



# **Nullawarre Groundwater Management Plan Annual Report**

2010-11

## Foreword

This report is submitted to the Minister for Water and the Glenelg Hopkins Catchment Management Authority in accordance with s32C *Water Act 1989*. A copy of this report is available for inspection at the offices of the Authority, and 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>	Nullawarre Water Supply Protection Area
<b>Segment</b>	Groundwater
<b>Area Declared</b>	6 October 2001
<b>Plan Approved</b>	1 May 2002
<b>Allocation Limit (Permissible Annual Volume)</b>	21,280 ML's
<b>Scheduled Plan Review</b>	30 September 2012
<b>Implementation Authority</b>	Southern Rural Water
<b>Relevant CMA</b>	Glenelg Hopkins Catchment Management Authority
<b>Report Period</b>	1 July 2010 – 30 June 2011

There were no significant issues identified in this report affect the Plan implementation.

Monitoring and metering indicate no significant changes in the condition of the resource or water usage patterns that require review of the Plan.

Signed



Craig Parker  
Acting Chief Executive Officer

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## **1 Introduction**

This report summarises licence information, metered usage and monitoring data collected for the period between July 1<sup>st</sup> 2010 and June 30<sup>th</sup> 2011 in accordance with the recommendations given in the Nullawarre Groundwater Management Plan (GMP).

The groundwater located in the Nullawarre Water Supply Protection Area (WSPA) encompasses all aquifers within 250 meters of the natural surface. The main aquifer is the Port Campbell Limestone formation. Groundwater within this WSPA is used for irrigation, dairy and stock and domestic purposes.

The Nullawarre GMP identifies Southern Rural Water (SRW) as the authority responsible for managing and administering the plan.

The objective of this Plan is to make sure that the groundwater resources of the Protection Area are managed in an equitable manner and so as to ensure the long-term sustainability of those resources.

The plan requires SRW to:

- Coordinate and cause to be carried out groundwater level monitoring and metering programs;
- 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;
- Seek review of the plan and if, in its opinion, amendments are necessary or desirable, make recommendations to the Minister accordingly.

The success of the Nullawarre GMP is measured through a number of licensing, metering and monitoring objectives and outcomes.

- 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 sustainability of the aquifer(s);
- Trading of existing consumptive use allocations will only occur in accordance with all relevant provisions of the Water Act 1989 and/or any supplementary rules adopted for the Nullawarre WSPA;
- No new groundwater licences will be issued if the total of all groundwater licence entitlements exceed the PCV declared for the Nullawarre WSPA.

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

## 2 Key Observations

### 2.1 Rainfall

Rainfall at Peterborough during the reporting period was 924mm (no data for May & June 2011).

Peterborough had 90mm of rain above the long term annual average to the end of April 2011.

