

ELMA issues and options

Discussion Paper 2. Longer-term concepts

Purpose of this paper

The purpose of this paper is to identify the issues related to Environmental Land Management Allocations (ELMA) and explore options to improve land management outcomes in the Lower Murray Reclaimed Irrigation Area (LMRIA).

This paper explores issues and presents some longer-term options for consideration. A separate discussion paper focuses on issues and options that can be managed in a shorter time frame through amendments to the River Murray WAP (see Discussion Paper 1 – amendments to the 2019 WAP). Feedback on other options/ideas to improve the use of ELMA is encouraged. Suggestions raised during consultation will be collated and put forward to the relevant board/agency/council/trusts for their consideration.

All documents related to the review can be found here www.naturalresources.sa.gov.au/elmareview.

This paper focuses on policy responses to issues related to:

- access to ELMA during dry conditions; and
- the availability of ELMA

The review will not include changes to the total volume of water set aside for environmental land management purposes in the Lower Murray (22.2 GL)

Principles to guide development of policy options

The following principles will guide policy responses aimed to improve management of ELMA allocations. Proposed policies should:

- be consistent with the objectives for ELMA that are included in the River Murray WAP
- avoid or minimize adverse impacts to businesses, the community, other water users and the environment
- manage the environmental condition of the LMRIA to protect and look after Ngarrindjeri cultural heritage
- contribute to the productive capacity of the LMRIA area for current and future generations
- protect existing productive uses in the LMRIA and promote future productive land use
- be equitable
- be based on the best available information
- be consistent with the NRM Act

Objectives for ELMA in the WAP

The objectives for ELMA as set out in the WAP are as follows:

- a) Contribute to the protection of environmental land and infrastructure of the LMRIA, including by:
 - i. reducing soil salinization as a result of saline groundwater discharge
 - ii. minimising oxidation of acid sulfate soils, and
 - iii. minimising cracking and movement of soils.

It is important that any proposed policy options contribute to the WAP objectives related to ELMA.

The River Murray WAP is a rulebook that guides the taking and use of water from the River Murray. It sets out objectives for managing the river and the principles (the rules) for how to do this. Principles can apply across the entire river or can be tailored to suit unique areas such as the LMRIA.

The River Murray WAP sets aside 22.2 million shares (equivalent to 22.2 gigalitres of water under normal water availability conditions) for ELMA. ELMA is exempt from the natural resources management (NRM) water levy (an administrative fee upon application). ELMA is specifically for use within the LMRIA, the entitlements and allocations are non-tradeable, not eligible for carryover, and expire and revert to the Minister for Environment and Water upon the sale of land. ELMA provides maximum benefit when applied in full every year.



Issues – water access and availability

Land within the LMRIA is particularly at risk of cracking, salinisation and exposure of acid sulfate soils if water is not regularly applied to land during drought. These adverse impacts are different to what is experienced along other parts of the River Murray under the same conditions because of the unique characteristics of the soil and its vulnerability when river levels are low.

This vulnerability was demonstrated most recently during the Millennium drought when a long period of low water availability across the Murray-Darling Basin resulted in river levels in the Lower Murray dropping to as low as -0.9 m AHD (Golder Associates 2011) and a lowering of the watertable (1.5 m to 3 m below usual pre-drought depths).

Water taking infrastructure could not access water at these very low river levels. The combination of low water application and low groundwater levels (watertable) led to severe soil cracking (in some places cracks were up to 4 m in depth) (Golder Associates 2011), subsidence (sinking) of the land surface by an average of 0.17 m and up to 0.6 m at some sites (Mosley et al 2017b), exposure of around 3,300 ha of acid sulfate soils (EPA 2013), and soil salinisation.



Figure 1: Soil cracking within a LMRIA levee bank



Figure 2: Acid drainage within the LMIRA

Many of the environmental management and infrastructure improvements made in the LMRIA were lost as a result of damage to public and private infrastructure. This damage included:

- out of level channels impeding flow
- sunken or subsided inlets
- leaking paddock and river inlets due to cracking and sinking
- severe cracking of soils in paddocks
- out of level paddocks, and
- river inlets which are unserviceable due to damage (Philcox and Scown 2013).

These impacts caused substantial adverse socio-economic effects as many irrigators ceased or down-scaled their operations and approximately a quarter (1000 ha) of remaining farming land was taken out of production. The farms that continued to operate post drought were left with the challenge and cost of remediating their land to enable productive farming to resume. While Commonwealth investment in irrigation efficiency has supported repairs to approximately 50% of the irrigation bays across the LMRIA (Mosley et al 2016), many of the problems that arose through drought have left a continuing legacy across the landscape (Mosley et al 2017, DEWNR 2017).

To minimise risks associated with future dry conditions, there are two issues that need to be considered:

- access to water during dry conditions (i.e. when river levels are low), and
- availability of ELMA.



Issue

Access to ELMA during low water availability

There are 89 irrigation siphons or sluices that supply water to farms in the LMRIA. This infrastructure can only operate when river levels are above a certain height to provide the hydraulic head needed to achieve suitable flow through the infrastructure.

A recent review of LMRIA irrigation infrastructure in the area by the University of Adelaide showed that the operation of infrastructure becomes affected when water levels fall below 0.5 m AHD between Mannum and Wellington. More than 95% of irrigation infrastructure in the LMRIA can be operated efficiently at water levels of 0.5 m AHD, but approximately 80% of irrigators will be negatively impacted and need to use alternative irrigation strategies if water levels fall to 0 m AHD (Mosley et al 2017b).

