



22 December 2010

Committee Secretary  
House of Representatives Standing Committee on  
Regional Australia  
PO Box 6021  
Parliament House  
CANBERRA ACT 2600

Dear Sir/Madam

**Gannawarra Shire Council Submission to the House of Representatives Inquiry  
into the impact of the Murray-Darling Basin Plan in Regional Australia**

The Gannawarra Shire Council would like to take this opportunity to provide input into the House of Representatives inquiry into the *'impact of the Murray-Darling Basin in Regional Australia'*.

As the proposed Murray Darling Basin Plan will impact on the future availability of water in the region, Gannawarra Shire Council would like to:

- work in partnership with all levels of government and the Murray Darling Basin Authority to minimise the socio-economic impacts of the Plan on our community at a local level
- maintain a balanced return of water to the River for environmental flows

In relation to the terms of reference of the Inquiry, attached is a submission on the issue. The submission addresses the following terms of reference from the Inquiry:

- **The direct and indirect impact of the Proposed Basin Plan on regional communities, including agricultural industries, local business activity and community wellbeing**

Anecdotal stories throughout our submission provide an insight into how this will affect some individuals within our community, but in particular this term of reference is addressed on pages 12-14 of our submission, under the section titled *'Impact of the MDBA Guide on Gannawarra'*.

Table 2 of the submission highlights the direct and indirect impacts on Gannawarra by 2029. There is an anticipated reduction of between \$66.4-\$132.7m per annum in regional output and between \$15.5-\$31.1m per annum in regional value added output. Employment within the community is anticipated to reduce by between 358 and 716 full-time equivalent jobs and without any intervention the total population of the Shire is anticipated to decline by between 888 and 1,766 people.

This information has been obtained from an independent consultant, RMCG, who prepared a report for Gannawarra Shire Council on the '*Socio-economic impact of the Basin Plan*', November 2010. A copy of this is contained in the appendix to the submission.

- **Options for water-saving measures or water return on a region-by-region basis with consideration given to an analysis of actual usage versus licence entitlement over the preceding fifteen years**

Recognising the changing irrigation environment, the local Torrumbarry Reconfiguration and Modernisation Strategy (TRAMS) Committee was formed by Goulburn-Murray Water in 2006 to bring together irrigators and community members to identify ways of defining and ensuring a smaller, more sustainable future irrigation footprint for the Torrumbarry Irrigation Area (TIA). The TIA includes the whole of the Gannawarra Shire and it is one region of the Goulburn Murray Irrigation District (GMID) in Northern Victoria. The TRAMS Group now reports to the Northern Victorian Irrigation Renewal Project (NVIRP) and has an advisory role in the modernisation of the GMID irrigation infrastructure.

This community is acutely aware that our wealth links closely to the level of irrigation water available. With an aim of securing a sound future for irrigation in the region, TRAMS has acted as a mechanism for investigation, discussion and community debate on the targeted rationalisation of irrigation infrastructure, the identification of engineering solutions for environmental assets and industry and community engagement on water saving measures and other aspects of this difficult issue. A difficult area of significant interest and concern to all stakeholders is the accurate accounting of savings created through various water saving initiatives.

The valuable work and approach of the TRAMS group (which includes local government representation) should be recognised and considered by the Federal Government and MDBA in identifying working models that include both industry and community engagement in identifying a positive way forward, notwithstanding the difficult nature of the discussion.

The Federal water buyback scheme currently being undertaken occurs in an ad hoc way that doesn't support an orderly or targeted purchase of water from the less productive land. This has both social and commercial impacts.

The activities of NVIRP are geared at creating significant water savings for sharing between farmers and the environment (and Melbourne water users). The Federal Government's very welcome recent announcement of \$1billion funding for Stage 2 of NVIRP will identify significant further water savings on-farm and on the irrigation carriers system for the GMID region. Assistance should be provided to farmers to encourage the identification and implementation of water efficient approaches.

It is important to consider the record of actual usage versus licence entitlement across the Basin. The Gannawarra Shire Council understands that Victoria's compliance record is very sound, which is not necessarily the case for all other States.

- The role of governments, the agricultural industry and the research sector in developing and delivering infrastructure and technologies aimed at supporting water efficiency within the Murray-Darling Basin

It is a high priority that all levels of government be involved in supporting water efficiency within the Murray-Darling Basin. The future of rural and regional Australia is dependent on access to a quality, reliable water supply. Governments need to work together to ensure this is available and to maximise the use this important resource.

The agricultural industry and research sector also need to have water infrastructure and water efficiency as high priorities for research, to maximise the use of this valuable resource. In conducting this research they need to consider all opportunities for water efficiency, including efficiencies for environmental watering.

Local government needs to continue to partner with the State and Commonwealth governments to ensure they receive input from the local level, to ensure any initiatives developed are appropriate at the local level.

- **Measures to increase water efficiency and reduces consumption and their relative cost-effectiveness**

Farmers within the Gannawarra Shire have been involved in the Northern Victorian Irrigation Renewal Project (NVIRP). This project is aimed at modernising irrigation infrastructure to capture water savings to be returned to the environment. This has potentially led to production efficiencies within the region and to farmers, as the reduction in the number of dairy farms across the Shire is not proportionate to the reduction in milk production.

According to a report released in July 2010 by HMC Property Group, '*Changing land use in the GMID 2006-2010: Where have all the dairies gone?*' there has been a substantial reduction in the number of properties primarily devoted to dairying. While drought and the resultant low water allocations are prominent factors, uncertainties regarding government water policies, including likely new diversion limits in the Murray-Darling Basin Plan, have also contributed to farmer decisions.

Compared to 2006, there has been a reduction of 57.9% of properties across the Goulburn Murray Irrigation District, and a 49.1% reduction within Gannawarra. Interestingly the improved season this year has seen some of these properties return to dairy production.

The above report also highlights that in northern Victoria for the period 2006-2010 there has been

- a reduction in dairy farm numbers of 52%
- a reduction in land devoted to dairying of 55%
- a reduction in total milk production of 32%.

Thus dairy farmers have identified ways to produce more milk from less water, driven by the extremely difficult drought conditions and low water allocations experienced over this period. While opportunities for further improvements and efficiencies are likely to exist it is recognised that more research would need to be conducted. Additional research investment assistance would be required.

- **Opportunities for economic growth and diversification within regional communities**

Substantial loss of water from the Gannawarra Shire (or for that matter northern Victoria) will not be able to be completely overcome; as has already been shown (see attached submission) it is inevitable there will be some level of reduction in agricultural output as a result of a reduction in water availability. It is clear that there are no silver bullets in relation to the impact of the loss of irrigation water. Time will be needed for businesses and the community to readjust. The likely impact is that there will be less value generated for local community. The reliance across the region on agriculture and its associated industries means that we are exposed to commodity market fluctuations both domestically and globally. This has had a dramatic impact on our Shire over recent years in the area of dairying.

There are measures that can be implemented to help offset the loss of water availability through the implementation of smarter farming and plant technology, but to expedite the uptake of this process, and to minimise the socio-economic impacts of implementing these measures, investment by other levels of government is required. This will ensure Australia retains a balanced, diversified, agricultural base whilst minimising the socio-economic impact on those communities facing substantial structural adjustment.

Locally, we recognise that while dairy and agriculture will continue to be a major force in our agricultural product mix for some time to come, we will need to diversify and to value add to our existing industries. Through the recent development of the Loddon Mallee Regional Strategic Plan – Northern Region a number of priorities were identified, which included creating new employment through targeted investment attraction strategies, as a means to at least maintain existing employment levels. Intensive agriculture, manufacturing, tourism, alternate energy investment and the investigation and implementation of natural gas between Echuca and Mildura are all included as priority areas.

- **Previous relevant reform and structural adjustment programs and the impact on communities and regions**

Gannawarra Council is aware how important reform and structural adjustment programs are to minimise the impact of significant and abrupt change on communities and regions. There have been numerous reform and structural adjustment programs in the past, with the most recent example affecting Gannawarra Shire being in the timber industry following the release of the VEAC River Red Gum Forests Investigation. This is not necessarily seen by our community as a best practice approach, as there was only limited assistance provided by the State Government to the affected workers and there was no assistance for the community impacted by this decision.

A key factor that will impact on the success of any reform and structural adjustment of the Murray-Darling Basin is the future land use of those farms previously used for irrigated agriculture. Attached is a copy of an RMCG report that Gannawarra Shire Council commissioned to investigate this issue: *'Impacts of sales of permanent water entitlements and land use planning options for the new dryland – Final Report February 2010'*.

A structured approach to return some farms to dryland may help minimise the socio-economic impact. It is important though, that planning policy responds to the productive uses of the new dryland and not to short-term structural adjustment issues. The February

2010 RMCG report indicates that for a dryland farm in Gannawarra to support a family it would require over 2,500ha. The transition from irrigated to dryland production systems would also require a new set of skills, knowledge and access to equipment and machinery of a more suitable scale. Redevelopment of irrigation properties will also require dismantling of irrigation infrastructure including channels, levees, and changing the farm layout to suit broadacre production systems. Redevelopment will be costly and will therefore require funding assistance to encourage the smooth transition and minimise the socio-economic impact. For most farmers the conversion of irrigated land to dryland would not be seen as financially attractive at this stage, which may result in farmers saying no deal.

The February 2010 RMCG report also identifies alternative land use options for the new dryland areas. These uses include broadacre cropping and grazing, intensive animal production and renewable energy generation, in particular solar. Tourism, carbon sequestration and native vegetation offsets are also identified as alternative uses, but are unlikely to be viable land uses on their own.

Further work needs to be done around this issue to explore the implications on communities and regions. Through a second round Sustainable Basin Communities grant, we are currently partnering with Loddon and Campaspe Shires and the North Central Catchment Management Authority and Latrobe University to look at this issue further. It will research the alternatives for farmers to consider, providing them with the best possible information to make an informed decision on the future of their land.

We recognise the importance, and support the intent, to improve access to water for the environment from the Murray Darling Basin, but we urge a balanced approach be taken. We offer our services to act as an interface with our local community, to better inform them and minimise any further mistrust on this issue.

Thank you for the opportunity to provide input into the Inquiry on the impact of the Murray-Darling Basin Plan in Regional Australia, which will dramatically affect the future of our area and our society.

The Mayor, Cr Max Fehring, and I would welcome the opportunity to speak to our submission, preferably at the Swan Hill hearing. Please do not hesitate to contact me on 03 5450 9353 if you would like further detail on any aspects of our submission or to arrange details for the hearing.

Yours sincerely



Rosanne Kava  
CHIEF EXECUTIVE OFFICER



**Submission to the  
House of Representatives  
Inquiry into 'the impact of  
the Murray-Darling Basin  
Plan in Regional Australia'**



**GANNAWARRA  
SHIRE COUNCIL**

**22 December 2010**



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## Overview

Gannawarra Shire Council is heavily reliant on the Murray and Goulburn Rivers for irrigated agriculture, particularly dairying, the region's largest industry. Ensuring the sustainability of agriculture within our region is vital to its future. To do this successfully a balance between the environmental, social and economic needs for water is essential.

As the Murray Darling Basin Plan will impact on the future availability of water in the region, Gannawarra Shire Council would like to:

- work in partnership with all levels of government and the Murray Darling Basin Authority to minimise the socio-economic impacts of the Plan on our community at a local level,
- maintain a balanced return of water to the River for environmental flows.

## Background

### History and current status of the community

Gannawarra Shire is located on the Murray River in Victoria. The major towns in the municipality include Kerang, Cohuna, Koondrook, Murrabit, Leitchville and Quambatook. The population is currently around 11,000 people<sup>1</sup>. While employment in the manufacturing and services sectors has increased over recent years, agriculture is still the main employer, with around 30% of total employment directly in agriculture<sup>2</sup>. In 2006 the Gross Value of Agricultural Production (GVAP) for the Shire was \$226 million, of which \$116 million was from livestock products (51%)<sup>3</sup>.



<sup>1</sup> Australian Bureau of Statistics. *ABS Census of Population and Housing, 2006*

<sup>2</sup> Australian Bureau of Statistics. *ABS Census of Population and Housing, 2006*

<sup>3</sup> Australian Bureau of Statistics. *ABS Catalogue 7125.0 Agricultural Commodities: Small Area Data, Australia, 2006-07*

It is clear from these statistics that the removal of large amounts of irrigation water as a result of the Murray Darling Basin Plan Sustainable Diversion Limit (SDL) recommendations, would have an instant and permanent effect on the economic future of the region and therefore on the population levels and future of settlements in our Shire.

Over recent years the Shire has been severely impacted by drought, the significant reduction in the redgum timber industry due to the State governments' decisions to create Red Gum National Parks and the downturn in the dairy industry particularly in Northern Victoria. Notwithstanding the proven resilience of our farmers and our communities, the MDBA Plan to mandate new SDLs has further exacerbated stress levels of farmers and reduced or delayed investment levels as people await some indication of certainty re: water resource availability.

Council recognises the need to come to grips with the many changes that have occurred and to plan for a positive future. Council is currently developing a new four year Economic Development Strategy and Gannawarra 2025, a comprehensive community plan that will set the overall strategic direction for the municipality for the next fifteen years. It is important, therefore, that the likely impacts of the MDBA Plan, are factored in and areas for diversification and possible structural assistance identified. Local solutions are critical but we will need help from the Government to ensure any negative community impacts are minimised.

## Council's Community Engagement Activities

Gannawarra Shire Council coordinated two community information sessions, one in Kerang with 110 attendees and another in Cohuna with 104 attendees. The strongest representation at both meetings of people came from an agricultural and farming background, but many of these also believed they had an environment and conservation focus, as their sustainability was dependent on looking after their land. There was also a strong level of interest from non-agricultural and farming background, with 25% of attendees at the Cohuna session from a non-agricultural business background.

A list of the wide ranging concerns and questions raised by attendees at the Forum as shown below:-

### Concerns raised in Community Forums by members of the community

#### *Social Impacts*

- If the MDBA were to include the community "eco-system" as part of the (environmental) structure, would/should it be considered for inclusion as part of the environment?
- Consideration should be given to the flow-on effects of water losses to communities eg schools, hospitals and other services. Towns that rely on farmers will be affected as farms close down, particularly family farms.
- Multiplier effect to economy ie cost of taking that much water at an estimated cost of (\$7,000/ML) out of the economy. This multiplier effect is what is currently provided employment and sustainability in rural communities.

#### *Economic issues*

- Decisions to reduce the capacity of communities to continue should look at the debt levels of those communities that have often maintained output by borrowing money. More reductions in water supply will equate to more borrowings and less production.
- The reality is that there has been a loss of a third of irrigation entitlements already, want to take another third, with only one third left behind after Plan – this will effect everyone in the community and everyone who has invested in modernisation.
- Substantial SDLs will mean that on-farm investment will be affected. This will have flow on effects on the security of other local businesses such as transport operators and motor mechanics.
- The ABARE data used in the Guide to the Basin Plan was based on industry wide analysis with the real figures relevant to particular regions being skewed. This information must be reassessed and put into the context of how it affects each region.

#### *Planning*

- Those who kept and maintained their irrigation assets with little or no compensation may be disadvantaged under this Plan. At the moment those people who have continued to change and revise their farm businesses are excluded from the decision making process.
- There should be recognition that the storages and weirs were built for irrigation purposes. If there were no storages, the river would have been dry in most years during the drought. There are complementary uses of the rivers that must be considered.
- There are engineering solutions to minimise environmental water requirements that can be implemented to achieve good environmental outcomes, instead of just purchasing water out of the system.

#### *Water savings*

- There needs to be clear accounting of figures regarding environmental flows and losses to the system eg Barmah Forest given that there is multiple use of the water.

- What happened to the 40% sales several years ago? Refer to the buyback by Commonwealth government already - will that be taken into account or are the suggested SDLs “over and above” what has already been purchased?
- Savings of over 1,000GL can be made just by opening up the Lake Alexandrina estuary and returning it to more natural tidal flows.

#### ***Environmental assets***

- There must be a challenge to the science of how much water the environment actually needs to be sustained.
- Need to question the science - it is fundamentally flawed. It is bigger than the MRGC. Need to get all Murray Darling Basin councils together. Do international treaties override Australian Constitution? This will affect every Australian. Water Authorities will not be viable to deliver water to those irrigators who are left. They will have to bear the cost of continuing irrigating.
- Farmers need to promote what they do for the environment eg eco-systems on-farm. There are many ways that farmers provide eco-system services by their farming practices, and these services should be recognised and taken into account when accounting for environmental management.
- The multiple use of water should be recognised. Amounts of water taken out of a regulated system for the environment – need to take into account the volume that is returned to the river.

#### ***Water Trading***

- It must be clarified if the Environmental Water Holder will pay normal water charges on environmental water, equal to those paid by irrigators, eg delivery shares, reduced allocations and exit fees.
- Call for a reduction in fixed water charges, given that as water rights are reduced, so too should the amount paid for water. At present, irrigators pay for 100 per cent of their water right, even when they receive less than their full entitlement.

#### ***Ideas from the community***

- Motion: “that there be no further irrigation cuts to the Torrumbarry Irrigation District’s allocation given that there have already been substantial purchases and sales made from the area already”.
- Need to connect more with metropolitan people, so they understand the issues and the implications for taking these radical decisions.
- Need to push the issue of SDLs. This submission should hammer the calculations on how the figures were arrived at, and the plan should be delayed until satisfactory information can be supplied (honest and true).
- SDLs should be subject to a separate inquiry.

Table 1 highlights the top seven social impacts of the MDBA’s proposed SDLs as identified by attendees of the Kerang and Cohuna consultation forums as most likely to impact on them.

**Table 1 Top 7 Social Impacts identified at the Gannawarra Shire Council Consultation Meetings**

	Cohuna	Kerang	TOTAL
Farming Families forced to make decisions	17	17	34
Significant rise in stress levels and health impacts	17	14	31
Small community decline	19	10	29
Significant loss of jobs	17	12	29
Declining educational access for children	14	7	21
Loss of young people	13	8	21
Delay to retirement plans	12	9	21

In relation to the economic impacts of any further water reductions, the biggest impact for community members at both sessions was that limited funds would cause difficult decisions to have to be made.

## Concerns with the MDBA process

### Lack of a socio-economic impact assessment

Apart from adequate justification of the proposed 3,000-4,000 GL reduction in SDLs, Gannawarra's main concern with the MDBA Guide process is the lack of a credible and detailed socio-economic impacts assessment. When considering any issue current best practice is to consider the triple bottom-line impact of any decision, including social, economic and environmental impacts. Although the Water Authority Act 2007 does focus on environmental issues, the Minister has now received legal advice from the Australian Government Solicitor that the plan provides for the use of the Basin water resources in a way that optimises economic, social and environmental outcomes and that subject to the environmentally sustainable limits, maximizes the net economic returns to the Australian community.

In May 2010, Gannawarra Shire Council participated in a study by Marsden Jacobs<sup>4</sup> to explore the economic and social profiles and impact assessment on the Goulburn Murray Irrigation District (GMID) Region. Very little of this information seems to have been included in the Guide. Some of the key findings of the Marsden Jacobs report relevant to Gannawarra are:

- allocation policy employed by Victoria has provided irrigators with high reliability water that has resulted in the development of high value industries dependent on that supply
- Since 2006-07 the region has suffered a series of low allocations, which has led to increased debt due to high cost of annual water purchases and/or bought in feed costs
- Dairy water use efficiency has improved significantly in last 10 years, including significant improvements in feed grown per ML of irrigation water used and is now, in the main, a highly efficient industry
- There are opportunities to improve on farm water use, especially in dairy, but current financial stress will limit investment in the short to medium term

<p><b>Name:</b> Paul &amp; Ann Loosemoore</p> <p><b>Company:</b> Mixed Farming</p> <p><b>Town:</b> Kerang</p> <p><b>Yrs in business:</b> 56</p>	
<p>We farm in partnership with our daughter and son-in-law. During the period of low water allocation our operation slipped from a profit of \$120,000 a year to an operation making an \$80,000 loss. If water was to be taken away on a permanent basis we could not continue to farm as we have been. There needs to be a study done on how or what farmers could grow profitably on a lower water allocation. There is no solution being offered for the future.</p>	

<sup>4</sup> Marsden Jacob Associates May 2010. *Goulburn Murray community profile – Irrigation Region: Delivering the Basin Plan – Economic and social profiles and impact assessment in the Murray Darling Basin.*

- The area has suffered a slump in confidence and high stress , the current environment is highly uncertain due to the substantial reform already undertaken, and uncertainty around likely impacts of SDLs, which is constraining investment
- A reduction in water availability presents a real risk for further loss of confidence (already at low levels) in irrigated dairying and a collapse in value of farm assets
- The irrigations system would need to shrink to about half the scale in the Northern Vicotrian Irrigation Renewal Project (NVIRP) business case to achieve the SDL targets
- Towns reliant on dairying (eg Cohuna) would shrink significantly or become increasingly welfare-dependent
- Tourism is an opportunity based around the Murray River and the Kerang Lakes, however it requires significant development and will not match the regional economic contribution made by irrigated agriculture if there are significant changes to water availability

## Consultation

The rural community has largely lost faith in government consultation on environmental issues. It will take time and effort to rebuild that trust. There are doubts regarding the genuineness of the MDBA Plan consultation process and concerns regarding their ability to communicate in language that the community can easily understand. Given the community's very unsatisfactory experience with the Victorian and NSW governments when consulting on the River Red Gum Forests, there is a perception government consultations are only conducted to 'tick a box', with no intention to listen to or consider the communities concerns.

Many rural communities have suffered considerable upheaval over the last decade due to the introduction of water trading, unbundling water from land, prolonged drought, fluctuation in commodity prices and now the locust plague and threat of losing their water to environmental flows. For Victorian farmers, this has placed further stress and mental health concerns on individuals and families, who are already struggling due to the uncertainty surrounding their future.

Although rural Victorians have been facing difficult times, they have been working with government agencies to implement sustainable, long-term solutions to return water to the environment, through projects such as the Living Murray and NVIRP scheme. The Guide does not appear to recognise this effort, but only considers future planned savings, without having evaluated the success of any existing initiatives.

The Guide will impact adversely on a number of Australian government policies, including settlement plans and population targets. By reducing industry in rural Australia,

### **Name:**

Tim Mitchell,  
B Agric Sci ,  
M Agribus

### **Company:**

Stock Feed

**Town:** Cohuna

**Yrs in business:** 9



During the four year financial period from July 2005-June 2009, my business in Cohuna, MVP Feeds had a very stable production level varying approximately 6% through those years. Turnover varied according to (grain) input price. Employment was stable at five employees. In the financial year 2009/10 production fell 28% and staff reduced to 3 employees as a direct result of low water allocations from the drought. Turnover fell over 40%. We anticipate the "plan" to have the same impact except permanently. Unfortunately, another 28% fall will be unsustainable.

employment opportunities will be reduced as will opportunities for migrant settlement in rural areas. People will be forced to move to metropolitan centres for employment, placing increased environmental, social and infrastructure pressures on the regional and capital cities.

## Environmental Science

The methodology used to determine the environmental water requirements is unclear and merits more comprehensive explanation and clear justification. The Act requires the MDBA to use best practice science, or in the case where this is not available to use the precautionary principle. It is important that MDBA can demonstrate it has used best available science and this should include data at the local catchment level.

There has been no opportunity for peer review of the environmental science and monitoring. It needs to be closely scrutinised by all interested parties, including relevant State Departments and Catchment Management Authorities, local government and the community. The ability of community members and local government to challenge the detail of the science is restricted as resources and access to independent expertise is limited.

The science used also needs to consider the qualitative knowledge held by locals that could be vital to develop a system that works well at the local level.

**Name:** Cameron English  
**Company:** Mixed Farming  
**Town:** Lake Meran  
**Yrs in business:**  
Family has farmed the property for 120 yrs



Family settled in the area in the 1890s because of water security, but have successfully farmed here through drought and floods. Family have used surface water since arriving and implemented gravity irrigation at its inception. Today I am still working the family farm with a young family, water uncertainty changes the dynamics of the farm being mixed, but a lack of water has seen 90% of the farm become dryland and enterprises fail due to lack of water – is this to be our future – will I be able to support my wife and children – will I be able to pass the farm on – will I need my wife to return to work. All these questions. If I lose my water, many of these questions will be answered. My land values will decrease as without water it is very difficult to farm.

Many farmers who attended our community information sessions emphasised their strong environmental credentials, highlighting that to be able to farm sustainably into the future they need to protect the environment. Therefore, they are interested in helping to get the system right.

Of strong concern is the lack of research to measure the existing benefits to the river system of returning environmental flows from projects like the Living Murray.

The 3,000GL requirement for the environment does not take into account existing savings made by environmental projects recently or currently being implemented. This is giving a distorted picture of the total water savings expected from these regions and does not recognise the achievements of

those regions that are already trying to make a positive contribution back to the environment. The figures should include recent water saving initiatives that have made a contribution to improved environmental flows, to give a more holistic view of the impacts of water savings to the environment.

The optimised use of infrastructure to deliver improved environmental watering outcomes, eg the Gunbower Forest project, should also be factored in.



The Guide and Technical background documents do not provide enough detail on the environmental watering plan. It is difficult to determine the accuracy of the watering plan for the environmental sites, when it does not provide the detail to assess if the level of environmental flows is appropriate at a local level. This information should be provided at a minimum at the catchment level.

### **Practicalities of implementing the Plan**

The Guide has overlooked some essential parts to the implementation of the Plan. Government buybacks have had a “Swiss cheese” effect on existing irrigation infrastructure systems, with irrigation infrastructure running past blocks no longer being irrigated to reach irrigated land further down the supply line. The work currently being undertaken by NVIRP is looking to address this issue.

Without projects like this however, it leaves substantial unused irrigation infrastructure and the cost of maintenance has to be borne by the few irrigators that are left. This may then make what was a productive, sustainable farming property unviable, forcing farmers to become ‘willing sellers’, even though they may not wish to sell but do so through desperation.

## **Impacts of the MDBA Guide on Gannawarra**

### **Impact of the SDLs on the Gannawarra agricultural sector**

With the prolonged impact of the drought, and low water allocations since the 2002/03 season when allocations first dipped below 100% in Victoria, there has already seen a substantial change to the Gannawarra agricultural sector. A report conducted by the HMC Property Group<sup>5</sup> looked at the impact for Shires across the GMID. All Shires showed a dramatic decrease in the number of dairy farms between 2006 and 2010, with a 49.1% decrease in dairy farms in the Gannawarra Shire Council being the lowest reduction. However, this still equates to a loss of 179 dairy farms from the Gannawarra municipality over a four year period. With the improvement in conditions this year, a number of these dairy farms have recommenced dairying.

The report also indicates that across the GMID the indication is that there has been a 29.5% decrease in working dairies over the same 4 year period. During this same period, a major value-adding processor, Murray Goulburn, also closed its cheese making factory at Leitchville, the Shire’s largest manufacturer. This resulted in the direct loss of 80 jobs, most of which were Gannawarra Shire residents. This doesn’t include the numerous indirect jobs that have been lost, including workers who lost their jobs when a

**Name:** John Webb  
**Company:** Transport  
**Town:** Cohuna  
**Yrs in business:** 36



I am 61. My wife and I have worked hard together to build up our business over 36 years. Our small transport business now run with the help of our son was a flourishing business employing 15, turning over an annual gross turnover of \$2 million. In March this year the Murray Goulburn Factory closed due to lack of milk and the drought. We lost 54% of our work overnight. Seven people lost their jobs. If we lose 34% of water out of this area that will be the end of our business. Another seven families with no job and therefore no incomes coming back into the town.

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<sup>5</sup> HMC Property Group July 2010. *Changing land use in the Goulburn Murray Irrigation District 2006-2010: Where have all the dairies gone?*

local trucking business that carted to the Leitchville factory had to reduce its workforce (see Webb Transports story on the previous page).

The introduction of the new SDLs is likely to further impact on the agricultural sector and flow on industries. Council conducted a study on the Impact of sales of permanent water<sup>6</sup> and arranged for this work to be updated to assess the socio-economic impact of the proposed SDLs in the Basin Plan Guide on the Gannawarra Shire<sup>7</sup> (Appendix A).

The Marsden Jacobs Associates report<sup>8</sup> on the Goulburn Murray Irrigation District (GMID) indicates that all dairy product is processed in the GMID region. As a result, a substantial reduction in regional output from Gannawarra is likely to have significant flow on effects to the regional value added industries. This is highlighted in the RMCG report to assess the socio-economic impacts of the Basin Plan on Gannawarra<sup>9</sup> (Appendix A), which shows there would be strong negative impacts on the region with:

- the regional output reduced by between \$66.4 and \$132.7m pa
- the regional value added reduced by between \$15.5 to \$31.1m pa

### Impact on the Gannawarra community

The reduction in regional output and regional value adding will have significant flow on effects for the community. The greatest impacts come from the reduction in value of production from irrigated agriculture, as the impact on dryland is minimal even with climate change. The RMCG report<sup>10</sup> considers how this reduction will impact on employment within the community and is demonstrated in Table 2 (Appendix A, page 15).

