



Published by Murray-Darling Basin Commission  
Postal Address GPO Box 109, Canberra ACT 2601  
Office location Level 4, 51 Allara St, Canberra City  
Australian Capital Territory

Telephone (02) 6279 0100 international + 61 2 6279 0100  
Facsimile (02) 6248 8053 international + 61 2 6248 8053  
E-Mail [info@mdbc.gov.au](mailto:info@mdbc.gov.au)  
Internet <http://www.mdbc.gov.au>

For further information contact the Murray-Darling Basin Commission office on  
(02) 6279 0100

This report may be cited as: *Guidelines for water recovery in the Living Murray*

MDBC Publication No. 34/08

ISBN 978 1 921257 74 2

© Copyright Murray-Darling Basin Commission 2008

This work is copyright. Graphical and textual information in the work (with the exception of photographs and the MDBC logo) may be stored, retrieved and reproduced in whole or in part, provided the information is not sold or used for commercial benefit and its source (*Guidelines for water recovery in the Living Murray*) is acknowledged. Such reproduction includes fair dealing for the purpose of private study, research, criticism or review as permitted under the Copyright Act 1968. Reproduction for other purposes is prohibited without prior permission of the Murray-Darling Basin Commission or the individual photographers and artists with whom copyright applies.

To the extent permitted by law, the copyright holders (including its employees and consultants) exclude all liability to any person for any consequences, including but not limited to all losses, damages, costs, expenses and any other compensation, arising directly or indirectly from using this report (in part or in whole) and any information or material contained in it.

Front cover image credit: Brayden Dykes

## Table of contents

1	Introduction.....	1
1.1	Framework of the Living Murray, and purposes of these guidelines.....	1
1.2	Steps to progress a water recovery measure .....	1
2	Guidelines relating to the Developmental Register.....	2
2.1	Introduction .....	2
2.2	Guidelines for applications to list on the Developmental Register .....	3
3	Guidelines relating to the Eligible Measures Register .....	11
3.1	Introduction .....	11
3.2	Design and consultation .....	13
3.3	Guidelines for applications to list on the Eligible Measures Register.....	13
4	Guidelines relating to the Environmental Water Register .....	25
4.1	Introduction .....	25
4.2	Process for accreditation and listing on the Environmental Water Register.....	25
4.3	Guidelines for the post-implementation review and final accreditation .....	27
4.4	Guidelines for additional information required for listing on the Environmental Water Register.....	31
	Glossary of terms .....	35
	Appendix 1 – Sample table of contents of a feasibility study .....	39
	Appendix 2 – Application form for listing on the Developmental Register.....	40
	Appendix 3 – Application form for listing on the Eligible Measures Register .....	47
	Appendix 4 – Application form for listing on the Environmental Water Register .....	57
	Appendix 5 – Further detail relating to cost calculations.....	62
	Appendix 6 – Procedure for interim listings on the Environmental Water Register...	65

## 1 Introduction

### 1.1 Framework of the Living Murray, and purposes of these guidelines

The Intergovernmental Agreement 2004<sup>1</sup> and the Living Murray Business Plan<sup>2</sup> ('the Business Plan') provide the framework of the Living Murray Initiative. This framework includes governments working with the community to recover water access entitlements that can be managed to achieve specific ecological outcomes<sup>3</sup>. The recovered water entitlement will be managed in accordance with the Living Murray Environmental Watering Plan, and sourced through the implementation of infrastructure improvement projects, on-farm projects, market based measures, and other projects<sup>4</sup>. This framework for the Living Murray Initiative includes proponents being able to apply to have water recovery measures listed on a central register<sup>5</sup> at stages of the development and implementation of the project<sup>6</sup>. Due to the nature of the projects, the proponents in most cases will be jurisdictions. However, this will not be always be the case<sup>7</sup>.

In the context of this framework, the purposes of these guidelines are:

- to provide greater clarity on the information required from proponents of water recovery measures in applications to the central register; and
- to provide guidance and hence more consistency in the subsequent assessment of these applications<sup>8</sup>.

These guidelines support the implementation of the framework in the Intergovernmental Agreement and the Business Plan,<sup>9</sup> and are subordinate to these documents. These guidelines supersede previous versions of guidelines.

Each water recovery project will have some unique features. Proponents preparing an application may make a case to those assessing an application<sup>10</sup> that some of the information specified in these guidelines is not required for a particular measure. Additionally, if required in the assessment of a measure, the proponent may be asked to provide information not foreshadowed in these guidelines.

### 1.2 Steps to progress a water recovery measure

Key milestones in the process to progress water recovery measures in the Living Murray are the listing of the measure on the central register at various stages of the development of the project. The central register has three parts:

---

<sup>1</sup> Intergovernmental Agreement on Addressing Water Overallocation and Achieving Environmental Objectives in the Murray-Darling Basin (2004), supplemented by the Supplementary Intergovernmental Agreement on Addressing Water Overallocation and Achieving Environmental Objectives in the Murray-Darling Basin (2006). These documents are available from the MDBC website, [www.mdbc.gov.au](http://www.mdbc.gov.au).

<sup>2</sup> The Living Murray Business Plan 2007. This document is available from the MDBC website.

<sup>3</sup> Refer to the Business Plan, Annex A

<sup>4</sup> Intergovernmental Agreement, Clause 23

<sup>5</sup> Intergovernmental Agreement, Clause 24

<sup>6</sup> The terms 'project' and 'measure' are used interchangeably in these guidelines.

<sup>7</sup> For example, the Ricegrowers' Association of Australia are proponents for three water recovery measures.

<sup>8</sup> One of the primary roles of the interjurisdictional Water Recovery Working Group is to assess water recovery applications (See also Business Plan, Annex C). Others, such as independent reviewers, also assess applications.

<sup>9</sup> Hence, there are many footnotes to reference to the Intergovernmental Agreement and the Business Plan

<sup>10</sup> Those groups involved in the assessment of an application are indicated later in these guidelines on Figures 1, 3 and 4.

- the Developmental Register (proposed measures for further development and subsequent assessment against eligibility criteria)<sup>11</sup>;
- the Eligible Measures Register (measures approved for accreditation against funding commitments under the Intergovernmental Agreement)<sup>12</sup>; and
- the Environmental Water Register (measures with water available for use under the Living Murray Environmental Watering Plan).

The central register contains the summary information listed in **Table 1**. As shown in **Table 1**, not all of the pieces of summary information are required on each register.

The steps to develop and implement a water recovery measure in the Living Murray are listed below.

- i) Identification of a possible water recovery measure
- ii) Feasibility assessment of a potential water recovery measure
- iii) Application for listing on the Developmental Register
- iv) Assessment of application for listing on the Developmental Register
- v) Listing on the Developmental Register
- vi) Measure development (including detailed design, consultation and obtaining of necessary approvals)
- vii) Application for listing on the Eligible Measures Register
- viii) Assessment of application for listing on the Eligible Measures Register, including an independent review
- ix) Listing on the Eligible Measures Register<sup>13,14</sup>
- x) Establishment of investment agreements (including project schedules)<sup>15</sup>
- xi) Implementation
- xii) Application for listing on the Environmental Water Register
- xiii) Assessment of application for listing on the Environmental Water Register, including an independent review<sup>16,17</sup> and
- xiv) Listing on the Environmental Water Register<sup>18</sup>.

---

<sup>11</sup> Intergovernmental Agreement – clause 25(i)

<sup>12</sup> Business Plan – clause 78

<sup>13</sup> Intergovernmental Agreement – clause 25(ii)

<sup>14</sup> Note: Where appropriate applications can be made to list a water recovery measure directly onto the Eligible Measures Register (Business Plan, clause 69). These applications will be subject to independent review prior to listing.

<sup>15</sup> Business Plan - Clause 83

<sup>16</sup> Business Plan – clause 78

<sup>17</sup> Business Plan – clause 72

<sup>18</sup> Note: All references to the Environmental Water Register in this post-implementation guideline refer to the aggregated basin-wide register of recovered water, except where specifically stated otherwise (Intergovernmental Agreement – Clause 55).

## Guidelines for water recovery in The Living Murray

An exception to the above steps is that a proponent can apply to list a water recovery measure directly on the Eligible Measures Register without previously seeking its listing on the Developmental Register.

These guidelines aim to assist in providing greater clarity and consistency in steps iii), iv), vii), viii), xii), and xiii) for proponents seeking to apply for a measure to be listed on the central register.

Guidelines associated with an application to list:

- on the Developmental Register are provided in section 2, and the associated application form is in **Appendix 2**;
- on the Eligible Measures Register are provided in section 3, and the associated application form is in **Appendix 3**; and
- on the Environmental Water Register are provided in section 4, and the associated application form is in **Appendix 4**.

**Table 1 – Summary information on central register**

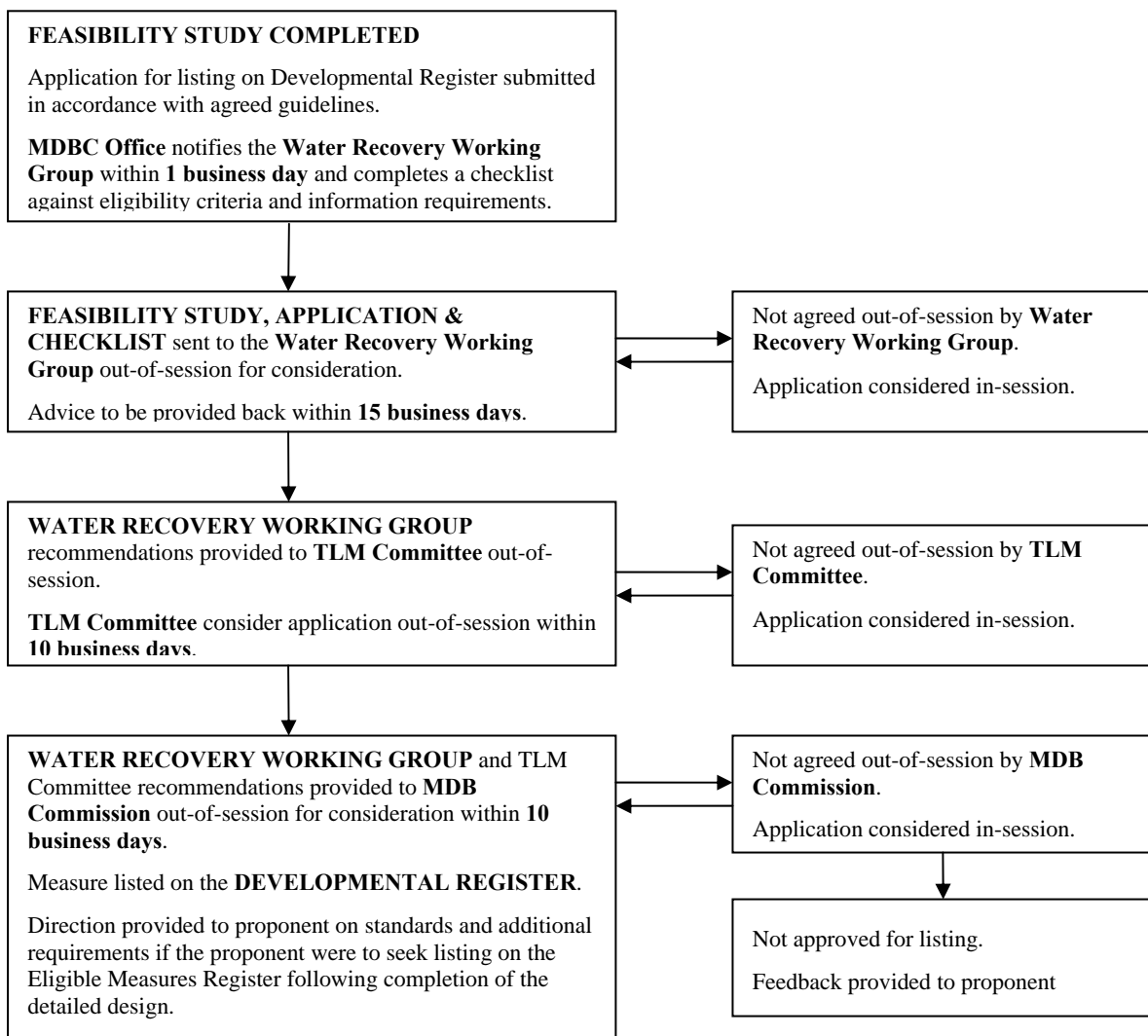
	<b>Register</b>		
	Develop-mental	Eligible Measures	Env. Water
<b>DESCRIPTION OF MEASURE</b>			
1. Measure title	✓	✓	✓
2. Proponent	✓	✓	✓
3. Type of measure	✓	✓	✓
4. How the water recovered would be secured	✓	✓	✓
5. Volume at source	✓	✓	✓
6. Volume at Murray		✓	✓
7. Volume at South Australian Border		✓	✓
8. Volume at the Barrages		✓	✓
9. Volume callable from storage		✓	✓
10. Indicative volume of accreditation		✓	✓
11. Reliability profile	✓	✓	✓
<b>PRIMARY CRITERIA</b>			
12. Importance of contribution to the Living Murray Environmental Watering Plan	✓	✓	✓
13. Cost to implement measure	✓	✓	✓
14. Cost per volume	✓	✓	✓
<b>OTHER MATTERS</b>			
15. Consultation	✓	✓	✓
16. Social impacts	✓	✓	✓
17. Economic impacts	✓	✓	✓
18. Cost of equivalent entitlement in the market		✓	✓
19. Indicative financial crediting amount		✓	✓
20. Salinity impact (year of implementation)		✓	✓
21. Water quality outcomes		✓	✓
22. Additional environmental impacts	✓	✓	✓
23. Third party impacts		✓	✓
24. Risks associated with implementation	✓	✓	✓
<b>DATA</b>			
25. Data files used in the hydrological analysis in the assessment	✓	✓	✓
<b>ENVIRONMENTAL WATER REGISTER ONLY</b>			
26. Associated Cap impact in tributaries, where relevant			✓
27. Source of water recovered (river valley)			✓
28. Channel capacity sharing characteristics – Murray			✓
29. Channel capacity sharing characteristics - tributary			✓
30. Type of water recovered (regulated or unregulated)			✓
31. Storage/call location(s) of regulated water			✓
32. Geographic limitations on its application the six Icon Sites			✓
33. Rules associated with trading of environmental water where appropriate			✓
34. Recommended monitoring of water recovery			✓
<b>REGISTER AND DATES</b>			
35. Register measure is listed on			✓
36. Date listed on Developmental Register	✓	✓	✓
37. Date listed on Eligible Measures Register		✓	✓
38. Date listed on Environmental Water Register			✓
39. Date of last review		✓	✓
40. Expressions of interest for investment		✓	✓

## 2 Guidelines relating to the Developmental Register

### 2.1 Introduction

The Developmental Register contains proposed water recovery measures that require further development prior to listing on the Eligible Measures Register<sup>19</sup>. Proposed measures may be accepted onto the Developmental Register if they demonstrate sufficient likelihood of accreditation<sup>20</sup> to warrant further investigation<sup>21</sup>, usually following a feasibility study. The process for listing a water recovery measure on the Developmental Register is shown on **Figure 1**<sup>22</sup>. Prospective proponents will be clearer on the requirements of a listing after considering section 2.2. Some guidance on the expected contents of a feasibility study is provided in **Appendix 1**. Following request, the MDBC may consider funding a feasibility assessment.

**Figure 1 - Process for listing measures on the Developmental Register**<sup>23</sup>



<sup>19</sup> Intergovernmental Agreement, Clause 25

<sup>20</sup> Intergovernmental Agreement, Clause 32, the primary criteria are contribution to fulfilling the requirements of the Living Murray Environmental Watering Plan, and cost effectiveness

<sup>21</sup> Intergovernmental Agreement, Clause 35

<sup>22</sup> In reality, recommendations can be made in-session or out of session.

