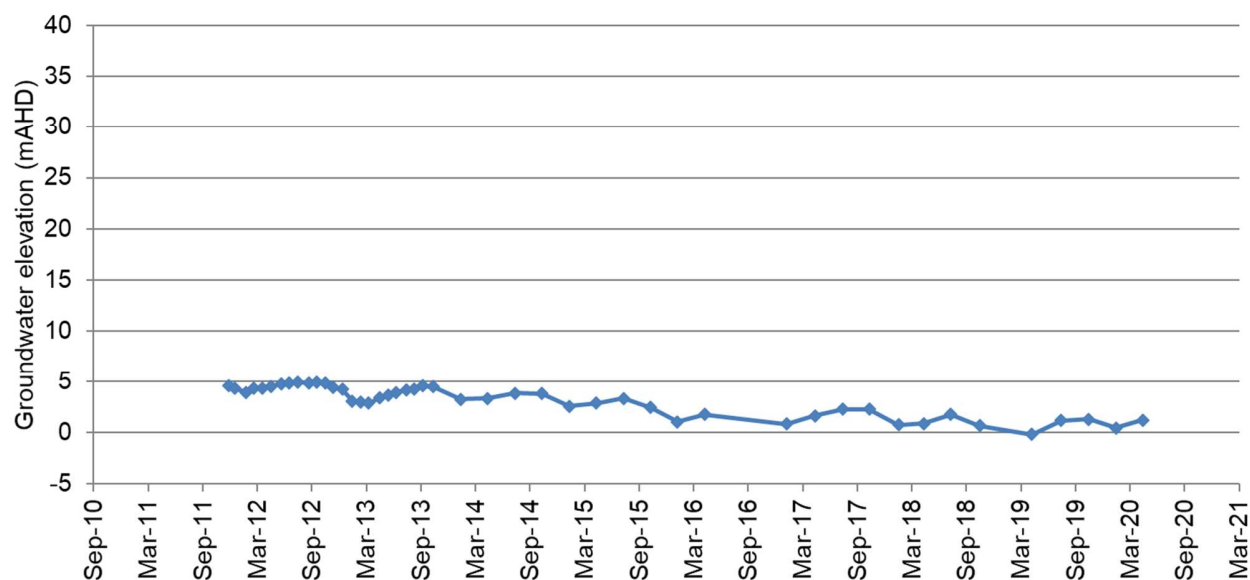
**BHID 64835 (Latrobe Valley Coal Measures)**



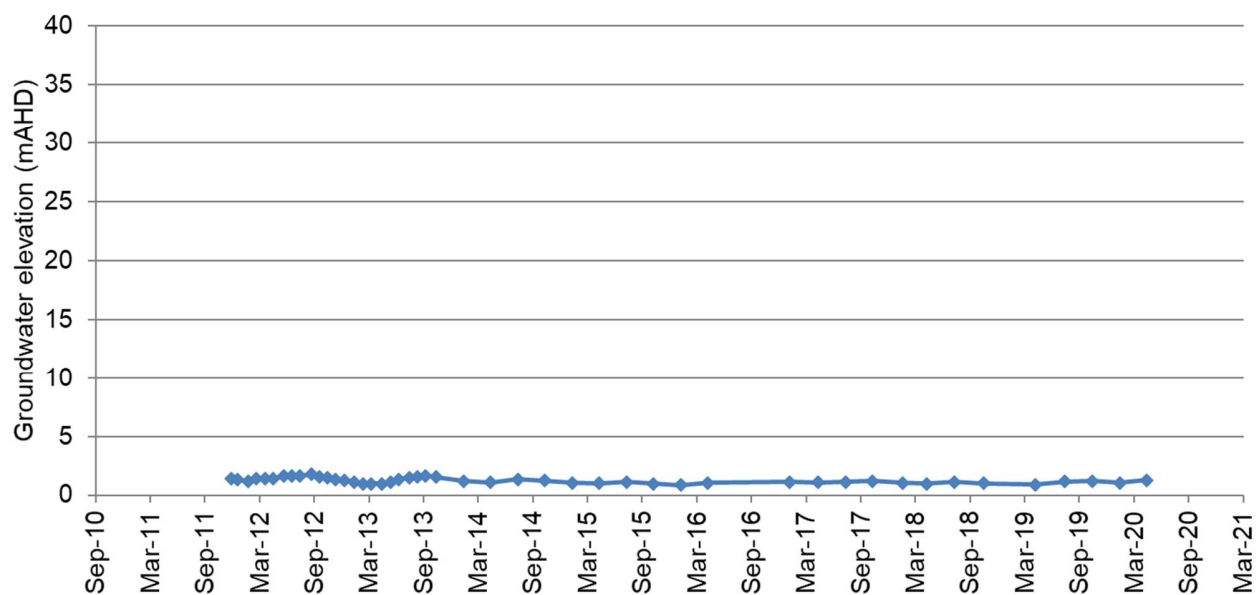
**BHID 110721 (Haunted Hills Fm)**



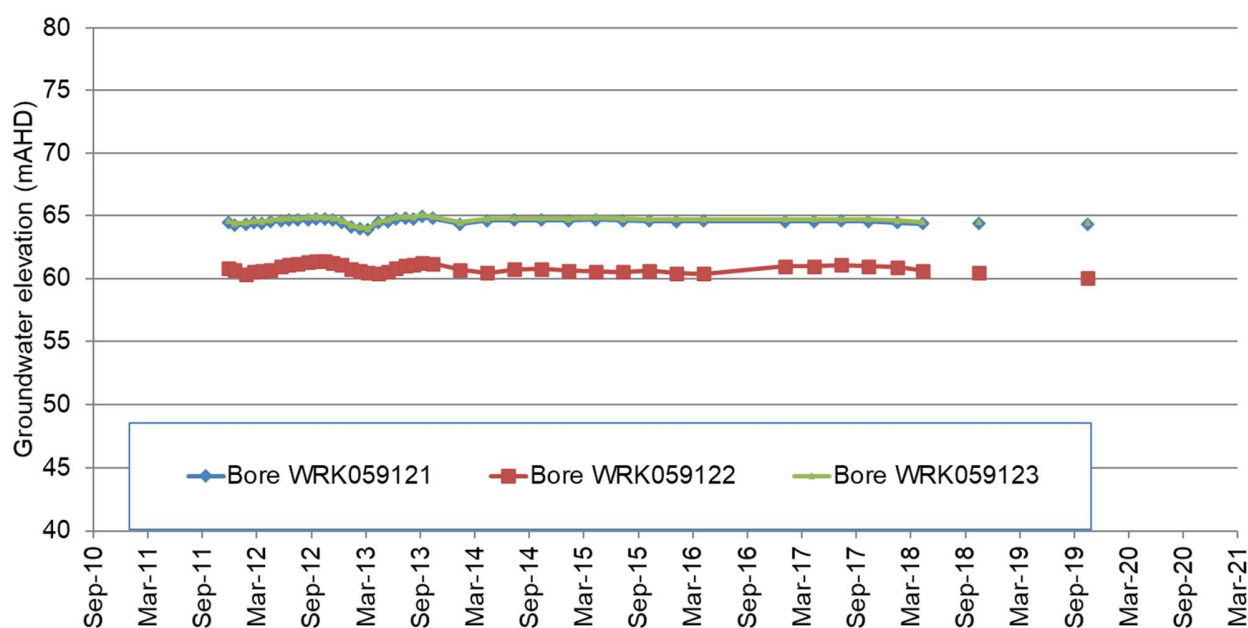
### BHID WRK059110 (Latrobe group)



