

*Audit of The Living Murray
Implementation
2006/07*

*Report of the Independent
Audit Group*



May 2008

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Independent Audit Group Members

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Paul Baxter
Terry Hillman

May 2008

Acknowledgments

The Independent Audit Group appreciated the cooperation of the Australian, State and Territory Governments and the Murray-Darling Basin Commission in engaging positively in the independent audit process, for making both data and officers available, and for the open and frank way in which the audit was conducted. Information was freely provided and the identification of issues as well as possible options for resolving them were discussed openly and constructively. The IAG also wishes to acknowledge the assistance provided by the officers of the Murray-Darling Basin Commission (MDBC) in the preparation of this report. The findings however are entirely those of the IAG.

The implementation of The Living Murray will for some time challenge the ingenuity and resources of Governments and communities. The IAG undertook this audit with the recognition that there is a lot of learning being done and yet to be done so that the Living Murray can deliver the outcomes sought by Ministerial Council.

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Auditors' Foreword

May 2008

Senator Penny Wong
Chair, Murray-Darling Basin Ministerial Council
Suite MG60
Ministerial Wing
Parliament House
Canberra ACT 2600

Dear Minister

We have pleasure in submitting to you our *Audit of The Living Murray Implementation 2006/07*.

At 30 June 2007, water recovery measures totaling 273.85 GL were listed on the Eligible Measures Register (meaning that the measure is either 'implementation ready' or being implemented). At the time of our audit in November 2007, measures to recover up to 508.65 GL had been listed on the Eligible Measures Register. As such, the IAG now believes that sufficient measures are coming forward to suggest that the target of 500 GL will ultimately be met. However, timing of completion of all measures relative to the June 2009 target date in the Intergovernmental Agreement may be an issue.

As of 30 June 2007, no completed measures had been listed on the Environmental Water Register of The Living Murray. However, water recovery measures were being implemented. For example, as of 1 July 2007, 120 GL (Long Term Cap Equivalent) of Victorian Low Reliability Water Share was potentially available for management under The Living Murray. The transfer of the first parcels of water onto The Living Murray Environmental Water Register is expected to occur in 2007/08.

The Independent Audit Group notes that progress has been made against all 15 recommendations from previous audits in Annex 2, and actions have been completed for 5 of them.

In our 2006/2007 audit, 9 issues have been identified for consideration by the Ministerial Council. With the recovery of water within the timeframe of the Intergovernmental Agreement now looking more likely than for the 2005/06 Audit, our attention has begun to shift to the management of the environmental water and the Icon Sites.

We hope that this audit is of value to you and the Ministerial Council.

Yours sincerely

DENIS FLETT
Chairman

PAUL BAXTER
Member

TERRY HILLMAN
Member

Contents

EXECUTIVE SUMMARY	1
1. INTRODUCTION	8
1.1 BACKGROUND	8
1.2 SCOPE OF THE AUDIT	9
2. INVESTMENT AND WATER RECOVERY OVERVIEW	11
2.1 BASIS FOR AUDIT	11
2.2 OVERALL PERFORMANCE AGAINST TARGETS	12
2.3 IAG ASSESSMENT	14
2.3.1 Overview	14
2.3.2 Issues Identified and Recommendations	14
3. WATER RECOVERY	16
3.1 BASIS FOR AUDIT	16
3.2 REGISTERS OF RECOVERED WATER	16
3.3 WATER RECOVERY - PROGRESS AT A PROGRAM SCALE	17
3.4 AUSTRALIAN GOVERNMENT	18
3.4.1 2006/07 Activities	18
3.4.2 Proposed 2007/08 activities:	18
3.5 NEW SOUTH WALES	18
3.5.1 2006/07 activities	18
3.5.2 Proposed 2007/08 Activities	19
3.6 VICTORIA	19
3.6.1 2006/07 Activities	19
3.6.2 Proposed activities for 2007/08	20
3.7 SOUTH AUSTRALIA	21
3.7.1 2006/07 activities	21
3.7.2 Proposed 2007/08 activities	22
3.8 AUSTRALIAN CAPITAL TERRITORY	22
3.8.1 2006/07 activities	22
3.8.2 Proposed 2007/08 activities	22
3.9 IAG ASSESSMENT	22
3.9.1 Overview	22
3.9.2 Issues Identified and Recommendations	23
4. WATER APPLICATION	25
4.1 BASIS FOR AUDIT	25
4.2 PLANNING FOR WATER APPLICATION	25
4.3 WATER APPLICATION ACTIVITIES	25
4.4 ENVIRONMENTAL RESPONSE TO WATERING ACTIVITIES	26
4.4.1 Lower Lakes, Coorong and Murray Mouth	26
4.4.2 Hattah Lakes	26
4.4.3 Chowilla Floodplain and Lindsay and Wallpolla Islands –	27
4.4.4 Summary	27
4.5 PROGRESS ON LONG TERM WATER DELIVERY OPTIONS FOR ICON SITES (THE ENVIRONMENTAL WORKS AND MEASURES PROGRAM)	27
4.6 IAG ASSESSMENT	28
4.6.1 Overview	28
4.6.2 Issues Identified and Recommendations	28
5. ACCOUNTING FOR ENVIRONMENTAL WATER	31
5.1 BASIS FOR AUDIT	31
5.2 OVERVIEW	31
5.3 TRADE IN RECOVERED WATER	31
5.4 IMPACTS	32

