

# Catchment Programs - Tatura

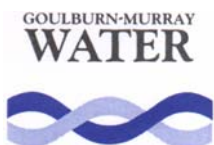
*Shepparton Irrigation Region Catchment Strategy*

## Key Performance Indicators for the Sub-Surface Drainage Program FINAL



## Goulburn-Murray Water

Annual Report for period ending 30<sup>th</sup> June 2005



The pictures on the cover display an example of the salinity impacts currently experienced within the Shepparton Irrigation Region, juxtaposed against a solar powered, low volume groundwater pump offering salinity protection for productive pasture farmland.

# **Catchment Programs - Tatura**

*Shepparton Irrigation Region Catchment Strategy*

**Key Performance Indicators**  
for the  
**Sub-Surface Drainage Program**  
**FINAL**

**G-MW Project Manager**

James Burkitt

**Funded By**

The Victorian Government  
and  
The National Action Plan for Salinity and Water Quality



# **Shepparton Irrigation Region Catchment Strategy**

## **Sub-Surface Drainage Strategy**

The Shepparton Irrigation Region Catchment Strategy (SIRCS) has evolved from the Shepparton Irrigation Region Land and Water Salinity Management Plan which was endorsed in 1990. The Sub-Surface Drainage Program (SSDP) is one of the core programs within the SIRCS. The core programs include:

- ☐ The Sub-Surface Drainage Program
- ☐ The Farm and Environment Program
- ☐ The Surface Water Management Program
- ☐ The Waterways Program.

The SSDP employs private groundwater pumping, public groundwater pumping, and tile drainage to manage groundwater levels for salinity control and salt disposal within the region.

Private groundwater pumping for farm re-use and for winter disposal is encouraged and assistance is available in the form of capital grants, as well as the Farm Exploratory Drilling Scheme (FEDS). The costs of pumping from private irrigation bores (including operation, maintenance and replacement) are met by the landholder.

Public groundwater pumps for salinity control may be installed where:

- ☐ Private groundwater pumping is not feasible;
- ☐ The area is affected by high watertables;
- ☐ There is sufficient landholder support.

The feasibility investigations and capital costs for new public groundwater pumps are jointly funded by the Victorian Government and the National Action Plan through the sub-surface drainage component of the SIRCS. Operating and maintenance costs of the public groundwater pumps are met by the direct and indirect beneficiaries of the scheme – landowners and local government.

## **SIRCS MER Strategy**

The SIRCS Monitoring, Evaluation and Reporting (MER) Strategy was developed to draw together aspects of natural resource monitoring in the Goulburn-Broken region at a strategic level that are relevant to the practices, policies and activities of the Regional Catchment Strategy.

This SSDP Performance Report is one of many reports detailing monitoring, evaluation and reporting within the Goulburn-Broken region, and is consistent with the principles and objectives of the MER strategy.

## **Key Performance Indicators**

Goulburn-Murray Water is responsible for implementing many aspects of the SSDP. Key Performance Indicators were developed for the program in response to a need for regular performance reporting to key stakeholders.

A more detailed set of indicators specific to the Public Pump Program are produced separately.

## **Further Information**

Requests for further information and comments can be directed to:

Mr Terry Hunter  
Manager Subsurface Drainage  
Goulburn-Murray Water  
PO Box 165 Tatura Victoria 3616

## Glossary

Term	Description
CGS	Capital Grant Scheme
DPI	Department of Primary Industries
DSE	Department of Sustainability and Environment
FEDS	Farm Exploratory Drilling Scheme
GBCMA	Goulburn-Broken Catchment Management Authority
G-MW	Goulburn-Murray Rural Water Authority
KPI	Key Performance Indicator
MDBC	Murray-Darling Basin Commission
NAP	National Action Plan
NHT	Natural Heritage Trust
Private Bore	Private Irrigation Bore, also known as a Private Groundwater Pump.
Program Development	Component of the SSDP related to development. Includes research and investigation.
Program Implementation	Component of the SSDP related to implementation. Includes all on-ground works (including the CGS, FEDS and Public Pump Program).
Program Monitoring and Reporting	Component of the SSDP related to monitoring and reporting. Includes biophysical and program (KPI) reporting.
Program Support	Component of the SSDP related to support. Includes committee meetings, coordination, program management, extension and capacity building.
Public Salinity Control Pump	A Public Pump design to manage salinity levels in the root zone.
Public Watertable Control Pump	A public pump designed to manage high watertables.
SIRCS	Shepparton Irrigation Region Catchment Strategy (formerly known as the Shepparton Irrigation Region Land and Water Salinity Management Plan or SIRLWSMP).
SIRGMP	Shepparton Irrigation Region Groundwater Management Plan
SIRIC	Shepparton Irrigation Region Implementation Committee
SPB	Salinity Plan Bore
SSDP	Sub-surface Drainage Program

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# Introduction

Key Performance Indicators have been developed for the Sub-Surface Drainage Program in order to provide a standard method for evaluating and reporting important aspects of program performance to key stakeholders, including government funding bodies, statutory and regulatory agencies, and community organisations and groups. The stakeholder relationships and program inputs is shown in Figure 1.

The indicators provide concise at-a-glance reporting on important monitored parameters, allowing ready evaluation of enterprise or program performance and ensuring that key information and trends are more easily absorbed and understood by the stakeholders.

Combined graphical and numerical indication is a key feature of the reporting, enabling comparison against previous periods and visual trend recognition whilst retaining the raw data.

