

REGIONAL IMPACT ASSESSMENT STATEMENT

REGULATION OF DRAINAGE DISCHARGES IN THE LOWER MURRAY RECLAIMED IRRIGATION AREAS

In accordance with Circular 19, *Preparing Cabinet Submissions*, Regional Impact Assessment Statements must be prepared where significant impacts on a regional area are expected to arise from a proposal. Significant impacts are those that will or are likely to affect an entire rural or regional community, or groups of people in regional communities over a short or long-term period.

This statement analyses the economic, social and environmental implications of proposed regulation of drainage discharges within the Lower Murray Reclaimed Irrigation Areas (LMRIA). It should be noted that an extensive study quantifying these impacts was undertaken in June 2001 by Primary Industries and Resources SA (PIRSA): the *Consultancy for Lower Murray Reclaimed Irrigation Areas Options Study*. As the EPA regulation proposal is complementary to other rehabilitation activities being undertaken within the Areas (coordinated through the Department for Water Land and Biodiversity Conservation and PIRSA), this Statement will only quantify impacts of proposed regulation undertaken by the EPA. Some information regarding the restructure/rehabilitation process is presented for contextual purposes.

Issue

The EPA proposes to regulate the activity of 'irrigated agriculture' via a Regulation made under section 140(2)(b) of the *Environment Protection Act 1993*. The Regulation would exempt irrigators and irrigation trusts within the Lower Murray Reclaimed Irrigation Areas from clause 13 of the *Environment Protection (Water Quality) Policy 2003* (Water EPP), which sets the relevant standards for discharges to water courses. The exemption would operate subject to conditions including:

- Compliance with *Environment Protection Authority Guidelines for Lower Murray Reclaimed Irrigation Areas* (the Guidelines), and
- Implementation of an Environment Improvement and Management Plan (EIMP) that satisfies the requirements of the Authority, for each property.

The Guidelines will require modification of land management practices, in the key areas of:

- a) Water management
- b) Land management
- c) Effluent management
- d) Monitoring and evaluation

The EIMP will cover a 1-5 year period and outline a number of actions within set timeframes, to address specific issues defined in relation to each farm. Such issues would relate to farm management practices associated with the discharge or recycling of waste water, and the maintenance of channels for reception, delivery and discharge of water. When applied on-farm, the EIMP would result in a continuing reduction in the amount of pollutant load being returned to the river via excess flood irrigation water and stormwater run-off.

The exemption forms part of a broad package of reforms undertaken within the Lower Murray Reclaimed Irrigation Areas (LMRIA) including:

- Irrigation water allocations and licences
- Drainage water quality management
- Irrigation and drainage infrastructure rehabilitation
- Government district privatisation
- Overall management arrangements.

The exemption will assist irrigators and trusts to work co-operatively with the Government to gradually improve environmental quality of the LMRIA. Without the exemption, irrigators would be liable for breaches of the Water EPP, as they are not currently able to comply with its requirements. However, with gradual improvements to farming practices and consequent improved quality of drainage discharges to the River Murray, the exemption presents irrigators and trusts with a grace period in which to modify their activities in order to come into compliance.

Region

All irrigators and trusts within the defined Lower Murray Reclaimed Irrigation Areas would be required to have an exemption from clause 13 of the Water EPP. Irrigated agriculture is defined as:

Flood irrigation for the commercial production of livestock, pastures and crops on land within the River Murray Water Protection Areas, northern extent 346700E, 6135900N; southern extent 353200E; 6086700N (known as the 'Lower Murray Reclaimed Irrigation Areas') using water allocated in accordance with the River Murray Prescribed Watercourse Water Allocation Plan adopted under the Water Resources Act 1997 and includes:

- *Farm management practices associated with the discharge or recycling of waste water (other than those regulated under the Code of Practice for Milking Shed Effluent 2003)*
- *Maintenance and operation of channels for reception, delivery and discharge of water, including any activities associated with the exercise by an Irrigation Authority of its powers and functions under the Irrigation Act 1994.*

The Lower Murray Reclaimed Irrigation Areas are those irrigation Areas between Mannum on the River Murray and Finniss on Lake Alexandrina that comprise the Lower Murray Reclaimed Areas Irrigation Management Zone in the Water Allocation Plan for the River Murray Prescribed Watercourse, as at July 2002. The Lower Murray Reclaimed Irrigation Areas are former floodplains that were converted to agricultural use during the early 20th Century. 'Reclaimed Areas' are below the level of the River Murray and protected by a common levee bank, those are or could be flood irrigated. A reclaimed area may comprise a single irrigated property or two or more continuous irrigated properties. These swamp areas are irrigated to produce pasture for dairying and account for approximately 20% of the State's irrigation water use. The Areas are approximately 5000 hectares in size with the average farm being 45 hectares in size.

