



**Minister for Environment
Minister for Water**

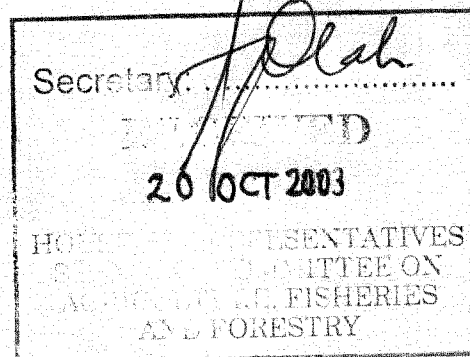
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15 OCT 2003

Our Ref: SU014596

Mr Ian Dundas
Secretary
Standing Committee on Agriculture, Fisheries and Forestry
Suite R1 - 110
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CANBERRA ACT 2600



Dear Mr Dundas

HOUSE OF REPRESENTATIVES INQUIRY INTO FUTURE WATER SUPPLIES FOR AUSTRALIA'S RURAL INDUSTRIES AND COMMUNITIES

The opportunity has been taken by the Victorian Government to provide information to the House of Representatives Standing Committee on Agriculture, Fisheries and Forestry Inquiry into Future Water Supplies for Australia's Rural Industries and Communities.

This submission provides information on the initiatives being taken by the Victorian Government in securing sustainable water supplies for Victoria's future and described in a recent release of the 'Securing Our Water Future' Green Paper for discussion.

The Inquiry has sought information on the metropolitan sector from Melbourne Water and the irrigation sector from the Association of Rural Water Authorities through supplementary questions addressed to these organisations. The questions asked were by nature of State significance and accordingly it is appropriate that the State provide a response.

The Inquiry has indicated particular interest in the outcomes of the Northern Mallee Pipeline Project and how this could serve as a model for other areas. A case study on the Wimmera Mallee System is provided in the submission. This describes the Northern Mallee Pipeline Project together with the resultant benefits and the associated learnings. Such learnings have and are being applied to the Wimmera-Mallee Pipeline Project for which conceptual design is currently being undertaken. Information is provided on how the Wimmera-Mallee Pipeline Project has benefited from such experience particularly in regard to stakeholder involvement, project management and financial structure.

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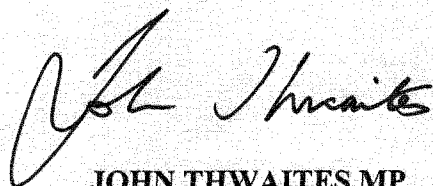
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The submission is based on input from relevant stakeholders in government, water authorities and water industry associations.

If you require any further information on this submission please contact Mr Peter Guttman on 03 9412 4426.

Yours sincerely

A handwritten signature in black ink, appearing to read 'John Thwaites', written in a cursive style.

JOHN THWAITES MP
Minister for Water

**HOUSE OF REPRESENTATIVES STANDING
COMMITTEE ON AGRICULTURE,
FISHERIES AND FORESTRY**

**INQUIRY INTO FUTURE WATER SUPPLIES
FOR AUSTRALIA'S RURAL INDUSTRIES
AND COMMUNITIES**

VICTORIAN GOVERNMENT SUBMISSION

October 2003

**HOUSE OF REPRESENTATIVES STANDING COMMITTEE ON
AGRICULTURE, FISHERIES AND FORESTRY INQUIRY INTO FUTURE
WATER SUPPLIES FOR AUSTRALIA'S RURAL INDUSTRIES AND
COMMUNITIES**

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VICTORIAN GOVERNMENT SUBMISSION

1. Introduction

The opportunity has been taken by the Victorian Government to provide information to the House of Representatives Standing Committee on Agriculture, Fisheries and Forestry Inquiry into Future Water Supplies for Australia's Rural Industries and Communities (the Inquiry).

This submission provides information on the initiatives being taken by the Victorian Government in securing sustainable water supplies for Victoria's future and described in a recent release of the "*Securing Our Water Future*" Green Paper for discussion.

The Inquiry has sought information on the metropolitan sector from Melbourne Water and the irrigation sector from the Association of Rural Water Authorities through supplementary questions addressed to these organisations. The questions asked were by nature of State significance and accordingly it is appropriate that the State provide a response.

The Inquiry has indicated particular interest in the outcomes of the Northern Mallee Pipeline Project and how this could serve as a model for other areas. A case study on the Wimmera Mallee System is provided in the submission. This describes the Northern Mallee Pipeline Project together with the resultant benefits and the associated learnings. Such learnings have and are being applied to the Wimmera-Mallee Pipeline Project for which conceptual design is currently being undertaken. Information is provided on how the Wimmera-Mallee Pipeline Project has benefited from such experience particularly in regard to stakeholder involvement, project management and financial structure.

The submission is based on input from relevant stakeholders in government, water authorities and water industry associations.

2. Policy Position

2.1 Overview

The Victorian Government has recognised that the biggest long-term challenge facing our nation is securing sustainable water supplies for our future. The challenge is to build a sustainable and world competitive economy at the same time as restoring the health of the environment.

Water is critical to Victoria's economic performance and quality of life. Safe, clean water is vital to the well being of every community.

The Government has a fresh agenda for sustainable water management to keep jobs on our farms, restore the health of our rivers and floodplains, and meet the demands for growth in our towns and suburbs. The Government has released a Green Paper on all areas of the water industry.

2.2 Green Paper

On 10 April 2003, the Minister for Water, Hon John Thwaites made a Ministerial Statement on implementing "*Water for the Future*." The Minister announced the Victorian Government's intention to issue a Green Paper "*Securing Our Water Future*." The Green Paper provides a framework for consultation with the community and industry so the next round of water reform is well founded and enjoys broad support.

The Premier of Victoria, the Hon. Steve Bracks and the Minister for Water, the Hon. John Thwaites released the Green Paper for discussion on 27 August 2003. A copy of the Green Paper is available on the Department of Sustainability and Environment website <http://www.dse.vic.gov.au/dse/index.htm> - follow the prompt under 'Securing our water future' to access the paper.

The Green Paper presents a plan to move towards the sustainable management of water as a demonstration of Victoria's leadership in water management on the national scene.

Victoria's clear water entitlements are generating immense economic benefits to the State. The Victorian water market is highly active, moving water away from low-value farming on poor soils, to export-orientated, state-of-the-art horticulture and dairying. This is important for jobs growth and brings increased income into the economy.

Victoria is also implementing major enhancements in our rivers of national importance. Victorian communities have championed the survival of the Snowy River and the Wimmera and Glenelg Rivers. The River Murray is the next major challenge.

Cooperative efforts among all jurisdictions will be required to ensure the future of the nation's water. The power of national action to effect change was illustrated through the Snowy River project in 2002. However, it is vital that the Commonwealth matches Victoria's funding of projects of national significance such as the Wimmera-Mallee Pipeline, which will save 93,000 megalitres of water from evaporation and seepage.

It is important that future national water reform recognises Victoria's progressive performance in water management. Victoria strongly supports the development of an open, cooperative (inter-jurisdictional) water market. However, to do this certain barriers must be overcome through national cooperation.