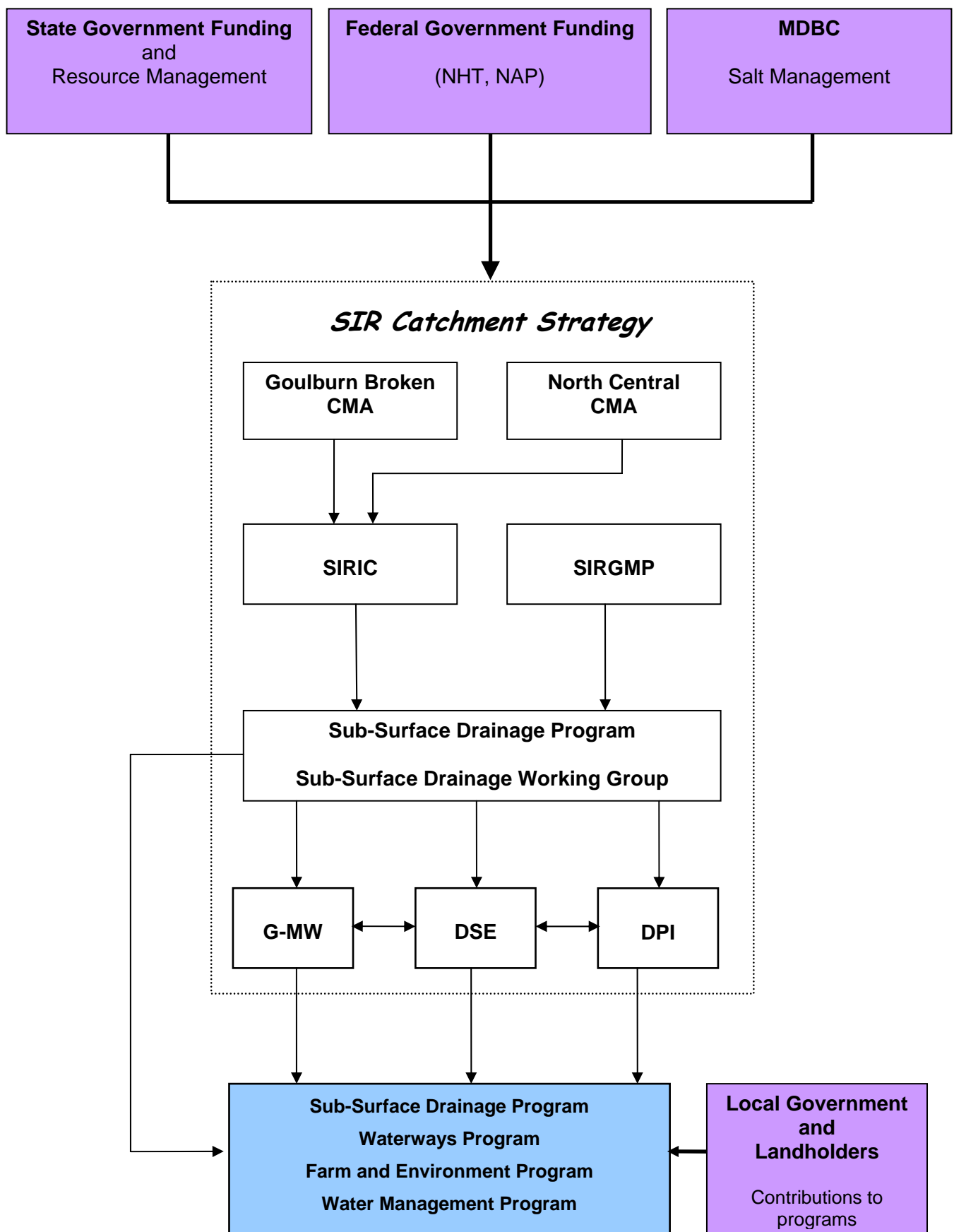
The Indicators are grouped into a range of categories that extend beyond purely financial and economic aspects and include environmental impacts/benefits and other indicators.

A map showing the Shepparton Irrigation Region has been included as Figure 2.

A set of headline indicators has been developed to give an overall indication of the performance of the SSDP. This diagrammatic representation is included as Figure 3.

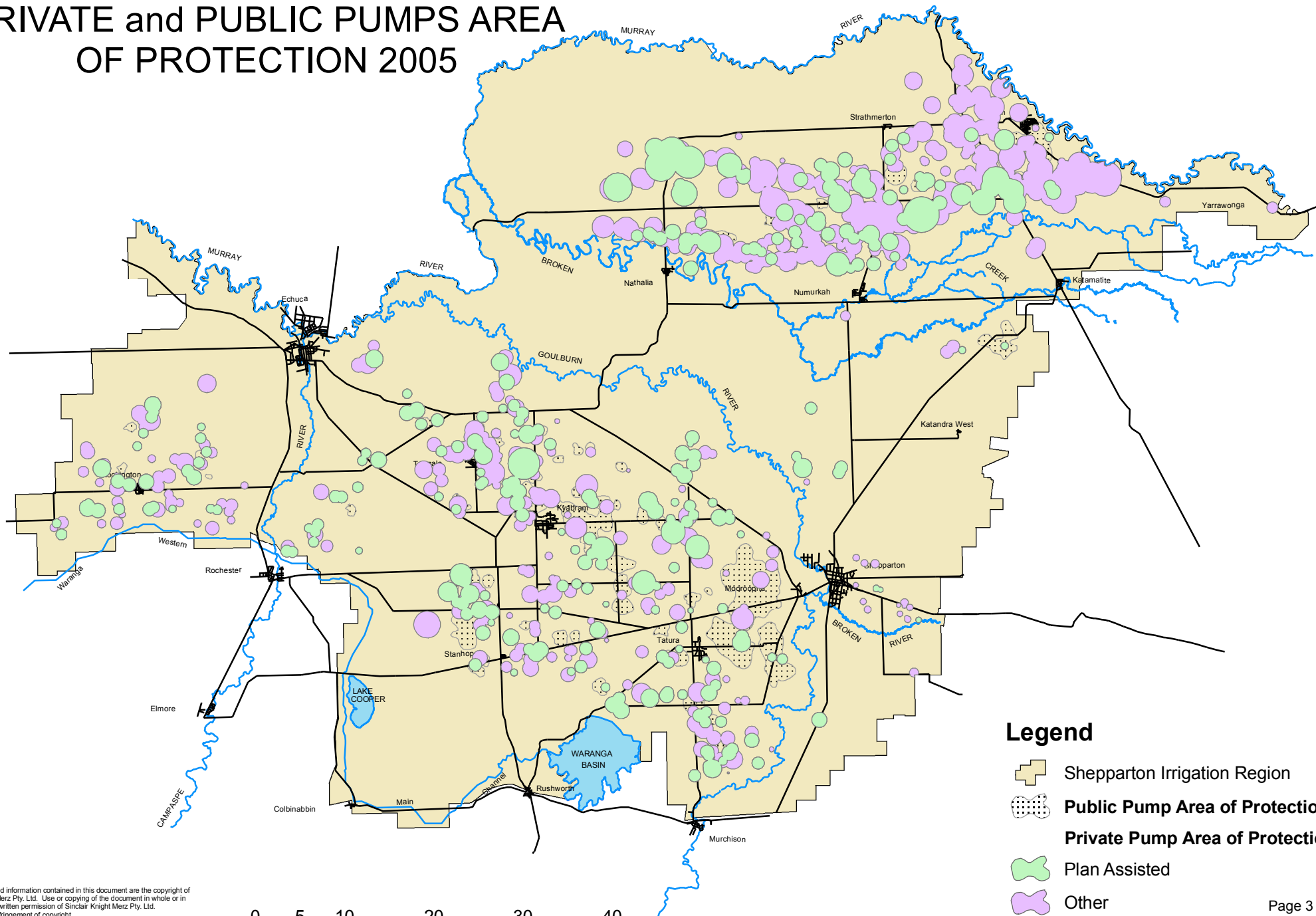
A short glossary has been included at the start of the report to aid understanding.