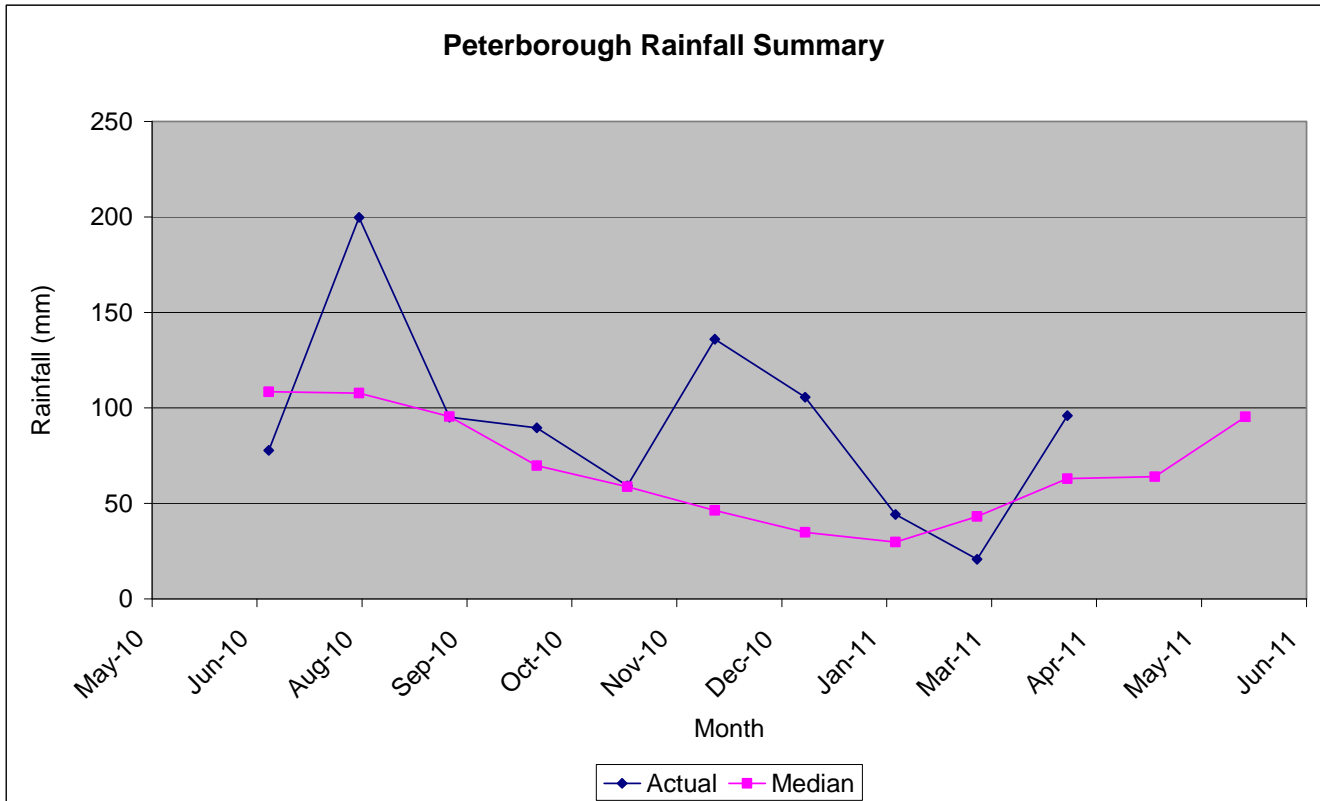


Figure 1: Rainfall graph for Peterborough from July 2010 to June 2011.

### 2.2 Water Levels

Groundwater levels are measured in twenty two (22) bores, monitoring the Newer Volcanics (1 bore) and Port Campbell Limestone (21 bores) aquifers (see map on following page).