There are 22 separate irrigation Areas constituted under the *Irrigation Act* 1994, comprising approximately 65 farms and approximately 25 irrigation trusts. The region provides about 15 percent of South Australia's milk supplies and provides the important role of compensating for seasonal troughs from other dairying regions. The farm gate value of dairy produce from the Lower Murray region is approximately \$32 million per annum. Regional processing of dairy products employs approximately 200 people. The dairy industry is a significant contributor to the regional economy. The region's strengths are its proximity to Adelaide, its milk quality and its potential for further improvement in farm productivity.

The economic studies prior to the commencement of the rehabilitation program predicted some decline of milk production in the short to medium term. The major finding from those studies was that the introduction of water trading would result in approximately 30 percent of land currently used for dairying being retired. This was without taking account of the impact of increased EPA standards. The studies demonstrated that the biggest single factor that would impact on dairying in this area would be the ability to trade water. The studies also indicated that milk production from the region would return to levels comparable as at the time of deregulation of the industry (2001). That is, the production lost in the early stages of the rehabilitation process would be restored after the initial exit of some irrigators, through improvements in water use and production efficiency.

On-farm improvements are essential to improve the efficiency of water use, especially laser-grading of paddocks. Further, the future of dairying in the Areas depends on a significant improvement in the quality of drainage water returned to the River Murray, accompanied by further improvement to the efficiency of flood irrigation from the River.

Rehabilitation means on-farm and off-farm works relating to the repair, upgrading, replacement, extension, relocation and installation of infrastructure and the levelling, restructuring and reforming of bays or paddocks, including any associated evaluation, planning, design and implementation of works. The proposed rehabilitation designs for flood irrigation are expected to greatly improve water use efficiency (from around 40% to approximately 80%) and reduce the pollutant load to the River by 70 to 80%.

Stakeholders

The key stakeholders include:

- Irrigators and irrigation trusts
- Representative bodies eg DairySA, Lower Murray Irrigators Action Group
- South Australian Dairy Farmers' Association
- Relevant State Government agencies: PIRSA, DWLBC, EPA, Office of Local Government, DTUPA, DFC, DAIS
- Statutory Corporations eg SA Water

Consultation

All stakeholders have been consulted continuously throughout the rehabilitation/restructure process.

The Lower Murray Reclaimed Irrigation Areas Steering Committee released a draft policy on *Management of Water Use* in June 2000 and sought comments on this until September 2000. This draft policy formed the basis of initial options for the broad package of reforms to land and water management in the Lower Murray Reclaimed Irrigation Areas.

Between October 2000 and April 2001, a project team led by PIRSA Rural Solutions undertook an Options Study, which outlined the options for management of the LMRIA, the economic, social and environmental implications for the Areas and indicative costing figures for improved land/water management practices.

The major discussion paper, *Options for Management of Irrigation Practices in the Lower Murray* was released in September 2001 following the results of the PIRSA Options Study. The Discussion Paper sought public comments for two months. A number of public consultation forums were held concurrently, including three meetings on 18 October 2001 at Murray Bridge, Mannum and Jervois. These consisted of a seminar and question time, followed by the two-month period for formal written responses.

The Government received 10 formal written responses to the Discussion Paper. Respondents included 4 government departments, one statutory corporation, irrigators represented by the Lower Murray Irrigation Advisory Board and four independent responses from irrigators. Key issues raised at the public fora and in response to the Discussion Paper focussed on equity and environmental issues and the need for greater involvement in decisions about irrigation management. A precis of submissions forms **Appendix One** to this Statement. The most frequently raised issues could be grouped into six categories and summarised in the following points:

- Community consultation, education and participation
 - the integral role of community consultation, education and participation in open planning and decision-making
 - the need for information dissemination to the community at all stages of the project
 - the need for general community education about irrigation and sustainability
 - the need for preferred models to be developed in partnership with irrigators to reflect localised issues