Interpretative notes are provided at the end of this document.








# SHEPPARTON IRRIGATION REGION

## PRIVATE and PUBLIC PUMPS AREA OF PROTECTION 2005



### Legend

-  Shepparton Irrigation Region
-  Public Pump Area of Protection
-  Private Pump Area of Protection
-  Plan Assisted
-  Other

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0 5 10 20 30 40 Km

Figure 3

**SIRCS - Sub-Surface Drainage  
Program**  
Headline Indicator Summary



KPI	Category	Reports On	Outcome	Comment
<b>AP-1</b>	<b>Area Protection</b>	Total area protected by the SSDP vs. Plan target area		Area protected dropping behind target figures
<b>PW-1</b>	<b>Program Works</b>	Number of Public Pump sites completed for the SSDP vs. Plan target		Public pumps well below target figure
<b>PW-2/3</b>	<b>Program Works</b>	Number of private irrigation bores vs. Plan target		Salinity Plan Bores still above targets although other targets dropping
<b>PO-1</b>	<b>Program Outputs</b>	Salinity Control Pumps volume pumped for the year vs. design capacity		Volume pumped was lower than design capacity as a result of no winter/spring disposal opportunity
<b>PO-6</b>	<b>Program Outputs</b>	Private Irrigation Bore pumped volume versus licence volume		The volume pumped from bores as a percentage of licenced volume was just below the average figure
<b>BE-1a</b>	<b>Budget, Revenue &amp; Expenditure</b>	Annual SSDP expenditure compared with budget		Budget target met
<b>CB-1</b>	<b>Economic Indicators</b>	Estimated Benefit/Cost ratio for the SSDP		Revised benefit/cost ratio will be available for next year's report
<b>EV-1</b>	<b>Environmental Indicators</b>	Area in hectares subject to shallow watertables (<2 m below ground)		Downward trend evident
<b>Overall Rating</b>				Satisfactory result given conditions but potential for targets to slip
<b>Legend</b> <div> </div> <div> </div>				
Result unsatisfactory or away from target				Insufficient data to assess
Performance Satisfactory or in direction of target				Borderline result

# SIRCS - Sub-Surface Drainage Program

## Operations Indicators

### Area Protection



Indicator		Current Period	Previous Periods				Past Average	Change +/-	Trend (%/year)	Comparison
		04/05	03/04	02/03	01/02	00/01				
AP-1	Total area protected by SSDP (ha) <sup>1</sup>	45,110	42,935	38,434	34,952	32,652	NA	2,175	8	<div>Total Area Protected by SSDP</div>
	Target Area <sup>2</sup>	50,854	46,320	41,872	37,510	33,218	NA			
AP-2	Area served by Public Salinity Control Pumps (ha)	8,600	7,596	7,192	6,042	4,557	NA	1,004	14	<div>Public Pump Area Protected</div>
	Target Area	12,200	10,200	8,400	6,800	5,400				
AP-3	Area protected by SSDP assisted horticultural irrigation bores (ha)	797	797	797	770	770	NA	0	1	<div>Private Pump Area Protected</div>
	Target Area	775	725	675	625	575	NA			
AP-4	Area protected by SSDP assisted private irrigation bores (ha)	35,697	34,526	30,429	28,124	27,309	NA	1,171	6	<div>SSDP Assisted Private Bores</div>
	Target Area	37,794	35,324	32,741	30,044	27,218	NA			

<sup>1</sup> Does not include Pre SSDP pumps; <sup>2</sup> Combines targets for AP2, 3, 4 and 5.

# SIRCS - Sub-Surface Drainage Program

## Operations Indicators

### Area Protection



Indicator		Current Period	Previous Periods					Past Average	Change +/-	Trend (%/year)	Comparison
		04/05	03/04	02/03	01/02	00/01					
AP-5	Area protected by SSDP assisted tile drainage systems - Horticulture only (ha)	16	16	16	16	16	NA	0	0		<b>Tile Drains</b> 
	Target Area	861	796	731	666	601	NA				
	Area protected by SSDP assisted tile drain systems - Pasture only (ha)	0	0	0	0	0	NA	0			
AP-6	Area Protected by Public Pumps installed before the commencement of the SSDP (ha) <sup>1</sup>	13,240	13,240	13,240	13,240	13,240	NA	0	NA		<b>Pre SSDP Public Pumps</b> 
	Area protected by Public Watertable Control pumps (Phase A pumps) (ha)	12,275	12,275	12,275	12,275	12,275	NA	0	NA		
	Area Protected by Salinity Control Pumps (Gigarre Pumps) (ha)	965	965	965	965	965	NA	0	NA		

<sup>1</sup> Phase A Pumps + Gigarre Pumps

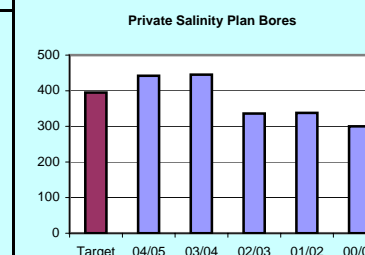
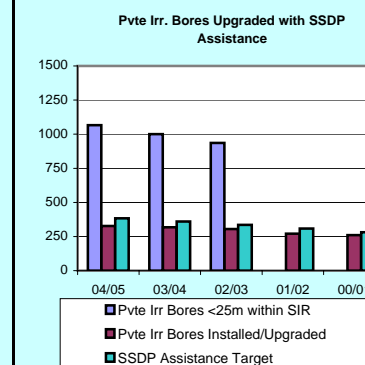
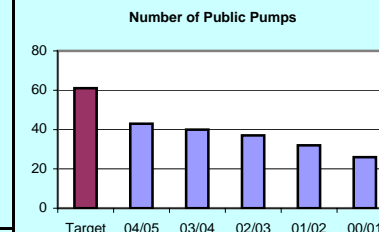
# SIRCS - Sub-Surface Drainage Program