5.5	IAG ASSESSMENT	32
5.5.1	<i>Overview</i>	32
ANNEX 1 – SPECIFIC ENVIRONMENTAL OUTCOMES.....		33
ANNEX 2 – PROGRESS REPORT ON ISSUES IDENTIFIED IN 2005/06 AND 2006/07 AUDITS.....		34
ANNEX 3 – GLOSSARY OF TERMS.....		39
ANNEX 4 – 2006/07 ENVIRONMENTAL WORKS AND MEASURES PROGRAM ACHIEVEMENTS		43

Executive Summary

The following is a brief history of the main actions establishing The Living Murray (TLM):

- **April 2002:** The Murray-Darling Basin Ministerial Council agreed to invest \$150m in environmental works and measures and to investigate water recovery about three environmental flow reference points.
- **November 2003:** The Murray-Darling Basin Ministerial Council agreed to the First Step decision to invest \$500 million to recover up to 500 GL of water for TLM for management in conjunction with the environmental works and measures
- **June 2004:** First Ministers of the Murray-Darling Basin Ministerial Council signed the *Intergovernmental Agreement on Addressing Water Overallocation and Achieving Environmental Objectives in the Murray-Darling Basin* (the Intergovernmental Agreement) providing a framework for the investment.
- **April 2005:** Intergovernmental Agreement operationalised through The Living Murray Business Plan, and included a requirement for the Independent Audit Group ('IAG') to audit progress in the implementation of The Living Murray. The Business Plan was updated in May 2007, and included the maintenance of this role for the IAG.
- **June 2006:** The Australian Government invested a further \$500 million through MDBC for additional water recovery (a notional \$200 million) and further funding of the Environmental Works and Measures program (approximately \$100 million). This was endorsed through a Supplementary Intergovernmental Agreement by the Council of Australian Governments in July 2006.

The focus of The Living Murray is to recover water and implement works to achieve specific environmental outcomes for six Icon Sites along the River Murray. The six Icon Sites are:

- Barmah-Millewa Forest;
- Gunbower Koondrook-Perricoota;
- Hattah Lakes;
- Chowilla Floodplain (including Lindsay-Wallpolla);
- Murray Mouth, Coorong and Lower Lakes; and
- River Murray Channel.

This is the third report of the IAG in relation to The Living Murray.

Indicative volumetric targets for each jurisdiction are shown in Table 1, along with progress towards these targets. As of 30 June 2007, no water had been recovered against the target of 500 GL. The volume listed on the Eligible Measures Register is 273.45 GL leaving a residual target of 226.55 GL. However, it is noted that significant progress is expected in water recovery in 2007/08. By November 2007, in excess of 500 GL of water recovery measures had been listed on the Eligible Measures Register and 120 GL of Long Term Cap Equivalent had been transferred for management under The Living Murray.