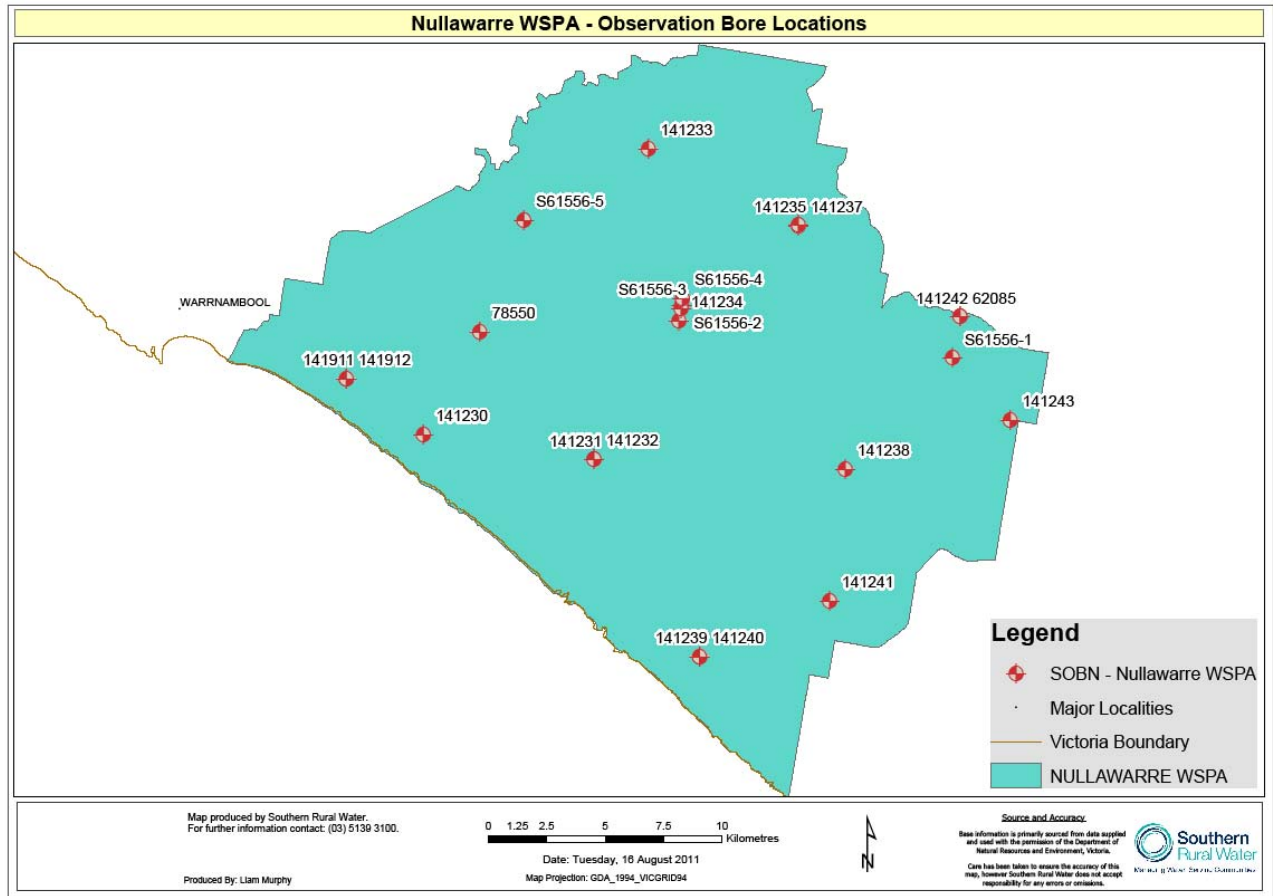
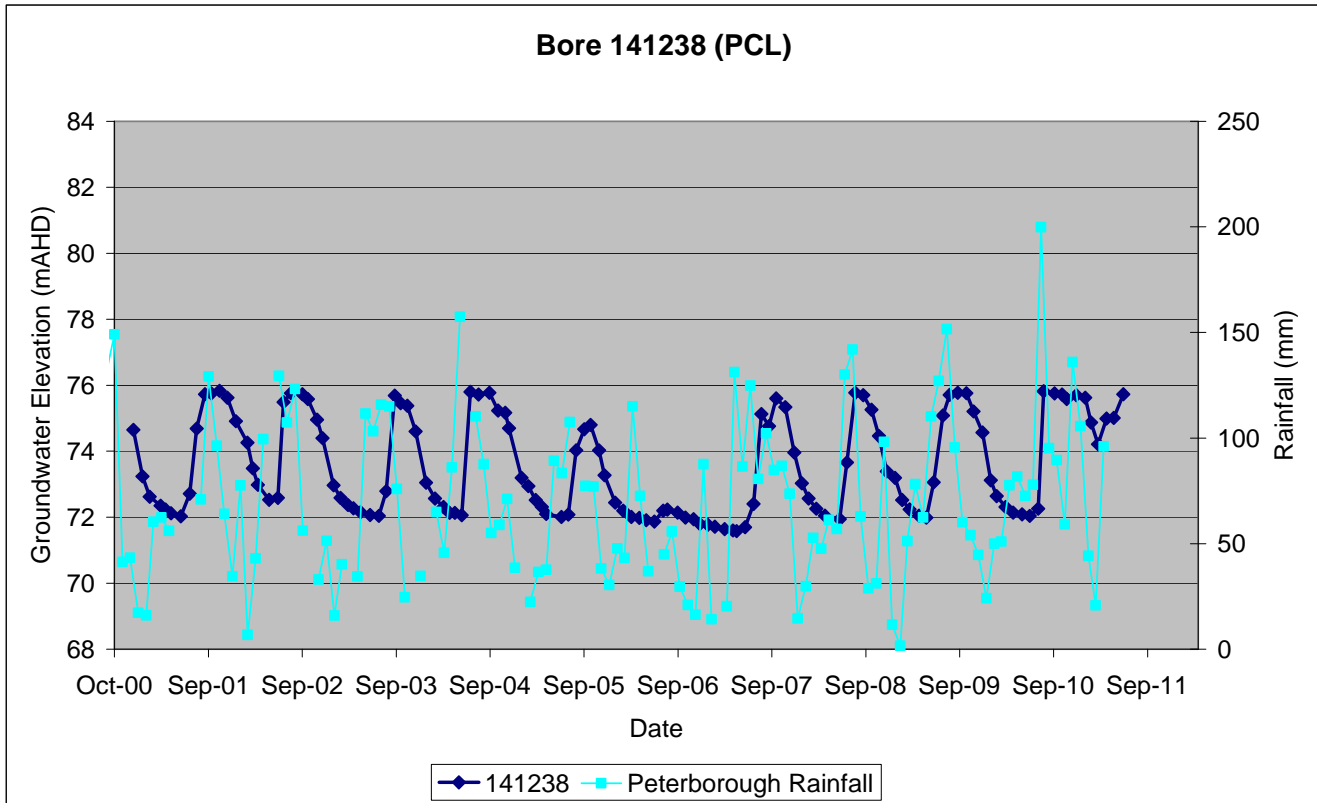