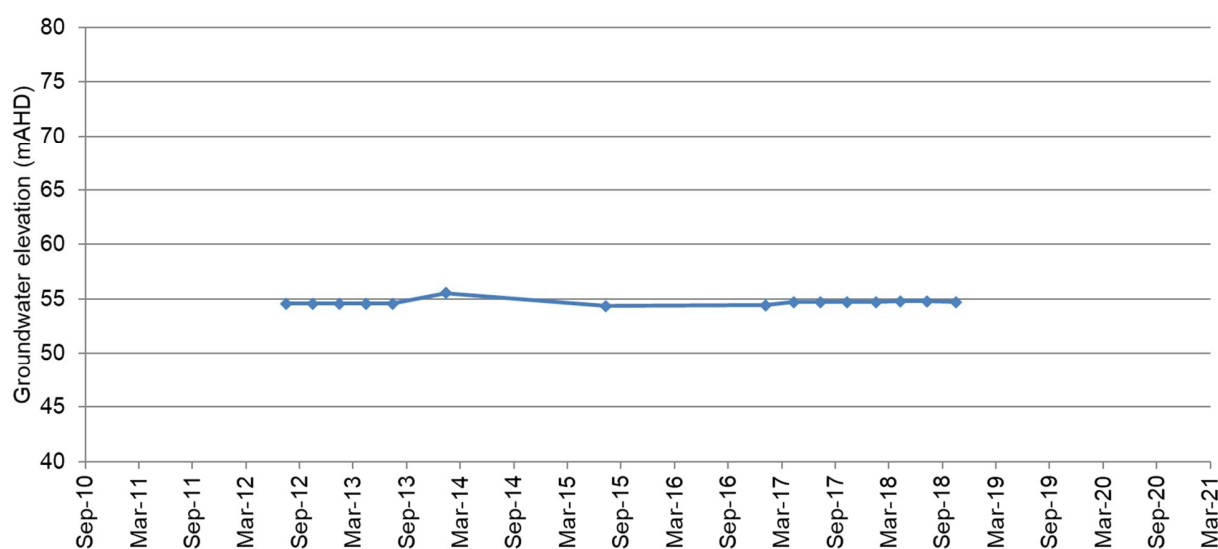
### BHID WRK059111 (Haunted Hills)



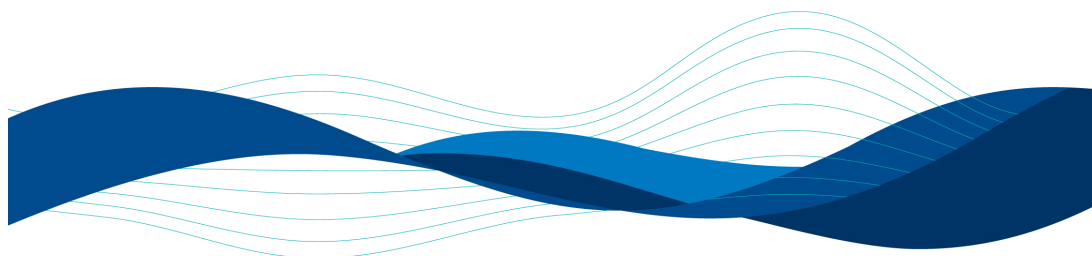
### BHID WRK059121, WRK059122 & WRK059123



### BHID WRK059124 (Haunted Hills)



## **6.1.2 Appendix 2 – Groundwater Management Review Survey 2019**



# **Yarram Water Supply Protection Area – Groundwater Management Review Survey 2019**

**April 2019**

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### Appendices

**Appendix A** – Yarram Groundwater Survey

**Appendix B** – Yarram Groundwater Management Plan Survey Comments

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## Executive Summary

A survey has been conducted as part of the review of the Yarram Water Supply Protection Area (WSPA) Groundwater Management Plan.

The survey seeks feedback on long-term groundwater management, reliability and quality, and invites comments on licence holders' experiences with water trading. The information collected from the survey also helps identify if there is a significant demand for better access to groundwater from the Lower Aquifers that underlie that Gippsland basin.

The surveys were sent to the license holders in groundwater management units Yarram WSPA and Stratford GMA which manages the Lower Aquifer. Surveys were also sent to users within Rosedale, Sale WSPA which manages the overlying aquifers and interested parties within the Gippsland region.

The survey was conducted in both paper and electronic form. The survey was completed a total of 256 were sent to relevant parties approximately 15.2% were returned.

Approximately 20% were returned from Yarram WSPA and 100% were returned from Stratford GMA. The response rate from Rosedale GMA and Sale WSPA are 1.5% had 3.9% respectively.

Key findings of the survey are:

- The management plan has worked well in managing issues in the areas of reliability of supply and maintaining water quality. The survey has not found any evidence decrease in water quality or reduction of reliability due to localised drawdown.
- The survey found 87% of the responses from Yarram WSPA reported they used water in the last financial year and 63% has reported above 60% of their water entitlement.
- There is significant support (100% of responses) for Carryover within the Yarram WSPA.
- There are significant demands (82.5% of responses) for water in the Lower Aquifers both inside and outside the boundaries of Yarram WSPA.
- The majority of the responses amount of additional water coveted is above 100 ML (76%) and a significant proportion want between 200 ML – 400 ML of additional entitlements. This is reflective of the amount of initial investment required to use this water and there is an economy of scale to utilise the water entitlements.
- The majority of the responses (62.5%) have indicated they have traded before and 80% of those who traded before indicated it was successful.
- Permanent trade is most coveted trade however one of the identified barriers to trade is the number of people who do not want to trade permanently.
- The number one most frequently mentioned barrier to trade is limited amount of people to trade with followed by people don't want to trade permanently. There is a good proportion of responses that indicate that they don't know how trade works.



- The majority of the responses (67%) are supportive of trade between Yarram WSPA to facilitate more trade and water availability. 23% of the responses did not support the proposal and 10% did not respond to the question.
- A common theme from comments from various questions are concerns of the declining groundwater levels in both Yarram WSPA and Statford GMA.
- The majority of the responses are satisfied with the communication provided by SRW, however some comments have suggested that SRW take on a more active role in trading for any unused water entitlements.

## 7 Background

Tertiary Aquifers of the Yarram Water Supply Protection Area (WSPA) are important for irrigation, commercial and industrial purposes, in addition to domestic and stock, urban supply and environmental requirements. These aquifers are anticipated to become an increasingly important source of reliable, high quality water to support economic productivity and population growth under climate change uncertainty.

The declining water levels within the Yarram as raised concerns regarding long-term sustainability, as such the area has been declared a Water Supply Protection Area and formally managed by a Groundwater Management Plan (GMP). However usage reports and studies conducted of the Gippsland regional has found that the onshore extractions contributes only a small proportion of the total extractions predominantly made up of offshore extractions for oil and gas and extractions in the Latrobe Valley for power generation purposes.

In 2017 a groundwater management plan review has commenced to:

- Identify any significant changes occurring in the WSPA, and any new government policy or legislation which may impact on the Plan
- Assess the status of the groundwater resource
- Assess the performance of the Plan, including any significant risks to the groundwater dependent values in the WSPA
- Make recommendations for improvements to the Plan if necessary

This groundwater user survey has been undertaken to inform the review.

The groundwater survey is attached in **Appendix A**.

## 8 Survey Overview

### 8.1 Objectives

The aim of the survey is predominantly aimed to collect feedback on the performance of the Yarram Groundwater Management Plan.