Table 1: Total volumes of water on the Environmental Water Register and the Eligible Measures Register for each jurisdiction as at 30 June 2007¹

	<i>New South Wales</i>	<i>Victoria</i>	<i>South Australia</i>	<i>ACT</i>	<i>Total</i>
Indicative Volumetric Target	249 GL	214 GL	35 GL	2 GL	500 GL
Volume on the Environmental Water Register – projects completed and accredited	0 GL	0 GL	0 GL	0 GL	0 GL
Volume on Eligible Measures Register – projects that are implementation ready or being implemented	81.45 GL	177.60 GL	14.40 GL	0 GL	273.45GL
Indicative shortfall to date	167.55 GL	36.40 GL	20.60 GL	2 GL	226.55 GL

1 - Reflects individual jurisdictions water recovery programs and assumptions that the Australian Government's Water through Efficiency Request for Tenders recovered water from NSW, and the MDBC's Pilot Water Environmental Water Purchase Project recovered water from each of NSW, Victoria and S on the basis of Cap shares..

In relation to investment in water recovery under The Living Murray, it is noted that there has been investment under Investment Agreements for only one measure, the *Goulburn-Murray Water Recovery Package*. For other measures (such as NSW Package B), whilst there has been considerable investment in the implementation of the measure by the proponent, it does not yet have a signed investment agreement allowing other jurisdictions to invest. An independent audit report was provided by Victoria for reported investment in relation to the Investment Agreement for the *Goulburn-Murray Water Recovery Package* in 2006/07.

Additionally, funds have been invested in The Living Murray to implement environmental works and measures (e.g. the construction of several fishways along the River Murray).

Like the previous reports of the IAG, this report is structured to broadly follow the sections of The Living Murray Business Plan relevant to the needs of the IAG. The IAG assessment focuses on issues identified and recommendations for their resolution.

The IAG's second report Review of The Living Murray Implementation 2005/06 – Report of the Independent Audit Group identified 8 issues and made recommendations in relation to each.

A summary of the status of progress in response to the 8 recommendations from the 2005/06 audit and the 7 remaining recommendations from the 2004/05 audit is presented in Annex 2. Progress has been made in regard to all of these recommendations, and actions have been completed for five of them. It is intended to ensure continuity and thoroughness in the future by reporting against all unresolved past recommendations in annual IAG reports, transferring each recommendation to subsequent reports until its successful resolution is recorded. During the 2006/07 audit process, 9 issues were identified by the IAG. A summary of each issue along with recommendations follow.

2007.01 **Collaboration between funders to achieve water recovery targets.**

A significant constraint has been overcome with the diversification of water recovery measures to include market-based measures and further on-farm measures. This broader suite of measures has significantly increased the probability of meeting the 500 GL target in a timely manner, addressing TLM IAG issue 2006.02.

There is general acknowledgement that government participation in the water market will have some effect but that this is largely unavoidable and is generally causing only minor issues with regard to delays and competition. There seems to have been some efforts to ensure that competition between market initiatives serving different programs is avoided by scheduling of activities or purchase projects focusing on different regions. There is still concern, however, that water recovery initiatives making competing offers for the same parcel of water (particularly infrastructure water efficiency projects stemming from the National Plan for Water Security) will cause confusion among water entitlement holders and have a negative impact on water recovery to meet TLM targets. The active pursuit of joint projects to the extent permitted under the *Trade Practices Act* for market-based measures, particularly between the Commonwealth under the National Plan for Water Security and other partner governments, is encouraged to support meeting TLM water recovery targets.

he IAG recommends that cooperation and coordination be enhanced between the partner governments, to the extent possible and permissible, to facilitate the effectiveness of governmental water recovery programs and hence the likelihood of achieving TLM Water Recovery targets, and to avoid unnecessary competition and associated community confusion.

2007.02 **Risk assessment procedures to account for current and recent threats to water recovery.**

The risks to water resource availability¹ were identified by IAG as an issue in the previous audit (2006.03) and this year the Terms of Reference for the IAG have been extended so that the IAG has an additional obligation with regard to risks (refer to *Review of Jurisdictional Assessment of Risks to shared Water Resources 2006/07*, MDBC May 2008). It is apparent from audit meetings with partner governments that there are activities such as farm dam construction, afforestation and increased groundwater extraction, which have affected water availability and that the impact is likely to have been predominantly on the proportion of water now available to the environment. Many of these activities are outside of current active management or have lag times prior to coming into full effect.

The IAG recommends that:

- (i) changes in the risks to basin water resources during the period between the initial implementation of the Cap until now be acknowledged, assessed and accounted for so as to avoid disproportionate erosion of environmental water and maintain the balance in The Living Murray recovering water for use at the Icon Sites; and*
- (ii) an agreed baseline and framework for assessing risks to water resources across the Basin be established.*

¹ climate change, increased groundwater use, increased number of farm dams, bushfires, afforestation and reduced return flow from irrigation.