While recovery of water for the environment will help protect the Lower Murray against low water levels, it will not eliminate all risk. Modelling undertaken for the Basin Plan shows that water levels may still fall below 0.5 m AHD in the Lower Murray approximately 8% of the time in the future.

Concepts outside of the River Murray WAP to improve access at low water levels

The River Murray WAP cannot improve access to water due to low water levels. This is beyond the scope of the River Murray WAP. The Department for Environment and Water (DEW) is investigating how to keep river levels as high as possible to protect the environmental assets of the Lower Lakes, through **negotiations** with the Commonwealth Environmental Water Holder (CEWH). In addition, the DEW has developed a **Barrage and Water Level Management Policy** that aims to maintain water levels below Lock 1 above 0.5 m AHD.

There may also be **funding opportunities for infrastructure upgrades** available to licensees through the Murray-Darling Basin Water Efficiency Program (WEP). This program requires entitlement (not including ELMA) to be returned to the CEWH to be eligible for funding. Other funding opportunities will continue to be explored by the DEW.

If you have suggestions to improve access to water when water levels are low that are different to those ideas presented above then the Board would like to hear from you.



Issue

Water availability

The most recent scientific work indicates that a minimum of three irrigations of one megalitre per hectare per year (i.e. 3 ML/ha/yr) would significantly reduce the risk of soil cracking and oxidation of acid sulfate soils under dry conditions (Mosley et al 2016). This level of irrigation would also have a positive effect on reducing soil salinity. It should be noted that to support pasture/crop growth, additional water was required to supplement this volume.

Under the current River Murray WAP, ELMA entitlements are given the same reliability as that of Class 3 in the All Purpose Consumptive Pool (irrigation entitlements). This means that when there is low water availability (i.e. not enough water to provide all entitlement holders with 100% allocations), ELMA entitlements are reduced at the same rate as Class 3 entitlements (e.g. if Class 3 entitlements are on 50%, ELMA entitlements are also on 50%).

Feedback on the water allocation framework through consultation on the draft River Murray WAP indicated that equity between Class 3 and ELMA entitlements was important. Ensuring equal reliability of ELMA entitlements also recognises that allocating 100% to ELMA when it isn't all being used could impact on allocations for other water users.

A science review undertaken by the EPA (2013) reported multiple lines of evidence (modelling, monitoring, and farm observations) that suggested the use of ELMA could prevent, or greatly lessen the severity and impacts of soil drying, cracking and acidification. Preliminary modelling suggested if ELMA was applied during the Millennium drought, it may have prevented acidification and risks to SA Water drinking water offtakes and the environment.

If conditions become dry in future years, water allocation and availability could be problematic if there isn't enough water to manage soil salinity and acid sulfate soils.

Concepts outside of the River Murray WAP to improve water availability

The Board has heard that water availability during dry times is an issue and are keen to further explore various concepts. At this stage there is no clear option to address the issue of water availability in dry times within our current (legislative and policy) settings.

The Board recognises the science review findings that a minimum of three irrigations of one megalitre per hectare per year would significantly reduce the risk of soil cracking and oxidation of acid sulfate soils under dry conditions (Mosley et al 2016) and would have a positive effect on reducing soil salinity.

The Board is seeking your input into possible solutions. Any longer-term solutions need to align with the guiding principles set out above.



Have your say

The Board are looking at ways to help and would like to hear any suggestions you might have on how these issues could be addressed to improve the land management outcomes of ELMA in the LMRIA. See below for how you can make a submission to the Board or find out more information.

Information pack

A series of papers have been prepared in relation to the ELMA review, these include:

- ELMA Review Scope and Background Information
- Discussion Paper 1. Issues and options – amendments to the 2019 WAP
- Discussion Paper 2. Issues and options – longer-term concepts (this paper)
- ELMA submissions/feedback form

References

DEWNR (2017), Survey of Environmental Land Management Allocation entitlement holders, Department of Environment, Water and Natural Resources, August 2017 (unpublished)

EPA (2013), *Use of ELMA to prevent future soil cracking and acidification in the LMRIA*, Environment Protection Authority, South Australia. Briefing to River Murray Advisory Committee, 20 August 2013.

Golder Associates (2011), *Lower Murray Levee Banks Condition Assessment and Remediation Options*, Golder Associates for the Department for Water, 2011.

Mosley L.M., Cook F.J., Fitzpatrick R.W. (2016), *Sustaining irrigation and soil conditions under changing land use and climate in the Lower Murray Reclaimed Irrigation Area. South Australian River Murray Sustainability Program*, Final Report to Primary Industries and Regions South Australia, The University of Adelaide, January 2017.

Mosley L.M., Carmichael N.J., and Hamilton B. (2017b). *Critical water levels for operation of irrigation infrastructure in the Lower Murray Reclaimed Irrigation Area (LMRIA)*. Report to the Department of Environment, Water and Natural Resources. The University of Adelaide, May 2017.

Philcox, M. and Scown, S (2012,) *LMRIA Sustainable Soils Project – Summary of Current Practices*, prepared by MDB Consulting and sCOWn Consulting for Dairy SA ,2013



For more information

ELMA review information can be found here:

www.naturalresources.sa.gov.au/elmareview

To provide feedback:

Via mail:

Natural Resources SA Murray-Darling Basin
Upper Level, Cnr Mann & Walker Street
Mount Barker 5251

E: rmwap.feedback@sa.gov.au

Or complete an online feedback form:

www.naturalresources.sa.gov.au/elmareview

The closing date for submissions is 27 November 2019.

Or please contact:

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For information related to water licensing please contact:

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Natural Resources Centre

Licences and Permits

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www.environment.sa.gov.au/licences-andpermits/water-licence-and-permit-forms

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