



Shepparton Irrigation Region Water Supply Protection Area Groundwater Management Plan

Annual Report for the year ending
30 June 2010

Compliance statement

Goulburn-Murray Water (G-MW) has prepared this report on the administration and enforcement of the Groundwater Management Plan for the Shepparton Irrigation Region (SIR) Water Supply Protection Area (WSPA) for the period 1 July 2009 – 30 June 2010 in accordance with Section 32C of the *Water Act 1989* (the Act).

The Minister for Water approved the SIR WSPA Groundwater Management Plan (the Plan) in 1999. G-MW has responsibility for the administration and enforcement of the plan. Summarised below, are G-MW's duties under the plan:

- groundwater volumetric usage meter fitting to all licensed irrigation bores existing prior to 1 July 1999 with usage of >20ML/year at the cost of G-MW (note that bores installed for licensed use since 1 July 1999 must be metered at the licensee's cost);
- groundwater volumetric usage meter reading – post irrigation (summer) season;
- groundwater level monitoring;
- groundwater level reporting (August watertable map production);
- groundwater salinity assessments;
- administering groundwater licensing within the prescriptions of the Groundwater Plan and in accordance with G-MW's statutory responsibility under the *Water Act 1989*; and
- review and report annually to the Minister administering the *Water Act 1989* on the prescribed activities of the plan.

Since the Plan's approval, G-MW has successfully implemented the metering and monitoring program. Other elements of the plan require ongoing attention on an annual basis, such as maintaining meters. G-MW continues to address these issues to ensure prompt resolution and completion.

G-MW has endeavoured to pro-actively manage overuse, however there were 45 licensees who had a recorded usage that exceeded their licence entitlement and were investigated. While overall usage in the SIR WSPA is declining, possibly because a number of users are having difficulty accessing the resource, it appears some of those that can access it are pumping above entitlement to compensate for the lack of water from other sources. In response to the overuse, warning letters have been sent out to the licence holders in question, which is in line with G-MW's overuse policy.

As required by Section 32D of the Act, this report will be submitted to the Minister for Water, the Goulburn Broken Catchment Management Authority and the North Central Catchment Management Authority. A notice of report availability will also be published in the "Shepparton News".

A copy of this report will also be available for inspection at the Cobram and Tatura offices of G-MW, on the website (www.g-mwater.com.au) or upon request.

Signed:

David Stewart
MANAGING DIRECTOR

Summary

The metered usage of licensed bores in SIR WSPA for the 2009/10 season was 49,701 ML. Groundwater usage has continued to decrease since the 109,247 ML used in 2006/07 season. The continued decrease in metered usage may be attributed to further decline in shallow groundwater levels, resulting in greater difficulty extracting shallow groundwater and hence leading to reduced bore yields.

Water levels in the SIR WSPA are monitored through two monitoring programs. A review of the Department of Sustainability and Environment (DSE) State Observation Bore Network, which is one of these programs, has seen 37 bore removed from the network in the SIR WSPA. This is due to the high density of monitoring bores across the area in comparison to other WSPA's. There are also 1,900 monitoring bores as part of G-MW/Department of Primary Industries shallow bore network. The data from these is mainly used in making decisions about land management issues such as salinity.

Only 16% of licensees in the SIR WSPA complied with G-MW's request for a groundwater sample during 2009/10. This is a decrease on the previous reporting period 2008/09, which had a return rate of 31%. G-MW is continuing to provide prompt feedback on salinity results to participating licence holders in an effort to improve the return rate in the salinity sampling program. In response to customer feedback, the timing of the mail out was changed and more information was provided on the use of the data.

The State wide dairy wash transition program operated during the 2009/10 irrigation season, and work has commenced on processing the applications received.

In recent years, the risk to land productivity from high watertables has only been in small and isolated parts of the SIR WSPA and these regions are contracting. Watertable levels have been falling over much of the region, and this has been adversely affecting many users reliant on a shallow groundwater as a resource. However, the impact of recent wetter climatic events in Northern Victoria on the watertable will need to be closely monitored. Preliminary results from a current project funded by DSE and the Goulburn Broken Catchment Management Authority (GBCMA) to understand the groundwater balance implications of variable climatic and water management regimes in the area has identified that the watertable is quite responsive to relatively moderate changes in rainfall.

In response to the changes in climatic conditions, strategic changes to existing Northern Victorian irrigation systems and key management issues, G-MW's groundwater resource and catchment managers are continuing to work together to develop adaptive management strategies to deal with the changing environment in the SIR.

Table of Contents

COMPLIANCE STATEMENT	I
SUMMARY	II
1 DESCRIPTION OF WATER SUPPLY PROTECTION AREA.....	1
1.1 BOUNDARY.....	1
1.2 LAND USE.....	1
1.3 GEOLOGY.....	1
1.4 OVERALL MANAGEMENT OF THE RESOURCE.....	1
2 PURPOSE OF THE GROUNDWATER MANAGEMENT PLAN	3
3 PLAN IMPLEMENTATION	4
3.1 USAGE.....	4
3.1.1 Usage volume.....	4
3.1.2 Factors affecting usage	7
3.1.3 Overuse and compliance	7
3.2 AUGUST SHALLOW WATERTABLE LEVELS	8
3.3 LICENCE TRANSFERS	10
3.4 LICENSING ACTIVITIES	10
3.5 METERING.....	11
3.5.1 Meter Readings.....	11
3.5.2 Data storage.....	11
3.5.3 Meter installation and maintenance	12
3.6 GROUNDWATER LEVEL MONITORING	12
3.6.1 Monitoring sites.....	12
3.6.2 Level readings	13
3.6.3 Data storage.....	13
3.6.4 Maintenance program	13
3.7 SALINITY MONITORING.....	15
3.7.1 Monitoring program.....	15
3.7.2 Results	15
4 FUTURE CONSIDERATIONS.....	17
5 ACKNOWLEDGEMENT	19
APPENDIX 1- REPRESENTATIVE HYDROGRAPHS	20

1 Description of Water Supply Protection Area

1.1 Boundary

A Water Supply Protection Area (WSPA)¹ is an area declared under the *Water Act 1989* to protect the groundwater resource in areas of intensive use. The Shepparton Irrigation Region (SIR) was declared a WSPA in September 1995. It is located in Northern Victoria and extends from Yarrawonga in the north-east to Murchison in the south and across to Tennyson and Echuca in the West (Figure 1).

1.2 Land use

The area covered by the Groundwater Plan is 674,000 ha. Around 300,000 ha are irrigated in most years. In the past the area has been predominately used for dairying, but in recent years there has been some movement out of this industry. Other industries include orchards, seed crops, lucerne, forage crops and vegetables.

1.3 Geology

The geology of the region is alluvial deposits overlying bedrock. The alluvial deposits are divided into three principal geological units:

- The Shepparton Formation;
- The Calivil Formation; and
- The Renmark Group.

The Shepparton Formation overlies the Calivil/Renmark aquifer and forms the uppermost geological formation (usually 80 to 100 metres thick) over most of the region. It is predominantly comprised of alluvial silts and clays interspersed with meandering channels of sands and gravels, typically up to 5 metres thick, and often discontinuous. The aquifers of sand and gravel are locally capable of supplying significant quantities of water. However, due to the highly variable characteristics of the Shepparton Formation, the occurrence of good quality groundwater available in useful quantities is highly irregular.