2007.03 **Need to maintain time-frame of water recovery.**

The IAG acknowledges feedback from partner governments that, with the nearing date for recovery of 500GL of water for TLM, there will be difficulty in finalising new water recovery infrastructure measures by June 2009. Given that this is set out in the Business Plan as a target date for recovery, it is questionable if there is any tolerance in meeting this deadline. While it may seem to be reasonable to expect some latitude in all 500 GL being on the Environmental Water Register by June 2009, there is a competing tension to ensure the water is available so as to limit further decline in the condition of Icon Sites.

The IAG recommends that the original timeframe for realisation of water recovery be adhered to where possible but that some latitude is considered in regard to the timing of recovered water being placed on the Environmental Water Register.

2007.04 **Need to clarify the auditing of financial records**

The need to clarify the intent of clause 204 of the Business Plan (2007) to ensure audit practicality and to avoid ambiguity in interpretation relating to the auditing of financial records specified in clause 203 of the Business Plan (2007) arose during the 2006/07 audit process.

Clause 204 of the Business Plan (2007) currently reads as follows:

Auditing referred to in clause 203 will be undertaken by the Independent Audit Group established by clause 12 of Schedule F of the Murray-Darling Basin Agreement 1992, with the first audit due by 31 July 2005. The financial records kept by jurisdictions will be subject to their standard auditing practices, with the audit report provided to the MDB Ministerial Council.

Firstly, it was found by Victoria that the auditing of financial records required the commissioning of a special audit rather than simply being “subject to their standard auditing practices”. This is not to say that commissioning a special independent audit is not standard practice, but is acknowledgement that the wording of clause 204 ought not to be interpreted as meaning that normal annual auditing procedures are likely to be sufficient to meet the intended requirement of this clause.

Secondly it was recognised that the audit report referred to in the words “with the audit report provided to the MDB Ministerial Council” may be referring to a report from the auditing of jurisdictional financial records or the report of the IAG.

The procedure adopted by Victoria and followed during the 2006/07 IAG audit process is consistent with an interpretation of clause 204 along the lines indicated by the following revised wording:

Auditing referred to in clause 203 will be undertaken by the Independent Audit Group established by clause 12 of Schedule F of the Murray-Darling Basin Agreement 1992, with the first audit due by 31 July 2005. The financial records kept by jurisdictions as specified in clause 203 i) and 203 ii) will be subject to independent audit commissioned by the jurisdictions, with the resulting audit report being provided to the IAG for it to consider and comment on in its report to the MDB Ministerial Council.

The IAG recommends that consideration be given to amending clause 204 of the Business Plan (2007) to clarify the intent of auditing financial records to be kept by jurisdictions as referred to in clause 203 i) and ii) and to facilitate practical audit procedures.

2007.05 **Timely development and delivery of water application infrastructure projects augmented through additional funding.**

The IAG recognises that there is concern regarding the progress of TLM infrastructure projects, particularly given that additional funding has been provided by the Australian Government to ensure timely delivery of a set of major infrastructure projects largely focused on TLM. The IAG notes that the time for start up in planning large-scale projects can be significant but is a necessary part of responding to recent substantial increases in available funds.

IAG accepts that the lead-in phase of major works can be time-consuming but that it is generally a sound investment to ensure all aspects of investigation and design are thoroughly undertaken to optimise the operational effectiveness of works so that environmental objectives can be met throughout the life of the works.

The IAG recommends that every effort should be made to comply with previously established deadlines but that sufficient flexibility be maintained in project programming to ensure that modelling is adequate and the design of works maximises the effective use of increased funding through ensuring that works are effective in meeting the environmental objectives throughout their operational life.

2007.06 **Human Resources.**

The issue of human resources continues to be a dominating factor controlling the implementation of The Living Murray, particularly in the area of experienced project managers being engaged to drive the development of works projects in [remote] Icon Sites and provide continuity to their management. This issue continues to apply more broadly in the area of natural resource management as identified by IAG last year (2006.01) and can be expected to worsen given both the institutional uncertainty prevailing and that several hundred additional staff are to be recruited to work on implementation of the National Plan for Water Security (Murray-Darling Basin Authority, Department of Environment and Water Resources and Bureau Of Meteorology.).