<sup>23</sup> Business Plan, Figure 3

As shown in **Figure 1**, groups involved in the assessment of an application for listing on the Developmental Register (and hence in verifying the information on the application form) are the Water Recovery Working Group, the Living Murray Committee, and the MDBC. Ultimately it is the MDBC<sup>24</sup> which makes the decision on whether to list (or not list) a project on the Developmental Register.

Proponents can apply to have a measure listed on the Developmental Register using the application form in **Appendix 2**. Guidelines for generating and assessing this information are provided in section 2.2.

## 2.2 Guidelines for applications to list on the Developmental Register

This section provides guidelines to assist proponents in completing applications to list on the Developmental Register (**Appendix 2**). A procedure to verify information is also provided. This will be used by the independent reviewers and interjurisdictional groups to assess the application.

Feasibility studies may be attached to the Developmental Register application and the relevant sections referred to in the application form. This will reduce the need to re-enter and duplicate information.

### 1. Measure Title<sup>25</sup>

*Information to be listed on the Developmental Register.* Measure title.

*Information to be provided in application.* The measure title and title of any identifiable sub-components of the water recovery measure.

### 2. Proponent<sup>26</sup>

*Information to be listed on Developmental Register.* Proponent name.

*Information to be provided in application.* Details relating to the proponent including: type of entity (eg. government department, company, co-operative, partnership, trust); contact details; any relevant registered trading names.

*Procedure to verify information (by those groups assessing the application as per Figure 1).* Proof of registration of a business may be requested if the entity is not well known to partner governments.

### 3. Type of measure<sup>27</sup>

*Information to be listed on Developmental Register.* Either: 'infrastructure improvement'; 'on-farm measure'<sup>28</sup>, 'market based measure'; 'urban measure'; 'regulatory measure'; or 'other'.

*Information to be provided in application.* The type of measure, location of the measure, a description of the measure, an overview of how the measure would be implemented, a conceptual diagram or diagrams of any works relating to infrastructure projects, and the expected time from when the Investment Plan will be finalised until water would be made available for environmental management. The feasibility study, or other relevant documents, may be attached and referenced in this section to provide additional detail.

---

<sup>24</sup> The MDBC itself, not MDBC officers. A definition of the MDBC is in the glossary of terms at the back of these guidelines.

<sup>25</sup> Intergovernmental Agreement - clause 28

<sup>26</sup> Intergovernmental agreement – clause 27

<sup>27</sup> Intergovernmental Agreement - clause 23

<sup>28</sup> An on-farm measure is usually a small scale infrastructure improvement project. Later in these guidelines, the term infrastructure measure sometimes refers to both.

*Procedure to generate information.* The type of measure would be described in the feasibility assessment – select the most relevant descriptor from the list above (eg. infrastructure improvement).

#### **4. How the water recovered would be secured if measures implemented<sup>29</sup>**

*Introduction.* Water recovered under the Intergovernmental Agreement is to be clearly assigned in perpetuity in licences and associated water accounts, as water access entitlements, or in other permanent arrangements. Consequently, the application must nominate the statutory instruments that will permanently secure the recovered water entitlement. Contracts with water entitlement holders providing the Parties with 99-year options over the use of that water for the purposes of the Living Murray Initiative are considered to be permanently secured.<sup>30</sup> Some of the legislation associated with water entitlements in each jurisdiction is referred to in the Business Plan<sup>31</sup>.

*Information to be listed on Developmental Register.* Either: ‘Standard entitlement’ or ‘other’.

*Information to be provided in application:*

- The legislation under which the recovered water entitlement would be secured<sup>32</sup> and the statutory instrument used to secure the water.
- A brief description of how the water will be secured for environmental management if the measure is implemented and
- Any terms (eg. tenure) that will apply to the use of the water.

*Procedure to generate information.* As recommended by the relevant jurisdiction.

*Procedure to verify information.* Confirm with representatives of the State or Territory where the measure is to be implemented that the procedure to secure the water is valid.

#### **5. Volume at source<sup>33</sup>**

*Introduction.* The volume at source is the estimated volume of water that would be recovered at the location of the measure (for example, at an irrigation channel in which a pipeline would be constructed, at a permanently inundated wetland from which water could be recovered by the construction and operation of a flow regulator, or at the location where a water entitlement is purchased).

Hydrological modelling is **not** required to calculate the volume associated with a measure for a listing on the Developmental Register. However, some proponents may prefer to do modelling before applying.<sup>34</sup> An example of a hydrological model that could be used is the SWET model for assessing the volume of water recovery from wetlands, which has been considered by the Water Recovery Working Group and is suitable for initial estimation of volume.

*Information to be listed on Developmental Register.* Estimated average long term annual volume to be recovered at source (GL) – this is the Long Term Cap Equivalent.

*Information to be provided in application.* Estimate of volume at source as calculated in the feasibility study. Reference to, or a brief description of, the methodology used to calculate the volume. If available, estimate of confidence levels for stated volumes.

---

<sup>29</sup> Intergovernmental Agreement - clauses 52, 29. Business Plan - Annex F

<sup>30</sup> Supplementary Intergovernmental Agreement, Clause 16

<sup>31</sup> Business Plan, Annex F

<sup>32</sup> Business Plan, Annex F

<sup>33</sup> Business Plan, Annex E Table 2, Annex H Clauses 17 – 24. NOTE “*best practice computer simulation model*” is the term used in the Business Plan, Annex E. The accepted models are: for the River Murray - MSM-Bigmod; for the Murrumbidgee River – IQQM; and for the Goulburn River and other northern Victorian tributaries of the Murray – REALM.

<sup>34</sup> Business Plan, Annex B.

Additional supporting documentation (such as the feasibility study) may also be attached to the application form and referenced.

*Procedure to generate information.* Proponent to calculate the water recovery expected from implementation of the measure.

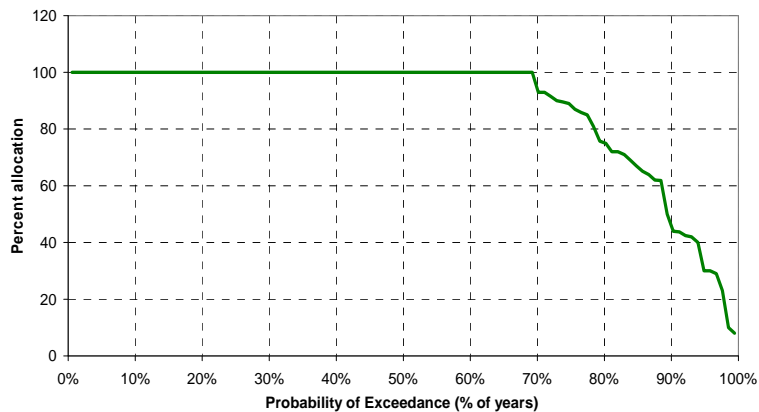
Cap Factors in the Business Plan<sup>35</sup> are to be used to convert a volume of entitlement to a Long Term Cap Equivalent. Alternatively, the proponent may suggest a method to calculate the volume for consideration by the Water Recovery Working Group<sup>36</sup>.

*Procedure to verify information.* Check the method and information provided.

## 6. Reliability profile<sup>37</sup>

*Introduction.* The reliability profile is the frequency distribution of allocations of water that would be expected following the implementation of the measure and transfer of entitlement for environmental management. The horizontal axis is the probability of exceedance (% of years) and the vertical axis is the allocation (% of entitlement). An example is given in **Figure 2**.

**Figure 2 - Example of a reliability profile**



*Information to be listed on Developmental Register.* The name of the standard water entitlement that is closest to the reliability profile of the water that would be recovered from the implementation of the measure will be included on the register, or 'other' if a standard entitlement does not describe the characteristics of the recovered water entitlement. Examples of standard water entitlements that could be listed on the Developmental Register are:

- NSW High (or General) Security Access License: Murrumbidgee Regulated; Murray Valley Regulated; or Lower Darling;
- Victorian High Reliability Water Share; Victorian Low Reliability Water Share; Murray Water System; Goulburn Water System; Broken Water System; Campaspe Water System; or Loddon Water System; and
- SA Water License: River Murray Prescribed Watercourse.

'Other' can be listed on the register if the reliability profile differs from a standard water entitlement.

<sup>35</sup> Cap Factors are in Annex E of the Business Plan

<sup>36</sup> For water recovery from permanently or frequently inundated wetlands or from storages, the Water Recovery Working Group has approved the 'Savings at Wetlands Evaporation Time-Series' model.

<sup>37</sup> Many of the standard water entitlements are listed in the Business Plan, Annex E, Table 2

*Information to be provided in application.* Any supporting information used as the basis for the selection of a reliability profile. This could be a chart like that shown on **Figure 2**.

*Procedure to generate information.* Seek advice from host jurisdiction (the Department of Water and Energy or the Department of Environment and Climate Change in NSW, the Department of Sustainability and Environment in Victoria, Department of Water, Land and Biodiversity Conservation in South Australia) on the reliability profile, particularly for non standard water entitlements.

In regard to listings on the Developmental Register, the provision of a reliability profile calculated using hydrological modelling is not required.

*Procedure to verify information.* Those involved in assessment on **Figure 1** to review information entered on the application form.

## **7. Importance of contribution to the Living Murray Environmental Watering Plan<sup>38</sup>**

*Introduction.* The importance of a contribution to the Living Murray Environmental Watering Plan resulting from the implementation of a water recovery measure involves consideration of:

- the environmental demand: the water needed from the Living Murray portfolio to deliver the agreed environmental outcomes at the six icon sites<sup>39</sup>;
- the characteristics of the water (eg. reliability profile) expected from projects already listed on the central register; and
- the characteristics of the water from the proposed measure.

*Information to be listed on Developmental Register.* Either: 'high priority'; 'medium priority'; or 'low priority' by the proponent.

*Information to be provided in application.* An indication of the priority of the water in achieving the objectives of the Living Murray Environmental Watering Plan together with a brief justification for this choice. Consultation with the host jurisdiction may be required. As at April 2008, there was further modelling to be undertaken to inform this selection.

*Procedure to generate information.* Proponent will ask the host jurisdiction (DECC or DWE in NSW, DSE in Victoria, DWLBC in South Australia) for advice on priority of investment in the context of the Living Murray Environmental Watering Plan.

*Procedure to verify information.* Review expected water from existing water recovery measures against objectives in Living Murray Environmental Watering Plan.

## **8. Cost to implement measure<sup>40</sup>**

*Introduction.* The estimated cost to implement a measure is the net present value (NPV) of capital costs and all foreseeable future recurrent costs, such as operation, maintenance and management that will be charged against the water recovery budget in the Intergovernmental Agreement<sup>41</sup>. Exclude from the calculation all sunk costs and accounting depreciation. For listing on the Developmental Register, the cost estimate is generally calculated in the feasibility study for the measure.

Ongoing water ownership costs (eg; headworks charges) payable on the water should be reported separately. These costs will be paid by the MDBC following listing of the recovered water on the

---

<sup>38</sup> Business Plan - clause 2. These outcomes are in the Communique from the Ministerial Council meeting in November 2003, at which the First Step Decision was made.

<sup>39</sup> Business Plan, Annex A

<sup>40</sup> Intergovernmental Agreement – clause 32 ii. Business Plan - clause 73.

<sup>41</sup> Business Plan, Glossary

Environmental Water Register. Estimates of these costs should be provided to the MDBC at the earliest possible date to facilitate accurate budget planning.

*Information to be listed on Developmental Register.* Estimated total cost to implement the measure (NPV), net of other potential contributions (such as cost sharing arrangements e.g. from other internal or external programs, State governments).

*Information to be provided in application.* The net present value cost calculated over a period of 30 years and a discount rate of 4%<sup>42</sup>; and the breakdown of the cost into: up-front cost; recurrent costs; and, predicted timing of expenditure (to inform budgeting and planning).

References to an attached feasibility study could be provided for more detailed costing information. An indication of the confidence of the cost estimate is also to be included.<sup>43</sup> Any proposed cost sharing arrangements would be stated.

*Procedure to generate information.* The cost estimate would usually be calculated using appropriate unit rates for the implementation of the measure (eg. cost of construction of a pipeline) for infrastructure projects, or the market price of water for market-based projects. Further detail relating to costing of measures is provided in **Appendix 5**.

*Procedure to verify information.* Evaluate and compare basis of cost estimates (eg. up-front costs, unit rates for materials and construction types, the cost of water entitlements in the market) with those from other similar projects. Assess other potential contributions.

## **9. Cost per volume<sup>44</sup>**

*Introduction.* One of the two primary criteria for accreditation of a water recovery measure is cost effectiveness<sup>45</sup> or the cost per unit of water.

*Information to be listed on Developmental Register.* Cost in \$ per ML<sup>46</sup> at source.

*Procedure to generate information.* This is calculated by dividing '8. Cost to implement measure' by '5. Volume at source'.

*Procedure to verify information.* Verify the above calculation.

## **10. Consultation<sup>47</sup>**

*Introduction.* A pre-requisite for listing on the Developmental Register is that preliminary consultation has commenced with groups that may be materially interested in or affected by the measure to the satisfaction of the Water Recovery Working Group.

*Information to be listed on Developmental Register.* Adequate or Inadequate as identified by the proponent (the assessors will verify this).

*Information to be provided in application.* The application form will include details of any stakeholder consultation that has been undertaken together with a statement from the host jurisdiction advising whether the consultation associated with the water recovery measure has been adequate in the context of the Business Plan.

---

<sup>42</sup> It is recognised that the cost of construction costs have been increasing at a rate of greater than 4%.

<sup>43</sup> Business Plan – Annex B

<sup>44</sup> Intergovernmental Agreement - clause 32 ii. Business Plan - Annex B.

<sup>45</sup> Intergovernmental Agreement – clause 32 ii.

<sup>46</sup> Volume (ML) is measured in Long Term Cap Equivalent

<sup>47</sup> Business Plan - clauses 171, 172.

*Procedure to generate information.* The proponent should consult with groups that are likely to be directly affected by the measure and record the results of this preliminary consultation for discussion with the host jurisdiction. Such groups could include individual irrigators, irrigation trusts, water authorities, government agencies, catchment management authorities and indigenous groups.

*Procedure to verify information.* Review of information provided on the application form.

## **11. Social impacts<sup>48</sup>**

*Introduction.* Key social impacts are to be identified for listings on the Developmental Register. These could include impacts on irrigators directly involved, other irrigators in the irrigation system, the local community, and the Indigenous community. Impacts may be positive or negative.

*Information to be listed on Developmental Register.* Either that the identification has been: 'Adequate' or 'Inadequate' in the view of the proponent (the assessors will verify this).

*Information to be provided in application.* A brief description of the method used to identify social impacts, and a preliminary list of social impacts that would have to be considered if the water recovery measure is further developed.

*Procedure to generate information.* The proponent should identify social impacts, based on the preliminary round of consultation and local knowledge. The outcomes of earlier social impact assessments could also be referred to. These identified impacts should be documented and provided to the host jurisdiction for consideration in the context of the Business Plan and advice.

Social impacts which could be considered may include:

- Changes to use of water and whether the changes are voluntary or compulsory;
- Indigenous place meanings (cultural significance);
- non-indigenous place meanings; and,
- non-extractive use values such as tourism and recreation.

*Procedure to verify information.* Review of information provided on the application form.

## **12. Economic impacts<sup>49</sup>**

For listings on the Developmental Register, key economic impacts are to be identified, but do not have to be thoroughly analysed.

*Information to be listed on Developmental Register.* Either that the identification has been: 'Adequate' or 'Inadequate' in the view of the proponent (the assessors will verify this).

*Information to be provided in application.* A brief description of the method used to identify potential economic impacts and the result, together with a preliminary list of economic impacts that would have to be considered if the measure is to be developed further. Both positive and negative impacts should be included.

*Procedure to generate information.* Identification of economic impacts would be based on the local knowledge of the proponent.