- a recognition of irrigators' role and responsibility for River health
- Responsibility, equity and cost division
 - the multitude of factors contributing to River pollution, including salt, nutrient, pesticide and pathogen loads from groundwater intrusion, houseboats, shacks, stormwater run-off and highland irrigation
 - the role of upstream users (in SA) in contributing to water quality
 - resolution of cost issues in an equitable manner
 - ongoing licensing and monitoring costs
 - joint responsibility for River pollution among users
- Uncertainty and community perceptions
 - inconsistency between water licences issued by DWLBC & EPA requirements
 - uncertain environmental/economic impacts of irrigators in the region
 - need to specify clear standards and targets
 - need to promote irrigators' achievements in farm improvements
- Public health risks
 - concerns about health risks of using downstream water discharges
 - concerns about health risks of pathogens entering River system
 - need to quantify risks associated with non-human sources of pollution
 - concerns about pathogen levels found in carp in drains
 - need for Government assistance in monitoring of nutrient and pathogen levels
 - need for monitoring of River responses to distribution/dispersion of bacteria over time
- Licensing structure and enforcement
 - EPA and DWLBC requirements should operate in conjunction with each other
 - Need for strong enforcement presence in the Areas
 - Sliding licensing scale would provide incentive for farm improvements
 - Need for management structure before the implementation of licensing requirements
 - Long term licences may increase value of properties through stability
- Monitoring responsibilities
 - currently a lack of data pertaining to irrigation activities along the River
 - monitoring regime must be equitable, cost effective with clear specific objectives
 - specific monitoring for Enteric Protozoa should occur on an event basis
 - monitoring should continue after implementation of licensing, to gauge improvements over time
 - monitoring should be linked to a Quality Assurance program
 - need for consideration of flooding
 - need for monitoring of pesticides and nutrients
 - need to monitor effects of suspended sludge and silt
 - need for a whole of river monitoring program

- Best Management Practice/Code of Practice Development
 - EPA must ensure an implementation strategy accompanies introduction
 - Need for pollution prevention rather than treatment
 - Will improve public perception of the industry and potential for marketing opportunities
 - Need for review mechanism
 - Need for accessibility by stakeholders (ie clearly expressed and implemented)
 - Need for policing of compliance

The EPA's preferred approach to regulation (including an exemption linked to an EIMP and compliance with Guidelines) was derived from comments received in response to the Options Paper and the need to develop an appropriate regulatory response to the requirements of the Water EPP. Initially the EPA favoured the licensing of irrigated agriculture as a 'prescribed activity of environmental significance', but legal advice from the Crown Solicitors' Office indicated that this would not be consistent with the requirements of the Water EPP. Further, licensing would have imposed substantial administrative costs on irrigators, which will not be imposed with the proposed method of exemption. The EPA will be able to seek the same improvements in environmental quality as would have been sought via licensing, but will not require onerous licensing fees to be paid. This will enable irrigators to invest more effectively, for example in fulfilling their requirements under the EIMP.

Key stakeholders were involved in the development of the *EPA Guidelines for the Lower Murray Reclaimed Irrigation Areas*, and a formal consultation session with the irrigation community was held on 5 July 2002 to seek input into this process.

In March 2003 the SA Government conducted two consultation and information sessions with the irrigation community to discuss new requirements for the Areas, and implications of these. All irrigators and other key stakeholders attended these sessions. The Minister for Environment and Conservation also attended these forums and answered questions directly from irrigators. Major issues raised by stakeholders at this forum included:

- Payment for costs of rehabilitation, including how much funding would be provided by the Government and access to additional loans to cover costs.
- Effects on the regional economy and social impacts for the community.
- Timing of reforms.
- Managing existing water allocations.
- Managing land retired from livestock production post-licensing.
- Water trading between irrigators.
- Farm management planning and the cost of preparing plans
- The need for consistent standards that could be understood easily by stakeholders

A further forum was held on 27 October 2003 to explain EPA proposals in detail and provide an opportunity for irrigators to ask any outstanding questions. The forum was well attended by a majority of irrigators in the region.

The EPA held a follow-up forum on 1 December 2003 to update irrigators on developments in the proposal, including changes to the definition of 'irrigated agriculture' and changes to the timing for the introduction of regulation.

In mid-December 2003 the Minister for Environment and Conservation wrote to all irrigators providing the formal Government response to issues raised by irrigators and Guidelines for the Areas Restructure Package and Rehabilitation Financial Assistance. These documents outline the various forms of assistance (including financial) available to irrigators during the restructure process.

