

MDBA ANALYSIS OF THE FLEXIBLE RATES OF FALL IN RIVER LEVELS DOWNSTREAM OF HUME DAM – THE SIX INCH RULE

BUSINESS CASE

PROPONENT: VICTORIA/NSW

The MDBA's advice covers the following criteria in the Basin Officials Committee agreed *Phase 2 Assessment Guidelines for Supply and Constraint Measure Business Cases* (the Guidelines reference shown in brackets):

- Eligibility (3.1)
- Ecological values of the site (4.2)
- Ecological objectives and targets (4.3)
- Anticipated ecological outcomes (4.4)
- Hydrology of the area and environmental water requirements (4.5)
- Operating regime (4.6)
- Assessment of risks and impacts of the operation of the measure (4.7)
- Complementary actions and interdependencies (4.9)
- Project governance and project management arrangements - legal and regulatory requirements (4.11.2)

Key points/summary

- The proposal meets the Basin Plan supply measure definition, noting comments below.
- A BOC endorsed trial of the proposed rule changes is being undertaken in 2014-15 and 2015-16. It is unclear from the business case whether the proponents intend to refine the proposal based on the outcomes of the trial currently underway. The MDBA suggests that a summary report setting out early findings from the trial should be provided to the SDLAAC, and considered by the proponents to potentially refine the proposal.
- The business case indicates that current operational rules may be overly conservative and additional loss savings may be possible with more operational flexibility. However, the proponents' modelling of the project may produce an over-estimate of on-ground outcomes as the benchmark model does not represent contemporary use of environmental water in Lake Mulwala.
- Anticipated ecological benefits are presented in terms of changes to SFI frequency (including with reference to the limits of change) and maximum dry spell, however, there is no discussion of the significance of these changes nor is information provided to put these results into context for the modelled scenario.

- Potential adverse ecological impacts are described in terms of changes to SFIs. Impacts on other parts of the flow regime are not comprehensively assessed, and the proponents should clarify whether any analysis of baseflow shortfall volumes has been undertaken.

1. Eligibility (3.1)

The proposal meets the requirements under the Guidelines for further assessment and consideration in the SDL adjustment mechanism.

1.1 Supply measure requirements (3.1.1)

The proposal would meet the definition of a supply measure under the Basin Plan (cl.7.03 and cl.7.15) to:

- operate to increase the quantity of water available to be taken in a set of surface water SDL resource units compared with the quantity available under the benchmark conditions of development; and
- achieve equivalent environmental outcomes with a lower volume of held environmental water than would otherwise be required.

The business case further states that there will be ‘negligible impact on the total volume available for entitlement reliability and the quality and quantity of flows to South Australia.’

This statement appears to support cl.7.15(1)d to ensure the measure has ‘no detrimental impacts on reliability of supply of water to holders of water access rights that are not offset or negated’ but this should be clarified by the proponents. A final determination of impacts on reliability is made by States, based on MDBA modelling.

1.2 Measures not included in the benchmark conditions of development (3.1.2)

The MDBA confirms that the measure was not in the benchmark conditions of development (cl.7.02 of the Basin Plan).

2. Ecological values of the site (4.2)

The description of the site’s ecological values in the business case is generally consistent with the assessment criteria in the Guidelines.

A relatively limited description of the ecological values of the six key environmental assets in the Murray system affected by the proposal (e.g. Barmah-Millewa, Hattah, etc.) has been provided. As this is a rule change rather than a works proposal, this level of detail is considered adequate. It is noted that the important values of the sites are well known and have been extensively described in readily available documents (e.g. Environmental Water Management Plans for Living Murray Icon Sites, assessment of environmental water requirements for the proposed Basin Plan).

3. Ecological objectives and targets (4.3)

Generally the business case meets ecological objective and target assessment criteria.

Ecological objectives and targets are not specified in the proposal. Instead, Site-specific Flow Indicators (SFIs) from Basin Plan modelling are used as targets to measure the effectiveness of the

proposal. Given the SFIs were developed to support ecological objectives and targets specified by the MDBA, there is an implicit and reasonable assumption in the proposal that those objectives and targets remain valid.

4. Anticipated ecological outcomes (4.4)

4.1 Anticipated ecological benefits (4.4.1)

The anticipated ecological benefits are presented in terms of changes to SFI frequency (including with reference to the limits of change) and maximum dry spell. However, there is no discussion of the significance of these changes in the business case. It is suggested that such discussion, including a reference to the modelled reduction in operational losses represented by this scenario, is provided by the proponents.

The business case shows marginal improvements in four of the SFIs. Flow and salinity limits of change indicators for the Coorong, Lower Lakes and Murray Mouth indicators remain largely unchanged other than one which decreases slightly (one per cent of year's reduction in mouth openness indicator). The SFI Limits of Change are satisfied (i.e. not breached) by the proposal. Maximum dry spell stays the same across the Murray system except for one SFI in the reach containing Barmah-Millewa Forest where maximum dry spell improves by two years.

The minor improvements in SFIs are matched by relatively minor improvements in unseasonal flooding. The business case shows a modelled six per cent reduction in unseasonal flooding events (≥ 4 days with flows above 10,600 ML/d at Yarrawonga Weir between the months January and May) down from 72 to 68 events.