It is proposed that management in the future will be based around five major principles, the first of which has been recently enshrined in Victorian legislation.

1. Water authorities will be retained in public ownership.
2. The Victorian Government will maintain the power to make decisions on the allocation of available resources, including surface water, groundwater, stormwater, water in supply systems, water reclaimed from sewerage and other water sources and Government will maintain overall stewardship of all water resources irrespective of source on behalf of all Victorians.
3. The management of water will be based on an understanding that the provision of water services that are valuable to the State's economy and to our society, is dependent on a healthy environment.
4. Users of the services our water systems provide, should wherever practical, pay for the full cost, including infrastructure and delivery costs, and environmental costs associated with that service.
5. The water sector charged with managing our water systems will be capable, innovative and accountable to the Victorian community.

The proposed implementation of these principles is described within the Green Paper a copy of which is provided to support the Inquiry.

3. Metropolitan Sector Supplementary Questions

Supplementary questions from the Inquiry addressed to Melbourne Water and dated 17 April 2003.

Question 3.1 - Has the 2050 Water Resources Strategy for Greater Melbourne been finalised and can the Committee receive a copy please?

The recommended water resources strategy for the Melbourne area, *21st Century Melbourne: a WaterSmart City, Final Report*, was released in October 2002. The Strategy contains 23 recommendations for the sustainable management of Melbourne's water resources for the next 50 years. The strategy details a blueprint to support growth of 30% over the period without the need to build a new dam. Amongst other things, the strategy sets a demand reduction target of 12% per capita by 2010 based upon average consumption during the 1990's.

The strategy was prepared by an independent committee appointed by the former Minister for Environment and Conservation and as such is not government policy. Shortly following the release of the strategy, the government released an immediate response, setting a revised demand reduction target of 15% per capita by 2010 and 10 initiatives to be implemented immediately. The 10 initiatives are based upon specific recommendations contained in the strategy. A copy of "*Planning for the future of our water resources, 21st Century Melbourne: a WaterSmart City*", Final Report is provided for information.

The full Government response has been included in "*Securing Our Water Future*" Green Paper released on 27 August 2003. The response supports the directions of the Strategy. The Green Paper goes beyond the Strategy and sets a strong future direction for the sustainable management of urban water.

Question 3.2 - What specific role can the Commonwealth play in achieving national guidelines for the use of recycled water?

Securing sustainable water supplies for future generations is one of the most important challenges facing the Nation. Australia is the driest inhabited continent in the world and yet one of the highest users of water per person taking into account all uses of water. The variability of our climate means that often water is scarce, with many areas close to reaching their sustainable limits.

The growing pressures on water nationally are already translating into serious concerns and challenges, which require changes to the way we use, consume, manage and allocate water. In this context Victoria will continue to encourage the Commonwealth and other States to pursue a national approach to the sustainable management of our most precious resource.

Water recycling forms a key component of water and waste water management, and can provide a suitable alternative for most non drinking water uses.

Water recycling is already being pursued by most States in agriculture as well as third pipe urban developments. Most of the States have existing guidelines or are in the process of developing guidelines for the use of recycled water.

The Commonwealth released as part of the National Water Quality Management Strategy "*Guidelines for Sewerage Systems: Use of Reclaimed Water*" in November 2000. Since these guidelines were developed there have been enormous gains in technology development and risk management in water recycling as well as a greater understanding of the role of recycled water as part of total water resource management. Internationally there have been further advances in the way recycled water is used for example Singapore's New Water scheme which treats recycled water to a standard safe for drinking.

The Commonwealth can continue to participate in work currently being led by Victoria, in cooperation with all Australian States and Territories and New Zealand. The work will develop new national guidelines on health and environmental risk management for matching the sources of recycled water with the uses of recycled water on a priority basis set by an expert panel.

The Commonwealth could also assist on a nationwide basis through:

- i. The development of a reference database that lists relevant state agencies accountable for regulation, management, research and development of recycled water schemes;
- ii. The development of a register of past and current research and development studies, and recycled water case studies for nationwide benefit and to avoid duplication; and
- iii. The funding of national research and development on recycling technology.

The Commonwealth Government can also assist by supporting a centre that is recognised nationally for providing access to experts and relevant state agencies, sharing of treatment technology, water recycling projects, research and information. An example to consider is the Co-operative Research Centres, generally known as CRCs. The aim of the CRCs is to provide collaborative research links and ventures between different sectors in order to achieve research outcomes of national economic and social significance. The Commonwealth Government contributes funding to the centres as does industry. The CRCs have a website hosted by the Department of Education, Science and Technology that can also be accessed from a participant's website (eg. CSIRO).

Question 3.3 - The Submission suggests Commonwealth funding can be provided for water recycling projects "of national significance". Can you please provide examples of such projects?

The use of recycled water to compensate for non-potable uses such as irrigation of agriculture and open spaces is significantly increasing worldwide. As stated in *New Water for Victoria – Victoria's Water Recycling Action Plan*¹, page 6, "Across Australia, recycled water is used for irrigated agriculture (eg the Virginia Scheme in SA), industrial applications (eg Eraring power station, NSW) and domestic toilet flushing and gardens (eg Rouse Hill, NSW, Mawson Lakes, SA).

Over the next five years Victoria will complete a number of key projects that will increase the use of recycled water in metropolitan Melbourne by between 17 GL per annum and 35 GL per annum

The following projects exhibit national significance in terms of the approach used.

- Aurora

A new suburb at Epping North, Melbourne will create one of the world's most sustainable housing developments. To be delivered by VicUrban the \$500 million, 634 hectare Aurora development will be a model for environmentally sustainable design and will house 25,000 people in up to 8,500 homes.

Existing sewer services are remote from the site which create the need and opportunity for VicUrban to construct a local sewage treatment plant and a recycled water system at Aurora. This innovative system will collect and treat waste water from all homes on the estate. Once treated to a class A standard the water will be returned to each home through a separate pipe to be used for toilet flushing, garden watering and car washing.

Aurora has been designed in accordance with the Neighbourhood Principles described in Melbourne 2030. In addition to water recycling, the development will incorporate sustainable living attributes including energy efficiency, use of renewable energy and opportunities for sustainable modes of transport such as walking, cycling and public transport.

Werribee Plains – A New Future for the Werribee Plains

A new future for the Werribee Plains aims to create a region renowned internationally for its commitment to sustainable development.

Large scale use of recycled water in the region is an initial key driver for the Vision. The Western Treatment Plant produces more than 100,000 ML per annum of treated waste water that could be reclaimed for productive use. Putting this water to productive use will provide significant benefits in terms of economic development in new agriculture markets, environmental improvements through reducing the nitrogen load to the marine environment as well conserving potable and river water in the region.

Infrastructure development to distribute up to 35,000 ML per annum of recycled water to the region includes consideration of the construction of a 45 kilometre

¹ A copy of the report is attached for information.

pipeline at a capital cost of over \$100 million. Fully developed the scheme would be the largest water recycling project in Australia.

- Sunbury-Melton Pipeline

Commissioned in October 2002, the Sunbury – Melton recycled water pipeline has the ability to increase the percentage of water recycled at Western Water to over 90%.