## Operations Indicators

### Program Works



Indicator		Current Period	Previous Periods				Past Average	Change +/-	Trend (%/year)	Comparison																								
		04/05	03/04	02/03	01/02	00/01																												
PW-1	Public Salinity Control Pump sites completed to date for the SSDP	43	40	37	32	26	NA	3	12	<div>Number of Public Pumps</div> <table border="1"><thead><tr><th>Period</th><th>Count</th></tr></thead><tbody><tr><td>Target</td><td>60</td></tr><tr><td>04/05</td><td>42</td></tr><tr><td>03/04</td><td>39</td></tr><tr><td>02/03</td><td>36</td></tr><tr><td>01/02</td><td>31</td></tr><tr><td>00/01</td><td>25</td></tr></tbody></table>	Period	Count	Target	60	04/05	42	03/04	39	02/03	36	01/02	31	00/01	25										
	Period	Count																																
Target	60																																	
04/05	42																																	
03/04	39																																	
02/03	36																																	
01/02	31																																	
00/01	25																																	
Target	61	51	42	34	27																													
PW-2	Number of shallow private irrigation bores within the SIR	1066	1000	936	Data not available		968	66	-	<div>Pvte Irr. Bores Upgraded with SSDP Assistance</div> <table border="1"><thead><tr><th>Period</th><th>Pvte Irr Bores &lt;25m within SIR</th><th>Pvte Irr Bores Installed/Upgraded</th><th>SSDP Assistance Target</th></tr></thead><tbody><tr><td>04/05</td><td>1050</td><td>300</td><td>350</td></tr><tr><td>03/04</td><td>1000</td><td>280</td><td>320</td></tr><tr><td>02/03</td><td>950</td><td>270</td><td>300</td></tr><tr><td>01/02</td><td>250</td><td>250</td><td>250</td></tr><tr><td>00/01</td><td>250</td><td>250</td><td>250</td></tr></tbody></table>	Period	Pvte Irr Bores <25m within SIR	Pvte Irr Bores Installed/Upgraded	SSDP Assistance Target	04/05	1050	300	350	03/04	1000	280	320	02/03	950	270	300	01/02	250	250	250	00/01	250	250	250
	Period	Pvte Irr Bores <25m within SIR	Pvte Irr Bores Installed/Upgraded	SSDP Assistance Target																														
	04/05	1050	300	350																														
03/04	1000	280	320																															
02/03	950	270	300																															
01/02	250	250	250																															
00/01	250	250	250																															
Private irrigation bores installed or upgraded to date with SSDP assistance	327	318	305	271	260	NA	9	6																										
SSDP Assistance Target	384	360	335	309	282	NA	24																											
PW-3	Private irrigation bores operating as Salinity Plan Bores	442	445	336	338	300	NA	-3	3	<div>Private Salinity Plan Bores</div> <table border="1"><thead><tr><th>Period</th><th>Count</th></tr></thead><tbody><tr><td>Target</td><td>395</td></tr><tr><td>04/05</td><td>445</td></tr><tr><td>03/04</td><td>445</td></tr><tr><td>02/03</td><td>336</td></tr><tr><td>01/02</td><td>338</td></tr><tr><td>00/01</td><td>300</td></tr></tbody></table>	Period	Count	Target	395	04/05	445	03/04	445	02/03	336	01/02	338	00/01	300										
	Period	Count																																
Target	395																																	
04/05	445																																	
03/04	445																																	
02/03	336																																	
01/02	338																																	
00/01	300																																	
Target	395	349	303	257	210																													



# SIRCS - Sub-Surface Drainage Program

## Operations Indicators

### Program Works



Indicator		Current Period	Previous Periods					Past Average	Change +/-	Trend	Comparison
		04/05	03/04	02/03	01/02	00/01					
PW-4	Private horticulture irrigation bores completed with assistance from the SSDP	20	20	20	20	20	NA	0	0		<p>Private Horticulture Pumps</p>
	Target	31	29	27	25	23					
PW-5	Private low volume pasture <sup>1</sup> sub-surface drainage systems completed with assistance from the SSDP	1	1	1	0	0	NA	0	NA		
PW-6	Total number of Tile drain sites (horticulture) assisted by the SSDP	4	4	4	4	4	NA	0	0		<p>Tile Drain Sites in the SSDP</p>
	Tile drain sites (pasture) assisted by the SSDP	0	0	0	0	0	NA	0	NA		

<sup>1</sup> Private C-type pumps (low volume pasture) - no targets set as yet



# SIRCS - Sub-Surface Drainage Program

## Operations Indicators

### Program Works



Indicator		Current Period	Previous Periods				Past Average	Change +/-	Trend	Comparison																								
		04/05	03/04	02/03	01/02	00/01																												
PW-7	Number of FEDS investigations completed <div>Horticulture Pasture Total</div>	1 50 51	2 67 69	3 64 67	1 61 62	8 44 52	4 59 63	-1 -17 -18		<div>FEDS Investigations</div> <table><caption>FEDS Investigations Data</caption><thead><tr><th>Period</th><th>Horticulture</th><th>Pasture</th><th>Total</th></tr></thead><tbody><tr><td>04/05</td><td>1</td><td>50</td><td>51</td></tr><tr><td>03/04</td><td>2</td><td>67</td><td>69</td></tr><tr><td>02/03</td><td>3</td><td>64</td><td>67</td></tr><tr><td>01/02</td><td>1</td><td>61</td><td>62</td></tr><tr><td>00/01</td><td>8</td><td>44</td><td>52</td></tr></tbody></table>	Period	Horticulture	Pasture	Total	04/05	1	50	51	03/04	2	67	69	02/03	3	64	67	01/02	1	61	62	00/01	8	44	52
Period	Horticulture	Pasture	Total																															
04/05	1	50	51																															
03/04	2	67	69																															
02/03	3	64	67																															
01/02	1	61	62																															
00/01	8	44	52																															
PW-8	Number of SSDP assisted evaporation basins for drainage disposal in the SIR (cumulative)	0	0	0	0	0	0	0																										
PW-9	Number of plan land based drainage disposal schemes for the SSDP (other than evaporation basins) (Cumulative) <sup>1</sup>	0	0	0	0	0	0	0																										
PW-10	Number of Public Salinity Control Pumps installed primarily for environmental protection <sup>2</sup>	0	0	0	0	0	0	0																										