This could include consideration of potential economic costs and benefits associated with implementation of the measure in relation to agricultural production; tourism; the initial and on-going

---

<sup>48</sup> Intergovernmental Agreement – Clause 33, Refer to 10. Consultation

<sup>49</sup> Intergovernmental Agreement – Clause 33

investment in the measure; costs if the measure were not implemented (eg costs to maintain an irrigation canal rather than substitute with a pipeline); salinity; and recreation.

*Procedure to verify information.* Discuss the information provided with a representative of the host jurisdiction.

### **13. Additional environmental impacts<sup>50</sup>**

*Introduction.* This item of the central register is to summarise additional environmental impacts at the water recovery source only. This item is not to consider the broader environmental benefits at the icon sites that are considered in '7. Importance of contribution to the Living Murray Environmental Watering Plan', nor is it to consider environmental impacts between the source (site of the water recovery) and the icon sites. The additional environmental impacts could be positive or negative.

Identification, rather than analysis, of additional environmental impacts is required for the Developmental Register. As salinity and water quality outcomes are considered separately, the additional environmental impacts relate to flora and fauna species and ecological communities (eg. wetland plant species, frogs, waterbirds) and habitats.

*Information to be listed on Developmental Register.* Either: 'negligible impact'; 'significant benefit'; or 'significant deterioration'.

*Information to be provided in application.* List any types of flora and fauna species and ecological communities that are likely to be affected and the potential impacts identified. Impacts are to be classified as one of; negligible impact, significant benefit or significant deterioration. Note if the project requires any other environmental approval eg. under the Environmental Protection and Biodiversity Conservation Act.

*Procedure to generate information.* Based on any hydrologic modelling analysis, the proponent is to conduct an initial assessment of the impacts of the changed flow regime on flora and fauna species and ecological communities at the source of the measure. This would be carried out as a component of the feasibility study and consider:

1. the area (hectares) that would be affected by the implementation of the measure;
2. whether the area is already highly modified and/or of low environmental value (this may be the case for many irrigation canals);
3. whether there are any flora and fauna species or ecological communities that may be adversely affected by the project that are listed as rare, vulnerable, endangered or critically endangered (for example, by reviewing map-based databases of rare and threatened species); and
4. whether the source is listed as being of International, National, State or regional significance.

*Procedure to verify information.* If considered to be significant, review of the application by the Environmental Delivery Team within the MDBC office, or the Environmental Watering Group, to assess the significance of the impact.

### **14. Risks associated with implementation**

*Introduction.* For the Developmental Register, the proponents are required to make a preliminary identification of potential risks that may affect the future implementation of the project.

*Information to be listed on Developmental Register.* The number of risks that are rated as high (ranking of 9) as indicated by 'severity' multiplied by 'likelihood' (low = 1, medium = 2, high = 3).

---

<sup>50</sup> Intergovernmental Agreement – Clause 33

*Information to be provided in application.* A description of risks associated with implementation, with an indication of each in terms of 'severity' and 'likelihood' (low = 1, medium = 2, high = 3).

*Procedure to generate information.* Potential risks, both technical and non-technical in nature may be identified during the preparation of the feasibility study. Examples of risks include:

- challenges in estimating the cost or the volume of water (eg. if the site of an infrastructure project is remote);
- unforeseen changes if there are long lead times between investment and delivery of the water entitlement;
- potential community opposition to implementation;
- adverse salinity impacts (eg. from saline groundwater intrusion resulting from the drawdown of water in a wetland, or from the flushing of water from an evaporation basin into the river); and,
- adverse water quality outcomes, particularly in regard to nutrients and turbidity.

*Procedure to verify information.* Assessors to review risks provided.

## **15. Reference where assumptions of the hydrological analysis can be found**

*Information to be listed on Developmental Register.* One of the following categories: 'provided', or 'not provided'.

*Information to be provided in application.* List all the references and data that provided assumptions used in the hydrological analysis in the feasibility study.

*Procedure to verify information.* Review references and data provided.

## 3 Guidelines relating to the Eligible Measures Register

### 3.1 Introduction

The Eligible Measures Register contains water recovery measures that are “implementation ready” or are being implemented and have been approved for accreditation against funding commitments under the Intergovernmental Agreement<sup>51</sup>. The listing of a measure on the Eligible Measures Register does not necessarily mean that it will be funded and implemented.

The ‘primary criteria’ for accreditation of an Eligible Measure are set out in the Intergovernmental Agreement<sup>52</sup>:

- i) *the degree to which the characteristics of the recovered water will fulfil the requirements of the Basin Environmental Watering Plan<sup>53</sup> to be developed under Clause 58, or any other environmental objectives which may be agreed; and*
- ii) *the cost effectiveness of the proposed measure, including initial cost per unit of water, and ongoing costs arising from the management, storage or delivery of the water to achieve the agreed environmental objectives.*

‘Other matters’ which may be taken into account in assessing proposals for further development or accreditation for funding include social and economic impacts, salinity and water quality outcomes, additional environmental impacts, and third-party impacts<sup>54</sup>.

In general, projects listed on the Eligible Measures Register are expected to be within  $\pm 10\%$  of the final cost and volume of the measure<sup>55</sup>. Specific design and consultation requirements for projects considered for listing on the Eligible Measures Register are provided in section 3.2.

The process for listing measures on the Eligible Measures Register is shown on **Figure 3**<sup>56</sup>. As shown on **Figure 3**, those involved in assessing an application to list on the Eligible Measures Register are independent reviewers, the Water Recovery Working Group, the Living Murray Committee, the MDBC, and Ministerial Council. Ultimately it is the decision of Ministerial Council whether to list (or not list) a project on the Eligible Measures Register (**Figure 3**). Only Ministerial Council can list or not list a measure. Feedback will be provided to the proponent throughout the assessment process.

Proponents wanting to list a measure on the Eligible Measures Register are required to complete and submit the application form in **Appendix 3**, following completion of detailed design and consultation. The information to be provided on the application form is shown in **Table 1**. Guidelines for generating this information are provided in section 3.3.

---

<sup>51</sup> Intergovernmental Agreement, clauses 24 and 25

<sup>52</sup> Intergovernmental Agreement, clause 32

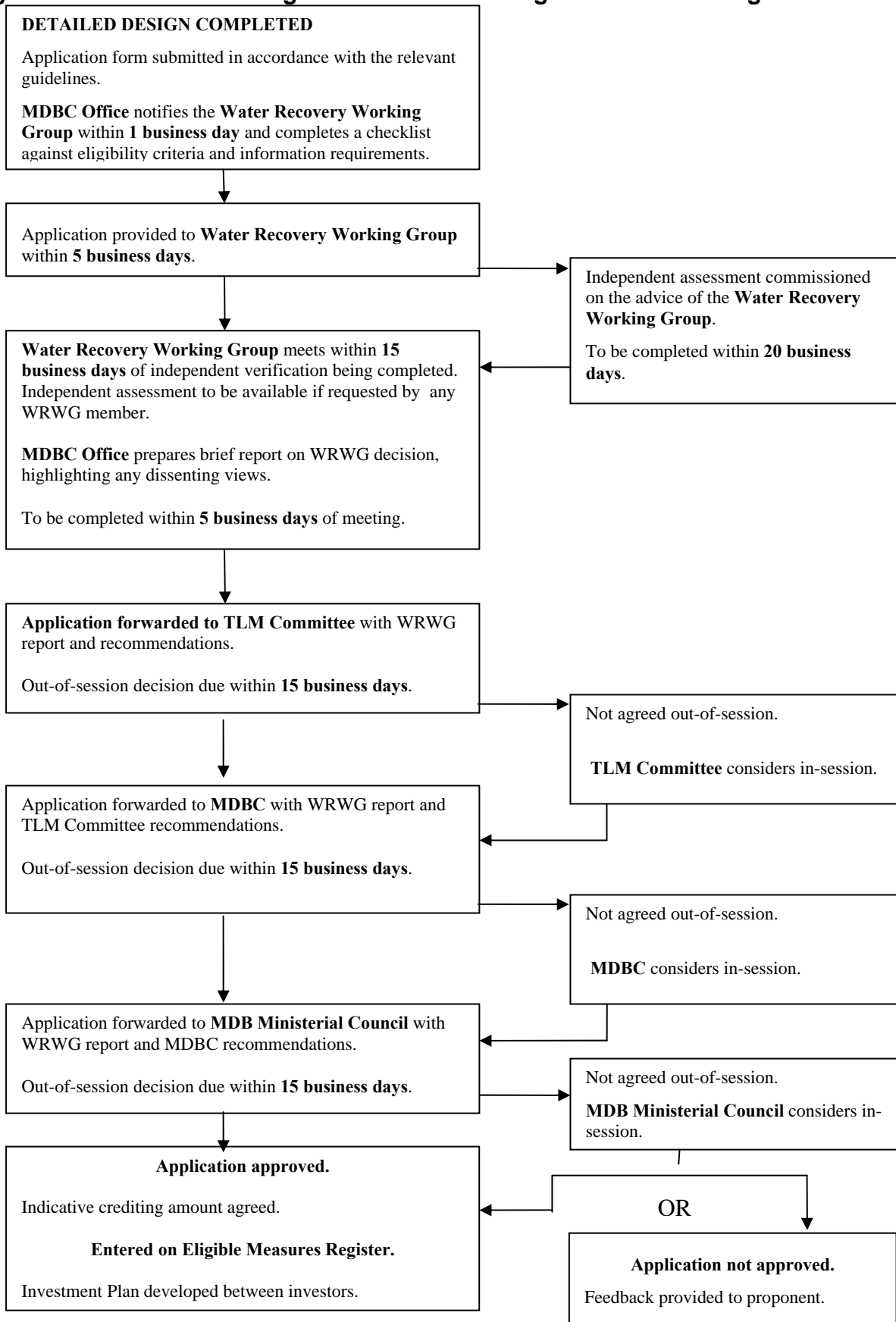
<sup>53</sup> The title of the ‘Basin Environmental Watering Plan’ was changed to ‘The Living Murray Environmental Watering Plan’

<sup>54</sup> Intergovernmental Agreement, clause 33

<sup>55</sup> Business Plan, Annex B

<sup>56</sup> Business Plan, Figure 4

**Figure 3 - Process for listing measures on the Eligible Measures Register<sup>57</sup>**



<sup>57</sup> Business Plan, Figure 4

## 3.2 Design and consultation

Prior to application for listing on the Eligible Measure Register<sup>58</sup>, the following should be undertaken on or behalf of the proponent and be available to support the application for listing:

- accepted best practice Cap computer hydrological modelling (unless the measure is a market based measure that uses Cap factors from past modelling);
- detailed design drawings for any infrastructure project, or the design of any market-based measures;
- a description of cost sharing arrangements for the measure;
- proof that the proponent would be entitled to water recovered and that it can be managed under the Living Murray;
- a statement of consultation with those with material interests or that are directly impacted;
- an analysis of key social and economic impacts; and
- a detailed identification of risks associated with the implementation of each water recovery measure.

The proponent should have a reasonable expectation that the costs of implementation per ML would be estimated within  $\pm 10\%$  of the post-implementation cost<sup>59</sup>.

## 3.3 Guidelines for applications to list on the Eligible Measures Register

This section provides guidelines to assist proponents in completing applications to list on the Eligible Measures Register (**Appendix 3**). A procedure to verify information is also provided which will be used by the independent reviewers and interjurisdictional groups to assess the application.

Application of accepted best practice hydrological and salinity modelling is usually required to fill a number of the columns listed in **Table 1** (5 – 11 inclusive and 20). An overview of the modelling approach to be taken is provided in **Box 1**.

---

<sup>58</sup> Business Plan, clauses 60, 69, and Annex B

<sup>59</sup> Business Plan, Annex B

## Box 1 - Overview of the approach to hydrological modelling

(The following can be changed by agreement of the Water Recovery Working Group and/or higher committees).

The predicted hydrological and / or salinity impact from the implementation of a water recovery measure will be the difference between a reference run, and the run that includes simulation of the water recovery measure. The models used will be MDBC's MSM-Bigmod or an alternative accepted best practice Cap computer simulation model for the system (e.g. REALM for the Goulburn River ran by DSE modellers, IQQM for the Murrumbidgee River ran by DWE modellers).

The reference run includes and integrates:

- River operating regimes;
- Water diversions (both accounted for and used for agricultural production or environmental benefit, and unaccounted);
- Environmental water entitlements made or agreed to before 29 August 2003<sup>60</sup>; and,
- Land and water management policies and practices.

The reference run will be reviewed and where necessary updated to include changes to operating rules that have been agreed to at that date, including new rules to achieve environmental outcomes agreed in the First Step Decision.

The period of record used in the modelling will be from as early as possible (usually 1891 for hydrological modelling) until mid 2003 (April or June, depending on the model).

The MDBC can undertake hydrological and salinity modelling for any water recovery measures on the River Murray (i.e. columns 5 – 11 inclusive and column 20 of the Eligible Measures Register). Proponents wanting this modelling undertaken will need to direct the request in writing to [water.recovery@mdbc.gov.au](mailto:water.recovery@mdbc.gov.au). At least 4 weeks and sometimes more will be required for the modelling to be completed. Hydrological and salinity modelling for the NSW tributaries can be completed by DWE, whilst DSE can complete the modelling for Victorian tributaries. Requests should be directed initially to [water.recovery@mdbc.gov.au](mailto:water.recovery@mdbc.gov.au).

### 1. Measure title<sup>61</sup>

Transferred from the Developmental Register or provided directly.

### 2. Proponent<sup>62</sup>

Refer to guideline to complete this column of the Developmental Register (section 2.2).

### 3. Type of measure<sup>63</sup>

*Information to be listed on Eligible Measures Register.* Either: 'infrastructure improvement'; 'on-farm measure', 'market based measure'; 'urban'; 'regulatory measure'; or 'other'.

*Information to be provided in application.* Details of the project, including the location and type of the measure, an overview of how the measure would be implemented including the statutory approvals that would be required, a conceptual diagram or diagrams of any works, and the expected time from when

<sup>60</sup> Examples include the Barmah-Millewa Forest Environmental Water Allocation, environmental contingency allowances for the Lower Darling and Murrumbidgee rivers, and the Victorian Murray Wetlands Environmental Water Allocation.

<sup>61</sup> Intergovernmental Agreement - clause 28

<sup>62</sup> Intergovernmental agreement – clause 27.

<sup>63</sup> Intergovernmental Agreement - clause 23

the Investment Plan was finalised until water would be made available for environmental management. For infrastructure projects, further detail would be provided in the attached design report.

*Procedure to generate information.* Information generated during the detailed design and consultation stage.

#### **4. How the water recovered would be secured if measures implemented<sup>64</sup>**

Refer to guideline to complete this column of the Developmental Register.

#### **5. Volume at source, 6. Volume at Murray<sup>65</sup>**

*Introduction.* Clause 49 of the Business Plan states:

*A Long-Term Cap Equivalent (LTCE) model shall be used to determine water volumes in line with procedures in Annex E. Where measures are proposed for which a determination of LTCE is not readily available, the Living Murray Committee shall determine an agreed methodology for the measure.*

For water recovery measures involving the transfer of water entitlements, the volume at source can be calculated by multiplying the volume of entitlement recovered by the relevant Cap factor<sup>66</sup>. In all other cases, the volumes associated with a water recovery measure would be estimated using accepted best practice models (Refer to **Box 1**).

The Volume at Murray will take account of losses which may be incurred during transmission of water from the source to the River Murray.

*Information to be listed on Eligible Measures Register.* Average annual volume in GL.

*Information to be provided in application*

1. Average annual volume (GL).
2. Either application of Cap factor for a standard water entitlement or the accepted best practice model used to calculate the volumes (eg. MSM-Bigmod, REALM or IQQM). If determination of this volume is not readily available, evidence of agreement of an alternative methodology by the Water Recovery Working Group.
3. Any transmission losses that may occur in the delivery of the recovered water from the source of the recovered water to the River Murray must be included, together with the assumptions used to make this assessment<sup>67</sup>.

