Shepparton Irrigation Region Implementation Committee

Water, Land and People

Annual Report 2002-2003

GOULBURN BROKEN
CATCHMENT MANAGEMENT AUTHORITY

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Department of Sustainability and Environment
Department of Primary Industries

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CONTENTS

OUR REGION – OUR PEOPLE

THE SHEPPARTON IRRIGATION REGION

The Shepparton Irrigation Region (SIR) covers over 500,000 hectares and occupies approximately one third of the Goulburn Broken Catchment, the eastern area of the North Central Catchment and forms part of the Murray-Darling Basin.

The SIR includes the municipalities of the City Of Greater Shepparton, Moira Shire and Campaspe Shire and the major rural centres Shepparton, Cobram, Echuca, and Kyabram. The townships of Mooroopna, Cobram, Rochester, Numurkah, Tatura, Nathalia, Stanhope, Lockington, Murchison, Colbinabbin, Tongala, Strathmerton, Katamatite, Undera, Girgarre, and Katandra also lie within the SIR boundary.

The irrigated area of 317,000 hectares within the SIR utilise approximately 1.5 million megalitres of water each year and in 2002-2003 produced the gross value of production calculated at approximately $5 billion. The main primary industries are horticulture, dairying, cropping, viticulture, wool, forestry and grazing.

The SIR is the centre for food processing industry that contributes a major percentage of Victoria's export earnings. Companies include Kraft Foods, Fonterra Cooperative Group (Bonlac), Snow Brand Australia, Cedenco, Simplot Australia, Nestlé Australia, Unifoods, Henry Jones Foods (IXL), Tatura Milk, Murray-Goulburn, Meiji-MGC Dairy Company, SPC Ardmona, Campbells Soups Australia and Girgarre Country Foods.

OUR PEOPLE

The SIR population is over 110,000 people and includes over 7000 rural properties, with over 20% of those being of a multicultural background.

Our region is home to the largest indigenous population outside of metropolitan Melbourne. Cultural and linguistic diversity is a feature of the region where well established communities, primarily as a result of Southern European post-war migration, co-exist with more recently arrived communities from countries such as Iraq, Iran and India.

WHAT DO WE DO?

The SIR is part of the corporate and business management structure of the Goulburn Broken Catchment Management Authority (GB CMA). The GB CMA also is directly responsible for the management and implementation of the Biodiversity, Floodplain and River Health and Water Quality programs in the SIR Catchment Strategy. The SIR Implementation Committee (IC) has representatives on Coordinating Committees in each of these programs.

The SIR IC has the prime responsibility to deliver the program of natural resource objectives of the SIR Catchment Strategy. The SIR Catchment Strategy is a 30-year strategy that provides the framework for land, water and biodiversity management and aims to improve the condition of natural resources in the SIR for current and future community. The SIR Catchment Strategy has been underway for over 12 years with the whole community working hard to achieve goals.

Under the *Catchment and Land Protection Act 1994* the SIR Catchment Strategy is reviewed every five years with an extensive review of natural resource management programs engaging in consultation with community based committees, State agencies, partner organisations and Local Government.

Issues

Salinity

Salinity has increased in the SIR through rising watertables and salt mobilisation, resulting in significant environmental, social and economic losses. Clearing of land and inefficient application of irrigation water has increased watertable levels. Annually 260,000 tonnes of salt is exported to the River Murray with adverse impacts to downstream communities in the Murray-Darling Basin. Research and Development, together with the onground works undertaken by the Farm, Sub-surface Drainage and Community Surface Water Management programs are the major thrust against salinity under the SIR Catchment Strategy in reducing accessions to groundwater and other salinity threats.

Water Quality

Contaminants including salt, nutrients from irrigation drainage, sewerage treatment plants, sediment mobilisation, urban stormwater and intensive animal industries affect the water quality in the SIR. The management of these contaminants is being addressed under action programs within the SIR Catchment Strategy.

Native Biodiversity

An improvement in information available has led to a stronger understanding of the importance of biodiversity to our natural and productive systems. All actions that impact on land and water impact on native biodiversity. The SIR Catchment Strategy aims to ensure that all impacts are considered in decision-making and that biodiversity needs are an integral part of all the natural resource management programs in the SIR.

Riverine Health

Storing and delivering water for urban and agricultural use has dramatically altered flow patterns of our rivers and creeks and had a direct impact on the region's aquatic biodiversity, quality of water and the waterway environment. The SIR Catchment Strategy programs target threats to stream health: erosion; sedimentation and salinisation; effects from agriculture, land clearing and urbanisation; changes to stream environment including introduction of exotic flora and fauna, de-snagging, construction of dams and barriers; river regulation and water extraction and poor river frontage management.

Pest Plants and Animals

Pest plants and animals have a negative impact on biodiversity ecosystem function and the productive capacity of the land and water resources. The SIR Catchment Strategy targets declared noxious weeds such as Paterson's Curse, prairie ground cherry, silver leaf nightshade, blackberry, sweet briar, St.John's wort, Chilean needlegrass, African lovegrass and hardheads. Priority pest animal species are foxes and rabbits and in the waterways European Carp are a major problem, causing turbidity, damage to stream habitat and depletion of native fish populations.

Climate Change - Greenhouse Gas Emissions

Climate change has implications for the long-term sustainability of our economy and community. There are opportunities to assist the reduction of greenhouse gas emissions that are consistent with salinity, biodiversity and water quality programs. Through revegetation programs and enhanced agricultural practices multiple benefits can be achieved.

WHO PAYS?

Annually, the SIR IC attracts funding of close to $18 million. The majority of this funding goes directly to onground works projects. The SIR Catchment Strategy is funded jointly by

the regional community, the Victorian, Commonwealth and Local Governments. The SIR Catchment Strategy is an integrated program of works with funds sourced from a wide area.

Regional Community

The regional community has a major commitment to implementing the SIR Catchment Strategy, both to capital projects and ongoing operation and maintenance. In 2002-2003, this was estimated at $37 million.

Government Funding

Government funding is provided through annual integrated budgets for the SIR Catchment Strategy prepared on the basis of bids submitted by the SIR IC. The 2002-2003 State and Federal Government allocations for SIR Catchment Strategy implementation totalled $14,164,000. This was made up of a State Government allocation of $8,365,000 through the State Consolidated Salinity Budget via Catchment Management and Sustainable Agriculture (CMSA) and Federal Government funding of $5,799,000 which was provided by the Natural Heritage Trust mainly through the MD2001 Program.

Industry Funds

Private industry also plays a significant role in the program. Powercor Australia Ltd provides substantial support to the Sub-surface Drainage Program in the form of a rebate on the cost of a pole and substation. SPC Ardmona contributes significantly for the East Shepparton Salinity Project.

OUR PARTNERS

Goulburn-Murray Water

Goulburn-Murray Water (G-MW) manages water storages and the supply and drainage channel infrastructure in the SIR. G-MW is the major partner in the delivery of the SIR Catchment Strategy through the Sub-surface and Community Surface Drainage Programs.

Department of Primary Industries

The Department of Primary Industries (DPI) is responsible for driving the key objectives of the SIR Catchment Strategy in natural resource management. The DPI implements the Farm and Environment Programs and, in conjunction with G-MW, the Community Surface and Sub-surface Drainage Programs. The Agriculture Victoria Division of DPI also carries out vital Research and Development programs providing scientific advice and direction.

Local Government

Local Government is a key partner, providing Statutory and Strategic Planning, participating in cost-sharing for the SIR Catchment Strategy and providing a link with the broader community. Local Government jointly with the Goulburn Broken Catchment Management Authority, funds a coordinator to ensure that the partnership operates effectively. This involves the municipalities of the Greater Shepparton City Council, the Moira Shire Council and the Campaspe Shire Council.

Goulburn Valley Water

Goulburn Valley Water (GVW) provides urban water supply and wastewater services in the SIR. GVW, in conjunction with the GB CMA, works to minimise phosphorous (to <1mg/L) exports from wastewater treatment plants to our river systems, improve water quality and for full reclaimed water reuse to land. GVW develop waste management plans in line with Government requirements and implement these plans to meet State Environment Protection Policy (Waters of Victoria) and the SIR Catchment Strategy. GVW also house the

Catchment Stormwater Officer who works in conjunction with GB CMA and all local councils throughout the SIR and catchment to improve stormwater through a range of structural and non-structural measures.

Goulburn Murray Landcare Network

The Goulburn Murray Landcare Network (GMLN) is a voluntary community-run forum, networking 35 Landcare groups in the SIR. A sound relationship has been established between the GMLN and the SIR IC. A number of projects are also undertaken by the GMLN in partnership with the GB CMA. The GMLN coordinates and funds regional projects such as community monitoring, the Weed Busters and Rabbit Busters program, "Impact Tours" and primary school education. These projects enhance the high level of community participation in the catchment management promoted under the SIR Catchment Strategy.

Ethnic Council of Shepparton and District Inc

The Ethnic Council of Shepparton and District Inc (Ethnic Council) represents more than 26 culturally and linguistically diverse communities who live across the region. Formed in 1991, this strong relationship supports and services the needs of these communities in land management issues. The 60 member Ethnic Council is represented on committees and in policy development by specialist staff from within the Ethnic Council and Agencies.

Private Farm Forestry Program

The SIR Farm Forestry Network (SIRFFN) facilitates and coordinates development and management of private forestry and eco-services in the SIR. The SIRFFN works with landholders to integrate private forestry into local farming systems and rural landscapes for improved investment, social and environmental outcomes. There is a representative from the SIR IC on this program and it is closely linked to environmental and farm tree projects.

Murray Dairy

Murray Dairy was established to lead the economic and social development of the dairy industry in northern Victoria and southern NSW. This is achieved by investing industry Research & Development funds in research programs and regional development activities that benefit all stakeholders of the dairy industry and the broader community. Murray Dairy with its partners, including the SIR IC, invests around $2 million annually on natural resource management Research & Development.

As part of the dairy industry's national natural resource management strategy "Dairying for Tomorrow – Sustaining Our Natural Resources", Murray Dairy has coordinated the development of a Regional Action Plan that focuses on:

- Building on existing partnerships with government and community organisations, including the SIR IC
- Extension initiatives to connect on-farm practice with natural resource management
- Research & Development to improve water use efficiency on dairy farms
- Enabling the industry to better report and demonstrate its environmental performance to the market and community
- Ensuring a strong, coordinated industry response to new and emerging issues

OUR ORGANISATION - COMMUNITY ENGAGEMENT

Members of the SIR IC are nominated because of their specific skills and community networks. The SIR IC meets on a six-week cycle throughout the year and is made up of eight community representatives and representatives from partnership agencies ie.

Department of Primary Industries and Goulburn-Murray Water. Working Groups have also been established for the four action programs:

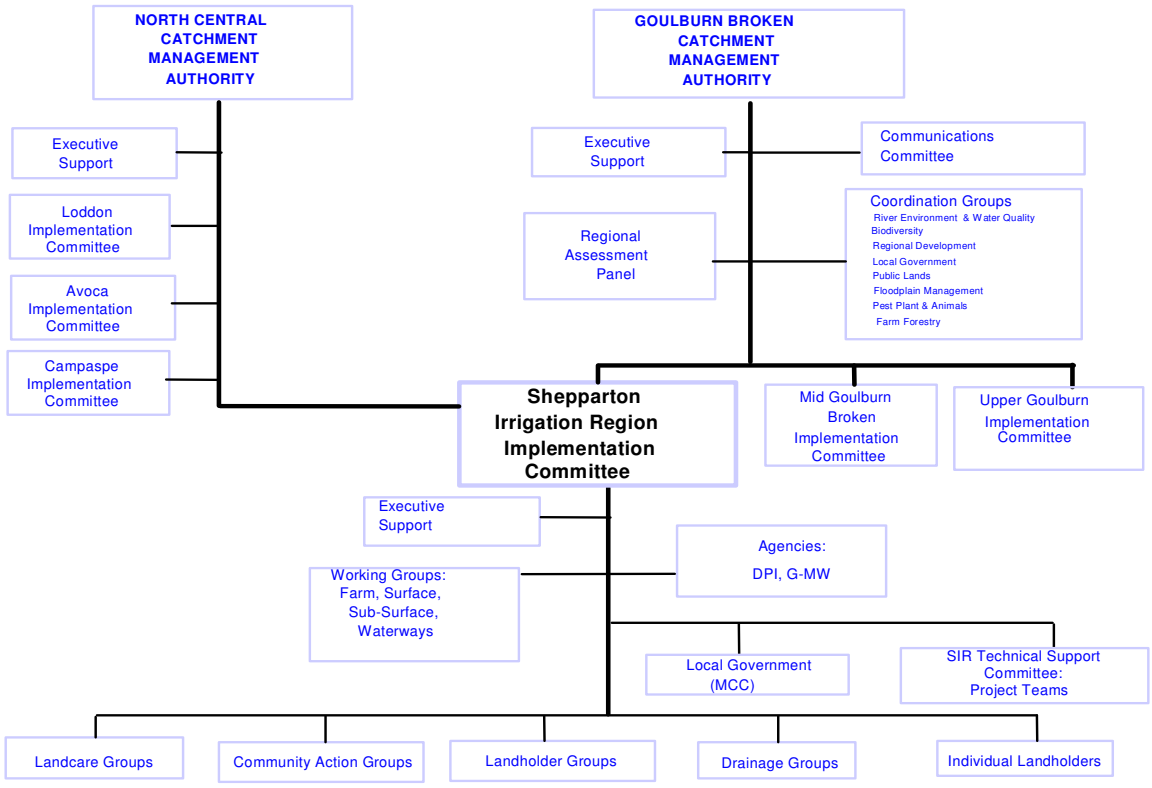
- Farm and Environment
- Surface Drainage
- Sub-surface Drainage
- Waterways

The Working Groups comprise community representatives (including representatives from each of the four Water Service Committees of Goulburn-Murray Water, Victorian Farmers Federation, Local Government and environmental groups and agency representatives. These groups manage all aspects of the particular program: budget allocation, works programs, monitoring, policy development and research. They address issues in detail so that the SIR IC can operate effectively and strategically ensuring strong input from all stakeholders in the partnership.

The SIR IC is supported by an Executive Support Team, which provides executive and technical advice for the implementation of the Catchment Strategy. Agency staff also provide technical input through a Plan Implementation Support Committee (PISC), the working groups and specific project teams. This seemingly complex structure ensures community input and ownership as the Catchment Strategy continues to evolve during implementation.

The SIR Catchment Strategy signifies a true partnership between the local community and all levels of government - state, federal and local. There has been a dedicated commitment and ownership from community members and agency staff because they all have a role in the evolution of it and a sense of responsibility for it.

Management Structure for the Implementation of the SIR Catchment Strategy



CHAIR'S REPORT

The year 2002-2003 has been an extremely difficult in the implementation of the Shepparton Irrigation Region (SIR) component of the Catchment Strategy. Despite this the members of the Implementation Committee (IC) continued to effectively carry out their role. The continued progress in the implementation of the Shepparton Irrigation Region component of the Catchment Strategy was due to a number of strengths in this catchment.

Strengths

- Strong links with the catchment community through the SIR IC members and members of the various working groups that report to the SIR IC
- A strong and vigorous partnership with the Landcare groups, the Goulburn Murray Landcare Network and more recently the Local Area Plan Groups
- A strong partnership between key agencies and authorities
- A strong technical support network to all aspects of the plan
- An integrated approach to tackling the key natural resource issues and protecting our important natural assets

Achievements

The partnership program with the Catchment and Water group of the Department of Sustainability and Environment is delivered with our regional partners in Goulburn-Murray Water and the Catchment and Agricultural Services business of the Department of Primary Industries. The progress towards our targets for onground works has again been impressive.

Landholders in the region have continued to implement salinity mitigation works, encouraged by the public expenditure in infrastructure such as surface drains and public groundwater pumps. Initial estimates indicate that landholders have expended over $37 million on their properties. The Private Forestry Project has been involved in a community project to mechanically thin private plantations resulting in 25 tonnes of treated hardwood logs, 100 tonnes to be sold for pulp and 100 tonnes to be sold for firewood.