Figure 2: Map showing State Observation Bore locations.



**Figure 3: Sample hydrograph showing groundwater elevation and rainfall.**

All hydrographs are presented in appendix 1.

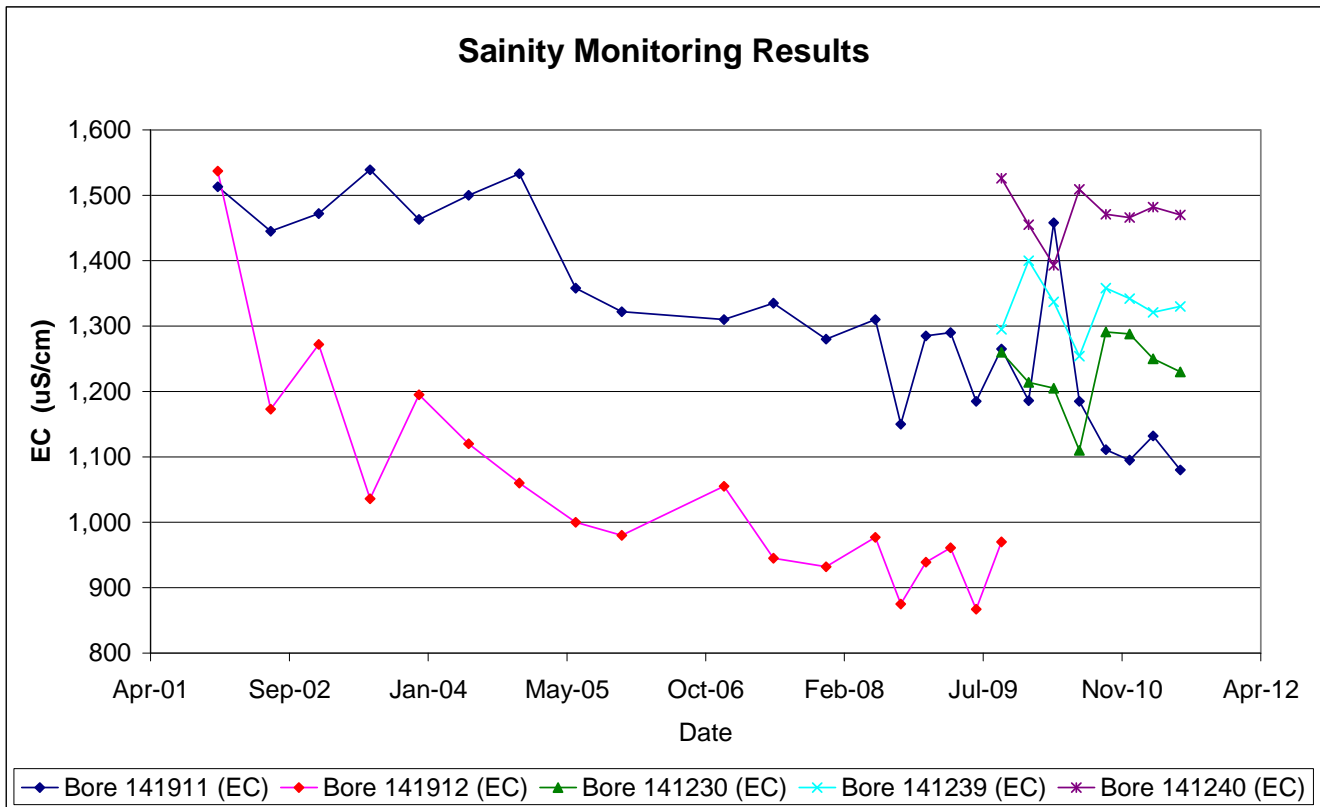
The review of the groundwater elevation data indicates that:

- Overall, groundwater levels are generally stable across the WSPA since the majority of monitoring commenced in 2001; and
- Minimum groundwater levels at the end of the most recent irrigation season (i.e. Autumn 2011) were higher than the previous two or three seasons.

### 2.3 Salinity / Water Quality

Salinity is regularly measured at four bores within the Nullawarre WSPA. Salinity in these bores is relatively stable over the period of record. Sampling frequency was increased to every three months rather than twice a year, as of June 2008 and some monitoring locations have been amended to better detect any changes in seawater intrusion risk. All monitored bores are along the coast.

Water salinity results are summarised in the graph on the following page.



**Figure 4: Graph showing groundwater salinity in Nullawarre.**

*EC (electrical conductivity) units are microSiemens per centimeter (uS/cm)*



## 2.4 Water Use

The following table provides detail on water use in the 2010-11 year as compared to four previous years.

<b>At 30 June</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
No. of licences	208	208	212	210	207
Total allocated volume (ML)	22,237.5	22,436.0	21,279.9	21,278.9	21,275.5
No. of metered licences	104	101	105	105	107
Total volume metered (ML)	20,890.2	20,782	20,438.3	19,763.8	20,423.2
Metered volume used (ML)	22,188.3*	11,715.2	13,536.1	9,859	4,059.8
Use of allocation (%)	106%	52%	64%	46%	19%
No. of licences with use greater than allocation	32	11	17	15	7
Permissible Consumptive Volume (PCV)	-	21,280.0	21,280.0	21,280.0	21,280.0
Use as a % of PCV	-	55%	64%	46%	19%
No. of D&S bores	-	1,355	1,355	1,355	1,014
D & S bores estimated use <sup>#</sup>	-	2,710	2,710	2,710	2,028
Estimated D & S use from licenses bores <sup>^</sup>	416	416	424	420	414

\*Usage data for the 2006-07 season is not accurate as it includes data from multiple years.

#Estimated 2ML per bore

<sup>^</sup>Estimated 2ML per licence

The usage during the reporting period was significantly less than previous years due to the above average rainfall.