*Procedure to generate information.* For a standard extractive water entitlement, apply the relevant Cap Factor. For other types of water recovery measures, implement the approach outlined in **Box 1** for all available years of data to calculate the average annual volume at source and the volume at Murray. Any transmission losses incurred in delivery of water from the source to the River Murray must also be included in the modelling process.

If the volume cannot readily be determined using the above approaches, implement the methodology agreed by the Water Recovery Working Group. Proponents requiring assistance with hydrological modelling should refer to **Box 1**.

---

<sup>64</sup> Intergovernmental Agreement - clauses 52, 29. Business Plan - Annex F

<sup>65</sup> Business Plan - Annex E, clauses 17 and 18 and Table 2. The measures described are already listed on the Eligible Measures Register. Some further information is provided on the Living Murray website: [www.thelivingmurray.mdbc.gov.au](http://www.thelivingmurray.mdbc.gov.au).

<sup>66</sup> Business Plan – Annex E, Table 2.

<sup>67</sup> Business Plan – Clause 114

*Procedure to verify information (by those groups assessing the application as per Figure 3).* Review the modelling report. If required, the independent reviewers or interjurisdictional groups may submit questions for response by the modellers, or a review meeting may be convened.

## **7. Volume at South Australia, 8. Volume at the Barrages**

*Introduction.* The volume at South Australia is the potential increase in flows across the South Australian border arising from implementation of the project.

Similarly, volume at the Barrages is the additional volume of water which could flow across the Barrages at the downstream end of the River Murray, if a measure is implemented. The volume at the Barrages and volume at South Australia will be similar, except if the water is recovered in South Australia.

*Information to be listed on the Eligible Measures Register.* The average annual volume (GL) at the South Australian border and the average annual volume (GL) at the Barrages.

*Information to be provided in application*

1. Average annual volume (GL).
2. The Cap computer simulation model used to calculate the volumes.

*Procedure to generate information.* Run MSM-Bigmod model (as described in **Box 1**) with the diversions unchanged from the benchmark. Add the average annual increase in diversions and the average annual increase in storage from this model run to the modelled increase in average annual flow at South Australia and flow over the Barrages.

Proponents requiring assistance with hydrological modelling should refer to **Box 1**.

*Procedure to verify information.* As for 5. *Volume at source.*

## **9. Volume callable from storage<sup>68</sup>**

*Introduction.* The volume callable from storage is a factor of the flexibility of environmental management to use a water entitlement to achieve the environmental outcomes that were agreed in the First Step Decision. The volume callable relates to the security and origin of the water. Accepted best practice hydrological models are used to calculate the volume callable.

*Information to be listed on Eligible Measures Register.* Average annual volume in GL.

*Information to be provided in application.* 1. Average annual volume (GL). 2. The Cap computer simulation model used to calculate the volumes.

*Procedure to generate information.* The procedure described below applies to the Cap computer simulation model that is applicable to the River Murray (MSM-Bigmod). Similar methods may be implemented in other valleys. Hydrological modelling is to be undertaken for the full record of data for which the model has been calibrated to mid 2003 (usually April or June depending on the model).

1. Determine reliability of supply of irrigation entitlements prior to water recovery (eg. NSW General Security, Victorian High Reliability Water Share, SA entitlement) in the reference run using the indicators outlined in 23. *Third party impacts.*
2. Model the reliability following the implementation of a water recovery measure without an environmental demand.
3. Increase environmental demands by extracting water from a headworks storage (e.g. Hume Reservoir) until the reliability of each water recovery profile returns to the pre-recovery situation.

---

<sup>68</sup> Intergovernmental Agreement – clause 55. Business Plan – Annex E, clauses 15, 37, 38

4. Calculate the volume callable as the long term average environmental extraction (calculated in 3. above).

Proponents requiring the undertaking of hydrological modelling should refer to **Box 1** and could contact modellers in the MDBC office.

*Procedure to verify information.* As for 5. *Volume at source.*

## 10. Indicative volume for accreditation<sup>69</sup>

*Introduction.* The indicative volume for accreditation will be determined at the source except where water recovered is delivered as an unregulated flow, where it will be credited at the River Murray channel<sup>70</sup>. Note: unless otherwise agreed, the volume to be credited against indicative water recovery targets for each jurisdiction is on the basis of jurisdictional ownership prior to implementation of the measure.<sup>71</sup> For example, water recovered from wetlands along the River Murray, would generally be shared between Victoria and NSW, as both States are currently equally apportioned transmission losses (which include losses to connected wetlands) associated with delivery of water along the River Murray.

*Information to be listed on Eligible Measures Register.* Average annual volume (GL).

*Information to be provided in application*

1. Average annual volume (GL) or volume for accreditation by jurisdiction ownership.
2. Justification of any difference between the proposed indicative volumetric crediting amount and the volume in '5. *Volume at source*' or '6. *Volume at Murray*' (whichever is applicable).

*Procedure to generate information.* If the flow is mainly regulated flow, the volume is '5. *Volume at source*'. If the flow is mainly unregulated, the volume equals '6. *Volume at Murray*'.

*Procedure to verify information.* Check which jurisdiction would be accredited with the volume of water.

## 11. Reliability profile<sup>72</sup>

*Introduction.* For the Eligible Measures Register, the reliability profile (if it is not already known for a standard water entitlement) would be determined using the accepted best practice modelling.

*Information to be listed on Eligible Measures Register.* As for Developmental Register listing (Refer to '6. *Reliability Profile*').

*Information to be provided in application.* The reliability profile, or standard water entitlement, plus any supporting information that was the basis for selection of the reliability profile.

*Procedure to generate information.* Compare the long term hydrological modelling described at 5. *Volume at source* with the reliability profiles of the standard water entitlements. If the reliability profile is totally different from a standard water entitlement, then calculate the reliability of the new entitlement using best practice modelling.

Proponents requiring assistance with hydrological modelling should refer to **Box 1**.

*Procedure to verify information.* Review information entered on the application form that was provided by the proponent. If necessary, discuss with modellers.

---

<sup>69</sup> Business Plan – clauses 39, 96, 99, 165, Figure 6

<sup>70</sup> Business Plan – clause 108

<sup>71</sup> Business Plan – clause 39

<sup>72</sup> Many of the standard water entitlements are listed in the Business Plan, Annex E, Table 2

## **12. Importance of contribution to the Living Murray Environmental Watering Plan<sup>73</sup>**

Refer to section 2.2, as the process is the same as for the Developmental Register.

## **13. Cost to implement measure<sup>74</sup>**

*Introduction.* Basically the procedure is the same for estimating the cost to implement a water recovery measure as for the Developmental Register, but based on more detailed information. For example, civil construction costs for infrastructure projects will be based on: detail design drawings and specifications; derived quantities; implementation schedule and 'worked up' unit cost estimates. This is especially important for water recovery measures that are to be implemented at remote sites where unit rates from other locations may be unreliable. Estimated costs for market-based measures may be based on observed market data or an alternative specified pricing strategy.

It is a matter of professional judgement by the proponent to determine whether enough cost data has been acquired to be confident that the cost estimate is accurate to within  $\pm 10\%$  of the actual cost to implement the measure. This level of accuracy is desirable and expected<sup>75</sup> but not mandatory.

The cost to be recorded in Eligible Measures Register will be that funded by the Living Murray Initiative. This estimate will take into account cost sharing arrangements with other potential contributors (eg. from State governments, or other programs)<sup>76</sup>.

*Information to be provided in application.* Cost to implement measure and justification. Any proposed cost sharing arrangements would also be stated.

*Procedure to generate information.* Calculate the cost of the measure from detailed design phase, analysis of Expressions of Interest, or benchmarking of water market prices.

*Procedure to verify information.* For infrastructure based projects, evaluate construction plan and schedule and compare basis of cost estimates to those from other similar measures. For market based measures, review information provided on application form and method used to calculate total cost.

## **14. Cost per volume<sup>77</sup>**

*Introduction.* The cost estimate for a Eligible Measures Register listing is expected to be accurate to within  $\pm 10\%$  of the post-implementation cost.

*Information to be listed on Eligible Measures Register.* Cost in \$ per ML.

*Procedure to generate information.* This is calculated by dividing the '12. Cost to implement measure' by the '9. Indicative volume for accreditation' – expressed in \$/ML.

*Procedure to verify information.* Repeat the above calculation.

---

<sup>73</sup> Business Plan - clause 3. These outcomes are in the Communique from the Ministerial Council meeting in November 2003, at which the First Step Decision was made.

<sup>74</sup> Business Plan, Annex B

<sup>75</sup> Business Plan, Annex B

<sup>76</sup> The cost sharing arrangements for those measures listed on the Eligible Measures Register under clause 36 of the Intergovernmental Agreement might be quite different to other measures.

<sup>77</sup> Business Plan, Annex B

## 15. Consultation<sup>78</sup>

*Introduction.* Community consultation is required in the development and implementation of water recovery measures<sup>79</sup>. This consultation is used to assist in the development of the measure and to identify issues associated with the implementation of the measure. The scale of consultation should match the scale of the measure.

Depending on the scale of the measure, groups that may be consulted include: water authorities; irrigators directly involved in the measure or agents for them; other irrigators in the system; irrigation companies; commodity groups; processing companies and commercial fishers; the local community; other rural and urban communities inside and outside the Murray-Darling Basin and metropolitan areas; Indigenous nations, Indigenous agencies and Councils; service businesses – financial and rural services, tourism and recreation; Government – Commonwealth, State/Territory, and local; MDBC; catchment authorities; Environment – national, regional, local groups/interests; Technical – scientists, engineers, environmental and social scientists, economists, farm managers, agronomists and horticulturists.

*Information to be provided in application.* The application form will include an overview of what stakeholder consultation has been undertaken, and advice from the host jurisdiction on whether consultation associated with a water recovery measure is adequate.

*Procedure to generate information.* In the context of the scale of the measure, consideration could be given to, but not limited to, the following questions:

1. In the development of the water recovery measure:
  - a. Has there been consultation with those individuals, groups and/or stakeholders directly and significantly impacted or materially interested in the water recovery measure?
  - b. Has the level of consultation been appropriate to the type and scale of the proposed water recovery measure?
  - c. Have opportunities been provided for community input into the development of the water recovery measure?
  - d. Have key community concerns been identified, and has an adequate attempt been made to address these concerns in the development of the water recovery measure?
  - e. Has appropriate information been provided to individuals, groups and/or stakeholders in relation to the water recovery measure within agreed timeframes?
  - f. Does the consultation that has been undertaken meet the legislative requirements for consultation within the specific jurisdiction?
2. For the future implementation of the water recovery measure, has an appropriate community consultation strategy, if needed, been developed?

If requested, the proponent is to provide evidence of consultation to the host jurisdiction for consideration.

*Procedure to verify information.* Review of information provided on the application.

---

<sup>78</sup> Intergovernmental Agreement - clause 74. Business Plan - clauses 26, 170, 171, 173. Business Plan – Annex B.

<sup>79</sup> Business Plan, Clause 171

## 16. Social impacts<sup>80</sup>

*Introduction.* The definition of social impacts in this context refers to the positive and negative effects on individuals and communities as a consequence of implementing a water recovery measure. Examples of social impacts are: how irrigators respond to changes to water availability and how irrigation companies and local communities are impacted. The term 'social impacts' is inclusive of cultural impacts (to the extent these are related to water recovery projects) and also includes any changes in the values, attitudes and beliefs that people may hold. The scale of social impact assessment should match the scale of the measure.

*Information to be listed on Eligible Measures Register.* 'Positive impact', 'Neutral impact', or 'Negative impact'.

*Information to be provided in application.* Depending on the scale and type of measure, the application form will contain information from the assessment of social impacts for each of the stages of social impact assessment: scoping, baseline assessment, prediction, mitigation, acceptability, and monitoring. The amount of detail will depend upon the scale of the water recovery measure and the associated scale of social impacts – for small measures it may be justifiable to not undertake all of these stages.

*Procedure to generate information.* The host jurisdiction will advise whether the social impacts associated with a water recovery measure are acceptable after considering the type of measure and the following:

*Scoping:* Have the appropriate range of individuals, stakeholders and communities been consulted? Has sufficient relevant literature been reviewed to identify and describe potential social impacts associated with the water recovery measure?

*Baseline assessment:* Has a description (eg. the number of irrigators impacted, the type and magnitude of impact) been provided of individuals, communities and/or social groups that may be potentially impacted by the water recovery measure?

*Prediction:* Are there potential significant social impacts associated with the water recovery measure, and what is the magnitude of these impacts?

*Mitigation:* Have appropriate mitigation strategies been identified to ease potential significant social impacts? (e.g. agreed safeguards relating to market based measures)

*Acceptability:* After the introduction of any mitigation measures, would the remaining social impacts be considered by the broader community to be minimal or reasonable?

*Monitoring:* Have procedures been described to monitor potential social impacts after the water recovery measure has been implemented? These procedures should provide information on the effectiveness of mitigation strategies.

If the measure is not being proposed to occur solely in the proponents' jurisdiction, the proponent is to provide the above information to other host jurisdictions for consideration of social impacts.

*Procedure to verify information.* Review documentation provided and assess using the indicators described above and recommendations of the host jurisdiction.

## 17. Economic impacts<sup>81</sup>

*Introduction.* The Business Plan requires an adequate analysis of key economic impacts associated with water recovery measures which should match standard practice and the scale of the project. This will include: clear identification of possible **significant** costs and benefits relative to maintenance of the status quo, how these impacts would be monitored, and design of appropriate mitigation strategies.

---

<sup>80</sup> Intergovernmental Agreement, clause 33.

<sup>81</sup> Business Plan - Annex B

Key economic impacts may be associated with agricultural production; tourism; the initial and on-going investment in the measure; salinity; and recreation.

*Information to be listed on Eligible Measures Register.* 'Assessment incomplete'; 'Insignificant economic impact' or 'Significant economic impact'.

*Information to be provided in application.* Likely level of impact and a brief description of the methodology used to assess the economic impacts, including the use of best practice economic methods, and the results of the analysis.

*Procedure to generate information.* For those economic impacts that are individually expected to be significant (as a suggestion, greater than 5% of the total cost to implement the measure), calculate the economic impact using the best practice methods (using discount rate of 4% over 30 year return period). If the aggregate of the individual economic impacts is a cost or benefit of greater than 10% of the total cost to implement the measure, then enter 'significant economic impact', otherwise enter 'insignificant economic impact' if all key economic impacts have been analysed.

Analysis will include estimation of the costs to implement the measure minus those due to not implementing the measure. For example – if a pipeline project is to be implemented in place of an unlined canal that will provide water saving efficiencies, there will be capital and recurrent costs due to the implementation of the project over the period of evaluation. Similarly there would be capital and recurrent costs due to retaining the canal over the same period. The financial impact is the difference between the two costs.

*Procedure to verify information.* Review information / report provided by the proponent. Compare to standard practice.

## **18. Cost of equivalent entitlement in the market<sup>82</sup>**

*Information to be listed on Eligible Measures Register.* The cost per ML for standard water entitlements, or 'not available' for reliability profiles described as 'other'.

*Information to be provided in application*

The cost per ML of equivalent entitlement in the marketplace or, if no equivalent entitlement, an estimate of a market cost based on the composition of the entitlement and the cost of other entitlements and the basis of estimate.

*Procedure to generate information.* If the reliability profile associated with the water recovery measure is similar to a standard water entitlement, the cost per ML would be estimated by reference to prices of water entitlements on existing water exchanges (eg. Watermove for water entitlements in northern Victoria). If the reliability profile is dissimilar to a standard water entitlement, then estimate the cost by creating a hybrid of multiple water reliability profiles and associated prices (i.e. some sort of a weighted average) or suggest an alternative method.

*Procedure to verify information.* Review selection/s and costs by referring to entry for '10. Reliability profile' and the data sources and methodology to calculate the cost estimate.

## **19. Indicative financial crediting amount<sup>83</sup>**

*Introduction.* Measures listed on the Eligible Measures Register will include agreed indicative financial and volumetric crediting amounts. (The indicative volume for accreditation is considered previously in '9. Indicative volume for accreditation'.)