The Government publishes a Lower Murray Reclaimed Irrigation Areas newsletter on a regular basis (usually bi-monthly), providing a written update to all stakeholders on relevant issues. The August 2004 edition of the newsletter discussed the proposed exemption and EPA requirements.

Face to face consultation with all affected irrigators and trusts occurred during the drafting of EIMPs in 2004, which has enabled stakeholders to seek specific advice on the impacts of the exemption for each affected property.

Further consultation occurred with irrigators and Trusts during February 2005 to update stakeholders on developments in the rehabilitation process.

Responses to consultation have been generally very positive, as it is recognised that significant economic benefits will arise from improved water use efficiency, improved water quality and rehabilitation of degraded properties. As the LMRIA has been subject to a dramatic change process over the past five years comprising of numerous regulatory proposals, consultation has been characterised by constructive, comprehensive and entrepreneurial interaction between irrigators and the Government. Key concerns raised by irrigators have related to the Government's expectation of irrigators' financial contributions to the rehabilitation and reform package. The Government acknowledges that the responsibility for reforms must be shared between all beneficiaries, and to this end, has provided a suite of assistance, mitigation and compensation measures available to irrigators. The Government also expects that some costs will be borne by irrigators and trusts. The Government has made information about proposed reforms publicly available and has continued to encourage stakeholders to consider and plan for future courses of action.

Summary of Impacts

All irrigators and trusts within the Lower Murray Reclaimed Irrigation Areas (as defined) would require an exemption from clause 13 of the Water EPP if undertaking the activity of flood irrigating land for the commercial production of livestock, pastures and crops.

As part of the regulation of irrigated agriculture within the LMRIA, irrigators and trusts would need to meet conditions of the exemption including:

- compliance with the *EPA Guidelines for Lower Murray Reclaimed Irrigation Areas* (the Guidelines), and
- the implementation of an Environmental Improvement and Management Program for a defined period of time.

Environmental Impacts

Regulation of drainage discharges further clarifies the role of irrigators and trusts within the State Government's strategic policy concerning the River Murray. EPA regulation forms part of a broader agenda to reform management practices of River Murray resources. Existing reforms have included Water Allocation Plans, deregulation of the dairy industry actions undertaken in accordance with Water Allocation Plans, dairy deregulation, COAG reforms and NAP funding for EIMPs.

Regulation of drainage discharges also formalises arrangements for environmental improvements; the exemption is viewed as the most equitable and appropriate way of ensuring compliance with each EIMP.

It should be noted that it is difficult to quantify many of the expected long-term environmental benefits of the proposal, including benefits from reducing nutrients and bacteria to the River, biodiversity values from wetlands and swamp abandonment and increased River flows. It is expected that regulation of drainage discharges will contribute to the following long-term environmental outcomes:

- More efficient water usage and monitoring
- Minimised discharge of harmful pollutants into the River
- Minimised blue green algae outbreaks
- Lowered impacts of human activity on flora and fauna
- Better quality of drinking water
- Reduced River smells
- Lowered costs to society generally resulting from greater quality of water used for recreational and consumption purposes
- Reduced expenditure on treating water, which will have flow-on reduced costs to consumers¹.

Economic Impacts

The EPA proposes to issue exemptions to individual irrigators subject to the implementation of an EIMP. The costs of preparing an initial EIMP for all relevant properties has been met via NAP funding, and drafting has been undertaken by Tonkin Consulting.

The EIMP will require land to be rehabilitated. The estimated cost to rehabilitate in order to comply with the EIMP requirements varies considerably and could be up to \$8000 per hectare. Farmers were given the opportunity to avail themselves of financial assistance provided under the NAP to exit the industry if they believed that rehabilitation of their land was uneconomic. In order to assist the remaining farmers to adjust to the new environmental requirements the State Government has offered a subsidy of \$3,135 per hectare to be matched by a contribution of \$630 per hectare from farmers to undertake rehabilitation works that will upgrade their properties and any shared infrastructure. Costs over these figures will be met by farmers. It is expected that the financial assistance will

¹ PIRSA Rural Solutions Report p64

enable the remaining farmers to establish a viable and sustainable basis for continuing to operate in the region and thereby establish a strong regional economy based on irrigated production.