The \$3.5 million, 30km pipeline is Victoria's most innovative and complex recycled water scheme and the State's longest recycled water pipeline to date.

The pipeline pumps 2.2 GL of water from the Sunbury wastewater purification plant to properties between Sunbury and Melton, to irrigate vineyards, olive groves, plant nurseries, golf courses and council reserves.

It diverts more than 2.2 GL of high-quality, tertiary-treated water from being discharged into Jacksons Creek, a major tributary of the Maribyrnong River.

The project has won two state awards for Western Water and its customers:

- Keep Australia Beautiful City Pride Award 2003, for ongoing Environmental Project (with Hume City Council), and
- SaveWater! 2003 Award, for Efficiency in Government (Government Department or Agency).

Nationally significant projects could also include:

- Projects which demonstrate innovative approaches and technologies for recycled water provision and use which, if taken up, could provide significant environmental, social or financial benefits, on an industry, regional or township basis. Some examples of proposed projects include:
 - Economic development projects that are designed intentionally to use recycled water. The Balliang Scheme near Werribee and the Eastern Irrigation Scheme from Carrum are examples of projects that have the potential to add up to \$200 million to Victoria's economy.
 - Environmental enhancement projects where recycled water of suitable quality is used to restore flows within degraded or stressed rivers, streams and creeks.
 - Supplementing current large scale irrigation schemes, for instance regions to the North and West of the State with recycled water. Water used for irrigation could then be returned to the waterways for environmental purposes or to cater for growth.
 - Stormwater harvesting in new urban developments which involves collecting stormwater, in particular winter flows, treating it and storing it as groundwater for subsequent use in the summer months. This is generally termed aquifer

storage and recovery (ASR). Potential uses could include agriculture, potable substitution for large open space irrigators or for domestic gardens through a third pipe system. Winter flows of recycled water from sewerage treatment plants could also be stored in this way for subsequent use.

- Projects developed on a holistic sustainability concept which include recycled water and aim to provide environmental, economic and social benefits through an integrated approach to sustainable water and energy use, urban design and economic development. An example to consider would be the Werribee Plains – A New Future for the Werribee Plains mentioned above.
- Projects which develop innovative non-structural market based or regulatory approaches, with potential widespread application, which promote recycled water use where it is the optimal water resource.
- Projects which result in substantial substitution of scarce water resources, environmental improvements, community well-being and/or economic development on a regional or township basis.
- Projects which develop or demonstrate innovative structural (eg. improved technology) and non-structural (eg. pricing) approaches to more efficient use of recycled water (and probably other water resources).

Question 3.4 - Please outline how the Commonwealth could assist with a program to educate the public on the use recycled water?

Generally, education of recycled water users will be the responsibility of the water authority or entity responsible for the water recycling scheme. However, the Commonwealth could assist broader community education and information transfer in the industry about recycled water on a nationwide basis, through:

- Education campaigns on water savings techniques in the urban and rural environments.
- Promotion of research (Universities) to encourage design and technology improvements that aim to reduce water wastage in the system
- A web-page on recycled water, say on an appropriate Commonwealth website which includes, for example:
 - General information about recycled water and water savings techniques.
 - A copy of the national guidelines for recycled water once produced
 - Data base of national and state agencies and contacts, nationally significant case studies and R&D projects

- A clear statement on recycled water explaining the Commonwealth's view on the role of recycled water in national integrated water resource management.
- Coordination and dissemination of information about nationally important projects through State agencies and national industry groups.
- Provision of funding to support National and State conferences on recycled water.
- Support publication of water recycling research of national interest from national agencies such as CSIRO.

A key element in the successful use of recycled water for non-potable purposes is to change the community's behaviour and perception towards it. The community needs to recognise that recycled water is a valuable resource that can be used for specific purposes and not to be treated as a waste product. For example, local councils have introduced paper and plastic recycling and provided the community with collection buckets for these items and a regular collection time. Now the majority of the community is treating paper and plastic as a resource by making the effort to separate these items from the real 'rubbish' and recycle them. The Commonwealth Government's role is to promote the use of this major and significant resource by leading by example. The Government needs to embrace the concept and incorporate water recycling into its objectives and projects. It needs to implement incentives to encourage nation wide beneficial use.

Question 3.5 - What do you envisage as the role of the Commonwealth in encouraging the use of water efficient appliances? Please clarify the statement that "existing competition and mutual recognition laws will limit the ability of the States to implement regulations" for minimum efficiency performance standards for electrical appliances?

The Victorian Government is committed to the development of a mandatory national water efficiency labelling scheme. The Government is seeking to have a nationally agreed scheme by early 2004 for its implementation by late 2004. Officers from the Department of Sustainability and Environment have been working closely with other jurisdictions and the water industry to facilitate the development of such a scheme.

The Commonwealth was given a clear mandate at the 23 April meeting of the Environment Protection Heritage Council to further lead the development of the scheme through a national working group involving States, Territories and New Zealand.

It is hoped that this scheme will facilitate the ability of States and Territories to apply more stringent standards to water efficiency appliances that may be sold to consumers.

Question 3.6 - Please expand on the suggestion in the submission that the Bureau of Meteorology's work should be of more practical value at the catchment level? What additional climate information would be of interest for water management purposes²?

Water managers have a key interest in the impact of current and likely future weather and climate patterns on a range of catchment streamflow characteristics (including annual yields, seasonal flow patterns, flood and low flow characteristics) and also on patterns of demands for water from various user groups.

Climate-related information of relevance to water managers is currently available from three main organisations in Australia - the Bureau of Meteorology, CSIRO Atmospheric Research and the Queensland Centre for Climate Applications - each of which provide a variety of services ranging from the provision of base data, varying types of analyses of historical data, seasonal and longer term forecasts, through to the development of longer-term climate change scenarios.

There would be major opportunities for improving the efficiency of operation of water supply systems if the predictability of key climate parameters over a range of time scales (e.g. shorter-term, seasonal, multi-seasonal, annual, inter-annual) could be improved and, ideally, predictions made available at spatial scales that are of direct relevance to water managers (i.e. at a catchment scale). This would require a better understanding of the "drivers" affecting climate at different time scales for various regions in Australia, including the identification of causes of decadal variability, and distinguishing such decadal variability from climate change signals.

The Australia Greenhouse Office, and the National Greenhouse Strategy, provides a vehicle for coordinating and progressing climate change research at a national level. However, there is no comparable "structure" available for coordinating and progressing a national agenda for research into climate variability which extends down to a regional/catchment scale. To date, detailed regional analyses addressing these factors has occurred only for Western Australia as a result of the Indian Ocean Climate Initiative, which was initiated by key agencies in Western Australia in response to a major change in climate patterns, and which has now been running for 6 years. It would be desirable to develop a national agenda for extending such analyses to other regions across Australia.

Victoria would be interested in participating in any discussions about a coordinated national program of climate variability research.

In the case of water management, improved understanding of climate "drivers" and improved predicability will have a wide range of benefits. For example:

- The security of water entitlements could be better specified;
- Water allocation processes could be improved – eg. by providing more certainty for users at the beginning of an irrigation season;

² Information is provided of 'interest to water management' from a Statewide perspective rather than 'of interest to Melbourne Water' to complement the Statewide significance of the question.