**Table 2 Direct and indirect impacts on regional output (\$million per anum) and employment by 2029**

Scenario	Gannawarra Water use GL	Direct impact on output (\$million)	Total value added (\$million)	Total employment (FTE)	Total population
Base case 2030	212	207	74	1,598	11,297
Scenario 2 2030	141	161	58	1,240	10,409
Scenario 3 2030	71	114	43	881	9,531
<b>Change from 2010 base case</b>					
Scenario 2		-47	-16	-358	-888
Scenario 3		-94	-31	-716	-1,766

While the Basin Plan will not be implemented in Victoria until 2019, the Australian Government has indicated it will achieve the Plan targets mainly through continuation of buyback initiatives. Therefore, the modelled impacts are likely to occur over the next 9 years, not as a steady change over the 20 years of the modelling period or as a step change at 2019.

<sup>6</sup> RMCG February 2010. *Gannawarra Shire: Impacts of sales of permanent water entitlements and land use planning options for new dryland – Final Report.*

<sup>7</sup> RMCG November 2010. *Gannawarra Shire: Socio-economic impact of the Basin Plan – Final Report.*

<sup>8</sup> Marsden Jacob Associates May 2010. *Goulburn Murray community profile – Irrigation Region: Delivering the Basin Plan – Economic and social profiles and impact assessment in the Murray Darling Basin.*

<sup>9</sup> RMCG November 2010. *Gannawarra Shire: Socio-economic impact of the Basin Plan – Final Report.*

<sup>10</sup> As per previous

Currently there is 300GL available for Gannawarra. Based on an anticipated reduction of 100GL of water from Gannawarra (scenario 2), ie one third of water currently available, there will be a loss of 358 jobs. If we lose two-thirds of our water ie 200GL (scenario 3), it will double the loss of jobs to 716 in the Gannawarra region.

This will result in population decline of between 888 and 1,766, based on the economic multiplier of 2.48. With an existing population of around 11,000 this will have substantial impacts for the local community. The findings are substantiated by the Marsden Jacob report, which states that:

“As water availability falls beyond that provided for by irrigation modernisation (NVIRP) and efficiency programs and buy-backs, social impacts will become severe with displacement of some people, declining populations in rural towns, and decreasing ability by local government and non-government organisations to provide services to at-need rural communities”.

The Gannawarra Shire has already started to feel some of these effects. With the closure of the Leitchville Cheese making plant, the region has already lost 80 direct jobs, and even more in indirect employment. This has placed huge stress on the local community, which can lead to mental health issues. There is a grave concern regarding how much more stress can be placed on local communities without detrimental impacts on people’s mental health.

## **Our Ask – next steps**

While we recognise and support the intent to improve access to water for the environment there are a number of equally important elements and needs to be addressed in the Plan or in support of it:

- We strongly urge a balanced approach with equal consideration to social and economic impacts of any proposed changes on families and communities, so it is vital to conduct a thorough socio-economic impact assessment at the local level
- Better consultation and communication at a local level, using local councils as an interface with their communities, to better inform the community and minimise any further mistrust
- Clarity regarding the technical data and in particular the true quantum of environmental water genuinely needed and the detailed environmental outcomes to be addressed by this water in each catchment
- The plan must recognise that the proposed SDLs will have a permanent and irreversible impact on the agricultural sector in Gannawarra and therefore on our economy and community
- Maximise water related infrastructure improvements – on farm and off farm and for the efficient delivery of water – to maximise savings and minimise any loss of consumptive water
- Provide early and comprehensive financial and other support for alternative business ventures and related training that will assist in diversifying our economies
- Strengthen the social support services to cater for those in distress

**Gannawarra Shire Council**

**22 December 2010**

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**Appendix A– Gannawarra Shire: Socio-economic impact of the Basin Plan - Final Report**  
**November 2010, RMCG Consultants for Business, Communities & Environment**

**Gannawarra Shire**

**Socio-economic impact of the Basin Plan**

*Final Report*

**November 2010**



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# 1 Introduction

In 2010, RMCG undertook an analysis of the impact of sales of permanent water entitlements on the economy, employment and population of Gannawarra. In October 2010, the MDBA announced further changes to water availability in the Basin Guide. Gannawarra requested that RMCG update the economic modelling to include the water availability scenarios outlined in the Basin Guide.

The key steps undertaken to do this included:

- Translating the SDLs proposed in the Basin Guide into the net impacts at the local level to provide future water usage;
- Using the future water usage scenarios to calculate impacts on production from irrigated agriculture to provide input into a regional input-output model; and
- Undertaking econometric modeling to isolate the overall change (direct and indirect) in local/regional output, value added and employment under each scenario to 2030.

## 2 Water usage scenarios

The Basin Guide has set Sustainable Diversion Limits (SDLs) of between 3,000 GL to 4,000 GL. Table 2-1 outlines the reductions of 27% to 35% to water usage in the Victorian Murray, which includes the Torrumbarry Irrigation Area (TIA), as proposed in the Basin Guide.

**Table 2-1 Reductions in water usage in the Victorian Murray to achieve SDLs**

Description	3000 GL	4000 GL
Reduction required to meet SDL in Victorian Murray	442GL	592GL
Victorian Murray long term Current Diversion Limit	1,656GL	1,656GL
Percentage reduction in water usage (Not including NVIRP and buyback to date)	-27%	-36%
Percentage of long term water use remaining	73%	64%

### 2.1 Adjustment for NVIRP and Commonwealth buyback to date

The reduction in water usage to achieve the SDLs needs to be adjusted to account for water savings that will be achieved through NVIRP and entitlements already purchased through Commonwealth buyback programs. Table 2-2 shows that a 14% to 23% reduction in water usage in the Victorian Murray is required to achieve the SDLs once NVIRP and Commonwealth buyback to date have been considered.

**Table 2-2 Reduction in water usage in the Victorian Murray to achieve SDLs accounting for NVIRP and Commonwealth buyback to date**

Description	3000 GL	4000 GL
Volumetric reduction to achieve SDLs in Victorian Murray	442GL	592GL
NVIRP 1 and 2 water savings (Assumes 85 GL out of 175 GL savings for Commonwealth is Murray water)	357GL	507GL
Commonwealth buyback to date (Victorian Murray 133 GL <sup>11</sup> )	224GL	374GL
<b>Net reduction to achieve SDL<sup>12</sup></b>	<b>224GL</b>	<b>374GL</b>
Vic Murray long term Current Diversion (including losses)	1,656GL	1,656GL
Net percentage reduction in Victorian Murray water usage <sup>13</sup> to achieve SDLs	-14%	-23%

### 2.2 Adjustment for the Torrumbarry Irrigation Area having had more net trade out than other Victorian irrigation areas

The TIA as at June 2010 held around 25% of the high reliability water shares (HRWS)<sup>14</sup> in the Victorian Murray. Given the scale of permanent trade that has occurred in the past, it is

<sup>11</sup> <http://www.environment.gov.au/water/policy-programs/entitlement-purchasing/vicmurray.html> accessed 12/11/2010

<sup>12</sup> Assumes that Vic purchases offset Vic SDL and not NSW or SA Murray SDL requirements

<sup>13</sup> Assumes losses can also be captured and used to offset SDL. If not the 1,656 reduces to 1,352 GL and the % reduction is 17% for 3,000 GL and 28% for 4,000 GL

<sup>14</sup> 291,678 ML in Torrumbarry of HRWS G-MW annual report Appendix B4 for 30/6/2010. Murray Vic total HRWS is 1,182,291 ML Vic Water Register 14/7/2010. This is 25% in Torrumbarry.

considered optimistic that buyback of entitlements to achieve the SDLs in the TIA will be no higher 25%.

By way of illustration, the DSE report on water trade 2008 indicates that up to 2005/06, 75% of all net permanent trade out of the Victorian Murray irrigation districts was from the TIA (Figure 2-1). However, more recently the percentage net permanent trade from the TIA has dropped to around 60%, with more water share traded out of the Murray Valley Irrigation Area. For this modelling, it has been assumed that the percentage of SDL buyback from the TIA will be between 25% and 60%<sup>15</sup> of the 224 to 374 GL Victorian Murray usage outlined in Table 2-2.

This translates to a reduction of 56 to 224 GL in usage in the TIA (Table 2-3).

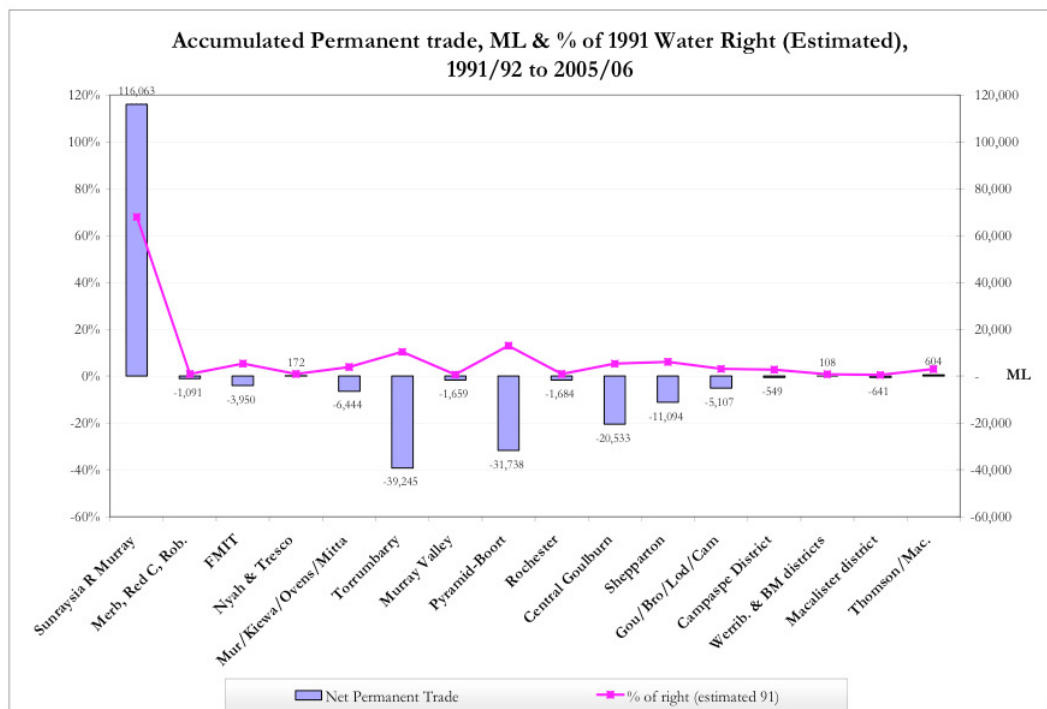


Figure 2-1 Cumulative permanent water trade in Victoria (1994/95 to 2005/06)

<sup>15</sup> Estimate for more recent trade %

**Table 2-3 Estimated water usage in the TIA under the Basin Guide<sup>16</sup>**

SDL Scenario	4000 GL		3000 GL	
	60%	25%	60%	25%
Proportion of Vic Murray buyback from TIA	60%	25%	60%	25%
Net reduction to achieve SDL	374	364	224	22
Buyback impact on TIA usage	- 224	- 93	-134	- 56
TIA HRWS as at 30/6/2010	292	292	292	292
Long term usage pre SDL assuming 124% <sup>16</sup> of HRWS to allow for LRWS and temporary trade	362	362	362	362
Remaining TIA usage within SDL	137	268	227	306

## 2.3 Impact of climate change

Reduction in water availability due to climate change is additional to reduction in water availability from implementation of the Basin Guide<sup>17</sup>. Reduction in water availability due to climate change are outlined in Table 2-4. These have been updated since the first report to include more recent climate change scenarios available in background reports to the Northern SWS. (Background Report 2<sup>18</sup>)

**Table 2-4 Change in average water allocation associated with climate change**

Entitlement	Climate change scenario	Average allocation derived from graphs	HRWS 291,678 <sup>19</sup> ML	LRWS 164,709 <sup>20</sup> ML
			Average allocation from HRWS (ML)	Average allocation from LRWS (ML)
Murray HRWS	Base case – long term average	99.3%	289,636	
	Scenario B – medium climate change	93.7%	273,302	
	Scenario D – severe climate change	84.3%	245,885	
Murray LRWS	Base case – long term average	59.5%		98,002
	Scenario B – medium climate change	36.0%		59,295
	Scenario D – severe climate change	18.8%		30,965

<sup>16</sup> Note the above table assumes LRWS (low reliability water share) is reduced in the same proportion as HRWS and that usage of HRWS allocation plus LRWS allocation and net temporary trade is equivalent to 124% of HRWS volume held. Note modelling from N. Vic. SWS suggests with Torrumbarry holdings of 292 GL HRWS and 165 GL LRWS there would be 388 GL available or 133% of HRWS (before climate change). However, usage would be expected to be below availability and 124% has been assumed. 124% is equivalent to an average 50% allocation of LRWS at 0.48 ML LRWS per HRWS, which is the ratio of LRWS issued at unbundling in 2007.

<sup>17</sup> On Page 34 the Basin Plan allowed for a 3% reduction in water availability due to climate change and the gap between the SDL and the CDL. This ignores the 3% and looks at the climate change impacts from the Northern Victoria Sustainable Water Strategy on long term water availability assuming there has been no reduction.

<sup>18</sup> page 2 background report to chapter 2 vic nsws

<sup>19</sup> G-MW Annual Report Page 90

<sup>20</sup> Based on 48% of HRWS held in Torrumbarry at time of unbundling in 2007 and assuming negligible net trade in LRWS

**Table 2-5 Change in water available for irrigation under climate change**

Climate change scenario	Water usage (ML)	Water usage reduction (ML)	Percentage reduction
Base case – long term average	387,638 <sup>21</sup>		
Scenario B – medium climate change	332,598	-55,041	-14%
Scenario D – severe climate change	276,850	-110,788	-29%

Therefore, the reduction in water availability due to climate change is estimated to be 14% for medium climate change and 29% for severe.

It is understood that these scenarios do not include the new reserve policy, which will affect the reliability of water in drought years. However, data is not yet available for this to be considered as part of this modelling.

## 2.4 Impacts of SDL and climate change

The combined impact on water use from climate change and the Basin Guide in the TIA is outlined in Table 2-6.

**Table 2-6 Water use after climate change and the Basin Guide SDLs**

Scenario	Proportion of buyback in TIA	Water use (GL)		
		Base case Nil climate change	Scenario B Medium climate change	Scenario D Severe climate change
Base Case – no Basin Guide	Nil	362	310	258
3,000 GL SDL	25%	306	262	218
	60%	227	195	162
4,000 GL SDL	25%	268	230	192
	60%	137	118	98

## 2.5 Other water trade impacts

The TIA has been a net seller of HRWS, generally to horticulture in the Mallee Region. The rate has been around 5 GL/y. Therefore, the total water use outlined in Table 2-6 may be further reduced by other longer-term water trade impacts. In earlier work these were tested at 3, 5 and 7 GL net trade out per year of HRWS from years 5 to 20 totalling reductions of 45 GL, 75 GL and 105 GL at year 20.

The horticulture development has slowed enormously since 2008 and so these reductions may not continue at such a high rate. For this modelling, 50 GL<sup>22</sup> net trade out has been assumed as a *reasonable* estimate of future permanent trade. This is equivalent to a reduction in water use of 62 GL (assuming LRWS is lost at same rate and the relationship of 124% holds).

<sup>21</sup> This availability is 133% of HRWS and is different to usage of 124% 362 GL as not all water available is used or carried over for use, some may be traded temporarily out of Torrumbarry.

<sup>22</sup> Assumed figures based on reduced sales

## 2.6 Summary of water availability

Water usage for irrigation at 2030 in the TIA for each of the SDL and climate change scenarios is summarised in Table 2-7.

**Table 2-7 Summary of impacts of climate change, Basin Guide and water trade on water use for irrigation in the TIA**

Scenario	Proportion of buyback in TIA	Estimated water use in 2030 (GL)		
		Base case Nil climate change	Scenario B medium climate change	Scenario D severe climate change
Base Case	nil	300 <sup>23</sup>	248	196
3,000 GL SDL	25%	244	200	156
	60%	165	133	100
4,000 GL SDL	25%	206	168	130
	60%	75	56	36

There is a lot of uncertainty associated with these numbers due to the assumptions that have been made. For the purposes of estimating economic impacts the, following water usage amounts were used to estimate gross value of agricultural production. This will provide an indication of the scale and range of impacts on the economy of Gannawarra.

These are:-

- 300 GL usage, shown in green, representing 2010 conditions;
- 200 GL usage, shown in grey, representing:
  - Severe climate change with no SDL;
  - **Or** medium climate change with 3,000 GL scenario at 25% buyback for Torrumbarry;
  - **Or** nil climate change with 4,000 GL SDL with 25% buyback in Torrumbarry; and
- 100 GL usage, shown in red, representing 3,000 GL SDL at 60% buyback for Torrumbarry with severe climate change.

<sup>23</sup> Goulburn Murray Water

### 3 Impacts on value of agricultural production

#### 3.1 Analysis of the Shire's Gross value of Agricultural Production

Gross value of agricultural production and area of agriculture ABS data for 2001 and 2006 were used to estimate the value of production generated per megalitre of water used (Table 3-1,

Table 3-2). Since 2006, the value of production per ML has risen due to intensification of dairying and more reliance on bought in feeds. It is estimated that this is now higher than the \$542/ML estimated in

Table 3-2. There are also ongoing improvements in productivity and a value of \$715/ML for irrigation and \$200/ha for dryland has been assumed for the future 20 year scenarios.

**Table 3-1 Area of agriculture and gross value of production (2001) used to estimate value of production per unit land area and per megalitre of water used in Gannawarra**

	Land area (ha)	Gross value of production (\$million)	Value of production per land area (\$/ha)	Value of production per ML of water used (\$/ML)
Total Irrigated Area (2001) 563,435 ML used all TIA 397,222 ML used Gannawarra	101,661	\$183	\$1,800	\$461
Total dryland area (2001)	233,647	\$40	\$171	
Intensive animal industries	Not available	\$25		
<b>Total Agricultural Area</b>	<b>335,308</b>	<b>\$248</b>	<b>\$740</b>	

**Table 3-2 Area of agriculture and gross value of production (2006) used to estimate value of production per unit land area and per megalitre of water used in Gannawarra**

	Land area (ha)	Gross value of production (\$million)	Value of production per land area (\$/ha)	Value of production per ML of water used (\$/ML)
Total Irrigated Area (2006) 468,470 ML used all TIA 330,271 ML used Gannawarra	84,526	\$179	\$2,118	\$542
Total dryland area (2006)	250,782	\$37	\$148	
Intensive animal industries	Not available	\$10		
<b>Total Agricultural Area</b>	<b>335,308</b>	<b>\$226</b>	<b>\$674</b>	

### 3.2 Estimates of gross value of production for each water availability scenario

For each of the water availability scenarios, the gross value of production has been estimated using \$715/ML for irrigation and \$200/ha for dryland. No change has been assumed in the value of intensive animal production and an average value of production of \$17.5 million was used. Note that the area of production associated with intensive animal production is not recorded by the ABS.

#### 3.2.1 300 GL water available

300 GL of water usage in the TIA, equates to approximately 212 GL water usage in Gannawarra Shire. The gross value of agricultural production in Gannawarra, based on using 212 GL is estimated to be \$225 million (Table 3-3).

**Table 3-3 Gross value of agricultural production, 300 GL water available in TIA**

Agricultural land use	Land Area (ha)	Estimated gross value of agricultural production (\$million)	Value of production per land area (\$/ha)	Value of production per ML of water used (\$/ML)
Total irrigated area	54,129	\$151	\$2,794	\$715
Total dryland area 2009	281,179	\$56	\$200	
Intensive animal industries	Not available	\$18		
Total agricultural area	335,308	<b>\$225</b>	\$671	

#### 3.2.2 200 GL water available

200 GL of water usage in the TIA equates to approximately 141 GL of water usage in Gannawarra Shire. The gross value of production in Gannawarra, based on using 141 GL is estimated to be \$178 million (Table 3-4).

**Table 3-4 Gross value of agricultural production, 200 GL water available in TIA**

Agricultural land use	ha	Estimated gross value of agricultural production (\$million)	Value of production per land area (\$/ha)	Value of production per ML of water used (\$/ML)
Total Irrigated area	36,086	\$101	\$2,794	\$715
Total dryland area 2009	299,222	\$60	\$200	
Intensive animal industries	Not available	\$18		
Total Agricultural Area	335,308	<b>\$178</b>	\$531	

#### 3.2.3 100 GL water available

100 GL of water usage in the TIA, equates to approximately 71 GL of water usage Gannawarra Shire. The gross value of agricultural production in Gannawarra, based on using 71 GL is estimated to be \$131 million (Table 3-5).



**Table 3-5 Gross value of agricultural production, 100 GL water available in TIA**

Agricultural land use	ha	Estimated gross value of agricultural production (\$million)	Value of production per land area (\$/ha)	Value of production per ML of water used (\$/ML)
Total Irrigated area	18,043	\$50	\$2,794	\$715
Total dryland area 2009	317,265	\$63	\$200	
Intensive animal industries	Not available	\$18		
Total Agricultural Area	335,308	<b>\$138</b>	\$392	

### 3.3 Summary of impacts on gross value of production

The impacts on gross value of production are summarised in Table 3-6. The reality is that this would be the **maximum economic impact** for these usage figures, as the water for the SDL will be acquired through a voluntary buyback. Buyback tends to reduce economic impacts, as water used to produce lower value commodities is generally sold in preference to the water used for higher value production. This means that the average gross income per ML for the usage following buyback would be higher than the \$715/ML average assumed in the modelling. Therefore these figures indicate the range of maximum economic impact. The reality may be somewhere in between.

**Table 3-6 Impacts of changed usage on gross value of production by 2030**

TIA water usage	Gross value of production in Gannawarra (\$million)	Reduction in Gross value of production from 2010 (\$million)
Scenario 1 - 300 GL	\$225	n/a
Scenario 2 - 200 GL	\$178	-\$47
Scenario 3 - 100 GL	\$131	-\$94

Note that impacts are very sensitive to value of production per ML. The following table illustrates this, with the overall economic impacts halved for the three scenarios if the value of production per ML increases.

TIA water usage	Value of irrigated production (\$/ML)	Gross value of production in Gannawarra (\$million)	Reduction in Gross value of production from 2010 (\$million)
Scenario 1 - 300 GL	\$715	\$225	n/a
Scenario 2 - 200 GL	\$880	\$201	-\$24
Scenario 3 - 100 GL	\$1,400	\$180	-\$45

## 4 Economic impacts

SGS Planning and Economics undertook the economic modelling. The model uses a methodology to generate customised regional input-output tables to measure the upstream (supplier) and downstream (buyer) linkages in a regional economy. By doing this a detailed picture of the industry dynamics in a region can be drawn.

A key input to this is the national input-output (IO) table published by the Australian Bureau of Statistics. It estimates the flows to and from each industry for Australia as a whole. That is, it shows, in monetary terms, the flow of goods and services from each industry to all intermediate industries, as well as those flows that are from consumption spending by different sectors such as households, government, fixed capital expenditure, etc. It also gives details of inputs into each industry such as wages and salaries, producer surpluses, indirect taxes, exports and imports. In estimating these flows to and from each industry, the national IO table gives a detailed “picture” of the entire economic system.

SGS uses the latest available localised data to scale down the national IO table, first to the host state economy, then to the local economy in question. The results of this process are a set of industry specific multipliers that estimate how \$1 million of turnover in a specific industry flows through to total regional:

- Output (or income or turnover)
- Value added (or contribution to Gross Regional Product (GRP), which is basically regional output less the value of imported product embodied in regional output)
- Full time equivalent employment levels

The SGS model traces industry sectors at a detailed level of classification, covering 109 industry sectors. In this study, the combination of industries used to simulate irrigated and dryland agriculture are as follows:

- Irrigated agriculture includes dairy cattle and horticulture industries
- Dryland farming includes grains, sheep, beef cattle and all other agriculture

The multipliers generated for the relevant industry sectors in Gannawarra are summarised in Table 4-1. They indicate that, for example, the Dairy Cattle industry in Gannawarra has an economic output multiplier of 1.41. This implies that for every \$100 of output produced by Dairy Cattle an additional \$41 is induced in the Gannawarra economy to support this and as a result of this production. Similarly, for employment, every 100 jobs in the Dairy Cattle sector supports 29 jobs in the Gannawarra economy.

Note that the impact of intensive livestock farming has not been modelled, as its contribution to the Gannawarra economy is stable throughout each of the three scenarios.

**Table 4-1 Generated Economic Activity Multipliers (SGS)\***

	Industry Sector	Output Multipliers	Value Added Multipliers	Employment Multipliers
Irrigated Agriculture	Dairy cattle	1.41	1.26	1.29
	Horticulture	1.46	1.22	1.23
Dryland Agriculture	Sheep	1.43	1.27	1.31
	Grains	1.65	1.28	1.52
	Beef cattle	1.46	1.26	1.26
	Other agriculture	1.46	1.22	1.23

\* Note that the multipliers estimated are broadly in line with those reported by the CRC for Irrigation Futures (2005). For instance, in Goulburn-Broken the employment multipliers estimated were: Cereal crops 1.5; Dairy 1.9; Fruit 1.7; Grapes 1.2; Grazing 2.4; Hay/seed 1.5; Other horticulture 1.2; and Tomatoes (proc) 1.2.

## 4.1 Key industry linkages

Changes to irrigated agriculture in Gannawarra will impact different industries at varying rates. The analysis of the industries that are most affected highlights the following top ten (SGS Planning and Economics):

1. Wholesale trade
2. Retail trade
3. Other food products
4. Road transport
5. Other property services
6. Banking
7. Other agriculture
8. Accommodation, cafes and restaurants
9. Services to agriculture
10. Retail mechanical repairs

## 4.2 Estimated impacts

The economic impacts of the progressive shift towards dryland farming in the Gannawarra economy, i.e. in moving from Scenario 1 to Scenario 2 and 3 respectively, are shown in the following tables. These are modelled assuming the value of production per ML of water used remains at \$715/ML; i.e. maximum economic impact as outlined in Section 3.3.

**Table 4-2 Direct and In-direct Impacts on regional output (in \$ million p.a.) by 2030**

	Direct impact on output (\$million)	Flow on impact on output (\$million)	Total output (\$million)
Scenario 1 (Base Case)	207	94	302
Scenario 2	161	75	235
Scenario 3	114	55	167
<b>Change from Base Case</b>			
Scenario 2	-46.8	-19.6	-66.4
Scenario 3	-93.6	-39.1	-132.7

**Table 4-3 Direct and In-direct impacts on regional value added (in \$ million p.a.) by 2030**

	Direct impact on value added (\$million)	Flow on impact on value added (\$million)	Total value added (\$million)
Scenario 1 (Base Case)	59	15	74
Scenario 2	46	12	58
Scenario 3	34	9	43
<b>Change from Base Case</b>			
Scenario 2	-12.5	-3.1	-15.6
Scenario 3	-24.9	-6.2	-31.1

**Table 4-4 Direct and in-direct impacts on regional employment (EFT jobs)**

	Direct impact on employment (FTE)	Flow on impact on employment (FTE)	Total employment (FTE)
Scenario 1 (Base Case)	1,235	363	1,598
Scenario 2	951	290	1,240
Scenario 3	666	215	881
<b>Change from Base Case</b>			
Scenario 2	-284	-74	-358
Scenario 3	-569	-147	-716

## 5 Population impacts

### 5.1 Existing distribution

RMCG's previous report highlights that development in Gannawarra is clearly focussed in Kerang, with Cohuna, Koondrook and Quambatook all comprising a residential base outweighed by the balance of the rural population. All but Koondrook have reduced in size over the past few decades, consistent with the trend across regional Victoria of large regional centres growing and most other towns declining.

**Table 5-1 Towns in Gannawarra 1981 & 2006**

Town	Population		Comments
	1981	2006	
Kerang	4,049	3,671	The population was stable in the 1980s, but has declined by almost 10% since 1991.
Cohuna	2,178	1,816	The population has declined steadily since 1981, and is particularly evident in the large decreases in the younger age groups and families with children. Decline in household size has been quite rapid, from 3.0 persons in 1981, to 2.1 persons in 2006.
Rural balance		2,572	Population declined by 1.1% between 2001 and 2006.
Koondrook	720	759	Modest population growth only.
Quambatook	359	232	

To the extent that the employment losses estimated in the previous section lead to population declines will obviously vary across Gannawarra. This will reflect the dependency of each town on irrigated horticulture and the proximity of substitute or competitor employment and residential locations.