In response to the drought conditions, the Pest Plant and Animal program in the SIR during 2002-2003 took into consideration landholder focus on the dry conditions. Through the efforts of the Goulburn Murray Landcare Network facilitators, SIR Landcare Groups and Department of Primary Industry staff, the program continued to maintain a coordinated approach to pest management in the community. This high level of activity has occurred in a climate of the lowest water allocations on record, widespread drought, reduced funding and the ever-changing political and institutional arrangements. These difficulties make the achievements all the more meritorious.

Conclusion

It is essential that the SIR IC continues to attract substantial government funding in order to maintain landholder confidence in the program. Our ability to implement well planned, fully integrated, environmentally sensitive and cost effective works, ensuring the future of the SIR, should not be placed in jeopardy. I am certain that one of the great strengths of the Shepparton Irrigation Region Catchment Strategy and its underlying programs is the continuing strong and healthy partnerships which have been established between the Community, Agency and Government.

Russell Pell
Chair
Shepparton Irrigation Committee Implementation Committee

IMPLEMENTATION REPORT

EXECUTIVE OFFICER'S REPORT

Overview

During 2002-2003 all the grant schemes in the Shepparton Irrigation Region (SIR) were modified to introduce an "expression of interest" process to improve the understanding of the progress of landholders in doing the works as part of the particular grants. This greater understanding provides a more accurate assessment of the potential funding requirement for grants for works underway.

The "expression of interest" process means that when landholders apply to be part of a grant scheme, approval to proceed with the works is not given unless the grant coordinator is confident that funding is likely to be available. Outcomes for the individual programs are summarised below and are further detailed in the individual project reports.

Implementation

Environmental Protection Program

The Environmental Protection Program is an integral part of all the SIR Catchment Strategy programs with program activities predominantly reflecting native biodiversity protection and enhancement and including both issue development and delivery of onground works. During the past twelve months, program achievements and direction have been challenged by staff departures, drought and support for the North East fires.

The Goulburn Broken Draft Native Vegetation Management Strategy goals and native biodiversity targets supporting the achievement of these goals have become part of the SIR Catchment Strategy. As a consequence native biodiversity protection and enhancement works are being directed towards high priority action zones, significant and particular Ecological Vegetation Class remnants and habitat localities. The Grey Crowned Babbler project in the Murray Valley area is an example of habitat protection and restoration works.

A strengthening of partnerships with other SIR IC programs, the catchment community and other regional and state natural resource managers, has brought about some very positive results highlighted in the annual target achievements. The program has also developed strong productive relationships with Local Government, Trust for Nature and Greening Australia resulting several Conservation Covenants with private landholders.

Through the development of adaptive management plans for significant wetland sites on private land and terrestrial sites on both public and private land, improved native biodiversity management practices are being implemented. The management plan development process has assisted the development of strong links with both community and agency bodies. Their development has also assisted funding applications, environmental water allocations and implementing native biodiversity monitoring regimes. Plans have been completed for Yielima and Inglis Bushland Reserves and Brays Swamp. Kinnairds Swamp, Reedy Swamp and Mansfield Swamp plans are close to completion. An Operational Agreement has been developed between Parks Victoria, Goulburn-Murray Water and the Department of Primary Industries to assist in reinstating a natural watering regime.

Again this year the program was successful in transferring 265ML of environmental water to Brays Swamp, one of the important Goulburn River wetlands. The transfer took place in March and the results are being assessed now.

Small isolated public land sites including road reserves supporting significant native biodiversity continue to be protected and enhanced through the implementation of a comprehensive SIR Public Land Works program. The most significant achievements in this program has been the Peppercorn Removal Project.

Direct seeding activity is now being incorporated into public and private land works, resulting in 47ha of revegetation using this method. Tree growing and environmental grant incentive schemes using the cost-share matrices are working successfully and delivering more onground works.

The program continues to consider and respond to Statutory Planning referrals. With the introduction of the Statutory Planning Case Management System the process has been simplified and case information is now available on-line. Statutory Planning referrals and the associated negotiations have provided a continual source of protection and enhancement opportunities.

We have reviewed the procedures for Environmental Monitoring, prepared a manual and a detailed report for the last 10 years.

As a result of a range of extension activities, agency and industry bodies appear to be more aware of native biodiversity and environmental best management practices. A noticeable and positive change in landholder attitude towards the retention of native vegetation and works associated with protection and enhancement is evident with landholders protecting larger areas of remnant vegetation and showing greater awareness of environmental protection legislation and enforcement procedures.

This year's program has led to the protection of 81ha of wetland and remnant vegetation.

Farm Program

A particular highlight in the works program was the completion of a further 225 Whole Farm Plan grants covering 17,368ha. This project continues to exceed targets and set new records for the number and area of Whole Farm Plans prepared. A total of 188,748ha of the irrigated part of the region are now covered by Whole Farm Plans. The plans prepared this year represent an increase of 5.5% and the area now “Whole Farm Planned” is 59.6% of the irrigated area.

These results are particularly pleasing in the context of the difficult seasonal and financial conditions that landholders were dealing with. This continued high level of activity in Whole Farm Planning shows that landholders are committed to planning for catchment works on their properties.

The Whole Farm Planning process continues to evolve and improve to satisfy changing environmental requirements. Over 137ha of native vegetation was planted on properties in the SIR as a result of the program. Another 81.2ha of remnant vegetation on private land were fenced for protection.

Works such as farm reuse and improved irrigation layout contribute significantly to the improvement in water use efficiency. These have both environmental and economic benefits. Each year in the SIR, a further 6% of properties are installing drainage reuse systems and 3% of the irrigation area is lasergraded.

Despite the drought conditions, the incentives for the construction of drainage reuse systems and installation of automatic irrigation have continued to be strongly supported by landholders. Incentives were paid for 99 drainage reuse systems that were installed to drain

6,716ha and brings the total number to 171 systems draining 12,794ha, which is 4% of the irrigated area in the SIR.

Thirty-nine automatic irrigation systems have been installed with assistance and these systems service 2,231ha and include 40 channel outlets that have also been automated under the scheme. The total number of automatic systems installed with assistance is now 66 serving an area of 3,604ha, just over 1% of the irrigated area.

River Health and Waterways Program

The Waterways Program focused on specific reaches of rivers and streams to achieve multiple benefits in stream health, water quality, and biodiversity. The main targets were the Seven and Castle Creeks, the Nine Mile Creek (anabranch of the Broken Creek), Goulburn River, Broken Creek and the River Murray. Community support for the works resulting from Local Area Planning and Land Care Groups was a highlight.

Major projects included the removal of exotic woody weeds from the Goulburn River between Nagambie and Loch Garry, and continuation of programs on the Broken Creek and Lower Goulburn River. A major bank stabilisation project at Bunbartha also included removal of a major exotic woody weed infestation. Seven existing rock weirs were modified to improve fish passage, and bank stabilisation works were carried out at seven locations on the Seven and Castle Creeks. Six new rock chutes were built on the Nine Mile Creek to stabilise the eroding bed and banks and improve habitat diversity. A major program has commenced on the River Murray to improve the frequency of wetlands filling during flood events. Implementation activities continued on the Kinnairds Wetland Master Plan, and new works commenced on the Gemmills Swamp Recreation Plan.

The Waterways Fencing and Revegetation Incentive Guidelines resulted in 38km of fencing to protect waterway frontage. Appropriate trees and understorey species were planted in the riparian zone along with grasses and water plants along the edges of waterways. Planting remained lower than normal due to the dry conditions (6,600 plants this year). A major abnormal activity was the watering of plantations to protect current and previous investments from the impacts of the drought. Off-stream stock watering points were provided at 53 locations to compensate for loss of stock access to waterways.

The success of the river health program is monitored and evaluated using the Statewide Index of Stream Condition. This index reflects the various aspects of river health (water quality, in-stream habitat, river hydrology, riparian condition and river channel form). A major review of the reference sites is due to be carried out in 2003-2004, and this will provide an important report card on the works carried out to date, and help in the planning of future works priorities.

A wide range of research, evaluation and demonstration projects continued to be supported within the catchment with a range of catchment partners.

Surface Water Management Program

The Surface Water Management Program continues to progress well with 14km of Primary Drains constructed, 2.2km of existing Primary Drains remodelled, and 26km designed. As well 6.5km of Community Drains were constructed this year. In addition 15km were surveyed and designed. This provided a regional drainage service to another 2,050ha, protecting this area from waterlogging and rising water tables. Eight drains previously managed by local government are in various stages of transfer to Goulburn-Murray Water under a new management option.

Progress occurred in a number of developments, including drain monitoring, nutrient stripping and drain management, to keep the SIR at the leading edge of best practice. All of these developments are aimed at improving downstream water quality.

Drainage resource assessments have been completed for the 20 existing main drain catchments. Drain Diversion Plans were completed for all but one of these catchments, allowing allocation of additional drainage diversion licences to proceed. Two new drain flow monitoring installations were also completed (MV drain 13 and Shepparton drain 4).

A review of the process for dealing with dairy effluent discharges to drains was undertaken in partnership with key agencies and changes recommended. Phosphorus loads exported from irrigation drains continued to show substantial decline, with the 5-year rolling average now below the target value for 50% reduction.

The program completed a joint research project together with Goulburn-Murray Water and Land and Water Rural Research Development Corporation looking at ways of reducing the nutrient and sediment loads in surface drains.

The Farm Dams Review and its potential implications has continued to interrupt the demand for the Nutrient Removal Incentive Scheme. This Incentive Scheme is aimed at building large farm storages (greater than 50ML) to capture high flow diversions from our major drains and results in significantly reduced nutrient outfalls from the region.

Six new systems were completed this year with a total capacity of 1425ML. There have been twenty-one systems constructed with assistance from this project with a total capacity of 4,043ML. A survey undertaken over 2002-2003 indicated that even in this very dry year these storages were able to prevent 1.8 tonne of phosphorus from reaching the rivers of the region. The total over the last four years is 25 tonne of phosphorus prevented from reaching the rivers of the region.

Sub-surface Drainage Program

Implementation of the SIR Groundwater Management Plan continued with a few of the remaining flow metres fitted to private groundwater pumps. The metering program is now effectively complete with 725 private groundwater pumps now metered. Routine groundwater monitoring, flow meter reading and groundwater sample collection and analysis were completed. Monitoring, analysis and reporting for the August 2002 watertable study were completed.

Members of the SIR IC have also been involved in the development of management plans for the Katunga and Campaspe Deep Leads.

As well as the work on the Groundwater Management Plan, the Sub-surface Drainage Program continued to progress. Exploratory drilling investigations were completed on 64 properties, identifying 23 sites suitable for private groundwater pumps and a number of sites with potential to be developed for public pumping sites. Fifty investigations are still currently in progress and there are 231 farmers on the waiting list.

A further thirty-two private groundwater pumps were installed and two existing pumps upgraded. This brings the total number of new pumps to 252, with 72 upgraded, protecting over 31,000ha. Eleven private systems are in the process of being completed. A further five public pumps were completed bringing the total to 37 protecting over 5,500ha.

The Sub-surface Drainage Program completed a review to develop a “Future Directions Strategy” and a “Five Year Research and Development Program”.

No winter-spring salt disposal under the Murray Darling Basin Salinity & Drainage Strategy was available from groundwater pumps last year, due to the low flows in the Murray. The SIR is presently debited with 2.52EC of its allocation of 4.9EC.

Funding

The implementation of the SIR component of the Catchment Strategy is funded jointly by the regional community and the Victorian and Commonwealth Governments. The program has continued to attract significant Federal funding - a reflection of our ability to implement well planned, environmentally sensitive and cost effective works. However Federal allocations are declining.

In 2002-2003, the total SIR IC budget was over $17.6 million. This was composed of 67% State funds, mainly from the National Action Plan Salinity and River Health Programs, 17% of Federal National Action Plan and Natural Heritage Trust funds – a significant decline. The majority of funds (75%) were directed to works. Other components include research and investigation, extension, monitoring, planning and coordination.

General

The SIR IC has continued to work closely with local Landcare Groups and networks to ensure their input into and support of the Catchment Strategy. The SIR IC has continued with the Community Salinity Grants program. Last year 17 groups in the SIR received a share of the $30,000 for a range of projects.

Local Area Planning as a means of delivering strategic planning aligned to the Goulburn Broken Catchment Strategy at a sub-catchment (Landcare Group) scale continues to gain momentum. This project is a joint activity between the Goulburn Murray Landcare Network, Department of Primary Industries and the Goulburn Broken Catchment Management Authority with eight Local Area Plans progressed through 2002-2003.

The four Local Area Plans to be launched, the Cornella, Wyuna, Invergordon and the Nanneella Local Area Plans are now well into implementation. During 2002-2003, the Nathalia Local Area Plan was launched and the three groups in development have all made progress in developing Local Area Plans for their areas.

Policy and Planning

The SIR IC and its working groups have continued their major input into the review of the SIR Catchment Strategy to align with a number of State activities and the National Action Plan. This includes major reviews of Surface Drainage, Farm, Environment, Waterways and Sub-surface Drainage Programs. These activities continue to provide opportunities to reflect on our progress in implementing the SIR Catchment Strategy and to develop programs to take these activities into the future.

The SIR IC prepared its Business Plan as a component of the Goulburn Broken Catchment Management Authority Regional Management Plan. Individual communication strategies are being developed for each new or amended policy issue as the IC endorses it.

The increasing competition for water; structural change and Greenhouse have required and will continue to require new thinking to keep our catchment at the forefront.

4 PROGRAM REPORTS

INTRODUCTION

The year 2002-2003 was one of achievement and progress in implementing the Shepparton Irrigation Region (SIR) component of the Goulburn Broken Regional Catchment Strategy.

The partnership program with the Catchment and Water group of the Department of Sustainability and Environment (DSE) is delivered with our regional partners in Goulburn-Murray Water (G-MW), Department of Primary Industries (DPI) and DSE. The progress towards our targets for onground works continues to be impressive. The support given by agency staff and the regional communities has been enthusiastic and dedicated towards achieving positive results.

SHEPPARTON IRRIGATION REGION CATCHMENT STRATEGY PROGRAMS

Program	Sub-program
Environmental Protection	• Environmental Works-Public Land • Environmental Works-Private Land • Environmental Management Plans • Conservation Volunteers (Public/Private Lands) • Environmental Assessment • Statutory Planning Referrals
Farm	• Local Area Planning • Water Use Efficiency - Whole Farm Planning, • Water Use Efficiency - Automated Irrigation • Water Use Efficiency - Drainage Reuse Systems • Whole Farm Planning • Drainage Reuse Systems • Biodiversity Enhancement on Private Land (Tree Growing) • Water Quality • G-MW Extension – Farm Management Services • Agronomic Research and Investigation
Surface Drainage	• Primary Drains • Community Surface Drains • Drain Management • Nutrient Removal Incentive Scheme
Sub-surface Drainage	• Public Groundwater Pumps • Private Groundwater Pumps • Capital Grants for Sub-surface Drainage
River Health and Waterways	• Boating Safety (Facilities) Grants Program • Structural Works Program – Erosion Control/Fish Passage • Murray Corridor Floodplain Rehabilitation Project
Water Quality	• Goulburn Broken Water Quality Strategy • Urban Stormwater
Monitoring	• Environmental Research and Investigation Shepparton Drain Nutrients – mandatory Mandatory Environmental Monitoring Salt Load Monitoring Effectiveness of Groundwater Pumping

Program Support	• Community Education and Landcare Support • Municipal Support Project • Department of Primary Industries – Sustainable Irrigation and Land Management Program Support
Research – Water for Growth Projects	• Market Mechanisms • Bayesian Networks • Improving Water Use Efficiency Through Improved Irrigation System Design • Soil Hydraulic Properties Mapping

ENVIRONMENTAL PROTECTION PROGRAM

Goal: To prevent and, where possible rehabilitate the natural environment of the Region from loss or serious damage from high watertables and salinity.

A number of challenges were confronted during the 2002-2003 year including the severity of the drought, the prolonged commitment required to fight the Alpine fires, a large number of staff departures from the Environmental Management Program team (EMP) of DPI, and a tight budgetary environment that made it difficult to replace staff. Despite these difficulties the team has been gradually rebuilt, staff placed in new positions have taken on the challenge and performed beyond expectations. The backlog of work created by the commitment to the Alpine fires has been wound back and some solid outputs achieved.