---

<sup>82</sup> Intergovernmental Agreement – clause 38. Business Plan – Annex B

<sup>83</sup> Business Plan - clauses 58, 71, 96, 100 and 102.

The indicative financial crediting amount will be assigned at the time that Ministerial Council agrees to list the measure on the Eligible Measures Register. A final crediting amount for the measure will be agreed by the Ministerial Council following implementation<sup>84</sup>. Ministerial Council can agree that there can be a difference between the cost to implement a water recovery measure and how much is credited against indicative investment targets, but this would be an exception.

*Information to be listed on Eligible Measures Register.* Indicative financial crediting amount (eg. \$5m).

*Information to be provided in application.* Proposed indicative financial crediting amount. Justification of any difference between the proposed indicative financial crediting amount and the cost in '12. Cost to implement measure'.

*Procedure to generate information.* Proponent decides how much of the cost to implement the measure will be sought for accreditation.

*Procedure to verify information.* Not applicable. The indicative financial crediting amount is by Ministerial Council<sup>85</sup>.

## **20. Salinity impact (EC at year of implementation)<sup>86</sup>**

*Introduction.* Salinity impacts, both positive and negative, may result from many water recovery projects. For example, purchase of water entitlements in high impact zones could result in both the recovery of water and salinity benefits.

*Information to be listed on Eligible Measures Register.* An estimate of the equivalent EC impact at Morgan from best practice modelling. (It is recognised that this will be assumption based).

*Information to be provided in application*

1. The likely EC impact at Morgan, together with a brief description of the modelling approach implemented, including assumptions.
2. Any additional information on changes to the spatial and temporal patterns of salinity as a result of the implementation of the water recovery measure.

*Procedure to generate information.* Implement the approach outlined in **Box 1** to calculate the average EC difference at Morgan. Proponents requiring assistance with hydrological modelling should refer to **Box 1** or contact the MDBC office.

*Procedure to verify information.* Review the modelling reports and, if required, seek additional information from the MDBC modellers.

---

<sup>84</sup> Business Plan – clause 100

<sup>85</sup> Business Plan – clause 71

<sup>86</sup> Intergovernmental Agreement – clause 33. Business Plan, clause 74. MDBC, Basin Salinity Management Strategy (BSMS), Guidelines, Version 1, 19 May 2003) - the equivalent EC impact at Morgan is a 'currency' in the Basin Salinity Management Strategy. Morgan, SA is the standard location for measurement of salinity impacts. The effect of the water recovery measure could be estimated relative to the benchmarks in the Basin Salinity Management Strategy in due course.

## 21. Water quality outcomes<sup>87</sup>

*Introduction.* The Business Plan requires the analysis of water quality impacts and assessment of whether or not the impacts are acceptable. Water quality parameters of primary concern (excluding salinity, which is considered separately) are nutrients and turbidity.

If the implementation of the measure would result in a deterioration of water quality, then there may be an offset designed and incorporated that improves the water quality. The cost of the offset would be included in the cost of the measure. Some of these offsets may be provided at the source of the water recovery, some may be provided at other sites.

*Information to be listed on Eligible Measures Register.* Either: 'negligible change', 'some improvement' or 'significant improvement'.

*Information to be provided in application.* Category of water quality outcome together with justification of why the category was selected, and a description of any offsets / mitigation measures needed.

*Procedure to generate information.* Analysis of potential water quality benefits and impacts (which may include a preparation of an Environmental Impact Statement or a Review of Environmental Factors). This could include review of:

- available water quality and hydrological data and existing reports following the implementation of other similar water recovery measures; and
- predictions for water quality associated with other water recovery measures.

*Procedure to verify information.* Review information provided in application, and if required, seek advice from other experts.

## 22. Additional environmental impacts<sup>88</sup>

*Introduction.* An analysis of any additional environmental impacts is required for listings on the Eligible Measures Register. For a project to proceed it will have to meet environmental planning requirements in Commonwealth, State (or Territory) and local government jurisdictions.

*Information to be listed on Eligible Measures Register.* Either: 'negligible impact'; 'significant benefit'; or 'significant deterioration'.

*Information to be provided in application*

1. Expected level of impact and specific impacts on the types of flora and fauna species, and ecological communities likely to be affected.
2. In the event of significant adverse environmental impacts, a description of environmental management strategies and the basis by which they were selected.

*Procedure to generate information.* Assess the impacts of the changed hydrologic and hydraulic regime on flora and fauna due to the project. This could be documented in a Review of Environmental Factors (or equivalent if appropriate). Identify whether a more detailed assessment or analysis (e.g. Environmental Impact Statement) is required. The impact assessment should consider:

---

<sup>87</sup> Intergovernmental Agreement – clause 33. Business Plan – clause 74, Annex B. Murray-Darling Basin Agreement – clauses 45 and 46. At Ministerial Council meeting 9 – 31 August 1990, the Council formally adopted as policy the following: *To maintain, and where necessary, improve existing water quality in the rivers of the Murray-Darling Basin for all beneficial uses – agricultural, environmental, urban, industrial and recreational: in the case of those parameters such as salinity and nutrients which are already recognised as causing problems, the policy is to improve existing water quality; in the case of other parameters which may at the moment be well below recognised limits, the policy is to endeavour to ensure that existing quality is not allowed to deteriorate.* This central principle of either improving or maintaining has since guided all recommendations and representations made by the Commission under Clauses 45 and 46 of the Agreement.

<sup>88</sup> Business Plan - Annex B. Annex C contains the terms of reference of the Environmental Watering Group

1. the area that would be affected by the implementation of the water recovery measure;
2. whether the area is already highly modified and/or of low environmental value (this may be the case for many irrigation canals);
3. whether there are any flora and fauna species or ecological communities that may be adversely affected by the recovery of water. These would be those listed as rare, vulnerable, endangered or critically endangered as a result of the implementation of the measure (for example, by reviewing map based databases of rare and threatened species); and
4. whether the source is listed as being of International, National, State or regional significance.

*Procedure to verify information.* Consult with the Commonwealth Department of Environment, Water, Heritage and the Arts, the host jurisdiction, any relevant State Departments, and/or the Environmental Delivery Team within the MDBC office. Seek advice from the Environmental Watering Group.

### **23. Third party impacts<sup>89</sup>**

*Introduction.* The definition of third party impacts in this context relates to how the implementation of a water recovery measure would result in a change of the reliability of entitlements held by third parties (ie. those not involved in the transaction). This definition is quite specific. The social impacts is a broader category than the third party impacts as defined here.

*Information to be listed on Eligible Measures Register.* ‘Negligible impact’ or ‘significant impact’.

*Information to be provided in application.* The anticipated level of impact together with supplementary detail on the analysis of third party impacts – based on any changes to reliability profiles from hydrological modelling.

*Procedure to generate information.* The host jurisdiction will advise whether third party impacts associated with a water recovery measure are acceptable after considering the extent of any changes in the reliability of the impacted water entitlements.

The host jurisdiction will advise whether ‘negligible impact’ or ‘significant impact’ is registered on the Eligible Measures Register. Further detail will be provided on the application form.

Proponents requiring assistance with hydrological modelling should refer to **Box 1**.

*Procedure to verify information.* Review results of the hydrological modelling used to assess third party impacts.

### **24. Risks associated with implementation<sup>90</sup>**

Use the guideline associated with the Developmental Register in section 2.2. Additionally, at this stage, there may be risks associated with finalising the runs in the hydrological modelling as these affect the volumes of water recovery associated with a water recovery measure.

### **25. Data files used in the hydrological analysis in the assessment**

*Information to be listed on Eligible Measures Register.* Name of model used in the hydrological assessment and ‘list supplied’.

*Information to be provided in application.* Name of model used in the hydrological assessment. List references and also primary data sources and files.

*Procedure to generate information.* Proponent to provide list of references and primary data sources and files in the required format.

---

<sup>89</sup> Intergovernmental Agreement – clause 33. Business Plan – Annex B

<sup>90</sup> Business Plan - Annex B

## 4 Guidelines relating to the Environmental Water Register

### 4.1 Introduction

Clauses 99 and 100 of the Business Plan state:

*On receipt of a Notice of completion from the relevant Investor Board, the Water Recovery Working Group will commission an independent post-implementation review of the actual project cost and volume of water recovered. The process for accreditation of the actual cost and volume of the project is set out in Figure 5.*

*The MDB Ministerial Council will consider the outcomes of the post-implementation review, and agree a final crediting amount for the measure. This process will ensure that measures are credited for actual water recovered rather than a pre-implementation estimate.*

Many of the details for listing on the Environmental Water Register can be provided after consideration by the Ministerial Council (as shown on **Figure 4**) as the post-implementation review focuses on cost and volume.

The Business Plan also requires that a satisfactory monitoring and evaluation program has been established that allows assessment of “...the success and impacts of [the] different water recovery approaches...”<sup>91</sup>. This will also be included in the post-implementation review.

Upon agreement of a final crediting amount by the Ministerial Council, the proponent and MDBC office will determine all other details required for listing of the measure on the Environmental Water Register.

A procedure to list, on an interim basis, parts of water recovery projects on the Environmental Water Register has been agreed by the jurisdictions and is at **Appendix 6**.

### 4.2 Process for accreditation and listing on the Environmental Water Register

The process for final accreditation and listing of measures on the Environmental Water Register is shown in **Figure 4**. Those involved in assessing an application to list on the Environmental Water Register are independent reviewers, the Water Recovery Working Group, the Living Murray Committee, the MDBC, and Ministerial Council. Ultimately, it is the decision of the Ministerial Council whether to list or not list a measure on the Environmental Water Register.

It is the responsibility of the proponent to develop and submit an application to the central register with all details required for review and accreditation (**Appendix 4**) following receipt of the Notice of Completion from the Investor Board<sup>92</sup>.

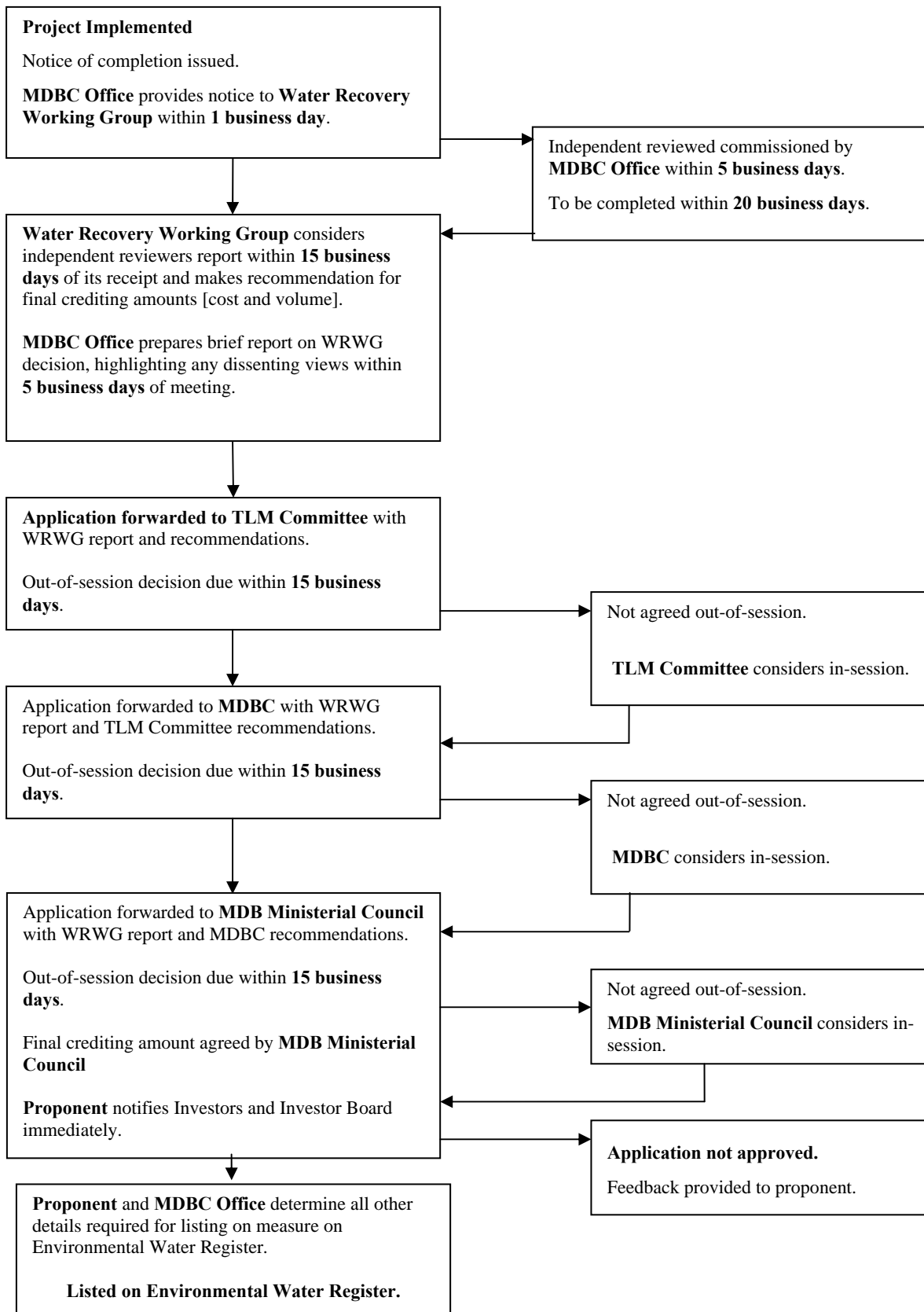
Following final accreditation of the measure, details required for listing on the Environmental Water Register will be specified by the proponent and MDBC office as per **Figure 4**.

---

<sup>91</sup> Business Plan – Clause 195 and Figure 5.

<sup>92</sup> To obtain a Notice of Completion, the proponent is required to submit a Proponent Completion Notice to the Investor Board for consideration.

**Figure 4 - Process for final accreditation and listing measures on the Eligible Measures Register<sup>93</sup>**



<sup>93</sup> Business Plan – Figure 6

### 4.3 Guidelines for the post-implementation review and final accreditation

The post-implementation review will verify the actual volumes of water recovered and the costs incurred in implementing the measure. Much of the data needed to populate the Environmental Water Register would be directly transferable from the Eligible Measures Register. Once the review has been completed, the information in the form in **Appendix 4** will be transferred to the Environmental Water Register. Guidance on completing the form is provided below.

The proponent will also provide a proposed monitoring and evaluation program associated with the measure. This is not intended to be onerous, and could tap into other monitoring programs within and by jurisdictions.

#### **a) Water recovery measure title, proponent, type of measure**

Copy from Eligible Measures Register or, if different, highlight any changes from the application to list on the Eligible Measures Register.

#### **b) Financial crediting amount**

*Introduction.* The final financial crediting amount is the net present value over 30 years and 4% discount rate of the actual cost to implement the measure (which must be within +/- 10% of the indicative crediting amount)<sup>94</sup>. The actual cost includes up-front capital costs and future operating and maintenance costs. Guidance on calculating the net present value is provided in the Developmental Register guidelines '8. Cost to implement a measure'. Note: there may be some ongoing operating costs which cannot be capitalised as one-off costs. Any such costs should be stated on the application form.

*Information to be listed on the Environmental Water Register.* Cost for the measure, calculated as the net present value for a 30 year life using a discount rate of 4%.

*Information to be provided in application.* A breakdown of significant costs, along with a schedule as used to calculate the net present value. Much of this may be in an auditors' report. Include details of the significant calculations. All of the costs may be up-front. Supporting information could be attached. Provide evidence of the actual implementation financial costs and benefits<sup>95</sup> and provide estimates along with a justification and a schedule for the operation, maintenance, monitoring and management costs for the 30 year period following commissioning. Any ongoing operating costs which cannot be capitalised in a one-off up-front cost should be identified. Where the cost is outside +/- 10% of the indicative financial crediting amount listed on the Eligible Measures Register, a brief explanation should be provided.