Pressure on the SA dairy industry generally is likely to increase over the medium to long term, commensurate with falling milk prices and production cost increases. However, the dairy processing plants at Murray Bridge and Jervois and the milk producing region of LMRIA are independent of one another. The processing plants do not need the milk from LMRIA to continue processing. If some swamps ceased dairy production, milk would be sourced from elsewhere. Similarly, if the plants were closed down, the market demand for milk from LMRIA would not be affected².

Social Impacts

Who will be impacted?

All irrigators within the Lower Murray Reclaimed Irrigation Areas, who conduct irrigation for commercial dairying/beef production or commercial production of crops and pastures will be affected by the proposal. The 2000 *DairySA Regional Profile* conducted by Shintana concluded that the overriding factor affecting the expansion of the dairy industry in the LMRIA is the water allocations established for the Areas, and the subsequent rehabilitation package³. Shintana predicted that, "...relative to other dairy sectors, operating costs will increase in the LMRIA due to future regulatory controls and rehabilitation costs."⁴

It should be noted that the two milk processing factories in the region have undergone significant development and expansion in recent years, and would need to consider future plans for expansion in the Areas if local milk production drops significantly as a result of the rehabilitation/restructure program (including the EPA exemption). While milk can be freighted into the Areas, transport costs are higher, so that a consistent supply of high quality locally-produced milk is preferable to milk produced in other Areas.

The Shintana report found that average herd sizes in the LMRIA are lower than in other parts of SA. LMRIA has one of the highest dairy farm cash incomes in SA, partly a reflection of lower operating costs of farms in the Areas. Off-farm income was much lower in the LMRIA than in other dairy regions of SA while debt levels were much higher. All of these factors will play a role in the region's prospects for industry expansion. Notably, debt levels are a key reason why farmers do not invest in farm improvements or implement natural resource management⁵.

Some farmers may need to abandon parts of the swamp Areas as a consequence of the requirements of regional restructure, including the conditions of the EPA exemption. Factors such as environmental restrictions on drainage water, the costs of rehabilitation, and uncertainty over future milk prices may encourage irrigators to trade water rather than continue in dairying. It is estimated that this situation may apply to approximately 10 – 30% of irrigators in the Areas although it is impossible to predict the exact number of irrigators affected. The rehabilitation program will identify those properties with the highest

² PIRSA Rural Solutions p47

³ PIRSA Rural Solutions Report p40

⁴ PIRSA Rural Solutions Report p43

⁵ PIRSA Rural Solutions Report p48

costs to rehabilitate, and it is expected that at least these properties will be abandoned as financially non-viable to continue as commercial farming enterprises.

It is likely that water allocations for abandoned areas would be sold and the land used for other purposes such as recreational use, wetlands or other forms of agriculture. Long-term management of the land must be undertaken to prevent increases in salinity. Under this scenario, the Department for Water Land and Biodiversity Conservation would undertake functions relating to the management of the land through the Environmental Land Management Allocation program.

Alternatively, some irrigators may purchase neighbouring properties, enabling them to become larger, more efficient and more viable in the future (although this may increase debt levels). Due to the transferability of water, adjustments to the dairy industry in the Region are likely to occur and rehabilitation costs may fall. For example, costs of sluice and meter upgrades would fall.

Further, partial compromises may be made as a result of efficiency gains in water usage. That is, irrigators may be able to sell or lease part of their water allocations through implementing more efficient water usage systems in their farming practices. Thus, although some costs will be incurred as part of the rehabilitation package, irrigators have the opportunity for resulting economic benefits.

Mitigation

Changes of land use will be a likely outcome of the regional restructure, triggered primarily by water allocations and to a lesser extent, conditions of the proposed EIMPs. Shintana found that future development in the Areas is dependent on the expansion of irrigation onto the adjacent highland. This land consists of shallow sands over limestone and does not have a deep soil profile. Most of the highland is unsuitable for irrigated pasture production. However, the land that is currently flood-irrigated could be converted from pasture production to fodder crops, which could enable water to be diverted for use in highland irrigation. Fodder crops could be ensiled and used in feedlots established on the highland and the Mallee could supply low cost grains. Similarly, reduced environmental impacts on the Areas would provide opportunities for other industries to develop. Although such industries are in their infancy and require further investigation for this region, they may include alternative small-scale livestock cultivation (eg goats or horses), horticulture, woodlands or cropping enterprises.