Environmental Works - Public Land

Peppercorn seedling regrowth was sprayed along the Murray Valley Highway between Nathalia and Yarrawonga.

Assistance was provided for fencing the Muckatah Township Reserve and a site assessment by Flora and Fauna (DSE) found 22 indigenous species.

Direct seeding of 16ha of Grey's Bushland Reserve, fencing erected on the western boundary and irrigation runoff water contained on private land. Daunt's Bend sandhill had 24ha of direct seeding with reasonable germination despite the dry conditions. Several other public land sites were sprayed in preparation for revegetation works but the dry conditions prevented them from being planted.

The Goulburn Broken Indigenous Seedbank collected 109kg of seed from within the SIR.

Environmental Works - Private Land

This year's works program has led to the protection of 81.21ha of wetland and remnant vegetation. There was also large amount of revegetation this year, with 96,726 plants planted. These plants were used to enhance 81.21ha of remnant vegetation and wetlands, the creation of 33.89ha of wildlife corridors and contributed to the 137.37ha of native vegetation planted.

Direct seeding was also further trialed throughout the 2002-2003 financial year with 11 properties involved. The total area direct seeded was 47.7ha, equating to 155.3 km. This was predominantly in "Plains Grassy Woodland/Pine Box Woodland" Ecological Vegetation Class. Further direct seeding is planned for September 2003.

A high amount of threatened fauna (65.57ha) was potentially protected through the Environmental Incentives Program. The Grey Crowned Babbler Project, Superb Parrot and

Bush Stone-Curlews were the three main threatened fauna species potentially being protected through environmental and tree growing initiatives.

Assistance was also provided to a highly valued environmental site at Naringaningalook through the Environmental Incentives Program. This site was recently purchased by Trust For Nature and contains remnants of Plains Grassy Woodland, Drainage-line complex and Pine Box Woodland Ecological Vegetation Classes. To date, 27km of direct seeding have been completed at this site. A seed production area is also in development at this site.

Environmental Management Plans

Brays Swamp Management Plan was completed and the Reedy Swamp Management Plan is awaiting one final signature. The Mansfield Swamp Management Plan final draft is near completion and the Wallenjoe, One Tree & Two Tree Management Plans have been initiated. Guidelines for developing Wetland Management Plans were completed and endorsed.

Environmental water was successfully delivered to Brays Swamp and monitored over a six week period during May-June with the following results reported:

- A “soup” of macro invertebrates developed early and increased in activity over the first four weeks before declining.
- No fish were recorded over the six-week period.
- Vegetation gradually responded to the supply of water. By the third week of monitoring the River Red Gums were responding showing fresh growth and flower buds and Cane Grass, Spike-Sedge and Nardoo were all sprouting.
- After four weeks of inundation Bathurst Burr and Spear Thistle plants had died.
- Frog species were heard and egg masses found early in the monitoring program. Some tadpoles were observed in weeks 2 and 3 and from week 3 onward only 1 frog species was heard.
- A large number and diverse range of terrestrial and wetland bird species utilised the wetland.
- The numbers and diversity of birds increased over time until week 6 of monitoring when numbers began declining. This could have been due to the widespread heavy rainfall making other sites available to the birds.
    - Abundant species were Grey Teal, Black Duck, Mountain Duck and Black Swan.
    - Interesting sightings were a pair of Peregrine Falcon, Blue-winged Shoveller, Pink-eared Duck, Tree Martin and Flame Robin. In the last week of monitoring a number of different species were noted including Hardhead, Hoary-headed Grebe, Collared Sparrowhawk, Black Falcon, Black-winged (Pied) Stilt, and Red-necked Avocet.
    - No nesting was observed over the 6-week period.
    - Whilst no known breeding attempts from any of the species occurred within this period, this would not be expected to occur until late winter or spring.
    - Unfortunately Brolga was not found to have visited the wetland, although May-June is often the period when this migratory species is first observed for the season.

As part of implementing the Reedy Swamp Management Plan an “Operational Agreement” was jointly developed with Parks Victoria and G-MW. The exciting results of this were G-MW has now allocated funds and started work updating inlet regulating structures. This was one of the key recommendations for Reedy Swamp to reinstate natural watering regimes.

Yielima Bushland Reserve Management Plan has been completed and the final draft of the Wyuna River Reserve Management Plan has been completed and distributed for

endorsement. Endorsement by all stakeholders of the Inglis Bushland Reserve Management Plan has occurred and it is ready for publishing, whilst the Congupna Bushland Reserve Management Plan is awaiting endorsement. Good progress has been made on the Wunghnu and Congupna plans. Only a small amount of work is required to complete them.

A fox control program was implemented in the Wyuna River Reserve. The Kyabram Field and Game Association were enlisted and they completed two culls.

Conservation Volunteers (Public/Private Lands)

A Conservation Volunteers Australia team spent two weeks in the SIR in December 2002 and collected 60kg of seed despite severe heat and poor seed set due to the drought. The Conservation Volunteers Australia team also watered 10,000 seedlings in the Strathmerton area planted as part of the Grey Crowned Babbler project.

Environmental Assessment

Completion of the Draft Shepparton 26P and Shepparton 2/11 Primary Drain Environmental Assessments.

Completion of two Public Salinity Control Pump Environmental Assessments at Lancaster and Byrneside and a review of final plans for Deakin 16P.

A newspaper article on the Giant Bullfrog attracted interest.

Statutory Planning Referrals

The EMP team dealt with 85 planning referrals within guidelines and a joint project with the North Central region in developing ecological thinning guidelines was commenced. These guidelines aim to bring consistency in approaches to thinning out stands of remnant vegetation where the number of stems/ha is too high.

FARM PROGRAM

Goal: To reduce groundwater accessions, soil salinisation and waterlogging on farms.

The Farm Program role is to implement the SIR Catchment Strategy with a specific focus on farm activities. Historically, the Farm Program set its objectives based on achieving a reduction of groundwater accessions, soil salinisation and waterlogging on farms. The goal of the Farm Program has evolved to *"Improve land management practices on private land within the Shepparton Irrigation Region to protect and enhance the environment; to improve economic viability, and to help rural communities make informed decisions"*. This recognises the important role that the community plays in the Farm Program activities and the focus on private land.

Local Area Planning

The SIR Implementation Committee (IC) has adopted an innovative Local Area Planning approach to encourage local communities to take the lead in planning and implementing land and water resource management in their own sub-catchments. This approach is expected to accelerate and improve the implementation and outcomes for the SIR Catchment Strategy.

During the year the four groups currently implementing Local Area Plan all undertook priority-setting workshops with DPI project officers. These workshops allowed the communities to re-assess the direction of their plans and their priorities.

At the same time, the Nathalia Local Area Plan was completed and moved into implementation following the launch of their Local Area Plan in November 2002. This brought the number of Local Area Plans in implementation phase to five.

Local Area Planning Success Stories

The Invergordon Local Area Plan group held a Waste Management Field day in September 2002 involving the local Primary School, Community members, GV Waste Management Group and DPI. The day covered issues such as silage wrap recycling and dairy effluent removal. The Local Area Planning group also invested a large portion of time to raising awareness of the Local Area Plan and its function.

The Wyuna Local Area Plan group has become well established in the 2002-2003 year and has developed a logo that is easily recognised by local community members. The logo is used to signpost investment and publications made by the Local Area Plan group. In January 2003 the Wyuna Local Area Plan group conducted a bus trip of the Wyuna catchment. The aim of the day was to look at potential sites for works and projects in the next 12 months. It also allowed all members to have a look at the whole catchment.

In April 2003, the Wyuna Local Area Plan group, in conjunction with the SIR IC and G-MW launched a low-flow groundwater pumping trial at a property in the Wyuna Area. Approximately 30 local people attended the launch. The trial aims to assess the effects of low-volume groundwater pumping for salinity control and the effectiveness of solar power for low-volume groundwater pumps.

Also in the year the Wyuna Local Area Plan group held a field day targeting the protection and enhancement of remnant vegetation. The day was well attended with 30 participants and several landowners commenced works as a result of the field day. These works cover some significant remnants in the Wyuna area and will provide vital links for wildlife corridors back to the Goulburn River. These works are included in a total of 50ha of area planted and area protected together with 12.3km of fencing in the Local Area Plan areas.

Wyuna and Nanneella Local Area Plan groups started working together and with G-MW and DPI to look at the possibility of creating two evaporation basins in their sub-catchment areas. In January 2003 the groups visited the Girgarre evaporation basin.

In April 2003, DPI Local Area Plan project officers were invited to present two posters on Local Area Plan Development and Implementation at the National Landcare Conference in Darwin. The conference also allowed the officers to share their ideas on the Local Area Planning process and learn from others from across Australia about working with community and volunteer groups.

Nanneella and District Local Area Plan group designed and launched a Rural Information Kit for the landowners in the catchment. The kit contains useful information for existing and new landowners to the area such as contact details for local community groups and a range of government agencies that provide environmental, economic and social services. This group has also held several community clean-up days for the local bushland reserve. Now that the reserve has been cleaned of larger rubbish, it is planned to investigate eco-tourism development opportunities.

In addition to the Local Area Plans that have been officially launched, the developing Local Plan Areas of Dhurringile and District and Bunbartha-Kaarimba-Zeerust Local Area Planning groups have also been busy conducting their own field days and promotional programs. These Local Area Plans, while in the development phase are on-line for launch in late 2003 or early 2004.

DPI Local Area Plan Implementation Officers were involved in conducting tours for groups such as the Environment Protection Authority, the Department of Treasury and Finance, the Department of Infrastructure, representatives from various universities across Australia and an international delegation from China. These visitors were all keen to see how the Local Area Planning process works and were impressed by the success of the groups.

Water Use Efficiency

Water Use Efficiency - Whole Farm Planning

The planning and implementation of Whole Farm Plans is considered one of the main activities to accelerate the implementation of the SIR Catchment Strategy. The project team has been involved in working with landowners as they develop Whole Farm Plans for their properties. These activities include follow-up visits to discuss with farmers the options of installing automatic irrigation equipment and constructing drainage reuse systems.

A record total of 225 Whole Farm Plans were completed covering an area of 17,368ha during 2002-2003. This not only exceeded the target number of 200 plans to be completed but also exceeded the previous record number of plans completed of 189 set in 1989-1990 and 2001-2002. The result is the largest area "Whole Farm Planned" in a year since the start of the Whole Farm Plan Incentive Scheme, outstripping the previous record of 16,675ha set in 2001-2002.

This all occurred during a "1 in 100 year" drought, and with the dairy industry, who make up a large percentage of the participants in the Whole Farm Plan program, experiencing a downturn in commodity prices.

Some reasons as to why there were so many Whole Farm Plans undertaken are:

- More than 30 Whole Farm Plans can be attributed to landowners seeking groundwater to supplement irrigation. Incentives for installation of groundwater pumps and upgrades of existing pumps both require Whole Farm Plans.
- Landowners were installing reuse systems to capture any irrigation runoff. Reuse systems incentives also require a Whole Farm Plan.
- Landowners with off-farm income and hobby farmers continued undertaking Whole Farm Plans.
- Bigger landowners were buying additional land and transferring water right to their home property, then undertaking a Whole Farm Plan on the dry property to develop it at a future date.
- Landowners considered a Whole Farm Plan to be the cheapest part of future developments and therefore were willing to undertake a plan this year, with the thought in mind to do more expensive development work in the future when the industry picked up.
- Large properties were being subdivided with the new owners wanting to commence works to make subdivided blocks separate entities. Landowners were not willing to irrigate unproductive land and were taking the opportunity to do works on these areas now that they were dry.

Grants totalling $552,857 were paid to landowners for preparing their Whole Farm Plans. This was well above the initial target of $350,000 and slightly above the modified target of $519,670. Landowners paid $1,135,204 for the preparation of these plans. A total of 123 grants were paid to landowners for having their plans certified by Local Government, breaking the previous record set in 2001-2002 of 70.

Whole Farm Plans were prepared for nine horticultural properties covering 292ha and 216 broadacre properties over 17,076ha. Over 59% of the irrigated area of the SIR has now been "Whole Farm Planned".

Two "Introduction to Horticultural Whole Farm Plan Workshops" were held in the region. One of these workshops followed a request from citrus growers in the Cobram area.

A total of 67 Whole Farm Plans were completed in areas covered by Local Area Plans, covering 6974ha.

A total of 193 new Whole Farm Plans commenced in 2002-2003. This was lower than the record number of plans commenced in 2001-2002 of 280, but still ranked as the 7th highest year since plans commenced in 1987.

Water Use Efficiency - Automated Irrigation

This is the third year of this project and the main aim of the project is to promote and accelerate the adoption of automated irrigation technology.

The long-term objectives for the project are:

- The promotion, adoption and uptake of automatic control of flood irrigation; and
- Improved water use efficiency, leading to reduction of watertables, reducing areas affected by salinity and lower nutrient loads to the rivers.

Short-term objectives include:

- Increasing the automated flood irrigation area in the SIR by 500ha for each year of the project;
- Demonstrations of benefits of automated irrigation systems particularly those that directly impact on the irrigator, (including reduced labour requirement for irrigation, improved lifestyle, more flexibility to start and cease irrigation and reduce wastage of water); and
- Implementation of the Automatic Irrigation Incentive introduced by the SIR IC to improve irrigation management in the Goulburn Broken Catchment.

Implementation of Automatic Irrigation Incentive

For the year 2002-2003 the total number of automatic irrigation systems completed with assistance from the incentive scheme was 39 landholders, automating 231ha. There were 24 new applications made for the automatic irrigation incentives this year.

The project team reviewed the evaluation plan for the project and undertook a survey using qualitative methods to assess the outcomes of the project. The study explored issues on:

- awareness of automatic irrigation systems;
- perception of benefits of automation;
- views on barriers to installing automation;
- feelings on the incentive for automation; and
- views on the dairy industry in general.

The key findings of this work were:

- Farm walks were one of the most common information sources on automation for farmers.
- The incentive for automation was considered an important help by most landowners for the adoption of automation. The majority revealed that without the incentive, landholders would not have adopted automation now, it would have been a project for the future.

- Landholders also responded that the provision of the incentive allowed them to automate a larger area of their farm.

Water Use Efficiency - Drainage Reuse Systems

A record total of 99 drainage reuse systems were installed as part of the incentive scheme in 2002-2003 servicing 6,716ha. This was an increase on 2001-2002 figures of 72 systems servicing 6078ha and was well above the initial 2002-2003 target of 31 reuse systems.

This record number of installations occurred despite the harsh economic climate facing many of the landowners involved in the incentive scheme. In fact the drought was given as one of the main reasons people were looking to install reuse systems, thus ensuring that any irrigation runoff could be captured and reused.

Since the incentive scheme started in 2001-2002, a total 4% of the irrigated area of the Goulburn Broken component of the SIR is serviced by a drainage reuse system installed as part of the incentive.

Some interesting facts relating to drainage reuse systems installed in 2002-2003 are:
- Of those landowners that installed a drainage reuse system as part of the incentive scheme 25% chose to connect the installation to electricity.
- The average time taken from application to payment of a grant following installation was 263 days.
- The average grants payment was 46.64% of the total costs. This ranged from 27.30% to 88.64%.

Actual demand for this incentive in 2002-2003 far exceeded that which could be funded, with 159 applications being made. Due to demand exceeding funding a process of taking new applicants on as “Expressions of Interest” commenced. Some of these “Expressions of Interest” were later converted to applications as funding became clearer. In total, 77 landowners still remain as “Expressions of Interest” as of June 30, 2003.

Grants totalling $935,609 were paid to landowners for installing drainage reuse systems, well above the initial target of $300,000.

The three components of the grant expenditure were:
- $322,308 (34.4%) for earthworks;
- $474,886 (50.%) for pump and motor; and
- $138,415 (14.8%) for electricity.

Landowners paid $2,006,191 for the installation of the reuse systems on their properties.