- The release of environmental flows could be managed with more confidence in the outcomes;
- Water authorities could improve delivery efficiency, and irrigators could improve the efficiency of water use and make more informed decisions about water trading;
- Water authorities could respond more effectively to drought conditions.

There would also be significant benefits for the management of natural resources more generally and for a wide range of climate-dependent industries (e.g. agriculture, fisheries, power generation, and tourism).

4. Irrigation Sector Supplementary Question Questions.

Supplementary questions addressed to the Association of Rural Water Authorities (ARWA) and dated 14 April 2003.

Commonwealth Programs

Question 4.1 - The submission implies that the Commonwealth should promote long term programs to improve water use efficiency. What type of programs does the ARWA have in mind?

Commonwealth research into on and off-farm efficiency in conjunction with the industry is required. Emphasis should be placed in promoting distribution system efficiency to make best advantage of on and off-farm improvements. Programs should complement actions taken to provide additional environmental flows and thereby complement interstate and COAG agreements. Relevant current examples where supply system efficiency complements the provision of additional environmental flows includes the Northern Mallee Pipeline, Wimmera-Mallee Pipeline Project, Snowy agreement and the Living Murray process.

Question 4.2 - The submission states (para 2.12) that "There is a need to streamline application/approval processes." Please provide examples, and comments on how these processes could be improved.

There is a need for a nationally based dedicated program similar to Road/Rail/Transport infrastructure that reflects the importance of water infrastructure to the nation.

At present there is no clear pathway to seek Commonwealth funding commitment for project implementation over a number of years.

The Commonwealth has traditionally defaulted to funding such projects through programs that provide annual funding. This method of funding results in the project losing the potential for significant innovative efficiencies and savings to the State and Commonwealth, that would be gained from a dedicated program budget that provides certainty. This is illustrated by the experience gained from the Northern Mallee Pipeline and represents an important precursor to successful implementation of the Wimmera-Mallee Pipeline Project.

Proposed National Water Efficiency Strategy

The submission recommends (para 2.15) that the Commonwealth develop a "National Water Efficiency Strategy" which could include programs such as setting minimum efficiency performance standards for electrical appliances and an associated star rating system.

Question 4.3 - What would be the key elements of such a strategy, apart from a system of water use efficiency standards for electrical equipment?

Any Commonwealth funded water efficiency strategy needs to take account of the various factors that demonstrate performance in the delivery of improved and sustainable water management services. Factors worthy for consideration would include the State's performance in achieving water efficiency gains and the complementary nature and interactions with varying basin strategies, such as salinity, nutrient and catchment management.

Water management initiatives should be complementary and build upon one another to demonstrate improved system efficiency and environmental requirements within and across catchments.

The strategy should consider providing funding for system upgrades, mechanisms to improve trading in water and the removal of 'national' barriers to improved water use and efficiency.

The proposed strategies should be leveraged through the Cooperative Research Centre for Irrigation Futures.

Irrigation

Question 4.4 - Given that 80% of Victoria's water use is for irrigation, how efficient is Victoria's irrigation, both the delivery systems and on-farm irrigation methods, compared to other States and overseas?

Efficiency has two objectives both additional water for the environment but also for development.

Significant improvements in irrigated agriculture have been realised in the Victorian irrigation sector over the last ten years. This has been achieved through the application of a range of mechanisms focussed both on technological development (e.g. changes in irrigation practice - furrow to spray to drip, laser grading of land, precision and differential watering, soil moisture monitoring, drainage monitoring and re-use systems) and market improvements (e.g. creation of a market in water entitlements).

Technology in water use efficiency has significantly increased over the period and adoption on-farm has dramatically improved water use, but with varying levels of adoption success across agricultural industries.

It is important to emphasize that surface water use management in Victoria has led to the irrigation sector meeting its salinity compliance requirements under the basin salinity strategy through improved water efficiency.

Ongoing improvement is to be encouraged and supported through benchmarking irrigation systems across Australia and development of a framework for water use efficiency. ANCID produces a water use efficiency report on an annual basis. This should be expanded to consider on-farm efficiency as described in a recent Land and Water Australia report entitled "*Gaining Acceptance of Water Use Efficiency Framework, Terms and Conditions*" May 2003.

Recent work undertaken by the Murray Darling Basin Commission has identified the opportunities that may be realised can be identified through benchmarking of the best practices in each aspect of the irrigation industry and encouraging others to emulate proven practices.

Recent analysis, Bureau of Transport and Regional Economics report (July 2003), highlights that Victoria is improving its water use efficiency (measured in dollars per ML) at a greater rate compared to other States. This is due to the security of the system based on high value agriculture hence the industries ability to respond to quality driver based on improved water use efficiency.

Generally delivery efficiency is similar to other States however current channel control systems that are being piloted are achieving significant results in terms of incremental savings.

Question 4.4.1 - How can efficiency of irrigation be improved? What would be indicative costs of making the improvements, and what would be the estimated saving in water?

Victoria has demonstrated significant improvement in the efficiency of irrigation through water trading. The \$320 million Victorian Water Trust provides a secure source of funding for much needed investment in Victoria's vital water resources. The Commonwealth should provide '\$ for \$' support to match this important initiative.

Table 1 shows the savings that look to be possible in northern Victoria for the Snowy and also for the Murray or Goulburn, together with the costs of those savings. The table shows that the first tranche of distribution savings is certainly worth pursuing, but the projects quickly become expensive.

Table 1: Potential savings in Murray and Goulburn authority distribution systems

Opportunity	Saving (Gigalitres)	Cost to Government (\$/megalitre)	Cumulative saving (GL)	Cumulative cost (\$M.)
Pipeline Woorinen horticultural area [#]	2	4,500	2	9
Pipeline Normanville domestic-&-stock [#]	4	1,000	6	13
Measure domestic-&-stock users	16	700	22	24
Pipeline Casey's Weir domestic-&-stock [†]	4	2,000	26	32
Decommission / downsize Lake Mokoan [†]	33 / 26		59 / 52	52 / 67
Reinstate Lake Boga in supply system [†]	- 5	950 /	54 / 47	55 / 70
Make Little Murray Weir lower [†]	5	1,750	59 / 52	63 / 78
Pipeline small, run-down channels*	30	3,000	c. 85	c. 160
5% more exact meters, in total chan. contr.*	100			
Cut leaks, seepage by total channel control*	20	1,500	c. 205	c. 340
Cut outfalls, by total channel control*	-			

Notes:

[#] These two items are already going ahead under the Snowy program. The Woorinen project is associated with other regional development objectives.

[†] These four items would fit together. Lake Mokoan (actually headworks, not distribution) evaporates significantly and does not work well; two options are decommissioning (with some licences bought out rather than provided with new supply from Eildon) and downsizing (the first option gets more savings and is cheaper, but has a bigger impact on recreation). Casey's Weir savings could help replace water lost to irrigators. Lake Boga's water quality is falling; it could catch extra unregulated flows, so less transfer needed from Snowy. Little Murray Weir would then need to be lower – so there would be a need for some pumping for Swan Hill.

