EPA Guidelines for

Lower Murray Reclaimed Irrigation Areas

Government of South Australia

EPA South Australia

WATER

EPA Guidelines for Lower Murray Reclaimed Irrigation Areas

Cover graphics: Cultivate Design

Photographs: (main) Dept for Water, Land and Biodiversity Conservation
(nos. 1, 2 & 4) Tonkin Consulting; (no.3) Lower Murray Irrigation
(no. 5) EPA

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ISBN 1 876562 59 5

October 2003

Printed on recycled paper

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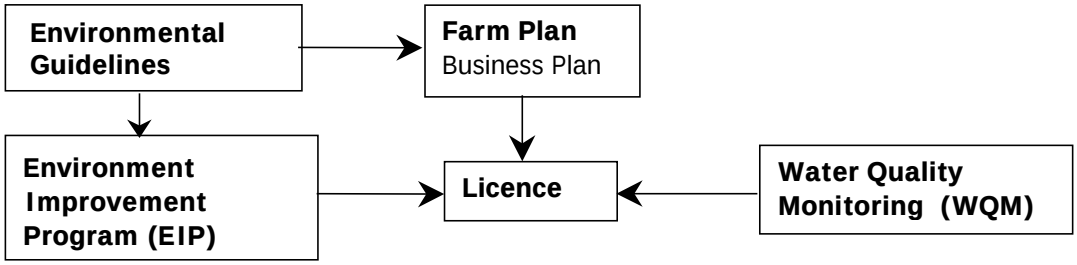
Introduction

Drainage discharges from irrigated farm enterprises in the Lower Murray Reclaimed Irrigation Area (LMRIA) can impact on the River Murray. They contain elevated levels of nutrients, particularly nitrogen and phosphorus, and high levels of *E. coli*, which are biological indicators of bacteria that can be harmful to humans. During times of low river flow these discharges contribute a significant proportion of the total pollution load in the river. As water quality deteriorates in the river the risk of blue-green algae growth and bacterial contamination of our domestic water supply increases.

These environmental guidelines have been produced to help irrigators meet their environmental duty of care (section 25 of the *Environment Protection Act 1993*) by managing their farm enterprises responsibly and minimising the impacts of their activity on the river. The *Environment Protection (Water Quality) Policy 2003* outlines how these specific guidelines should be developed and used to help irrigators meet their environmental duty of care.



The environmental guidelines list four types of best management practices illustrated with examples of reducing impacts on the river, whether from dairying, or other livestock or cropping enterprises. Not all key practices will apply to each farm, and other practices may be applicable or are still to be developed. Each irrigator will need to assess the pollution risk potential of all farm activities and identify the practices that will reduce or minimise their risks and meet the objectives and targets of the environmental guidelines. These practices will be inserted into an irrigator's Environment Improvement Program (EIP) as part of their licence.

Water management

Use best available management practices to:

- optimise the volume of water applied
- minimise the volume of drainage water generated

while meeting the water requirements of the crop and not exceeding the property's water allocation.

Target: To achieve at least a 65% water application efficiency on each farm.

Why: Surface irrigation drainage water contains relatively high levels of nutrients and bacteria. Inefficient irrigation generates large volumes of drainage water which, if disposed of to the river, has environmental impacts and degrades river water quality.

Key water management practices

Water delivery

- Provide a uniform paddock surface of suitable slope to significantly improve water application efficiency, and reduce runoff and environmental contamination (laser levelling).
- Clean and maintain side drains to improve drainage flow.
- Re-form side banks to prevent surface water entering the side drain.

Irrigation scheduling

- Apply the correct flow rate and volume of water at the appropriate intervals to match the crop's water requirements.
- Turn off water in time to minimise the volume of drainage generated, particularly after fertilising (even 15 minutes can make a large difference with the high flow rates of the LMRIA).
- Use an evaporation gauge, or similar device, to schedule irrigation to best meet the crop's demand for water.

Irrigation management

- Water individual bays rather than many bays at one time.
- Delay irrigation after grazing to allow sunlight to disinfect effluent and kill bacteria, and reduce the potential for manure to 'wash off' the paddock.
- Maintain irrigation infrastructure, particularly keeping drains and channels free of weeds and obstructions to flow.
- Fence off infrastructure, including channels, drains and storage areas, to prevent damage by stock.

Drainage recovery and reuse

- Capture tailwater runoff and/or main salt drain water for reuse within swamp or highland areas.
- Maximise the land area used to irrigate with recycled drainage water.

- Monitor salinity levels to determine if shandying with river water is required before reusing.
- Reuse drainage water as soon as possible to maximise storage capacity of runoff and minimise seepage losses.
- Maintain the reuse system regularly to ensure reliable operation.

Land management

Use best available management practices to optimise the crop uptake of nutrients being applied to paddocks, and reduce or minimise nutrients and chemicals contaminating the drainage system from any source on the farm.

Target: To minimise nutrients leaving the farm in drainage, reduce or minimise the risk of any chemical runoff or contamination, and maximise plant uptake.