Biodiversity Enhancement on Private Land (Tree Growing)

There were large amounts of revegetation in 2002-2003 with 96,726 plants planted. These plants were used to enhance 81.21ha of remnant vegetation and wetlands, create 33.89ha of wildlife corridors and contribute to the 137.37ha of native vegetation planted.

Direct seeding was also further trialed throughout the 2002-2003 financial year with 11 properties involved. The total area direct seeded was 47.7ha, equating to 155.3km, which was predominantly in Plains Grassy Woodland/Pine Box Woodland Ecological Vegetation Classes. Further direct seeding is planned for September 2003.

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Water Quality

Improving and sustaining Water Quality, Nutrient Best Management Practices and Dairy Shed Effluent in the Goulburn-Broken Catchment

This year has seen the Goulburn Broken Nutrient/Effluent project achieve many milestones including assisting 140 dairy farmers across the catchment; providing training to 120 service providers and industry representatives; and strengthening relationships with several key stakeholders.

Nutrient monitoring on the Cross & Read properties (North Murchison/Toolamba sub-catchment study), concluded at the end of September 2002, followed by data collation and progression towards a more detailed report submitted to the SIR IC in February 2003.

The results and extensive data was used to develop a nutrient management manual for dairy farmers highlighting best management practices. The manual (currently in draft format for technical review) will be published and distributed to dairy farmers within the Goulburn Broken Catchment.

Proposals were developed for the future focus of the Nutrients project following the completion of the North Murchison/Toolamba work. The redirection of the Nutrient project saw the team assisting farmers manage nutrient hotspots on-farm due to an increased development of intensive feeding areas (a drought strategy implemented by farmers given the lack of pasture).

Despite the drought, effluent and nutrient management on-farm continues to be a priority for farmers and communities within the Goulburn Broken Catchment. This was evident following the development of strategic plans from both the Nathalia and Invergordon Local Area Planning groups.

The project has redirected resources developing project strategies, identifying extension “deliverables” and industry partnerships necessary to reduce nutrient loading of waterways and drainage within the Goulburn Broken Catchment, with a specific focus on Murray Valley Drain 13.

A significant achievement has been the development of a joint organisational framework between DPI and G-MW in relation to dealing with non-compliant dairy effluent discharges. The new relationship will see DPI extension officers initiating farmer contact and follow-up inquiries to ensure compliance to legislation.

Highlights

- The strengthening of links and partnerships with other organisations and stakeholders necessary to improve water quality in the Goulburn Broken Catchment. These include:

- Meeting with and securing support from the Nathalia Local Area Planning Group to target Murray Valley Drain 13.
- Meeting with Mawson Quarry to develop a feedpad cost analysis. General perception following the poor season is that there will be a significant increase in intensive feeding areas across the catchment.
- Joint approach with G-MW to share resources and strategies in targeting Murray Valley Drain 13 (media, data analysis and extension approaches).
- Joint approach with the Northern Irrigation Region Dairy team of DPI to share extension activities (specifically programs with a nutrient focus).
- Development of non-compliant landowner framework with G-MW regarding dairy effluent discharges into drains (close to implementation).
- An improved working relationship with the Environment Protection Agency to manage non-compliant landowners and ensure a quick response.
- Partnership with Goulburn Murray Landcare Network drain monitoring groups.
- Partnership with the MDBC Dairy Stewardship Project (environmental management farm trials in the Goulburn-Broken Catchment).

- Development of new resources and management tools to assist farmers, communities and the service sector progress towards nutrient best management practices, which will ultimately improve water quality within the GB CMA.

Impact of the drought

With the poor season, the Nutrient team restricted farmer contact due to financial constraints and the need for dairy farmers to focus investment on feed and water resources. Overall, one-on-one consultancies to design and implement effluent systems were down 50%.

The significant increase in feedpads and intensive feeding areas also complicated the management of existing effluent systems as farmers increased manure loadings to ponds. The concentrations of nutrient on intensive feeding areas will also require an education program for farmers to ensure they productively manage these areas in the future.

Goulburn-Murray Water Extension

Farm Management Services

Goulburn-Murray Water, (G-MW) as the lead agency responsible for the Sub-surface Drainage Program provides advice on groundwater, salinity and groundwater pumping. As a result G-MW is a key partner in the Farm Program involved with ensuring sustainable and safe groundwater management as a consideration in the development of Whole Farm Plans. Also, referred Whole Farm Plans are checked for compliance with Local Government Uniform Planning Regulations

G-MW project staff contribute to the overall extension services provided under the SIR Catchment Strategy by:

- promoting SIR Catchment Strategy implementation;
- pamphlet preparation;
- leading and assisting in field days, tours & presentations; and
- providing technical support to community groups.

Key Goulburn-Murray Water Extension Services

- Technical support provided as required to Local Area Plan and Landcare Groups, including the co-ordination of a field day near Wyuna on low-volume groundwater pumping for salinity control.
- Assessment of reasons why some private groundwater pumps are not being used and determining if some of these pumps can be made operational, with or without SIR Catchment Strategy assistance.
- Technical advice for 194 Whole Farm Plan referrals on issues relating to natural drainage for the Municipalities across the region.

Agronomic Research and Investigation

SIR Farm Water Management Investigations (formerly Serial Biological Concentration)

A key aspect of sustainable irrigated agriculture is management of shallow groundwater at the farm and regional scale. Despite implementation of all conceivable irrigation efficiency options, the watertable will remain high in some places, and groundwater pumping will be necessary to limit productivity losses from increased soil salinity. Groundwater pumping for farm re-use is also a water-saving measure in that it re-uses water that has passed below the plant root zone.

However groundwater contains salts, so re-use is dependent upon the salinity of that water. In many cases, the salinity is low enough to enable it to be used conjunctively within the irrigation enterprise. Where groundwater salinity is higher, optimum pumping rates for watertable reduction may be constrained by application salinity limits (for reasons of productivity, soil structure and/or disposal limits), so alternative re-use options are needed.

This project examines the long term issues surrounding higher salinity irrigation re-use, groundwater salinity trends, higher salinity agriculture options, salt tolerance, soil structure management, Serial Biological Concentration (SBC), climatic influences, salt load management and ways of managing salt to avoid the need for downstream disposal.

This project has provided a service in the research of farm water management options at higher groundwater salinities in the SIR. Key aspects supported under this project are:

- Undera Serial Biological Concentration study site
- Tongala long term conjunctive groundwater pumping study
- Mt Scobie partial conjunctive use study
- Provision of technical assistance to the SIR IC

Project Objectives

- To continue current monitoring and reporting activities at the Mt Scobie partial conjunctive use site.
- To conclude and document work on the Tongala conjunctive use monitoring project and on the Undera SBC pilot project.
- To develop an agreed work program in consultation with regional stakeholders that addresses current regional farm water management priorities.
- Implement the work program to investigate and evaluate new management systems and/or emerging water management issues for saline and contaminated water in the SIR.

Achievements

- After consultation with regional stakeholders, monitoring of groundwater conjunctive use under severe irrigation water restrictions has continued during the 2002-2003 irrigation season.
  - Data collected from the 2002-2003 season has been added to the data set. Initial analyses show average groundwater levels are now the lowest on record.
  - After consultation with regional stakeholders work has continued at the Undera SBC site, but with an emphasis on intensive monitoring of the shallow groundwater system on 2 bays in order to provide data required for modelling of the system. Intensive monitoring has now been completed for the 2002-2003 season.
- The longer-term program will be influenced by larger developments still progressing, such as the Regional Catchment Strategy and Regional Catchment Investment Plan. Significant input has been provided to the development of the SIR Sub-surface Drainage Program Research & Development Strategy, from which future work will be framed.

Links to Farm Activity

The project outputs are directly linked to strategic and policy aspects of the Farm Program and Sub-surface Drainage Program of the SIR Catchment Strategy. For example, the Tongala sub-project has played a significant role in informing policy development with respect to conjunctive groundwater use and salinity management.

The Mt Scobie trial is taking place on an operating dairy farm. Ongoing involvement and input to the Plan Implementation Support Committee and the Sub-surface Drainage Program provides a direct link to regional farm activity through the provision of objective information derived from sites that local people can see.

Future Directions

The budget from the Catchment and Water group of the Department of Sustainability and Environment will be significantly reduced in 2003-2004. Therefore while work at the Mt Scobie Partial Conjunctive Use site will continue as planned, work on the Tongala Conjunctive Use Project will cease in July 2003. The future direction and scope of work at the Undera SBC site will depend on successful applications for funding from other sources.

The project direction in other areas is being significantly influenced by developments within the catchment at a number of levels. These include development of the Regional Catchment Strategy, the Regional Catchment Investment Plan and the SIR Sub-surface Drainage Program Research and Development Strategy.

A key output of the project in 2003-2004 will be the successful realignment of the project with current catchment Research and Development priorities. Some aspects of this project will be pursued in more detail and with a slightly different emphasis under Water for Growth project funding during 2003-2004.

Groundwater Management

High watertables and land salinisation are commonplace in the irrigation areas of Northern Victoria. Community endorsed catchment management strategies tackle this problem in two ways. The first option is a preventative measure and involves reducing accessions to the watertable (eg surface drainage and more efficient irrigation). The second option treats the symptoms of salinity by implementing groundwater pumping.

The preferred salinity control option will vary across the landscape and is influenced by soil and groundwater conditions. However, the current strategy applies blanket recommendations across the region without regard for location in the landscape.

Recent research supports the hypothesis that a proportionally greater amount of recharge is occurring through relatively small areas of highly permeable prior stream levee soils. If correct, this would suggest that the SIR Catchment Strategy recommendations should change to reflect a more targeted approach to land and water management.

Research is required to identify how significant the recharge through these prior stream soils is and what its impact is on groundwater processes and salinity. Tighter control on recharge and more intense groundwater re-use in these smaller prior stream areas may reduce the reliance on groundwater pumping from the larger areas of heavier soil types and ultimately reduce salt disposal needs from the region.

Sub-surface drainage and salt disposal will still be needed in some areas even if recharge can be substantially reduced. A range of salt disposal options are available to irrigated areas, varying from export to the river to farm re-use for irrigation. The internal and external impacts of these salt disposal options vary.

There is a need to develop a framework to assist land and water managers in making strategic decisions on managing saline drainage water within irrigation regions so that impacts on the River Murray are reduced. This framework will be used to help determine the optimal scale and type of drainage system implemented to control salinity problems.

Project Objectives

- Determine the impact of high recharge under prior stream soils on environmental and production indicators.
- Minimise salinity and watertable problems caused by prior stream soils through reduced recharge and groundwater pumping.
- Develop guidelines on reducing the dependence on groundwater pumping through minimising recharge and more strategic locating of groundwater pumps in relation to their position in the landscape.
- Quantify the impact of different groundwater disposal schemes on end-of-catchment water quality targets.
- Develop guidelines on the optimal scale and technique for managing groundwater disposal.

Achievements

- Impacts of recharge reduction through light soils defined. A simple model of the impact of soil type on watertable levels has been developed. This model demonstrates that high recharge through light soils results in mounding of the groundwater system. The potential for this mound to dissipate laterally to lower, less permeable soils is not clear.

  The SWAP model was used to assess the potential to reduce recharge through light soils by improving irrigation scheduling. Improved scheduling reduced recharge by, on average, 0.5 ML/ha/year. However, even with good scheduling, recharge was still 1.3 ML/ha/yr on the light soil. This indicates that there is limited scope to reduce recharge through light soils when irrigation is based on the border-check system. Alternative irrigation systems or groundwater pumping is required in such situations to prevent adverse impacts on the regional groundwater system.

The analysis undertaken in assessing the effectiveness of groundwater pumping in controlling impacts of recharge indicated that groundwater pumping under the light soils did not prevent the formation of a groundwater mound caused by high recharge. This indicates that greater pumping rates would be required to prevent the formation of the mound.

However, pumping rates are already high and greater pumping rates would be difficult to manage within a farm context. It may therefore be more effective to implement recharge reduction measures. This analysis has been presented to the Sub-surface Drainage Program Working Group of the SIR IC.

The benefits of reducing recharge were defined in terms of production and environmental impacts. The trade-off between recharge reduction and groundwater pumping was assessed from an economic perspective. This work was linked to the Catchment and Water funded project Alternative Irrigation Systems (14371).

The cost of preventing the impacts of deep drainage below border-check irrigated pastures on regional groundwater systems was evaluated. Two conceptually different approaches were considered. An efficient sprinkler irrigation system was installed to minimise deep drainage losses; and Sub-surface drainage was used to intercept deep drainage losses, thus preventing net accessions to the regional groundwater system.

Installing a groundwater pump to recycle deep drainage losses was less expensive than converting the border-check system to an efficient sprinkler irrigation system. This finding is limited to areas with low salinity and highly transmissive aquifer systems that allow groundwater pumping and farm reuse without impacting on pasture growth. Such aquifers are found under 55% of the border-check irrigated pastures in the SIR.

Groundwater pumping already protects approximately 40,000ha of the border-check irrigated pastures in the SIR. Groundwater pumping and farm re-use has application to a further 40,000ha of border-check irrigated pastures in the SIR.

Some 60,000ha of pastures do not have suitable aquifers that allow groundwater pumping with farm re-use. The cost of deep drainage is higher in these areas, as there is limited potential for farm re-use of pumped groundwater. Options for minimising deep drainage appear highly beneficial in these areas. Conversion to sprinkler irrigation is one option that is less expensive than installing sub-surface drainage in areas where groundwater pumping and farm re-use is not possible.

Further analysis is warranted to quantify the potential benefits of reducing deep drainage in areas where groundwater pumping and farm re-use has limited application.

- Framework for managing groundwater disposal accepted by SIR IC.
- A review of production, salt disposal and other environmental benefits of salt disposal options has been conducted.
- A conference paper has been accepted for the Australian National Committee of Irrigation and Drainage conference, the paper describes the water and salt balance of the SBC system.
- A journal paper has been accepted for publication. This paper contrasts different options for a dairy farm to manage saline drainage effluent.
- The project team is now developing a framework to assist decision-making for managing groundwater disposal.

Links to Farm Activity

The main activities during this year have been desktop, involving planning, reviewing and consolidating existing knowledge. Nevertheless, the project still has good links to farm activities through participation in committees and links with other more field-based projects.

The project also has strategic linkages with projects funded through the SIR IC and has contributed to scientific aspects of field programs.

SURFACE DRAINAGE PROGRAM

Goal: To provide, by the year 2020 a surface drainage system to the 267,990ha of the Shepparton Irrigation Region which is currently undrained. Currently 183,100ha is served which is 35% of the area - this is from 2001-2002 report.

The Surface Water Management Program had another successful year despite one of the driest seasons on record and perhaps the worst financial constraints facing most landowners for many decades. Once again, the incentivised programs for landowners have accelerated the adoption of improved surface water management.

Works included construction of 14km of Primary drain including Campaspe 3A and Muckatah Stage 2; 6.5km of Community drain, including Mosquito Drain 6/25P and Mosquito Drain 10/25P. Design and remodelling of 40km of Deakin Main drain and a further 15km of Community Drain was designed including environmental assessments for Shepparton 3B/11P and Shepparton 26P. These assessments provide valuable information about the environmental features within each catchment and assist in the protection and enhancement of biodiversity values.

All these works involve many intensive and sometimes protracted negotiations between landowners, design and construction contractors and agency staff from Goulburn-Murray Water and the Department of Primary Industries. Landowner community group volunteers are an integral component of this program. Their local knowledge and enthusiasm for improved water management is the catalyst for these great achievements. A total of 2,050ha is now protected from waterlogging and associated salinity by improved surface water management works completed this year.

As part of a concerted effort to secure long-term management arrangements for Community drains, five schemes were transferred from local government to Goulburn- Murray Water management and another eight are part way through this transition.

Another important aspect of surface water management is the Drain Nutrient Removal Incentive scheme, which achieved its annual target of six new storages with a combined capacity of 1,420ML. A further four applications to construct a combined capacity of 620ML have been approved. This achievement is quite staggering considering the expensive nature of these works and the financial constraints imposed on landowners during this past year. Since 1998, 21 storage systems with a combine capacity of 4,043ML have been constructed to intercept drainage flows with elevated nutrient levels which otherwise would enter natural waterways. The target to construct 10,000ML storage volume by 2016 is on schedule.