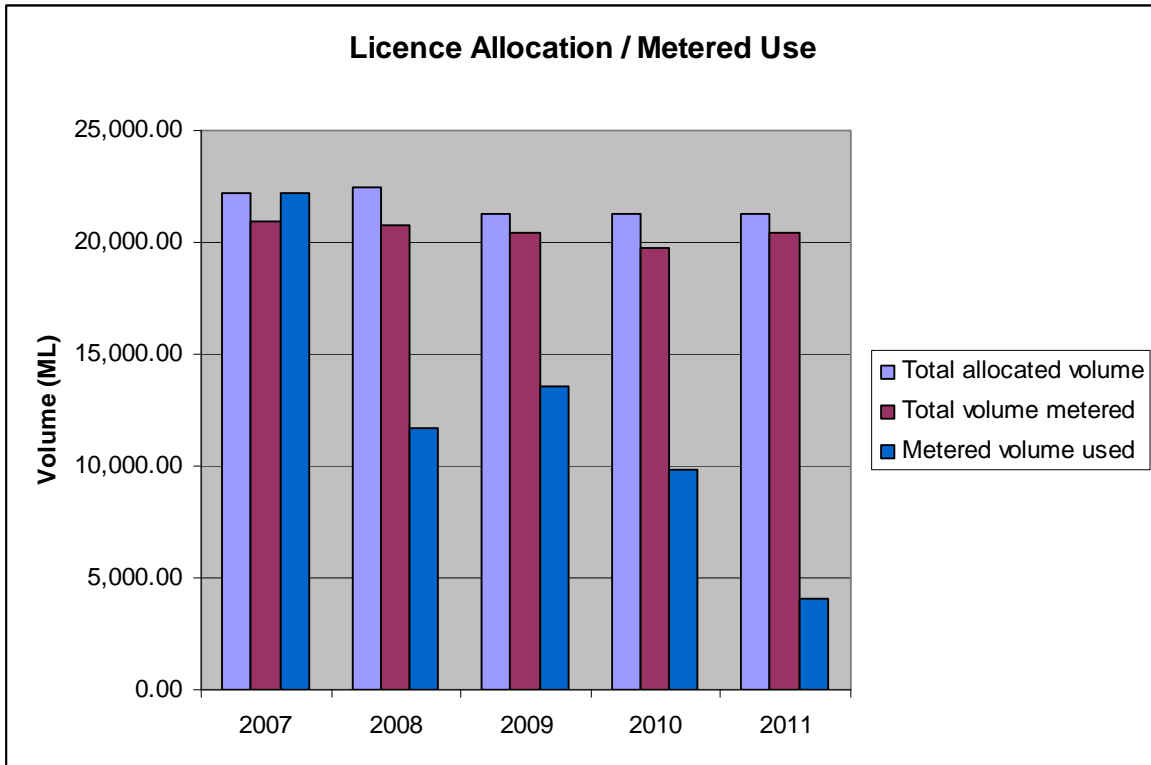


Figure 5: Licence allocation compared to metered volume and usage.

## 2.5 Non compliance

The following table lists the licences where water was taken in excess of licensed entitlement.

Licence No	Licence Volume	Amount taken	Amount overused	Comment
BEE022384	10	27	17	Metered dairy bore. The entitlements are currently under review as part of the Dairy Shed Water Licence Transition Program.
BEE023011	1	1.4	.4	
BEE026380	2.4	8.6	6.2	
BEE026678	1.3	7.6	6.3	
BEE030033	1	2.3	1.3	
BEE030176	1	15	14	
BEE032575	1.2	17.7	16.5	
<b>Totals</b>	<b>17.9</b>	<b>79.6</b>	<b>61.7</b>	

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.

Warning letters were issued to two licence-holders for over-use for the 2009-10 irrigation season. There was no repeat offence from either of the licence-holders for the 2010-11 irrigation season.

### 3 Plan Implementation

#### 3.1 Monitoring

##### 3.1.1 Prescriptions

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

Plan Requirement	Comments
<p><b>8.1 Construction and maintenance of monitoring bores</b> The Secretary must for each bore specified in Schedule 2</p> <ul style="list-style-type: none"> <li>(a) periodically inspect the condition of each bore; and</li> <li>(b) maintain each bore in good condition; and</li> <li>(c) keep a record of all inspections and work undertaken under paragraph (a) or paragraph (b).</li> </ul>	<p>The monitoring bores are owned and managed by the Department of Sustainability &amp; Environment (DSE).</p> <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 DSE carries out maintenance on bores that have been identified by the field service provider through the Extra Works Advice. This is bore specific.</p>
<p><b>8.2 Water levels</b></p> <ul style="list-style-type: none"> <li>(a) When this Plan commences SRW and the Secretary must continue to implement a water level monitoring program for each bore specified in Schedule 2.</li> <li>(b) The monitoring program requires: <ul style="list-style-type: none"> <li>(i) the Secretary to determine the potentiometric level in each bore listed in Schedule 2 during February, May, August &amp; November of every year; and</li> <li>(ii) SRW to determine the potentiometric level in each bore in Schedule 2 in every month of the year not mentioned in item subclause 8.2(b)(i); and</li> <li>(iii) the Secretary and SRW respectively, must record every potentiometric level in each bore on the Groundwater Management System within 30 days after the level is determined.</li> </ul> </li> </ul>	<p>SRW works closely with the DSE to ensure that the monitoring program meets the requirements of the Plan.</p> <p>If SRW identifies bores of greater interest, monitoring may be undertaken in addition to the DSE's monitoring program.</p> <p>The water level monitoring program includes all bores listed in Schedule 2 plus additional bores installed since the Plan was approved</p> <p>Monitoring is completed monthly in a total of 22 bores</p> <p>Data is uploaded to GMS on a monthly basis</p> <p>SRW regularly reviews the groundwater level monitoring program and data.</p>
<p><b>8.3 Water quality</b></p> <ul style="list-style-type: none"> <li>(a) When this Plan commences SRW must implement a water quality-monitoring program for each bore of Schedule 3.</li> <li>(b) When this Plan commences SRW must implement a water quality-monitoring program for each bore referred to in clause 9.1(a).</li> <li>(c) The monitoring program requires: <ul style="list-style-type: none"> <li>i). the SRW to collect and analyse for salinity, a sample of water from each bore of Schedule 3 at</li> </ul> </li> </ul>	<p>The number of salinity monitoring points has increased from two to four. Bore number 141912 is no longer monitored due to uncertainty around the bore construction and condition. Water quality samples are taken quarterly and the data is uploaded to GMS.</p> <p>Sampling of licensed bores was conducted in 2009.</p>