Changes of land use may facilitate biodiversity or environmental management practices that are more conducive to species conservation. This may provide opportunities for the development of environment-related industries such as eco-tourism. The 2000 *draft Regional Tourism Profile - Murraylands* identifies nature-based tourism as a future opportunity for the Areas. From a survey conducted at the time, activities based around the river rated highly among tourists' responses. Tourists also expressed concerns regarding pollution of the water. Evidently water quality is considered an important facet of enjoying activities in the Areas; improved water quality thus provides an opportunity for increased recreational and tourism usage.

The Government recognises that the restructure and rehabilitation of the LMRIA will have a significant impact on irrigators' livelihoods and has proposed a number of financial assistance programs for eligible owners. These programs are coordinated by DWLBC and include:

- Farm Adjustment Program: provides credit towards rehabilitation costs to assist with restructuring.
- Exit Assistance Program: provides financial assistance to retire or sell irrigated properties.
- Farm Business Planning: provides financial support for business planning.

These programs are not part of the EPA exemption and are explained in detail in the DWLBC publication, *Guidelines on New Requirements and Public Financial Assistance in the Lower Murray Reclaimed Irrigation Areas*.

The size of the government contribution to the costs of rehabilitation will have a significant impact on the financial viability of farms post rehabilitation. Based on financial performance and associated physical structure of dairy farms in 1999-2000, only the top 20% of farms are likely to be financially viable if they were required to pay all laser levelling and annual operating costs plus 100% of the capital costs of the infrastructure. If dairy farmers were required to pay all laser levelling and annual operating costs plus 50% of the capital costs of the infrastructure, then it is likely that only the bottom 20% of the farms would not be viable. It is unlikely that the bottom 20% of farms could afford to pay more than 10% of the capital costs of the infrastructure and all laser levelling and annual operating costs⁶.

Coordination

As previously noted, EPA regulation of drainage discharges forms only one part of the entire regional restructure. Relevant government agencies have participated throughout the development of the restructure including:

PIRSA: Conducted the 2001 Options Study for regional restructure
Data collection
Provides advice and assistance on farming practices

DWLBC: Liaison between Federal and State Government on Water Allocation reforms, National Action Plan for Salinity and Water Quality.
Coordinates compensation, exit grants and Government financial assistance to irrigators.
Responsible for administration of the *River Murray Act 2003* and *Irrigation Act 1994*.
Provides information and assistance regarding irrigation and drainage management reforms.
First point of contact for all general enquiries.

Local Government: provides regionally specific advice and assistance to constituents.

SA Water: Provision of water supply infrastructure

⁶ PIRSA Rural Solutions Report p101

Preferred Option

The EPA considered numerous models for regulating drainage discharges. Initially it favoured licensing of irrigated agriculture as a prescribed activity of environmental significance, and considered four different licensing models. Initially the preferred model entailed licensing of one overarching regional body (and therefore only one licence), similar to a licensing model currently operating in New South Wales. This would have minimised the licence fee but was found to be legally unfeasible. Grouping the Areas into 27 small irrigation districts was another option but raised the equity issue of district liability for individual irrigators' actions. A third option involved individual irrigators holding a licence with no overarching regional management body. This was the most costly option for irrigators in terms of financial and human labour resources. The fourth option required all irrigators to hold a licence and accept responsibility for drainage discharges from their property.

The EPA considered exempting irrigators from the requirements of clause 13 of the Water EPP after it received legal advice in early 2004, stating that the proposed licensing regime would be inconsistent with the requirements of the EPP. As irrigators cannot currently comply with the EPP, but the total elimination of drainage discharges to the River by 2008 is a primary outcome for the rehabilitation package, a temporary exemption was the most appropriate regulatory response. The EIMP will enable irrigators to work with relevant government agencies to undertake required rehabilitation activities without risking liability for breaches of the Water EPP.

The choice of a preferred regulatory option was heavily influenced by prevailing environmental, social and economic factors specific to the region. In 2001 water trade modelling suggested that approximately 20% of the Areas is non-viable for future irrigated commercial farming activities, on the basis of planned water allocations and necessary efficiency gains as well as environmental sustainability. Consequently it was anticipated that approximately 30% of the irrigators in the Areas would exit from the Areas altogether, retire certain parts of their land from irrigated activities or trade their water allocation through an outright sale or rental agreement. In light of high feed prices, low milk prices and high water prices during 2002, the number of irrigators expected to exit from irrigated farming activities may be as high as 50% of the current number. These factors are independent of the rehabilitation process and were thus required to be taken into account in developing a regulatory model to complement the other reforms in the Areas. As a consequence of the numerous regional reforms taking place within the LMRIA, fulfilling EPA requirements was required to be a low-cost and relatively low-labour activity for irrigators. On this basis, the proposed exemption is preferred as it will achieve:

- Direct irrigator responsibility for drainage discharges
- Irrigator responsibility for making choices regarding land retirement, exiting the Areas and water allocations
- Direct irrigator involvement in broader rehabilitation decisions via a farm-specific Environmental Management and Improvement Program
- Irrigator involvement in regional decision-making, through irrigation Trusts
- Lower financial and labour costs to implement conditions of EIMP.