Undoubtedly the loss of employment estimated is likely to be associated with some population losses. However it is very difficult to estimate if these associated population losses are likely to lead or indeed, exacerbate, a spiral of decline.

### 5.2 Extending the employment estimates

To provide an estimation of the population losses likely to be associated with the employment losses generated in Section 3.4, SGS has matched recent employment to population rates in Gannawarra. The analysis in Table 5-2 indicates that a population of 2.48 supports each job in Gannawarra.

**Table 5-2 Jobs to Employment Ratio, 2001-2006**

	2001	2006
Total employment	4,861	4,317
Total population	11,378	11,297
Job to population ratio	2.34	2.62
Average	<b>2.48</b>	

If it is assumed that this relationship holds in future, the change from Scenario 1 to 2 and 3 respectively can be estimated. Table 5-3 summarises this analysis.

In short, it is estimated that by 2030 moving from Scenario 1 to:

- Scenario 2 would be associated with an overall decline in population of 888
- Scenario 3 would be associated with an overall decline in population of 1,776

**Table 5-3 Population Estimates for 2029 Scenarios**

	<b>Ratio</b>	<b>Scenario 2</b>	<b>Scenario 3</b>
Employment Loss		-358	-716
Population	2.48	-888	-1,776

## 6 Summary of socio-economic impacts

**Error! Reference source not found.** summarises the economic, and employment impacts of the Basin Guide and climate change in Gannawarra.

Things to note:

- In using the model output, we recommend that the range of the impacts be quoted, as there are many variables that will impact on the true outcome.
- The greatest impacts come from the reduction in value of production from irrigated agriculture. Impact on dryland is minimal even with climate change.
- While the Basin Plan will not be implemented in Victoria in 2019, the Australian Government has indicated that it will achieve the Plan targets mainly through continuation of buyback initiatives. Therefore, the modelled impacts are likely to occur over the next 9 years, not as a steady change over the 20 years of the modelling period or as a step change at 2019.

**Table 6-1 Direct and indirect impacts on regional output (\$million per anum) and employment by 2029**

Scenario	Gannawarra Water use GL	Direct impact on output (\$million)	Total value added (\$million)	Total employment (FTE)	Total population
Base case 2030	212	207	74	1,598	11,297
Scenario 2 2030	141	161	58	1,240	10,409
Scenario 3 2030	71	114	43	881	9,531
<b>Change from 2010 base case</b>					
Scenario 2		-47	-16	-358	-888
Scenario 3		-94	-31	-716	-1,766

## Comparison with previous modelling findings

The table below summarises the scenarios modelled and reported in the February 2010 report and from this work.

Things to note:

- Since the modelling was undertaken in Feb 2010, the estimates of Base Case water usage has declined further. The base case in the November 2010 model is for 2010 conditions, no climate change, no SDL, with water trade out (62 GL) for the year 2030 so that in comparing the two model outputs, the starting points are not the same:-
  - (387 GL in Feb 2010 for all Torrumbarry for 2009 base case with 273 GL use in Gannawarra; compared to
  - 300 GL for all Torrumbarry 2030 base case and 212 GL use in Gannawarra for Nov 2010)
- The base case in February 2010 had a water use of 387 GL in Torrumbarry for year 2009 conditions (under normal climate); this has reduced to an estimated 362 GL for 2010 due to sale of water shares out of Torrumbarry from 337 GL HRWS to 292 GL HRWS.

### Direct and indirect impacts on regional output (\$million per anum) and employment by 2029

Model	Scenario	Ganna warra Water use GL	Direct impact on output		Total value added		Total employment	
			Irrigation	Dryland	Irrigation	Dryland	Irrigation	Dryland
2010 February modelling	Base case 2009	273	195	53	66	21	1,159	439
	Scenario 1 2029	106	76	62	26	25	452	509
	<b>Change from 2009 base case</b>							
	Scenario 1 2029			-110		-37		-636

			Irrigation	Dryland	Irrigation	Dryland	Irrigation	Dryland	
November 2010 modelling	Base case 2030	212	151	56	51	23	1,159	439	
	Scenario 2 2030	141	101	60	34	24	773	467	
	Scenario 3 2030	71	50	63	17	26	386	495	
	<b>Change from 2010 base case</b>								
	Scenario 2			-46.8		-16		-358	
	Scenario 3			-93.6		-31		-716	



# Gannawarra Shire

## IMPACTS OF SALES OF PERMANENT WATER ENTITLEMENTS and LAND USE PLANNING OPTIONS FOR NEW DRYLAND





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## EXECUTIVE SUMMARY

### Introduction

Since the 1990s, the irrigation water sector in Victoria has undergone significant reform with the unbundling or separation of water entitlements from land and the introduction of a water market enabling both permanent and temporary trade in water. A key principle underpinning this reform is enabling water to move to its highest value use.

As a result of these reforms, there has been significant water trade, particularly in northern Victoria. Broadly, water has moved from lower value production systems, such as mixed cropping and grazing and less productive land to higher value production systems such as horticulture and dairy and land with greater productive potential.

There has been significant permanent and temporary water trade in Gannawarra Shire. RM Consulting Group was engaged by the Shire, with support from the Department of Planning and Community Development Rural Land Use Planning Project to examine the social and economic impacts resulting from the sale of permanent water entitlements and explore land use planning options across the Shire to support productive and sustainable use of the new dryland. Additional funding from the North Central Catchment Management Authority enabled the detailed modelling of the socio-economic impacts of permanent water sales.

### Project objectives

The objectives of the study are to:

- Understand the opportunities and challenges of changing land and water use in Gannawarra Shire.
- Understand the social and economic implications and consequences of the (permanent and temporary) sale of irrigation water from farms within the Shire.
- Review land use planning options to support the productive and sustainable use of rural land, particularly in areas impacted by the sale of water entitlements.
- Provide land use planning policy advice to Gannawarra Shire to manage the impacts of the sale of water entitlements out of the Shire.
- Serve as a pilot study of land use planning approaches and options in conjunction with the New Dryland Options for the Loddon Campaspe Irrigation Region Project, funded by Caring For Our Country through the North Central Catchment Management Authority.

### Gannawarra Shire

Gannawarra Shire is located in northern Victoria on the Murray River with Kerang the main service centre. The local and regional economy and employment is underpinned by agriculture, particularly dairy and associated manufacturing and service industries. Like other regional communities, Gannawarra has an ageing and declining population. The region has a semi-arid climate and the availability of irrigation water markedly increases the productive capacity of the land. The most productive soils in the Shire are associated with the Gunbower Creek and more elevated areas on the floodplain such as the main channel west of Leitchville and the sandy rises and lunettes west of Kerang.

Goulburn Murray Water (GMW) manages and supplies irrigation water in Gannawarra. A large proportion of the Torrumbarry Irrigation Area (TIA) and a small portion of the Pyramid Boort Irrigation Area are located within the Gannawarra Shire. Since 1995, there has been a total of 74GL of High Reliability Water Shares permanently traded out of the TIA to 2007/08. The trade of permanent water out of the TIA has been offset to some extent by significant trade in temporary water into the district, averaging 31GL/year in the six years to 2005/06. Since then there has been little net trade back into the TIA. In addition, overall water use has declined from around 600GL/year to around 387GL/year, with most of this decline occurring since 2001/02.

### **Planning policy context**

The Gannawarra Planning Scheme clearly identifies that the current focus for the rural areas of the shire is for agricultural use. The shire includes productive and valuable agricultural land, both irrigated and dryland, which is to be protected for farming as well as supporting alternative agricultural enterprises such as intensive animal industries.

Rural living has been identified as playing an important role in attracting new residents to the Shire. Consistent with State policy, and as provided for in Council's existing strategy (Urban and Rural Strategy Plan), it is important that such development is located close to, and builds upon, existing towns and settlements to enhance their viability and ensure sustainable servicing costs.

### **What is driving change in water use?**

Introduction of water trade, unprecedented dry conditions, and Federal and State Government programs to secure water for the environment, industry and population has had a dramatic impact on the irrigation water sector and to on-farm management of water. The impacts of these drivers on farm businesses have been further exacerbated by low commodity prices and high cost of temporary water. Further trade into and out of the TIA will be influenced by:

- Further adjustment of the cap on permanent water trade, currently set at 4% (lifted from 2% in 2006)
- Demand from other irrigation areas and urban centres
- Federal government buy-back
- Increased water scarcity due to climate change
- Increases in water shares for irrigators arising from water savings from the Northern Victoria Irrigation Renewal Project.

### **Future water use scenarios**

The amount of irrigation water available for irrigation in the future, will be influenced by:

- Federal buy-back of water – estimated at 25 GL/annum for the next five years for the TIA (based on Commonwealth water purchase target of 45GL of Murray HRWS with 25GL below the Barmah Choke<sup>1</sup>)
- Water trade to other irrigation districts – the long term trend has been 5GL/year (however has been as high as 13.5 GL in 2007/08 and 15.7 GL in 2008/09 due to the drought).

---

<sup>1</sup> <http://www.environment.gov.au/water/policy-programs/entitlement-purchasing/2008-09.html> accessed 30/7/09

- Water availability under climate change – the medium climate change scenario in the Northern Victoria Sustainable Water Strategy (DSE 2008) forecasts reduced water availability by 11% by 2030 with forecasts a of 5% increase and 20% decrease by 2030 under low and high climate change scenarios respectively.
- Upgrade and modernisation of the irrigation network – this will bring improved efficiencies on-farm and reduce expected rate of water traded to other districts from 5 GL per annum to 2 GL per annum.

Three 20-year climate scenarios for the TIA were used to model future water use. 387 GL long-term cap equivalent water use for 2008/09 was used as a starting point. These scenarios included:

Climate Scenario 1: **No climate change impacts** + Federal buy back of water + continued water trade to other irrigation districts + efficiency improvements from NVIRP

Climate Scenario 2: **Moderate climate change impacts** + Federal buy back of water + continued water trade to other irrigation districts + efficiency improvements from NVIRP

Climate Scenario 3: **Continuation of low inflows of last 10 years** + Federal buy back of water + continued water trade to other irrigation districts + efficiency improvements from NVIRP.

Based on these three scenarios, water use in TIA is expected to reduce to between 38% and 21% of water use in the late 1990s or to somewhere between 120 and 220 GL per annum. A return to 'normal' conditions would still see water use reduce to the upper end of this range.

### **Future agricultural output and extent of irrigation**

To assess the social and economic impacts of changed water use in Gannawarra, it was necessary to estimate the change in value of production in agriculture. The future extent of irrigation and the value of agricultural production were calculated from the base case or current situation and a future Gannawarra water use scenario of 107 GL per annum (equivalent to 150 GL in the TIA). Based on these assumptions, the gross value of production is expected to fall by between 30% to 40% and the irrigation area reduced by 60% to around 30,000ha. (NB this assumes continuation of current land uses and does not consider new opportunities or a change to production of higher value commodities.)

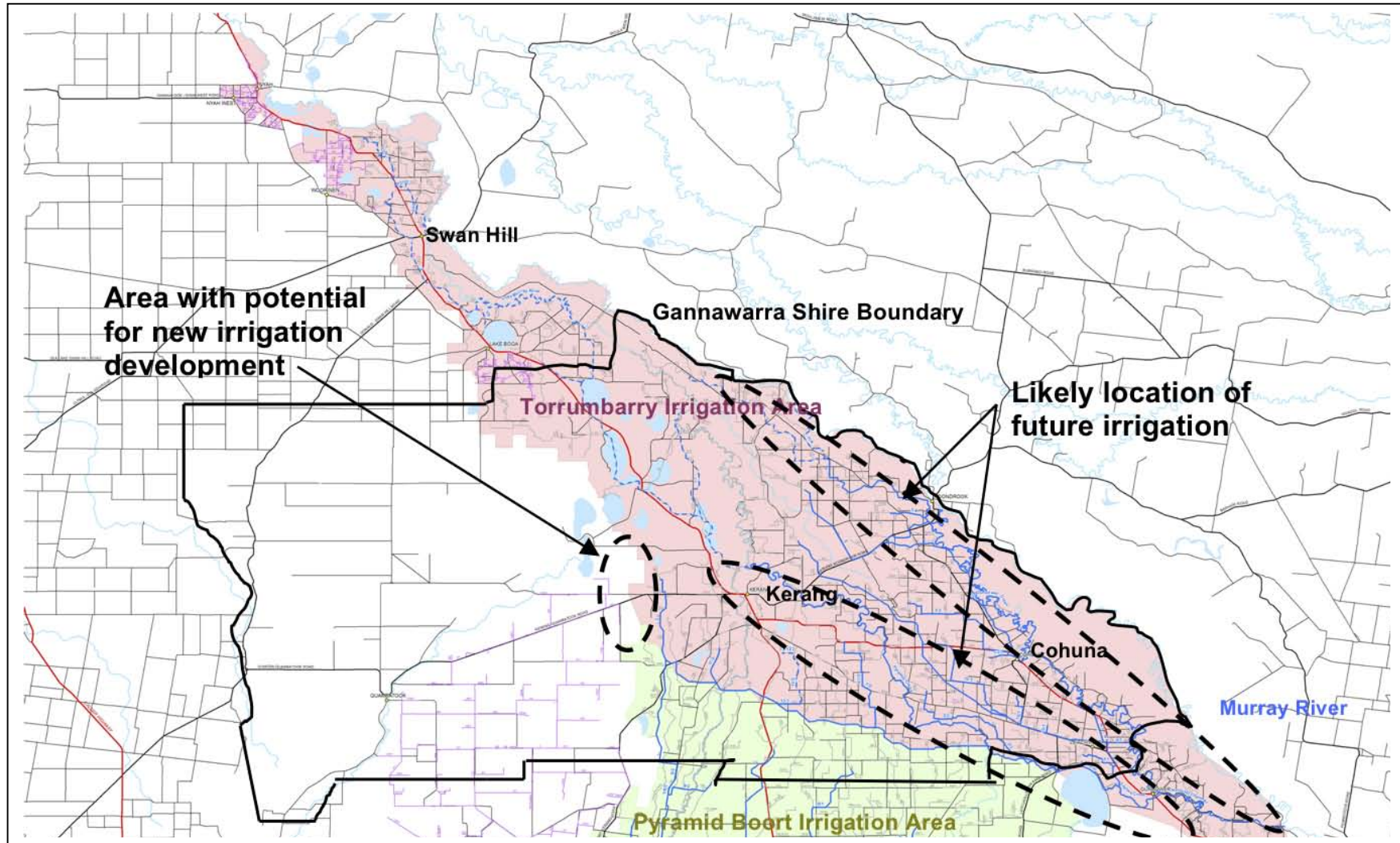
The location of irrigated agriculture in the future, the irrigation footprint, will evolve over time. While personal preference will still decide farm location it will be influenced by:

- Targeted buy-back of entitlement from properties along irrigation spurs. This approach is being encouraged via the Federal buy-back program to target water purchases to "groups of willing sellers" and reduce impacts on the wider system.
- Scattered sale of entitlement from across the area
- Proximity to the 'backbone' or major supply channels defined by NVIRP will have a major influence on the location of irrigation in the future, with the cost of connection to the system and transport of water from the backbone borne by the landholder.
- Soil type and the capability of the soil to produce high value crops and maximise return per ML of water used.



Based on these considerations, a future irrigation footprint possible in Gannawarra is suggested in Figure 1-1.

Figure 1-1 Possible future irrigation footprint in Gannawarra



## Alternative land use options

Alternative agricultural uses for new dryland farmland in Gannawarra are limited to mainly broadacre cropping and grazing and intensive animal production, due to the climate and soil types. Other land use options such as tourism, carbon sequestration and native vegetation offsets are unlikely to be viable as a sole enterprise but could complement agricultural land use.

The area is suited to renewable energy generation, particularly solar, and this may become a viable land use and could complement agricultural land use or be a stand-alone enterprise. However, the timing and scale of a local solar industry will depend on expansion of Renewable Energy Targets and ultimately the price paid for electricity generated from solar sources.

There are some opportunities for boutique agriculture on irrigated land around townships.

## Socio economic impacts of reduced water use in Gannawarra

Conversion of irrigated farms to dryland will have impacts at the farm, local and regional level. There are a few productive dryland uses including agriculture, renewable energy and production for carbon markets. These all require large property sizes e.g. for dryland grazing and cropping over 2,500ha. Transition to alternative dryland uses is likely to occur in the medium to long term with investment from outside the region. It will be important that planning policy responds to these productive uses and not only to shorter-term structural adjustment issues.

Reduced water use in Gannawarra will impact on local and regional output with associated declines in employment and population. The results of input output modelling indicates that by 2029, moving from the Base Case (2009) to:

- Future Water Use Scenario 1 would be associated with an overall decline in regional output of \$157 M annually, regional value added of \$37 M annually and regional employment of 636 jobs.
- Future Water Use Scenario 2 would be associated with an overall decline in regional output of \$113 M annually, regional value added of \$27 M annually and regional employment of 456 jobs.

While a reduction in water use in Gannawarra will have significant impacts on the regional economy, the modelling does demonstrate that within a reduced water use regime, there are opportunities to reduce the socio-economic impacts by increasing productivity per megalitre of water used within the irrigated agriculture sector. This can be achieved through adoption of more efficient irrigation systems as proposed under the upgrade and modernisation of the irrigation infrastructure. It is critical therefore that planning policy focus on supporting a more efficient irrigation sector, particularly in the 5km zone either side of the irrigation backbone.

## Structural adjustment

Gannawarra has experienced economic decline associated with low water availability. Current and proposed changes to water policy and climate change mean that a return to a pre-drought economy is unlikely without significant new development or emergence of a new industry. As a result the municipality is experiencing significant structural adjustment and it is likely that this will continue.

The planning policy recommendations outlined in this report are focused on strong support for irrigated agriculture. Gannawarra's strength now and into the foreseeable future will be in the dairy industry. The recommendations signal to the wider dairy industry, the water sector and agribusiness

that Gannawarra is committed to supporting investment in dairy and making Gannawarra an attractive area for ongoing investment in irrigated agriculture. However, further assistance is required to support the Gannawarra community.

A strategy to address adjustment should focus on measures to facilitate growth of competitive industries, investment in public services and facilities to compensate for a decline in these activities and avoid short-term measures that will artificially prop up the economy.

Gannawarra is not the only municipality facing reduced water use, a declining economy and population. Gannawarra's neighbours, Loddon in Victoria and Wakool in New South Wales, are both in similar situations. Reduced water availability is also impacting in irrigation districts and local economies across the Murray Darling Basin including the northern Victorian municipalities of Mildura Moira, Campaspe, Swan Hill. There is an opportunity for Gannawarra to form strategic partnerships with other municipalities to build a strong case for State and Federal Government support for assistance during this period of significant structural adjustment.

### **Planning policy recommendations**

A suite of planning policy recommendations are proposed that seek to address the changed land use circumstances brought about by reduced water use. While the planning scheme alone cannot drive economic development or population growth, the planning policy should seek to:

- Maximise Gannawarra's competitive advantages:
  - Access to modernised irrigation network
  - Road and rail infrastructure
  - Environmental assets including Ramsar wetlands, lakes and Murray River
  - Attractive residential options that are in a commutable distance to regional centres such as Swan Hill and Echuca.
  - High solar access
  - Large properties which can provide buffers for intensive animal industries
- Maximise Gannawarra's economic strength and minimise impediments to growth
- Focus on the irrigated agriculture sector, particularly dairy, but also horticultural opportunities and intensive animal production
- Plan for the long term and avoid policy that responds only to short term structural adjustment pressures at the expense of agriculture in the future.

The key outcome that Council is seeking from its rural land is ongoing economic viability. The land use planning framework recommended in this report aims to take advantage of the attributes of the Shire and plan for land uses that can generate jobs and income, and support residents remaining in the Shire.

The land use planning framework and recommendations for changes to the Gannawarra Planning Scheme are based on the following objectives:

- To enhance economic development, in particular job creation in the Shire
- To retain population
- To retain services

- To build on strengths and assets of the Shire
- To minimise restrictions on development and maximise flexibility
- To support innovation and growth

### **Irrigation areas - Farming Zone 1**

The purpose of the irrigation areas is to maximise the potential for irrigated agriculture and the returns from the available water. This outcome will be supported by retaining large lots and minimising dwellings and other land uses not compatible with irrigated agriculture. Dwellings have the potential to restrict agricultural practices through complaints about amenity impacts.

It is recommended that:

- These areas remain zoned Farming
- Local planning policy be amended to:
  - Discourage the creation of new lots, including house lot excisions
  - Discourage the development of new dwellings
  - Discouraged non-soil based land uses
- The minimum subdivision size is increased from 20ha to 40ha in the schedule to the Farming Zone.

### **New dryland – Farming Zone 2**

The new dryland is the land that was previously irrigated but no longer has access to water or the irrigation network. The potential and suitability of these areas for agriculture or other land uses is dependant on distance from existing population centres, amenity, development density, access to services, infrastructure and water.

Those areas that are close to existing towns, retain some access to water, contain existing dwellings and are of a relatively high density of development have the potential for a vibrant mix of traditional agriculture and boutique and niche operations.

It is recommended that:

- These areas remain zoned Farming
- Existing subdivision controls be retained
- Local planning policy be amended to:
  - Support dwellings where they are required to promote an agricultural use of the land.
  - Support house lot excisions where consolidation of the balance of the property is an outcome, and there is no risk to the agricultural use of the surrounding land.
  - Support re subdivisions where a more productive property is the outcome.

### **New dryland – Farming Zone 3**

Those areas that are isolated from existing settlements and currently contain few dwellings have the potential for traditional cropping and grazing activities, intensive animal activities, renewable energy

developments and timber plantations. The isolation and low density of development in these areas is an opportunity for agricultural growth, and developments such as intensive animal industries and renewable energy as these uses have buffer requirements and amenity risks.

It is recommended that:

- These areas remain zoned Farming
- The minimum subdivision size be increased from 40ha to 100ha
- Local planning policy be amended to:
  - Discourage the creation of new lots;
  - Support house lot excisions where consolidation of the balance of the property is an outcome, and there is no risk to the agricultural use of the surrounding land.
  - Discourage the development of new dwellings

### **Existing dryland**

While this report does not look at the existing dryland areas. It is recommended that the planning policy for existing dryland be amended to be consistent with the objectives and outcomes of New dryland – Farming Zone 3 i.e. that:

- These areas remain zoned Farming
- The minimum subdivision size be increased from 40ha to 100ha
- Local planning policy be amended to:
  - Discourage the creation of new lots;
  - Support house lot excisions where consolidation of the balance of the property is an outcome, and there is no risk to the agricultural use of the surrounding land.
  - Discourage the development of new dwellings

### **Rural Activity**

There is the potential to enhance tourism and agricultural output through the development of a few rural activity nodes. These nodes will build on existing development and assets (such as riverine areas and lakes) to provide an opportunity for rural tourism and boutique agriculture in high amenity locations close to townships.

The criteria for the development of a rural activity node are:

- Close to an existing town
- Existing land fragmentation and dwelling development
- Agricultural potential
- High amenity

Areas to be considered for a Rural Activity Zone (RAZ) are Koondrook, Gunbower Island (close to Cohuna) Murrabit, Kangaroo Lake and Lake Charm

The intended use for these areas would be intensive agricultural businesses, including wineries or other horticulture, and rural tourism accommodation. The key objective of these areas is to be of high amenity so as to attract visitors.

The lot size identified for these areas should be suitable for agricultural land uses and should support retaining a rural character and density of development. The lot size should be determined as a part of the identification and detailed planning for an area. It generally should be a minimum of 5ha.

The development proposed for the land should also retain a rural character and presentation and as such should be of low density.

It is recommended that:

- These areas be rezoned Rural Activity Zone.
- Local planning policy be developed to:
  - Support new dwellings where they are required to promote new agricultural or rural tourism enterprises.
  - Discourage house lot excisions as property consolidation is not sought and excisions will contribute to increasing the density of development in the area that may compromise its amenity.
  - Support new tourism developments where they are consistent with the rural presentation of the area and will contribute to the amenity and tourism experience of the area. A low density of development is sought within the property and within the area.

### **Rural Conservation**

Gannawarra includes a number of unique environmental assets that not only should be protected for their contribution to biodiversity, but also promoted as a significant tourism asset. These areas would include those with significant environmental value and limited agricultural prospects. These areas are likely to include some land along the Murray River and land around the lake systems. These areas should be used and managed with a conservation focus and tourism uses and dwellings that are compatible with the environmental values of the area should be supported in these areas to assist with the management of the land and to capitalise on these assets and contribute to the local economy. Retaining this land in farming use has a high risk of undermining the environmental values and does not capitalise on these assets.

It is recommended that:

These areas be rezoned Rural Conservation Zone.

- Local planning policy be developed to:
  - Support new dwellings and tourism developments where they promote the environmental values of the land.
  - Discourage the creation of new lots, including house lot excisions.

### **Rural Living**

Rural living is a legitimate part of Council's settlement strategy. Council supports the provision of a range of attractive residential options across the Shire to retain and attract residents. The Urban and Rural Strategy Plan set out a comprehensive set of residential opportunities across the Shire,

including a number of rural living opportunities. These opportunities will provide for demand in the current planning period. Beyond this, should further supply be required, some new dryland areas close to existing settlements could be considered for rural living development.

### **Other**

A key requirement to supporting growth and development within these rural areas is reducing regulation where appropriate. It has been identified that the current flood controls (in particular ESO4) and the Vegetation Protection Overlay (VPO) are not sufficiently accurate in their application and trigger applications or impose restrictions where they may not be warranted. It is recommended that the application of the flood controls and the VPO be reviewed based on more recent information and mapping techniques.

### **Conclusion**

A key focus of this study was to investigate options for productive use of new dryland in Gannawarra and recommend planning policy to accommodate these alternative uses. The analysis of the socio-economic impacts of reduced irrigation water availability clearly demonstrates however, that from a social and economic point of view, the planning scheme must focus on protection of the irrigated agriculture industry in Gannawarra. Other land uses can be accommodated, but these should not be at the expense of irrigated agriculture, which provides the greatest opportunity of securing an economic future for Gannawarra.

Therefore, recommendations for the land use planning framework in Gannawarra are an integrated package for all the rural areas that combines irrigated and dryland agriculture as well as opportunities for tourism and rural activity in appropriate locations.



# 1 Introduction

Since the 1990s, the irrigation water sector in Victoria has undergone significant reform with the unbundling or separation of water entitlements from land and the introduction of a water market enabling both permanent and temporary trade in water. A key principle underpinning this reform is to enable water to move to its highest value use.

As a result of these reforms, there has been significant water trade, particularly in northern Victoria. Broadly, water has moved from lower value production systems, such as mixed cropping and grazing and less productive land to higher value production systems such as horticulture and dairy and land with greater productive potential.

In Gannawarra Shire, water reform has had significant impacts on the local economy and agriculture. Rate revenue is estimated to have fallen by 15% due to reduced land values following unbundling of water entitlements. Water trade from the Torrumbarry Irrigation Areas (of which Gannawarra is a significant component) to other irrigation districts has averaged 5GL/year since water trading was introduced, but has been as high as 15GL/year. Recent drought and low water allocations have resulted in a significant drop in water use in the Torrumbarry Irrigation Area from 600GL/year in the 1990s to just over 100GL/year in 2008.

Water trade and drought have significantly affected Gannawarra Shire, more so than other northern irrigation municipalities. RM Consulting Group was engaged by the Shire of Gannawarra, with support from the Department of Planning and Community Development Rural Land Use Planning Project to examine the implications to rural land use in Gannawarra Shire resulting from the sale of permanent water entitlements and explore land use planning options across the Shire to support productive and sustainable use of the land. Additional funding from the North Central Catchment Management Authority enabled the detailed modelling of the socio-economic impacts of permanent water sales.

## Project Objectives

The objectives of the study are to:

- Understand the opportunities and challenges of changing land and water use in Gannawarra Shire.
- Understand the social and economic implications and consequences of the (permanent and temporary) sale of irrigation water from farms within the Shire.
- Review land use planning options to support the productive and sustainable use of rural land, particularly in areas impacted by the sale of water entitlements.
- Provide land use planning policy advice to Gannawarra Shire to manage the impacts of the sale of water entitlements out of the Shire.
- Serve as a pilot study of land use planning approaches and options in conjunction with the New Dryland Options for the Loddon Campaspe Irrigation Region Project, funded by Caring For Our Country through the North Central Catchment Management Authority.

## **Acknowledgements**

The Gannawarra Shire project is one of 16 projects funded through the Rural Land-Use Planning Program of the Victorian Department of Planning and Community Development. The program is aimed at supporting local government to undertake strategic studies on emerging issues in regional Victoria and to improve the protection and management of rural land through planning schemes.