The survey seeks feedback on

- The status of the trading market in the region and barriers to trade.
- Reliability of groundwater supplies
- Groundwater quality
- Water availability

SRW have received some feedback on the emergence of the change of industry within the wider Gippsland area this includes geothermal industry and intensive horticultural industry. The interests for water entitlements in the Lower Aquifers within both Yarram WSPA and the wider Gippsland area have increased in recent years. In additional assessing the performance of the groundwater management plan, the survey aims to gauge the amount of additional demand on the Lower Aquifers.

## **8.2 Survey Method and Duration**

The surveys were sent to the license holders in groundwater management units Yarram WSPA and Stratford GMA which manages the Lower Aquifer. Surveys were also sent to users within Rosedale, Sale WSPA which manages the overlying aquifers and interested parties within the Gippsland region.

The survey was filled in in two ways; an electronic copy could be completed online or a paper copy could be filled in and mailed back.

A total of three versions of the survey were used;

- existing Yarram WSPA license holder version consisting of 21 questions
- potential license holders version of the Lower Aquifer consisting of 9 questions; and
- Online survey has a total of 22 questions which not all questions are applicable.

The survey is designed to be filled in within 10 – 15 minutes.

Approximately 38% of the surveys were filled out electronically and 62% were filled out in paper form.

The survey was mailed out on the 26<sup>th</sup> of February and concluded on the 25<sup>th</sup> of March 2019. Mail surveys are accepted up to 1<sup>st</sup> April 2019 to account for delays in postage.

To encourage honest responses and response rate, the survey included the option to be completed anonymously.

The field officers working in Gippsland area were asked to encourage any users or interested parties they come into contact with to fill out the survey.

## **8.3 Target population and sample**

This survey is open to existing Yarram WSPA license holders, interested parties of the Lower Aquifer. The area surveyed extends from the Latrobe Valley to Lakes Entrance and the Ninety Mile Beach to Corner Inlet.

A total of 256 surveys were sent to customers across the Yarram WSPA and the Stratford GMA including users within the overlying aquifers in Rosedale GMA and Sale WSPA with an invitation to either complete online or fill out a paper copy.

Contacts were made to relevant industry bodies and organisations to identify interested parties of water entitlement in the Lower Aquifer and encourage participation for the survey. The contacted industry bodies and organisations includes

- Destination Gippsland (Tourism Victoria)
- Regional Development Victoria
- Wellington Shire

Media releases were sent to Bairnsdale Advertiser, Gippsland Times, Yarram Standard and Latrobe Valley Express.

A total of 39 surveys were completed which represents a response rate of 15.2%.

Approximately 20% of the 80 surveys sent to Yarram WSPA customers were returned, which is higher than a similar survey using similar methodology.

While response rate from Stratford GMA is more than the number of surveys sent out, 10 out of 9 surveys sent out were returned.

## 9 Sample Characteristics

To fully understand the responses collected from the survey, the characteristics of the responses also give valuable insights to the users within the WSPA.

A large proportion of the responses were by mail, approximately 61% of the responses were returned in paper form while approximately 20% of the responses were completed anonymously.

The results are presented by:

- Response Rate per Groundwater Management Area
- Other water sources
- Water entitlement and water usage volume
- Water use type

### 9.1 Groundwater Management Area

The proportion of the responses from each Management Unit (MU) are summarised in **Table 1**.

**Table 1: Response Rate per GMA**

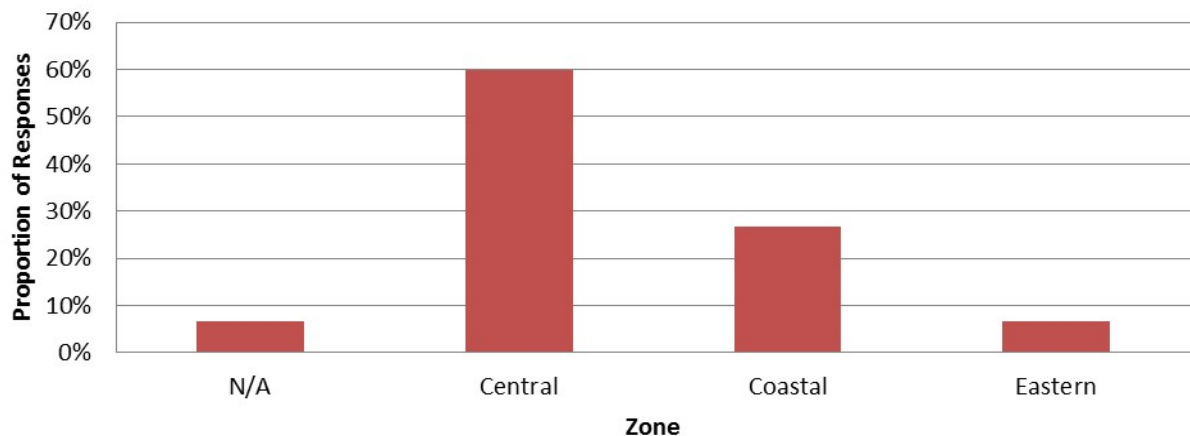
	Yarram WSPA	Rosedale GMA	Sale WSPA	Stratford GMA	Not Available
Total surveys sent	80	65	102	9	
Responses returned	14	1	4	10*	8
Response Rate	18.8%	1.5%	3.9%	100.0%	

The majority of the responses are from Yarram WSPA and Stratford GMA; these are Groundwater Management Plan and Local Management Plan that directly manages the Lower Aquifer.

## 9.2 Yarram WSPA Samples Characteristics

As this review focuses on assessing the performance of the Yarram Groundwater Management Plan. Characteristic data were only collected from the users in Yarram WSPA.

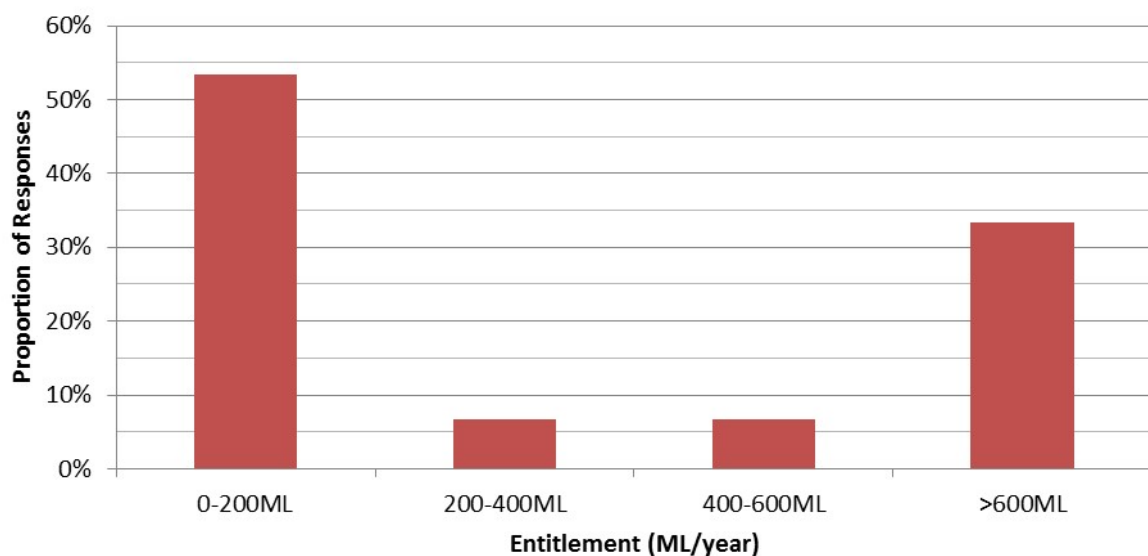
**Figure 1: Proportion of responses by zone in Yarram WSPA**



The majority of the responses are located in the Central Zone. The Central Zone has been historically been known to higher development for irrigation than other areas of the WSPA. As such permanent trade into this zone has been restricted due to interference concerns.