<sup>1</sup> For example tree lots, salt tolerant crops etc; <sup>2</sup> As opposed to agricultural or infrastructure protection

# SIRCS - Sub-Surface Drainage Program

## Operations Indicators

### Program Outputs



Indicator		Current Period	Previous Periods				Past Average	Change +/-	Trend	Comparison
		04/05	03/04	02/03	01/02	00/01				
PO-1	Public Salinity Control Pump volume pumped for the year (ML)	2043	1956	1375	1580	2001	1728	87		<p>Public Pumps Volumes</p>
	Public Salinity Control Pump design capacity (ML)	4278	3949	3788	3060	2747	3386	490		
PO-2	Public Salinity Control Pump salt load exported from the region for year (kT)	1.65	1.59	1.22	1.19	0.95	1.24	0.07		<p>Public Pump Salt Load</p>
	Public Pumps annual salt export capacity <sup>1</sup> (kT)	9.0	8.5	Data not available						
	Public Pumps salt disposal allocation (SDA)	1.49	1.44	1.39	1.20		1.34	0.06		

<sup>1</sup> Based on design capacity and nominal salinity and assumed disposal percentages

# SIRCS - Sub-Surface Drainage Program

## Operations Indicators

### Program Outputs



Indicator		Current Period	Previous Periods				Past Average	Change +/-	Trend	Comparison
		04/05	03/04	02/03	01/02	00/01				
PO-3a	Phase A pumps volume pumped for the year (ML)	3688	4076	Data not available			NA	-388		<p><b>Phase A Pumps Volume Pumped</b></p> <p><b>Girgarre Pumps</b></p>
PO-3b	Phase A operation time compared to service level (%)	95%	Data not available							
PO-3c	Girgarre evaporation basin annual pumping (ML) <sup>1</sup> -v- Target <sup>2</sup>	213	241	10	201	384	209	-28		
		396	396	396	396	396	-	-		

<sup>1</sup> Refers to pumps T102 and T103 only

<sup>2</sup> Target assumes winter/spring disposal is available (dependant on River Murray flows - last opportunity was 2000/01)

# SIRCS - Sub-Surface Drainage Program

## Operations Indicators

### Program Outputs



Indicator		Current Period	Previous Periods				Past Average	Change +/-	Trend	Comparison																		
		04/05	03/04	02/03	01/02	00/01																						
PO-4	Private Irrigation Bores SDA pumping for the year (ML) <sup>1</sup>	0	0	0	0	0	0	0		<div>Private Pump SDA Pumping</div> <table><thead><tr><th>Period</th><th>SDA Pumping</th><th>SDA Pumping Allocation</th></tr></thead><tbody><tr><td>04/05</td><td>~6000</td><td>0</td></tr><tr><td>03/04</td><td>~5500</td><td>0</td></tr><tr><td>02/03</td><td>~4500</td><td>0</td></tr><tr><td>01/02</td><td>~3000</td><td>0</td></tr><tr><td>00/01</td><td>~4500</td><td>0</td></tr></tbody></table>	Period	SDA Pumping	SDA Pumping Allocation	04/05	~6000	0	03/04	~5500	0	02/03	~4500	0	01/02	~3000	0	00/01	~4500	0
	Period	SDA Pumping	SDA Pumping Allocation																									
04/05	~6000	0																										
03/04	~5500	0																										
02/03	~4500	0																										
01/02	~3000	0																										
00/01	~4500	0																										
Private Irrigation Bores SDA pumping allocation <sup>2</sup> (ML)	6159	5745	4439	2838	4727	4,437	414																					
PO-5	Private Irrigation Bores SDA salt exported for year (T) <sup>1</sup>	0	0	0	0	0	0	0																				

<sup>1</sup> Climatic conditions did not allow salt disposal pumping <sup>2</sup> Potential maximum amount only

# SIRCS - Sub-Surface Drainage Program

## Operations Indicators

### Program Outputs



Indicator		Current Period	Previous Periods				Past Average	Change +/-	Trend	Comparison
		04/05	03/04	02/03	01/02	00/01				
PO-6	Private Irrigation Bores total volume pumped for the year (ML) <sup>1,2</sup>	64820	64288	101823	NA	NA	83,056	532		<p><b>Private Pump Pumping Statistics</b></p>
	Private Irrigation Bores total pumping (licenced volume) capacity (ML) <sup>3</sup>	138669	118132	121757	NA	NA	119,945	20,537		
	Usage as a percentage of licenced volume	47%	54%	84%	NA	NA	69%	-8%		
PO-7	Private Irrigation Bores assisted by the SSDP, volume pumped for the year (ML) -v- total pumping capacity (licenced volume)	Data not available					-	-		<p><b>Private Pumps - Delivery of Service</b></p>
		Data not available					-	-		
PO-8	Number of irrigators that received SSDP assistance, under-using groundwater (<65% safe volume)	Data not available			25	57	41	-		

<sup>1</sup> Likely to be higher - the total volume pumped is based upon bores where the pumping volume can be reliably calculated

<sup>2</sup> 2002/3 was a drought year and groundwater usage was increased by irrigators