Why: Irrigation runoff generated after applying fertiliser, and to a lesser extent grazing, can account for a significant proportion of the total nutrient load being discharged into the river which, in turn, increases the risk of blue-green algae growth. Other sources of nutrients and chemicals, including leakage from silage pits, chemical storage and mixing areas, and farm dumps, can also contribute significant pollution to the river.

Key land management practices

- Match fertiliser application with crop demand and herd requirements (e.g. use a balance sheet approach).
- Leave an unfertilised zone or 'buffer strip' at the drain end of the bay (to reduce the quantity of nutrient in the irrigation runoff).
- Time irrigation to avoid surface runoff immediately after fertiliser application.
- Apply fertiliser in smaller amounts more often to match plant use and minimise leaching.
- Use grazing management strategies to optimise the growth of the pasture, and maximise plant water use and nutrient uptake.
- Protect land not suited to grazing by fencing off riparian zones, native vegetation areas and salt affected areas.
- Do not construct silage pits or bunkers on the floodplain (swamp) or within 100 m of the river to prevent leakage into drains and channels.
- Do not bury carcasses within the floodplain or within 100 m of the river to prevent contamination of the groundwater.
- Plant buffer strips around and/or between laneways, walkways, channels and roads to minimise contamination of runoff and the receiving environment.
- Prevent runoff and leaching from farm dumps and chemical (including fuel) storage and mixing/use areas by adhering to legislative guidelines (e.g. use bunds or banks to confine runoff in case of accidental spillage, dispose of containers appropriately and do not dispose of chemical or fuel containers in farm dumps).

Effluent management

Use best available management practices to minimise the effluent generated and prevent contamination of the drainage system. Where possible, use all effluent on-farm.

Target: To adhere to the *Code of Practice for Milking Shed Effluent 2003* and the *Environment Protection (Water Quality) Policy 2003*.

Why: Effluent from dairy surrounds, hard standing areas and laneways is a significant potential pollution source containing high levels of nutrients and bacteria that may find their way to the river, particularly during wet years, and increase the risk of bacterial contamination of our domestic water supply. Manure from other livestock types could also contaminate the drainage system and the River Murray.

Key land management practices

- Follow the requirements of the Environment Protection (Water Quality) Policy 2003.
- Use manure and effluent to build up highland soils rather than on the flood irrigated area.
- Do not apply manure or effluent on the flood irrigated area and within 50 m of drains or channels.
- Use banks and/or cut-off drains to prevent manure entering drains or channels.
- Adhere to local council requirements for scraping manure from public roadways and disposing/using appropriately.
- Regularly scrape stock access areas (e.g. laneways, yards, watering points, other gathering areas) to prevent build up of manure and use/dispose of appropriately.
- Do not use manure from calf rearing sheds/areas on the flood irrigated area (use only on highland soils and remove regularly).
- Do not allow runoff from calf rearing sheds/areas to enter the drainage system (such areas located near drains or channels must have cut-off banks or bunds to prevent runoff from entering drains and channels).
- Use bunding/contouring bridges and paddocks to divert contaminated stormwater runoff from entering drainage channels.

Monitoring and reporting

Keep accurate records of water, land and effluent management practices as required for compliance with these environmental guidelines.

Target: To ensure all irrigators adequately report their compliance with the guidelines.

Why: Adequate monitoring and reporting will ensure that all irrigators are treated equally and fairly in meeting the requirements of the guidelines, and that impacts are reduced.

Key monitoring and reporting practices

- Develop an EIP that specifies best management practices to be implemented on each farm over a specific timeframe.
- Use a simple self assessment annual reporting procedure (prepared by EPA for irrigator use; possibly a 'tick a box' checklist).
- Use a farm management record folder that can be easily updated.

Further information

For more information on specific best management practices refer to the *Guidelines for Management of the LMRIA* (available from the LMI office), the EPA *Code of Practice for Milking Shed Effluent 2003* and the *Environment Protection (Water Quality) Policy 2003* (available from the EPA web site—*www.epa.sa.gov.au*—or telephone (08) 8204 2004).

Familiarise yourself with the following existing requirements and follow them:

- *Manual for spreading nutrient rich waste on agricultural land* (available from PIRSA on CD-ROM only—Freecall 1800 652 483)
- Farm chemical users course and legislative requirements—call the PIRSA Rural Chemicals Program: (08) 8226 0549 for details
- *Occupational Health, Safety and Welfare Act 1986 (SA)* and its requirements—available from *www.workcover.com*, or call 13 18 55
- development regulations on earthworks, dam construction, dredging and building work—contact your local council
- EPA Guideline *Wastewater Lagoon Construction*, September 2002—available from *www.epa.sa.gov.au*, or call (08) 8204 2004
- *Environment Protection Act 1993* requirements such as section 25, General Environmental Duty of Care.

Copies of legislation are available from *www.parliament.sa.gov.au*, or call the Government Information Centre—13 23 24.