The survey has found that 60% of the responses has reported that Groundwater was their only source of water.

**Figure 2: Proportion of responses vs water entitlement volume in Yarram WSPA**

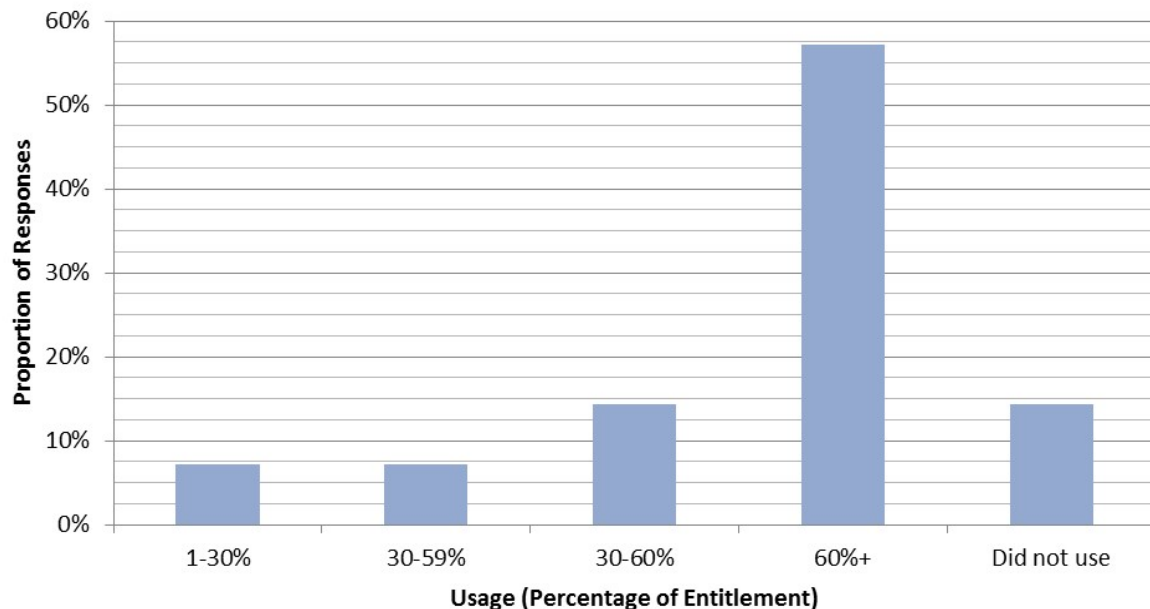


The 47% of the responses were users with significant entitlements (>200ML) (**Figure 2**) without any other form of water license.

The survey found 85% of the responses reported they used water in the last financial year and 57% has reported above 60% of their water entitlement. The usage behaviour within the Yarram WSPA reflects the investment required to utilise the

water within the Lower Aquifers. The usage rates among the larger entitlement holders are significantly higher than those with smaller entitlements. This is likely due to a couple of reasons; there is an economy of scale when it comes to water usage within Yarram and these users already have the infrastructure in place to utilise the water.

**Figure 3: Proportion of responses and their usage as a percentage of entitlement**



A large proportion of water use within Yarram WSPA is for both irrigation and domestic and stock use, followed by dairy use. The water entitlements within Yarram WSPA are held predominantly by dairy farmers.

**Table 2: Proportion of responses by type of water use**

	Irrigation	D&S	Dairy
<b>Number of Responses</b>	14	12	8
<b>Proportion of Responses</b>	93%	80%	53%

## 10 Groundwater Management Plan Performance

The survey responses have been grouped into the following the following sections:

1. Reliability of groundwater supplies and water quality
2. Demands for additional water
3. Trade
4. Carryover
5. Communication with SRW
6. Individual comments

## 10.1 Reliability and Water Quality

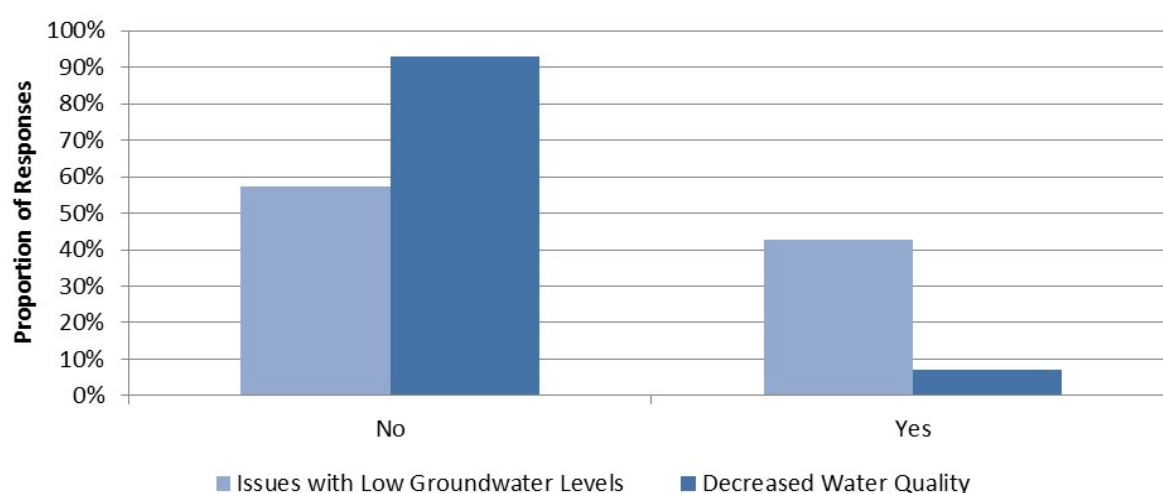
Under the Water Act 1989, groundwater dependent value should be protected. This includes reliability of supply and also water quality of the water for the intended use.

In Yarram WSPA, managing reliability of supply is a little different from other areas. As the water levels within the aquifers are declining due to activities outside the boundary of the WSPA, the groundwater management plan can only manage reliability of supply caused by localised drawn down, the GMP cannot address the cause of the declining levels.

The survey has found that although over 46% of the responses has reported issues with groundwater levels, further analysis of the comments has found are mostly concerns of the declining levels and the longterm sustainability of extraction under the current infrastructure and additional irrigation costs associated. The survey has found that there are no reports of unreliability of groundwater supply due to localised drawdown in the middle and lower aquifers since the implementation of the Yarram Groundwater Management Plan. Similarly, there are no reports of decrease in water quality due to saline intrusion.

This could be due to the upgrades made to irrigation infrastructure within the Yarram WSPA in recent years in response to the declining groundwater levels.