<sup>3</sup> Licenced volume of pumps where usage can be reliably calculated

# SIRCS - Sub-Surface Drainage Program

## Financial Indicators

Budget, Revenue and Expenditure



2004-2005  
Performance  
Report

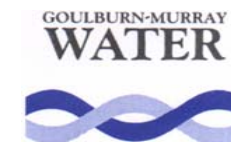


Indicator		Current Period	Previous Periods					Past Average	Change +/-	Trend	Comparison
		04/05	03/04	02/03	01/02	00/01					
BE-1a	Annual SSDP expenditure compared with budget (\$millions)										<p>SSDP budget vs expenditure</p>
	Expenditure	4.7	5.0	4.6	4.1	4.0	4.4	-0.3			
	Budget	4.4	4.9	4.8	3.7	4.0	4.4	-0.5			
BE-2	Revenue from operation of public salinity control works										<p>Salinity Control Works Revenue</p>
	Landholder Contribution	\$507,402	\$413,830	\$375,689	\$310,691	\$228,501	\$332,178	\$93,572			
	Local Government Contribution	\$103,926	\$84,760	\$75,316	\$63,635	\$46,801	\$67,628	\$19,165			
	Total	\$611,328	\$498,590	\$451,005	\$374,326	\$275,302	\$399,806	\$112,738			
BE-3	Percentage of annual budget invested in SSDP Research and Investigation	10%	9%	data not available			NA	1%			

# SIRCS - Sub-Surface Drainage Program

## Financial Indicators

### Revenue and Expenditure



Indicator		Current Period	Previous Periods				Past Average	Change +/-	Trend	Comparison
		04/05	03/04	02/03	01/02	00/01				
<b>BE-1b: Program budget breakdown (x 1000 \$)</b>										
Component	Item									
Development <sup>1</sup>	Actual Cost	492	334	Data not available			NA	158		<p><b>Development Costs</b></p> <p><b>Support Costs</b></p> <p><b>Implementation Costs</b></p> <p><b>Monitoring and Reporting Costs</b></p>
	Budget Cost	689	446	Data not available			NA	244		
Support	Actual Cost	1901	1321	Data not available			NA	580		
	Budget Cost	1318	1194	Data not available			NA	124		
Implementation	Actual Cost	1853	2848	Data not available			NA	-995		
	Budget Cost	1955	2762	Data not available			NA	-807		
Monitoring and Reporting	Actual Cost	479	506	Data not available			NA	-27		
	Budget Cost	434	489	Data not available			NA	-55		

<sup>1</sup> For a full description of each component please refer to the glossary

# SIRCS - Sub-Surface Drainage Program

## Financial Indicators

Budget, Revenue and Expenditure



Indicator	Current Period	Previous Periods				Past Average	Change +/-	Trend	Comparison																								
	04/05	03/04	02/03	01/02	00/01																												
<b>Capital Grant Scheme (CGS)</b>																																	
<b>CG-1</b>																																	
New pasture CGS systems costs									<div>Capital Grant Scheme Expenditure</div> <table><caption>Capital Grant Scheme Expenditure Data</caption><thead><tr><th>Period</th><th>Pasture</th><th>Horticulture</th><th>Upgrades</th></tr></thead><tbody><tr><td>04/05</td><td>\$250,000</td><td>\$0</td><td>\$0</td></tr><tr><td>03/04</td><td>\$900,000</td><td>\$0</td><td>\$0</td></tr><tr><td>02/03</td><td>\$750,000</td><td>\$0</td><td>\$0</td></tr><tr><td>01/02</td><td>\$150,000</td><td>\$0</td><td>\$100,000</td></tr><tr><td>00/01</td><td>\$250,000</td><td>\$0</td><td>\$0</td></tr></tbody></table>	Period	Pasture	Horticulture	Upgrades	04/05	\$250,000	\$0	\$0	03/04	\$900,000	\$0	\$0	02/03	\$750,000	\$0	\$0	01/02	\$150,000	\$0	\$100,000	00/01	\$250,000	\$0	\$0
Period	Pasture	Horticulture	Upgrades																														
04/05	\$250,000	\$0	\$0																														
03/04	\$900,000	\$0	\$0																														
02/03	\$750,000	\$0	\$0																														
01/02	\$150,000	\$0	\$100,000																														
00/01	\$250,000	\$0	\$0																														
Landholder	\$115,262	\$451,650	\$379,967	\$69,937	\$134,907	\$259,115	-\$336,388																										
Capital Grant	\$151,612	\$476,510	\$370,083	\$84,712	\$119,864	\$262,792	-\$324,898																										
Total	\$266,874	\$928,160	\$750,050	\$154,649	\$254,771	\$521,908	-\$661,286																										
New horticulture sytems costs																																	
Landholder	\$0	\$0	\$5,300	\$0	\$0	NA	\$0																										
Capital Grant	\$0	\$0	\$5,940	\$0	\$0	NA	\$0																										
Total	\$0	\$0	\$11,240	\$0	\$0	NA	\$0																										
CGS system upgrades																																	
Landholder	\$3,542	\$1,043	\$5,597	\$69,652	\$6,826	\$20,780	\$2,499																										
Capital Grant	\$3,892	\$1,937	\$7,710	\$29,405	\$10,238	\$12,323	\$1,955																										
Total	\$7,434	\$2,980	\$13,307	\$99,057	\$17,064	\$33,102	\$4,454																										
Total Administration Costs	\$202,474	\$257,259	\$210,000	\$188,462	\$185,150	\$210,218	-\$54,785																										
Average cost to manage grants process per site	\$22,497	\$17,151	\$8,750	\$47,115	\$46,288	\$29,826	\$5,346																										
<b>Farm Exploratory Drilling Service (FEDS)</b>																																	
<b>FE-1</b>																																	
Total cost of annual FEDS investigations for the SSDP	\$1,009,143	\$1,357,673	\$1,091,140	\$967,808	\$832,988	\$1,062,402	-\$348,530	<div>FEDS - Cost per Investigation</div> <table><caption>FEDS - Cost per Investigation Data</caption><thead><tr><th>Period</th><th>Pasture</th></tr></thead><tbody><tr><td>04/05</td><td>\$20,000</td></tr><tr><td>03/04</td><td>\$20,000</td></tr><tr><td>02/03</td><td>\$17,000</td></tr><tr><td>01/02</td><td>\$16,000</td></tr><tr><td>00/01</td><td>\$19,000</td></tr></tbody></table>	Period	Pasture	04/05	\$20,000	03/04	\$20,000	02/03	\$17,000	01/02	\$16,000	00/01	\$19,000													
Period	Pasture																																
04/05	\$20,000																																
03/04	\$20,000																																
02/03	\$17,000																																
01/02	\$16,000																																
00/01	\$19,000																																
Number of FEDS investigations <sup>1</sup>	50	67	64	61	44	59	-\$17																										
Average cost per FEDS investigation	\$20,183	\$20,264	\$17,049	\$15,866	\$18,932	\$18,028	-\$81																										