The Renmark Group and Calivil Formation (often considered one hydrogeological unit) are unconsolidated gravels and sands which lie unconformably upon basement rock. These sediments were deposited along broad valleys by ancient rivers flowing from the highlands onto the plain. In the Riverine plains of Northern Victoria, the Renmark Group/ Calivil Formation form three major aquifers (commonly referred to as "Deep Leads") that generally follow the course of today's Murray, Campaspe and Goulburn Rivers. These aquifers broaden toward the north and west and merge to form a continuous sheet under much of the south-eastern Murray Basin.

1.4 Overall management of the resource

The SIR WSPA was declared to manage groundwater resources within 25 metres of surface. The groundwater resource below 25 m is managed separately. In the Murray Valley the resource is managed under the Katunga WSPA Groundwater Management Plan. In the Campaspe and Goulburn catchments the resource is managed under the Lower Campaspe Valley WSPA² and Mid-Goulburn Groundwater Management Area management arrangements respectively.

¹ These areas have also previously been referred to as a Groundwater Supply Protection Area (GSPA)

² Effective from 1 August 2010, the Campaspe Deep Lead WSPA was abolished and its groundwater management plan was revoked. A new Lower Campaspe Valley WSPA was declared and it is being managed under interim management arrangements until a new plan is developed.

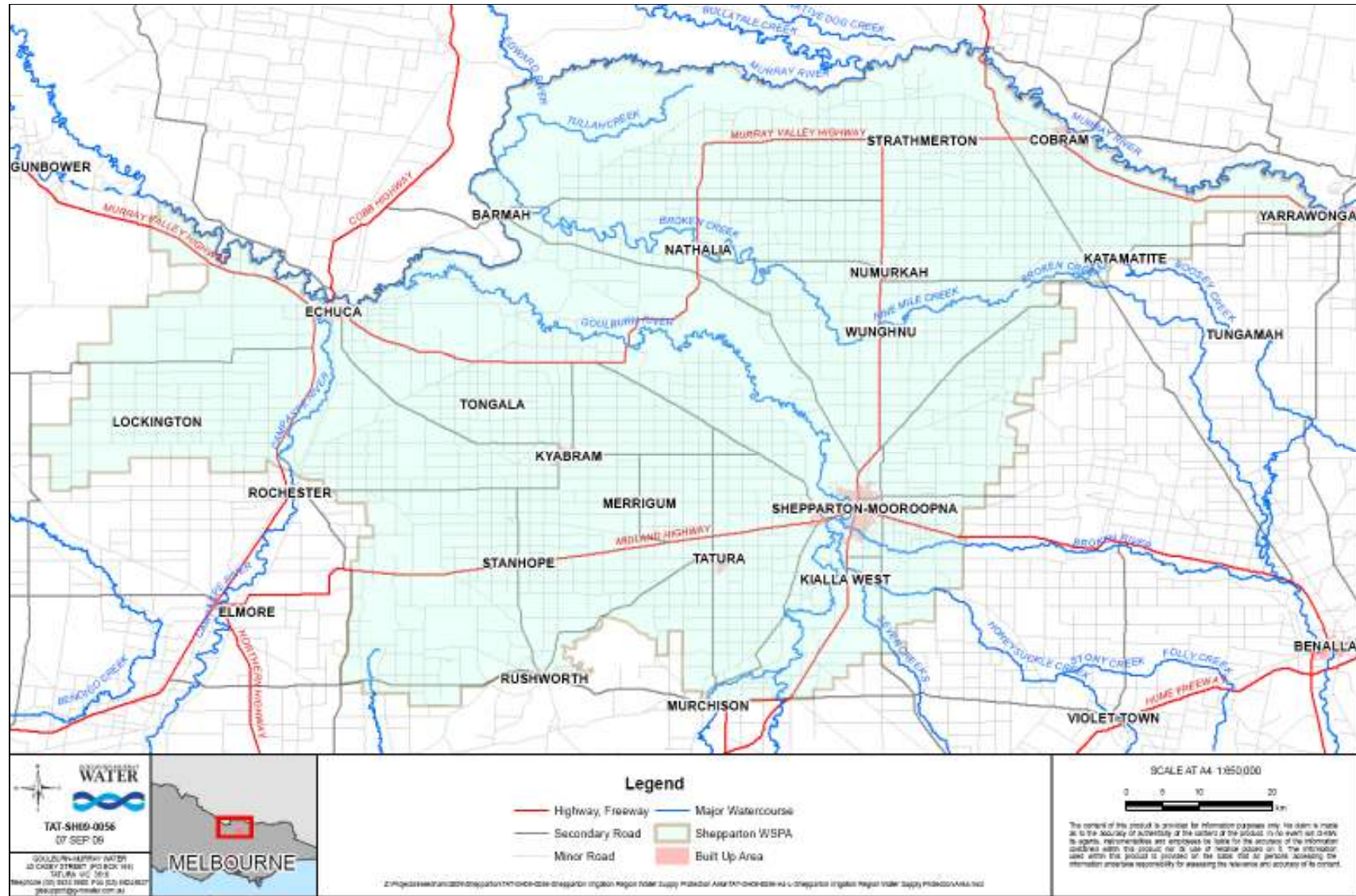


Figure 1 - Shepparton Irrigation Region (SIR) WSPA boundary

2 Purpose of the Groundwater Management Plan

When an area is declared a WSPA, a Groundwater Management Plan must be developed and implemented. The process for development of a management plan is specified in the *Water Act 1989* (the “Act”). The SIR WSPA Groundwater Management Plan (the “Plan”) was approved by the Minister responsible for the Act in 1999. No review date is specified in the plan.

The Plan is unique by comparison to other groundwater management plans in Victoria in both its intent and management measures. It was developed to augment the SIR Land and Water Salinity Management Plan (the Salinity Plan). Section 2 of the Plan states:

“The primary objective of this Plan is to support the implementation of the Salinity Plan which aims to protect the Region’s agricultural productivity and natural resources. It will do this by encouraging and supporting regular and responsible pumping of groundwater to provide salinity control while protecting both the groundwater resource and the rights of groundwater resource users.”

Other groundwater management plans have been developed to manage the potential overuse of groundwater resources that could result in excessive declines in groundwater levels within those WSPA’s covered by such plans. The SIR WSPA Groundwater Management Plan is considered to be of limited value for groundwater resource management because it does not have a Permissible Consumptive Volume (PCV) to cap the issuing of new entitlement or mechanisms to control water usage (i.e. set allocations) on a seasonal basis. Also the variability of the upper Shepparton Formation and lack of contiguous aquifers (as discussed in section 1.3 of this report) means there are difficulties managing groundwater as a transferable and tradable resource in most areas of the SIR.

A monitoring and metering program provides the information necessary to manage the groundwater in the WSPA. However, groundwater level monitoring is not undertaken with the specific aim of tracking where excessive declines in groundwater levels are occurring. Rather monitoring is undertaken to allow watertable and salinity control works to be targeted in the high watertable areas.