**Figure 4: Issues with low groundwater levels and water quality**



## 10.2 Demands for additional Waters

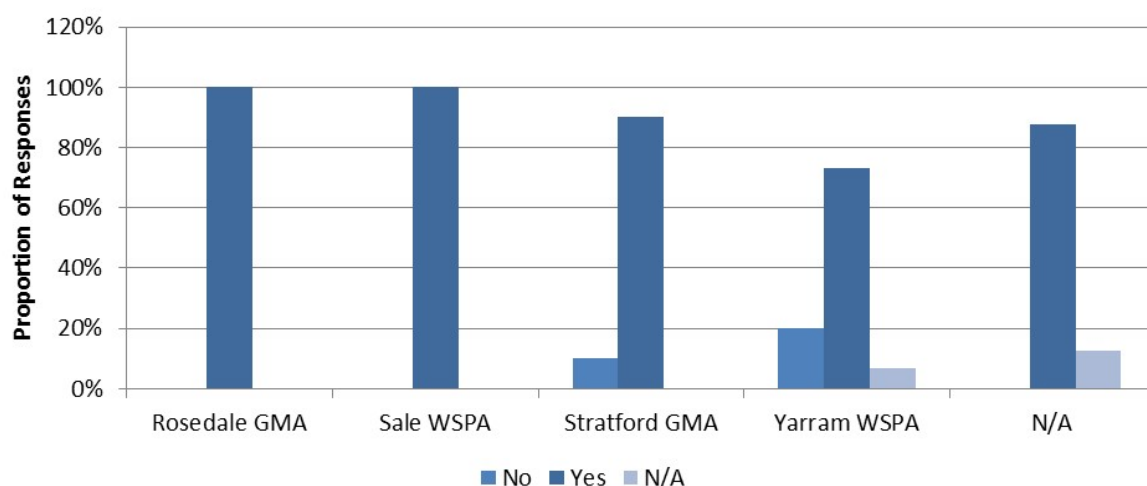
### 10.2.1 Demands for additional water in the Lower Aquifer

There is a significant demand for water in the Lower Aquifers both within the Yarram WSPA and outside the boundary of the Yarram WSPA.

Approximately 73.3% (11 responses) of the responses from Yarram WSPA responded with a yes for additional entitlements. In the whole Gippsland region, a total of 32 (84.2%) responses have indicated that additional water would be beneficial to their business.

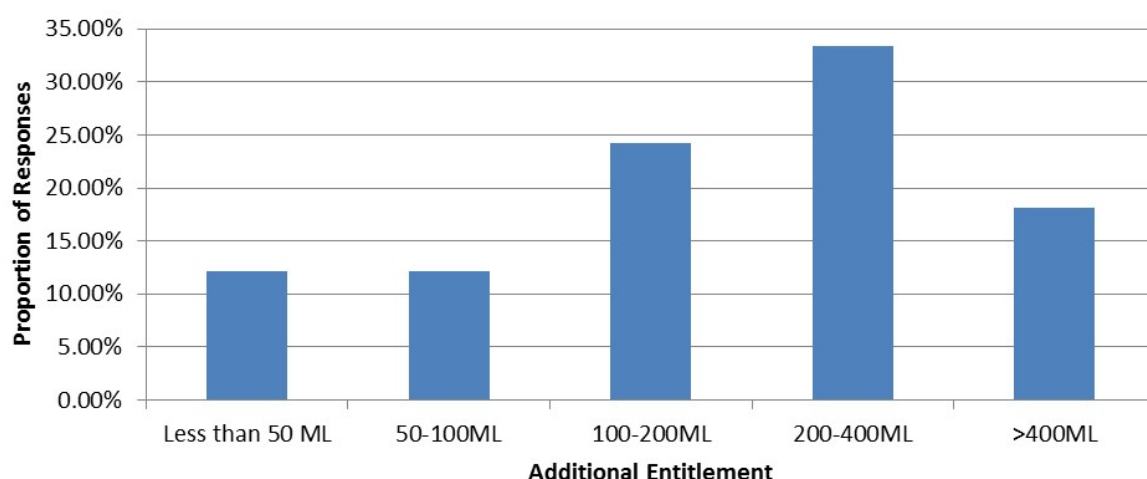
The proportion of responses per GMA is presented in **Figure 5**.

**Figure 5: Proportion of the responses per GMA wanting additional water.**



The amount of additional water requested from the stakeholders is substantial. Approximately 76% of those who want additional water have said they want an amount larger than 100 ML, while the majority of the responses want between 200ML- 400ML. This is a reflection of the cost of infrastructure to irrigate in the Lower Aquifers.

**Figure 6: The amount of additional water wanted**



Several existing customers and interested parties made contact to obtain more information regarding the review and also discuss their water needs. This included stakeholders within the geothermal industry, intensive horticultural, dairy and cattle farming. These stakeholders indicated that additional water would facilitate the ability to increase production.

## 10.3 Trade

### 10.3.1 Trade Behaviour – Yarram WSPA

Trading rules in the Yarram WSPA are based on a series of zonal limits and restrictions.

The existing rules for Yarram WSPA are as follows:



### **Prescription**

1. The Corporation must not approve an application for the permanent or temporary transfer of a licence under section 62 of the Act into the Coastal Zone.
2. The Corporation must not approve an application for the permanent transfer of a licence under section 62 of the Act into the Central Zone.

Permanent transfer into the Coastal Zone is prohibited to minimise the risks associated with intrusion of saline water into the aquifers. While the Central Zone represents the highest water entitlement intensity within the WSPA. The trade rules address concerns of localised draw down resulting in reduced reliability of the water supply.

The usage rates within Yarram WSPA averages around 50% of the total entitlements, with approximately 60% during a dry season. There are significant unused volumes within the Yarram WSPA that could potentially be utilised through trade.

### **Trade Success**

Approximately 64% of the responses have indicated that they have traded before; 31% has traded as a seller and 33% and traded as a buyer.

The majority (80%) of those who attempted trade have reported a success. This could be attributed to that consultations were made with SRW staff before an application has been attempted. The SRW staff would've informed them of any potential issues and the likelihood of success for the proposed trade.

### **Trade Type**

The responses have shown that a combination of both temporary and permanent trade has been utilised in the both Yarram WSPA and also in the wider Gippsland region.

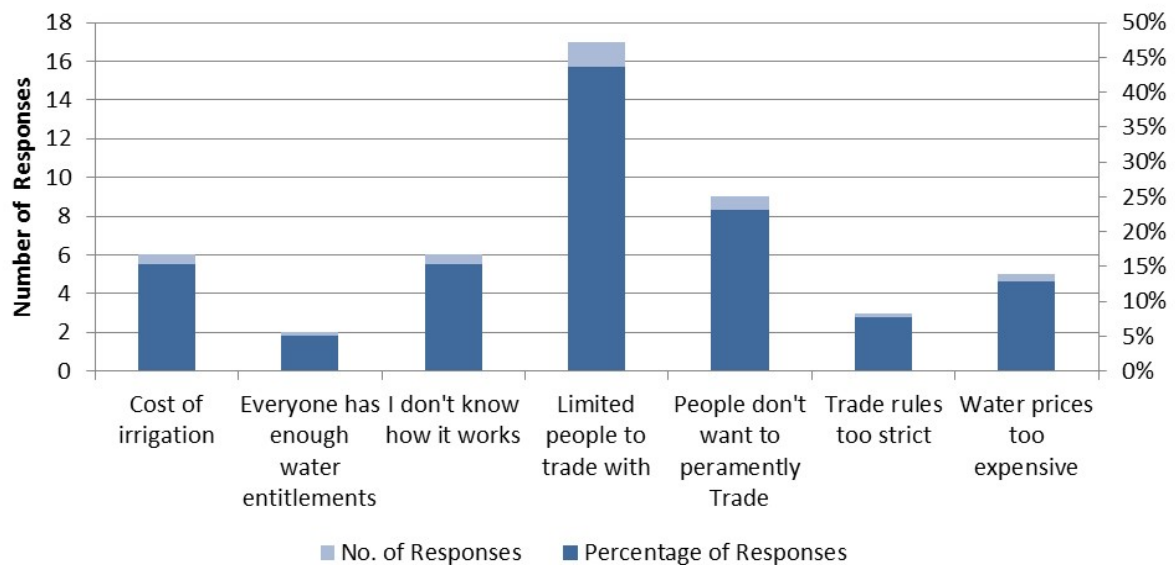
Further analysis of the data has found that permanent trade has more interest than temporary or the "leasing" of water. This can be a reflection of the initial capital costs associated with access to water in the Lower Aquifer. Temporary trade is considered high risk in terms of investing in additional infrastructure. Temporary transfer is normally used to meet any projected shortfalls.