The Consultant Team were supported by a Project Steering Committee: John McCurdy – Manager Planning, Shire of Gannawarra; David Johnston – Consultant Planner, Shire of Gannawarra; Matthew Cameron, John Smelt and Alex Gunn - Department of Planning and Community Development.

## 2 Gannawarra Shire

### 2.1 Location

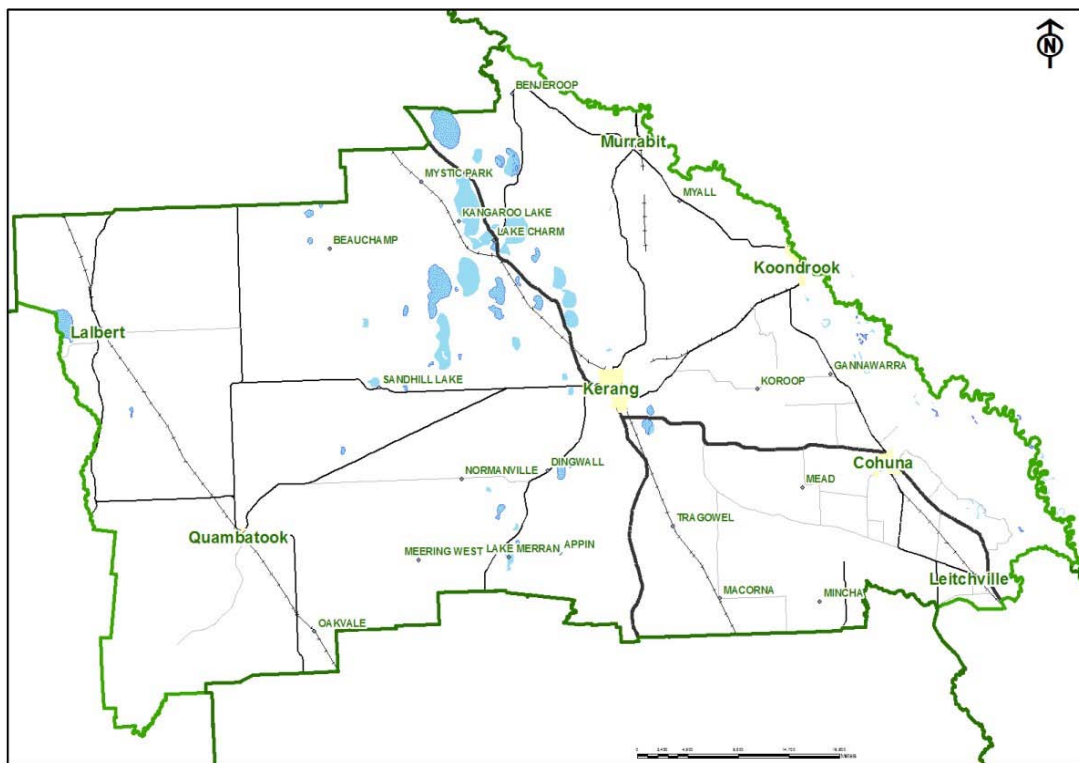
Gannawarra Shire covers an area of 3,732 km<sup>2</sup> and is located on the Murray River (Figure 2-1) in northern Victoria with a population base of 11,665 (ABS Census 2006). The main population centres are Kerang (3,671), Cohuna (1,816) and Koondrook (759). Around 4,000 people or 38% of the population live in the rural areas of the Shire.

### 2.2 Land use

The Gannawarra Shire website provides the following description of land use and communities:

- *Land west of the Loddon River.* Dryland cropping is a predominant feature of this area accompanied by some irrigation and recreation areas around the Kerang lakes.
- *Koondrook and Murrabit.* People are reliant on dairying, the water industry, the timber industry and tourism around the Murray River.
- *Kerang and surrounding districts.* It is the main regional service centre for the municipality, providing services such as the administrative base of Council and several government agencies as well as expanding industrial area and businesses to support local and other service provision.
- *Cohuna and Leitchville.* The majority of people in the areas surrounding the towns are reliant on dairying (including the Murray Goulburn cheese factory). The water industry (which provides significant employment) is also prominent and other businesses, industries and services exist to support the local industries or products for other areas.
- *The dairying area between Cohuna and Kerang* extends from the Murray River south to the border of the Shire. Residents have association with either or both Cohuna and Kerang, and this area is a mixture of dryland and irrigation farming.

Figure 2-1 Gannawarra Shire



## 2.3 Economy

### Overview

The shire is predominantly rural with 30% of the Gannawarra workforce involved directly in the agriculture sector in 2006. Local processing of agricultural products, particularly milk, is also important (Table 2-1). The Murray Goulburn milk processing plant at Leitchville is the biggest employer in the municipality and is estimated to employ around 100 people from the region (Gannawarra Shire website). (Note following preparation of the draft report, the plant at Leitchville was closed).

Given the importance of agriculture and associated sectors to the Gannawarra economy, any substantial change in the agricultural base will have significant flow on impacts to the Shire economy.

**Table 2-1 Employment distribution 2006**  
(Victorian Local Governance Association [www.vlga.org.au](http://www.vlga.org.au))

Employment sector	Number of persons	Percentage of total employment
Agriculture	1,265	30
Mining	27	0.6
Manufacturing	378	8.8
<i>Food product manufacturing</i>	164	3.8
Electricity, gas water and waste services	101	2.3
Construction	230	5.3
Wholesale trade	126	2.9
Retail trade	507	11.8
Accommodation and food services	116	2.7
Transport, postal and warehousing	152	3.5
Information media and telecommunications	23	0.5
Financial and insurance services	70	1.6
Rental, hiring and real estate services	70	1.6
Professional, scientific and technical services	100	2.3
Administrative and support services	68	1.6
Public administration and safety	203	4.7
Education and training	258	6.0
Health care and social assistance	415	9.6
Arts and recreation services	22	0.5
Other services	127	3.0
Inadequately described	38	0.9
<b>Total</b>	<b>4,312</b>	

### Agricultural industries

Agriculture is the most significant industry in Gannawarra, with dairy the most significant commodity. The drought and low water allocations saw a decline of \$22million in the value of agricultural production in the shire between 2001 and 2006 (Table 2-2). Note however that the value of dairy increased slightly in the same period. The overall decline in the value of production will have continued with two consecutive years of low water allocations. The value of production from agriculture is substantially lower than Swan Hill, which has a significant horticulture sector and Campaspe, which has a substantial dairy sector.

The structure of the agricultural industries (Table 2-3) indicates that there has been significant restructure within the dairy industry with most dairy farms in the medium to large income (>\$200k) range. By comparison most of the grazing and cropping farms are in the medium to small size (<\$200k) range. It is from this latter group that most of the permanent water sales has occurred. There are a small number of economically important piggeries.

**Table 2-2 Value of agricultural commodities produced, 2001 and 2006 (ABS Agricultural Census Data)**

Commodity	2001 VACP Gannawarra \$m	2006 VACP Gannawarra \$m	% of 2006 Total VACP	2006 VACP Swan Hill \$m	2006 VACP Campaspe \$m
Dairy	105	113	50%	10	237
Cereals and field crops (inc seed)	59	41	18%	94	23
Livestock sales – cattle and calves	29	27	12%	5	65
Crops and pasture hay	13	21	9%	4	41
Sheep – wool and livestock sales	10	9	4%	11	14
Intensive animal	25	10	4%	1	14
Horticulture	7	5	2%	217	46
<b>Total</b>	<b>248</b>	<b>226</b>		<b>342</b>	<b>439</b>

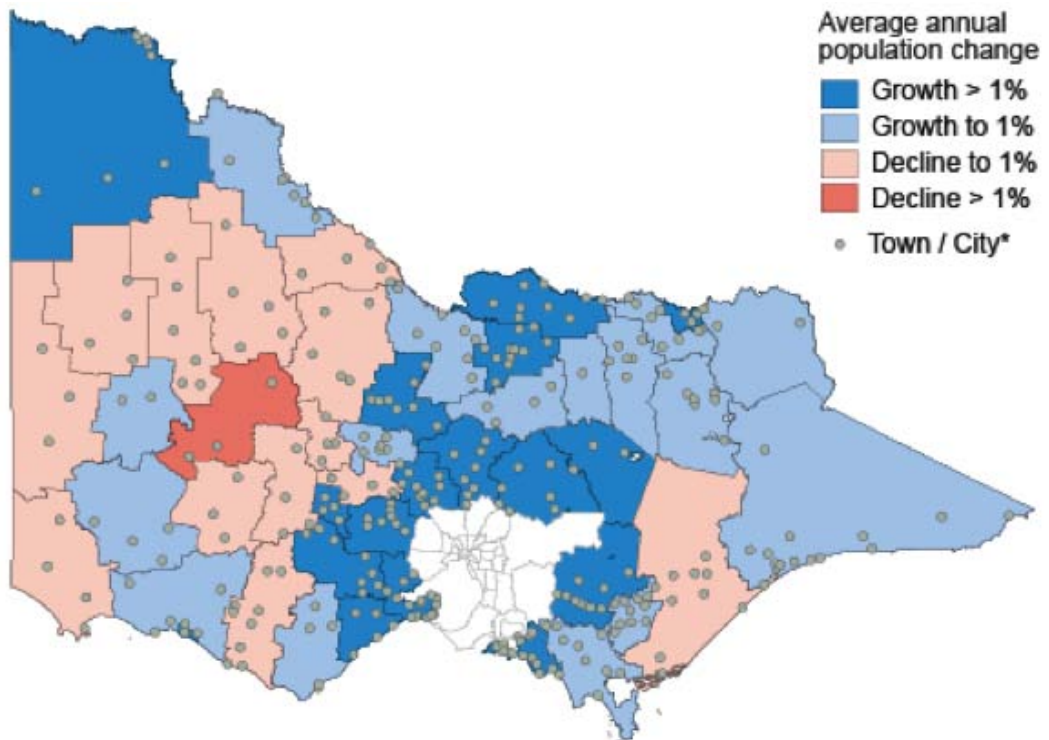
**Table 2-3 Structure of agricultural industries based on Estimated Value of Agricultural Operations, 2001 (ABS Agricultural Census Data)**

Commodities	<\$50K	\$50 - \$100K	\$100 - \$200K	\$200 - \$500K	\$500K - \$1mil	>\$1mil	Total
Dairy	5	23	128	192	27	4	378
Grain	9	14	41	67	14	3	148
Beef	65	22	11				
Mixed cropping	13	7	9	8	2		40
Sheep	16	7	6	3			32
Sheep/beef	7	5	7	1			20
Pigs				3	9	6	18
Vegetables	4	2	1	1		1	10
Grapes	1				1	1	3

## 2.4 Population

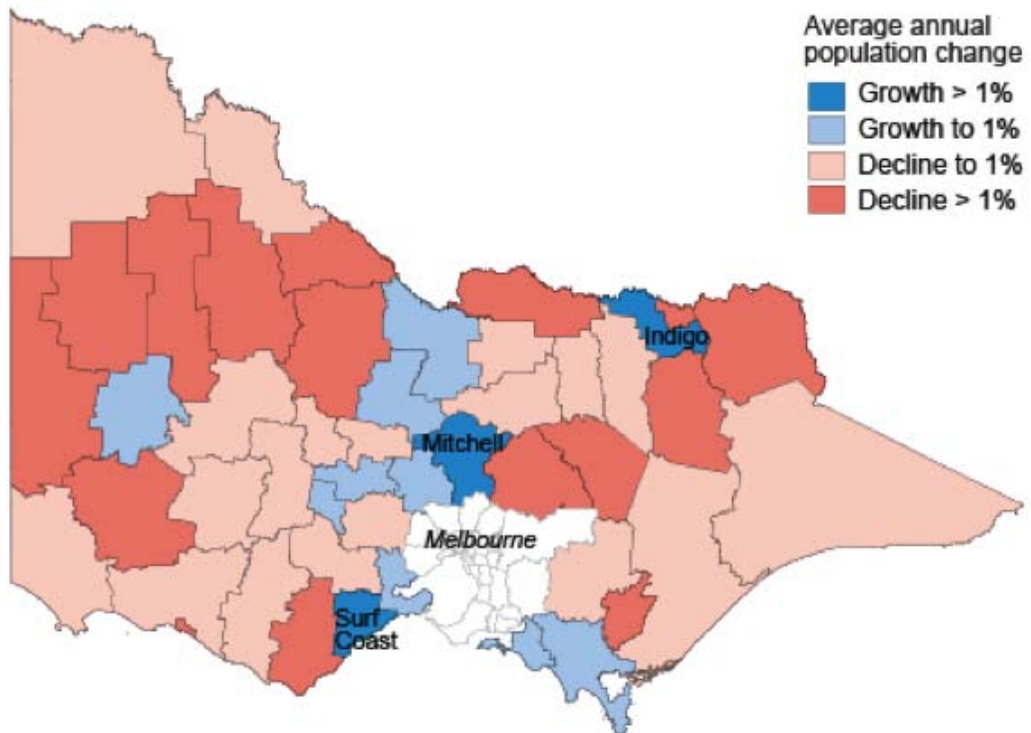
Population change in Gannawarra has seen an overall decline, particularly in the rural areas of the Shire (Figure 2-2, Figure 2-3), with some modest growth in Koondrook (Table 2-4). The overall trend in population decline is consistent with other rural municipalities around Gannawarra, such as Loddon and Wakool. Municipalities such as Campaspe and Swan Hill, which have larger economies and a large centre servicing the regional hinterland, have had stable or growing populations (Figure 9-1). The downward trend in population is expected to continue into the future (Figure 9-2).

Figure 2-2 Average annual population change in towns and cities\*, 1996 to 2006



\* cities and towns with populations greater than 200 persons, excluding Melbourne  
Source: DPCD 2008 Towns in Time database

Figure 2-3 Average annual population change in rural areas\*, 1996 to 2006



\* areas outside cities and towns  
Source: DPCD 2008 Towns in Time database

**Table 2-4 Population change within Gannawarra (DSE 2008a)**

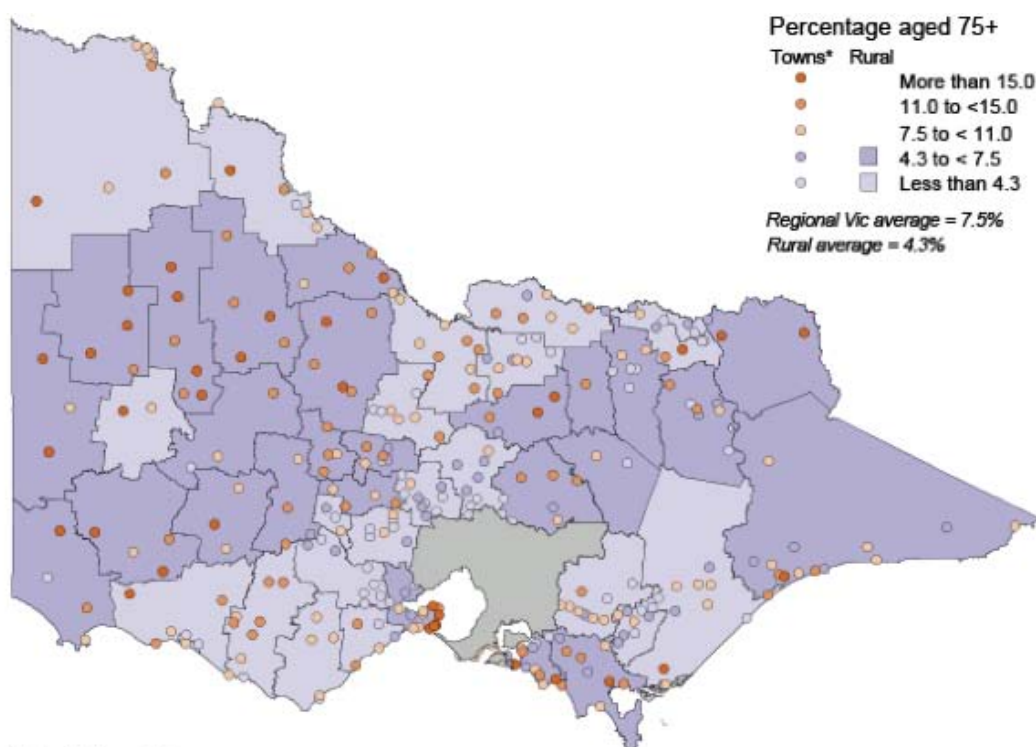
Town	Population		Comments
	1981	2006	
Cohuna	2,178	1,816	The population has declined steadily since 1981, and is particularly evident in the large decreases in the younger age groups and families with children. Decline in household size has been quite rapid, from 3.0 persons in 1981, to 2.1 persons in 2006.
Kerang	4,049	3,671	The population was stable in the 1980s, but has declined by almost 10% since 1991.
Rural balance		2,572	Population declined by 1.1% between 2001 and 2006
Koondrook	720	759	Modest population growth
Quambatook	359	232	

## 2.5 Population characteristics

The population of Gannawarra is also an ageing one, with more than 10% of persons in Kerang, Cohuna and Koondrook aged 75 plus (Figure 2-4).

Gannawarra, along with Loddon and Buloke, is ranked amongst the lowest of Victorian municipalities with regard to gross median weekly family income. Median household income in Gannawarra ranges between \$700 and \$800 per week, similar to Swan Hill, but less than Campaspe.

**Figure 2-4 Population aged 75-plus, towns and rural balances, 2006**

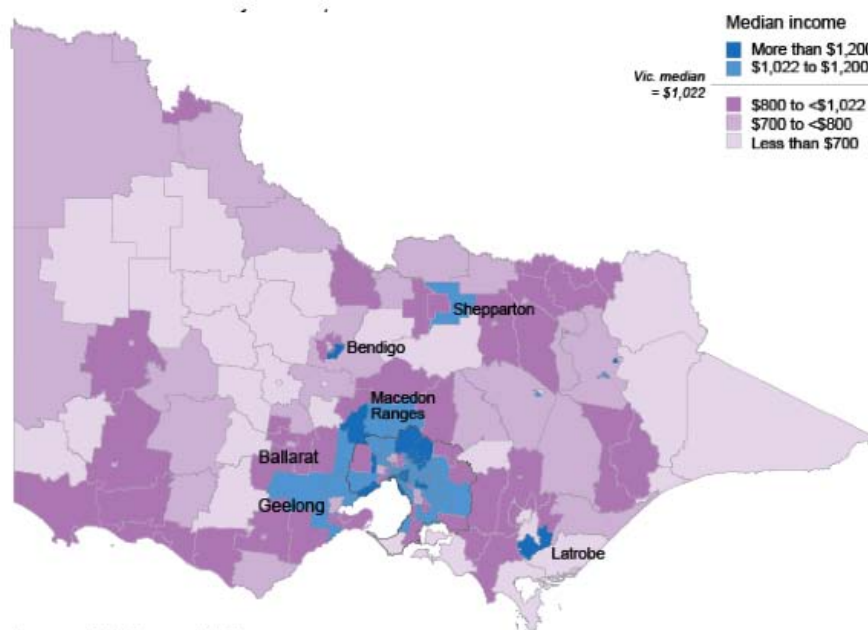


\* Population >200 persons

Source: DPCD 2008a Towns in Time



Figure 2-5 Median household weekly income, 2006



## 2.6 Agricultural land and water resources

### Climate

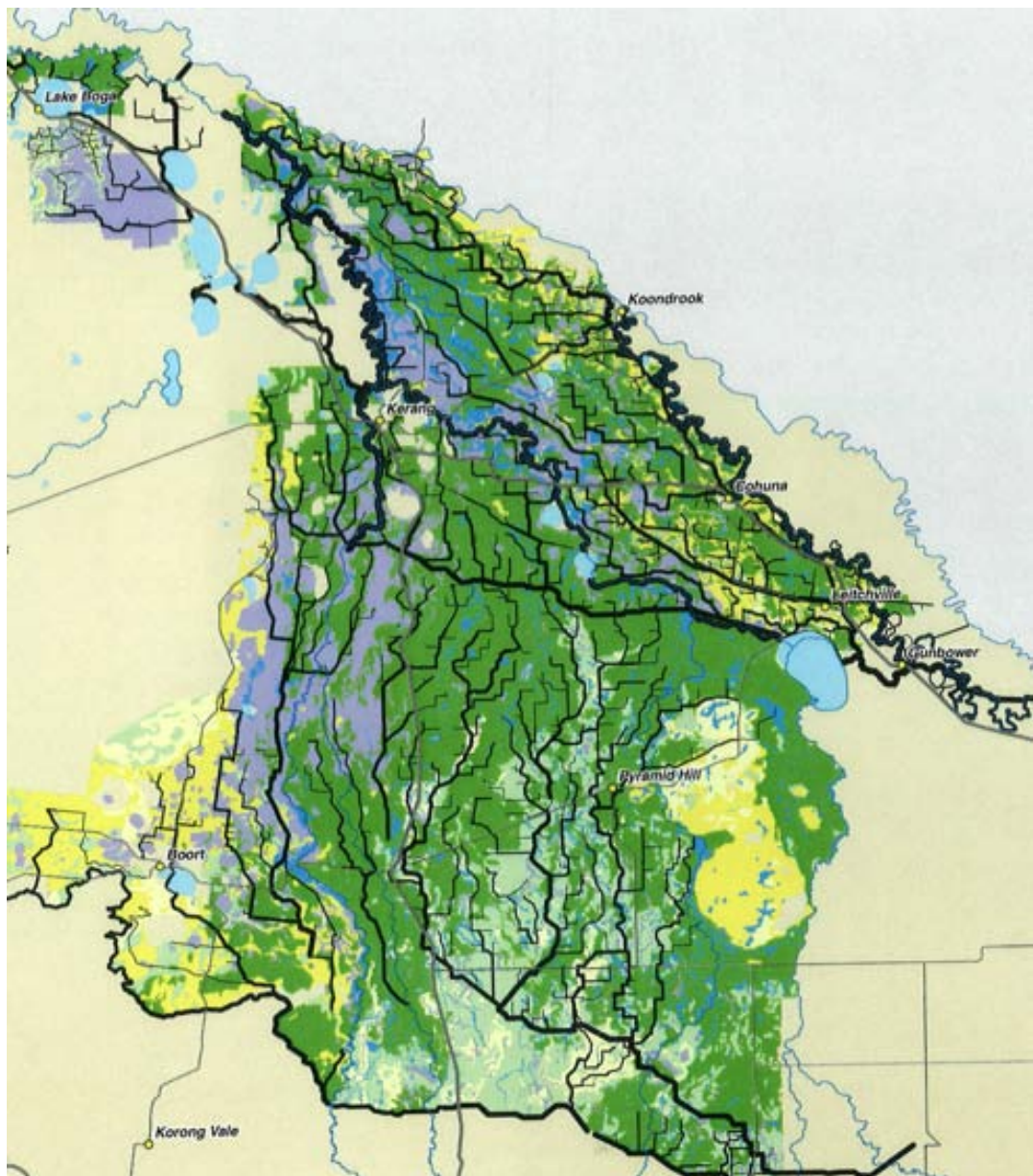
Gannawarra Shire has a semi-arid climate with hot dry summers and cool mild winters. Average annual rainfall is 371.8mm and mean maximum temperatures range from 31.5°C in January to 14.1°C in July.

### Land

Soils in the region are complex with both Mallee and floodplain landforms present. Irrigation soils in the area have been extensively mapped (Figure 2-6). This mapping indicates a significant proportion of the irrigation area in Gannawarra has Group 4 soils - heavy textured soils susceptible to salinity problems. These are suitable for irrigated pastures and cropping in conjunction with salinity control measures.

Ribbons of Group 1 and 2 soils are found adjacent to the Gunbower Creek, Pyramid Creek of Leitchville and on sandy rises and lunettes west of Kerang. The soils generally have no, or few, constraints for irrigation and can be used for production of irrigated horticultural crops, cropping and pasture production.

Figure 2-6 Suitability of soils for irrigated crops (GMW 2006)\*

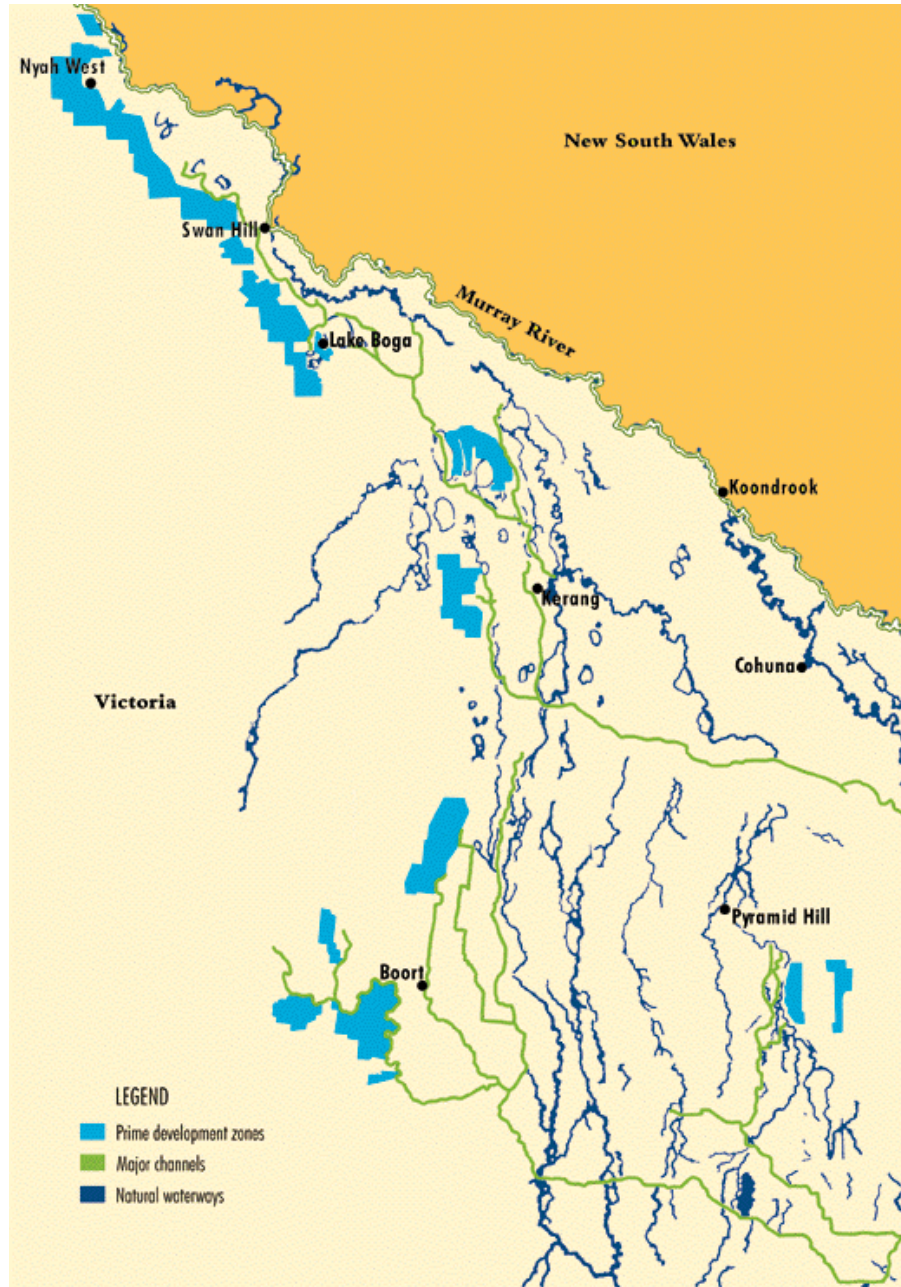


**Legend**

- Yellow (Group 1 and 2) – soil with no serious disabilities for irrigation of horticultural crops, fodder crops, annual and perennial pasture
- Green (Group 3 and 4) – Soils with several disabilities for irrigation including low permeability, shallow surface, moderate salinity. Suitable for irrigation of cereals, summer crops and annual and perennial pastures
- Purple (Group 5) – Low-lying soils liable to salinity problems. Suitability for irrigation of cereals, summer fodder crops and annual and perennial pastures dependent on drainage and grading measures

Loddon Murray 2000 plus undertook an assessment of land within the region to identify the land attributes of areas currently serviced by irrigation and to identify areas that have merit for irrigation development in the future. Figure 2-7 shows the location of these prime development zones and that within Gannawarra, there is an area west of the Loddon River that has merit for new irrigation development.