As explained in section 1.4, the SIR WSPA overlies several deep lead aquifers (Murray Valley and Campaspe) which are declared as separate WSPA’s (Katunga and Campaspe Deep Lead respectively) and have their own management plans. Copies of the Plans and of the annual reports for all three WSPA’s are available on the G-MW website (www.g-mwater.com.au).

3 Plan implementation

3.1 Usage

3.1.1 Usage volume

The metered usage of licensed bores in SIR WSPA for the 2009/10 season was 49,701 ML (Table 1). The location of all licensed (metered and un-metered) bores is shown Figure 2 while the recorded 2009/10 usage for each extraction point (presented as a range) is shown in Figure 3. The metering program and how usage is calculated is explained in section 3.5.

Groundwater usage has continued to decrease since the 109,247 ML recorded in 2006/07 (Figure 4). As will be discussed in section 3.1.2 there are a number of possible contributing factors for this.

Table 1 - Groundwater use in 2009/10 compared to the previous two years

Parameter	At 30 June 2008	At 30 June 2009	At 30 June 2010
Number of groundwater licences ³	1,417	1,445 ⁴	1,398
Total licence entitlement volume ⁵	237,498 ML/yr	241,030 ML/yr	235,591 ML/yr
Total entitlement of bores with metered use	193,159 ML/yr	155,358 ML/yr	128,858 ML/yr
Total number of meters	910	924	993
Total metered volume used	85,801 ML (869 verified bores)	57,154 ML (779 verified bores)	49,701 ML (610 ⁶ verified bores)
Total metered use as a percentage of total licence entitlement volume	36%	24%	21%
Total metered use as a percentage of total entitlement of bores with verified use	44%	36%	38%
Number of licences with estimated volumes	0	0	0
Total estimated volume used	0 ML	0 ML	0 ML
Total use	85,801 ML	57,154 ML	49,701 ML

³ Includes all section 51 licences- Irrigation and dewatering

⁴ This figure differs from that reported last year, as it now includes dewatering licences

⁵ Total volume of groundwater allocated under licence (excludes Domestic & Stock)

⁶ The reduction in the number of verified bores compared to previous seasons is due to not reporting bores with metered usage of OML this season.