Drain diversion plans for 20 main drain catchments have been completed which has allowed the allocation of additional drainage diversion licences for these systems. Drainage diversion rates exceeded the strategy target of 50% of drainage flow and thereby contributing to improved water quality for our regional waterways.

SUB-SURFACE DRAINAGE PROGRAM

Goal: To, where possible and justified, protect and reclaim the Shepparton Irrigation Region's land and water resources from salinisation through management of the Region's groundwater.

Public Groundwater Pumps

Feasibility level investigations were completed at six sites, and were in progress at a further three sites. Four of the completed investigations were successful and gained community support to proceed with pump design and construction. One investigation identified a site with potential to be developed as a low-yielding private pumping system. The other investigation was declared unsuccessful when the only options identified required disposal to an evaporation basin due to the high salinity of the groundwater. There was insufficient landholder interest in this option for further assessment to be carried out.

Five public pump sites were completed and handed over for management by Goulburn-Murray Water. One site was substantially constructed, and construction commenced at two sites. Designs were completed for four sites, and were in progress for two sites.

The total salt load for disposal from the five completed sites was 1769 tonnes, with a disposal impact of 0.184EC. The rated area for the five sites was 808ha.

Private Groundwater Pumps

Continuing demand from landholders for Farm Exploratory Drilling Service (FEDS) investigations enabled a high level of activity to be maintained.

Investigations were completed on 64 pasture properties, with the following outcomes:

- 23 were successful in locating private groundwater pumping sites
- 25 were unsuccessful, but identified potential public pump sites
- 2 were unsuccessful, but located low yielding sites
- 12 were unsuccessful, with very limited or no pumping potential
- 2 were unsuccessful, with low groundwater levels

Private groundwater pumping has been promoted to Local Area Plan groups, and 23 of the investigations completed during 2002-2003 were on properties within the area of Local Area Plans. Of these, six were group investigations, providing efficiency gains for the delivery of the service. A further 23 investigations commenced on properties, with works in progress.

Horticultural property investigations were completed on two properties, with both being unsuccessful. Investigations were in progress on two other properties.

The promotional program for FEDS that was commenced during 2001-2002 was continued. There was good landholder response to this program, resulting in many registrations for FEDS investigations.

Capital Grants for Sub-surface Drainage

There continues to be a high level of demand for the installation of groundwater pumping systems on pasture properties. Pasture property grant payments were made for 32 new systems and two upgraded systems that were completed. Progress payments were made for 11 new systems and for one system to be upgraded. Grant Assessment Pump Tests were completed on ten systems.
Grant payments for Private Exploratory Drilling were made for five completed systems, and progress payments were made for another three systems. Design pump tests were completed for two systems.

Horticultural property grant payments were made for the one new completed system.

The Contractor Accreditation Scheme continues to be an effective tool to streamline the grants process and to maintain consistent standards of system design and construction. The scheme was developed during 1998 to ensure that groundwater pumps installed with Capital Grants Assistance are constructed in accordance with a code of practice.

Salt Disposal Management

Flow conditions in the River Murray and Broken Creek during winter/spring 2002 reached trigger levels for disposal to commence, but there was concern that the flows may not be sustained for a long enough period to warrant a request for all eligible pumps to be started. Private pumps were not given the opportunity to dispose during this period because it would be too difficult to ensure that all pumps could be stopped at short notice if river flows decreased rapidly. Public pumps that could dispose to drains were started but didn't complete a full winter/spring disposal period.

Extension

Project staff coordinated a workshop in January 2003 to determine what has worked well in increasing the knowledge and participation of not only community segments but also extension staff.

Successful community education activities included:

- Watertable Watch program,
- field days,
- the "bottom up" approach to extension,
- launches,
- the use of matrixes for incentives,
- watertable maps and
- working with existing and new community groups (eg. Landcare and Local Area Plan groups)

Achievements that fostered community participation included:

- having active community representation and ownership through committees,
- using community leaders as advocates for project work,
- flexibility in catchment management programs to go with changing priorities and needs of the community, and

Challenges for the Sub-surface Drainage Program include:

- distilling the complex messages regarding groundwater management,
- including more people in the information loop,
- not assuming that everyone knows the issues, and
- providing training for agency staff to increase awareness and knowledge of groundwater use and management.

Project staff also conducted several semi-structured interviews with key stakeholders of the sub-surface drainage program. The interviews were designed to assist in developing simple and agreed Best Practice Guidelines for groundwater management. This work will provide inputs to a new Water for Growth project to be managed by Department of Primary Industries Research and Development in 2003-2004.

Project staff were involved in developing an agreed process for documenting and reporting environmental assessments of new public groundwater pumps. The review of existing reporting priorities and communication pathways were streamlined to deliver more concise and strategically important information. The new process captures specific information relating to environmental features within and outside the area of influence of the public groundwater pump, and identifies situations where improved environmental outcomes could be obtained if the proposed public pump location was changed.

Support to Sub-surface Drainage Program Implementation

DPI project staff provided the following support:

- Extension inputs for two new public groundwater pumps were completed in the Wyuna and Dhurringile and District Local Area Plan areas. Staff developed a checklist that is used to assist in identifying issues for landowners and providing a better follow-up extension service.
- A tour of the Girgarre Evaporation Basin was organised, including a talk by a landowner who benefits from the groundwater pumping and evaporation basin. A “Most Significant Change” evaluation technique was used to capture this landholder’s story and his assessment of the role that the evaporation basin and groundwater pumps have played in the protection of his farm.
- Coordinated three community workshops in Kyabram, Undera and Girgarre. The workshops presented findings from a survey of groundwater users undertaken in the Natural Heritage Trust project “Effective implementation of groundwater best management practices” and key topics identified through the survey process.
- Provided a free service for testing the salinity of groundwater samples brought in by landowners. During the peak of the irrigation season, staff tested on average two samples per day.
- Delivered a joint agency presentation to the Sub-surface Drainage & Groundwater Management Plan Working Group on the public groundwater pumping program, highlighting the extension processes and other partnerships required to establish and construct a public groundwater pump.
- Organised and delivered a presentation to the Goulburn-Broken Sustainable Irrigated Agriculture and Land Management team at DPI, Tatura. The presentation painted a broad overview of the Sub-surface Drainage Program including activities, infrastructure and guidelines.
- Delivered presentations on the Sub-surface Drainage Program to the Bunbartha-Kaarimba-Zeerust and Muckatah-Naring Local Area Planning groups.

SIR Groundwater Management Plan Support

The following activities were undertaken:

- Routine watertable monitoring and groundwater database input. Additional monitoring was completed for the August 2002 watertable study.
- Annual collection of groundwater samples from private pumps.
- Provided support for the Groundwater Management Plan Working Group.
- A detailed work plan and budget was developed for the SIR Groundwater Management Plan.
- Groundwater usage and salinity trends were assessed.
- Developed strategic response to issues identified from usage and salinity trends.
- Assessed options for metering "difficult" sites.
- Assessed options for dealing with non-operational flow meters.

- Assessed private groundwater pumps with apparent low usage.
- Assessed March 2003 groundwater levels in the Murray Valley Irrigation Area.

RIVER HEALTH - WATERWAYS PROGRAM

Goal: Protection and enhancement of the environmental, economic, recreational and aesthetic values of the rivers and waterways (stream health). Protection of public and private assets from stream related impacts.

SIR Waterway Working Group

The SIR Waterway Working Group has held six meetings across the SIR addressing many locally important issues. Some of the key issues discussed in the working group were:

- Willow Strategy - Details of the occurrence of willows in the SIR were contrasted with the incidence of willows in the middle and upper catchments where seeding willows are a particular threat to waterway health. The case for continuing to work on willow management and eradication programs in SIR waterways was made and the potential threat from willows used as windbreaks on irrigation farms was considered. The catchment-wide strategy will help prioritise projects across the catchment and identify high risk sites as well as sites where value for money returns are high in terms of river health protected or restored.
- River Murray Wetlands Project - Details of the River Murray Wetlands restoration projects were of great interest to members. Works are being carried out to increase the frequency of filling wetlands that are adversely affected by river regulation and suffering from too few flooding events. Some of the works carried out had an immediate payback with a flood event in July 2003.
- Broken Creek Operations Study - Members took a great interest in the review of operations on the Broken Creek system. Operating requirements for the fish ladders were identified and built into the operating rules. The need to identify environmental flow and water level requirements separate from the irrigation requirements has led to the initiation of a full review of the Broken Creek River Health Strategy. This will commence in the first half of 2003-2004. Waterway Working Group Members were involved in the establishment of a water quality monitoring network for the Broken Creek after a serious fish kill in the lower Broken Creek in November 2002.
- Grazing of Riparian Lands - Waterway Working Group Members raised concerns regarding the condition of Riparian Lands and Crown Water Frontages under pressure from grazing. It was acknowledged that the drought was putting pressure on landowners to find feed and water for stock, but the damage to riparian vegetation and associated soil erosion would cause a major impact on waterway health and water quality. A sub-committee was formed and the case for improved riparian land management was taken to the Mid Goulburn Broken and Upper Goulburn Waterway Working Groups for their information and support.

Community Members

Russell Pell (Chair)	Kyabram
Ron Pearce	Picola
Alan Sutherland	Shepparton
Bill Probst	Kialla
Tate Hamilton	Corop
Nick Roberts	Shepparton

Summary Completed Works Inspected in 2002-2003

Fencing	
Length of fencing (kms)	38.2
Off-stream Water	
Total number of off-stream projects	13
Total number of dam projects	4
Total number of dams	5
Total number of trough projects	9
Total number of troughs	48
Revegetation	
Area protected-remnant (ha)	111
Area protected and enhanced (ha)	15
Area revegetated (ha)	0
Total area (ha)	126
Total number of plants (over and understorey)	8000
Number of native grasses	2000
Structural Works and Activities	
Alignment training	6
Fishway	33
Rock beaching	4
Grade control structure	20
Exotic weed control	14
Earthworks	26

Boating Safety (Facilities) Grants Program

Location: Yambuna Bridge, Lower Goulburn River
Works: Construct ramp, parking area & signage
Grant amount: $10,000
Total Cost: $12,500

Before the current road bridge was built at this site there was a punt for stock and light vehicles to cross the river. The approaches to the punt were excavated into the riverbank and still exist as rough access to the river that is used by the public for launching of small crafts. Sites such as this have the potential to be the cause of erosion and littering (with water quality impacts) if not properly constructed, maintained and regulated. This site has regional significance for the recreational fishing community, and for the Emergency Services who require access to the Goulburn River during emergency situations.

Structural Works Program – Erosion Control / Fish Passage

Bank restoration works were undertaken to four selected sites down stream of the Goulburn Valley Highway on the Seven Creeks. The works followed on from last year's works program with badly eroded banks stabilised using timber pile fields as alignment training.

Photograph: Example of bank restoration works

Remodelling work was carried out to eight existing grade control structures down stream of the Goulburn Valley Highway on the Seven Creeks to allow improved fish passage.

Photograph: Example of remodelling grade control structures

Construction works at the East Goulburn Main Channel siphon on the Seven Creeks site involved a structure that was built downstream of the exposed siphon and when completed has flooded the exposed siphon pipe and allowed for fish passage.

Photograph: Seven Creeks fish passage works

Works completed on the Castle Creek upstream of the Ross Road Bridge at Arcadia. This works was undertaken to provide fish passage to an existing weir in the creek. Works to stabilise two sections of eroding bank upstream of the structure was also undertaken.

Photograph: Works on the Castle Creek

Woody Weed Removal & Bank Stabilisation works at Fairley Downs on the Goulburn River. The first activity was to remove all the non-native vegetation from the banks of the waterway. The bank stabilisation works involved driving timber pile groins in the bank in strategic locations.

Photograph: Woody weed removal and bank stabilisation works on the Goulburn River

Works comprised the construction of two Grade Control Structures to stabilise the inlet/outlet channel from the Gemmills Swamp wetland to the Goulburn River

Photograph: Grade Control Structures

The work to the Shepparton Weir on the Goulburn River was undertaken to provide fish passage. The works involved the placement of approximately 250 tonne of large rock to create a pool and riffle effect across the structure. Improvements to the boat ramp are pending funds from State Boating Council.

Photograph: Fish passage works, Goulburn River, Shepparton Weir

Murray Corridor Floodplain Rehabilitation Project

Yarrawonga to Tocumwal

Preparatory work for the project involved field assessment of all recognisable and promising wetlands, topographic survey, hydrographic modelling of various flow scenarios and comparison of each scenario against natural and current conditions. This led to the identification of onground works to improve water management and delivery to the target wetlands. Social feasibility, including indigenous involvement, then followed and led to the preparation of the Proposed Works Program.

The wetlands in the reach between Yarrawonga and Tocumwal generally retain some form of natural seasonality in flood timing (from the Ovens River Catchment), though experience a reduction in flood frequency and duration due to the dams on the River Murray and the Mitta Mitta River. For these wetlands, more passive methods of rectifying the flood regime have been developed such as reductions in sill levels (commence-to-flow thresholds) of selected flow alignments.

The management outcomes from reinstating a more natural flooding regime to wetlands within the study area include:

- Re-creating a wetland type that was once common but now rare within the regulated floodplain
- Re-establishment of submerged macrophyte beds
- Expansion of emergent microphyte stands throughout the wetlands

- Development of habitat for a range of indigenous flora and fauna that specifically require a natural hydrological regime in the frequent (annual) return period
- Development of ecological (physical, chemical and biological) processes that may benefit the riverine system following seasonal connection with the river
- Restoration of flow passage for native fish migration

The bulk of funding for the construction of approved works is already available, having been provided by the Victorian Government through the Rural Water Reform Program and some targeted works funded via the Murray-Darling Basin Commission. Funding for the 2003-2004 program was provided through a Murray-Darling Basin Commission Rivers Program, Environmental Flows Investigations.

A five-year monitoring program is also to be established, in conjunction with the Cooperative Research Centre for Freshwater Ecology (via Latrobe University) and other programs as appropriate. Ecological monitoring is to begin in 2003-2004, with both pre and post-works monitoring to be undertaken.

The initial construction program involved basic onground earth works prior to 30 June 2003, with more complicated regulating structures to be designed and constructed within the following financial year. The GB CMA field works activities involved earthworks excavation, rock beaching, habitat restoration, revegetation, and restoration of public access facilities such as roads, bridges and fencing. Aboriginal site monitors were engaged to supervise all earthworks excavations. It was satisfying to see many of the sites perform as designed in the floods during July 2003.

Location of work sites in Yarrawonga to Tocumwal reach:

- Bruce's Bend: Little Reedy Lagoon & Big Reedy Lagoon.
- Cobrawonga Island: Duck Hole
- Cobram Regional Park: Horseshoe Lagoon, Schier's Lagoon & Wetland 117.
- Quinn's Island.

This redundant weir on Schiers Lagoon has been removed

This culvert was a barrier to fish movement into Horseshoe Lagoon near Cobram, and has been removed.

Water Quality Program

Goal: Minimise the risk of blue green algae outbreaks within the Goulburn Broken catchment thereby protecting aquatic ecosystems, public health, industry and water users; minimise nutrient contributions to the River Murray (and reduce the risk that nutrients from our catchment will cause or contribute to algal blooms downstream); foster regional development (by ensuring the quality of water to industry, agriculture and the community); enhance the riverine environment; and minimise/optimise water treatment costs.

Goulburn Broken Water Quality Strategy

A review of the 1996 Water Quality Strategy was carried out in 2002 as part of the five year review of strategies throughout the Goulburn Broken catchment. The 2002 review has retained much of the technical information as this is still regarded as sound and based on best available scientific and technical information.

The revised Water Quality Strategy was completed in late 2002 after a two-month period for public comment. There were approximately 10 submissions from this period which were discussed by the technical steering committee overseeing the review of the Strategy. These comments were incorporated into the document where appropriate. Additional work was also carried out on the economic evaluation of the costs and benefits of the Water Quality Strategy.