**Figure 2-7 Prime development zones, Loddon Murray 2000 plus**  
([http://home.vicnet.net.au/~lm2000/pdzs/pdzs\\_map.htm](http://home.vicnet.net.au/~lm2000/pdzs/pdzs_map.htm))



### Irrigation water entitlements and water use

Goulburn Murray Water (GMW) supplies irrigation water in Gannawarra. A large proportion (around 70%) of the Torrumbarry Irrigation Area (TIA) and a small portion of the Pyramid Boort Irrigation Area are located within the Gannawarra Shire (Figure 2-8). Currently, there

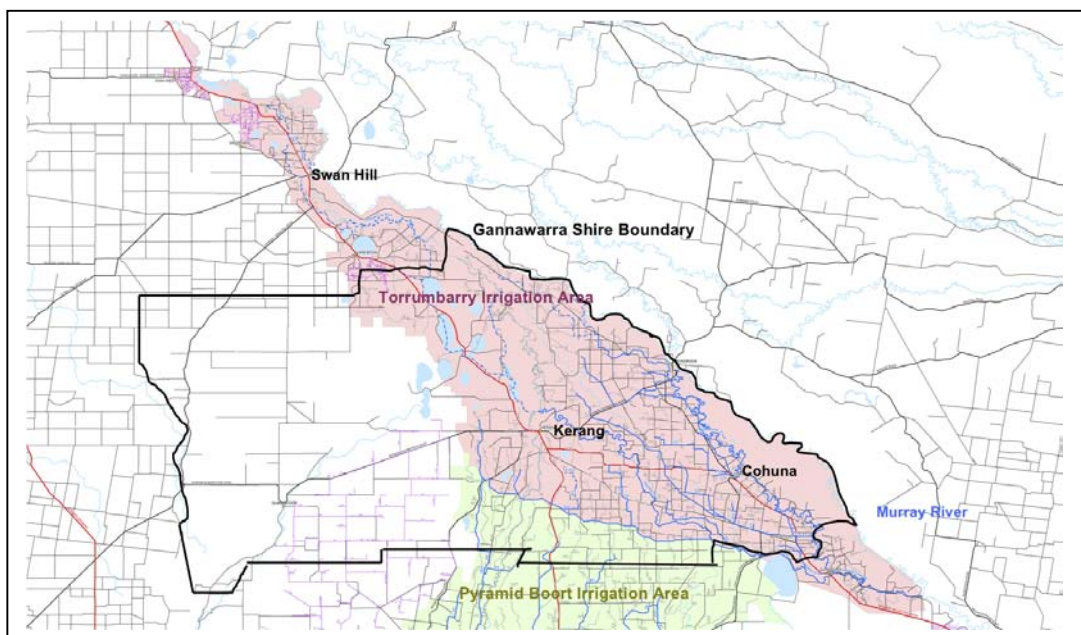
are 2,600 water entitlements in the TIA with a total water volume of 331GL. Since 1995, there has been a total of 74GL of High Reliability Water Shares permanently traded out of the TIA to 2007/08. In addition, overall water use has declined from around 600GL/year to around 387GL/year with most of this decline occurring since 2001/02.

Further to this, the reduced availability of sales or Low Reliability Water Shares in recent years has had a significant impact on water use. From 1999 to 2001, there was 90% to 100% availability of sales water. This was followed by 29% availability in 2002/03 and 0% availability in 2003/04, 2004/05, 2006/07 and 2008/09 and 41% availability in 2005/06.

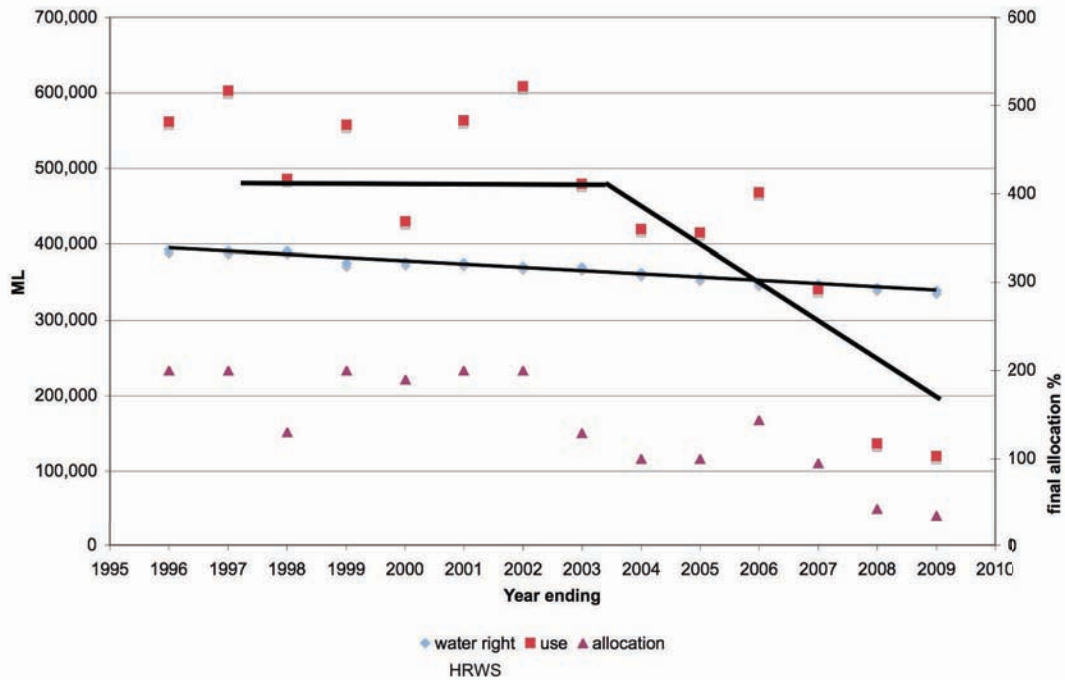
The trade of permanent water out of the TIA has been offset to some extent by significant trade of temporary water, averaging 31GL/year in the six years to 2005/06.

However, since 2006/07 there has been little net trade back into the area. The decline in net trade has been driven by the continued low water allocations and high water prices as well as a slump in milk prices. While milk prices were strong, dairy businesses could afford to purchase temporary water, even at higher than average prices, to supplement their water allocation. However, the slump in milk prices has meant that this is no longer cost effective and temporary trade has declined and permanent sales have continued.

**Figure 2-8 Irrigation areas and Gannawarra Shire**



**Figure 2-9 Change in water use and water right in the Torrumbarry Irrigation Area (GMW)**



Notes: Includes Woorinen (old Annual Reports report Swan Hill including Woorinen). Conversion of S&D rights to HRWS in 2007/8 increased HRWS in that year. 5% of HRWS has been added back to previous years to account for this. But there is still some discrepancy with net trade out figures.

## 2.7 Summary

Gannawarra Shire is located in northern Victoria on the Murray River. The local and regional economy and employment is underpinned by agriculture, particularly dairy and associated manufacturing and service industries. Gannawarra has an ageing and declining population. Total water use and permanent water entitlements have both declined in the TIA.

### **3 Planning policy context**

#### **3.1 Gannawarra Planning Scheme**

The Gannawarra Planning Scheme provides the strategic context for land use planning in the shire, as well as the statutory provisions. It includes State level policy and local level policy. Of relevance to this project, the policy directions that relate to farming and agricultural land from the State Planning Policy Framework can be summarised as follows:

##### **Clause 17.05 Agriculture**

Protect productive farmland that is of strategic significance in the local or regional context.

Support effective agricultural production and processing infrastructure, rural industry and farm-related retailing and assist genuine farming enterprises to adjust flexibly to market changes

Planning should provide encouragement for sustainable agriculture and support and assist the development of innovative approaches to sustainable practices.

Subdivision of productive agricultural land should not detract from the long-term productive capacity of the land.

##### **Clause 17.06 Intensive animal industries**

Facilitate the establishment and expansion of cattle feedlots, piggeries, poultry farms and other intensive animal industries in a manner consistent with orderly and proper planning and protection of the environment.

In addition, the planning scheme also addresses environmental issues, rural living, tourism, plantation forestry and renewable energy. These policy directions may have some bearing on the opportunities that may arise from this project. These policy directions can be summarised as:

##### **Clause 15 Environment**

Retain natural drainage corridors with vegetated buffer zones of at least 30m wide along waterways.

Preserve floodplains or other land for wetlands and retention basins.

Protect water quality.

Avoid locating piggeries, poultry farms and feedlots on floodplains unless site design and management is such that potential contact between such substances and floodwaters is prevented, without affecting the flood carrying and flood storage functions of the floodplain.

Protect and enhance native vegetation.

Protect the habitat values of wetlands and wetland wildlife habitats designated under the Convention on Wetlands of International Importance (the Ramsar Convention) or utilised by

species designated under the Japan-Australia Migratory Birds Agreement (JAMBA) or the China-Australia Migratory Birds Agreement (CAMBA).

**Clause 15.11 Heritage**

Protect places of natural or cultural heritage.

**Clause 15.14 Renewable energy**

Promote the provision of renewable energy.

**Clause 16.03 Rural Living and rural residential development**

Land should only be zoned for rural living or rural residential development where it is located close to existing towns and urban centres, can be serviced and will not encroach on high quality productive agricultural land or adversely impact on waterways or other natural resources.

**Clause 17.04 Tourism**

Encourage the development of a range of well-designed and sited tourist facilities that build upon the assets and qualities of surrounding urban or rural activities and cultural and natural attractions.

**Clause 17.07 Forestry and timber production**

Facilitate the establishment, management and harvesting of plantations, harvesting of timber from native forests and the development of forest based industries.

Of relevance to this project, the policy directions from the Local Planning Policy Framework can be summarised as follows:

**Clause 21.04-1 Sustainable Agricultural Development**

Maintain agriculture as a key part of the economy

Increase opportunities for high value irrigated agriculture

Protect good quality agricultural land

Promote diversification and value adding at the source

**Clause 21.04-2 Natural Resource Management**

Protect and enhance the condition of the Shire's environment, including protection of remnant vegetation, protection of water quality, minimisation of salinity and maintenance of floodplains.

**Clause 21.04-3 Town Development**

Rural living and low density residential development is to be located in designated locations at Cohuna, Kerang, Koondrook, Murrabit, Kangaroo Lake and Lake Charm.

#### **Clause 21.04-4 Cultural and Tourism Development**

Protect local heritage and support tourism development that respects and responds to local assets.

#### **Clause 21.04-5 Infrastructure**

Maintain water rights and water infrastructure in the region to support agriculture.

The Gannawarra Planning Scheme also includes relatively small subdivision sizes within the Farming Zone, with a reasonable degree of flexibility. The minimum subdivision size is 40ha in dryland areas and 20ha (with the opportunity for smaller lots where it can be demonstrated that there is a requirement for horticultural purposes) in irrigated areas. In addition to house lot excisions, there is also the opportunity to create a lot of 0.5ha for a use other than accommodation.

### **3.2 Key directions from Council strategies**

In 2007, Council completed a land use strategy, the Gannawarra Urban and Rural Strategy Plan. The objective of this strategy was to enhance residential and tourism development through the provision of opportunities for development in high amenity areas, while protecting agriculture, environmental assets and the viability of existing settlements.

This strategy identified opportunities for rural living development at Cohuna, Murrabit, Koondrook, Kangaroo Lake and Lake Charm. It further identified that tourism facilities in rural areas should be supported in the shire where there is demonstrated need and market demand, where a rural location is required and where the proposal builds on and contributes to local attractions and the tourist economy.

### **3.3 Conclusions**

The Gannawarra Planning Scheme clearly identifies that the existing focus for the rural areas of the shire is for agricultural use. The shire includes productive and valuable agricultural land, both irrigated and dryland, which is to be protected for farming. The planning system allows for Council to determine to remove some land from agricultural use but any change in land use should be planned for, justified and the economic, social and environmental risk and benefit of its removal from agriculture rigorously assessed.

The Gannawarra Planning Scheme provides support for alternative agricultural enterprises such as intensive animal industries, although these should generally be directed away from the floodplains. Timber plantations are also supported, particularly on cleared land. Some tourism developments can be integrated into the rural area, although impacts on agricultural activity need to be considered and minimised.

There is the opportunity to elevate the environmental function of some areas based on the significant environmental assets of the shire. Tourism and some limited dwelling development may be integrated into such areas where it can support enhancement of the environmental condition.

Rural living has been identified as playing an important role in attracting new residents to the shire. Consistent with State policy, it is important, as provided for in Council's existing



strategy (Urban and Rural Strategy Plan), that such development is located close to, and builds upon, existing towns and settlements to enhance their viability and ensure sustainable servicing costs.

## 4 Context – What is driving irrigation change?

### 4.1 Water trade

Water trading was introduced in Victoria to enable the transfer of water to the most productive, environmental or consumptive use. Figure 4-1 and Figure 4-2 show the cumulative permanent water trade and cumulative temporary water trade for irrigation districts across Victoria between 1991/92 and 2005/06 respectively. These indicate that there has been significant water trade – both temporary and permanent into and out of the Torrumbarry and Pyramid Boort Irrigation areas. This reflects the recent period of high water prices and low water allocations and movement of water to high value uses such as new horticultural developments in Sunraysia. Water trade has provided an opportunity for some farmers to generate significant income from permanent water sales.

Water trade arrangements have also changed the way many growers are managing their water allocations - selling permanent entitlements and releasing significant capital and securing water requirements through the temporary market. This trend has been consistent across the TIA and Central Goulburn systems, particularly amongst dairy farmers. Permanent water entitlements have been sold and water requirements are purchased on the temporary market with extra feed purchased during times of water shortage. In Pyramid Boort, however, temporary trade back into the district has not offset sale of permanent water entitlements.

**Figure 4-1 Cumulative permanent trade in Victoria, 1994/95 – 2005/06 (DSE 2008b)**

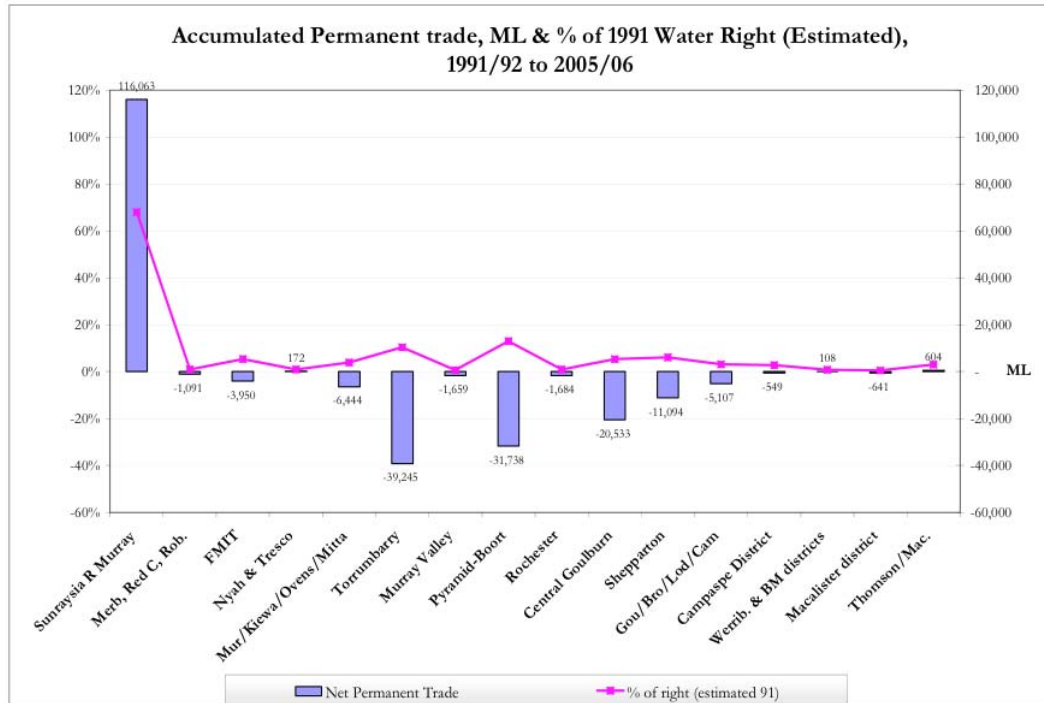
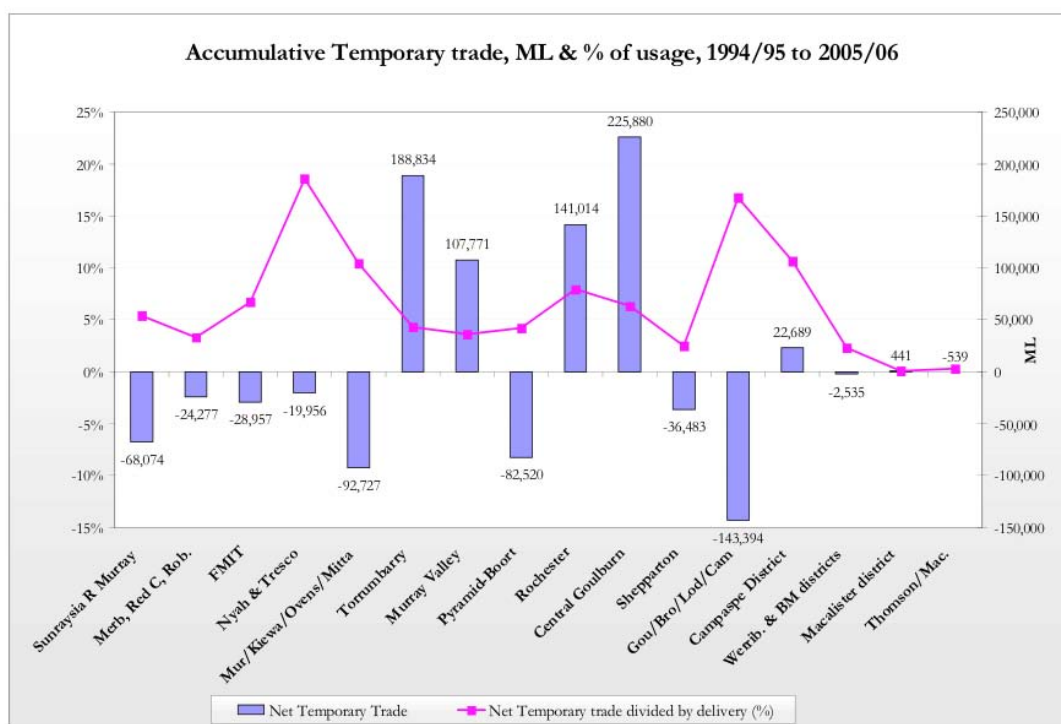


Figure 4-2 Cumulative temporary trade in Victoria, 1994/95 – 2005/06 (DSE 2008b)



## 4.2 Unprecedented dry conditions

The introduction of water trading has coincided with an unprecedented period of low rainfall and low inflows to water storages. Average inflows between 1997/98 and 2007/08 have been well below the long-term average, particularly the winter/spring inflows that are responsible for most of storage fill. In the Murray system during 2008 for example, August rainfall was below average and the monthly system inflow of 275 GL was less than a fifth of the long-term average of 1,550 GL. The combined inflow for the three winter months (of 670 GL) was the equal 5th lowest in 117 years of records (MDBC 2008).

As a consequence storages are low with active storage in the Murray system only 1,690 GL (or 20% of capacity), which is well below the August long term average of 5,600 GL (or 62% capacity). This represents unprecedented circumstances for farm businesses.

The MDBC, in Spring of 2008, forecasted that even with above average rainfall in the coming months, inflows would likely remain well below average and recovery of the system is likely to take several years of above average rainfall. So while allocations in Pyramid Boort and Torrumbarry have been well below average over the last few years, 29% and 95% in 2006/07, 57% and 43% in 2007/08 respectively, this situation is likely to continue for some time.

## 4.3 Federal buy-back of water

The Federal Government *Water for the Future* program is a \$12.9 billion plan that aims to secure long-term water supply. As part of this plan, \$3.1 billion will be invested in *Restoring the Balance in the Murray-Darling Basin* to purchase water entitlements from willing sellers.

The Australian Government conducted the first round of water purchases in 2007-08 and around 24GL of entitlements worth nearly \$34million was purchased. The invitation for growers to tender for the Federal buyback was oversubscribed in 2008/09.

Through the Southern Basin Water Entitlement purchase, the Australian Government aims to purchase regulated and unregulated entitlements from irrigators downstream of the Menindee Lakes and includes: Murray River; Lachlan; Murrumbidgee; Kiewa; Ovens; Goulburn; Campaspe; Loddon; Avoca; Wimmera-Mallee; and the Darling River south of Menindee Lakes. Other initiatives for returning water to the Basin include:

- Exit grant package for small block irrigators in the Murray-Darling Basin.
- Working with irrigation communities to buy out water entitlements from areas willing to move out of irrigation, facilitated by a price premium reflecting the value of water savings from closure of infrastructure such as supply channels. Note that the details of the targeted buy-back are still to be defined.
- Working with State Governments to co-fund the purchase of appropriately located irrigation properties and their water entitlements to enhance environmental outcomes in the northern Basin.

As a result of the buy-back the total water volume available for irrigated agriculture in the Murray Darling Basin will be reduced.

#### **4.4 Murray Darling Basin Plan**

The Commonwealth Water Act 2007 requires the Murray Darling Basin Authority (MDBA) to prepare and oversee a Basin Plan. This plan is a legally enforceable document that provides for the integrated management of all the Basin's water resources. Some of the main functions of the Basin Plan will be to:

- Set and enforce environmentally sustainable limits on the quantities of surface water and groundwater that may be taken from Basin water resources
- Set Basin-wide environmental objectives, and water quality and salinity objectives
- Develop efficient water trading regimes across the Basin
- Set requirements that must be met by state water resource plans
- Improve water security for all uses of Basin water resources.

The Basin Plan will be a single, consistent and integrated approach to managing all the water resources in the Murray–Darling Basin. The plan will describe the Basin's surface-water and groundwater resources and explain how industry, environment and all communities, including Indigenous communities, across the Basin, currently use them.

The central legal requirement of the Basin Plan is to set environmentally sustainable limits on the amount of water that can be taken in future from the Basin's water resources. Such a limit is known as a 'sustainable diversion limit' (SDL).

SDLs will limit the quantity of surface water and groundwater that may be taken from the Basin water resources as a whole. There will also be SDLs to limit the quantity of surface water and groundwater that can be taken from individual water resource plan areas and

particular parts of water resource plan areas within the Basin. These areas will be defined in the Basin Plan and will draw upon current state water resource plan areas.

The current cap on surface-water diversions is set at a level based on historic use and does not limit the use of groundwater. The SDLs will replace the current cap and set limits on the taking of both groundwater and surface water from the Basin.

Given the stresses on the Basin environment, it is likely that the Basin-wide SDL for both groundwater and surface water will be set at a level below the current level of use (MDBA 2009). The Draft Basin Plan will be available for public comment in June 2010 with the SDLs to take effect in Victoria in 2014.

## **4.5 NVIRP**

The Northern Victoria Irrigation Renewal Project (NVIRP) is a program of works that will modernise and upgrade irrigation infrastructure in northern Victoria. Stage 1 of the project will see \$1 billion of works implemented over the next five years.

While the project will deliver water savings and improved irrigation efficiency for growers, implementation of the NVIRP will see some rationalisation of redundant or under-utilised irrigation infrastructure and a reduced public irrigation infrastructure footprint. As part of the commitment by the Federal Government to funding Stage 2 of the project, NVIRP needs to identify 60 GL annually for Federal buyback outside of the 4% cap on permanent water trade. NVIRP is likely to work closely with groups of landholders looking to participate in the buyback.

The following key indicators of regional viability will assist in prioritising areas to be considered for buyback including:

- Conveyance efficiency
- Soil suitability
- Salinity risk and other environmental considerations
- Flooding risk
- Asset age and condition
- Cost of supply

Given the land versatility attributes and state of the irrigation infrastructure, areas of Gannawarra are likely to be candidates for buy back. Conversely, the NVIRP will create opportunities for improving irrigation efficiency on existing farms and for some previously dryland areas to be newly developed for irrigation such as the prime development zone identified in Section 2.6.

### **TRAMS and Pyramid Boort Future Management Strategy**

Working groups in the Torrumbarry and Pyramid Boort Irrigation Areas have been working to rationalise or reconfigure local irrigation infrastructure to offset system-operating costs and improve delivery efficiency through the Torrumbarry Reconfiguration and Modernisation Strategy (TRAMS) and the Pyramid Boort Future Management Strategy. The works recognise the environmental needs of natural carriers within the local distribution network,

including the Gunbower Creek and the Kerang Lakes systems. Works to date have resulted in water savings and reduced ongoing maintenance costs by decommissioning of some channels, reconfiguration of delivery and rationalising of meters.

These activities have now been incorporated into the wider NVIRP program of actions.

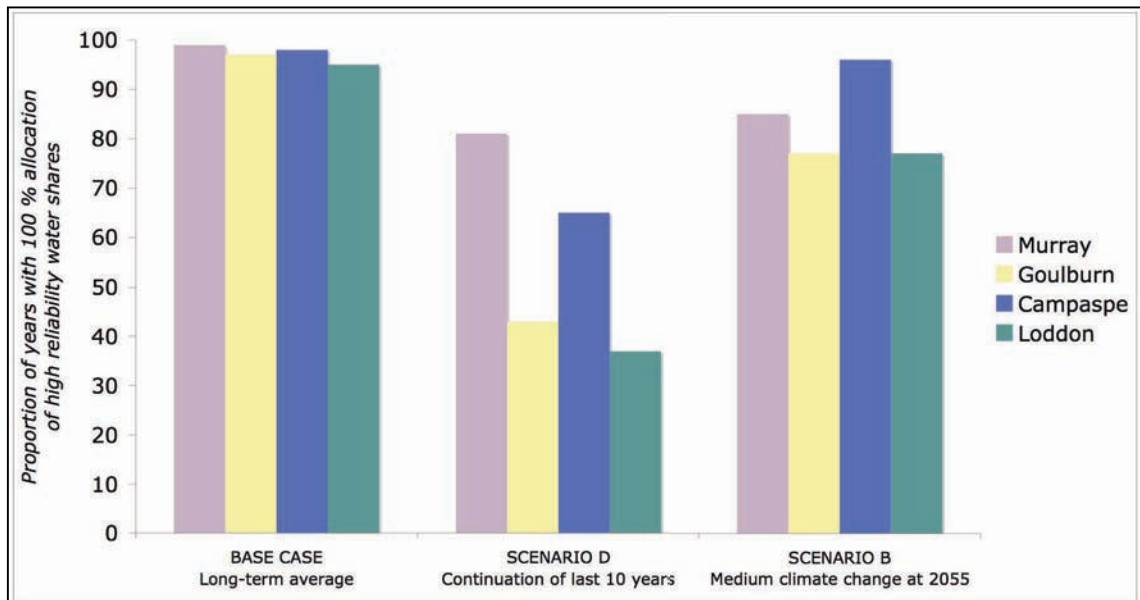
#### 4.6 Climate change and future water availability

Climate change is predicted to have similar impacts to that of drought and reduced water availability, but over a longer timeframe. Over 20 to 40 years, climate change will result in higher average temperatures, lower average rainfall and potentially an increase in the frequency of droughts.

For dryland farms, the timing of the decline will heighten the impact of reduced total rainfall under climate change, which is likely to occur mostly during the pasture and crop growing months of winter and spring. Rainfall events will also become more intense but less frequent, increasing the uncertainty associated with them. Together, these factors mean that precipitation will be less reliable and that the rain that does fall will be less useful for plant growth.

For irrigated farms, low rainfall is exacerbated by the fact that a reduction in rainfall leads to a proportionately greater reduction in streamflow (water flowing into storages). In the Murray-Darling Basin, for example, a 10% drop in rainfall leads to a 35% drop in streamflow (Jones et al. 2001). This is likely to lead to allocations in the future that vary more and are less than 100% more often (see Figure 4-3).

**Figure 4-3: Potential impact of climate change scenarios on the proportion of years with 100 per cent allocation of high reliability water shares (DSE 2008c)**



Source: Adapted from DSE (2008), CSIRO modelling for Northern Region Sustainable Water Strategy Discussion Paper

## 4.7 Structural adjustment

Current water policy, such as the Federal buy-back program and emerging arrangements for water management in the Murray Darling Basin, indicate that the proportion of long term average water yield available for irrigation will be reduced. The time frames for implementation of this policy will see significant changes to water availability in the short to medium term (the next five to ten years).

These policy drivers, coming on top of a period of low water allocations, high water prices and commodity price slumps, which has left many farm businesses with reduced equity, are likely to result in a period of significant adjustment in irrigation communities. For rural municipalities such as Gannawarra, which are highly dependent on agriculture, particularly irrigated agriculture it is important they understand the scale of this adjustment and seek appropriate support to assist the community through this adjustment process.

## 4.8 Summary

Introduction of water trade, unprecedented dry conditions and Federal and State Government programs to secure water for the environment, industry and population has had a dramatic impact on the irrigation water sector and to on farm management of water. Further trade into and out of the TIA will be influenced by:

- Further adjustment of the cap on permanent water trade, currently set at 4% (lifted from 2% in 2006)
- Demand from other irrigation areas and urban centres
- Federal government buy-back
- Changes to Sustainable Diversion Limits to be announced in the Draft Basin Plan
- Increased water scarcity due to climate change
- Increases in water shares arising from water savings from NVIRP

These factors, combined with a period of low water allocations and commodity prices is likely to result in significant adjustment in irrigation communities. For rural municipalities such as Gannawarra, which are highly dependent on agriculture, particularly irrigated agriculture it is important that the scale of adjustment is understood and so that appropriate support can be sought to assist the community through the adjustment process.