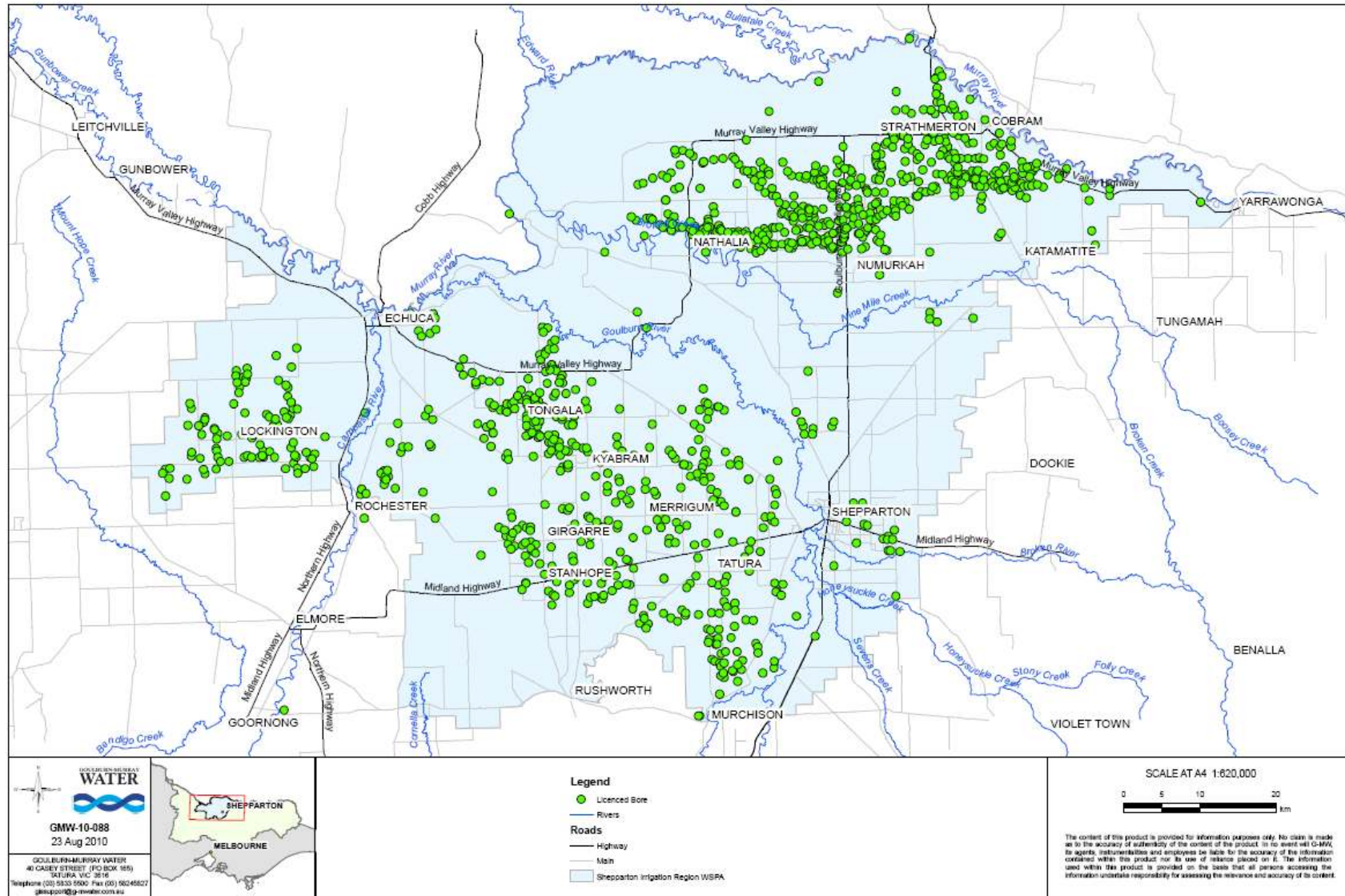


Figure 2 - Location of licensed bores within the SIR WSPA

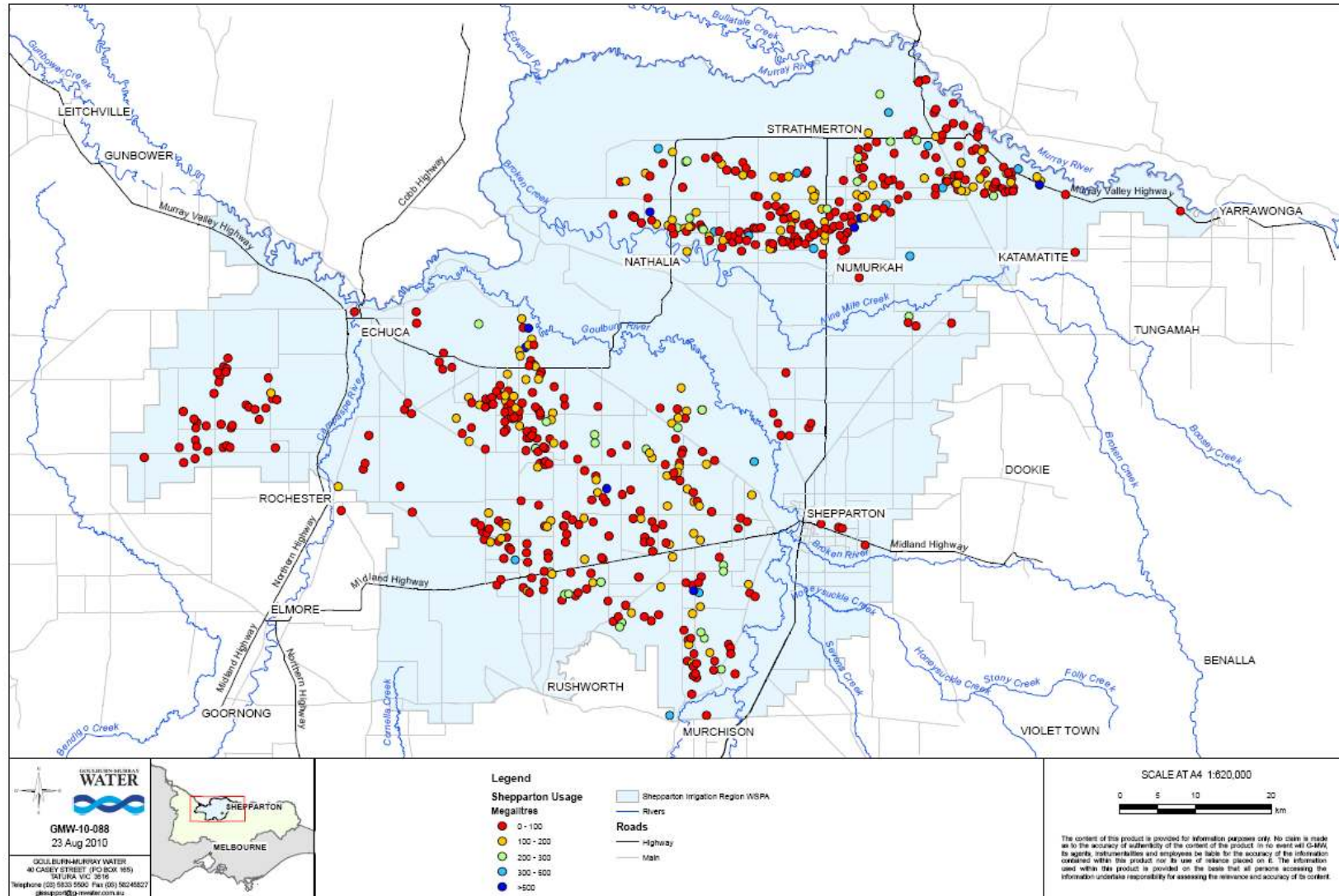


Figure 3 - Metered usage for individual extraction points for 2009/10

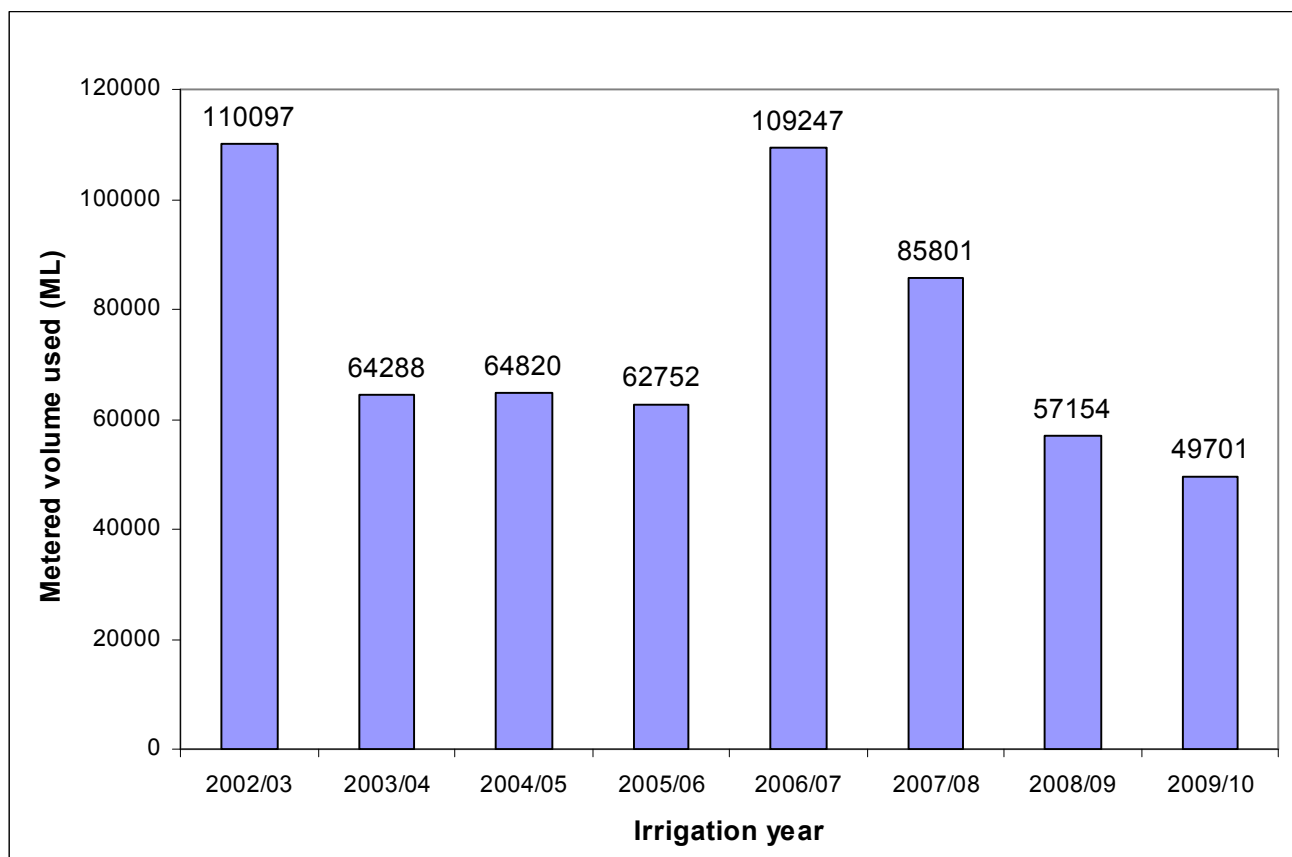


Figure 4 - Annual Metered usage for each season since 2002/2003.

3.1.2 Factors affecting usage

In the first half of the season, low rainfall and surface water allocations continued as per previous seasons. There was a continued reliance on resource use from groundwater to meet the shortfalls. However, it appears shallow groundwater users are having greater difficulty extracting groundwater. Many shallow groundwater pumping bores could no longer operate due to watertable levels dropping below the bore; or in other circumstances, limited groundwater access is possible with significantly reduced bore yields.