* The savings and costs under these four items will depend on detailed planning for each area (Katandra, Rochester, etc.) and the optimal mix of pipelining, total channel control, etc. arrived at for each area. The full costs may be about double those shown here; Goulburn-Murray Water will also contribute since channels to be pipelined need renewing anyway and total channel control will reduce its operating costs.

The Snowy program, to which Victoria has committed \$150 million, seeks to return flows primarily by investing in such savings projects. This program is well geared to investing in the first lot of economic projects.

However, given that water needs to be returned to other rivers as well as the Snowy, and distribution savings are becoming increasingly expensive, the Government needs to consider alternative approaches to retrieving water for the environment. These are described in some detail in the Green Paper section 5.3.

Traditionally Government has provided grants in recognition of the public benefits related to on-farm improvements in areas such as salinity and nutrient management. There is a tendency for on-farm improvements to support increased development rather than return flow to the environment. Victoria will be increasingly seeking partnerships with the community to build on the success of these programs by looking for opportunities for market based and regulatory tools to improve water use efficiency.

In recognition of the broad range of opportunities available to support efficiency improvements there is a move away from grants to greater use of market mechanisms and regulatory tools to enable and encourage continuous improvement.

Major distribution system water savings are envisaged to support increased flows to the environment as recognised by the targets set for improved flows to the Snowy River. This will result from the initiatives being undertaken in the Goulburn and Murray catchments that are based on improving delivery efficiency. These projects have a lower transaction cost compared with on-farm savings.

Opening up of interstate markets will also encourage adjustment with water moving to higher value, more efficient enterprises.

Question 4.5 - What are the best ways to get farmers to adopt improved irrigation methods?

The market mechanisms and regulatory tools as described above are important but their value is enhanced by supporting farmers to change behavior. There is a need to understand farm business and what motivates farmers to improve water use efficiency. Mechanisms to improve water management efficiency must complement farm business objectives and not be independent programs.

Clearly there is a move by farmers to adopt a whole of farm approach to management. Time is recognised by farmers as important, as demonstrated by dairy farmers' preference for automated irrigation systems to save and reallocate valued time to non-farm activities. Similarly potato farmers are using drip tape instead of sprinklers to save time and improve lifestyle. Improved irrigation practice also results in product enhancements that have generated market demand and thereby encourage other farmers to change their behaviour.

Question 4.6 - What strategies are Victorian farmers adopting to better cope with Australia's highly variable climate?

Farmers are developing much greater understanding about the interconnection between the climate, crop production, irrigation practices, land capability and environmental impacts. In other words a whole system understanding and approach is being developed. Specific examples include reviewing weather forecasting pre irrigation water order, linking weather forecasting with irrigation scheduling and improved water scheduling technology on farm i.e. computer based scheduling and real time operational information through telemetry.

Consequently this is placing increasing pressure on the irrigation distribution system, which, due to its age, is failing to provide commensurate support to enable improved quality in production. Improved practices demonstrated by farmers consequentially place demand on irrigation delivery systems to deliver improved service i.e. water on demand. Without system improvements regional development will be limited. Some sophisticated approaches are being trialed by water authorities to support real time irrigation delivery and address the shortcoming of a gravity-based delivery system. Such innovations need to be supported and encouraged.

On balance farmers are doing more with less and utilising an increasingly active trading market to manage seasonal variations in security.

Research

The submission states (para 2.19) "There is a clear role for the Commonwealth to provide ongoing research and development funding for areas of importance to the rural water industry, in particular in relation to climate change and impacts on rainfall in future."

Question 4.7 - Do you consider that research currently undertaken is targeted at providing practical solutions to farm issues?

A lot of industry based research is being undertaken. It is becoming increasingly evident that there is a need to look at improving sustainable irrigation development across the country by treating it as a discipline in its own right. The initiatives to establish a Cooperative Research Centre for Irrigation Futures should assist considerably in this regard.

Funding arrangements are focussed across irrigation industries (e.g. dairy, horticulture, crops) and focus on farms as business entities. Each industry tends to consider its research needs on issues such as salinity and water use efficiency independently of and secondarily to the key issues of productivity improvements for their specific commodity. The charter of the research corporation dictates this approach in most cases. There is a need to dedicate increased funding to the discipline of sustainable irrigation development.

Question 4.7.1 - Is research by Commonwealth and State bodies well coordinated?

There have been significant recent moves to align Commonwealth NAP, NHT, NLP goals for Research Development Education (Extension) & Evaluation investment with State agriculture sectoral and irrigation industry needs, through regional investment planning. In order to achieve desired landscape change, the capabilities of private business operators to learn and adopt improved environmental performance for water use on-farm must be supported by a coordinated approach to applied research. Victoria is already leading research investment in some critical areas through investigation and development of appropriate systems (eg EMS, market instruments, prime development zoning, stewardship models etc).

The importance of the discipline of sustainable irrigation development warrants the Commonwealth to adopt a national perspective and contribute to research into irrigation at a level that recognises its significance to Australia's economic, social and environmental well being.

Question 4.8 - What do you think should be the key areas of research in relation to water?

A key focus for research should be in targeting development of profitable production and enterprise systems to land capability.

This will need to be supported by research in specific areas including -

- Climate change,
- Recycled water and irrigation,
- Landuse impacts on catchment yield,
- Irrigation water scheduling,
- GIS utilisation,
- Groundwater and surface water aquifer management,
- Plant water use,
- Impact of water quality on agricultural production,
- Irrigation with saline water,
- Farmer behavioral change – assisting farmers to improve business performance whilst advancing wider social and environmental outcomes.
- Industry adjustment,
- Water pricing strategies to address externalities and demand management.

Question 4.8.1 - Has there been sufficient research on groundwater resources in Australia?

Increasingly irrigators are looking to groundwater as a resource to complement reduced surface water availability and manage costs. This 'switching' places demands on the aquifer. Clearly there is an increasing need for improved research to understand the inter relationship of ground water and surface water, the performance of aquifers and establish the sustainable yield of aquifers.

Groundwater is an important source of water for many Victorians, although it is often perceived as a poor cousin to surface water. It is usually described as an alternative to surface water. At a strategic level surface water issues generally swamp it. Research into groundwater systems has potentially suffered as a result.

As well as providing water for urban and rural users, there are numerous ecosystems dependent on groundwater. Groundwater dependent ecosystems include stands of native vegetation, wetlands, waterways, stygofauna communities and offshore discharge zones.

From a Victorian perspective there has been limited research into many areas.

Opportunities for research include:

- Surface water/groundwater interaction.
- Impacts of forestry on groundwater processes.
- Groundwater salinisation through recycling where irrigation occurs.
- Statistical methods applying to hydrogeology.
- Social research – behavioural attitudes to issue such as water trading, conservation, sustainability etc.

Third Party Stakeholders

Question 4.9 - How can Rural Water Authorities take into account the interests of third party stakeholders, such as tourism/leisure operators, in administering water storages such as Lake Eildon?

Victoria under its 'Water for the Future' policy is increasingly requiring all water authorities to adopt a triple bottom line based accounting approach to improve water management. This is intended to recognise the multiple benefits provided from water storages.

Examples of where this approach is being applied is at Lake Mokoan and Lake Eppalock.