The IAG recommends that:

- (i) efforts continue with partner governments to address the skills shortage, and*
- (ii) the shortfall in capacity is acknowledged and planned for in timing delivery of The Living Murray. This may necessitate the recognition of a longer timeframe for complete delivery of The Living Murray as foreshadowed by IAG in 2005/06.*

2007.07 **Preservation of key relict communities at Icon Sites and monitoring of affects of continued extreme conditions.**

The encouraging array of positive ecological responses to the application of very limited volumes of water in 2006/07 indicates that availability of water is a primary limiting factor in these systems and, therefore, that the delivery of appropriate flows to Icon Sites will result in substantial outcomes from The Living Murray. However, continued dry conditions are resulting in further stress at these sites, increasing the risk that parts of the ecosystem will deteriorate to a point at which complete recovery of the targeted features of Icon Sites is not possible:- for example, for long lived plant communities. This emphasises the urgency of water recovery, the need to ensure that environmental water reserves are not re-allocated to consumptive use during droughts, and the need to monitor the condition of Icon Sites to support the prioritisation and efficacy of environmental water application through The Living Murray Environmental Watering Plan.

The IAG recommends that watering of Icon Sites is strategically targeted to ensure that, in the short term, key relict populations survive the current drought; that monitoring continues to maximise learning from the extreme circumstances; and to ensure the application of environmental water to optimise recovery when greater volumes become available. It is suggested that the Environmental Watering Group makes public the reasons for selection of watering priorities.

2007.08 **Rationalisation of management arrangements in multi-jurisdictional Icon Sites to achieve holistic ecological outcomes.**

There is a need for further work to ensure that investment and allocation of water is closely linked to planned environmental outcomes –as articulated in the Ministerial Council objectives and further developed as part of the Environmental Management Plans for each Icon Site. Icon Site Blueprints have made considerable progress in this regard but, if modelling shows that all water needs cannot be met at any site, water and works proposals may need to be revised. Internal consistency should be maintained amongst the objectives particularly regarding the translation of the initial Ministerial Council objectives into the Environmental Management Plans.

Where Icon Sites overlap jurisdictional boundaries, management actions need to be coordinated to achieve planned outcomes, though it should also be noted that processes supporting these outcomes may not apply evenly across Icon Sites. For instance, successful bird recruitment would require the provision of both nesting areas and food sources which are likely to be spatially separate – perhaps in different jurisdictions.

It was apparent to the IAG that for sites located in multiple jurisdictions there was an evident risk that such sites might be managed in a fragmented manner reflecting jurisdictional boundaries, rather than as a whole. Environmental water should be managed efficiently within and between Icon Sites to meet the agreed environmental outcomes, irrespective of jurisdictional (and therefore management) boundaries. There is an obvious need for single, integrated management arrangements with clear accountability and authority if Icon Sites are to be managed optimally. It is not intended that any review of management arrangements would change existing responsibilities for jurisdictional management functions such as forest management, but rather strengthen the integration of planned management actions and the associated accountability to make the most of available water in achieving the agreed environmental outcomes. It is essential that the deployment of scarce environmental water be timely, flexible, and provides maximum benefit to the ecosystem of the whole Icon Site.

*The IAG recommends that:
the Living Murray Committee ensure that planned environmental outcomes reflect the developing understanding of Icon Sites and the objectives proposed by the Ministerial Council;
and
the management arrangements for Icon Sites, particularly in relation to the management of available environmental water, be reviewed to ensure that a single, integrated management structure is in place, with an accountable manager being appointed on merit through a joint process and with the lines of authority clearly defined, to ensure that sites are managed holistically to optimise spatially diverse ecological functions that combine to achieve planned outcomes.*

2007.09 **Accounting for continued ecological decline resulting from extended extreme climatic conditions.**

It was anticipated that intervention through The Living Murray First Step would ultimately arrest the continuing ecological decline for some targeted attributes of Icon Sites through the provision of environmental water. However, the extreme drought of the past few years has not only limited the opportunity for remedial watering but appears to have greatly lowered resilience and accelerated the decline of floodplain ecosystems and the River Murray, Lower Lakes, Coorong and Murray Mouth. Some ecological communities have been affected to such an extent that managed recovery is unlikely over the coming decade. This means that the task of rehabilitation of Icon Sites has probably become significantly more difficult, emphasising the need to manage very limited water allocations strategically. There also may need to be an assessment of the achievability of the Icon Site environmental objectives in the light of the impacts of the severe drought.