However, the situation in relation to both rainfall and surface allocations improved later in the season and this meant that there may have been less reliance on groundwater. The rainfall across the region through the 2009/10 season was 501.6 mm, gauged at the Kyabram DPI site. This is the highest rainfall in many years, with the rainfall from January to June 2010 being 333.2 mm, compared to 120.4 mm for the same period last year. In the 2009/10 season, while initially low at the start of the season, the final allocations for the Murray and Goulburn systems were 100% and 71% of high reliability water shares respectively. This is an increase on the previous season, when allocations were 35% and 33% respectively.

3.1.3 Overuse and compliance

A total of 45 licensees had a recorded usage that exceeded their licence entitlement and were investigated. This is an increase on 39 reported overuse cases from the 2008/09 season. While overall usage in the SIR WSPA is declining, possibly because a number of users are having difficulty accessing the resource, it appears some of those that can access it are pumping above entitlement to compensate for the lack of water from other sources.

In response to the overuse, warning letters have been sent out to the licence holders in question, which is in line with G-MW's three strike policy. If the overuse is continued over the next season, further action will be taken. The target for managing licensed use remains at zero use in excess of entitlement, however G-MW recognises that managing use within entitlement in the SIR WSPA must also include consideration of the catchment management objectives of the Plan.

There were eight other compliance cases that are in various stages of investigation within the SIR WSPA during the 2009/10 season, relating to other licensing and metering compliance issues.

3.2 August shallow watertable levels

The Plan specifies that the August groundwater levels from the DPI/G-MW shallow bore network (discussed in section 3.6.1) are used annually to produce a shallow watertable map. The August period is chosen as there is generally greater rainfall and less groundwater usage during this time, therefore giving the highest watertable levels and showing the areas at greatest risk to salinity. The 2008 and 2009 watertable maps are shown in Figure 5.

In August 2009 shallow watertable levels were generally within three metres of the ground surface across about 1.5% (8,968 Ha), of the monitored area of the SIR WSPA, compared to around 7.6% (42,721 Ha) in August 2008. Note that in 1997 the percentage of land area in the SIR WSPA with watertable levels within 3 metres of the ground surface was 54% (306 353 Ha). The changing area covered by the contours is shown over the years in Figure 6. From this figure, it can be observed that since 2005, the shallow water levels have continued to decline.

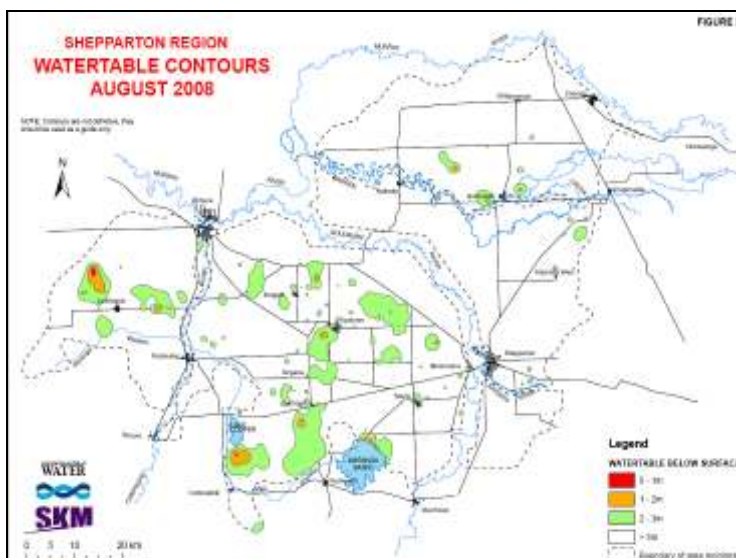
Nearly all districts across the SIR WSPA experienced the continued watertable decline in areas bounded by the 1 m, 2 m and 3 m watertable contours between August 2008 and August 2009. The 1m contour area was reduced to zero on the August 2009 map. The current area of high salinity risk (0-2 m depth to watertable) decreased from the in 3,505 ha in 2008 to 1,045 ha in 2009.

The "lower than average" groundwater recharge conditions within the SIR WSPA may be attributed to the significantly reduced natural rainfall recharge to the shallow aquifer during the period leading up to the August 2009 levels. It is clear that while there is risk to land productivity in some small regions of the SIR WSPA, the need for watertable control measures in these affected areas is continuing to decrease, most likely due to water applied being used by plants and evaporation and not recharging the shallow aquifers. It is also acknowledged that the changing irrigation footprint due to the regions modernisation program could affect the shallow groundwater levels.⁷

Hydrographs from four DPI monitoring bores are presented in Appendix 1- Representative Hydrographs. These hydrographs have been adapted from those prepared by SKM⁷.

⁷ Sourced from the SIRCIS Groundwater and Salt management program August 2009 watertable study report 2 March 2010 prepared by SKM.

a) August 2008



b) August 2009

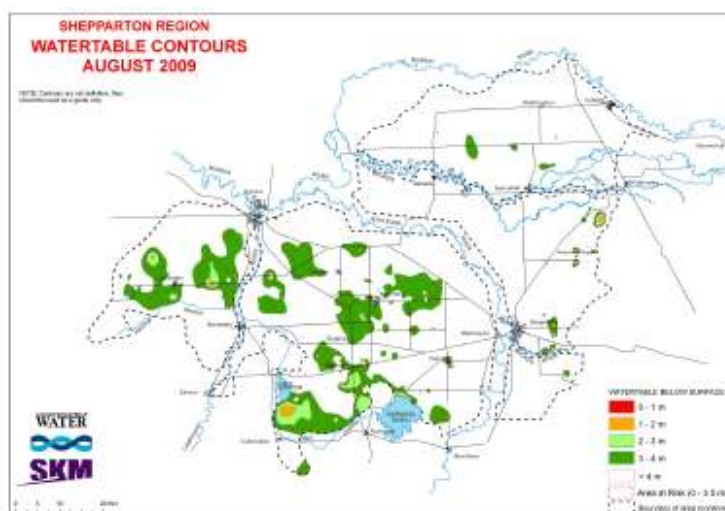


Figure 5 - Watertable contour maps for 2008(a) and 2009 (b)(Maps prepared by SKM⁷)