## 5 Future water use scenarios

### 5.1 Future water use

To examine the implications of land use change in Gannawarra as a result of water trade out of the Shire, it is useful to project forward to gain an appreciation of the likely scale of change and an understanding of where the change is likely to occur. A small working group was convened, comprising consultants and agency representatives with an understanding of the area, to discuss future scenarios for water trade in the TIA and Gannawarra.

The amount of irrigation water permanently sold from the TIA, will be influenced by:

- Federal buy-back of water – estimated at 25 GL/annum for the next five years for the TIA (based on Commonwealth water purchase target of 45GL of Murray HRWS with 25GL below the Barmah Choke<sup>2</sup>)
- Water trade to other irrigation districts – the long term trend has been 5GL/year (however has been as high as 13.5 GL in 2007/08 and 15.7 GL in 2008/09 due to the drought)
- Water availability under climate change – the medium climate change scenario in the Northern Victoria Sustainable Water Strategy (DSE 2008) forecasts reduced water availability by 11% by 2030, with forecasts a of 5% increase and 20% decrease by 2030 under low and high climate change scenarios respectively;
- Upgrade and modernisation of the irrigation network – this will bring improved efficiencies on-farm and reduce expected rate of water traded to other districts from 5 GL per annum to 2 GL per annum.

Three 20-year climate scenarios for the TIA were used to model future water use. 387 GL long-term cap equivalent water use was used as a starting point.

Climate Scenario 1: **No climate change impacts** + Federal buy back of water + continued water trade to other irrigation districts + efficiency improvements from NVIRP

Climate Scenario 2: **Moderate climate change impacts** + Federal buy back of water + continued water trade to other irrigation districts + efficiency improvements from NVIRP

Climate Scenario 3: **Continuation of low inflows of last 10 years** + Federal buy back of water + continued water trade to other irrigation districts + efficiency improvements from NVIRP.

Based on these three scenarios, water use in TIA is expected to reduce to between 38% and 21% of water use in the late 1990s or to between 120 and 220GL per annum.

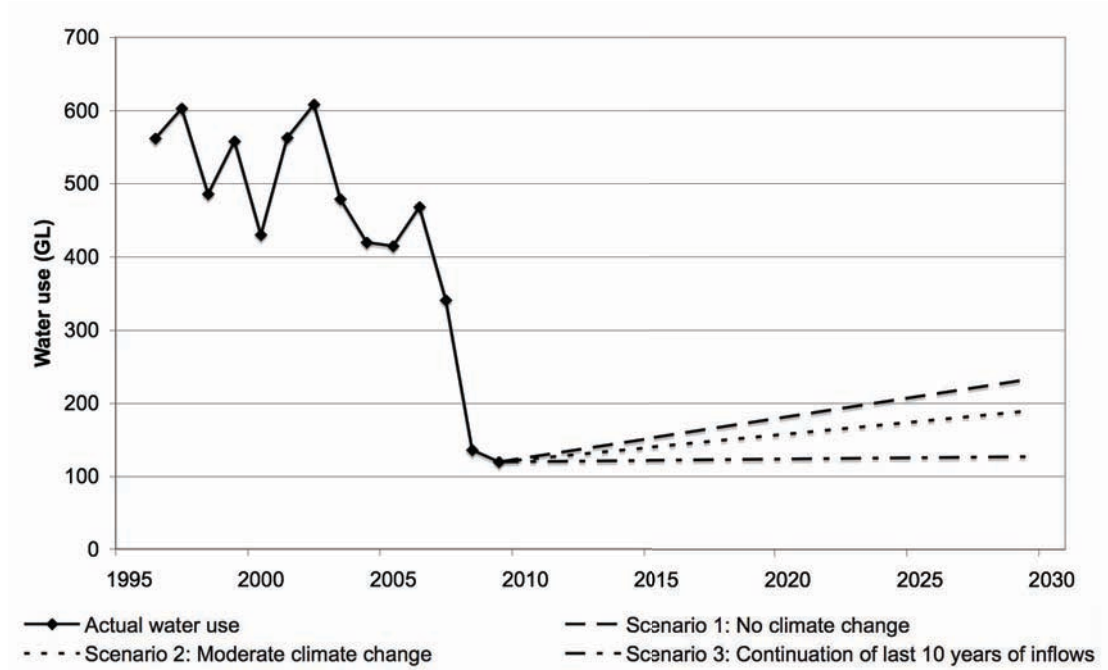
Figure 5-1 shows actual water use in the TIA since 1995 and then indicates long term water use to 2030. **It should be noted that the line indicating water use from now to 2030 is a dotted line as this is likely to be variable year by year depending on water availability, allocations and price. In reality the line will more closely reflect the jagged line of**

<sup>2</sup> ; <http://www.environment.gov.au/water/policy-programs/entitlement-purchasing/2008-09.html> accessed 30/7/09



actual water use. What is important to note is that the *long term average water use* is expected to be somewhere between 120 and 220 GL/annum.

Figure 5-1 Actual water use (1996 to 2009) and future water use scenarios for the Torrumbarry Irrigation Area



## 5.2 Conclusions

In Gannawarra in the future, there is likely to be less water available for irrigation, with between 120 and 220GL/annum estimated to be available the TIA, equivalent to between 84 and 150 GL/annum in Gannawarra.

## 6 Future agricultural output and extent of irrigation

### 6.1 Scenarios and assumptions

To assess the social and economic impacts of changed water use in Gannawarra, it was necessary to estimate the change in value of production in agriculture. This section of the report estimates the future extent of irrigation and the value of agricultural production calculated from the base case or current situation and a future Gannawarra water use scenario of 107 GL per annum (equivalent to 150 GL in the TIA). **This section of the report should be read with caution** – it is not intended to provide a prediction of future agricultural production or value of production in Gannawarra. It is only to be used to understand the relative impacts of changed water use in Gannawarra. It assumes continuation of current land uses and does not consider new opportunities or a change to production of higher value commodities.

The assumptions used in the modelling are summarised here.

#### Base case – 2009

The base case represents the current situation in 2009.

- 275 GL water use per annum within Gannawarra (around 71% of water use in TIA);
- Gross value of production irrigation - \$715/ML
- Water applied at 3.9ML/ha
- Gross value of production dryland \$200/ha

#### Water Use Scenario 1 – 2029

The first scenario projects forward to 2029 and estimates the area of production and gross value of production using the same assumptions as the base case, but with reduced water use of 107GL per annum.

- Moderate climate change impacts + Federal buy back of water + continued water trade to other irrigation districts + efficiency improvements from NVIRP resulting in 107 GL water use per annum within Gannawarra
- Gross value of production irrigation - \$715/ML
- Water applied at 3.9ML/ha
- Gross value of production dryland \$200/ha

#### Water Use Scenario 2 – 2029

The second scenario projects forward to 2029 and estimates the area of production and gross value of production, with reduced water use of 107GL per annum and a higher value for irrigated agricultural produce. The latter was included to reflect a shift to high value irrigated agriculture that is possible with the proposed improvements to the irrigation network.

- Moderate climate change impacts + Federal buy back of water + continued water trade to other irrigation districts + efficiency improvements from NVIRP resulting in 107 GL water use per annum within Gannawarra
- Gross value of production irrigation - \$1000/ML
- Water applied at 3.9ML/ha
- Gross value of production dryland \$200/ha

Table 6-1 sets out the findings and assumptions of these calculations. The gross value of production is estimated to fall by between \$111million and \$80million and the irrigation area reduced by 60% to around 30,000ha based on annual water use of 107GL/year in Gannawarra. Note that the total GVP for the base case and future scenarios includes the value of production from intensive animal production of \$18million, which has been assumed to remain unchanged, as it will not be impacted by the change in irrigation water availability.

From these estimates of changed value of water use, it is important to note the relative impacts on dryland and irrigated production. A significant increase in total dryland area results in a relatively small increase in the value of production. By comparison, a 60% drop in the area of irrigation results in a 37% drop in the value of production in Scenario 2. This highlights the importance of the irrigated agriculture sector in the local economy and ensuring minimal impediments to the adoption of on-farm and regional measures to improve water use efficiency.

**Table 6-1 Estimates of future value of agricultural output and extent of the agricultural footprint in Gannawarra**

	Hectares	Gross value of production (\$million)	Assumptions
<b>Base case – 2009</b>			
Total agricultural area	335,308	<b>266*</b>	253 GL water use (long term cap equivalent) GVP irrigation - \$715/ML Water applied at 3.9ML/ha GVP dryland \$200/ha
Total irrigated area	69,827	195	
Total dryland area	265,481	53	
<b>Future scenario 1 – 2029 gross value of production \$715/ML</b>			
Total agricultural area	335,308	<b>156*</b>	107 GL water use (long term cap equivalent) GVP irrigation - \$715/ML Water applied at 3.9ML/ha GVP dryland \$200/ha
Total irrigated area	27,245	76	
Total dryland area	308,063	62	
<b>Future Scenario 2 – 2029 gross value of production \$1,000/ML</b>			
Total agricultural area	335,308	<b>186*</b>	107 GL water use (long term cap equivalent) GVP irrigation - \$1000/ML Water applied at 3.9ML/ha GVP dryland \$200/ha
Total irrigated area	27,245	106	
Total dryland area	308,063	62	

\* Includes \$18million GVP from intensive animal husbandry, which has been assumed to remain unchanged from the base case.

## 6.2 Future irrigation footprint

The location of irrigation farms in the future, or the irrigation footprint, will evolve over time but will be influenced by:

- Targeted buy-back of entitlement from properties along irrigation spurs. This approach is being encouraged via the Federal buy-back program to target water purchases to “groups of willing sellers” and reduce impacts on the wider system.
- Scattered sale of entitlement from across the area
- Proximity to the ‘backbone’ or major supply channels defined by NVIRP will have a major influence on the location of irrigation in the future, with the cost of connection to the system and transport of water from the backbone borne by the landholder.
- Soil type and the capability of the soil to produce high value crops and maximise return per ML of water used.

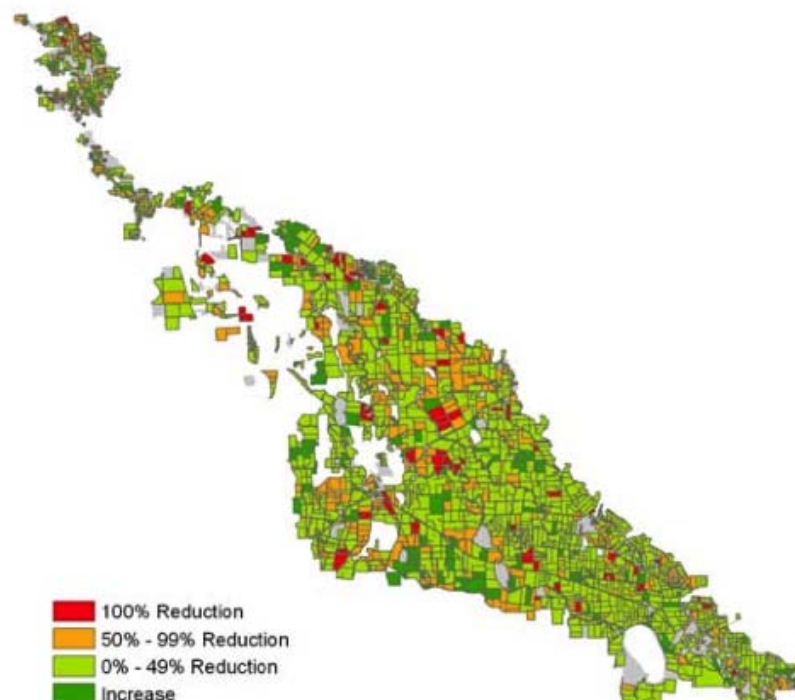
To provide some indication of a future irrigation footprint the results of a number of studies were combined including:

- Change in water use in the TIA to 2005 (Figure 6-1);
- Modelling of targeted buy-back of water to maximise agricultural output and irrigation efficiency as well as environmental benefits such as reducing salt loads to the Murray River (Figure 6-2);
- Proposed backbone in the TIA under NVIRP (Figure 6-3).

### Change in water use in the TIA

To date, sale of entitlements has resulted in a mosaic of irrigated land interspersed with dryland or fallow land uses (Figure 6-1).

**Figure 6-1 Property scale change in water use in the TIA, 1998 to 2005 (Crossman et al 2009)**



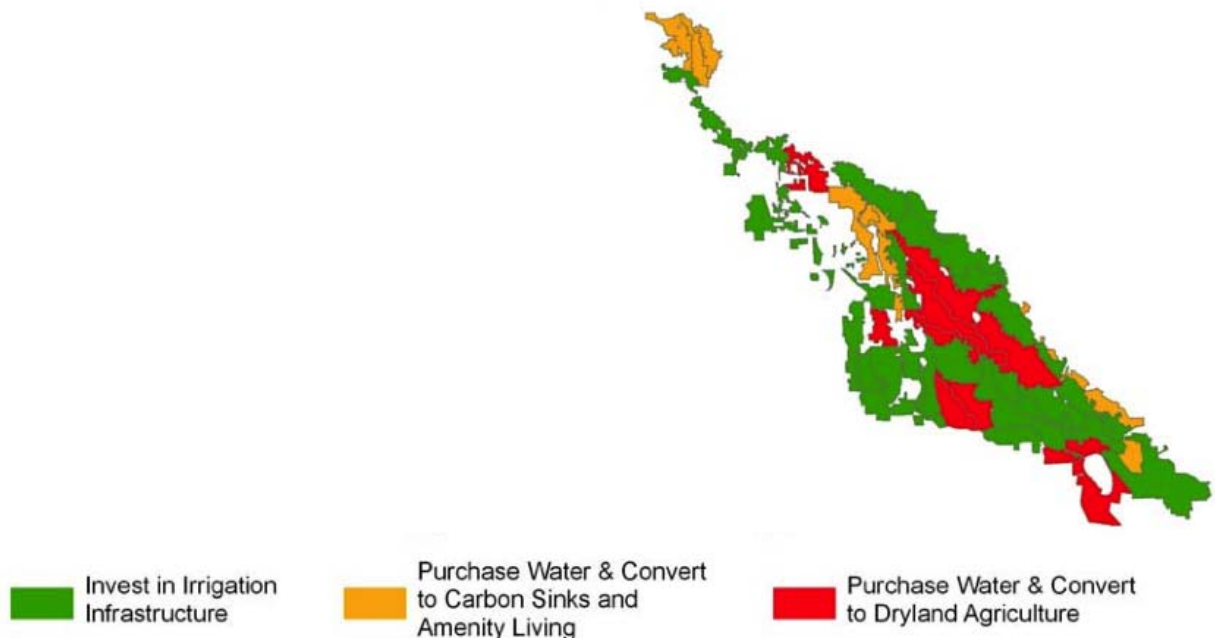
### Modelling of targeted buy-back of water to maximise agricultural output and irrigation and environmental benefits

Crossman et al (2009) developed an approach for reconfiguring irrigation that aimed to increase total benefits – agricultural, environmental and irrigation efficiency. The approach was applied to the TIA using the following criteria to identify areas where different investment strategies for irrigation modernisation could be applied:

- Land suitability for irrigation
- Salinity impact
- Connection to high value environmental assets
- Connection to floodplain ecosystems
- Connection to residential or environmental amenity areas.

This modelling identifies (Figure 6-2) areas for targeted investment in irrigation upgrade to maximise environmental benefits and also to focus modernisation to land with a high suitability for irrigation to maximise agricultural production. (Note that this did not consider water availability constraints or the impact of initiatives such as the Federal buy back or NVIRP.)

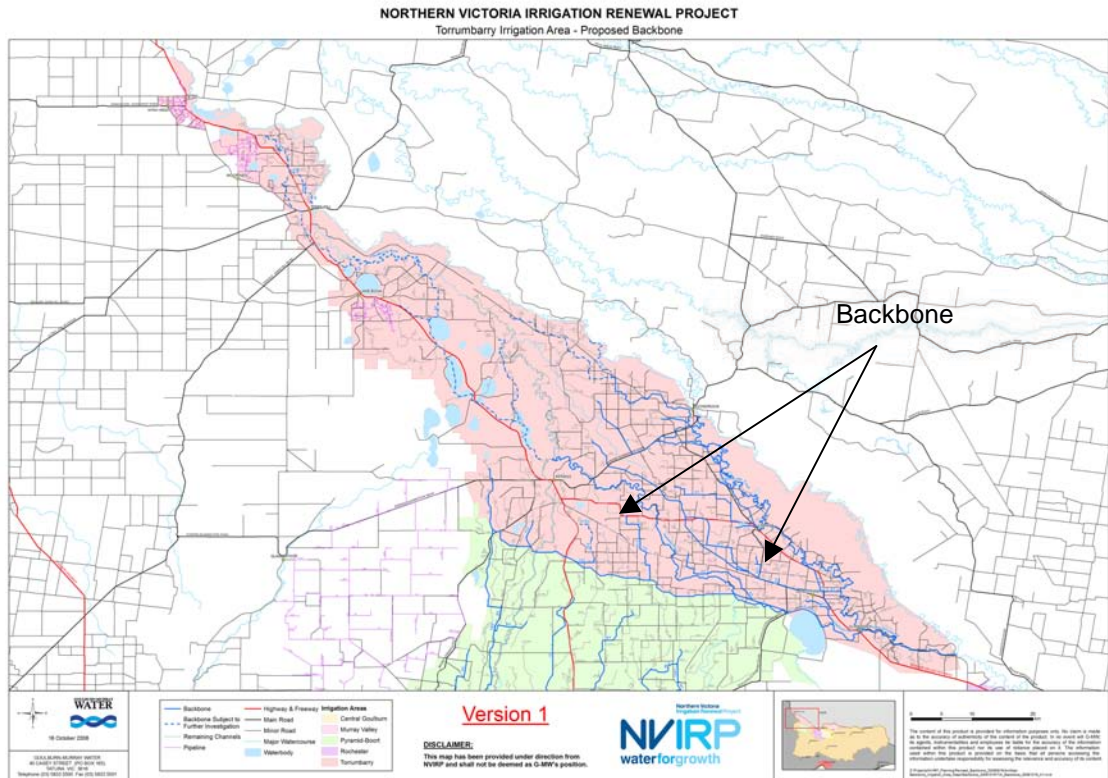
**Figure 6-2 Identification of areas for targeted investment in irrigation upgrade to maximise production, social and environmental benefit (Crossman et al 2009)**



### Proposed irrigation backbone, NVIRP

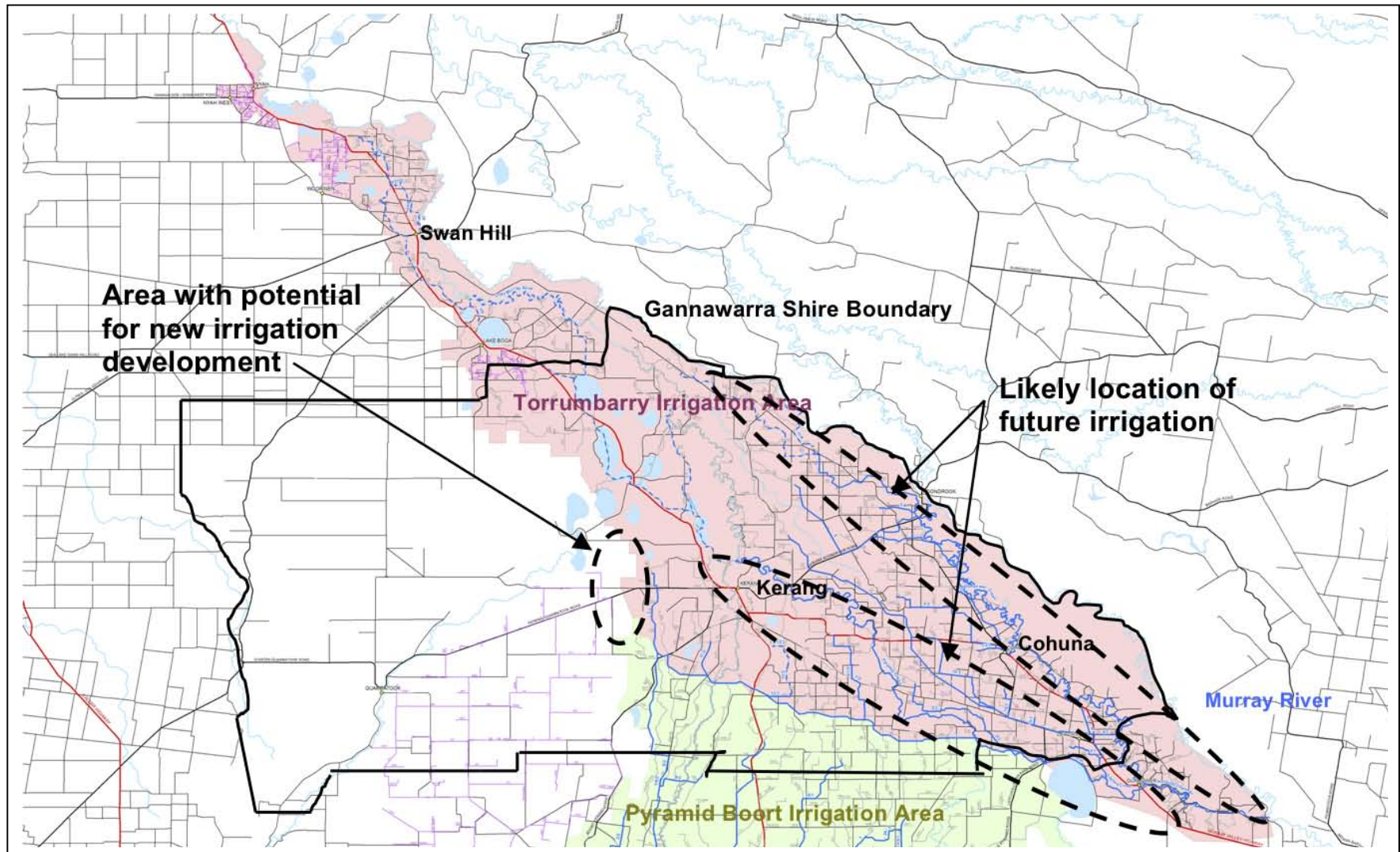
Another consideration will be the cost of connection to and pumping water from the irrigation backbone. Currently, beyond 5km from the backbone, the cost of irrigation is considered to be too high for production of most commodities.

Figure 6-3 Proposed backbone in the Torrumbarry Irrigation Area (NVIRP 2009)



Combining the mapping from these three studies, a map of a future irrigation footprint for Gannawarra is proposed (Figure 6-4).

Figure 6-4 A possible future irrigation footprint in Gannawarra



### **6.3 Conclusion**

Reduced water availability for irrigation in Gannawarra will result in a smaller irrigation footprint and the value of agricultural production in the Shire. The modelling indicates that long term water use of 107GL/year in Gannawarra (150 GL/year in the TIA) will lead to a reduction in the gross value of production of between \$111million and \$80million and the irrigation area reduced by 60% to around 30,000ha. The location of irrigation in the future is likely to be closely aligned with the irrigation backbone.



## 7 Alternative land use options

This section of the report identifies alternative land use options for the new dryland areas of Gannawarra and assesses whether changes to planning policy are required for their implementation.

### 7.1 Agriculture

The North Central Catchment Management Authority with funding from *Caring for our Country* has undertaken a number of studies associated with a wider project - *New Dryland Options for the Loddon Campaspe Irrigation Region*. The study is linked to the Land and Water Management Plan for the Loddon Campaspe Irrigation Area. One of the subprojects, Sub-project 1 - New Dryland is of particular relevance to this study and the findings are referenced in detail in this section of the report. The subproject identifies land use options for new dryland areas in the Loddon Campaspe Irrigation Area, their feasibility and suitability to the region, and opportunities for conducting trials. The findings of this work have been used extensively here.

The following table outlines agricultural options found to be feasible in Gannawarra that could provide sufficient income to support a farming family.

There is an existing intensive animal industry in Gannawarra with a number of piggeries located around Leitchville and Macorna. Gannawarra has a number of attributes that make it attractive for intensive animal production:

- Access to relatively undeveloped land that enable producers to meet the buffer requirements of the Code of Practice
- Access to appropriate infrastructure including power and water
- Capacity to accommodate facilities away from urban centres
- Ready access to feed grains
- Excellent transport network for access to processing facilities

**Table 7-1 Dryland agricultural options for Gannawarra (RMCG 2009)**

Options	Feasibility/Constraints
Stock grazing <ul style="list-style-type: none"> <li>▪ traditional annual pastures</li> <li>▪ saltbush</li> <li>▪ native grasses</li> <li>▪ dryland lucerne</li> </ul>	Area of farms will need to increase substantially (between 2,500ha and 5,000ha) Significant adjustment and population decline in rural areas
Feedlots	Labour requirements Access to reliable water Compliance with Code of Practice
Intensive livestock – poultry, pigs	Labour requirements Access to reliable water Compliance with Code of Practice
Cropping	Area of farms will need to increase substantially (between 1,400ha and 2,400ha) Significant adjustment and population decline in rural areas
Fodder production	Area of farms will need to increase substantially (between 1,400ha and 2,400ha) Significant adjustment and population decline in rural areas

These options are consistent with the Farming Zone, the prevailing zone of the rural areas of the Gannawarra Shire. Planning approval would be required for intensive animal industries and may be required for a feedlot, but subject to meeting requirements on buffers, environmental impacts and effluent disposal should be supported. Intensive animal industries and feedlots should also be directed away from flood prone areas. Given the increasing size of farms and opportunities for growth of the intensive animal industry, consideration should be given to increasing the minimum subdivision sizes from the current 40ha in dryland areas and 20ha (with the opportunity for smaller lots) in irrigation areas. The risk and benefit of house lot excisions should also be assessed as a basis for a review of policy. This is discussed in further detail in Section 10.

### 7.1.1 Options that value-add to agriculture

The following options were found to be feasible but would not support a farming family so would provide an additional and alternative source of income to and agricultural business.

**Table 7-2 Options that value-add to agriculture (RMCG 2009)**

Options	Impacts
Tourism – Farm Stay	Feasible in conjunction with other enterprises or income Limited to areas with landscape or environmental values
Carbon sequestration	Feasible in conjunction with other enterprises or income Market is not well developed so areas required for an economic return cannot be estimated
Creation of planting off-sets	Feasible in conjunction with other enterprises or income Market is not well developed so areas required for an economic return cannot be estimated
Firewood/timber	Feasible in conjunction with other enterprises or income Slow growth rates will limit production

The planning scheme supports tourism that builds upon and can be integrated into an existing farm business on land zoned Farming. A bed and breakfast that accommodates up to six people on an existing farm does not require planning approval. Planning approval may be granted for larger tourism enterprises such as group accommodation and restaurants that are associated with an existing agricultural use. Timber plantations are also supported and may or may not require planning approval depending on their size and location.

There is also opportunity to build on existing tourism assets such as the Murrabit Community Market and caravan parks at Kangaroo Lake and Lake Charm. Caravan parks are prohibited in the Farming Zone so may require consideration of the Rural Activity Zone.

The planning scheme supports carbon sequestration and the setting aside of land for planting of offsets as a part of, and in conjunction with, the existing farming operation.

## 7.2 Renewable energy

At this stage, opportunities for large-scale renewable energy generation are largely driven by the cost of producing the energy. Currently, coal costs about \$50/MWh, gas about \$55/MWh, wind \$120/MWh and solar \$200-220/MWh. Consequently, most investment in renewable energy generation is currently focused on wind energy. Average yearly wind speeds in Gannawarra are not sufficiently high to make it attractive for wind energy capture (Green Hand Institute 2008). However, average daily solar radiation in Gannawarra does make it attractive for solar energy generation.