The IAG recommends that the environmental objectives and milestones for managing the Icon Sites be reviewed in the light of the impacts of the severe drought to ensure realistic, planned outcomes.

1. Introduction

1.1 Background

On 25 June 2004, First Ministers of the Murray-Darling Basin Ministerial Council from New South Wales, Victoria, South Australia, the Australian Capital Territory, and the Australian Government signed the *Intergovernmental Agreement on Addressing Water Overallocation and Achieving Environmental Objectives in the Murray-Darling Basin* ('the Intergovernmental Agreement').

On 1 April 2005, the Murray-Darling Basin Ministerial Council activated The Living Murray Business Plan ('the Business Plan'). The Business Plan provides a framework for the implementation of the actions under the Intergovernmental Agreement. It includes arrangements for investing \$500 million committed for the recovery of an estimated requirement of an average 500 GL per year of water by the New South Wales, Victorian, South Australian, ACT and Australian Governments. Further investment has also been provided through the Ministerial Council for the complementary Environmental Works and Measures Program which will provide improved health of the River Murray System including through the provision of increased operational flexibility in the delivery of recovered water.

In June 2006, the Australian Government invested an additional \$500 million in the activities of the Murray-Darling Basin Commission in large part to accelerate the delivery of The Living Murray. This included a further (notional) \$200 million for water recovery and additional investment in the Environmental Works and Measures Program. In July 2006, the Council of Australian Governments agreed to a Supplementary Intergovernmental Agreement setting out the arrangements associated with this additional funding. An updated version of the Business Plan was approved by the Murray-Darling Basin Ministerial Council on 25 May 2007 to reflect the evolution of the arrangements around The Living Murray.

The initial focus of The Living Murray is to recover water and implement works to achieve specific environmental outcomes for six Icon Sites along the River Murray. The six Icon Sites are:

- Barmah-Millewa Forest;
- Gunbower Koondrook-Perricoota;
- Hattah Lakes;
- Chowilla Floodplain (including Lindsay-Wallpolla);
- Murray Mouth, Coorong and Lower Lakes; and
- River Murray Channel.

The original set of specific environmental outcomes is at Annex 1.

Since 2005 the Independent Audit Group ('IAG') has audited progress in the implementation of the Living Murray at the same time as its annual audit of compliance to the Murray-Darling Basin Cap.

1.2. Scope of the audit

This IAG audit is performed in accordance with the terms of reference from Clauses 203 and 204 of the Business Plan (2007), which are given below.

203. *Auditing will be conducted to meet the requirements of Clause 78 of the Intergovernmental Agreement, which states that:*
- The following will be subject to annual external auditing to the satisfaction of the MDB Ministerial Council:*
- i) financial records of expenditure accredited against funding commitments under the Intergovernmental Agreement;*
 - ii) financial records of any temporary or permanent trade of recovered water;*
 - iii) registries of recovered water;*
 - iv) the environmental management of recovered water; and*
 - v) management of the impacts on the Long Term Diversion Cap which result from the recovery and delivery of water under the Intergovernmental Agreement.*
204. *Auditing referred to in clause 203 will be undertaken by the Independent Audit Group established by clause 12 of Schedule F of the Murray-Darling Basin Agreement 1992, with the first audit due by 31 July 2005. The financial records kept by jurisdictions will be subject to their standard auditing practices, with the audit report provided to the MDB Ministerial Council.*

Additionally, in February 2006, the Murray-Darling Basin Commission revised the Terms of Reference of the IAG to “*permit the provision of advice on any issues related to The Living Murray of which it becomes aware during the course of its annual audit.*” The IAG welcomes this response to Issue 2005.01 raised in its 2004/05 report on the Living Murray.

1.3. This Report

This is the third report of the IAG on The Living Murray. The IAG report focuses on issues identified and recommendations for their resolution.

The first report Review of The Living Murray Implementation 2004/05 – Report of the Independent Audit Group identified 12 issues and made recommendations in relation to each issue. The second report Review of The Living Murray Implementation 2005/06 – Report of the Independent Audit Group identified 8 issues and made recommendations in relation to each issue.