Once comments were incorporated and work completed on the Water Quality Strategy the Goulburn Broken River Health and Water Quality Coordinating Committee signed off on the document. The 2002 Water Quality Strategy was then submitted to the GB CMA Board who also signed off the document. The Goulburn Broken 2002 Water Quality Strategy was submitted to the state government in early 2003 for endorsement. This process is taking longer than expected with delays happening at a state government agency level requiring high input negotiations. This has slowed down the process of state endorsement of the document.

However, implementation of the Water Quality Strategy has a twenty year time frame, beginning with the original Water Quality Strategy in 1996 and finishing in 2016. Thus, the Goulburn Broken Water Quality Strategy has been implemented for the past six years and will continue throughout the Goulburn Broken catchment.

Urban Stormwater

In 2002-2003, the Goulburn Broken catchment received funding from the Victorian Stormwater Action Program (VSAP) to implement a two year stormwater awareness and education project. This enabled the appointment of a Catchment Stormwater Project Officer to raise community awareness about stormwater quality issues and impacts on waterways. The VSAP funding was matched by combined funding from GB CMA, Goulburn Valley Water, most local catchment councils, Regional Waste Management Group and G-MW.

Council and Industry

Storms Self-Management System

A self-management system called "Storms Self-Management System (SSMS)" has been developed to aid councils in monitoring and incorporating best management practices into their maintenance and construction activities. The system also assists audits of council operations to measure compliance with best practice. The City of Greater Shepparton has incorporated SSMS into their environmental management plan and Benalla City Council are trialling the system. Other councils in the catchment have also shown interest in the SSMS.

Concrete Pamphlet

In conjunction with the City of Greater Shepparton a Concrete Pamphlet has been developed to raise awareness and educate industry in best practice principles. Concrete transport and wash down practices are recognised across many municipal Stormwater Management Plans as an activity with high potential to affect stormwater quality. The pamphlet is being distributed to concrete batch operators to hand out to promote awareness of issues relating to concrete wash down procedures and transport of mud and sediments onto roadways.

Schools and Community Education

'Drains Are Just For Rain'

"Drains are Just for Rain" banners have been designed, developed and have been circulating around the catchment over the last 6 months. Over an 18 month period the street banners will be displayed in each town for approximately 4 weeks. A community day is held in each town to coincide with the placement of the banners to provide information to the general public in both stormwater and waste management issues. The Regional Waste Management Group supports the community day by supplying the EcoVan (full of educational information and activities designed for school children. The Goulburn Valley Regional Waste Management Group and Representatives of Green Corp have stencilled "The Drain is Just for Rain" extensively across the catchment. Schools also get involved, with many primary school students stencilling their towns.

Council Onground Stormwater Education Activities

Greater Shepparton City Council

With the burgeoning development rates the Shepparton Council Stormwater Management and Water Sensitive Urban Design are becoming more and more important. The Greater Shepparton City Council has been involved with the Goulburn Broken Stormwater Education Project developing the Self-Management System and Standard Drawings for sediment control on construction sites.

The Greater Shepparton City Council has placed Water Sensitive Urban Design and Gross Pollutant Trap conditions on planning permits. Kialla Lakes Estate and Forsyth Estate in Mooroopna have incorporated Water Sensitive Urban Design principles into the drainage design treatment. Kialla Lakes Estate has also included the construction of the Lowanna Waters Wetland.

Something to explore in the future is the monitoring and enforcement of building and construction sites. With the explosive development rates around the area there have been some compromises in these activities that continue to have a major impact on the degradation of stormwater quality from transporting mud onto roads.

Building and construction sites continue to have a major impact on the degradation of stormwater quality

Sewage Treatment Plants

In 2002-2003 Goulburn Valley Water achieved 80% reuse of reclaimed water throughout their region. The total volume of reclaimed water used for irrigation purposes, by Goulburn Valley Water and third party users, increased by 11% to 6,964ML. Further, a significant decrease in the volume of reclaimed water was returned to waterways. The volume decreased from 3,685 (in 2001-2002) to 1,787ML with 24 of the 27 wastewater management facilities managed by Goulburn Valley Water having total land-based reuse.

In March 2003 Goulburn Valley Water received “ISO 14001” certification for their Tongala wastewater treatment facility. An Environmental Management System was established for the accreditation that addressed environmental, social and economic issues. Goulburn Valley Water is now aiming to achieve accreditation for all their wastewater management facilities.

Waterwatch

Waterwatch has been operating in the Goulburn Broken Catchment for 10 years. The Waterwatch Program assists schools and community groups to monitor water quality in their area. It combines a range of activities to promote awareness of catchment water quality issues with extensive data collection and interpretation. Waterwatch is, more than ever,

being viewed as a method to monitor improvements in local water quality following onground actions by the community.

Catchment Capers

"Catchment Capers" is an integrated catchment wide collaborative project directed at upper primary and lower secondary students and based on the Waterwatch Program. It contains additional activities dealing with water, land and catchment flora and fauna issues. Thirty schools from across the region are taking part in Catchment Capers in 2003. Students monitor a water body monthly and participate in a series of activities that complement their monitoring program. The following website has been developed for participating schools: www.gvwater.vic.gov.au/catchmentcapers

A "State of the Catchment" symposium for Catchment Capers schools was held in 2002 at which students presented their findings to a gathering of participating schools. Catchment Capers 2003 was launched by Deputy Premier Thwaites on the Goulburn River in Shepparton in March 2003.

Minister Thwaites Launches Catchment Capers

Schools

Tours highlighting natural resource management issues were provided for primary schools in the SIR. Waterwatch has been involved in the organisation and running of school cluster "Environment Days". The Project has also offered training to student and practicing teachers at a number of teacher in-services. Waterwatch assisted the Toolangi Discovery Centre and Outdoor Education Centre in the development of water quality based activities for visitors to these establishments.

Community Monitoring Networks

Networks of community water monitors have been established along many of the major waterways in our catchment. These groups regularly monitor a number of water quality parameters at over 250 sites across the region.

A revamped "Drainwatch" project is operating in the large irrigation areas from Cobram to Kyabram. "Drainwatch" encourages farmers to manage their fertilizing and irrigation activities to minimize the export of nutrients such as phosphorus from their farms. Waterwatch monitoring of drain water continued, although dry conditions caused low drain flows that restricted sampling opportunities.

Water Week

The major theme for National Water Week in 2002 was stormwater. Over 3,900 primary school students from 24 schools had the opportunity to learn more about stormwater issues by attending a pantomime developed by Waterwatch.

The pantomime called "Follow the Yellow Fish Road", educated students and teachers in ways to reduce the amount of pollution ending up in stormwater drains. Following the pantomime, grades 5 and 6 students from each school worked with council employees to stencil drains in each town with the stormwater message "*The Drain is Just for Rain"*.

The pantomime "Follow the Yellow Fish Road", educated students and teachers

MONITORING PROGRAM

Goal: To review the efficiency of outcomes achieved by implementing the plan, provide data for prioritising and targeting works and from regular plan review, identify the impact of salinity and nutrient pollution where no plan activity has been undertaken.

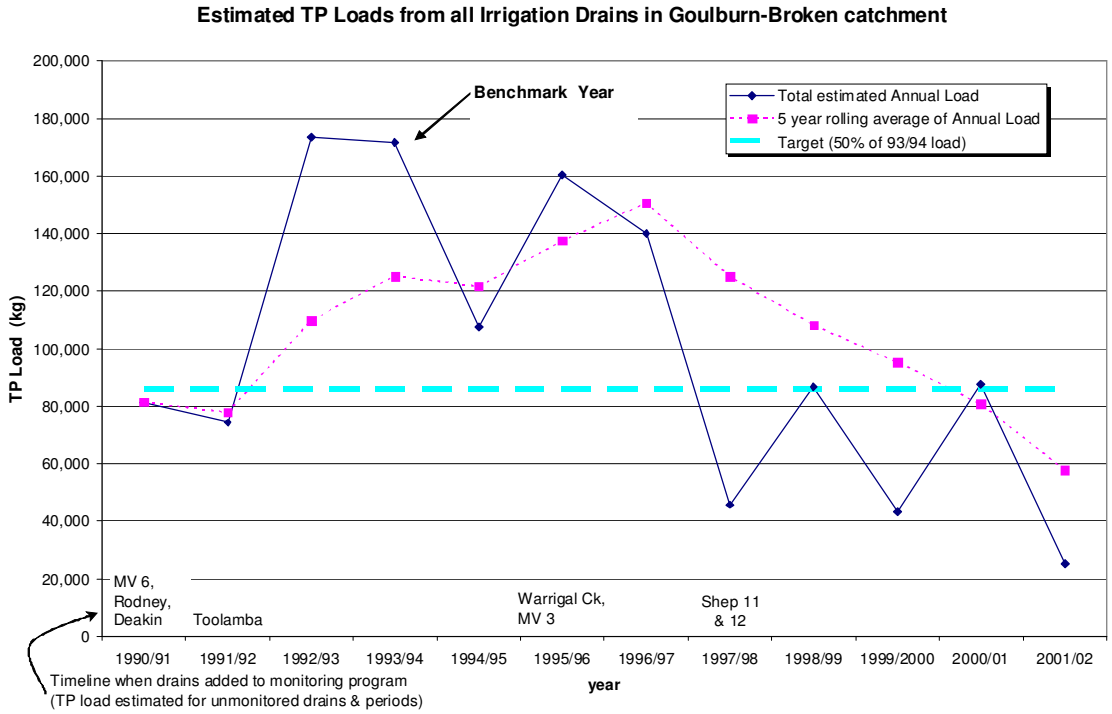
Environmental Research and Investigation

Shepparton Drain Nutrients – Mandatory

Monitoring of drain flows and water quality parameters at 14 sites continued. Two new drain flow monitoring stations were installed to assist in improving drain management.

Quarterly and annual reviews of drain nutrient data for the SIR showed that phosphorus loads exported from irrigation drains were the lowest of the 13 years of records. The phosphorus reduction target for drains under the Goulburn Broken Water Quality Strategy has been met, although a series of wet years could result in a reversal of recent trends and emphasises the need to continue the drain nutrient management program (see Graph 1).

Community monitoring of drain water quality continued through the Waterwatch program, although dry conditions caused low drain flows that restricted sampling opportunities.



Graph 1. Estimated TP loads from irrigation drains

The reviews of drain nutrient data also indicated that:

- Murray Valley Drain 6 discharged the largest load of TP, TN and suspended sediment (in previous years Deakin Drain has had the highest loads);
- Murray Valley Drain 6 continued to have the highest nutrient generation rate (kg/ha/yr); and most drain generation rates were substantially reduced

Other drain monitoring activity included:

- Initiated quarterly reporting of phosphorus loads exported to rivers via drains and compared to the Water Quality Strategy targets.
- A draft report produced on Sonde continuous monitoring equipment operation and data quality.
- "Chlorophyll a" monitoring at the Deakin Drain and Murray Valley Drain 6 sites.

Mandatory Environmental Monitoring

Progress against targets:

- Monitoring of all seven sites completed twice during 2002.
- All data collected from 1995 to 2002 analysed and compiled into one report. (Department of Primary Industries (2002): *Mandatory Environmental Monitoring: Monitoring Manual for the Shepparton Irrigation Region)*
- A monitoring manual for the SIR developed for future monitoring.
- All reports and photopoint information made accessible in hard copy and on computer. (Department of Primary Industries (2002): *Mandatory Environmental Monitoring: Shepparton Irrigation Region Environmental Monitoring Report for 1995-2000).*

To complete the 2002 quarterly monitoring of all seven sites and to have analysed all data gathered over the past eight years has been fantastic. Some of the first conclusions to be drawn from this project are:

- It is difficult to differentiate the impacts on sites of environmental degradation (eg salinity) from other causes (eg drought)
- Generally the salinity levels do not appear to be rising
- High nutrient levels have been recorded at Reedy Swamp
- New parameters need to be measured
- Consistency in monitoring is needed.

Salt Load Monitoring

Routine monitoring, site maintenance and database input continued.

A review of project monitoring and analysis continued. A second draft report was completed late in 2001-2002 that incorporated changes and additional requirements suggested in the review of the first draft. Comments have been made on the second draft, and work on the final report has commenced. Work on a report on 1999-2000 to 2001-2002 monitoring continued.

The annual contribution to the hydrographic equipment replacement fund was made. Repairs were made to monitoring equipment at two sites.

Effectiveness of Groundwater Pumping

Progress

- Routine monitoring and maintenance of bore networks established under past sub-regional drilling programs continued. An analysis of groundwater levels in the Barmah Forest commenced.
- Routine (biannual) sampling and detailed analysis of groundwater from a selection of public groundwater pumps continued, and a report summarising the information collected to date was completed. This included an assessment of trends and recommendations for ongoing work on the project.
- Reports on groundwater threats and control options near sites of high environmental importance were completed. These assessments are to be incorporated into site management plans being developed by DPI. A draft program to implement recommendations from the reports was developed.
- Work continued on the following tasks:
  - a low volume pumping trial to test options for salinity control in "C Type" areas;
  - an assessment of licensing and groundwater management implications for groundwater pumping from excavated storages ("dragline holes");
  - an analysis to develop a technique to predict groundwater salinity changes at private groundwater pumping sites.

PROGRAM SUPPORT

Goal: To provide the framework to manage and coordinate the Shepparton Irrigation Region Catchment Strategy.

Program Support for 2002-2003 is coordinated under the guidance of the Executive Officer and provides high level strategic and technical advice and administrative support to the Partnership Agencies and the Community. A key function of Program Support is to ensure maximum value from the $18 million public funds allocated for implementation of the SIR Catchment Strategy. Funding was coordinated across 50 projects and three agencies.

Technical Projects - Overview

Among the technical support projects this year was the review of the 'salinity impacts audit model'. This model is now being applied to sub-catchments in the SIR for enhanced monitoring of the implementation of the SIR Catchment Strategy.

Another technical project in 2002-2003 was the review of the Sub-surface Drainage Program monitoring and reporting requirements. This was conducted to ensure that the SIR is meeting Catchment Strategy commitments. The dry conditions in 2002-2003 prompted the inclusion of an extra project to assess options for the operation of public pumps to assist drought management in the SIR. Progress was also made on a project to assess salt loads entering the Goulburn River between the Goulburn Weir and Murchison. This year also saw the completion of a nutrient stripping study with recommendations presented to the SIR IC.

Technical support was provided by the SIR Geographic Information System (GIS) Service. In 2002-2003 this service responded to over 70 map and information requests during 2002-2003. To ensure accurate data and mapping, the GIS group maintained and upgraded the Community Surface Drainage and Farm Exploratory Drilling Service GIS data layer for the Surface and Sub-surface Drainage programs. Landcare group boundaries for the SIR were also updated.

Implementation of the SIR Catchment Strategy is being accelerated through the project "Local Area Planning Technical Support". During 2002-2003, four highly motivated rural communities continued to be supported in their efforts to develop a plan to address natural resource management concerns matching Catchment Strategy priorities for their districts. The development of a Local Area Plan is community driven. This project merely facilitates the process by providing technical and organisational resources for community working groups to develop a plan for their area that has community and agency cooperation. This may require up to three years planning and development with regular monthly meetings and community feedback days. The Nathalia and District Local Area Plan was launched in November 2002. Bunbartha-Kaarimba-Zeerust community has been circulated and received comments on a preliminary draft plan. The two remaining communities, one in the Dhurringile area and one in the Muckatah area are at the 'priority setting' stage.

Community Education and Landcare Support

The Community Education component of Program Support promoted community awareness of salinity related issues to a range of audiences. This year 35 schools participated in Saltwatch with approximately 1400 students attending sessions. A lot of EC readings were taken and two new activities, "Salty Liquorice" and "Groundwater Aquifer" were introduced. Saltwatch was also delivered to multicultural audiences including the Arabic Speaking School and the Italian Women's Group in Shepparton (see Case Study).

Community Salinity Grants proved popular with schools, Landcare and community groups in 2002-2003 with $36,402 of the $50,000 available going to 25 applications from within the SIR. Grant applications from the region totalled $62,574 with a total project value of $122,705. The Community Salinity Grants 2002-2003 contributed to projects involving purchase of salinity testing meters, field trips to saline sites, and salinity education days. The partnership with the Landcare community in the SIR was maintained through strong links with the Goulburn Murray Landcare Network. Landcare support staff were available during 2002-2003 to provide facilitation advice and assistance as well as desk-top publishing support.