Lake Mokoan, which is part of the Goulburn Murray System, is an artificial lake created by the damming of the former Winton Swamp near Benalla. The lake has many problems, including high water losses from evaporation, poor water quality and high costs. Reduction in such losses is an important component of returning flows to the Snowy River. The lake is also a regional recreation facility and options are being considered to meet and respect economic, environmental and social impacts of changes to the lake's operation.

The report evaluates the specific options under review which include retaining the lake but operating it under modified rules, reducing the lake area, and reverting the lake area back to the original natural wetlands. Further public comment on these options will be sought, as part of the agreed public consultation process. No decision will be taken on the future of the lake until the Final Report and public comments have been considered by the Victorian Government.

Goulburn Murray Water is currently preparing a management plan for Lake Eppalock that is largely focused on water quality issues. All relevant stakeholders are to be part of the plan development process. The intent of the plan is to define operating requirements to not only ensure the water quality values of the lake are protected in the future but also appropriate management arrangements are in place to meet community recreational values.

An important aspect in the application of the triple bottom line approach, is the need for change in the approach of water authorities and other water management organisations. No longer can such authorities singularly focus on irrigation supply

but must recognise and value the multiple benefits that water storages provide and the broader impact of operational decisions.

To formalise this approach the Green Paper has suggested that the functions and roles of a storage operator be specified under the *Water Act 1989*. In the first instance, these functions and roles could be assigned to water authorities who are currently operating large storages. The functions and roles could include:

- Formal recognition of storages and their functions to supply water and provide for recreational and public use.
- The rights and powers to properly manage storages.
- Processes to engage with local government to contribute to statutory planning to protect the water quality and environmental values of storages and surrounding land.
- Processes for preparing and implementing recreational plans.
- Mechanisms to collect revenue from people and agencies who derive benefit from the dams.
- Processes for decommissioning dams.

5. Wimmera Mallee Case Study– A Framework for Sustainable Water Management³.

5.1 Summary

The lessons learnt from the Northern Mallee Pipeline Project serve not only as a lesson for development of the Wimmera-Mallee Pipeline Project but stimulate a framework for regional water management of rural supplies across Australia.

The Wimmera-Mallee Pipeline Project is of regional significance supporting improved management of catchment and surface water resources to the benefit of the community, environment, recreation and regional development.

The Wimmera-Mallee Pipeline Project provides an opportunity to create a tangible national example of the robust and sustainable water-allocation model promoted by COAG.

At present in the Wimmera Mallee area there is:

- Significant over-allocation caused by wastage in distribution of the resource that has resulted in adverse impacts on the environment and uncertainty of security of supply for water users; and
- Little flexibility in the system to respond to changing circumstances and demands for new allocations for development opportunities.

As a result the Wimmera-Mallee Pipeline Project has the potential to deliver a dynamic and sustainable package where:

- A robust process for addressing the environment's needs will be guaranteed;
- Urban users will receive a more secure and far higher quality of supply;
- Stock and domestic and commercial users can be allocated secure access rights to water;
- An opportunity for improved trading to efficiently allocate the resource across the delivery system whilst promoting growth through diversified enterprise; and
- The environmental flow manager will be able to manage flows on a counter-cyclical basis to mirror dry weather and wet weather flows.

The Wimmera-Mallee Pipeline Project is seen as the biggest adjustment project in the Murray Darling Basin to recover water currently lost. It is the largest available investment opportunity to achieve water savings through a single project. It is an initiative of national significance and has the potential to restore close to natural flows to two heritage rivers with significant floodplain and wetland values.

³ The case study has been developed from material provided by Wimmera Mallee Water and publications on the Wimmera-Mallee Pipeline Project as prepared by Marsden Jacob and Cornell Wagner.

5.2 Introduction

A matter of particular interest to the House of Representative Inquiry is the outcomes of the Northern Mallee Pipeline Project and how that could serve as a model for other areas.

The Federal Government has obviously been a key player in piping programs in the Wimmera-Mallee for over 10 years and its participation has largely come about through regional community involvement and representation.

The Federal Government is a major stakeholder in this project and one of the reasons it provided funding was the prospect of it being a water conservation model that could be of value in other parts of Australia.

The case study has been prepared to provide additional information on the Northern Mallee Pipeline Project and how it has served as a useful model for development of the Wimmera-Mallee Pipeline Project.

The Wimmera-Mallee Pipeline Project provides an opportunity to create a tangible national example of the robust and sustainable water-allocation model promoted by COAG.

5.3 Northern Mallee Pipeline Project

5.3.1 Description

The Northern Mallee Pipeline Project was initiated by Wimmera Mallee Water in the early 1990's to reduce the huge losses, in the order of 80%, occurring in open unlined channels in the northern Mallee region and return water savings to the Wimmera and Glenelg Rivers. The cost of replacing Wimmera Mallee Water's open channels with pipes was paid for mainly by Federal and State Governments with Wimmera Mallee Water and private investors paying for a smaller share. The individual farmers paid for the cost of on-farm reticulation, tanks and troughs to replace private channels and dams.

The project was carried out in 7 main stages with Stage 1 starting in 1992 and Stage 7 completed in June 2002.

The Project covered an area of 581,000 ha and resulted in an overall annual saving of 48,610 ML of which 34,690 ML saved is to be provided to the environment, 7,350 ML for security and 6,570 ML for new users⁴. Overall the cost of Wimmera Mallee Water works totalled \$ 40.5 million and cost of on farm works \$ 9.9 million.

The Federal and State Governments contributed an equal amount of funding \$19.1 million (ie. 37% each) over the life of the Northern Mallee Pipeline Project. In

⁴ *Wimmera Mallee Entitlements Project, Northern Mallee Pipeline Water Savings*, DSE, internal report, 2002.

addition Wimmera Mallee Water contributed \$2.3 million to fund the project (\$40.5 million total).

The Northern Mallee Pipeline Project involved replacing the open channel water supply system utilised for stock and domestic supply north of Sea Lake with a fully piped supply system. The project provided services for approximately 500 houses, 1700 farm properties and 12 towns.

The project is based on drawing water from the Murray River and abandoning supply from the Grampians headworks system. It comprised of 4 river pumps, 150 kilometers of rising main, 4 tanks, 3 balancing storages, 6 relift pumps and 2450 kilometers of reticulation network.

5.3.2 Agreements With Government

Earlier stages of the Northern Mallee Pipeline Project were constructed according to agreements between Federal and State Governments that described the specific outcomes of the stage of the project. Later stages of the project (Stage 4 and onwards) were generally presented in the form of a National Heritage Trust project submission, with reference to the overall funding and allocation of savings. Contracts for implementation of these stages focussed on the works aspects of the project, and were contracts between the then Department of Natural Resources and Environment and Wimmera Mallee Water.

5.3.3 Outcomes

The project value to consumers and the environment is demonstrated through –

- Improved flows for the environment and protection of nationally recognised wetlands.
- Increased security of supply.
- Improved raw water quality.
- Improved on-farm management.

Value is increased through –

- Proving itself as a working example of good practice.
- Providing high security water to farms in the driest part of Victoria during the worst drought in 100 years⁵.
- Enhanced service delivery with associated economic and social benefits to farmers and small rural communities.
- Providing savings in previously lost water that has been returned to the environment.