<p>least once each year; and</p> <p>ii). SRW to collect and analyse for salinity, a sample of water from each bore in 8.3 (b) at least once each year; and</p> <p>iii). SRW must record the results of each sample on the Groundwater Management System within 30 days after the level is determined.</p>	<p>Due to cost, rate of reply and uncertainties around bore construction, it is not considered viable to sample these bores annually</p>
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### 3.1.2 Issues Affecting Implementation

Activities under taken during the reporting period generally comply with the requirements of the Plan. The exceptions are that SRW does not take water quality samples from all licenses bores annually. Due to cost, rate of reply and uncertainties around bore construction, it is not considered viable to do so. There were no significant issues identified during the sampling that was conducted in 2009 to suggest that annual water quality sampling was necessary.

## 3.2 Metering

### 3.2.1 Prescriptions

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

Prescription	Comments
<p><b>9.1 Installation and maintenance of bore meters</b></p> <p>a) When this plan commences SRW must:</p> <ul style="list-style-type: none"> <li>I. Ensure that a flow meter is fitted to every bore being used in association with a Licence;</li> <li>II. Inspect the condition of the flow meter whenever it is read under sub-clause 9.2(a)</li> <li>III. Maintain the flow meter in good condition</li> <li>IV. Recalibrate the flow meter at any time when the authority has reason to believe that a reading from the meter may be inaccurate</li> <li>V. Replace any damaged flow meter</li> <li>VI. Keep a copy of all work done under paragraphs iii), iv) and (v) in relation to a flow meter</li> </ul>	<p>All active licensed bores are metered in accordance with State Government policy and SRW requirements. An additional 7 meters were installed during the reporting period.</p> <p>Meters are visually inspected when they are read each year.</p> <p>A significant meter maintenance/replacement program will commence in 2011/12 to ensure that meters are operating effectively.</p> <p>Maintenance was undertaken of 9 meters during the reporting period. One meter was replaced due to upgrade of pump equipment. A record of works was kept.</p>
<p><b>9.2 Meter readings</b></p> <p>(a) When this Plan commences SRW must implement a bore metering and monitoring program for each bore operating in the Protection Area.</p> <p>(b) The metering program requires SRW to:</p> <ul style="list-style-type: none"> <li>(i) read each meter to determine the volume and rate of extraction in each bore at least in December, March and June of every year; and</li> <li>(ii) record for every bore:</li> </ul>	<p>Meters are read at least twice per year. The meter readings and usage data are recorded in SRW's metering system. The information in the metering system includes the groundwater licence number, bore number, date of reading and usage.</p>

<ul style="list-style-type: none"> <li>• the volume and rate of extraction in each bore; and</li> <li>• the Groundwater Management System identification number; and</li> <li>• the groundwater licence number; and</li> <li>• the date on which the meter is read; and</li> <li>• the hours of usage of the pump engine; and</li> <li>• any relevant information about the accuracy of the meter.</li> </ul> <p>(c) SRW shall estimate the volume and rate of extraction for any bore where the meter has failed.</p>	
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### 3.2.2 Compliance and Exceptions

Activities under taken during the reporting period generally comply with the requirements of the Plan.