### Solar energy capture

Solar energy can be converted to electricity in one of two ways:

- Solar photovoltaic - this type of technology generates electricity from light
- Solar thermal - this type of technology generates electricity from heat

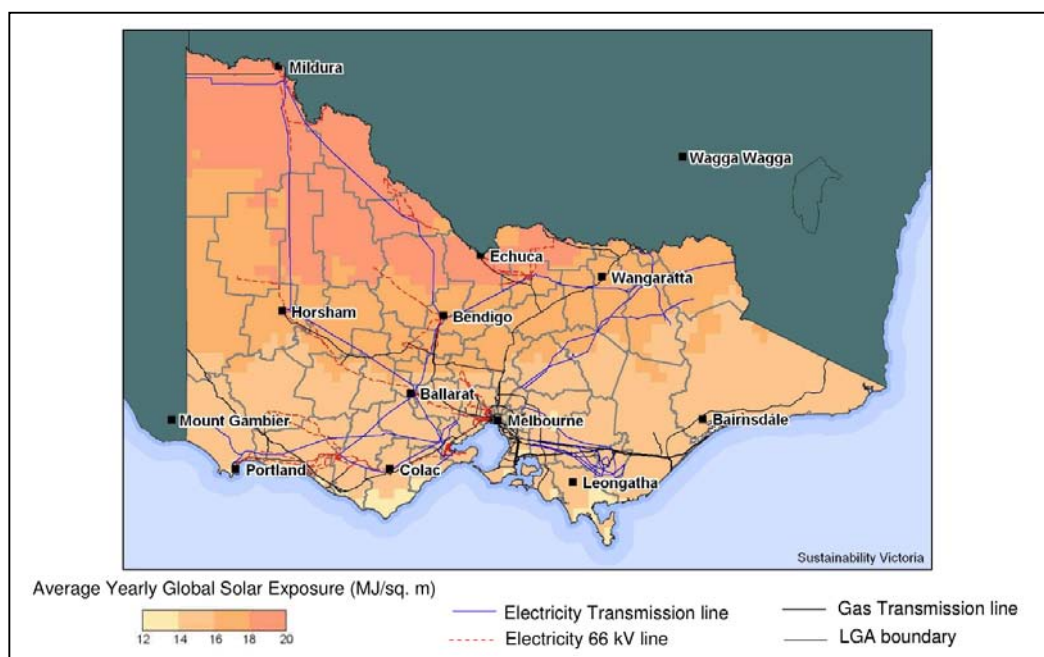
The suitability of an area for solar energy capture will depend on:

- Quality of the sun and minimum energy levels generated. This includes factors like pollution, clarity and consistency. Photovoltaic needs clarity of sunlight while thermal just needs heat. The energy levels generated are important financially as anything above a certain percentage is straight profit.
- Access to, and capacity of, the grid. Access is not so much an issue (almost everyone has access) but size of the grid and the capacity to take extra electricity at that location may be. Most projects are normally looking at between 50-100 MWh, which is unlikely to exceed the capacity of the grid in many places.
- Regulatory. In solar there is obviously the choice between utility size developments or distributed (on houses). At the moment the feed-in tariff is only allowed for up to 1.5kWh of energy so effectively restricts it to households and small businesses.

Figure 7-1 shows the annual average annual solar exposure In Victoria and the proximity to the electricity and gas grid by LGAs. This indicates that Gannawarra is well placed for solar energy capture, however, the opportunities will be limited until there are increased Renewable Energy Targets and more investors looking to participate in the renewable energy market.

Wind energy facilities are subject to planning approval within the Farming Zone. They can be supported in farming areas where the impact on the environment, amenity and landscape is not considered to be significant. The use and development of land for a solar energy facility within the Farming Zone until recently was prohibited. Amendment VC60, gazetted on 21 September 2009, states that Renewable Energy facilities are subject to planning approval within the Farming Zone. They can be supported in farming areas where the impact on the environment, amenity and landscape is not considered to be significant. It may be appropriate to rezone land for Solar Energy Facilities given the prevailing land use would no longer be farming.

**Figure 7-1 Average annual solar exposure and proximity to the electricity grid (Sustainability Victoria 2009)**



## 7.2.1 Options not examined further

The NCCMA study also identified a number of options, which were found to be not viable. The options were not examined further in the feasibility assessment and the reasons for excluding them are show below.

**Table 7-3 Options excluded prior to feasibility assessment (RMCG 2009)**

Option	Reason for exclusion
Alternate stock e.g. goats, emus, ostriches	The information available on alternative stock production systems is limited, especially on a regional scale. It is not possible to assess the feasibility of this option with any degree of confidence. However, there is a history of poor outcomes being associated with alternative stock and a very high risk of poor feasibility.
Processing	Industry other than rural industry is prohibited in the Farming Zone. There may be opportunities for processing of local agricultural produce. However, without further details of the development it cannot be assessed further under the Planning Scheme.
Sub-division for rural residential development	While minimum areas for sub-division have been set for each of the Local Government Area (as per the schedules to the Farming Zone – see appendices), this is only for situations where the subdivision is for agricultural purposes. The Farming Zone cannot be subdivided for rural residential development.
Honey production	Honey production involves the continual relocation of bees to areas where suitable vegetation exists and is flowering. This vegetation is limited in the LCIR. Furthermore honey production is not relevant to a single farm scale operation.
Seed production for revegetation	The demand for native vegetation seed is not high enough to warrant assessing the feasibility of this option further. Some local businesses already exist to supply this service and cover the current demand.
Kangaroo meat	There is limited information on kangaroo meat production systems. It is not possible to assess the feasibility of this option with any degree of confidence. However, it is predicted the area required to produce kangaroo meat would exceed the current farm size in the LCIR. Furthermore, other regions have a competitive advantage due to the large areas available e.g. western NSW and northern South Australia (rangelands).
Bush food	There is limited information on bush food production systems. It is not possible to assess the feasibility of this option with any degree of confidence. Additional research and trials are needed before this option is adopted.
Ecosystem service – maintaining soil fertility, provision of shade and shelter	No market exists for these services as they are largely based on private benefit.
Ecosystem service - control of agricultural pests	This is a duty of care requirement – it is unlikely a market will become available for the control of pests. Opportunities for additional payments are rare.
Ecosystem service – water balance	Actions undertaken by a landholder on an individual farm are unlikely to have a measurable impact on the regional groundwater system. There is no market available for this service and it is not expected that one will develop in the future.

Option	Reason for exclusion
Ecosystem service – floodplain management	The Goulburn Broken CMA is investigating this area. However, their landscape is quite different to the LCIR (vegetated). Goulburn-Murray Water is also looking into opportunities for paying farmers to not farm the floodways by buying properties and realigning the boundaries. Some properties have already been purchased by superannuation funds (e.g. Kilter) to obtain additional floodplain management outcomes. This may be more of an opportunity for groups of farmers rather than individual farmers. However, in all three cases, the source of funding to pay for floodplain management services has not been identified.
Ecosystem service – moderation of wind and water over the landscape	The flat topography and heavy soils means the region is at a low risk of erosion. There is no market available for this service and it is not expected that one will develop in the future.

### 7.3 Boutique agriculture

There a number of areas in Gannawarra that lend themselves to boutique agriculture. This includes areas around towns such as Kerang and Murrabit that have been used for agriculture in the past but due to the settlement and development pattern are not attractive for development of large scale agricultural businesses. However, their proximity to towns and access to water for irrigation make them attractive for boutique agriculture.

It needs to be highlighted though that boutique agriculture will never be at a scale to make a significant economic impact. It should therefore be located so that there are minimal impacts on commercial-scale agriculture.

### 7.4 Planning permits for intensive animal husbandry

Landholders looking to establish a new or expand an existing intensive animal facility will need to apply for a planning permit. For a cattle feedlot, piggery or broiler farm, a key element in approval of the planning permit, is for the landholder to demonstrate compliance with the relevant Code of Practice:

- Victorian Code for Broiler Farms (2009)
- Code of Practice Piggeries (revised 1992)
- Victorian Code for Cattle Feedlots (1995)

These set out requirements for:

- Location, siting and size
- Farm design, layout and construction
- Traffic, site access, on farm roads and parking
- Landscaping
- Waste management
- Farm operation and management

It is essential that the requirements of these codes are understood and considered prior to purchasing land or making other investments for establishment of a new facility or expanding and existing facility.

## **7.5 Conclusions**

Alternative agricultural uses for new dryland farmland in Gannawarra include broadacre cropping and grazing and intensive animal production. There is an existing intensive animal industry and the Shire has a number of attributes that make it attractive for further expansion. Other land use options such as tourism, carbon sequestration and native vegetation offsets are unlikely to be viable as a sole enterprise but could complement agricultural land use. The area is suited to renewable energy generation, particularly solar, and this may become a viable land use and could complement an agricultural land use or be a stand-alone enterprise. However, the timing and scale of a local solar industry will depend on expansion of Renewable Energy Targets and ultimately the price paid for electricity generated from solar sources. There are some opportunities for boutique agriculture on irrigated land around townships.

## 8 Stakeholder Views

### 8.1 Consultation

Consultation was undertaken to test the findings of a desktop review of the current situation with Gannawarra and also future scenarios for water use, agriculture and rural land use. A series of phone interviews was conducted with local representatives from the Department of Primary Industry, agribusiness and real estate agents. The interview questions are listed in Appendix 2. A workshop was also held with agency representatives. This section of the report documents the findings of the consultation.

Note that due to privacy restrictions, the consultant team were unable to contact landholders who had sold water to discuss their reasons for selling and future plans for the land.

### 8.2 Local industry phone interviews

#### Rationale for permanent trading

Both permanent and temporary water trading has occurred in the Gannawarra Shire, with the predominant reason for permanent trade being the desire to improve cash flow and cover existing debts (\$2,000-3,000/ML was available July 2009). Some respondents felt that when water trading was first introduced, many individuals sold their water to complement their superannuation. They then either remained on the farm (as a lifestyle property) or sold the land and moved to an urban centre to retire. In recent times however, those selling permanent water have done so as a result of extreme hardship through ongoing drought and low water allocations i.e. trade has occurred through financial and emotional necessity rather than desire.

Permanent trade of water is thought to be a sensitive subject in the region due to the perceived negative implications for land values.

#### Age trends

A mixed response was obtained regarding whether permanent trade of water was linked with specific age groups in the Shire. Some felt that no pattern was obvious, with both younger (up to 35 years) and older irrigators selling water permanently. However, the reasons behind selling water were thought to differ for each group. General observations were:

- Younger irrigators are selling water “for a quick buck”
- The older generation would like to leave farming but does not have a younger generation in the family willing to continue the farm.

Others have noticed that as older irrigators sell water, an opportunity has arisen for younger irrigators to gradually move into more productive irrigation land at a cheaper rate as the water had been traded away. Those starting out in irrigation farming tended to purchase farms of lower land capability (low capital inputs, but higher management inputs) due to the cheaper purchase price. Over time, some have bought better quality irrigation land (where water has been traded away) and have traded water back onto these higher productive areas. This process is thought to be more cost effective than purchasing a good quality irrigation farm from the outset.



## Land use trends

Responses varied in terms of the types of agriculture experiencing the greatest permanent trade of water. Most interviewees felt mixed farming had the highest permanent trade initially due to land productivity generally being lower and mixed farming systems having a higher degree of flexibility and adaptability to changing conditions. As low water allocations have continued and milk prices have declined, the dairy industry has experienced substantial levels of permanent water trade. Occasionally a mixed farm will also permanently sell.

The dairy zone around Kerang (particularly east of Kerang near the Tragowel corner and towards Cohuna) has had a particularly high volume of permanent trade from dairy farms. Other areas experiencing relatively higher levels of permanent trade were seen to be Macorna and Murrabit. Permanent trade outside these areas was thought to have a scattered distribution.

## Current “new dryland” land use

Areas where water has been permanently traded are generally considered to be salt affected, marginal land that has a low potential for productive agriculture outside irrigated crops and pasture. In many cases, the land has been “abandoned” resulting in extensive weed issues (e.g. Soft Roly Poly, Bathurst Burr). Many commented that the increase in Soft Roly Poly has been dramatic and has resulted in both practical and aesthetic impacts (e.g. choked irrigation channels).

Some of the more productive areas have been leased for agistment of stock. There are also some cases of dryland lucerne being established. One respondent commented that there has been a lag period between the conversion to new dryland and the management of that land, with some growers continuing stocking rates based on the historical irrigated pasture system. This has resulted in over-grazing, pasture health declining and land degradation.

Several new dryland farms have attempted rainfall based cropping with limited success due to the dry conditions. One grower with self-mulching black clays had produced no crops over the last three years due to a lack of rainfall.

Despite the above, the large majority of areas where water has been permanently traded are not currently being used for production.

## Future “new dryland” land use

Interviewees believed few alternative land use options have been considered or adopted by owners of new dryland, outside those currently attempted.

Only one example of new land use was identified – the Future Farming Landscapes investment initiative by VicSuper. Through the initiative, Kilter Pty Ltd purchased agricultural land through the Lake Boga and Kerang regions. More productive soils have been used for irrigation, while less productive areas are being developed for new income streams e.g. forestry, green energy, water (floodplain) and ecosystem services.

This example is not indicative of smaller scale individual farm businesses.

## Temporary trade

In previous years, there has been some temporary trade of water into areas where water has been permanently sold. This was predominantly used for providing supplementary feed for stock (e.g. sorghum and millet annual summer forage crops). Purchase of temporary water has occurred more in mixed farming systems rather than dairy or horticultural systems.

This year resulted in little temporary trade in the region for summer crops. Despite a reduction in water price from \$600/ML to \$300-350/ML, the reduction in grain prices have meant a low demand for temporary water. One respondent stated wheat production was currently \$250/t, which at 6t/ha equated to a breakeven water price of \$350/ML. Therefore, this year there has been little incentive to purchase water temporarily.

## Ownership of new dryland

New dryland areas are available for purchase on the market, however the rate of sale has been variable with little interest in some blocks and others being more desirable depending on the assets associated with the block (e.g. dwellings). Many respondents were surprised the value of new dryland had been relatively stable following the initial halving of value when water was traded off the land. Land sold for \$1,600/acre two years ago and now sells for approximately \$800-1,000/acre (after declining to \$100/acre in some cases). Several commented that the value of the land is closely tied with the productive potential (which is viewed as low for new dryland), however the land is on the market for a much higher rate. Many thought new dryland areas could provide approximately \$200/acre.

One respondent felt there was a sentiment amongst some landholders to purchase property to improve the layout of their farms (“get the perfect square”) and because it is rarely available on the market.

The availability of delivery shares with a parcel of land can be a positive or negative for buyers - delivery shares provide the potential to trade water back on the farm but have a high annual cost (\$2,500 per delivery share).

Individuals from outside the local area (e.g. Melbourne, Western Australia) are purchasing new dryland properties. The reasons for purchasing these properties vary greatly with some planning dryland systems and others using land for lifestyle uses (e.g. horses).

## Conclusions

- Permanent water trading has occurred in the Gannawarra Shire predominantly for financial reasons (supplementing retirement funds, covering debt during financial hardship).
- Irrigators of all ages are selling water permanently, although the reasons vary depending on their stage of life.
- Permanent water trade provides opportunities for irrigators to expand or upgrade their existing properties onto more productive soils.
- Mixed farming experienced the greatest permanent trade of water initially. Dairy farms are now also trading water permanently.

- Kerang has experienced the greatest trade of permanent water. Macorna and Murrabit have also had substantial permanent water trade.
- Many areas where water has been permanently traded away are “abandoned” and associated with poor land management. Dryland cropping on these areas has been unsuccessful due to a lack of adequate rainfall. Grazing on these areas has not often accounted for the change to rain fed pasture and over-grazing has occurred.
- Few commercial land use options outside traditional dryland farming systems have been identified or adopted by local landholders in areas where water has been permanently traded away.
- Temporary trade of water onto new dryland areas has occurred in the past to supplement stock feed (summer forage crops). Low grain prices have resulted in little temporary trading back into the Shire this season.
- New dryland land values are dramatically less than the land values prior to water trade. However, the land values in new dryland areas are surprisingly still well above the productive potential of the land for dryland agriculture.

### **8.3 Agency workshop findings**

A workshop was convened involving representatives from Goulburn Murray Water, NVIRP, Department of Primary Industry, and North Central Catchment Management Authority and attended by Councillors to test findings of the future scenarios modelling. A list of the workshop attendees is provided in Appendix 3.

The scenarios with regard to future water use were discussed. Views ranged as follows:

- The future scenarios are not very positive and there are many variables in the way water use may unfold influenced by prices (water, inputs, commodities, government policy)
- While the trade out figures could be argued, they are relatively minor compared to the amount that will go via federal buy-back.
- GMW felt that the long term water use scenario was realistic (220GL in the TIA by 2030)

Circumstances noted by participants that were not picked up in the report:

- Human innovation and enterprise
- Don't know what the future holds
- What is Gannawarra's competitive advantage and what will attract innovation?
- There is little surplus cash amongst current landholders to experiment and trial new things. Innovation is likely to come from new migrants or injection of funds from outside the region.

#### **Agency policy and programs**

The agency representatives were asked to comment on their agency policy and programs and what opportunities they may present for Gannawarra. The following is a summary of the responses:

## **DPI**

DPI has a free market position such that where adjustment is necessary, the market will determine the outcome and government should not interfere other than to provide advice and information to assist with decision-making.

## **NVIRP**

The program of modernisation and upgrade is focused on a regional development outcome through securing water and the irrigation industry

## **GMW**

The unknowns are more an issue than the known. Greenfield sites are more efficient to develop than re-development of existing small holdings – what role can ‘we’ play in assisting this transition.

## **NCCMA**

Committed to the new dryland and options for its productive and sustainable use.

## 9 Socio-economic impacts of reduced water use in Gannawarra

This section of the report takes the modelled water use future for Gannawarra and considers the impacts that this may have on farm businesses, the regional economy, employment, and the Shire. **This section of the report should be read with caution.** The socio-economic analysis has only considered the impacts associated with the changed water use circumstances and agricultural output outlined in Section 6. It does not consider the emergence of new industries or other influences on economic development that may occur over the next 30 years. It is intended to provide a sense of the potential *scale* of the changes in employment, population and the regional economy that may occur. It is also intended to provide Gannawarra with a platform to address structural adjustment through State and Federal Government programs.

### 9.1 Farm level impacts

#### Farms transitioning to dryland

As discussed in Section 7, without irrigation, the soil types and climate of Gannawarra are capable of supporting broadacre grazing and some cropping. With the climate in Gannawarra, a family would require between 2,500 and 5,000ha (RMCG 2009) if dependent on the farm as the sole source of income. Even with some form of off farm income, dryland operations will require an increase in holding size.

The stakeholder interviews indicate that the transition from irrigated to dryland production systems can be difficult for some landholders. The transition will require a new set of skills, knowledge and over time, access to equipment and machinery of more suitable scale.

Redevelopment of irrigation properties for dryland production will require dismantling of irrigation infrastructure including channels, levees, as well as changing the farm layout to suit broadacre production systems. Redevelopment will therefore be costly. Past experience suggests that redevelopment is more likely to be undertaken by new migrants to Gannawarra rather than current landholders. There will be landholders who wish to continue living on the farm with or without some form of production while others will try and sell their properties for which there is a relatively small market. Land leasing is also an option for landholders.

The transition from irrigated production to dryland production is therefore likely to take some time and there will be periods when some land will be unproductive. While this is not ideal, solutions should focus on ensuring the land is attractive to investors for productive uses of the land.

#### Farms continuing to irrigate

Irrigation will continue and the irrigation footprint will evolve over time. In the short to medium term, the irrigation footprint will reflect a combination of sale of scattered entitlements, targeted buyback and consolidation around the NVIRP backbone. In the longer term, irrigation is likely to be consolidated 5km either side of the backbone (beyond 5km, the cost of transporting water becomes prohibitive unless for very high value commodities).

For irrigators close to the backbone, there will be opportunities to capitalise on the upgrade of the irrigation network and improve water use efficiency. Irrigators looking to make long term investments in farm improvements and expanding operations will be looking for affordable land close to the backbone.

Irrigators more remote from the backbone have the option of continuing to irrigate. However, there will be a price penalty associated with higher costs of connection to the backbone and higher ongoing costs of transporting water.

### Broader regional impacts

Econometric modelling by SGS Economics and Planning quantified the impacts of the future water use scenarios on regional output, population and employment. The modelling estimates how \$1million of turnover within the agricultural industry flows through to the region as:

- Output (income or turnover)
- Value added (or contribution to Gross Regional Product or regional output less the value of imported product embodied in regional output).
- Full time equivalent employment levels.

#### 9.1.1 Modelling assumptions

The modelling was undertaken using the same assumptions to estimate future gross value of production in Section 6.1, summarised here again in Table 9-1. The modelling identifies how regional output, value added and employment is likely to change as the water use in Gannawarra moves from the Base Case in 2009 to Scenario 1 or Scenario 2.

**Table 9-1 Summary of modelling assumptions**

	Gross value of production (\$million)*	Assumptions
<b>Base case – 2009</b>		
Total Agricultural area	266	253 GL water use (long term cap equivalent) GVP irrigation - \$715/ML Water applied @ 3.9ML/ha GVP dryland \$200/ha
Total irrigated area	195	
Total dryland area	53	
<b>Future scenario 1 – 2029 gross value of production \$715/ML</b>		
Total Agricultural area	155	107 GL water use (long term cap equivalent) GVP irrigation - \$715/ML Water applied @ 3.9ML/ha GVP dryland \$200/ha
Total irrigated area	76	
Total dryland area	62	
<b>Future Scenario 2 – 2029 gross value of production \$1,000/ML</b>		
Total Agricultural area	186	107 GL water use (long term cap equivalent) GVP irrigation - \$1000/ML Water applied @ 3.9ML/ha GVP dryland \$200/ha
Total irrigated area	106	
Total dryland area	62	

\* Total GVP includes the value of production for intensive animal husbandry (\$18million), which is assumed to remain the same in both scenarios.

### 9.1.2 Economic activity and employment

The results of the modelling are summarised in Table 9-2. The modelling indicates that by 2029, moving from the Base Case (2009) to:

- Scenario 1 would be associated with an overall decline in regional output of \$157 M annually, regional value added of \$37 M annually and regional employment of 636 jobs.
- Scenario 2 would be associated with an overall decline in regional output of \$113 M annually, regional value added of \$27 M annually and regional employment of 456 jobs.

A reduction in water use in Gannawarra will have impacts on the regional economy. However, the modelling does demonstrate that within a reduced water use regime, there are opportunities to reduce the socio-economic impacts by increasing productivity per megalitre of water used. This can be achieved through adoption of more efficient irrigation systems as proposed under the upgrade and modernisation of the irrigation infrastructure by NVIRP.

Therefore, it is critical to the regional economy that strategic actions by Gannawarra will minimise impediments and support a more efficient irrigation sector.

**Table 9-2 Direct and indirect impacts on regional output (\$million per anum) and employment by 2029**

	Direct impact on output		Total value added		Total employment	
	Irrigation	Dryland	Irrigation	Dryland	Irrigation	Dryland
Base case - 2009	195	53	66	21	1,159	439
Future water use scenario 1	76	62	26	25	452	509
Future water use scenario 2	106	62	36	25	632	509
<b>Change from base case</b>						
Future water use scenario 1	-110		-37		-636	
Future water use scenario 2	-80		-27		-456	

### 9.1.3 Population

*Victorian in Future* (DSE 2009) has predicted that Gannawarra's population in 2026 will decline slightly to 10,810 or 855 less than the population in 2006. (These projections are based on analysis from the 2006 Census of Population and Housing and consider rates of fertility, mortality and migration)

Using an employment to population ratio the impact of reduced water use on population can be estimated. Currently in Gannawarra, for every 1 person employed there are 2.48 people living in the Shire. Based on a drop in employment of 636 from Scenario 1 and 456 from Scenario 2, the population is expected to decline by 1,577 and 1,131 persons respectively on top of the decline predicted by DSE. This gives a total predicted population of 9,233 and 9,679 respectively (Table 9-3).

Note this assumes that no new industry or employment opportunity arises during this time period.

**Table 9-3 Population estimates for 2029**

	<b>Population loss</b>	<b>Total predicted population (including predicted decline by DSE and additional decline from reduced water use)</b>
Future water use scenario 1	-1,577	9,233
Future water use scenario 2	-1,131	9,679

A population of 10,000 is considered a threshold below which communities have difficulty in generating sufficient economic activity to be sustainable in the long term (Australian Local Government Association 2003) and there is a significant increase in the incidence of community vulnerability in rural communities (Australian Housing and Urban Research Institute 1999)

The estimated population decline attributed to reduced water use will potentially see Gannawarra's population hit the threshold below which key community services such as health, banking, finance and retailing can be supported. This poses a further risk of a spiraling decline in population that can result in closure of facilities such as schools.

## 9.2 Local government

### Rate revenue

One of consequences of permanent water sale from Gannawarra is the loss of rate revenue. As irrigated land is converted to dryland the Capital Improved Value of the land, on which the rates are calculated reduces. Currently, 38% of Gannawarra's rate revenue comes from agricultural land, with rates on irrigated land contributing 75% of this.

A reduction in the area rated as General Farmland Irrigated from just over 100,000 ha to around 30,000 ha (Gannawarra Shire Annual Report 2008/09) and a concomitant rise in the area rated as Farmland Dryland, is estimated to result in a 19% reduction in total rate revenue (based on 2009 rates) or just over \$1million per annum. Gannawarra ratepayers have been shielded to some degree from the full impact of the unbundling of water entitlements on rate revenue. A State Government Incentive Program provided assistance to Council to make up the rate revenue shortfall caused by the reduced land values following separation of land titles and water entitlements (Gannawarra Shire 2009). The incentive program will cease in 2010.

Infrastructure maintenance and service provision is already a significant challenge for small-economy municipalities such as Gannawarra. Further decline in rate revenue will make service provision difficult without additional support. With population predicted to decline by 1,000 by 2026 (DSE 2009), the burden of re-distribution of rates would fall heavily on to fewer residential rate payers, many of whom are on some sort of government support, and commercial and industrial businesses relying on fewer customers. Increasing charges for services will be increasingly difficult with a declining and mainly ageing and welfare dependent population.



The Australian Local Government Association (2003) noted that in ageing municipalities, with low levels of disposable income, the capacity to pay rates became more stressed, there was an increase in the proportion of the population entitled to pensioner rate concessions and increased reliance by local government on fees and charges

### 9.3 Comparisons with other municipalities

Gannawarra is not unique in the circumstances it is facing. Neighbouring municipalities such as Buloke, Loddon and across the river in New South Wales, Wakool Shire are also experiencing declining populations (Figure 9-1, Figure 9-2) exacerbated by the economic and social impacts of reductions in long term irrigation water use. By comparison, the municipalities of Swan Hill and Campaspe with larger populations and associated service industries will be able to maintain or increase growth. They also have stronger irrigated agricultural sectors, based on horticulture and dairy and are less likely to see significant reductions in water use in the long term.

There is an opportunity for Gannawarra to form strategic partnerships with other municipalities to build a strong case for State and Federal Government support for assistance during this period of significant structural adjustment. It will also be important to maximize opportunities from partnerships with neighbouring municipalities with stronger and more diverse economies.