⁵ Wimmera Mallee Water 'carted' water to domestic and stock consumers in the southern part of their area but not to the northern part that is now supplied from the Northern Mallee Pipeline. Water carted is only intended to provide a domestic supply. There is the potential for significant business risk impact on grazing and intensive (feedlot) farming interests if the drought continues.

- Providing a robust institutional arrangement, through bulk entitlements, for guaranteed entitlement to the environment – Wimmera River and Glenelg River.

5.4 Project Learnings

The Northern Mallee Pipeline Project was developed in seven stages each operated to a tight budget provided following an annual budget allocation process. This concentrated the Project on infrastructure renewal with channels being replaced by pipelines in accordance with the level of funding available. Farmers were encouraged to implement complementary works to take advantage of channel replacement as undertaken by Wimmera Mallee Water.

The Project achieved significant benefits and improvements in domestic and stock service delivery and opportunities for improved farm management practices, together with increased flow to the environment and for recreational use. The project clearly met the imperatives of its time.

The associated return to the Federal and State Government investment can be described in terms of incremental improvement of 'What Is' rather than realising generational change through 'What Could Be' which more closely aligns with today's expectations.

Project expectations have changed significantly over time. Not only do resource management projects have to deliver resource sustainability but must also demonstrate real benefits through broader social, economic and environmental benefits.

In today's environment there is an expectation that broader regional development opportunities need to be achieved including –

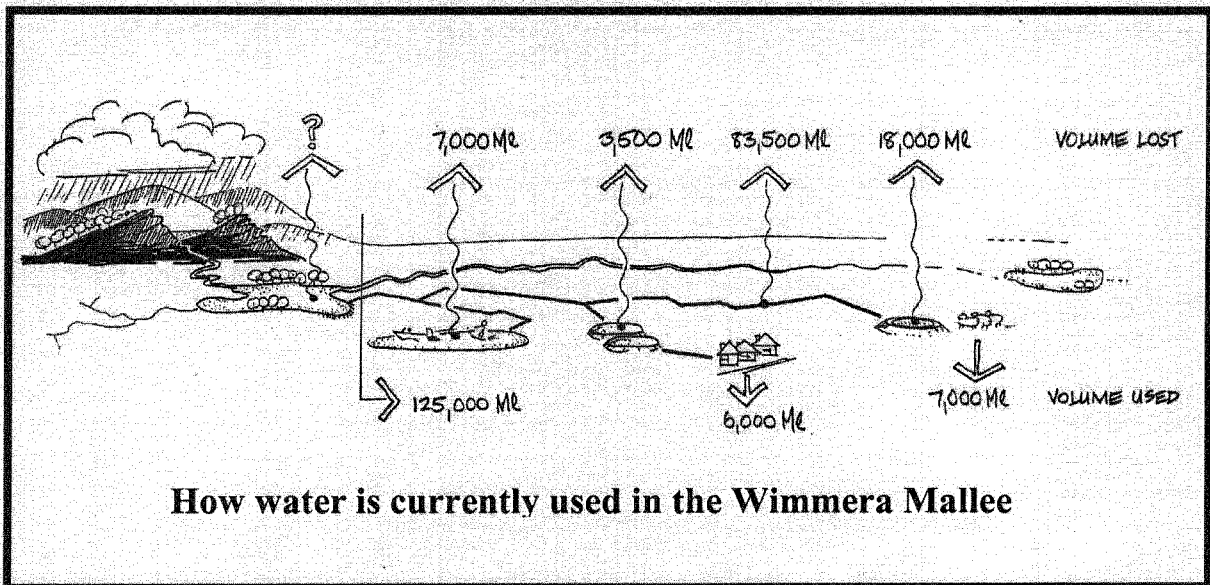
- Optimisation of the project design across areas for optimal configuration.
- Achievement of significant cost savings through economies of scale for purchasing and contracting.
- Opportunities to promote signals for new market investment and associated larger scale investments.
- Improvement in urban water supplies through continuous feed of good quality water.

To achieve such outcomes a broader project management focus is expected. This requires a fundamental change in financing arrangements from annual funding towards long term investment strategies that enable exploration of broader regional and system wide opportunities.

5.5 Wimmera-Mallee Pipeline Project

5.5.1 Background⁶

The Wimmera Mallee water supply system extends from the Grampians in the southern Wimmera, north to Ouyen in the Mallee. Because of the poor quality of groundwater resources and the highly variable rainfall in the region, farming in the region is dependent on a reliable water supply system. The current supply system consists of about 17,000 kilometers of interconnected open channels that are predominantly gravity fed from the storage system in the Grampians. On average, 125,000 megalitres per annum is delivered via this system to all rural, domestic and industrial users in the region.



As highlighted in the diagram above, the nature of this system makes it highly susceptible to water loss through evaporation and seepage. It is estimated that 112,000 megalitres, which is almost 90 percent of total water distributed, is lost annually in this manner. In years of low rainfall, the volume of water distributed is insufficient to meet the primary demand from rural, domestic and industrial users, which results in minimal water remaining for recreational water bodies and environmental flows. This has significant consequences in economic, environmental and social terms for the Wimmera Mallee region.

5.5.2 Project Objective

The impetus for the Wimmera-Mallee Pipeline Project is to provide environmental flows and ensure a secure supply of better quality water for the region while significantly reducing the quantity of water diverted from the natural river system. The project is intended to make a significant improvement to the way that water resources within the catchment are distributed, accessed and managed.

⁶ WIMMERA-MALLEE PIPELINE PROJECT - Initial Consultation, June 2003

The substantial saving of water, which is currently lost to evaporation and seepage, will allow for improved environmental outcomes and the maintenance of recreational assets. This saved water belongs to the community in the broadest sense and the community is involved in decisions about how it should be used.

5.5.3 Overview

(i) Financial

The Wimmera-Mallee Pipeline Project seeks a 26% Federal contribution for this estimated \$300 million project (again, the same contribution as the State Government). The Federal Government has already allocated \$7.5 million this year to the project, \$4 million of which is for new piping in the Patchewollock/Speed and Cannie Ridge areas which is being carried out by Wimmera Mallee Water. The remaining \$3.5 million is for a detailed design and business case of the rest of the piping scheme. The State Government has matched these contributions.

(ii) Process

Stages are:

(a). Feasibility Study - completed

A feasibility study was completed for this project approximately two years ago. This study was successful in placing the project on the political agenda and attracting "in-principle" support from the Federal and State Governments. In this context, the feasibility study has been successful in raising awareness of the project. To take this project the next step, information presented within the feasibility study will be reviewed and incorporated into the project as appropriate.