APPENDIX ONE: PRECIS OF WRITTEN RESPONSES TO DISCUSSION PAPER FOR THE OPTIONS FOR MANAGEMENT OF IRRIGATION PRACTICES IN THE LOWER MURRAY

Precis of Written Responses

- Concerns over the public health implications of using downstream water discharges from the swamp Areas. Including the off-take for the Murray Bridge to Onkaparinga pipeline, which is a major supply to metropolitan Adelaide, and off-takes for a number of rural communities.
- SA Water would prefer to see no discharges from the LMRIA, accept it is an unlikely outcome and next best thing is to control the water quality discharged via licensing.
- Effectiveness of licensing will depend upon the parameters set for any discharge.
- Concern with public health risk associated with discharge of *Giardia* and *Cryptosporidium* from run-off.
- Volume of any tail water system should account for a 1 in 10-year rain event.
- Discharge of drainage water to the highland Areas should occur throughout the year.
- Monitoring for Enteric Protozoa should occur on an event basis.
- Monitoring should continue after implementation to elucidate improvements.
- EPA and DWR requirements should overlap, thereby relying on the delivery of one condition on another.
- Upstream users (both within and outside Lower Murray boundaries) contribute to decreasing water quality.
- Equity issues need to be resolved, especially relating to cost impositions
- Prevention of pollution rather than treatment
- Development of a Code of Practice will minimise pollutants discharged but also contribute to improved public opinion of the industry.
- Sliding scale licence fee by linking the Code of Practice, thereby promoting improvements.
- Code of Practice required to be continuously reviewed over time.
- Installation of tail drains results in loss of significant land for pasture.
- Management structure should be in place before implementation of a licence.
- Single licence may result in apathy from irrigators to comply.
- Monitoring needs to be cost effective and equitable.
- Link monitoring programs to Quality Assurance Programs.
- EPA must police the compliance of irrigators.
- Education programs developed and implemented for irrigators.
- 10 year licences to add security to the value of the properties.
- Enterococci should be monitored for as there is an excellent correlation with pathogens in surface, sub-surface and main channel River Murray water.
- Carp contribute to the nutrient status of the River Murray.
- Flood events should be considered.
- Ongoing licence and monitoring costs are a concern.
- Risks associated with non-human sources need to be quantified.
- Significant numbers of pathogens have been detected in sub-surface run-off.
- Consideration of total daily maximum limits (TDML) to select appropriate indicators and target values to comply with recreational guidelines.
- Monitoring for pesticides and nutrients should take place.
- As a minimum, 20% of all monitoring should incorporate events such as irrigation and flood events.

- Major contributor to pollution is sub-surface movement.
- The effect of suspended silt and sludge on loads discharged should be determined.
- Dairy shed effluent movement should be incorporated into monitoring programs.
- *Campylobacter* should be the pathogen monitored.
- Irrigators and the community recognise their responsibility to ensure river health.
- DWR licences stipulate that drainage water be returned to the river.
- Irrigators should not be the sole recipients of blame.
- Lower Murray Irrigators contribute only 2.7% on average (and up to 12% in drought years) of the total nutrient load to the river.
- Uncertain on environmental and economic impacts.
- Non-irrigation impacts on the river.
- Whole of river monitoring scheme needs to be developed and implemented by the government.
- Independent verification of the licensing, monitoring and code of practice components should occur on a regular basis.
- Licence fee needs to allow for incentives to improve.
- Definition of the Scheduled Activity must be resolved.
- Clear standards and targets must be specified
- EIP's should reflect the staged approach to rehabilitation.
- Entity that holds water licence should hold drainage licence.
- Workshops for irrigators should be a part of the process.
- Code of Practice should be straightforward in easy to read language.
- Monitoring needs to be effective, not just for monitoring sake.
- Promotion of the irrigators achievements in improving on-farm management.