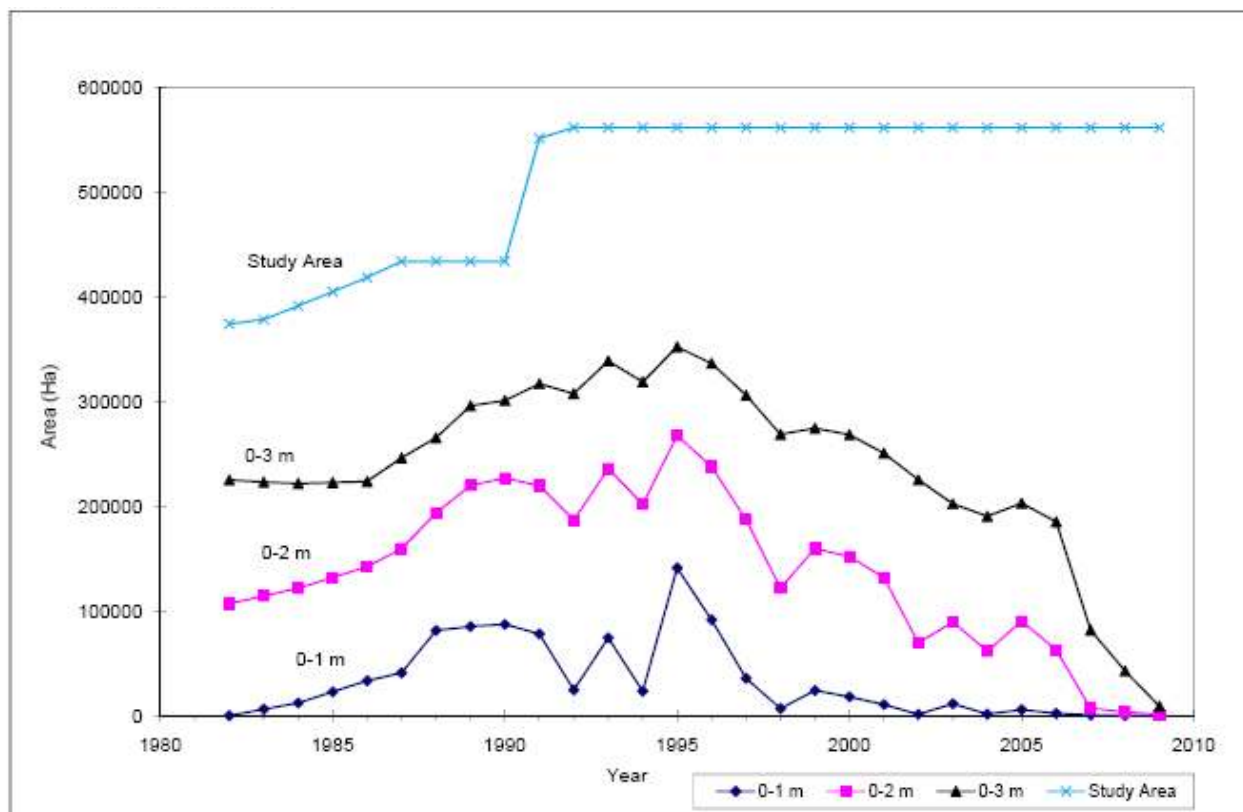


Figure 6 - Watertable contour area over time (Graph prepared by SKM⁷)

3.3 Licence transfers

Transfer of licence groundwater entitlement (temporary or permanent) is not permitted in the SIR WSPA.

3.4 Licensing activities

Over the 2009/10 season, 161 SIR irrigation and dewatering licenses were renewed. As part of the renewal process, 17 licenses were also cancelled by the applicants. Throughout the season, 17 new licenses were issued with entitlement based on a risk assessment (Table 2).

Table 2 - Licensing activities for 2009/10

Activity	No.	Total Volume (ML)
New licences issued	17	2523
Licence alterations	9	0
Licences revoked	0	0
Licence cancellations	17	1262
Licence amalgamations	0	0
Licence renewals	161	31229

The State wide dairy wash transition program operated during the 2009/10 irrigation season and aimed to ensure that licence volumes reflect the historic use of dairies. All operating dairies are now required to have a section 51 licence for the commercial use of water in the dairy. Work has commenced on processing applications received under this program.

3.5 Metering

3.5.1 Meter Readings

Metering water use enables better management of the water resource. It provides vital information on the volume of water used and the extraction point location which aids in the sustainable management of the resource. It also ensures that the water is shared equitably and licensees stay within their annual allocation. Metering also provides benefits to the farming operation and can lead to greater water use efficiencies. The requirements under the plan in relation to installation, maintenance and reading of meters are specified in section 11.2 of the plan.

Under the requirements of the Plan, all private dewatering bores and bores licensed to extract greater than 20 ML/year must be metered. All new licences are to be metered irrespective of the amount of licensed volume.

The meters in the SIR WSPA were read in the months of May/June. Metered usage for each bore was calculated by subtracting the start meter reading from the end of season reading. All metered usage was verified and no usage was estimated.

3.5.2 Data storage

For effective management of the groundwater resource, data management systems are required to allow the storage and retrieval of large quantities of data. Metering data is stored and maintained by G-MW. In previous years, the meter readings have been entered into internal databases and usage figures have been generated from these. The 2009/10 season was the first season in which the G-MW Irrigation Planning Module system, an internal database for recording meter reading and usage data, was used.

3.5.3 Meter installation and maintenance

In accordance with the Plan, all licensed irrigation bores with an annual usage of more than 20 ML⁸ installed prior to 1 July 1999 have had funding provided for the supply and fitting of a G-MW approved volumetric flow meter. In 2009/10, eight new volumetric flow meters, which meet G-MW's specifications, were installed at the owner's expense. In addition, the condition of meters was noted when readings taken. Seventeen defective meters were identified and repaired and six meters were replaced in 2009/10 (Table 3).

Table 3 - Meter installation and maintenance activities 2009/10

Activity	Total at 30 June 2010
Number of meters installed	8
Meters requiring installation	33
Meters requiring maintenance	17
Meters replaced	6

3.6 Groundwater level monitoring

Monitoring of groundwater levels provides information to enable sustainable management of the resource. Observation bores provide information to:

- assess annual and long term impacts on water levels from groundwater pumping;
- monitor regional and local seasonal drawdown;
- examine interrelationships with rivers and other aquifers;
- provide information for future resource assessments;
- assess potential management issues.

However, as discussed in section 2, in the SIR WSPA groundwater level monitoring is not only about resource management but also about identifying high risk, high watertable areas to enable watertable and salinity control works to be targeted in these.

3.6.1 Monitoring sites

The SIR WSPA is monitored by the two programs

1. G-MW/DPI shallow bore network, and
2. State Observation Bore Network (SOBN) bores (Figure 7).

This is different to most other areas which are monitored mainly by the State Observation Bore Network (SOBN).

DSE conducted a review of the SOBN bores in the area covered by the SIR WSPA in the 2009/10 season. The outcome is that there are 83 SOBN bores to remain in the SIR WSPA, and 37 bores to be removed. The reasoning behind the removal of some bores is that there are 1900 G-MW/DPI monitored bores in the area, so the current monitoring is considered excessive. Both monitoring networks in the area will continue to be reviewed.

⁸ 20 ML is the annual groundwater usage defined as the upper limit for low capacity bores in the SIR and is a figure endorsed by the former SIR Groundwater Management Plan Working Group in 2000.

3.6.2 Level readings

The shallow bore network is monitored throughout the year by a sub-contractor for G-MW, with a once a year monitoring run across the area for the August watertable map use (see section 3.2), as well as quarterly or half yearly for a portion of these bores.

The SOBN bores in the SIR WSPA are monitored and maintained by DSE and levels are recorded in the 70 bores by a sub-contractor on a quarterly basis.

3.6.3 Data storage

As discussed in section 3.5.1 of this report, databases are required for the storage and retrieval of collected data to enable analysis and reporting.