(b). Conceptual Design of the Pipeline – in progress

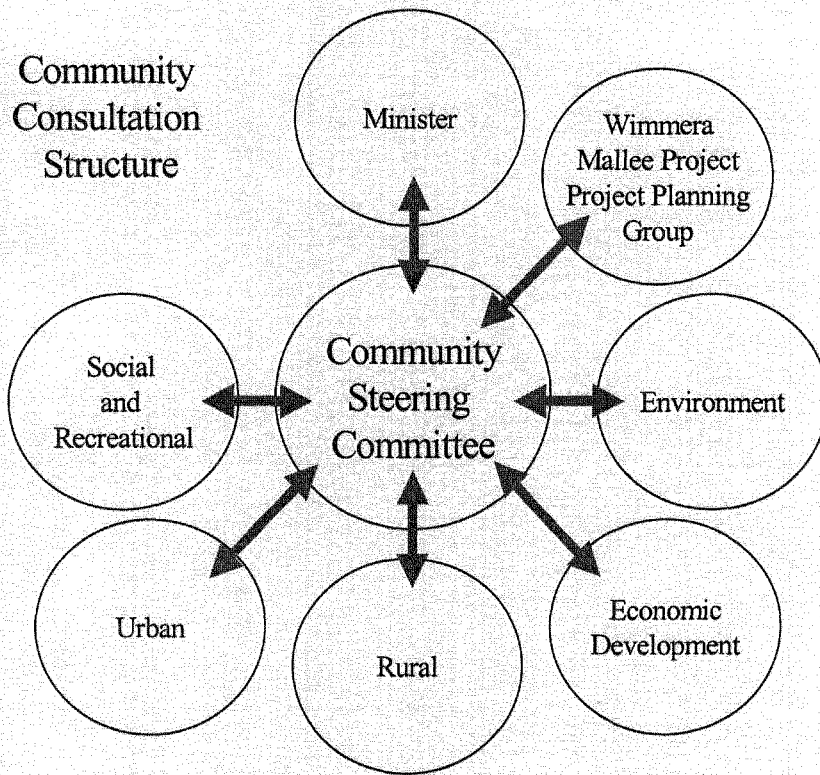
Conceptual design options for the proposed project are being prepared which will be used to develop the detailed design of the pipeline project. An extensive consultation program is being conducted with the regional community. This consultation program includes, but is not limited to, authorities, agencies, local farmers, town and rural landowners, and other community stakeholders.

The consultation program is intended to identify:

- The level of community support for the project.
- How the community believes the saved water should be used.
- Issues and challenges associated with implementation of the pipeline.

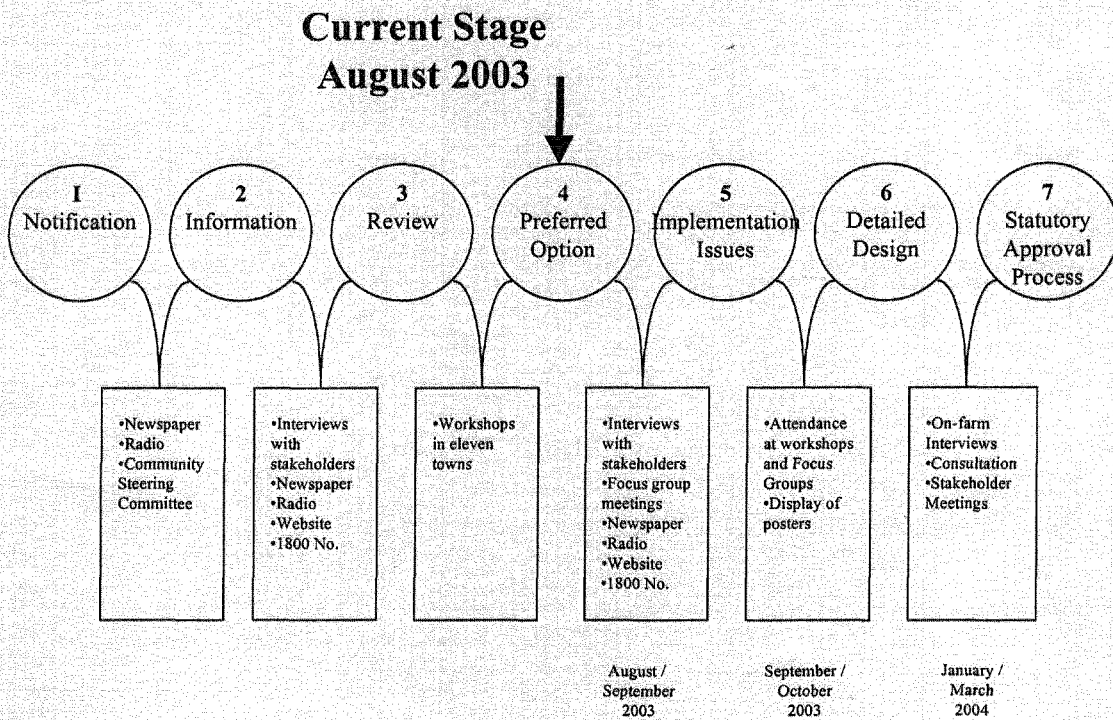
This information will be used to inform the design of the pipeline.

Opportunities will be provided for the regional community to comment on the proposed design concepts before being presented to the Federal and State Governments.



Based on *Wimmera-Mallee Pipeline Project, PIPE IT, Progress Report*, March 2003.

Conceptual Design Program⁷



⁷ Based on *PIPE IT, Saving Water for Western Victoria*, Consultation Newsletter.

(c) Business Case

Based on the preferred design of the pipeline, a business case will be prepared. This business case will be used to capture the social, economic and environmental benefits of the project with the view to securing funding from the Federal and State Governments.

Development of the business case evaluates the impact of restructured water management throughout the region and provides valuable information of the short to long term impacts. This will include consideration of scheme impact on "whole of region" outcomes including benefits, costs and risks to the environment, the community and the economy.

With completion of the business case stakeholders will be empowered to make decisions on scheme development.

5.5.4 Project Concept Description

A commitment to total project funding is required to deliver the benefits effectively across the region. A major supply pipeline is to be constructed from Lake Bellfield to a pump station near Lake Taylor to supply the Wimmera Mallee area at an indicative cost of \$ 40 million. As a result there will be significant improvement in the quality of supply as Lake Bellfield water is of a very high quality, and the existing system involves discharge and transfer via river and channel with resultant detrimental impacts on quality. Utilising other good quality water sources such as Lake Wartook will provide security of supply. The improvement in resource management provides the potential for a number of storage reservoirs no longer being required to harvest resources for supply, allowing them to be used for other purposes such as recreation. Such reservoirs could then be operated at a lower level to reduce evaporation losses⁸.

From the pump station near Lake Taylor a piped distribution system is to be implemented in stages along four legs. An east leg towards Charlton, a western leg towards Dimboola, a northern leg towards Warracknabeal and a central leg towards Donald. The implementation plan, yet to be developed, will consider the areas where greatest benefit will be gained. A structured approach to development is seen as the means to smooth workload and provide "attractive" contracts to the benefit of the project proponents and constructors.

⁸ Evaporation is a function of the lake surface area. The topography of the storages is such that as the lake level reduces there is a significantly smaller surface area.

ADDITIONAL INFORMATION HELD BY THE SECRETARIAT

**Attachments to Submission No. 175 -
Victorian Government, Minister for Water.**

- 1. Planning for the Future of our water resources - 21st Century
Melbourne: a WaterSmart City - Final Report**
- 2. Securing Our Water Future - Green Paper for Discussion**
- 3. New Water for Victoria - Victoria's Water Recycling Action Plan -
October 2002**