<sup>1</sup> Only refers to pasture FEDS  
CG-1 and FE-1 04-05.xls CG-1,FE-1



# SIRCS - Sub-Surface Drainage Program

## Economic Indicators

*Benefit/Cost*



Indicator		Current Period	Previous Periods				Past Average	Change +/-	Trend	Comparison
		04/05	03/04	02/03	01/02	00/01				
CB-1	Estimated benefit/cost ratio for the SSDP <sup>1</sup>	not available yet		2.4						
CB-2	Estimated benefit/cost ratio for Public Salinity Control Pumps (pasture)	not available yet		1.6						
CB-3	Estimated benefit/cost ratio for Private Irrigation Bores (pasture)	not available yet		3.1						
CB-4	Estimated benefit/cost ratio for the horticultural program <sup>2</sup>	not available yet		2.7						

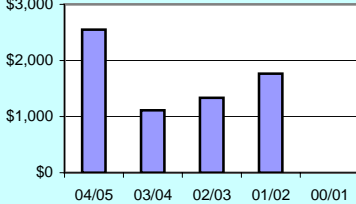
<sup>1</sup> Based on MDBC DESM Results - combined from pasture and horticultural programs <sup>2</sup> Includes horticultural pumps and tile drains

# SIRCS - Sub-Surface Drainage Program

## Economic Indicators

Benefit/Cost



Indicator		Current Period	Previous Periods				Past Average	Change +/-	Trend	Comparison												
		04/05	03/04	02/03	01/02	00/01																
CB-5	SSDP program costs (Millions) <sup>1</sup>	\$4.7	\$5.0	\$4.7	\$4.1	\$4.0	\$4.4	-\$0.3		<div>Cost per Hectare Protected</div>  <table><caption>Cost per Hectare Protected Data</caption><thead><tr><th>Period</th><th>Cost per Hectare Protected</th></tr></thead><tbody><tr><td>04/05</td><td>\$2,550</td></tr><tr><td>03/04</td><td>\$1,113</td></tr><tr><td>02/03</td><td>\$1,335</td></tr><tr><td>01/02</td><td>\$1,765</td></tr><tr><td>00/01</td><td>NA</td></tr></tbody></table>	Period	Cost per Hectare Protected	04/05	\$2,550	03/04	\$1,113	02/03	\$1,335	01/02	\$1,765	00/01	NA
	Period	Cost per Hectare Protected																				
	04/05	\$2,550																				
03/04	\$1,113																					
02/03	\$1,335																					
01/02	\$1,765																					
00/01	NA																					
Area Protected (ha)	44,778	42,935	38,434	34,952	32,652	37,243	1,843															
	Cost per hectare protected <sup>2</sup>	\$2,550	\$1,113	\$1,335	\$1,765	NA	\$1,405	\$1,437														

<sup>1</sup> Includes private and public contributions

<sup>2</sup> Costs per hectare are calculated on an annual basis (increase in area protected divided by total annual cost)

# SIRCS - Sub-Surface Drainage Program

## Environmental Indicators

### Benefits and Impacts



## 2004-2005 Performance Report



Indicator		Current Period	Previous Periods				Past Average	Change +/-	Trend	Comparison
		04/05	03/04	02/03	01/02	00/01				
EV-1	Groundwater levels - Area threatened by shallow watertables (<2 m below ground) (ha)	61,647	89,703	69,544	132,118	152,074	110,860	-28056		<p>Area threatened by shallow groundwater</p>
EV-2	Groundwater salinity trend in private irrigation bores <sup>1,2</sup>									<p>Groundwater salinity trend</p>
	% increasing	Data not available		44%	35%	Not available	40%	NA		
	% decreasing	Data not available		15%	24%	Not available	20%	NA		
	% stable	Data not available		41%	41%	Not available	41%	NA		

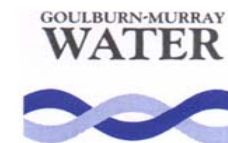
<sup>1</sup> Based on average salinity readings for selected bores

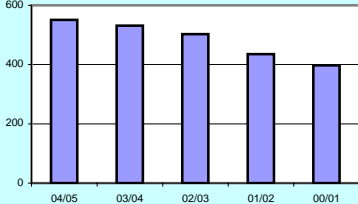
<sup>2</sup> Now undertaken on a five yearly basis

# SIRCS - Sub-Surface Drainage Program

## Environmental Indicators

### Benefits and Impacts



Indicator		Current Period	Previous Periods				Past Average	Change +/-	Trend	Comparison												
		04/05	03/04	02/03	01/02	00/01																
EV-3	Area of environmental features protected by Private Pumps (ha)	3277	Data not available							<div>Environmental Area Protected by Public Pumps (ha)</div>  <table><thead><tr><th>Period</th><th>Area (ha)</th></tr></thead><tbody><tr><td>04/05</td><td>551</td></tr><tr><td>03/04</td><td>532</td></tr><tr><td>02/03</td><td>503</td></tr><tr><td>01/02</td><td>435</td></tr><tr><td>00/01</td><td>398</td></tr></tbody></table>	Period	Area (ha)	04/05	551	03/04	532	02/03	503	01/02	435	00/01	398
	Period	Area (ha)																				
	04/05	551																				
03/04	532																					
02/03	503																					
01/02	435																					
00/01	398																					
Area of environmental features protected by Public Pumps (ha)	551	532	503	435	398	467	19	8														
	Total	3828																				

# SIRCS - Sub-Surface Drainage Program

## Miscellaneous Indicators

### Program Review Long-Term



Indicator		Current Period	Previous Periods					Past Average	Change +/-	Trend	Comparison
		04/05	03/04	02/03	01/02	00/01					
MI-1	Number of irrigators using more than licence entitlement volume	91	107	222	NA	NA		165	-16		<p><b>FEDS Applications</b></p>
MI-2	Number of FEDS applications <sup>1</sup> Received	54	56	194	109	17		94	-2		
	Completed	50	67	64	61	44		59	-17		
	To be Completed	33	35	23	28	32		30	-2		
	Waiting List	19	63	112	45	6		57	-44		
MI-3	Percentage of successful FEDS investigations (Benchmark - 25%)	26%	15%	36%	18%	25%		23%	11%		<p><b>Successful FEDS Applications</b></p>
MI-4	Average soil salinity in rootzone for indicator public pump (dS/m) <sup>2</sup>	2.70 (26% decrease)	Not Available	Not Available	Not Available	3.64		NA	-0.94		

<sup>1</sup> Only Refers to pasture FEDS

<sup>2</sup> Based on results for Public Pump Ro107

## **Interpretation Notes for 2004/2005 Indicators**

### **Area Protection Indicators**

These indicators focus on reporting the area of land protected by the Sub-Surface Drainage Program. The area of land protected by each of the key implementation areas of the SSDP are separately reported and also amalgamated to report on the total area protected. The area protected is based on either pumping test data for individual groundwater pumps (for public pumps) or the assumption that 1 ML of groundwater licence volume equates to 1 ha of groundwater protection (for private irrigation bores).