*Procedure to generate information.* Refer to guideline for listing on the Eligible Measures Register.

*Procedure to verify information (by those groups assessing the application as per Figure 4).* Review all the provided documentation and identify any gaps, then calculate the net present value for the actual cost of the measure.

For infrastructure measures. The independent reviewers will consider cost calculations based on construction costs and, if relevant, the proposed operation and maintenance schedules. The independent reviewers may provide comments on the "reasonableness" of costs (including cost sharing arrangements),

---

<sup>94</sup> Business Plan, Annex B

<sup>95</sup> Note: Benefits may include cost savings, proceeds for disposal of assets.

the design report (including as-built drawings with final quantities of materials) the commissioning report, the proposed operation and maintenance schedules, and any reports from audits commissioned by the Investor Board. If needed, the reviewer will undertake an inspection of the works.

For non-infrastructure measures. This is a similar process to above. The independent reviewers will review the documentation of the implementation costs of the measure for reasonableness.

### **c) Volume recovered**

*Introduction.* The volume recovered is the volume at the source of recovery (in Long Term Cap Equivalent<sup>96</sup>) except where water recovered is delivered as an unregulated flow<sup>97</sup>. In the latter instance, the volume recovered will be calculated at the River Murray channel.

Where there have been any changes during implementation which may have affected the net volume recovered, the best practice modelling<sup>98</sup> must be repeated with these changes included. The version of the model accredited at the time listing on the Eligible Measures Register is to be used to determine the volume of water recovered.

*Information to be listed on the Environmental Water Register (following accreditation by the Ministerial Council)*

The volumes recovered (GL) at various locations including the:

- i) estimated average long term annual volume to be recovered at source (LTCE<sup>99</sup>);
- ii) estimated average long term annual volume to be recovered at Murray; and,
- iii) estimated annual volume callable from storage.

*Information to be provided in application.* If volume is unchanged from the pre-implementation estimate, provide a brief justification with reference to all supporting documentation including previous application for Eligible Measures Register listing and independent review completed at that time.

If volume is changed, provide relevant documentation as per Eligible Measures Register guideline – 5. *Volume at Source.* The post-implementation design report and any other supporting information would accompany the application for listing.

#### *Procedure to generate information*

Infrastructure measures. If a water entitlement is provided for management under the Living Murray as part of an infrastructure measure, then the assessment of volume for an infrastructure measure is the same as for a market based measure (see below). Otherwise, if there is no significant difference in the design and operation or the storage and operational details (if the water is going to be stored and released), then refer to the application for listing on the Eligible Measures Register. Examples of significant differences between the pre and post-implementation specifications that may affect the volume are:

- i) a significant change to the layout, sizing and operation of the as-constructed measure compared to the design assessed previously;
- ii) the acquisition of new site survey or updated information (for example improved satellite imagery of wetlands that would allow a better quantification of evaporation losses); or,

---

<sup>96</sup> Long Term Cap Equivalent is defined in the Business Plan, Annex E, clause 14.

<sup>97</sup> Business Plan – clauses 108-110

<sup>98</sup> As per the Business Plan, Annex E, clause 15.

<sup>99</sup> Long Term Cap Equivalent

- iii) a change in analytical and modelling procedures for estimation which have been approved by the WRWG.

If there is a significant difference between the pre and post-implementation specifications, re-calculate the volume at the source, the volume at Murray and volume callable from storage using the procedure outlined in **Box 1**. The reference run created for the pre-implementation scenario must also be used for the post-implementation scenario. For further detail on the calculation method refer to Eligible Measures Register guideline – 5. *Volume at Source*.

Non-infrastructure measures. Multiply the quantity of entitlement by the relevant Cap Factor<sup>100</sup>.

*Procedure to verify information.* If volume is unchanged from the pre implementation assessment, review the justification. If volume is changed, review the application, post-implementation design report and supporting information, and modelling report. If required, consult with proponent or modellers<sup>101</sup>.

#### **d) How the water recovered has been secured**

*Information to be listed on the Environmental Water Register.* Either ‘standard entitlement’ or ‘other statutory instrument’.

*Information to be provided in application.* Provide details of statutory instruments that will permanently secure the recovered water entitlement. Attach documentation of any terms (eg. tenure) that will apply to the use of the water. If unchanged from Eligible Measures Register application, refer to this application.

*Procedure to verify information.* Check legal standing of statutory instruments and effect of terms (if any) on the use of the recovered water. Ensure that it is clear that the water entitlement is for management under the Living Murray.

#### **e) Reliability profile**

*Information to be listed on the Environmental Water Register.* As for listing on the Developmental Register, and the Eligible Measures Register.

*Information to be provided in application.* Reliability profile of completed project and justification for selection of this profile. If unchanged from listing on the Eligible Measures Register, a reference to this application and associated independent review can be provided.

*Procedure to generate information.* If there is no significant change in the reliability of the measure, refer to the application for listing on the Eligible Measures Register, otherwise:

- i) if the measure involves a different standard water entitlement to that assessed previously for listing on the Eligible Measures Register, then the reliability profile for the measure will become the reliability profile for the new standard water entitlement; or,
- ii) if the measure involves a non-standard water entitlement, the reliability profile is to be re-estimated by repeating modelling as described in section c) “Volume recovered” above.

Examples of titles of standard water entitlements are provided in section 6. *Reliability Profile* of the Developmental Register guidelines (section 2.2).

---

<sup>100</sup> Business Plan – Annex E

<sup>101</sup> Note: The review is required to be complete within 20 business days, therefore any questions will need to be provided and answered as quickly as possible.

*Procedure to verify information.* Review all information provided by the proponent, including justification for any changes to the reliability profile.

## **f) Monitoring and evaluation program**

*Introduction.* Monitoring of individual measures will be required<sup>102</sup> to assess the benefits and impacts associated with water recovery, to support the adaptive management of environmental water and to inform future water recovery priorities. Monitoring of individual measures may require:

- i) volumetric monitoring of water recovery associated with individual measures over time to build a knowledge base; and,
- ii) monitoring of any deleterious impacts upon tributaries or incidental environmental benefits from water recovery<sup>103</sup>.

*Information to be listed on the Environmental Water Register.* A brief description of the specific hydrological monitoring proposed for the measure.

*Information to be provided in application.* Details of a program for monitoring the measure including, but not limited to:

- i) whether any infrastructure is operated consistent with the design specifications (details of any management plan and asset register listings can be attached);
- ii) any proposed additional flow measurement (e.g. gauging stations);
- iii) any regime to monitor changes to the environmental condition at the source of water recovery; and,
- iv) any proposed programs to monitor social and economic impacts.

*Procedure to generate information.* Develop a monitoring and evaluation program for the measure that will enable assessment of actual volume recovered and any other significant issues. This program may draw on other existing monitoring programs for other purposes.

*Procedure to verify information.* Review proposed monitoring program and assess whether the program will fulfil the objectives stated with the monitoring plan.

## **g) Data files used in the hydrological analysis**

*Information to be listed on the Environmental Water Register.* Name of model used in the hydrological assessment and 'list supplied'.

*Information to be provided in application.* Name of best practice model used in the hydrological assessment, any modelling reports and list of references, primary data sources and files. Where there have been no changes from the application to list on the Eligible Measures Register, a reference to that application is all that is required.

*Procedure to generate information.* As per Eligible Measures Register guideline '25. Data files used in the hydrological analysis in the assessment'.

---

<sup>102</sup> Business Plan – clauses 195, 198.

<sup>103</sup> Business Plan, Clause 195

*Procedure to verify information.* As per Eligible Measures Register guideline '25. *Data files used in the hydrological analysis in the assessment*'. Review any changes since listing on the Eligible Measures Register.

#### 4.4 Guidelines for additional information required for listing on the Environmental Water Register

Clauses 156 and 157 of the Business Plan state:

*'Water recovered for the environment, including both 'new e-water' and 'old e-water' recovered since 1993-94, will be acknowledged on environmental water registers once the measure has been implemented. Registers will be maintained in the State or Territory where the water is recovered and at an aggregated scale for the Living Murray initiative by the MDB Commission Office.*

*The Environmental Water Registers, at both scales, will include the following information associated with the recovered environmental water:*

- (a) source of water recovered;*
- (b) estimated average volume delivered to the River Murray Channel;*
- (c) Long Term Cap Equivalent volumes;*
- (d) Volume callable from storage;*
- (e) associated Cap impact in tributaries, where relevant;*
- (f) security and reliability characteristics;*
- (g) channel capacity sharing characteristics;*
- (h) type of water recovered (regulated or unregulated);*
- (i) storage/call location(s) of regulated water;*
- (j) geographic limitations on its application the six Icon Sites; and*
- (k) trading of environmental water where appropriate.*

Of the above items, b), c), d), f), h) and i) have been provided via the application for accreditation process (section 4.3). The remaining items required for listing on the Environmental Water Register are to be determined by the proponent and MDBC Office, as per Figure 6 of the Business Plan. **Table 1** shows the columns of the central register which are to be completed for listings on the Environmental Water Register.

#### **Volumetric Crediting Amount**

*Information to be listed on the Environmental Water Register.* Accredited volume as agreed by the Ministerial Council.

#### **Financial Crediting Amount**

*Information to be listed on the Environmental Water Register.* Accredited cost as agreed by the Ministerial Council.

## Associated Cap impact in tributaries

*Information to be listed on the Environmental Water Register.* Details of any Cap impact / adjustment in tributaries<sup>104</sup>.

*Procedure to generate information.* Review outputs from hydrological modelling undertaken as per **Box 1** and assess potential impacts. Advice / interpretation can be sought from MDBC modellers.

## Source of water recovered

*Introduction.* The source of the recovered water entitlement is the location (normally river valley) where the measure has been implemented<sup>105</sup>. Water recovered will be credited against financial and volumetric targets at the source of recovery, except where water recovered is delivered as an unregulated flow, where it will be credited against financial and volumetric targets at the River Murray channel and will be accounted for at the tributary gauging station closest to the River Murray channel.

For water recovered in the ACT, the source of recovery is defined as Halls Crossing<sup>106</sup>.

*Information to be listed on the Environmental Water Register.* Source of water recovered (river valley) or where unregulated the appropriate location on the River Murray.

## Channel capacity sharing characteristics – Murray<sup>107</sup>

*Introduction.* During particular periods of operation, the capacity of the River Murray channel to deliver water can become limited<sup>108</sup>. Channel capacity constraints also occur in the Murrumbidgee and Goulburn river systems. In the absence of agreement, the access to channel capacity of water released under an environmental entitlement will be equivalent to that of the water entitlement from which it was sourced. Further consideration of channel access rules that could be beneficial for both the environment and consumptive users should be considered.

*Information to be listed on the Environmental Water Register.* ‘Likely constraint’ or ‘No likely constraint’ (default unless believed otherwise)

*Procedure to generate information.* The MDBC, in consultation with the Environmental Watering Group, will assess the potential for implementation of the measure to cause channel constraints. This will include consideration of:

- i) how water is likely to be managed under the *Living Murray Environmental Watering Plan* (if that information is available);
- ii) the period(s) when constraints are likely;
- iii) the limitation to environmental releases during these periods;
- iv) impacts of the constraint; and,
- v) definition of MSM-Bigmod model run used for the assessment (if the model is used).

---

<sup>104</sup> Business Plan – clause 165

<sup>105</sup> Business Plan - clauses 108-110

<sup>106</sup> Business Plan – clause 109

<sup>107</sup> This parameter relates to both water recovery and subsequent use

<sup>108</sup> Business Plan, Annex E – clause 33

As it will be difficult to isolate this information for a single water recovery measure, the default of “no likely constraint” should be used, unless sufficient justification can be provided otherwise. Where a constraint is identified, a short report will be prepared and referenced in the Environmental Water Register.

### **Channel capacity sharing characteristics – tributary<sup>109</sup>**

*Information to be listed on the Environmental Water Register.* ‘Likely constraint’ or ‘No likely constraint’.

*Procedure to generate information.* As for “Channel capacity sharing characteristics – Murray”. Potential tributary constraints could be assessed by DWE or DECC in NSW, or DSE in Victoria.

### **Type of water recovered (regulated or unregulated)**

*Introduction.* Regulated systems are defined as watercourses that have their flows regulated by government-constructed dams, weirs or water storage schemes. The term ‘*regulated*’, in relation to listings on the Environmental Water Register, refers to water that is supplied from a system with one or more major storages and can be ordered or “called” on either by releasing from storage or by supplying at a nominated diversion point.

Unregulated systems are defined as watercourses in which flows are not regulated by dams, weirs or water storage schemes. A specific volume of water may be allocated but there can be no guarantee that the volume will still be available or supplied in any one year. The term ‘*unregulated*’, in relation to listings on the Environmental Water Register, refers to water that is supplied from an unregulated water system **or** water that is supplied from a regulated water system, but only during periods of declared “surplus” flows in the system.

*Information to be listed on the Environmental Water Register.* ‘Regulated’, ‘unregulated’ or ‘proportion regulated’.

*Procedure to generate information.* Determine type of water recovered based on the above criteria<sup>110</sup>. If appropriate, provide a statement supporting the nominated type consistent with the above definitions. This statement will be referenced from the Environmental Water Register and stored electronically.

### **Storage / call location(s) of regulated water**

*Information to be listed on the Environmental Water Register.* Names of storage/call location(s) for the measure.

*Procedure to generate information.* Determine nominated storage/call location(s) for the measure consistent with operation of the measure and the *Living Murray Environmental Watering Plan*.

### **Geographic limitations on application of water to the six Icon Sites<sup>111</sup>**

*Information to be listed on the Environmental Water Register.* Identification and description of any geographic limitations.

*Procedure to generate information.* Determine any constraints in consultation with the Environmental Watering Group and River Murray Water production team.

---

<sup>109</sup> This parameter relates to both water recovery and subsequent use

<sup>110</sup> Business Plan – glossary of terms

<sup>111</sup> This parameter relates to both water recovery and subsequent use

**Rules associated with trading of environmental water where appropriate<sup>112</sup>**

*Information to be listed on the Environmental Water Register.* Rules / constraints for trade of the water.

*Procedure to generate information.* Determine any trading rules in consultation the Environmental Watering Group and other jurisdictional and MDBC programs. These rules will be in a protocol for trade of environmental water in the Living Murray<sup>113</sup>.

---

<sup>112</sup> Relates to use of the water, rather than recovery of the water

<sup>113</sup> Business Plan, clause 150.

## Glossary of terms<sup>114</sup>

**Access characteristics** – The conditions under which the entitlement holder can access allocations. These will vary across States and the Territories, water management areas or source. Characteristics may govern timing and volume and other circumstances as required. This relates to the reliability profile of an entitlement.

**Allocation** - An allocation is the water available in a year based on a water access entitlement.

**Business day** – A day on which banks are open for business in the State or Territory in which the project is being undertaken, and if the project is being undertaken in more than one State or Territory, a day on which banks are open for business in the State or Territory of the proponent, excluding a Saturday, Sunday or public holiday.

**Business Plan** – The Living Murray Business Plan approved by the Ministerial Council at meeting 42 – 25 May 2007.

**Cap Factor** – The ratio between entitlement and Long Term Cap Equivalent (LTCE)<sup>115</sup>.

**Developmental Register** – Register of water recovery measures which have undergone a feasibility study, and are considered likely to meet the criteria for listing on the Eligible Measures Register in the future.

**Eligible Measures Register** – Register of accredited water recovery measures that are deemed investment-ready under the Intergovernmental Agreement 2004.

**Entitlement** – An entitlement is a share of a particular water resource; i.e. the water available to entitlement holders in a valley. The notional volume attached to an entitlement is often the maximum annual allocation that can be applied, and is thus more than the water available on average.