For the both monitoring programs, the data is entered into the Groundwater Management System (GMS) database. This state-wide database is managed by the Department of Sustainability and Environment (DSE). The levels for all bores are entered into this database within 30 days after they were determined so that the data can be accessed and interpreted.

3.6.4 Maintenance program

The shallow bore network is maintained by G-MW according to an agreed work schedule.

SOBN Bores are visually inspected during monitoring and any maintenance required is noted on the electronic monitoring run field sheets kept by the sub-contractors. During the reporting period, no long-term maintenance issues were identified. Maintenance such as painting the bores or clearing the site is undertaken as required by the sub-contractor.

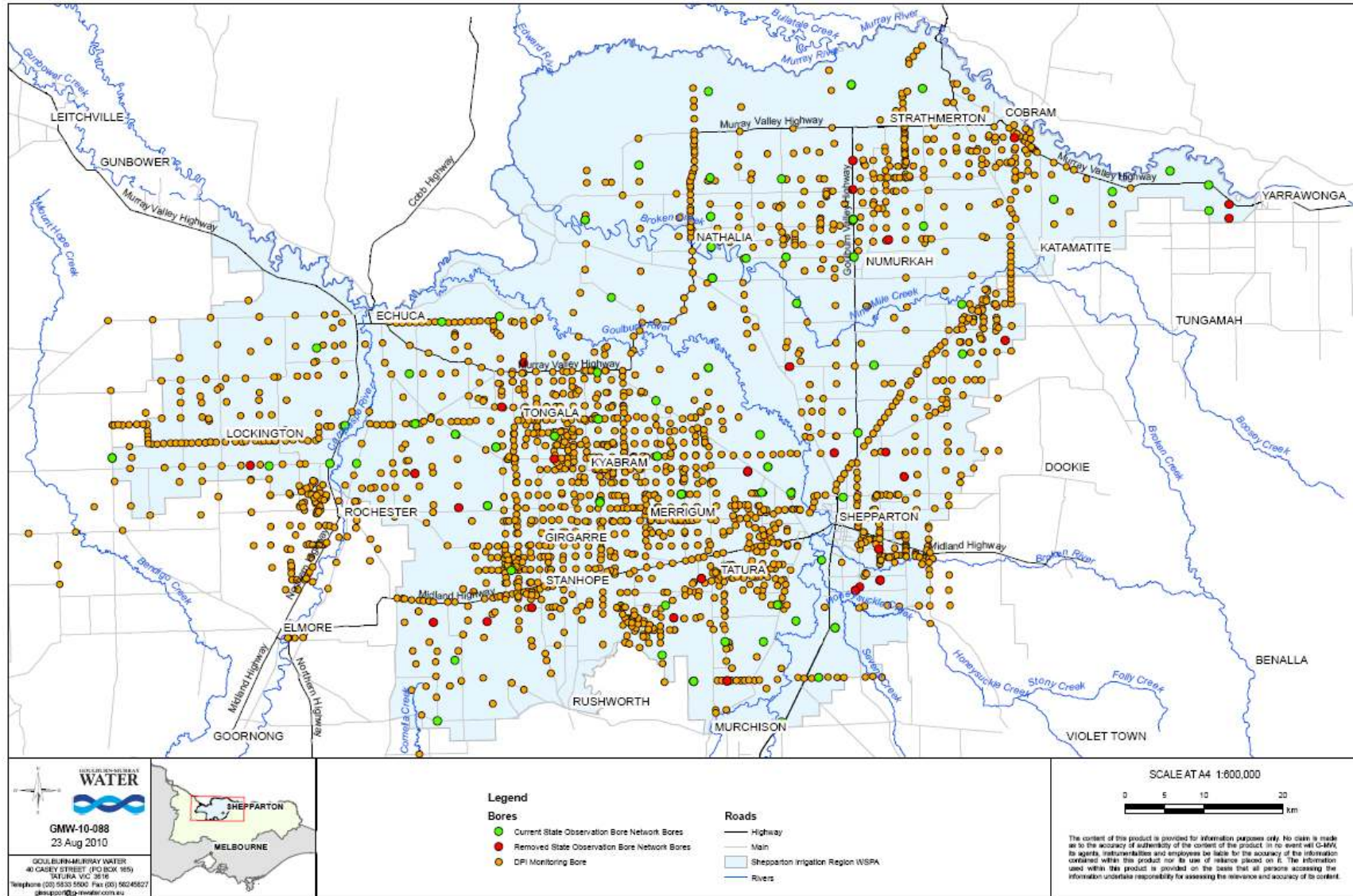


Figure 7 - Location of bores in the DPI/G-MW shallow bore network and the State Observation Bore network

3.7 Salinity monitoring

3.7.1 Monitoring program

Regular analysis of water from bores is required so that potential future salinity issues can be better understood. As part of its long term groundwater salinity monitoring program, G-MW conducted a salinity sample mail-out to registered owners of all licensed shallow (i.e. <25m deep) bores in the SIR WSPA in January 2010. A sample bottle was sent along with a pre-paid return envelope and a letter requesting that a groundwater sample be collected during operation of the bore and returned to G-MW for salinity determination.

3.7.2 Results

A total of 171 samples were returned between January and June 2010 from a total of 1084 for 2009/10 which was a return rate of 16%. This is almost half of last season's rate of 31%.

The following improvements to the salinity monitoring program were adopted in 2009/2010 based on feedback from a survey of groundwater users:

- Changed covering letter to highlight benefits of returning salinity samples and flagging the importance of this information for the future management of the resource.
- Conducted mail out of sample bottles in January rather than November.
- Contracted out the analysis of returned samples to speed up processing time.
- Results were sent in May/June of 2010 rather than waiting to include the result with the sample bottle for the next season as was previously the practice.
- Gave the opportunity for landholders to get their results emailed out.

However, implementing these changes did not increase the response rate. As previously discussed, the number of bores operating and pumped volumes have reduced and this may be a contributing factor for the non-return of samples. In addition, the mailout coincided with a period of higher rainfall and therefore some bores may not have been used during this period.

The spatial distribution of groundwater salinity sample results return in 2009/10 is presented in Figure 8. It highlights that groundwater salinity in the SIR WSPA is highly variable due to the complex nature of the shoe-string sands that make up the upper Shepparton Formation. However from the above distribution it can be observed that shallow groundwater quality is generally better in the eastern Murray Valley and between Kyabram and Echuca.

In the past the results from the monitoring were incorporated into a corporate database. The results from this season and all the historical data were uploaded into the state Groundwater Management System Database. As discussed in section 3.6.1 of this report, this is the same database used for storing monitoring bore groundwater levels.