A summary of the status of progress in response to the 12 recommendations from 2004/05 and the 8 issues from 2005/06, based on information available for the October 2007 audit process, is at Annex 2. It is intended to ensure continuity and thoroughness in the future by reporting against all unresolved past recommendations in annual IAG reports, transferring each recommendation to subsequent reports until its successful resolution is recorded.

The focus of the report is the 2006/07 year. To support the audit, partner governments provided information and participated in a meeting with the IAG. Information available to the IAG at the time of the audit is referred to as required to assist with consideration of matters relevant to The Living Murray implementation.

The report is structured to broadly follow the sections of The Living Murray Business Plan 2007 relevant to terms of reference of the IAG. A glossary of terms is presented in Annex 3.

2. INVESTMENT AND WATER RECOVERY OVERVIEW

2.1 Basis for Audit

The Business Plan establishes indicative investment and volumetric targets for water recovery that provide a benchmark for assessment of progress by the IAG. The basis for the audit presented in this section is Clause 203 parts (i) and (iii) of the Business Plan as set out in the introduction to this report.

The indicative investment targets in the Business Plan, clause 35) are given in Table 2.

Table 2: Indicative Investment Targets

<i>State / Territory</i>	<i>State / Territory Contribution</i>	<i>Commonwealth Government Indicative Contribution</i>	<i>Murray-Darling Basin Commission Indicative Contribution</i>
NSW	\$115m	\$100m	\$100m
Vic	\$115m	\$86m	\$86m
SA	\$65m	\$14m	\$14m
ACT	\$5m	-	-
Commonwealth			
Total	\$300m	\$200m	\$200m

The indicative water recovery targets in the Business Plan, clause 40) are set out in Table 3.

Table 3: Indicative water recovery targets (GL)

	<i>New South Wales</i>	<i>Victoria</i>	<i>South Australia</i>	<i>Australian Capital Territory</i>	<i>Commonwealth Government</i>
Indicative Volumetric Target	249 GL	214 GL	35 GL	2 GL	-

2.2 Overall Performance Against Targets

The performance against the indicative targets should be considered in the context that the most important targets are that:

- an estimated average of 500 GL/year is to be recovered.
- an investment of \$500m (plus a notional \$200m from the Supplementary Intergovernmental Agreement) is to be made.

Clause 32 and 33 of the Murray Business Plan calls for the establishment of indicative annual investment targets. These annual targets have not been established.

Based on information provided by jurisdictions to date (generally not audited financial records), investment in 2006/07 is shown in Table 4.

Table 4: Actual investments under Investment Agreements against targets set out in Business Plan

Jurisdiction	Indicative targets	Actual investment in 2006/07	Cumulative Investment to 30 June 2007
Australian Government	\$200m	\$12.678m	\$15.162m
New South Wales	\$115m	\$7.290m ¹	\$8.719m
Victoria	\$115m	\$2.265m	\$3.694m
South Australia	\$65m	\$4.121m	\$4.928
Murray-Darling Basin Commission	\$200m	\$0m ²	\$0m
Australian Capital Territory	\$5m	\$0m	\$0m

1 – NSW made an advance payment of \$2,971,000 in 2005/06 which is accounted for in 2006/07.

2 – Project schedules to the Goulburn Murray Water Recovery Measure Investment Agreement were signed before the MDBC received funds and the authority to be an investor. As this was the only measure coming forward for investment in 2006/07, MDBC investment for the year was \$0.

A summary of progress in water recovery against the indicative water recovery targets in the Business Plan is given in Table 5. A summary of the measures listed on the Eligible Measures Register is at Table 6.

Table 5: Progress against the indicative water recovery targets

	<i>New South Wales</i>	<i>Victoria</i>	<i>South Australia</i>	<i>ACT</i>	<i>Total</i>
Indicative Volumetric Target	249 GL	214 GL	35 GL	2 GL	500 GL
Volume on the Environmental Water Register – projects completed and accredited	0 GL	0 GL	0 GL	0 GL	0 GL
Volume on Eligible Measures Register – projects that are implementation ready or being implemented	81.45 GL	177.60 GL	14.40 GL	0 GL	273.45GL¹
Indicative shortfall to date	167.55 GL	36.40 GL	20.60 GL	2 GL	226.55 GL

1 - Based on the assumptions that the Australian Government's Water through Efficiency Request for Tenders recovered water from NSW, and the MDBC's Pilot Environmental Water Purchase Project recovered water from each of NSW, Victoria and SA on the basis of Cap shares.