Municipal Support Project

The SIR Catchment Strategy was successfully represented in negotiations relating to native vegetation clearance issues and the implementation of a rate rebate scheme for land covered by Trust for Nature conservation covenants. This was made possible with the ongoing Municipal Catchment Coordination Project. Funding for coordination of this project is provided jointly by the GB CMA, Campaspe and Moira Shire Councils and the Greater Shepparton City Council.

Sustainable Irrigation and Land Management Program Support

The DPI is the lead agency driving the implementation of the SIR Catchment Strategy. Leadership at all levels continued during 2002-2003 to ensure effective delivery of the DPI responsibilities under the implementation of the SIR Catchment Strategy. A continuous improvement approach is taken with management of projects and programs using the Australian Business Excellence Framework. Valuable input was provided into a range of community and agency working groups and committees. In particular these include technical support for the SIR IC, Water Services Committees, SIRTEC and the Sub-surface Drainage, Surface Drainage, and Farm Program working groups.

Local staff play a pivotal role in the implementation of the DPI Cultural Diversity Strategy. Much of this strategy was based upon learnings generated within the SIR by staff working with local multicultural communities. A range of learning opportunities and workshops have been provided to assist staff improve our service of the most culturally diverse rural region of Australia, the SIR. An excellent working relationship exists between the DPI and the Ethnic Council of Shepparton and District. Many staff have undertaken cross-cultural training to improve understanding of the local indigenous communities with the assistance of Rodney Carter, the indigenous facilitator, within the Northern Irrigation Region.

Extension staff used a variety of methods to communicate the activities and successes of the SIR Catchment Strategy, including one-to-one discussions, group discussions, workshops, conferences, hosting of local and international tour groups, seminars, press releases, posters and brochures, visits to schools and special interest groups.

Statutory Planning responsibilities have again consumed resources due to dealing with increased numbers of land development and native vegetation clearance issues, resulting in a restructure of existing resources. On average, 15 Statutory Planning applications were processed each month in addition to investigations relating to illegal clearing and channel remodelling.

The past 12 months has also seen re-establishment of strong links to Research and Development staff. Success stories are the integrated project with both research and extension components focussed on Water Use Efficiency under the Water for Growth Initiative and the Bayesian Network Project. Leaders continue to work for process improvement with colleagues across geographical and agency boundaries.

A series of extension improvement forums were convened for regional extension staff to improve linkages by increasing communication and understanding between programs and agencies. There is a strong focus on staff development and succession planning through access to conferences, workshops, special projects and backfilling of staff on leave.

Program Support Case Study: 'Mamma Mia and Saltwatch'

Who was involved?

Lyndall Ash and, Cindy Ambrosio from the Department of Primary Industries

Changes in landowner or community attitudes

A recent successful Saltwatch activity that engaged an Italian women's group was a prime example of change in community attitudes. Capacity building primarily seeks to identify skills of communities whilst at the same time identify gaps/needs and work together to meet those gaps or needs.

Cindy Ambrosio and Lyndall Ash (Department of Primary Industries) ran the Saltwatch session based on "A Story of a Catchment" with Giovanna Busiello (Co-ordinator of Italian Womens Group), St Mel's Womens Group. The significant factors were firstly that this Saltwatch activity was presented with minimal alteration for the adult audience from the school-age target group. Secondly, the Saltwatch session was conducted primarily in a language other than English.

The activity raised awareness regarding the SIR as a catchment and environmental issues with a group that may otherwise have been overlooked. The interaction raised awareness amongst the group of women involved as to how their actions ultimately affect the wider community, and provided an increased rapport with the group.

The SIR Catchment Strategy has, as one of its goals, that of building the capacity of its communities and as part of its salinity management actions, specifically mentions multicultural issues. In this instance both the building of capacity within a multicultural community alongside salinity and environmental issues were addressed.

Photograph 1: Cindy Ambrosio running Saltwatch activities with St Mels Women's Group.

Photograph 2: Cindy Ambrosio running "Story of a Catchment" Saltwatch Activity.

Photograph 3: Lyndall Ash, on right, explaining water quality issues to members of the St Mels Womens Group.

Photograph 4: Cindy Ambrosio East Shepparton Project Officer, left Giovanna Busiello (Co-ordinator of Italian Womens Group), centre and Lyndall Ash, Department of Primary Industries, right, at the St Mels and Italian Womens Group Saltwatch activity.

RESEARCH - WATER FOR GROWTH PROJECTS

Market Mechanisms

Sustainable use of water resources in the dairy industry is a regional priority. While there has already been major improvement in water use efficiency over the past 20 years, for which drought and water trading have played a big part in forcing change, policies and incentives also play a part in encouraging improved irrigation efficiency.

This research project aims to accelerate the rate of improvement by identifying what factors have been the most successful in promoting beneficial change. These identified 'market mechanisms' will then be looked at in detail to see what their intended (and possible unintended) consequences will be. Having considered the various options available, the project is then to consider how the best mechanisms can be most effectively promoted throughout the region's dairy industry.

Starting in July 2001, this project up until June 2003 has identified the range of market mechanisms available, held discussions with stakeholders and progressed the study, in detail, of the mechanisms identified. It has started looking at opportunities to trial promising methods with people in the industry.

The final stage of the project is to look at taking the results to a trial across the region. A key issue to be considered is how well dairy farmers can respond to new initiatives under conditions of drought and low market prices. Once complete, this project will have assessed the practical application of market mechanisms to bring about continued improvements in water use efficiency. These should also be applicable to the broad range of natural resource management issues.

Bayesian Networks

Bayesian Networks are a method of representing systems. A Bayesian Network approach is being used in this project to develop a systematic framework to represent the water resources system. A framework constructed in this way contains a conceptual model of the system and all the linkages between the parts of the system are identified and incorporated into a computer model. This can then be used to help understand and consider the effect of different decisions in farm water resource management.

Work until June 2003 has concentrated on developing a working network model of the irrigated farming system of the SIR. Called INTECA-Farm, the model combines practical and scientific research knowledge of the irrigation system. It has then been given a test run and the results considered by people in the management group to see how well it represents the system. Similar models are being developed for the groundwater and surface water systems.

The project has progressed well in the past year. Key achievements have been in developing the conceptual model and collecting and distilling the essential knowledge that defines how each part of the system interacts with the others. Work is also proceeding in working out ways to operate the model in a realistic way, for example by developing ways to present results in a map format and to build the model on real parts of the catchment. A key benefit of this is to allow as wide an audience as possible to see and understand the results of the model.

Improving Water Use Efficiency through Improved Irrigation System Design

Drought has raised enormously the profile of water use efficiency over the past year. As the northern Victorian dairy industry is the largest user of irrigation water, ways to improve water use efficiency are very important for the future of the industry and are the focus of this study.

Border-check (flood) irrigation is the main way pasture is grown and while considerable advance has been made over the past decade with laser grading and farm design, a method to get the highest water efficiency out of farm designs and take into account soil types has not been available.

Existing irrigation simulation models can aid in improving farm design in terms of matching irrigation to soil types. This study assessed irrigation design performance standards and how well various models were suited to conditions in the SIR.

Project outputs:

- Establishment of a project to map the soil hydraulic properties throughout the SIR
- Reviewed six irrigation models; two that are valuable tools for local conditions
- Tested combinations of bay length, slope and width to examine the sensitivity of these factors in water use efficiency
- Held meetings with irrigation surveyors, designers and extension staff to demonstrate methods developed and assist in actual designs
- Helped further understanding of implications of alternative irrigation systems and how they fit in with the need for higher water use efficiency

Soil Hydraulic Properties Mapping

The water holding and drainage properties of soils are very important in respect to the design and operation of irrigation farming. In terms of water use efficiency and salinity management, knowing how much water should be applied is an important consideration. The variation of soil properties is also very variable throughout the SIR. This project was designed to take measurements of soil hydraulic properties from at least 50 locations, based on the mapped soil types.

The results of testing in the field and in laboratories show the natural range of soil hydraulic properties found in the SIR. The information gathered will support further improvements in irrigation design through improved matching of irrigation type to soil and enterprise needs. Better understanding of the soil properties will also assist in siting new irrigation developments, changes to existing supply systems and targeting irrigation incentive schemes.

This study has made substantial progress, with data collected for the six major soil groups in the region completed by June 2003. Work in 2003-2004 will then look at assessing farm-scale variability in soil properties and see whether it is possible to develop a simple method of mapping the essential soil properties rapidly and cheaply to help with irrigation design on farms.

APPENDICES

PHYSICAL PERFORMANCE INDICATORS

Program Activity Description	Note	2002-2003			Cumulative Total to Date	Cumulative Target 2020
		Target for year	Actual to date	% +/-		
Farm and Environment Program						
Broadacre Whole Farm Plans						
Number		126	216	171	2,507	5,000
Area (ha)		10,000	17,076	171	182,868	350,000
Horticulture Whole Farm Plans						
Number	1	14	9	64	163	250
Area (ha)		350	292	83	5,880	25,000
Re-use Systems Incentives	2					
Number		70	113	161	193	
Area served (ha)			7,666		15,450	
Volume of storage (ML)			535		1,060	
Total Re-use Systems	3,4					
Number			113		3,476	
Area served (ha)			7,666		201,450	
Volume of storage (ML)			535		13,782	
Automatic Irrigation Incentives						
Number		40	39	97.5	66	
Area served (ha)			2,231		3,604	
Number outlets automated			20		47	
Landforming/laser grading (ha)	5	10,000	7,800	78	168,700	300,000
Environmental Works						
Tree Growing Incentives (ha)		40	58.1	145	519.3	
Protection of Wetlands						
Management Plans complete			1		1	
Private Land Environmental Incentives						
Protected (ha)		52	0	0	289	
Revegetated (ha)		20	See below			
Protection of Remnant Vegetation						
Sub-surface Drainage (ha)	6		148		1774	
Management Plans complete			1		1	
Private Land Environmental Incentives						
Protected (ha)		52	81.2	160	621.42	
Revegetated (ha)		20	79.3	386	100.39	

Program Activity Description	Note	2002-2003			Cumulative Total to Date	Cumulative Target 2020
		Target for year	Actual to date	% +/-		
Sub-surface Drainage Program						
Private pumps installed - broadacre						
Number: new / upgrade		20	32/2	170	233/71	365/95
Agreed Volume (ML/yr)	7	2,000	2277	114	27,753	51,500
Area protected (ha)	8	2,000	2277	114	27,753	51,500
Private pumping - broadacre						
Agreed Volume (ML/yr)	9		*n/a*			
Volume pumped (ML)	10		*n/a*			
Salt disposed (tonnes)	11		0	0		
Private - horticulture						
Number: New/Upgrade		2	0	0	20/1	40/10
Area protected (ha)	12		0		770	1,000
Tile drainage (ha)		0	0	0	15.9	300
Public						
Number	13	6	5	83	37	425
Volume pumped (ML/yr)	14	600	TBD		2,826	40,000
Area protected (ha)	15	1,200	1,043		7,715	85,000
Surface Water Management Program						
Primary						
Length designed (km)		35	32	91	343.5	644
Constructed: New (km)	16	14	14	100	172.9	362
Remodelled (km)		14	2	14	46.6	282
Area drained: Direct (ha)			1,173			17,285
Indirect (ha)			6,597			68,026
Community						
Length designed (km)		19	15.4	81	1,157.5	2,102
Constructed (km)		22	6.5	30	501	2,102
Area drained (ha)		2,200	650	30		
Nutrient Removal Schemes						
Number		5	6	120	21	
ML Storage			1,425		4,043	

Program Activity Description	Note	2002-2003			Cumulative Total to Date	Cumulative Target 2020
		Target for year	Actual to date	% +/-		
Waterways Program						
Structural (Migration)						
Fish Ladders		1				
Fishways		3	17			
Control Erosion / Sediment						
Bank Protection - Sites (km)		5 (0.5)	8 (n/a)	160		
Alignment Training		2	0			
Weed / Exotics						
Weed Control Projects (km)		5	10	143		
Willow Management No (km)		2(0.05)	In above			
Frontage and Riparian Protection						
Frontages Fenced No.(km)		25 (40)	35(38.2)	140(95.5)		
Outfalls constructed			1			

Notes for Table: Physical Performance Indicators:

1. Does not include horticultural whole farm plans prepared by landholders with technical assistance from agency staff.
2. Includes NC component of SIR.
3. Assumes 1,000 systems constructed prior to the commencement of the plan.
4. Includes an estimate of post plan systems prior to incentives becoming available in 2001.
5. Includes re-grading works. This needs to be taken into account when considering cumulative total. Estimated from the 1996-1997 census.
6. Sub-surface drainage protection of environmental features, includes wetlands. Doesn't include area enhanced by regional surface drainage.
7. Average annual volume to be pumped in accordance with the capital grant agreement.
8. Assumed that 1 ML/yr pumped and re-used regularly and within Plan guidelines provides salinity control for 1 ha.
9. Estimate of minimum required pumping volume for registered salinity plan bores.
10. Estimated volume factored from measured volume of salinity plan bores.
11. Salt load pumped under Salt Disposal Allocation contract, 2002 winter disposal period (no disposal available).
12. Assumed that small horticultural pumps operate on average for 100 days/yr and that 1.0 ML/yr pumped provides salinity control and reasonable watertable control for 1 ha.
13. Pumps with final rating completed. The 1999-2000 targets are interim values (less than original Plan targets) that have been adopted pending resolution of disposal issues. The future targets are the original Plan targets, and include targets for pumps disposing to evaporation basins.
14. Assuming 120 days per year of operation.
15. Area of private land rated as receiving salinity control. The target values are based on the assumption that the average gross area served by public pumps is 200 ha per site.
16. The Cumulative Total has not increased by the length of drain completed, as the previous Cumulative Total was incorrect due to the use of "equivalent lengths" of drains in previous reporting.

SIR CATCHMENT STRATEGY BUDGET AND FINAL EXPENDITURE 2002-2003

SIR Catchment Strategy Programs	State Funds $'000	Federal Funds $'000	Regional Funds $'000	B'fwd $'000	Re-allocated funds $'000	Total Budget funds $'000	Program Expenditure $'000
Environmental Protection	164	330	-	7	-39	462	463
Farm	2,390	387	-	39	188	3,004	2,895
Surface Drainage	2,583	2,095	282	409	-279	5,090	5,325
Sub-surface Drainage	1,054	1,304	639	248	220	3,465	3,225
Waterways	1,042	550	250	66	50	1,957	1,578
Water Quality	34	70	-	121	20	245	174
Monitoring	264	255	95	-	-19	595	590
Program Support	1,125	809	35	200	30	2,199	2,000
Research - Water for Growth Projects	712	-	-	34	-	747	728
Total	**9,369**	**5,800**	**1,301**	**1,125**	**170**	**17,765**	**16,981**

Summary of Cost Share Details

	Annual Expenditure 2002-2003 $	Accumulated Expenditure $
Government	16,981,000	181,248,440
Community	37,463,210	484,919,590
Total	**53,344,210**	**666,168,030**

Note: estimates for water quality and waterways included for the first time in 1999/2000 report.

Government Expenditure
Includes expenditure of funds from budget allocation, plus funds transferred into the Strategy during the year. The total amount for the year was for works related to the SIR CS.

Government expenditure has been obtained from reports on each project, provided by relevant agency. Appropriate managers, subject to verification certified the expenditure reports as correct by audit.

Community Expenditure
Regional community and landholder expenditure was derived from a survey of farmers within the SIR, and from records of government administered assistance programs.

Accumulated Expenditure
Accumulated expenditure is expressed in 2002/2003 dollars. Previous expenditure was adjusted by applying the Victorian CPI increase of 3.7% in 2002-2003.

COMMUNITY SALINITY GRANTS

Community Salinity Grants were established in 1986 to help raise awareness and understanding of salinity.

Grants are available for salinity education and demonstration projects undertaken by schools, farmers and community groups in the Goulburn Broken catchment. The scheme encourages projects that are related to local salinity management plans and strategies. Groups may apply for a grant up to a maximum of $8,000.