**Environmental entitlement** – A firm, non-discretionary perpetual entitlement for environmental water created under relevant State/Territory legislation and subject to terms and conditions as agreed between governments to achieve the agreed environmental outcomes. Environmental entitlements may be either extractive or in-stream. The majority will be extractive

**Environmental Watering Group** – An advisory committee to prepare and keep up-to-date the Living Murray Environmental Watering Plan; to assess whether Living Murray Environmental Management Plan for each Icon Site is consistent with the Living Murray Environmental Watering Plan; and to prepare and supervise the implementation of the River Murray Channel Icon Site Environmental Management Plan.

**Environmental Water Register** – The register of completed water recovery measures with water available for use under the Living Murray Environmental Watering Plan.

**Final crediting amount** – Cost and volume at which investment in a water recovery measure will be accredited against water recovery and financial targets established in the Living Murray Business Plan.

**Host jurisdiction** – The State or Territory in which a water recovery measure would be implemented.

**Impact** – Positive or negative consequence as the result of an action, such as the implementation of a water recovery measure.

**Indicative crediting amount** – The cost and volume at which investment in a water recovery measure will be accredited against water recovery and financial targets established in the Living Murray Business Plan up until a final crediting amount is established.

---

<sup>114</sup> The majority of the terms have been drawn directly from the glossary in the Business Plan.

<sup>115</sup> Business Plan, Annex E, clause 19

**Inside Cap (Share)** – An entitlement for which water use is counted as use by a State under Schedule F of the *Murray-Darling Basin Agreement* contributing to the Long Term Diversion Cap.

**In-stream entitlement** – an entitlement which requires a particular flow to be passed at a particular point in a waterway, or which allows alteration to the timing of flow in a waterway. There is no entitlement to extract water from the waterway, and use does not count under the Cap. Examples are minimum flows downstream of dams, and the Barmah-Millewa environmental water entitlement.

**Intergovernmental Agreement 2004 or The Living Murray IGA** – The *Intergovernmental Agreement on Addressing Water Overallocation and Achieving Environmental Objectives in the Murray-Darling Basin* between the Commonwealth of Australia and the Governments of New South Wales, Victoria, South Australia and the Australian Capital Territory, signed at the Council of Australian Governments meeting on 25 June 2004, as supplemented by the Supplementary Agreement on Addressing Water Over allocation and Achieving Environmental Objectives in the Murray-Darling Basin between the Commonwealth of Australia and Governments of New South Wales, Victoria, South Australia and the Australian Capital Territory, signed at the Council of Australian Governments meeting on 14 July 2006.

**Investment Agreement under the Living Murray Initiative** – The investment agreement as agreed between each investor for each particular water recovery measure.

**Investor Board** – The board established by the Proponent to undertake all tasks set out in clause 5.2 of the Investment Agreement under the Living Murray Initiative for a particular measure.

**Jurisdiction** – In the context of the Living Murray Environmental Watering Plan, the Commonwealth of Australia, New South Wales, Victoria, South Australia and the Australian Capital Territory.

**Living Murray Committee** – Provides advice to the Murray-Darling Basin Commission on the Living Murray. Receives advice from the Water Recovery Working Group and the Environmental Watering Group.

**Living Murray Environmental Watering Plan** – the Basin Environmental Watering Plan referred to in Clause 58 of the Intergovernmental Agreement.

**Long Term Diversion Cap** – A reference to the total volume of water permitted to be diverted within the Murray-Darling Basin in line with the Ministerial Council's decision to limit diversions to 1993-94 levels of development.

**Long Term Cap Equivalent**<sup>116</sup> –The volume registered for a particular recovery work or measure calculated using the accepted best practice model for that system as the:

- (a) long-term average contribution to the Cap; or
- (b) potential contribution to the long-term average flows in the relevant river valley.

**Material interest** – Those that have a pecuniary interest in the implementation or outcome of a water recovery measure.

**Measures** – Includes strategies, plans and programs<sup>117</sup>. In regard to water recovery measures, a synonym with 'project'.

**Murray-Darling Basin Commission** - The MDBC is the executive arm of the Murray-Darling Basin Ministerial Council. It comprises an independent President, two Commissioners from each Contracting Government (ie the Commonwealth, NSW, Victoria, SA and Qld) and a representative of the ACT Government. Apart from the President, Commissioners are normally chief executives and senior executives of the agencies responsible for management of land, water and environmental

---

<sup>116</sup> Business Plan, Annex E, clause 14

<sup>117</sup> Murray-Darling Basin Agreement, clause 2

resources. The Council of Australian Governments has agreed in principle that the MDBC will become part of a Murray-Darling Basin Authority. The MDBC has an office as a secretariat.

**Murray-Darling Basin Ministerial Council** – Ministerial Council established under the *Murray-Darling Basin Agreement*, consisting of up to three Ministers from the Governments of the Commonwealth, New South Wales, Victoria, South Australia and Queensland with prime responsibility for matters relating to water, land and environment.

**New environmental water (“new e-water”)** – Water recovered for the environment through funding allocated under the Intergovernmental Agreement 2004 and Supplementary Agreement 2006.

**Old environmental water (“old e-water”)** – Water recovered for the environment prior to 29 August 2003.

**Ongoing cost** – Costs arising from the management, storage or delivery of water to achieve the agreed environmental objectives.

**Other new environmental water (“other new e-water”)** – Water recovered for the environment after 29 August 2003 and funded through investment other than the Intergovernmental Agreement 2004.

**Outside Cap (or Rule Based or In-stream)** – An entitlement for which water use is not accounted as use by a State under Schedule F of the *Murray-Darling Basin Agreement* and so is not counted within the Long Term Diversion Cap.

**Over-allocation** – Refers to situations where with full development of water access entitlements in a particular system, the total volume of water able to be extracted by entitlement holders at a given time exceeds the environmentally sustainable level of extraction for that system.

**Packages** – Has the same meaning as proposal, where a proposal may comprise a single water recovery measure or a number of identifiable measures.

**Place meanings** – Place meanings are the meanings that people give to places. Place meanings include the aesthetic, symbolic and spiritual, and are often accompanied by a strong emotive component.

**Regulated** – When used in the Environmental Water Register, this term refers to water that is supplied from a system that is regulated by one or more major storages and can be ordered or “called” on either to be released from storage or to be supplied at a nominated diversion point.

**Regulated systems** – Watercourses that have their flows regulated by Government constructed dams, weirs or water storage schemes.

**Reliability profile** - Reliability refers to the frequency with which an entitlement is supplied in full or rationed. Components of reliability are: frequency of restriction of access; severity of restrictions; minimum expected allocation; and the timing of allocation announcements.

**Stakeholders** – Includes all individuals and entities that have an interest in the implementation and/or outcomes of a water recovery measure.

**Statutory instrument** – A legally valid document issued under the provisions of an Act of Parliament.

**Supplementary Agreement 2006** – Second Intergovernmental Agreement relating to Murray-Darling Basin management, signed on 14 July 2006.

**Unregulated** – When used in the Environmental Register, this term refers to water that is supplied from an unregulated water system or water that is supplied from a regulated water system, but only during periods of declared “surplus” flows in the system.

**Unregulated systems** – Watercourses in which flows are not regulated by dams, weirs or water storage schemes. A specific volume of water may be allocated but there can be no guarantee that the volume will still be available or supplied in any one year.

**Volume callable** – The volume of water which can be extracted from a headwork's storage (typically Hume Reservoir for water recovery measures along the River Murray) for environmental use as a result of the water recovery measure without reducing water supply reliability of existing entitlements.

**Volume at Murray** – Average annual volume at the gauge closest to the River Murray (eg. Balranald on the Murrumbidgee River, McCoys Bridge on the Goulburn River).

**Volume at Source** – The average annual volume at the location at which water would be recovered (eg. an irrigation off-take, or a wetland).

**Volume at the South Australian border** - The average annual volume at the South Australian border.

**Water access entitlements** – A perpetual or ongoing entitlement to exclusive access to a share of water from a specified consumptive pool as defined in the relevant water plan<sup>118</sup>.

**Water Recovery Working Group (WRWG)** – The Water Recovery Working Group (WRWG)<sup>119</sup> is a high level, jurisdictional-based group established under the Business Plan. It has appropriate skills to provide technical assessment and advice on water recovery measures nominated for listing on the central register of water recovery measures. The group manages the independent auditing and completion certification of projects under the Intergovernmental Agreement.

---

<sup>118</sup> Definition from the National Water Initiative

<sup>119</sup> Business Plan, Annex C

## Appendix 1 – Sample table of contents of a feasibility study

The length and content of a feasibility study will be dependent on the scale and complexity of the measure. A justification for cost and volume estimates is required. If necessary, further supplementary information can be provided in other accompanying reports.

A sample table of contents for a feasibility study is shown in **Box A1.1**.

### **Box A1.1 - Sample table of contents of a feasibility study**

#### **Background**

#### **Description of current situation ('Do nothing' option)**

#### **Description of possible measure/s that will be investigated for water recovery**

#### **Methodology to assess water recovery potential**

#### **Assessment of measure**

- Advantages and disadvantages
- Consultation
- Cost to implement measure
- Volume of water which could be recovered

#### **Risks regarding any potential future implementation**

- Identification of all potentially significant risks

#### **Conclusions**

#### **Recommendations for further work**

## Appendix 2 – Application form for listing on the Developmental Register

For further detail, refer to the *Guidelines for proposed water recovery measures in the Living Murray, section 2.2.*

### 1. Water recovery measure title

<b>Measure title</b>
<b>Titles of identifiable subcomponents, if any</b>

### 2. Proponent

<b>Name of proponent</b>			
<b>Further details – eg. type of entity, contact details, trading name</b>			
CONTACT			
PHONE NUMBER		MOBILE NUMBER	
FAX NUMBER		E-MAIL ADDRESS	
POSTAL ADDRESS	ADDRESS		
	SUBURB/TOWN		
	STATE		POSTCODE
OFFICE ADDRESS	ADDRESS		
	SUBURB/TOWN		
	STATE		POSTCODE
TRADING NAME/S			
TYPE OF ENTITY			
OTHER DETAILS			

### 3. Type of water recovery measure

Type of water recovery measure
<i>Eg. infrastructure improvement, market based measure etc.</i>
Further details – eg. location, project description
<i>Insert description of project. This should include an overview of how the project would be implemented, further information required to develop the project, location, etc. A conceptual diagram could be provided for infrastructure-based projects. Refer to the feasibility study of the project where appropriate.</i>

#### 4. How water recovered would be secured if the water recovery measure was implemented

<b>Statutory instrument</b>
<i>(e.g. NSW - Water Sharing Plan for the NSW Murrumbidgee, Murray or Lower Darling Regulated Rivers Water Sources)</i>
<b>Name of the legislation under which the recovered water entitlement would be secured</b>
<i>The legislation under which the recovered water entitlement would be secured (e.g. Water Management Act, Water Resources Act etc.). Also, a brief description of how the water will be secured for environmental management if the measure is implemented; and any terms (eg. tenure) that will apply to the use of the water.</i>

#### 5. Volume at source

<b>GL</b>	<b>Agreed methodology used to calculate volume</b>
	<i>Provide description of methodology and / or refer to relevant section in attached feasibility study.</i>
	<b>Confidence level for estimated volume</b>
	<i>(e.g. +/- 20%)</i>

#### 6. Reliability profile

<i>Title of standard water entitlement closest to reliability profile from the measures– eg. NSW Murray General Security, and additional information that was used as the basis of selection</i>
--

## 7. Importance of the contribution to the Living Murray Environmental Watering Plan

*Priority of the water in achieving the objectives of the Living Murray Environmental Watering Plan. (e.g. high, medium, low) and a brief justification for this choice of priority*

## 8. Cost to implement measure

<b>Cost Component</b>	<b>NPV \$,000</b>	<b>Methodology/Supporting Documentation</b>
Capital cost or initial cost		<i>Refer to the relevant section of the feasibility study</i>
Future operation and maintenance cost		<i>Refer to the relevant section of the feasibility study</i>
<b>Total</b>		
<p>Timing of expenditure over 30 years.</p> <p>Details of proposed cost sharing arrangements (if applicable).</p> <p>Ongoing operational expenses not included in the cost estimate.</p>		

## 9. Cost per volume

*Provide cost per volume, estimate of accuracy range (eg.  $\pm 20\%$ ), and justification of accuracy range  
Refer to attached feasibility study where necessary*

## 10. Consultation

<b>Adequacy of consultation</b>
<i>Adequate or Inadequate.</i>

### Legislation and groups likely to be affected or materially interested

<b>Legislation</b>	<b>Materially interested group</b>	<b>Outcome of preliminary consultation <sup>§</sup></b>

*§ Agreement reached, or identify points of disagreement and any ongoing measures or steps to resolve differences. Reference to the attached feasibility study may be provided.*

### 11. Social impacts

<b>Adequacy of identification of social impacts</b>
<i>Adequate or inadequate</i>

<b>Methodology of assessment of social impacts</b>	
<i>Refer to appropriate section of feasibility study.</i>	
<b>Social group</b>	<b>Identified key impacts</b>

### 12. Economic impacts

<b>Adequacy of identification of economic impacts</b>
<i>Adequate or inadequate</i>
<b>Method of assessment of economic impacts</b>
<b>Economic impacts that may be assessed prior to listing on the Eligible Measures Register</b>
<i>List economic impacts requiring assessment</i>

### 13. Additional environmental impacts

<b>Environmental impact at the source of the water recovery measure</b>	
<i>Negligible impact, Significant benefit or Significant deterioration</i>	
<b>Type of flora and fauna species or ecological communities</b>	<b>Identified potential impact</b> <i>(negligible impact, significant benefit or significant deterioration)</i>

### 14. Risks associated with implementation

<b>Risk #</b>	<b>Risk</b>	<b>Likelihood</b>	<b>Severity</b>
1			
2			
3			
4			
5			

*Likelihood and severity to be scored as either 1 (low), 2 (medium), 3 (high)*

### 15. References where assumptions of the hydrological analysis can be found

*List all the references and data that provided assumptions used in the hydrological analysis in the feasibility study. Refer to attached feasibility study if applicable.*

## Appendix 3 – Application form for listing on the Eligible Measures Register

For further detail, refer to the *Guidelines for proposed water recovery measures in the Living Murray*, **section 3.3**.