The area protected is also compared to targets where applicable. These targets were devised in the original 1989 Program and are revised every five years. Yearly targets, based upon budget availability, are also set by the SSDP at the start of each financial year. Meeting these yearly targets provides an indication of the efficiency and effectiveness of the SSDP in implementing works and measures. The overall SSDP targets and subsequent five yearly targets are a function of the expected available budget over the long term. Reporting against these targets gives an indication of how the SSDP is progressing towards total implementation.

Although the KPIs indicate that there has been a steady increase in the area currently protected by the SSDP, current five year targets, and therefore potentially the overall 30 year targets, are not being met. This can be largely attributed to public funding limitations, the severe drought conditions that have existed over the last few seasons limiting private landholder funds, and decreasing focus placed on groundwater control by landholders. Increased public funding levels and a return to a wetter climatic cycle will restore landholder focus on the need to control groundwater levels in the SIR and increase implementation rates.

### **Program Works Indicators**

Program Works are concerned with gauging the completion, operation and upgrade of bores, tile drainage systems, evaporation basins and other land based drainage disposal schemes under the SSDP. Works are categorised as either:

- Public
  - Salinity Control
  - Watertable Control
- Private
  - Pasture
  - Horticulture
  - Tile Drainage

The total number sub-surface drainage works installed with funding assistance from the SSDP, and the number of FEDS investigations is also recorded. The number of FEDS investigations decreased, largely due to decreased demand.

Overall the SSDP is achieving its yearly targets (based upon budget limitations), but is falling behind in the achievement of its five-yearly, or 'overall', targets.

## **Program Output Indicators**

Program Output Indicators for the SSDP report the performance of salinity control works for Public Salinity Control Pumps, Public Watertable Control Pumps (the so called 'Phase A' pumps), and Private Irrigation Bores (including those with capital grants assistance). The performance is measured in terms of groundwater volumes pumped and salt exported.

Outputs for the Public and Private pumping components of the SSDP are affected by a range of factors, including climate and surface water allocations. Of particular note, winter/spring disposal pumping from private and public groundwater bores has not been conducted in recent years due to insufficient dilution flows in the River Murray (largely a response to extended dry conditions during the past few years).

## **Budget, Revenue and Expenditure Indicators**

These indicators focus on financial statistics of the SSDP Program and include budget and expenditure data, the relative contributions by the private and public sector, and research and development investment.

SSDP expenditure for 2004/5 exceeded the original budgets largely due to an availability of funds which were not foreseen at the start of the financial year. Administration costs for capital grants (new private pumps and upgrades) were higher than last year but still below the five year average, and FEDS costs per investigation were similar to last year.

## **Economic Indicators**

Economic Indicators report on the benefit/cost aspects of the SSDP, as well as the cost per hectare protected. Benefit/cost figures are updated on a five yearly basis as part of the five year review of the SSDP. Updated benefit/cost figures will be available in 2006 and will be included in the next SSDP KPI report.

The overall cost/hectare protected for the SSDP increased from the last reporting period and is well above the five year average. This is due to a decreased area protected by the SSDP over the reporting period.

## **Environmental Indicators**

The environmental indicators are intended to demonstrate the environmental benefits and impacts of the SSDP. The indicators focus on groundwater levels, salinity trends, and impacts.

Unfortunately, circumstances beyond the SSDP control limited the data availability of these indicators.

## **Miscellaneous Indicators**

MI-1 indicates that the number of irrigators over-using their groundwater entitlement decreased slightly from the last reporting period, and decreased by more than 50% compared to groundwater use during the peak of the drought (2002/3).

MI-2 gives an indication of the strength of the FEDS program, which is a key indicator of landholder interest and the potential for the SSDP to assist in works on the ground. 2004/5 shows a significant decrease in the FEDS waiting list from previous years indicating a need to increase promotion of the FEDS program to avoid a slow down in FEDS and capital grants in the coming period. There was also a slight decrease in the total amount of FEDS investigations completed in 2004/5.

MI-3 shows a significant increase in the amount of successful FEDS investigations with 2004/5 seeing a return to performance above the benchmark figure.

## **T1 - Soil Salinity Measurements**

Soil salinity measurements have been implemented to determine the impact of Salinity Control Public Pumps on soil salinity within the root zone, and to compare the effectiveness of different techniques for measuring the salinity change.

A key assumption of the SSDP is that lowering the pressure level in aquifers (ie. lowering the watertable) promotes leaching of salt from the root zone. This assumption is based on a significant body of scientific work conducted in the region from the 1960's to the 1990's and numerous on-ground examples/observed behaviours.

This KPI Category uses a limited number of representative sites to confirm the effectiveness of the Program in promoting leaching (and therefore managing root zone salinity), and subsequently protecting agricultural productivity.

Initial investigations were carried out in 2002/3 on two Salinity Control Public Pumps. From these investigations, Public Pump Ro107 was assessed as suitable for further investigations and baseline conditions were established through electromagnetic (EM38) and soil salinity surveys. Further EM38 and soil salinity surveys were then earmarked for 2004/5 (ie. two year reporting period) to enable an assessment of soil salinity changes.



Five other public pump sites were investigated for potential ongoing soil salinity monitoring but none were found to be suitable

Soil salinities recorded in the rootzone for Public Pump Ro107 showed an average decrease of 26%. This result may also have been influenced by continuing dry conditions through the study period and falling watertables.