### **Barrier to Trade**

The most frequently cited barrier to trade is the limited number of people to trade with and people do not want to permanently trade their water entitlement.

To capture as much information as possible with trading behaviors, multiple reasons could be selected part of the survey.

**Figure 7: Barrier to trade**



The responses has indicated the limited number of people to trade is the most frequently reported barrier to trade. There is however a significant amount of responses that reported that the limited knowledge of trading of water entitlements. This may be able to be improved through educational campaigns and

### 10.3.2 Changes to Trade Rules

Approximately 50% of the responses within Yarram WSPA has indicated that they would like to see changes to the trade rules.

A number of responses included comments regarding the kind of changes to trading rules they would like to see. These changes include:

- Increase educational campaign to users on trading
- Changes to the zonal trading scheme
- Increase in flexibility
- Increase in clarity and transparency

There is overwhelming support for trade between Stratford and Yarram WSPA, approximately 67% are in support of this proposal, 23% do not support this proposal and 10% did not respond to the question.

The support to trade between Stratford GMA and Yarram WSPA is especially significant within the Stratford GMA. Where the amount of water entitlements available for trade is fairly limited and business owners has reported that this has limited development opportunities and restrict the business growth.

## 10.4 Carryover

Carryover is generally supported within Yarram WSPA with all of the responses (100%) supporting implementation of carryover within the Yarram WSPA.

## 11 Communication

The majority of the responses (74%) stated they are satisfied with the how groundwater management is communicated by SRW of all the responses.

The satisfaction of the level of communication is dependent on the Groundwater Management Area or the Water Supply Protection Area.

There were some comments regarding SRW taking a more active role in water trading especially unused water entitlements and concerns regarding the declining groundwater levels within the aquifers.

A summary of the comments are listed in the **Appendix B**.

## 12 Groundwater Management Plan Comments

The general comments section for the Groundwater Management Plan is designed to capture any aspects of groundwater management that is not part of the questions.

A number of responses have included comments regarding different aspects of groundwater management such as requests for SRW to take a more active role trading any unused water entitlements, more flexible water trading rules to support new business growth, concerns of the declining levels in the Yarram WSPA.

A number of responses contained comments regarding their view of the role of both SRW and also the Plan. These responses are also presented in **Appendix B**.

## 13 Survey Summary

The Yarram Groundwater Management survey has been conducted as part of the Groundwater Management Plan review in 2019.

The data collected from the survey aims to inform the review in assessing the performance of the Groundwater Management Plan and elevate the demands for water in the Lower Aquifer.

The responses rate is 19% in Yarram WSPA and overall response rate is 14.8%. The response rate is typical for a survey in similar circumstances.

The survey has given valuable insights on the water use behaviors of the customers, trade behaviors or any issues that customers may have.

A few key findings of this survey are:

- The recent upgrades in irrigation infrastructures in the Yarram WSPA have mitigated some of the risks associated with reduced reliability of supply, especially within the Central Zone. There are no observations of reduced reliability of supply due to localised drawdown. There are also no reported cases of deterioration of water quality within the Yarram WSPA.
- Trade is current the most effective, sustainable, equitable method to utilise the unused proportion water entitlements within the Yarram WSPA. Most of the responses have indicated that they have traded in the past in either buyer or seller

capacity. There is not a well-developed trading market within the Yarram WSPA or the wider Gippsland area, the most frequent reason that the as a barrier for trade is the limited amount of people to trade with. There are also a significant proportion of responses that indicated that they did not understand trade.

- There is a good amount of support for the ability to trade between Stratford GMA and Yarram WSPA. Comments such as increase the “trading pool” for water to facilitate trade but also increase the ability to develop new and emerging business in the area. This is also supported by the amount of additional water outside the Yarram WSPA.
- There is significant support for Carryover within the Yarram WSPA.
- A significant proportion of responses has cited concerns of the declining groundwater levels in both Yarram WSPA and Statford GMA.
- The majority of the responses are satisfied with the communication provided by SRW, however some comments has suggested that SRW take on a more active role in trading for any unused water entitlements.

## Appendix A Survey

### Yarram Groundwater Management Review

January 2019

Dear Sir or Madam,

Southern Rural Water would like your views on the management of groundwater in the Yarram Water Supply Protection Area (see map on **Page 21** ).

Your feedback will help us to assess whether the current groundwater management plan is working well, or whether there is a need to make some improvements to the plan.

The attached survey will help us to understand your views on:

- How groundwater is being managed
- Water trading
- Reliability of your groundwater supply
- Groundwater quality
- Water availability

This survey has 21 questions and should not take more than 10 minutes of your time. Depending on your circumstances, not all questions will apply to you.

We understand that you value your privacy and therefore this survey can be completed anonymously. If you do choose to fill it in anonymously we ask that you fill in the groundwater management area and zone in which your bore is located.

Your views are important, as every response will help us shape future management rules.

You can choose to fill in the survey in one of two ways:

- **Paper version - please return in the prepaid envelope by Monday 25 March 2019, marked 'Yarram GMP Survey'.**
- Online – please copy and paste this link into your internet browser – <https://www.surveymonkey.com/r/LPR6RDF>

If you would like more information about the current management plan, go to:

[http://www.srw.com.au/files/Technical\\_reports/Yarram\\_Groundwater\\_Management\\_Plan.pdf](http://www.srw.com.au/files/Technical_reports/Yarram_Groundwater_Management_Plan.pdf)

If you have any questions about this survey or the review, please contact Joan Deng on 03 9259 5056 or Luke Krupa on 5139 3175.

Yours sincerely,

**Matt Hudson**

**Acting Manager Groundwater and Rivers**

### Yarram Groundwater Management Plan – Survey

Please circle your answers and write comments in the space provided

**Name:** (optional): .....

**Zone:**.....

**1. What is your permanent entitlement in ML (Megalitre)?**

- a. 0-200
- b. 200-400
- c. 400-600
- d. Above 600

**2. Roughly what percentage of your water entitlement did you use last year?**

- a. Did not use, please provide details.....
- b. 1-30%
- c. 30-60%
- d. 60%+

**3. Other than groundwater, do you have any surface water entitlements?**

- a. Yes
- b. No

**4. Has your groundwater quality changed in the last few years?**

- a. Yes
- b. No
- c. If yes please provide details .....
- .....

**5. How many bores do you have?**

- a. 0-2
- b. 3-4
- c. 5+

**6. What do you use your water for? (select all that apply)**

- a. Irrigation
- b. Dairy
- c. Industry
- d. Stock and domestic
- e. All of the above
- f. Other.....
- .....

**7. Have you had issues with low bore water levels in the past?**

As the water levels within the lower tertiary aquifer are declining steadily, this question is targeted to assess the effects of localised drawdown.

- a. Yes
- b. No
- c. If yes please provide details .....

.....

**8. How deep are your bore(s) from the natural ground surface (meters)?**

Answer: .....