### 1. Water recovery measure title

<b>Measure title</b>
<i>If appropriate, transfer from the Developmental Register</i>
<b>Titles of identifiable subcomponents, if any</b>

### 2. Proponent

<b>Name of Proponent</b>			
<b>Further details – eg. type of entity, contact details, trading names</b>			
CONTACT			
PHONE NUMBER		MOBILE NUMBER	
FAX NUMBER		E-MAIL ADDRESS	
POSTAL ADDRESS	ADDRESS		
	SUBURB/TOWN		
	STATE		POSTCODE
OFFICE ADDRESS	ADDRESS		
	SUBURB/TOWN		
	STATE		POSTCODE
TRADING NAME/S			
TYPE OF ENTITY			
OTHER DETAILS			

### 3. Type of water recovery measure

Type of water recovery measure
<b>Supplementary detail – location, project description, etc</b>
<i>Include the location and type of the measure, a description of the measure, an overview of how the measure would be implemented including the statutory approvals that would be required, the expected time from when the Investment Plan was finalised until water would be made available for environmental management, and any design drawings. Refer to attached supporting documentation for further detail (e.g. business case). (approx. 3-5 pages)</i>

#### 4. How water recovered would be secured if the water recovery measure was implemented

<b>Statutory instrument</b>
<i>(e.g. NSW - Water Sharing Plan for the NSW Murrumbidgee, Murray or Lower Darling Regulated Rivers Water Sources)</i>
<b>Name of the legislation under which the recovered water entitlement would be secured.</b>
<i>The legislation under which the recovered water entitlement would be secured (e.g. Water Management Act, Water Resources Act etc.). Also, a brief description of how the water will be secured for environmental management if the measure is implemented; and any terms (eg. tenure) that will apply to the use of the water.</i>

#### 5. Volume at source (GL)

<b>GL</b>	<b>Methodology of estimation</b>
	<i>If the source is not the River Murray, also provide an estimate of transmission losses that may occur in the delivery of water from the source to the River Murray and justification for selection of this estimate.</i>

#### 6 - 9. Volumes (GL)

	<b>GL</b>	<b>Name of hydrological model used for estimation</b>
6. Volume at Murray		<i>Either a best practice model MSM-Bigmod, REALM or IQQM, or the volume of entitlement multiplied by the relevant Cap Factor, together with justification for selection of the Cap Factor.</i>
7. Volume at South Australia		<i>Generally MSM-Bigmod</i>
8. Volume at the Barrages		<i>Generally MSM-Bigmod</i>
9. Volume callable from storage		<i>Either MSM-Bigmod, REALM or IQQM</i>

## 10. Indicative volume for accreditation

### GL

*If the water recovered is callable from storage, then copy the Volume at Source; if the water recovered results in an increase in unregulated flows then copy Volume at Murray from item 5 or 6 above. Note: if water recovered is to be shared by jurisdictions (e.g. wetland water recovery), then indicate indicative volumes for each jurisdiction on the basis of jurisdiction ownership prior to implementation and provide justification of any difference between the proposed indicative volumetric crediting amount and the volume in '5. Volume at source' or '6. Volume at Murray' (whichever is applicable).*

## 11. Reliability profile

### **Title of standard water entitlement closest to reliability profile**

*If there are no entitlements that are close to profile, list other*

### **Information that supports selection of reliability profile**

*If the reliability profile is different from a standard water entitlement, also insert the profile in here.*

## 12. Importance of the contribution to the Living Murray Environmental Watering Plan

*Priority of the water in achieving the objectives of the Living Murray Environmental Watering Plan. (e.g. high, medium, low) and a brief justification for this choice of priority*

## 13. Cost to implement measure

*Calculate the cost of the measure from detailed design phase, analysis of Expressions of Interest, or benchmarking of water market prices. Expected to be within +/- 10% of implemented cost.*

Cost Component	NPV \$,000	Methodology/Supporting Documentation*
Capital cost or initial cost		<i>* Refer to design and construction cost estimate; or initial cost estimate</i>
Future operation and maintenance cost		<i>* Refer to documentation of recurrent cost estimate</i>
Total		-
Timing of expenditure over 30 years		
Details of proposed cost sharing arrangements (if applicable).		

## 14. Cost per volume

*Provide cost per volume, estimate of accuracy range (eg.  $\pm 10\%$ ), and justification of accuracy range (eg: sensitivity analysis)*

## 15. Consultation

### Adequacy of consultation

*Adequate or Inadequate. Attach a statement from the host jurisdiction advising whether the consultation associated with the water recovery measure has been adequate in the context of the Business Plan.*

### Detail of consultation

*Provide details of all consultation undertaken, or refer to attachment, to enable reviewers to assess adequacy.*

Group	Details and outcomes of consultation

## 16. Social impacts

### Adequacy of identification of social impacts

*Adequate or Inadequate. Attach a statement from the host jurisdiction advising whether the assessment of the social impacts associated with the water recovery measure is considered adequate in the context of the Business Plan and whether these impacts are likely to be acceptable.*

### Summary from social impact assessment

*Insert summary here or reference attachment.*

Assessment Stage	Description of assessment
Scoping	
Baseline Assessment	
Prediction	
Mitigation	
Acceptability	
Monitoring	

### 17. Economic impacts

List significant costs and benefits	Relevant areas of the economy affected	Any recommended impact mitigation strategy
Method of assessment of economic impacts and reference to supporting documentation		
<p><i>Include the identification of methods used in the economic analysis, and the results of the analysis.</i></p>		

### 18. Cost of equivalent entitlements in the market

Names of similar standard water entitlements or 'not available' if '10. Reliability profile' listed as 'other'	Cost/ML for entitlements
Basis of cost estimate if similar water entitlement is not available in the market	

### 19. Indicative financial crediting amount

\$
<p><i>If proposed indicative financial crediting amount is different to '12. Cost to implement measure', please justify.</i></p>

20. Salinity impact (year of implementation)

<b>Equivalent EC impact at Morgan</b>
<b>Description of modelling approach implemented, including how the water would be used</b>

21. Water quality outcomes

<b>Change in water quality</b>
<b>Justification for category selection and description of any offsets / mitigation measures needed</b>

22. Additional environmental impacts

<b>Assessment of impact</b>		
<i>Negligible impact, significant benefit</i>		
<b>Type of flora and fauna species or ecological communities</b>	<b>Identified potential impact</b>	<b>Environmental management strategy</b>
<b>Reference to supporting documentation</b>		
<i>Include the basis by which the impacts and environmental management strategies were selected. Refer to attachments if necessary.</i>		

### 23. Third party impacts

Rating of third part impact - eg. negligible impact, significant benefit
<i>Negligible Impact or Significant Impact</i>
Description of indicator/s (if any) for which there was a significant impact
<i>Include details on the analysis used to determine third party impacts.</i>

### 24. Risks associated with implementation

Risk #	Risk	Likelihood	Severity
1			
2			
3			
4			
5			

*Likelihood and severity to be scored as either 1 (low), 2 (medium), 3 (high)*

## **25. Data files used in the hydrological analysis in the assessment**

*List all the references and data that provided assumptions used in the hydrological analysis in the detailed design stage of the project. Refer to attached documentation where appropriate.*

## Appendix 4 – Application form for listing on the Environmental Water Register

For further detail, refer to the *Guidelines for proposed water recovery measures in the Living Murray, section 4.3.*

### Water recovery measure title

<b>Measure title</b>
<i>Transfer from Eligible Measures Register</i>
<b>Titles of identifiable subcomponents, if any</b>

### Proponent

<b>Name of Proponent</b>			
<b>Further details – eg. type of entity, contact details, trading names</b>			
CONTACT			
PHONE NUMBER		MOBILE NUMBER	
FAX NUMBER		E-MAIL ADDRESS	
POSTAL ADDRESS	ADDRESS		
	SUBURB/TOWN		
	STATE		POSTCODE
OFFICE ADDRESS	ADDRESS		
	SUBURB/TOWN		
	STATE		POSTCODE
TRADING NAME/S			
TYPE OF ENTITY			
OTHER DETAILS			

### Type of water recovery measure

<b>Type of water recovery measure</b>
<i>Transfer from Eligible Measures Register</i>
<b>Supplementary detail – location, project description, etc</b>
<i>Refer to Eligible Measures Register application. Identify any changes which occurred during implementation.</i>

### Cost to implement measure

<b>Cost Component</b>	<b>NPV \$,000</b>	<b>Methodology/Supporting Documentation</b>
Capital cost or initial cost		
Future operation and maintenance cost		
Total		-
Timing of expenditure over 30 years		
Details of cost sharing arrangements (if applicable).		

## Volume recovered

### Volume at source (GL)

GL	Methodology of estimation

### Other Volumes (GL)

	GL	Name of hydrological model used for estimation
Volume at Murray		<i>Either MSM-Bigmod, REALM or IQQM, or the relevant Cap Factor, together with justification for selection of the Cap Factor.</i>
Volume callable from storage		<i>Either MSM-Bigmod, REALM or IQQM</i>
Volume for accreditation		<i>Either Volume at Source (if regulated) or Volume at Murray (if unregulated)</i>
<p><b>Justification for volumes</b></p> <p><i>If volume is unchanged: brief justification for not changing the pre-implementation estimate and reference to all supporting documentation including previous application for Eligible Measures Register and independent review at that time.</i></p> <p><i>If volume is changed: describe modelling approach and attach post-implementation modelling report.</i></p>		

## How water recovered has been secured

*If information is unchanged from Eligible Measures Register application, then refer to Eligible Measures Register rather than re-stating.*

<b>Statutory instrument</b>
<i>(e.g. NSW - Water Sharing Plan for the NSW Murrumbidgee, Murray or Lower Darling Regulated Rivers Water Sources)</i>
<b>Name of the legislation under which the recovered water entitlement has been secured.</b>
<i>The legislation under which the recovered water entitlement would be secured (e.g. Water Management Act, Water Resources Act etc.). Also provide a brief description of how the water has been secured for environmental management and any terms (eg. tenure) that apply to the use of the water.</i>

## Reliability profile

*If unchanged from listing on the Eligible Measures Register, reference to this application and associated independent review can be provided.*

<b>Title of standard water entitlement closest to reliability profile</b>
<i>If there are no entitlements that are close to profile, list other</i>
<b>Information that supports selection of reliability profile</b>
<i>If the reliability profile is different from a standard water entitlement, also insert the profile in here.</i>

## Monitoring and Evaluation Program

*Provide details of monitoring programs to assess volume and effects of water recovery measure. Also provide details of how the outputs from the monitoring program will be evaluated and incorporated into future water recovery measures.*

## Data files used in the hydrological analysis

*List all the references and data that provided assumptions used in the hydrological analysis for the implemented measure. If there has been no change since listing on the Eligible Measures Register, refer to Eligible Measures Register listing.*

For the remaining parameters to be listed on the Environmental Water Register (**Table 1**), where appropriate, attach data from the application to list the measure on the Eligible Measures Register.

## Appendix 5 – Further detail relating to cost calculations

Financial costs can include capital costs, implementation costs and operating costs. Normally an NPV calculation would exclude all sunk costs<sup>120</sup> as these are costs not solely associated with the project and accounting depreciation<sup>121</sup> as this is not a flow of cash.

Financial benefits can include incomes generated by the project, as well as offsets and reductions generated by the project, or proceeds from the sale of assets and equipment.

Examples of costs that could be included in the net present value (NPV) for a measure are provided in **Table A5.1**. A spreadsheet which can be used for calculating NPV for both infrastructure and market-based measures has been developed and is available upon request from the MDBC office (email [water.recovery@mdbc.gov.au](mailto:water.recovery@mdbc.gov.au)).

**Table A5.1 – Costs which can be included for water recovery measures**

*Note: This list is not comprehensive*

	<b>Up-front</b>	<b>On-going</b> (costs associated with managing, operating, and maintaining the water recovery)
<b>Infrastructure</b>	<ul style="list-style-type: none"> <li>• Project management – specific to project.</li> </ul> <p><u>Pre-construction:</u></p> <ul style="list-style-type: none"> <li>• development applications;</li> <li>• site surveys;</li> <li>• land negotiations and acquisition;</li> <li>• environmental impact assessments;</li> <li>• project risk assessments;</li> <li>• preparation of designs, specifications and contract documents;</li> </ul> <p><u>Construction:</u></p> <ul style="list-style-type: none"> <li>• project management costs;</li> <li>• construction costs based on derived quantities and unit cost estimates. For water recovery measures that are to be implemented at remote sites, the capital cost</li> </ul>	<ul style="list-style-type: none"> <li>• Operating costs (including power costs, operating labour, administration and reporting, routine inspections);</li> <li>• Maintenance costs (including proposed minor and major renewals in accordance with schedules, equipment replacement costs).</li> <li>• New or additional management costs;</li> <li>• Any infrastructure charges;</li> <li>• Proceeds from the sale of equipment;</li> <li>• Cost reductions generated by the project; and,</li> <li>• New or additional income generated by the project.</li> </ul>

<sup>120</sup> Note: Sunk costs are costs that are not new for the project and are already incurred. Eg. overheads that currently exist in an organisation.

<sup>121</sup> Note: Accounting depreciation is a financial approach used for accounting/tax purposes and does not represent a flow of resources or utility. Economic depreciation is defined as a decline in the value of an asset over its life and is included in the calculation by taking into account the salvage value of the asset when sold or at the end of the 30 years.

	<p>estimate should be prepared based on first principles, as unit rates from other locations may be unreliable. The estimated costs should also include site preparation and fencing;</p> <ul style="list-style-type: none"> <li>• contract payments for construction and plant hire and day labour;</li> <li>• construction management and supervision fees;</li> <li>• supporting infrastructure costs such as roads, electricity, and telecommunications; and</li> <li>• mechanical and electrical costs including pumps, switchboards, power supply, telemetry, commissioning (including operation and maintenance manuals).</li> </ul>	
<p><b>Market - based</b></p>	<ul style="list-style-type: none"> <li>• Project management – specific to project.</li> </ul> <p><u>Pre-implementation:</u></p> <ul style="list-style-type: none"> <li>• preparation of project implementation documentation (e.g. fact sheets, information brochures, advertising);</li> </ul> <p><u>Implementation:</u></p> <ul style="list-style-type: none"> <li>• the cost of the water entitlement (perhaps including access termination fees;</li> <li>• costs associated with conveyancing;</li> <li>• cost of market assessment of the prices of water entitlements; and,</li> <li>• project contingency.</li> </ul>	<ul style="list-style-type: none"> <li>• costs associated with administering ongoing water purchase, if all water is not purchased up-front;</li> <li>• recurrent costs, such as head-works charges; and,</li> <li>• new or additional management costs.</li> </ul>

The Net Present Value is calculated using the following formula.

$$NPV = C_0 + \sum_{t=1}^n \frac{C_t}{(1-r)^t}$$

Where

t = year of expenditure from initial expenditure (initial expenditure = year 0)

n = total time of the project (30 years)

r = discount rate (4%)

C<sub>t</sub> = the net cash flow (the amount of money spent – income) in year t.

C<sub>0</sub> = initial cash flow (expenditure - income) in year zero.

## Appendix 6 – Procedure for interim listings on the Environmental Water Register

1. Clause 28 of the Intergovernmental Agreement 2004 states:

*A proposed measure nominated to the register may comprise a number of identifiable sub-components, where such an aggregation is necessary to the feasibility and effectiveness of the proposal. Such proposals will be assessed as a single measure and may not be disaggregated except at the discretion of the nominating party.*

2. In implementing some measures a proponent may recover discrete parcels of water at various stages prior to completion of the entire water recovery measure. These may or may not be sub-components as described under clause 28 of the Intergovernmental Agreement 2004. The associated entitlement could be transferred for environmental use. The Proponents may then choose to request an interim listing of these parcels of recovered water on the Environmental Water Register pending completion of the entire water recovery measure.
3. To request an interim listing, a proponent is to submit a formal request to the Registrar (at the MDBC). This request should be supported by sufficient information to clearly demonstrate the recovery of the water (eg. by transfer of entitlement) and its availability for environmental use. Such requests along with the supporting information will immediately be referred to the Water Recovery Working Group (WRWG) for review.
4. The WRWG may elect to have the recovered volumes independently verified, prior to the interim listing, particularly in relation to measures recovering water not of a standard entitlement type, although this is not a requirement. It is the responsibility of the proponent to ensure that there are no significant third party impacts resulting from the recovery of this water.
5. All such requests shall be considered for listing in a similar process to that of applications for listing on the Developmental Register, with Commission acting on the recommendation of the Living Murray Committee to approve any such listings.
6. The Environmental Water Register will clearly show that these listings are for a component of a water recovery measure listed on the Eligible Measures Register. It will also show that the process described in Figure 5 of the Living Murray Business Plan 2007 must be undertaken to list a completed water recovery measure on the Environmental Water Register and to agree to the final crediting volume for the measure. The complete process for listing on the Environmental Water Register shall consider all sub-components of a water recovery measure, including any which were listed as interim listings.
7. Applications for interim listing on the Environmental Water Register should include all information required to enable the water to be used under the Living Murray Environmental Watering Plan.
8. Listings made on the Environmental Water Register under this process shall be reviewed annually by the Water Recovery Working Group.
9. Any protocols for Cap adjustment for environmental entitlements or for financial management for the recovered water would apply to this water entitlement.
10. Proponents should be aware that that the final review and approval to list on the Environmental Water Register could result in a different crediting volume to that accepted

for the interim listing of the recovered water. It is the responsibility of the proponent to ensure that there are no significant third party impacts resulting from the recovery of any water listed on the Environmental Water Register using the above process.

11. To the extent that this process is inconsistent with the Living Murray Business Plan 2007, the Living Murray Business Plan 2007 will prevail.