The exceptions are that SRW does not record the hours of usage of the pump engine or the rate of extraction from bores. It is not reasonably practical to undertake either of these activities. Meters would need to be upgraded to allow fro the recording of the extraction rate.

Due to the large number of meters and resources, meters are not read three times per year. Meters are read at least twice per year, but a number of larger users may be read more frequently and spot checks occur during the irrigations season. This approach ensures the most appropriate use of SRW's resources.

Since the development of the Plan, metering has advanced significantly in all areas as a result of State Government Policy and SRW requirements. All active bores with a licence volume of 10ML or greater are metered. These metering requirements exceed the intent of the prescriptions in the Plan.

### 3.2.3 Issues Affecting Implementation

The occurrence of iron bacteria continues to be an issue for meters in the Nullawarre WSPA. This issue is being addressed by a meter maintenance/replacement program commencing in 2011/12. Electromagnetic meters are also being trialled to determine whether they are more effective in areas that suffer from iron bacteria.

### 3.2.4 Metering activities

Report any activities in the area relating to metering for example installation of new meters, maintenance, compliance checks etc.

	<b>Year to 30 June 2011</b>	<b>Total for WSPA at 30 June 2011</b>
Number of licences issued	0	207

Number of meters installed	7	164
Meters requiring maintenance	9	
Meters replaced	1	
Meters read (1 – date)	Jan/Feb 2011	
Meters read (2 – date)	May/Jun 2011	
Number of estimated readings	0	

### 3.3 Restrictions on Licensing and Licence Transfers

#### 3.3.1 Prescriptions

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

Plan Requirement	Comment
<p><b>10. Restrictions and prohibitions on issuing groundwater licences</b>                      (a) SRW must not grant a groundwater licence entitlement for any volume of groundwater once the Permissible Annual Volume for the Protection Area is exceeded.                      (b) The Permissible Annual Volume referred to in 10(a) is detailed in Schedule 4.</p>	No new licences were issued during the reporting period.
<p><b>11. Extent to which a licence may be transferred</b>                      That Transferable Water Entitlements be permitted within the GSPA and administered in accordance with s62 of the Water Act with particular regard to s40.</p>	Four transfers were processed during the reporting period.
<p><b>12. Notification of domestic and stock uses</b>                      The occupier of any bore from which groundwater is taken solely for domestic and stock use must after this Plan commences register their bore(s) with SRW.</p>	No action – this is the responsibility of landowners

#### 3.3.2 Compliance and Exceptions

Activities under taken during the reporting period generally comply with the requirements of the Plan.

#### 3.3.3 Issues Affecting Implementation

There are no issues to report.

### 3.4 Licensing Activities

The following table provides details of licensing activities.

Year to 30 June 2011	No.	Volume ML
New licences issued	0	0
Additional volumes on existing licences	0	0

Licences revoked	0	0
Permanent transfers	4	223.5
Temporary transfers	1	94.0
D&S Bores notifying use	1	2.0*

\*estimate of DS volume only

### **3.4.1 Issues Affecting Implementation**

There are no issues to report.

## **4 Conclusions**

The objective of this Plan is to make sure that the groundwater resources of the Protection Area are managed in an equitable manner and so as to ensure the long-term sustainability of those resources.

Review of the groundwater elevation data indicates that:

- Overall, groundwater levels are generally stable across the WSPA since the majority of monitoring commenced in 2001; and
- Minimum groundwater levels at the end of the most recent irrigation season (i.e. Autumn 2011) were higher than the previous two or three seasons

Therefore, it is considered that the groundwater resources of the WSPA are being managed sustainably. A review of the Plan is not proposed at this time.

The DSE is conducting a strategic review of groundwater boundaries across the state to align management units with aquifer boundaries. This review has the support of SRW and endorsement of the Western Sustainable Water Strategy has been sought. SRW believe that the existing Nullawarre WSPA boundary does not fully encompass the aquifer system. As such it is likely that changes to the boundary and management units could occur in future. SRW will keep the community informed before any changes are made.

## 5 Appendices

### 5.1.1 Appendix 1 - Hydrographs