**9. How deep is your pump intake from the natural ground surface (meters)?**

Answer: .....

**10. Would you like to have carryover?**

- a. Yes
- b. No

Comment.....

(Carryover allows water entitlement holders to take a proportion of their unused water allocation in the following season.

For example if carryover is 10% of total entitlement. If your entitlement is 100 ML/year and you've used only 70 ML, you will accrue 10ML carryover and can use 110 ML next season.)

**11. Would additional groundwater entitlements (from the Lower Aquifer) benefit you and your business?**

- a. Yes
- b. No

**12. How much additional water entitlement (from the Lower Aquifer) would you like?**

- a. Less than 50 ML
- b. 50 – 100 ML
- c. 100 – 200 ML
- d. 200 – 400 ML
- e. More than 400 ML

**13. Have you tried to trade groundwater in the past?**

- a. Yes, as seller
- b. Yes, as buyer
- c. No (go to Question 17)

**14. Was the trade successful?**

- a. Yes (go to question 16)
- b. No

**15. If trading was not successful, what was the reason for this?**

- a. There are limited people willing to trade

- b. The price of water was too expensive
- c. Other, please comment below.....

.....

**16. Were you interested in permanent trade or temporary trade?**

- a. Permanent trade
- b. Temporary trade

**17. What do you see as barriers to trade?**

- a. I don't know how it works
- b. There are limited people willing to trade with
- c. Water prices are too expensive
- d. People don't want to permanently trade
- e. Costs of irrigations (power and irrigation infrastructure)
- f. Everyone has enough water entitlements
- g. Trading rules are too strict
- h. Other; please comment.....

**18. Would you like to see any changes to the trade rules?**

- a. Yes
- b. No

Comment.....

.....

**19. Would you like the opportunity to trade water between Yarram WSPA and Stratford GMA?**

- a. Yes
- b. No

Comment .....

.....

.....

**20. Is the current level of communication with SRW with regards to groundwater management meeting your needs?**

- a. Yes
- b. No

Comment .....

.....

.....



**21. Do you have any other comment regarding the current groundwater management plan or groundwater issues in general in Yarram Water Supply Protection Area?**

.....

.....

.....

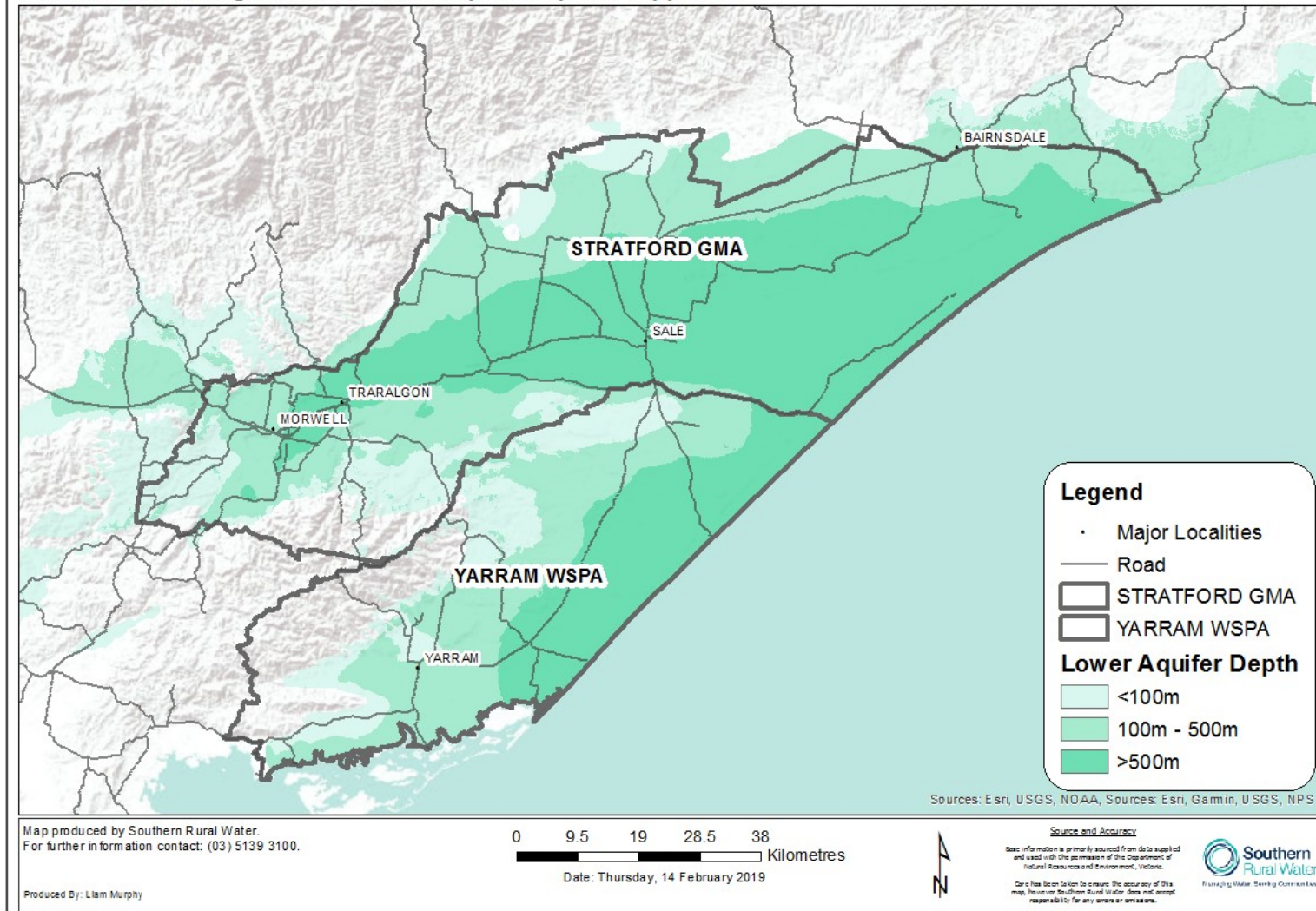
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Thank you for taking the time to complete this survey.