The modelled potential benefits are likely to be an overestimate of actual on-ground outcomes. As identified by the proponents in response to a South Australian query, the River Murray System River Operations Specific Outcomes and Objectives document was amended to reflect the rules of the trial implementation of this proposal. This effectively means that the trial implementation rule changes, which form the basis of this proposal, are already embedded within operational rules. In addition the business case notes that River Murray Operations has taken steps over the past five years to minimise the frequency and severity of unseasonal high flow events by anticipating rain rejection events in advance of any reduction in demand, holding Lake Mulwala slightly lower to create airspace to capture excess flows. These changes are presumably not reflected in the model and therefore the practical effect of the rule change may be even less than the modest modelled effect.

4.2 Potential adverse ecological impacts (4.4.2)

The potential adverse ecological impacts are described in terms of changes to SFIs. None of the SFI metrics decline under the proposal. There may be some negative impacts on baseflow/freshes which will need to be managed however impacts on the flow regime other than SFIs are not explicitly assessed.

The rule changes are proposed to affect flows between January and May and it appears likely this will reduce in-channel flows. The proponent should present a preliminary analysis of all limits of change and in-channel flows (baseflows and freshes) which shows any reduction in outcomes achieved in the benchmark run.

An Earth Tech 2008 report on the proposal notes that whilst proposed changes have been developed to minimise the risk of bank erosion, there is an increased risk of bank failure due to drawdown with monitoring required. The trial of the rule changes being undertaken in 2014-15 and 2015-16 is intended to determine if bank failure and other erosional processes pose a significant risk, and therefore if amendments are required to the proposed rules. This uncertainty makes it difficult to provide an assessment of potential adverse ecological impacts of the proposal and preliminary results from the first trial would assist in this (see further discussion on the trial below).

5. Hydrology of the area and environmental water requirements (4.5)

5.1 Current hydrology and proposed changes to the hydrology (4.5.1)

The business case shows that the proposed rule change can lead to less unseasonal flooding to Barmah-Millewa Forest and some improvements to Basin Plan flow indicators without affecting third parties for example through flows to South Australia. The assessment appears adequate.

5.2 Environmental water requirements (4.5.2)

The environmental water requirements (SFIs) developed by the MDBA to inform the Basin Plan are used as the basis of the proposal. The SFIs are supported by scientific evidence and are linked to the ecological values, objectives and targets of the sites. The business case indicates that the rule changes would apply in the months of unseasonal flooding, January to May. Evidence within multiple reports (e.g. Barmah-Millewa Forest Icon Site Environmental Management Plan 2006-07, Chong and Ladson 2003, DSE Victoria 2003 and the CSIRO Sustainable Yields report (2008) describe the unseasonal flooding period as between mid-December and April, with a substantial reduction in flooding as a result of regulation occurring in May. The proponents should provide further justification for selecting the January to May period to apply the rule changes, and give some indication of how the outcomes of the proposal would change if the application period was December-April.

6. Operating regime (4.6)

A trial of the rule changes is being undertaken in 2014-15 and 2015-16. It is unclear from the business case whether the proponents intend to refine the proposal based on the outcomes of the trial currently underway (endorsed by BOC). It is therefore difficult to accurately assess the suitability of the operating regime. In response to a query from South Australia the proponents noted that the proposal can be further refined upon completion of the trial implementation when outcomes are more clearly understood. However, this is not formally a part of the proposal and it is unclear when such a refinement to the proposal is intended, or whether there will be sufficient time to amend the proposal before supply measures are assessed for an SDL adjustment. The MDBA suggests that a summary report setting out early findings from the trial should be provided to the SDLAAC, and potentially considered by the proponents to potentially refine the proposal.

The MDBA River Management Division has previously indicated a willingness to prepare a report on interim findings from the two year trial currently underway (2014-15 and 2015-16) in a manner and timeframe that would assist the SDL process. The report could include, for instance, an indication of any likely refinements to the proposed rule based on learnings from the trial thus far, and the details

of potential future refinements. For example, the proposed average loss calculated over four days may be conservative based upon early trial results which suggest an averaged loss over six days could potentially produce a higher supply contribution.

It is noted that the business case supporting document from Jacobs (2015) is internally inconsistent with regard to the time period over which the rule is applied. For instance, on p.22 it is stated that relaxation of the six inch rule would occur at all times of the year, whereas in other places, such as p. 38, it is stated that Scenario 1 was modelled as per the Earth Tech (2007) proposed changes which restrict the application period to January through May.

7. Assessment of risks and impacts of the operation of the measure (4.7)

The business proposal has addressed risks associated with salinity at Lake Alexandrina, Coorong and the Barrages. Risks to water quality degradation have been identified and the modelling of the River Murray system with the proposed changes has indicated that the likelihood of increased risks of the supply measure to water quality are not significant. However, the proposal also indicates that this assessment is only preliminary and that a final assessment by the MDBA is required to ascertain the full extent of salinity risk. The risk management strategy complies with the AS/NZS ISO 31000:2009.

8. Complementary actions and interdependencies (4.9)

The business case notes clear interactions between this proposal and the Hume Dam Airspace proposal however the project is not dependent on the airspace proposal.

The business case also notes that there is little interaction between the proposed rule change and the proposal in the Constraints Management Strategy to increase maximum channel capacity downstream of Hume Dam from its current limit of 26,000 ML/day to close to 40,000 ML/day.

As acknowledged by the proponent, it is expected that all likely linkages and interdependencies for this measure and its associated SDL resource unit, including any constraints measures, will become better understood as the full adjustment package is modelled by the MDBA.

9. Project governance and project management arrangements (4.11)

9.1 Legal and regulatory requirements (4.11.2)

The proposal does not appear to impact any transitional or interim plans. However, if any actions in the project result in an amendment to a transitional or interim water resource plan we would expect that the Basin State would seek accreditation of any such amendment in the normal way.