Group	$
Arcadia & District Landcare Group	175
Bunbartha Landcare Group	514
Congupna Tallygaroopna Landcare Group	462
Congupna Tallygaroopna Landcare Group	2,900
Cornella Local Area Plan Implementation Committee	5,000
Goulburn Broken Waterwatch/Goulburn Valley Water	5,440
Goulburn Murray Landcare Network	2,000
Goulburn Murray Landcare Network	4,000
Guthrie Street Primary School	1,750
McGuire College Shepparton	430
Muckatah Landcare Group	529
Murchison Primary School	1,400
St Josephs College Echuca	600
St Mary of the Angels Secondary College Nathalia	200
Undera Primary School	470
Wanganui Park Secondary College	450
Wyuna Landcare Group Inc	330
Wyuna Landcare Group/Wyuna Local Area Plan	2,000
Ethnic Council of Shepparton & District	1,200
Dhurringile Landcare Group	5,550
Dhurringile Landcare Group	702
Total Grants paid in the Shepparton Irrigation Region	**$36,402**

SIR SALT DISPOSAL REPORT 2002-2003

Progressive Uptake of Salinity Disposal Entitlements in the SIR

Activity	Uptake of Salt Disposal Credits (EC)			
	Pre-1991	Total 2001-02	Progress 2002-03	Total 2002-03
Primary Drains	0.055	0.367	0.040	0.407
Community Surface Drains	0.008	0.103	-0.008	0.095
Public Groundwater Pumps	-	1.204	0.184	1.388
Private Groundwater Pumps	-	0.689	0.003	0.692
Horticultural Sub-surface Drainage	0.030	0.155	0.001	0.156
Total	**0.093**	**2.518**	**0.220**	**2.738**

SIR COMMITTEE and WORKING GROUP MEMBERS 2002-2003

SIR Implementation Committee

Voting Members Community Representatives	Non-Voting Members Agency Representatives	Executive Support Agency Staff
Russell Pell - (Chair) Numurkah Peter Gibson (Deputy Chair) Nanneella Allen Canobie - Numurkah Stephen Farrell - Echuca Peter McCamish - Ardmona Athol McDonald - Girgarre Ann Roberts - Shepparton Nick Roberts - Tatura	Bruce Cumming - DNRE Pat Feehan – G-MW Terry Hunter – GMW	Ken Sampson - DPI Peter Howard - GB CMA Pam Collins - DPI Ross Plunkett - G-MW David Lawler - DPI Melva Ryan/Alex Sislov - DPI Geoff Lodge - DPI Andrea Smith - GB CMA Gordon O'Brien - GB CMA

Attendance Record

Name	02-5	02-6	02-7	02-8	03-1	03-2	03-3	03-4
Allen Canobie	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Steve Farrell	Yes	Yes	Apol	Yes	Yes	Yes	Yes	Yes
Nick Roberts	Yes	Yes	Yes	Apol	Yes	Yes	Yes	Yes
Peter Gibson	Yes	Yes	Yes	Yes	Yes	Yes	Apol	Yes
Athol McDonald	Yes	Yes	Yes	Yes	Yes	Apol	Yes	Yes
Russell Pell	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Peter McCamish	Yes	Yes	Yes	Apol	Yes	Yes	Yes	Yes
Ann Roberts	Yes	Yes	Yes	Apol	Yes	Yes	Yes	Yes

Working Group Members

Group	Voting Member	Non-Voting Member
SIR Technical Support Committee - SIRTEC	Allen Canobie – SIR IC Russell Pell – SIR IC Peter Gibson – SIR IC Peter McCamish - SIR IC Ken Sampson – DPI Ross Plunkett – G-MW Peter Dickinson – G-MW Greg Smith – G-MW Chris Norman – DPI Bruce Cumming – DPI Melva Ryan – DPI Geoff Lodge – DPI David Lawler – DPI Steve Lottkowitz – DPI Justin Sheed – GB CMA Gordon O'Brien – GB CMA Andrea Smith – GB CMA Alfred Heuperman – DPI	Peter Howard - GB CMA Pam Collins – DPI Corresponding Members Graham Barrow – EPA Laurie Gleeson – GV-W Peter Gray – NVFGA

Budget Sub-Committee	Allen Canobie Stephen Mills Athol McDonald Peter McCamish	Ken Sampson – DPI Chris Norman – DPI Peter Dickinson – GMW Greg Smith- GMW Peter Howard – GB CMA Pam Collins – DPI

Sub-surface Drainage Working Group	Kevin Chapman Peter McCamish John Avard Les Langley Ian Whatley George Trew Bruce Cumming Peter McCamish Andrea Smith Peter Dickinson	Ken Sampson – DPI Peter Dickinson – G-MW Peter Howard - GB CMA

Surface Drainage Working Group	Allen Canobie Geoff Witten Noel Russell Peter Gibson Morris Brown Hank Sanders Les Langley Stephen Farrell John Pettigrew Ron Brooks George Trew Neville Moss	Ken Sampson – DPI Peter Howard – GB CMA Pam Collins – DPI

Farm Working Group	John Cornish Athol McDonald Nick Roberts Bob Watters John Pettigrew Jim McKeown Ann Roberts Ian Klein Les Langley Peter Gibson Rien Silverstein George Trew	Ken Sampson – DPI David Lawler – DPI -

Waterway Working Group	Russell Pell Nick Roberts Ron Pearce Alan Sutherland Bill Probst Tait Hamilton	Graeme Wilkinson - G-MW Gordon O'Brien- GB CMA

PRESENTATIONS AND PUBLICATIONS

Environmental Protection

Environmental Works on Private Land Project C304

Presentations

- Wyuna Landcare Group
- Shepparton TAFE
- GV Regional Environment Education Program (REEP)
- Chinese Delegation
- Muckatah Landcare Group

Surface Drainage

G-MW Primary Drains – Shepparton Regional Surface Drainage Project D800

Publications

- Sinclair Knight Merz (2003), Mosquito Catchment Drainage Resource Assessment

Irrigation Drain Management Project DV705

Presentations

- Farm field day at Nathalia for Broken Creek Landcare Group – Waterwatch Nutrients in Drains results

Publications

- Drain Resource Assessments (Mosquito)
- SKM, Nutrients in Irrigation Drains in the SIR July 2001 to June 2002
- G-MW (Smith & Carey), Cumulative Nutrient Load Analysis for Surface Drains in the SIR

Community Surface Drainage Project F099B

Presentations

- Co-ordinated a regional tour for delegates from Inner Mongolia – County Alixan

Sub-surface Drainage

Groundwater Pumping Extension Project F121

Publications

- Groundwater Quality and Usage Options table (chart used at Stanhope Field Days)
- Contaminates in Your Water (with above chart in Pumpers Trumpet, Winter edition)
- Management strategies for groundwater use in drought conditions: reducing the impact on your farm
- Groundwater Notes: ‘Using saline groundwater in the Shepparton Irrigation Region’, ‘Locating groundwater in the Shepparton Irrigation Region’ and ‘Reusing saline groundwater safely: strategies to reduce risk’

Presentations

- Environment Protection Authority
- Department of Treasury and Finance
- Department of Infrastructure and Rural Development

Monitoring

Effectiveness of Groundwater Pumping Project R499

Presentations

- Sinclair Knight Merz (Aug 2002). R499 - Hydrological Assessment and Salinity Status of Public Land Reserves in the Shepparton Irrigation Region
- Sinclair Knight Merz (Aug 2002). R499 - Hydrological Assessment and Salinity Status of Wetlands in the Shepparton Irrigation Region
- Sinclair Knight Merz (Oct 2002). R499 - Effectiveness of Groundwater Pumping Review of Public Groundwater Pump Hydrochemistry Monitoring Data

Shepparton Drain Nutrients Project C806A

Publications

- Department of Primary Industries (2002): Mandatory Environmental Monitoring: Monitoring Manual for the Shepparton Irrigation Region
- Department of Primary Industries (2002): Mandatory Environmental Monitoring: Shepparton Irrigation Region Environmental Monitoring Report for 1995-2002
- Sinclair Knight Merz (2003), Nutrients in Irrigation Drains in the SIR July 2001 to June 2002
- G Smith & R Carey, G-MW (2002), Cumulative Nutrient Load Analysis for Surface Drains in the SIR
- Sinclair Knight Merz (Aug 2002). R499 - Hydrological Assessment and Salinity Status of Public Land Reserves in the Shepparton Irrigation Region
- Sinclair Knight Merz (Aug 2002). R499 - Hydrological Assessment and Salinity Status of Wetlands in the Shepparton Irrigation Region
- Sinclair Knight Merz (Oct 2002). R499 - Effectiveness of Groundwater Pumping Review of Public Groundwater Pump Hydrochemistry Monitoring Data

Mandatory Environmental Monitoring Project T072

Publications

- Department of Primary Industries (2002): *Mandatory Environmental Monitoring: Monitoring Manual for the Shepparton Irrigation Region*
- Department of Primary Industries (2002): *Mandatory Environmental Monitoring: Shepparton Irrigation Region Environmental Monitoring Report for 1995-2002*

Program Support

Planning - Continuing Development of the Shepparton SMP Project S802

Publications

- Hydro Environmental (Jan 2003). Review of Strategic Research and Investigation Project Needs (Subsurface Drainage Program)

Planning - Development of Sub-regional Management Plans Project S815

Publications

- Sinclair Knight Merz (Nov 2002). Salt Inflows to the Goulburn River between Goulburn Weir and Murchison

Research - Water For Growth Projects

Soil Hydraulics Properties Project 8326 13525

Presentations

- A technical workshop was conducted on 27 September 2002 to discuss the project with a wide range of stakeholders.
- The project reported to participants of the Irrigation System Design Tool workshop, DPI Tatura, February 2003.

Market Mechanisms Project 8325 15050

Presentations

- Presentation to DRDC on WUE in irrigated dairy industry – current situations and future options – Fiona Johnson November 2002
- Presentation to SIRIC on principles of achieving WUE through policy instruments - December 2002
- Presentation to Murray Dairy Industry Steering Committee – Fiona Johnson February 2003
- Presentation to Water Use Efficiency Coordinating Committee on principles of achieving natural management policy objectives – Fiona Johnson February 2003
- Presentation at SIRIC reporting day on market mechanisms, their application in natural resource situations and an overview of future directions for the project – Melinda Leth April 2003
- Presentation to 'Our Rural Landscapes', change program development workshop on policy instruments to deliver NRM outcomes – Fiona Johnson May 2003
- Presentation to GBCMA Farm Working Group to update committee on project direction and recent changes – Melinda Leth May 2003
- Presentation to Future Farming Systems on market mechanisms, their appropriateness for natural resource situations and potential links with the Future

Bayesian Networks Project 8326 15050

Presentations

- Centre for Land Protection Research Seminar
- Arthur Conacher as a part of land capability assessment review
- South African Academy of Engineering and the Australian Academy of Technological Sciences and Engineering NSW Ag Water Use Efficiency Unit
- Hector Malano and PhD students - Department of Civil and Environmental Engineering, University of Melbourne
- Carmel Pollino -Water Studies Centre, Monash University
- Heather Frame – DPI Mildura

Improving Water Use Efficiency Project 8327 15050

Presentations

- Workshop for Irrigation Designers and Whole farm planning staff on the use of irrigation models held in February 2003
- Clive Lyle (Clive Lyle and Associates) seeking information about irrigation modelling for projects in China, particularly Tarim Basin
- NRE Cadets

PROGRAM STAFF 2002-2003

SIR IC acknowledges the valuable contribution and dedication of the staff of our partnership Agencies throughout the past year.

Environmental Protection			
Name	**Agency**	**Name**	**Agency**
Alex Sislov	DPI	Jim Castles	DPI
Kim Dyson	DPI	Rebecca Heard	DPI
Matt O'Hare	DPI	Kathy Ryan	DPI

Farm			
Name	**Agency**	**Name**	**Agency**
Bruce Cumming	DPI	Jen Pagon	DPI
Greg Roberts	DPI	Chelsea Nicholson	DPI
David Lawler	DPI	Penny Shaw	DPI
Chris Nicholson	DPI	Scott McDonald	DPI
Rabi Maskey	DPI	Chris Guthrie	G-MW
Kym Ockerby	DPI	Alan Lavis	G-MW
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Surface Drainage			
Name	**Agency**	**Name**	**Agency**
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John Bouchier	DPI	Carl Walters	G-MW
Georgie Fraser	DPI	Daryl Eaton	G-MW
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Rebecca Lukies	DPI	Carolyn Nigro	G-MW
Mark Paganini	DPI	Sam Green	G-MW
John Ford	DPI	Stuart Nield	G-MW
Owen Hayden	DPI	Eileen Young	G-MW
Paul O'Connor	DPI	Trevor Bassett	G-MW
Daniel Hunter	DPI	Laurie Floyd	G-MW
Paul Kenny	G-MW	Phil Lesire	G-MW
Bruce Dunbar	G-MW	Phil Hoare	G-MW
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Sub-surface Drainage			
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Waterways			
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Wayne Tennant	CMA	Guy Tierney	CMA
Gordon O'Brien	CMA	Lou Torelli	CMA
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Water Quality			
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Monitoring			
Name	**Agency**	**Name**	**Agency**
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GLOSSARY

AAV	Aboriginal Affairs Victoria
ANCID	Australian National Committee of Irrigation and Drainage
ATCV	Australian Trust for Conservation Volunteers
CAS	Catchment and Agriculture Services
CaLP	Catchment and Land Protection
CMA	Catchment Management Authority
CMSA	Catchment Management & Sustainable Agriculture
CRC	Cooperative Research Centre
CSD	Community Surface Drainage
CSIRO	Commonwealth Scientific Industry Research Organisation
DDP	Drain Diversion Plan
DNRE	Department of Natural Resources and Environment
DRDC	Dairy Research and Development Corporation
EM	Electromagnetic
EPA	Environmental Protection Agency
FEDS	Farm Exploratory Drilling Scheme
FRP	Filterable Reactive Phosphorus
GAM	Generalised Additive Model
GIS	Geographical Information System
GMLN	Goulburn Murray Landcare Network
GMP	Groundwater Management Plan
G-MW	Goulburn-Murray Water
GPIS	Groundwater Pumping Incentive Scheme
GSPA	Groundwater Supply Protection Area
GVEEP	Goulburn Valley Environment Employment Program
IIP	Improved Irrigation Practices
ISDG	Irrigation Surveyors and Designers Group
LAP	Local Area Plans
LPIS	Land Protection Incentive Scheme
LWRRDC	Land and Water Rural Research and Development Corporation
MASNV	Municipalities Against Salinity in Northern Victoria
MCC	Municipal Catchment Coordinator
MD2001	Murray-Darling 2001 Program (NHT)
MDBC	Murray-Darling Basin Commission
MDBSDS	Murray-Darling Basin Salinity and Drainage Strategy
MIL	Murray Irrigation Limited
NATA	National Association of Testing Authorities
NHT	Natural Heritage Trust
NLP	National Landcare Program
NOX	Oxidised Nitrogen
NRMS	Natural Resource Management Strategy
O&M	Operations and Maintenance
PISC	Program Implementation Support Committee
RCS	Regional Catchment Strategy
REALM	Resource Allocation Model
RWC	Rural Water Corporation
SBC	Serial Biological Concentration
SDA	Salt Disposal Allocation
SIR	Shepparton Irrigation Region
SIR IC	Shepparton Irrigation Region Implementation Committee
SIRCS	Shepparton Irrigation Region Catchment Strategy
SIRLWMP	Shepparton Irrigation Region Land and Water Management Plan
SIRLWSMP	Shepparton Irrigation Region Land and Water Salinity Management Plan
SKM	Sinclair Knight Merz
SPAC	Salinity Program Advisory Council
SPC	Shepparton Preserving Company
SPPAC	Salinity Pilot Program Advisory Council
TKN	Total Kjeldahl Nitrogen
TP	Total Phosphorus
UDV	United Dairyfarmers of Victoria
VFF	Victorian Farmers Federation
WFP	Whole Farm Plan
WSC	Water Services Committee

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The Geographic Information Systems Group at DPI Tatura produced maps used in this report.