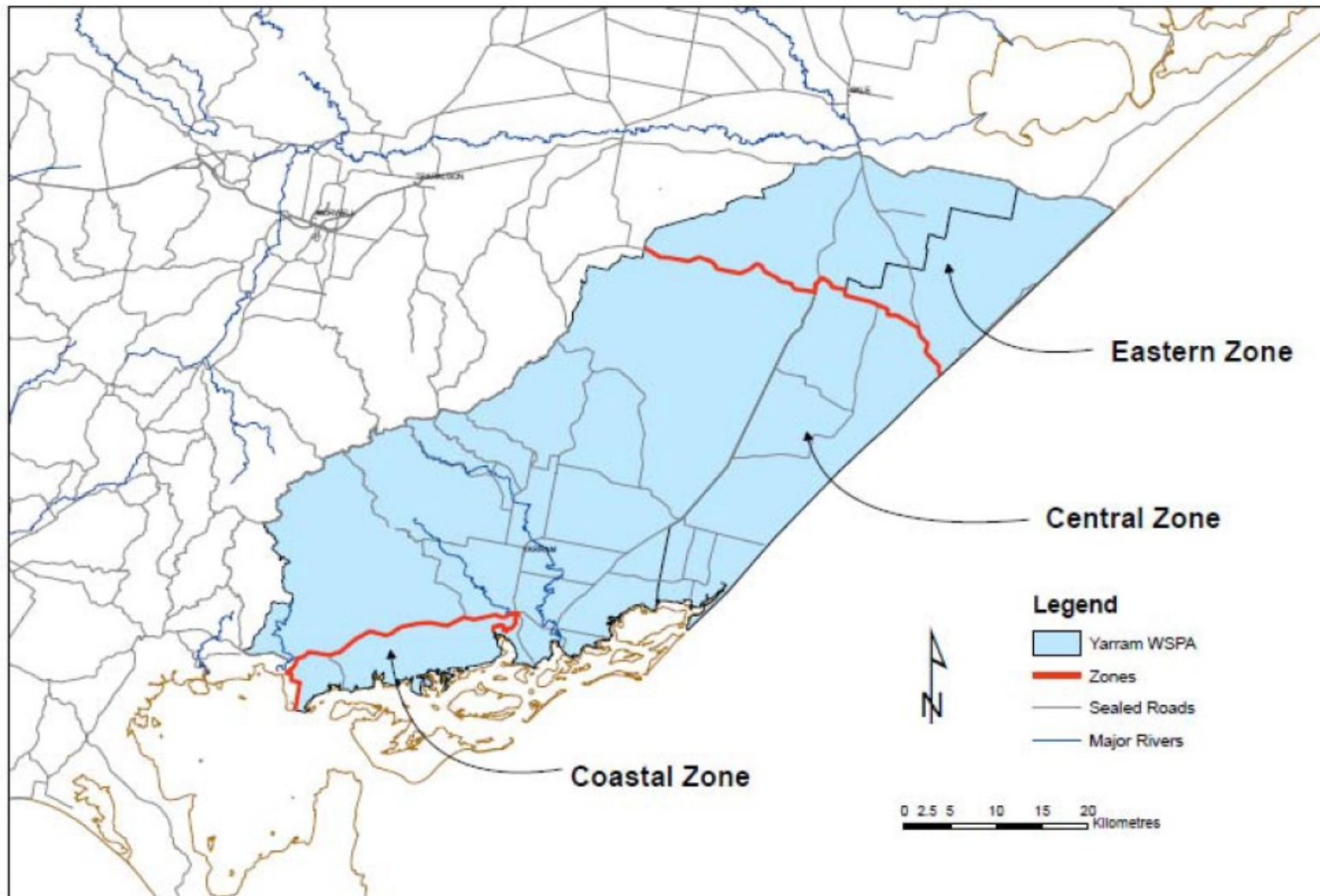
**Please remember to post the survey back to us  
in the Reply Paid envelope by Monday 25 March 2019.**

## Map of Yarram WSPA and Stratford GMA

### Groundwater management and Lower Aquifer depth in Gippsland



## Map of Yarram WSPA Groundwater Management Zones



## Appendix B

### Changes to Trade Rules Comments

You should not be able to just sit on it use it or loose it
one zone
Less confideniality
We would liket o sell our water permanently. This would provide us with a cash injection and let someone else use this water to increase production on their poperty
Not sure what the present trade rules are.
Have not traded before
More flexible than lines on a map. If the applicant can show connectivity then flexibility should be allowed.
See comment below
trading rules ok but not enough people to trade with!!!!
Less transfer fees charged by SRW
Trading groundwater is not appropriate - the flows are not quick and uniform as they are with surface water. Too rapid draw down (even with purchased entitlements) has significant impacts on other nearby users.
There are good models for water trading that allow more certainty for the irrigator who is investing significant funds in production. If you have a licence a "buffer" for seasonality would be helpful so in a particularly dry year you can purchase say 30% above your existing right with out having to go through hoops and even potential Hydro surveys (this could be based on your property already having a "current" survey in place.)
To be able to trade between Stratford and yarram
Coal mines being allowed to trade
Water needs to be able to trade from the coastal zone to the central zone as there are willing permanent sellers from the zone.

### Communication Comments

The groundwater management does not address the root cause of water issues. It just adds to the cost burden on the farmers.
tried to discuss about issues with declining aquifer in my area (stratford). Fall on deaf ears.
The cost of new infrastructure out weights the 72 Meg that I have for 800Ac. I would be interested in obtaining more permanent megs of water to justify new irrigation system. Yes I have traded water with a neighbour to help out in tough times.
Licencing department are difficult to reach by phone and email.
What communication?
but improving with some new ideas to improve the use of groundwater in our area.

## Groundwater Management Plan Comments

There should be a push for non users to trade their entitlement or the very least temp trade. This should be law in area declared drought areas that it comes on a site run by southern rural water. This could be setup as a temp license to extra water with a temp trade of entitlement it would help in big way when very dry conditions exists.
Not at the moment, Thank you!
The cost burden of groundwater management should be borne by the offshore industry responsible for the major issue of water levels, not farmers.
We would like to permanetly sell our entitlement.
Not really
I know the state have no control what happens offshore but I really think our ground water should be used for food production. Offshore oil, gas and coal mines seem to be the cause of our declining water levels over time
Need more water
Latrobe City Councilâ€™s (LCC) is a stakeholder within the Yarram Groundwater Management Plan (YGMP) area. LCC supports the management planâ€™s objectives of equitable management of water resources to ensure their long-term sustainability. LCC is developing the Gippsland Regional Aquatic Centre (GRAC), a major infrastructure project for the benefit of the greater Traralgon area. This project will use a zero-water-use geothermal heating system for water and space heating, whereby water is pumped from a deep Traralgon-aquifer bore, transferred through a heat exchanger, and injected into the same aquifer. This geothermal system will significantly improve the sustainability of the GRAC project by saving over 20,000 tonnes of CO2 (compared to traditional water- and space- heating options). The 2010 version of the YGMP does not reference aquifer injection relating to geothermal and other (for example, managed aquifer recharge) water-conservation projects. LCC would like the YGMP to be sympathetic to sustainability initiatives such as the GRAC project.
Naturally occurring springs on my property do not produce water due to activities of Esso and others. I have had to construct a stock and domestic bore to access this water. I have 58 meg of catchment water and believe that the licence should be amended to permit me to use the same volume of water from my bore for irrigation. This is not currently permitted but it is only fair that I have access to water that was available previously. The surface water and bore water are interconnected.
The deep aquifers such as the Latrobe are being are unregulated offshore, and hence are being heavily drawn down by Esso. Excess use of these aquifers risks the potential of increased salination of irrigated soils and surface streams through run-off.
The biggest challenge I see for irrigation development is that there appears to be a significant number of bore licences held by people who don't currently have a bore in operation or plan to build a functional bore. It is too low a cost to sit on the asset (license) and not use it this restricts access to water and increases the cost of temporary water for irrigators.
There would need to be consideration for maximum quantity limits that can be transferred to new bores in new areas. E.g moving 300Mg to a new bore that has not been pumped may lead to issues in the future.
The management plan does not tell the depth of the deep aquifer. There is no mention of possible geothermal use for water, with large portion re-injected. Maybe it is not deep or

hot enough, but if it is then the Australian Geothermal Association

([australiangeothermal.org.au](http://australiangeothermal.org.au)) would appreciate being consulted on any rule changes.

I'm finding the shallow bore is too slow and if I could sink another larger bore into the lower aquifer and increase my water allocation, I could put more area under fixed sprinklers to complement the two pivots I put in last year. Would help with the long term sustainability of the dairy farm here. Just finding the shallower bore less efficient

As there have rarely been any water available for permanent trade in the Yarram WSPA there are willing sellers from the coastal zone as they can't justify the cost of infrastructure and the risk of salt intrusion + dropping levels. This would allow central irrigators to satisfy their need and then water could be traded to Stratford GMA.