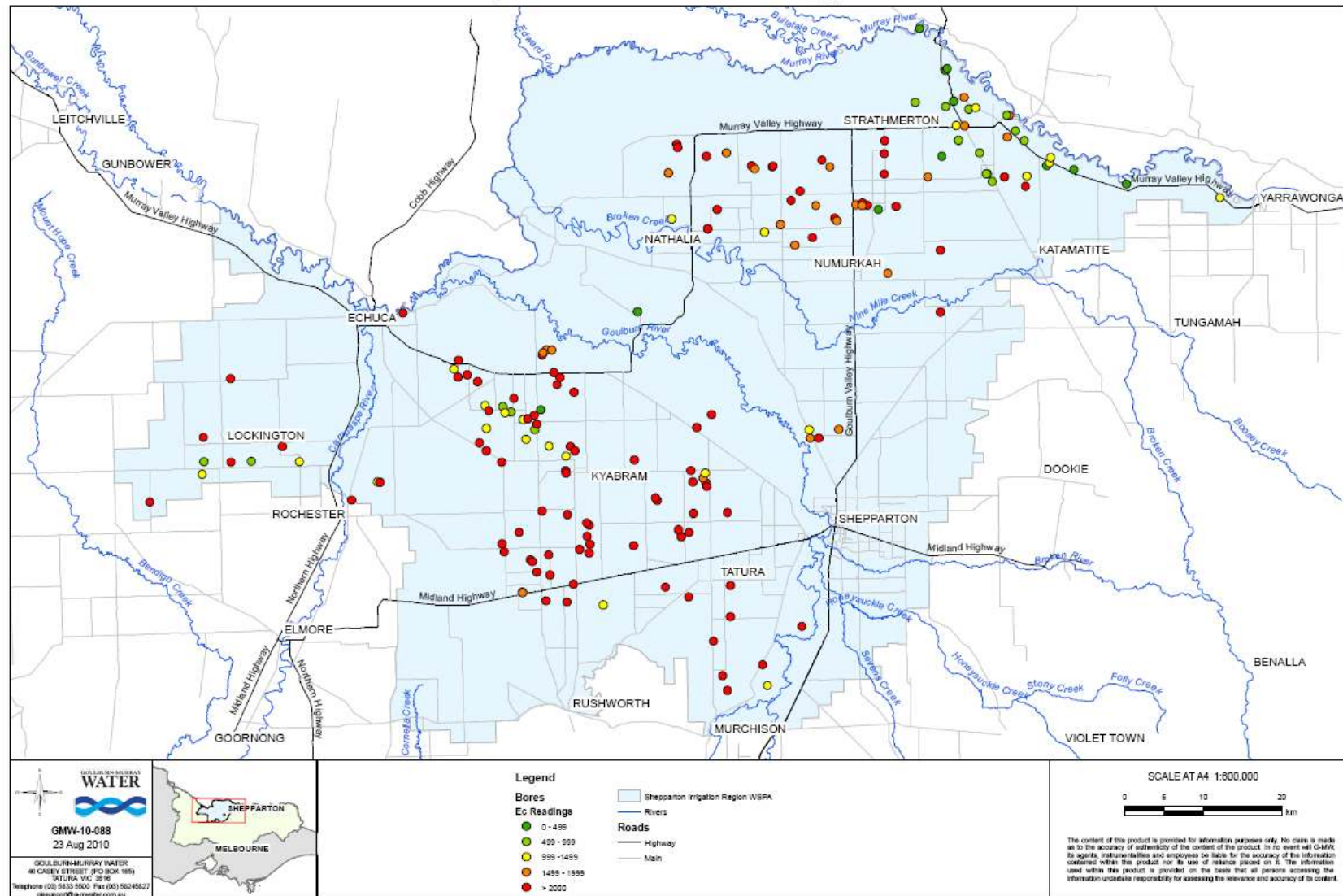


Figure 8 – Distribution and EC range of returned groundwater salinity samples from licensed bores in SIR WSPA

4 Future considerations

Due to the extended dry climatic conditions over the last decade, G-MW, in consultation with DSE and other Groundwater Plan stakeholders, needs to ensure the SIR WSPA can be successfully managed to encompass both sustainable resource use needs and catchment strategy objectives (e.g. salinity management). It has been recognised that the Plan is of limited value for future groundwater resource management because it does not have mechanisms to allow shallow groundwater to be adaptively managed in response to changing seasonal and climatic conditions.

It is also clear that since 2002/03 there has been a greater reliance on shallow groundwater as a resource. This has been mainly due to the low surface water allocations and the need for irrigators to seek viable alternatives to maintain agricultural production. Whilst this has led to short term benefits to production, there is an increased risk that, due to licence holders being less able to meet licensed blending requirements with surface water supplies, land productivity may decline as a result of more saline groundwater being applied. Licence holders have generally had access to some surface water and are able to temporarily transfer additional surface water as required; however it is also recognised that overall availability of surface water has made it difficult for licence holders to meet the blending requirements specified in their groundwater licence.

Currently groundwater licence volumes can be reduced upon licence renewal if salinity increases in pumped groundwater are not able to be addressed through access to and blending with surface water supplies. Whilst this may be an effective mechanism for reducing the impact of salt on land productivity, the current groundwater licensing and management framework does not recognise shallow groundwater as a relatively low security and opportunistic resource. This may lead to licence holders being less willing to invest in and rely on shallow groundwater and may also have implications for shallow groundwater pumping programs developed to bring about catchment benefits (e.g. lowering watertables). Currently, there is an ongoing review of licensing conditions of SIR WSPA licences to identify if some conditions may need to be updated.

The annual salinity monitoring program has again been identified as an area needing improvement. Based on customer feedback to a survey conducted in 2007/08 the mail out was conducted later in the season. However, this year's return rate continued to decrease in comparison to last season. G-MW will continue to look at ways to get across the importance of salinity information in terms of groundwater and land management in the coming season.

Databases are also expected to be a focus of management into the future. Several projects are currently underway with G-MW to consolidate and improve management of existing and new groundwater information. "Maximo" is a system that has been created to replace the existing assets database. This new system will record detailed information about meters across the G-MW area, and work with the new GIS system, Weave, that is being developed. These tools will aid in the representation of information in a geographical context, and allow better management of resources. The streamlining of these databases will aid projects such as resource appraisals in collating known information about areas.

In addition, on a statewide level, there are several data storage projects underway. The Water Management Information System (WMIS) will incorporate data from the GMS and the Victorian Data Warehouse. The data from this statewide system will then be incorporated into the National Groundwater Information System (NGIS), which is being developed by the Bureau of Meteorology to manage groundwater information at a national level.

Work has continued on a project funded by DSE and the GBCMA to understand the groundwater balance implications of variable climatic conditions and water management regimes in the area. Key outputs from this work will be development of an adaptive management system and ‘triggers’ for salinity and shallow groundwater resource management. The aim is to achieve harmonisation of land salinity and shallow groundwater resource management. Consideration of future management of the shallow groundwater will also be undertaken in the development of a groundwater management plan for the newly declared Lower Campaspe Valley WSPA² and in an upcoming review of the Katunga WSPA Groundwater Management Plan.

Preliminary investigations indicate that the watertable is quite responsive to relatively moderate changes in rainfall. This could have implications on next season’s watertable study, due to the amount of rain that has fallen in late 2009/10 and early 2010/11 seasons.

5 Acknowledgement

As acknowledged in the footnotes, various maps, graphs and discussion presented in this report referring to the watertable have been sourced from the Shepparton Irrigation Region Catchment Implementation Strategy (SIRCIS) Groundwater and Salt management program August 2009 watertable study report (2 March 2010) prepared by SKM.

Appendix 1- Representative Hydrographs