**Figure 9-1 Population change in northern municipalities (DSE 2008a)**

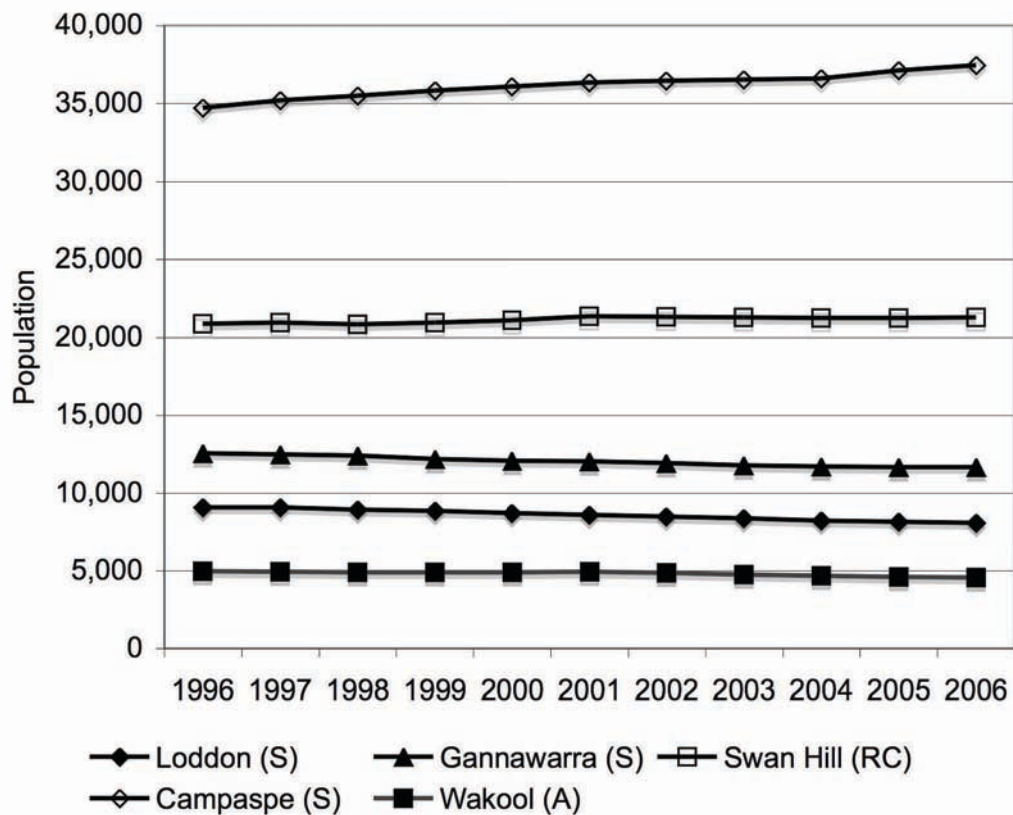
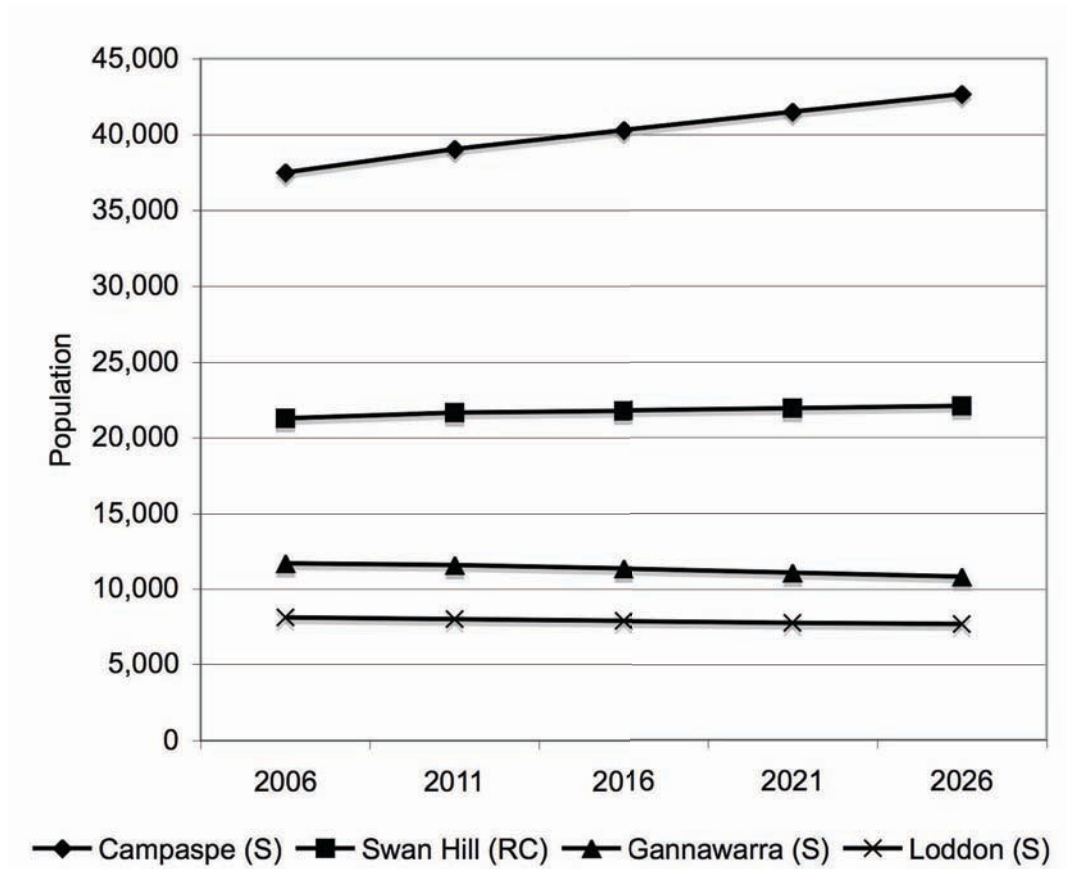


Figure 9-2 Predicted population change in northern municipalities (DSE 2008a)



## 9.4 Conclusions

Conversion of irrigated farms to dryland will have impacts at the farm, local and regional level. There are a few productive dryland uses including agriculture, renewable energy and production for carbon markets. These all require large property sizes e.g. for dryland grazing and cropping over 2,500ha. Transition to alternative dryland uses is likely to occur in the medium to long term with investment from outside the region. It will be important planning policy responds to these productive uses and not to shorter-term structural adjustment issues.

Reduced water use in Gannawarra will impact on local and regional output with associated declines in employment and population. However, upgrade and modernisation of the irrigation infrastructure has the potential to increase productivity per megalitre of water use and an opportunity to mitigate the social and economic impacts. It is critical therefore that planning policy focus on minimizing impediments to a more efficient irrigation sector, particularly in the 5km zone either side of the irrigation backbone.

Gannawarra is not the only municipality facing reduced water use, a declining economy and population. Gannawarra's neighbours, Loddon in Victoria and Wakool in New South Wales, are both in similar situations. There is an opportunity for Gannawarra to form strategic

partnerships with other municipalities to build a strong case for State and Federal Government support for assistance during this period of significant structural adjustment.

The transition of irrigated land to dryland is beyond the influence or control of Council, driven as it is by Federal and State policy and climate conditions. However, Council is in a position to strongly and positively influence perceptions of Gannawarra as an area with a competitive advantage for irrigated agriculture. Planning policy that strongly supports irrigated agriculture and makes Gannawarra an attractive area for ongoing investment in irrigated agriculture is within Council's control.

## 10 Planning policy recommendations

### 10.1 Principles and considerations

#### 10.1.1 Planning policy scope

The trend in sale of permanent water entitlements and the associated impacts is understandably, of critical concern for Gannawarra, its Council and community. It is occurring at a time when the Gannawarra community is grappling with the challenges of population decline, ageing demographic, drought and a less resilient local economy.

A key driver for Gannawarra in undertaking this study was to identify productive and sustainable land use options for the new dryland area and recommend planning policy to accommodate these outcomes. There is an underlying expectation that changing planning policy will translate into economic and/or population growth. Planning policy, on its own, cannot drive economic growth or population growth. It can complement or respond to economic development and population initiatives. Therefore, in developing planning policy recommendations, principles underpinning sound economic development and population growth strategies for municipalities undergoing structural adjustment were considered. This provided clarity around the purpose and desired outcomes of any planning policy changes. These principles are summarised here.

#### 10.1.2 Economic development

The Australian Local Government Association Report: *Competitive Regions* (1999) outlines the economic development and local strategies for strengthening regional economies. The statements most relevant to this study include:

- *Globalisation and structural change are the most significant forces impacting on international, national and regional economies and local government needs to be positioned to respond to the challenges that these forces pose for communities.*
- *Regions can respond and adapt by identifying and strengthening their competitive advantages. Fostering competitive advantages and developing those sectors that have a particular export orientation is likely to realise significant economic return. Wealth generating initiatives (driven by exports) can be complemented by consumption led growth (driven by population growth).*
- *While not all regions will develop a dominant international export driven economy, it is important that strong links are forged with neighbouring regions that have or will.*

Gannawarra's dairy industry is part of a regional industry with an export focus. Significant investment in irrigation infrastructure upgrade is occurring that will provide opportunities to improve efficiency of water use in the dairy industry and potential growth of horticulture. In order to maximise the economic potential of this industry, Gannawarra as an overarching strategy should:

- Maintain strong relationships with the dairy industry and communicating the Shire's efforts to provide a sound base for the dairy industry into the future.
- Actively engage with NVIRP

- Maintain strong relationships with neighbouring 'dairying' municipalities to ensure alignment of policies supporting dairy, actively promote Gannawarra's dairying credentials, ensure engagement in and identify opportunities for Gannawarra to capture spin offs from wider regional dairying initiatives.
- Ensure that Gannawarra's policies strongly support the dairy industry.

Gannawarra's intensive animal industry, while modest compared to some other regions, has capacity to expand. It is well located close to grain feed sources and processors. Importantly, Gannawarra has a competitive advantage over other areas in sufficient land to accommodate buffers from urban settlement. Planning policies should support expansion of the intensive animal industry

Planning policy should also ensure that Gannawarra is positioned to support new industry requiring rural land including development of land identified as Prime Development Zone.

### **10.1.3 Population growth**

The 2003-2004 *State of the Regions* report prepared for Australian Local Governance Association by National Economics examined the relationship between demographic change and regional productivity. The report explains that although population growth is a strong driver of regional productivity, it will be the type of population growth that will be of importance to local government as the ageing of the population continues over the next few decades. The report concluded that if population growth were concentrated in the working age group it would act as a powerful positive driver of regional economic performance. On the other hand, if population growth is concentrated in the 55 and over age group, regional productivity will decline. The consequence is that unless population growth comprises people aged 25-54, then a smaller economy will result.

The report also found that population ageing could exacerbate trends in regional economies currently experiencing lagging economic growth i.e. they will age more rapidly and experience lower population growth compared to those regions with stronger economic performance.

Planning policy aimed at attracting the retiree market should not be in conflict with policy to support economic development.

### **10.1.4 Structural Adjustment**

Gannawarra, like a number of regional communities is experiencing decline as a result of structural adjustment. A strategy to address these issues should focus on measures to facilitate growth of competitive industries, investment in public services and facilities to compensate for a decline in these activities and avoid short-term measures that will artificially prop up the economy. There is a temptation to focus on the problems, in this case, areas transitioning to dryland. However, this study has found that the greatest economic opportunities will come from irrigated agriculture. Gannawarra's strength now and into the foreseeable future will be in the dairy industry. It will be critical that the wider dairy industry, the water sector and agribusiness are clear that Gannawarra is committed to supporting investment in dairy.

### 10.1.5 Planning policy outcomes

To complement broader economic development, population growth and structural adjustment strategies, the planning policy recommendations should therefore seek to:

- Maximise Gannawarra's competitive advantages
- Maximise Gannawarra's economic strength and minimise impediments to growth
- Plan for the long term and avoid policy that responds only to short term structural adjustment pressures.

## 10.2 Planning Response

### 10.2.1 Introduction

Through this project, Council is seeking to develop a position about how best to use and manage the irrigation and new dryland areas of the Shire to support the economic viability of the region following water reform. The loss of water from the region and reduction in irrigation footprint changes the prospects and respective value of land for different land uses. It also changes the conditions required to promote or support rural land uses, in particular agriculture. This fundamental change to Gannawarra forces a rethink on the role and function of the rural areas, as well as a review of the planning controls. Planning controls need to be reviewed to ensure they support any revisions to the land use planning framework, as well as respond to the changed underlying conditions for agriculture and associated requirements.

The following sections of this chapter, detail the planning response including revised vision, objectives and planning policy for rural land in Gannawarra.

### 10.2.2 Background

Gannawarra Shire is facing a significant change to its economy, character and identity as a result of changes to the irrigated agriculture sector. Drought, water trading, Federal buy back, modernisation and climate change together will result in less water being available to Gannawarra irrigation farmers and a contraction in the area of land with access to irrigation.

Agriculture is the core of the Gannawarra economy, and irrigated agriculture is a substantial component of the agricultural sector. Reduction in irrigated agriculture will affect the local economy, and removal of irrigation from some areas will affect the viability and sustainability of these areas for agriculture.

Gannawarra retains a number of significant competitive advantages despite these challenges, including:

- Access to modernised irrigation network
- Road and rail infrastructure
- Environmental assets including Ramsar wetlands, lakes and Murray River
- Attractive residential options that are in a commutable distance to regional centres such as Swan Hill and Echuca.
- High solar access

- Large properties which can provide buffers for intensive animal industries

Council is faced with a number of opportunities and demands on its rural land and this land use planning response builds on these competitive advantages and aims to protect opportunities for agricultural growth, provide for new agricultural opportunities, as well as support other rural land uses such as tourism, conservation and rural lifestyle.

This response is influenced by a State planning policy context that directs that rural land should be maintained for agricultural use where it has productive potential, rural living must be sustainable in terms of environmental, economic and social cost and environmental assets are to be protected.

Council has previously done a significant amount of work in relation to planning for a sustainable supply of rural living land around the Shire. The findings of this project do not change the outcomes of that project. The changes to agricultural prospects as a result of changes to irrigation opportunities do not alter the supply and demand scenario planned for in the Urban and Rural Strategy Plan. This project addresses the non-residential prospects for rural land.

### **10.2.3 Vision**

The key outcome that Council is seeking from its rural land is ongoing economic viability. The land use planning framework aims to take advantage of the attributes of the Shire and plan for land uses that can generate jobs and income, and support residents remaining in the Shire.

Following modernisation, the irrigation infrastructure available in Gannawarra will be a significant asset and competitive advantage. Gannawarra includes high quality soils that will have access to a world-class irrigation system and these areas will be used for highly productive agriculture and will be the core of the local economy.

To supplement this, opportunities will be provided for boutique and niche agriculture that utilises the soils and water of the area and can enhance the local tourism experience.

Other rural land uses will be supported including intensive animal industries, renewable energy development, and rural industry and timber plantations.

Tourism will also be supported by providing opportunities to experience the significant natural assets of the Shire, including the wetlands and Murray River.

### **10.2.4 Objectives**

The land use planning framework and recommendations for changes to the planning scheme are based on the following objectives:

- To enhance economic development, in particular job creation in the Shire
- To retain population
- To retain services
- To build on strengths and assets of the Shire

- To minimise restrictions on farming development and maximise flexibility
- To support innovation and growth

## 10.2.5 Planning policy recommendations

### Irrigation areas - Farming Zone 1

The purpose of the irrigation areas is to maximise the potential for irrigated agriculture and the returns from the available water. This outcome will be supported by retaining large lots and minimising dwellings and other land uses not compatible with irrigated agriculture. Dwellings have the potential to restrict agricultural practices through complaints about amenity impacts.

It is recommended that:

- These areas remain zoned Farming
- Local planning policy be amended to:
  - Discourage the creation of new lots, including house lot excisions
  - Discourage the development of new dwellings
  - Discouraged non-soil based land uses
- The minimum subdivision size is increased from 20ha to 40ha in the schedule to the Farming Zone.

### New dryland – Farming Zone 2

The new dryland is the land that was previously irrigated but no longer has access to water or the irrigation network. The potential and suitability of these areas for agriculture or other land uses is dependant on distance from existing population centres, amenity, development density, access to services, infrastructure and water.

Those areas that are close to existing towns, retain some access to water, contain existing dwellings and are of a relatively high density of development have the potential for a vibrant mix of traditional agriculture and boutique and niche operations.

It is recommended that:

- These areas remain zoned Farming
- Existing subdivision controls be retained
- Local planning policy be amended to:
  - Support dwellings where they are required to promote an agricultural use of the land.
  - Support house lot excisions where consolidation of the balance of the property is an outcome, and there is no risk to the agricultural use of the surrounding land.
  - Support re subdivisions where a more productive property is the outcome.



### **New dryland – Farming Zone 3**

Those areas that are isolated from existing settlements and currently contain few dwellings have the potential for traditional cropping and grazing activities, intensive animal activities, renewable energy developments and timber plantations. The isolation and low density of development in these areas is an opportunity for agricultural growth, and developments such as intensive animal industries and renewable energy as these uses have buffer requirements and amenity risks.

It is recommended that:

- These areas remain zoned Farming
- The minimum subdivision size be increased from 40ha to 100ha
- Local planning policy be amended to:
  - Discourage the creation of new lots;
  - Support house lot excisions where consolidation of the balance of the property is an outcome, and there is no risk to the agricultural use of the surrounding land.
  - Discourage the development of new dwellings

### **Existing dryland**

While this report does not look at the existing dryland areas. It is recommended that the planning policy for existing dryland be amended to be consistent with the objectives and outcomes of New dryland – Farming Zone 3 i.e. that:

- These areas remain zoned Farming
- The minimum subdivision size be increased from 40ha to 100ha
- Local planning policy be amended to:
  - Discourage the creation of new lots;
  - Support house lot excisions where consolidation of the balance of the property is an outcome, and there is no risk to the agricultural use of the surrounding land.
  - Discourage the development of new dwellings

### **Rural Activity**

There is the potential to enhance tourism and agricultural output through the development of a few rural activity nodes. These nodes will build on existing development and assets (such as riverine areas and lakes) to provide an opportunity for rural tourism and boutique agriculture in high amenity locations close to townships.

The criteria for the development of a rural activity node are:

- Close to an existing town
- Existing land fragmentation and dwelling development
- Agricultural potential
- High amenity

Areas that should be considered for a Rural Activity Zone (RAZ) are Koondrook, Gunbower Island (close to Cohuna) Murrabit, Kangaroo Lake and Lake Charm

The intended use for these areas would be intensive agricultural businesses, including wineries or other horticulture, and rural tourism accommodation. The key objective of these areas is to be of high amenity so as to attract visitors.

The lot size identified for these areas should be suitable for agricultural land uses and should support retaining a rural character and density of development. The lot size should be determined as a part of the identification and detailed planning for an area. It generally should be a minimum of 5ha.

The development proposed for the land should also retain a rural character and presentation and as such should be of low density.

It is recommended that:

- These areas be rezoned Rural Activity Zone.
- Local planning policy be developed to:
  - Support new dwellings where they are required to promote new agricultural or rural tourism enterprises.
  - Discourage house lot excisions as property consolidation is not sought and excisions will contribute to increasing the density of development in the area that may compromise its amenity.
  - Support new tourism developments where they are consistent with the rural presentation of the area and will contribute to the amenity and tourism experience of the area. A low density of development is sought within the property and within the area.

### **Rural Conservation**

Gannawarra includes a number of unique environmental assets that not only should be protected for their contribution to biodiversity, but also promoted as a significant tourism asset. These areas would include those with significant environmental value and limited agricultural prospects. These areas are likely to include some land along the Murray River and land around the lake systems. These areas should be used and managed with a conservation focus and tourism uses and dwellings that are compatible with the environmental values of the area should be supported in these areas to assist with the management of the land and to capitalise on these assets and contribute to the local economy. Retaining this land in farming use has a high risk of undermining the environmental values and does not capitalise on these assets.

It is recommended that:

- These areas be rezoned Rural Conservation Zone.
- Local planning policy be developed to:
  - Support new dwellings and tourism developments where they promote the environmental values of the land.

- Discourage the creation of new lots, including house lot excisions.

### **Rural Living**

Rural living is a legitimate part of Council's settlement strategy. Council supports the provision of a range of attractive residential options across the Shire to retain and attract residents. The Urban and Rural Strategy Plan set out a comprehensive set of residential opportunities across the Shire, including a number of rural living opportunities. These opportunities will provide for demand in the current planning period. Beyond this, should further supply be required, some new dryland areas close to existing settlements could be considered for rural living development.

### **Other**

A key requirement to supporting growth and development within these rural areas is reducing regulation where appropriate. It has been identified that the current flood controls (in particular ESO4) and the Vegetation Protection Overlay (VPO) are not sufficiently accurate in their application and trigger applications or impose restrictions where they may not be warranted.

It is recommended that the application of the flood controls and the VPO be reviewed based on more recent information and mapping techniques.

## **10.3 Conclusions**

A key focus of this study was to investigate options for productive use of new dryland in Gannawarra and recommend planning policy to accommodate these alternative uses. The analysis of the socio economic impacts of reduced irrigation water availability clearly demonstrates however, that from a social and economic point of view, the planning scheme must focus on protection of the irrigated agriculture industry in Gannawarra. Other land uses can be accommodated, but these should not be at the expense of irrigated agriculture, which provides the greatest opportunity of securing an economic future for Gannawarra.

Therefore, recommendations for the land use planning framework in Gannawarra are an integrated package for all the rural areas that combines irrigated and dryland agriculture as well as opportunities for tourism and rural activity in appropriate locations.

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## Appendix 1: Agricultural options (RMCG 2009)

Option	Environmental		Social/practical		Economic <sup>^</sup>		Overall feasibility*
	Feasible?	Considerations	Feasible?	Considerations	Feasible?	Considerations	
Stock grazing - feed:							
<ul style="list-style-type: none"> <li>▪ Traditional pastures - clover, medics etc</li> </ul>	Yes	<ul style="list-style-type: none"> <li>▪ Few varieties of clover tolerate salinity</li> <li>▪ Need autumn or winter rain to germinate</li> <li>▪ Can be damaged by floods</li> </ul>	Yes	-	See below for stock grazing		Likely
<ul style="list-style-type: none"> <li>▪ Saltbush - note another saline option for moderately low salinity and low to medium rainfall is bluebush</li> </ul>	Yes	Not suitable on heavy clays	Yes	-	See below for stock grazing		Likely
<ul style="list-style-type: none"> <li>▪ Native grasses</li> </ul>	Yes, if adequate rainfall to establish	<ul style="list-style-type: none"> <li>▪ Excess nutrients need to be used before planting i.e. phosphorus</li> <li>▪ Need adequate rain to germinate and maintain growth for stock feeding</li> </ul>	Potentially not – until more research is available	Establishing native grasses from scratch for stock grazing has not been widely adopted. Lack of certainty over the viability of this alternative may mean the majority of farmers will not accept the practice until evidence becomes available.	Unknown		Unknown
<ul style="list-style-type: none"> <li>▪ Dryland lucerne</li> </ul>	Yes, if sodic soils are carefully managed	<ul style="list-style-type: none"> <li>▪ Soil needs to be herbicide free to establish</li> <li>▪ Not tolerant of waterlogged or sodic soils</li> <li>▪ Adequate soil moisture needed for germination</li> </ul>	Yes	-	See below for stock grazing		Likely

Option	Environmental		Social/practical		Economic^		Overall feasibility*
	Feasible?	Considerations	Feasible?	Considerations	Feasible?	Considerations	
<ul style="list-style-type: none"> <li>Feedlots e.g. dairy, beef</li> </ul>	Yes	<ul style="list-style-type: none"> <li>Land below 1 in 100 year flood level is not ideal</li> <li>Needs reliable stock and domestic water</li> </ul>	Potentially not	<ul style="list-style-type: none"> <li>Higher labour</li> <li>New skill required</li> <li>Quite different to irrigation enterprises</li> <li>Regulations must be adhered to e.g. manage the aesthetics of the area</li> <li>High level of technology</li> </ul>	Potentially	<ul style="list-style-type: none"> <li>Depends on cost of inputs e.g. grain, water</li> <li>Depends on market demand</li> </ul>	Likely
Stock grazing - stock:							
<ul style="list-style-type: none"> <li>Traditional sheep and beef</li> </ul>	Yes	Needs reliable stock and domestic water	Yes	Stock management skills needed for irrigators experienced in crop only	Potentially if farm size is large enough	Area of land needed is 5000 ha to west of LCIR (rainfall @ 350 mm, 4 DSE/ha) and 2500 ha to east (rainfall @ 450 mm, 8 DSE/ha) – see appendices	Likely
<ul style="list-style-type: none"> <li>Intensive livestock – chicken meat and piggeries</li> </ul>	Yes	<ul style="list-style-type: none"> <li>Land below 1 in 100 year flood level is not ideal</li> <li>Needs reliable water</li> <li>Susceptible to high temperatures</li> </ul>	Potentially not	<ul style="list-style-type: none"> <li>Higher labour</li> <li>Not common in region – may not be socially accepted for some enterprises</li> <li>New skill required</li> <li>Quite different to irrigation enterprises</li> <li>Regulations must be adhered to e.g. Code for Broiler Farms</li> <li>High level of technology</li> </ul>	Potentially	<ul style="list-style-type: none"> <li>Depends on cost of inputs e.g. grain, water</li> <li>Some enterprises allow imports e.g. pork</li> <li>Depends on market demand</li> </ul>	Likely
Cropping:							
<ul style="list-style-type: none"> <li>Grains production - cereals, legumes and oil seeds</li> </ul>	Yes, depending on the crop and local conditions	<ul style="list-style-type: none"> <li>Negatively impacted by salinity</li> <li>Not usually suitable for waterlogged soils depending on the crop</li> <li>Low rainfall will restrict</li> </ul>	Yes	-	Potentially if farm size is large enough	Area of land needed is 2400 ha to west (rainfall @ 350 mm) and 1400 ha to east (rainfall @ 450 mm). Assumes 70% of land is cropped	Likely

Option	Environmental		Social/practical		Economic^		Overall feasibility*
	Feasible?	Considerations	Feasible?	Considerations	Feasible?	Considerations	
		<ul style="list-style-type: none"> <li>some crops e.g. Linseed</li> <li>Can be susceptible to frost.</li> <li>Higher temperatures may be an issue for faba beans.</li> </ul>				– see appendices	
<ul style="list-style-type: none"> <li>Fodder production - cereals (for hay), forage crops</li> </ul>	Yes	<ul style="list-style-type: none"> <li>Negatively impacted by salinity</li> <li>Not tolerant of waterlogging</li> <li>Needs good drainage if it is grazed – avoid pugging of soil</li> <li>Can be susceptible to frost</li> </ul>	Yes	-	See above for cereal production		Likely
Tourism - Farm Stay	Yes in some locations	<p>Needs aesthetically pleasing areas and sites to attract visitors.</p> <p>Requires agriculture to remain the primary land use in the farming zone – planning zone.</p>	Yes	<ul style="list-style-type: none"> <li>Some specific hospitality and marketing skills may be required</li> <li>May need to manage timing of some farm operations with guests e.g. noise and aesthetics management</li> </ul>	Yes – in conjunction with other enterprises or income	Limit of six people at any one time in the planning scheme	Likely but very limited
Firewood	Potentially not – if water is inadequate	<ul style="list-style-type: none"> <li>Need adequate rainfall or groundwater (with low salinity) for tree growth and regeneration after harvesting</li> <li>Careful tree choice needed for waterlogged or saline areas</li> </ul>	Potentially not – community acceptance	<ul style="list-style-type: none"> <li>Plantations are not common in the region – may not be accepted</li> <li>Some new skills needed regarding planting and managing trees</li> <li>Regulations must be adhered to – Code of Practice</li> </ul>	Yes – in conjunction with other enterprises or income	Slow growth rate under low rainfall likely to limit production	Unknown
Timber	Potentially not – if water is inadequate	As above for firewood	Potentially not – community acceptance	As above for firewood	As above for firewood	As above for firewood	Unknown
Carbon sequestration e.g. Landcare Carbon Smart	Yes	<ul style="list-style-type: none"> <li>Need adequate rainfall or groundwater (with low</li> </ul>	Yes	May need new knowledge development	Yes – in conjunction with other enterprises or	Market is not well developed	Likely

Option	Environmental		Social/practical		Economic^		Overall feasibility*
	Feasible?	Considerations	Feasible?	Considerations	Feasible?	Considerations	
		salinity) for tree growth ▪ Careful tree choice needed for waterlogged or saline areas		Must be registered	income		
Protection of remnant vegetation through Bush Tender and EcoMarkets	No	Very few remaining remnants (original vegetation) for protection. LCIR may be less attractive due to poor vegetation condition	Potentially not	Some may be reluctant due to negative connotations associated with being "green"	Yes – in conjunction with other enterprises or income		Unlikely
Creation of off-sets for future development through Bush Broker	Yes	▪ Need adequate rainfall or groundwater (with low salinity) for tree growth ▪ Careful tree choice needed for waterlogged or saline areas	Potentially not	▪ Some may be reluctant due to negative connotations associated with being "green" ▪ Some skills needed regarding planting trees	Yes – in conjunction with other enterprises or income		Likely



## Appendix 2: Interview questions

### Questions

1. Are you aware of many individuals who have sold water in the Gannawarra Shire?
2. If yes, have they sold the water permanently or temporarily?
3. What are the main reasons for selling the water permanently?
4. Has the age of the farmers had any influence? Is it more common amongst older farmers compared to younger or vice versa?
5. What land uses have had the greatest permanent trade of water away from the farm?
6. What areas of the Shire have had the greatest permanent trade of water away from the farm?
7. What is this land being used for now?
8. What land use options have people been considering when water is traded away?
  - Agricultural
  - Non-agricultural
9. Are there any barriers to these possible land uses?
10. Are many people investigating different options? How are they doing their research?
11. Has water been traded back in temporarily in many cases?
12. If yes, for what purpose?
13. Where water has been permanently sold, is ownership of this type of land being transferred? i.e. is it being sold and purchased by others?
14. What price is the land being sold for?
15. What is the capability of this type of land?
16. Has the capability changed before and after the water was traded (local perceptions)?
17. Has the value of the land changed before and after the water was traded (selling prices)?

## Appendix 3: Workshop Attendees

Lyn Merrett	Planning Officer, Gannawarra Shire
John McCurdy	Manager Planning, Gannawarra Shire
Neville Goulding	Councillor, Gannawarra Shire
Peter Koetsveldt	Goulburn Murray Water
Mark Paginini	NVIRP
Keith Den Houting	Councillor, Gannawarra Shire
John Smelt	DPCD
Alex Gunn	DPCD
Jamie Bell	DPCD
Matthew Cameron	DPCD
Melissa Tylee	NCCMA
David Johnston	Gannawarra Shire
Neil McBeath	DPI
Glen Hall	Councillor, Gannawarra Shire