Table 6: Listings on the Eligible Measures Register¹

Measure (proponent)	Volume (GL)	Cost (\$m)
NSW Package A (NSW)	9	8.9
NSW Package B (NSW)	62	63.25
<i>Goulburn-Murray Water Recovery Package (Victoria)</i>	145	93
Lake Mokoan Water Recovery Package ² (Victoria)	24	13.7
Securing Government Held Water for Environmental Use (SA)	13	19.5
Water Through Efficiency Tender (Australian Government) ³	0.45	0.765
Pilot Environmental Water Purchase Project ⁴ (MDBC)	(Up to) 20 ⁵	(Up to) 36 ⁵
Total	(Up to) 273.45	(Up to) 235.1

1- Total volumes and total costs in this table are at the time of registration – and may change.

2 – Based on an exposure draft of the Investment Plan, the volume and cost may change from the original application.

3 – The Australian Government has indicated that the volume and cost will be less than the original application.

4 – Listed on the Eligible Measures Register as the 'Pilot Market Purchase Measure'.

5 – Actual volume to be confirmed following conveyancing, and will be less than this.

As of the time of the audit, other proposals were being assessed using processes in the Business Plan that may recover around 200GL.

2.3 IAG Assessment

2.3.1 Overview

Water recovery implementation has gathered momentum in most jurisdictions. Whilst the Australian Government and the MDBC do not have volumetric water recovery targets themselves, they are assisting the States to reach their targets. As recommended last year by the IAG, there has been a diversification of water recovery measures enabled in clause 23 of the Intergovernmental Agreement, including market-based measures. The IAG now believes there is good evidence that the target of recovering 500GL can be met largely within in the original timeframe (June 2009).

2.3.2 **Issues Identified and Recommendations**

2007.01 **Collaboration between funders to achieve water recovery targets**

A significant constraint has been overcome with the diversification of water recovery measures to include market-based measures and further on-farm measures. This broader suite of measures has significantly increased the probability of meeting the 500 GL target in a timely manner, addressing TLM IAG issue 2006.02.

There is general acknowledgement that government participation in the water market will have some effect but that this is largely unavoidable and is generally causing only minor issues with regard to delays and competition. There seems to have been some efforts to ensure that competition between market initiatives serving different programs is avoided by scheduling of activities or purchase projects focusing on different regions. There is still concern, however, that water recovery initiatives making competing offers for the same parcel of water (particularly infrastructure water efficiency projects stemming from the National Plan for Water Security) will cause confusion among water entitlement holders and have a negative impact on water recovery to meet TLM targets. The active pursuit of joint projects to the extent permitted under the *Trade Practices Act* for market-based measures, particularly between the Commonwealth under the National Plan for Water Security and other partner governments, is encouraged to support meeting TLM water recovery targets.

The IAG recommends that cooperation and coordination be enhanced between the partner governments, to the extent possible and permissible, to facilitate the effectiveness of governmental water recovery programs and hence the likelihood of achieving TLM Water Recovery targets, and to avoid unnecessary competition and associated community confusion.

2007.02

Risk assessment procedures to account for current and recent threats to water recovery

The risks to water resource availability² were identified by IAG as an issue in the previous audit (2006.03) and this year the Terms of Reference for the IAG have been extended so that the IAG has an additional obligation with regard to risks (refer to *Review of Jurisdictional Assessment of Risks to shared Water Resources 2006/07*, MDBC May 2008). It is apparent from audit meetings with partner governments that there are activities such as farm dam construction, afforestation and increased groundwater extraction, which have affected water availability and that the impact is likely to have been predominantly on the proportion of water now available to the environment. Many of these activities are outside of current active management or have lag times prior to coming into full effect.

The IAG recommends that:

- (i) changes in the risks to basin water resources during the period between the initial implementation of the Cap until now be acknowledged, assessed and accounted for so as to avoid disproportionate erosion of environmental water and maintain the balance in The Living Murray recovering water for use at the Icon Sites; and*
- (ii) an agreed baseline and framework for assessing risks to water resources across the Basin be established.*

² climate change, increased groundwater use, increased number of farm dams, bushfires, afforestation and reduced return flow from irrigation.

3. WATER RECOVERY

3.1 Basis for Audit

The basis for the audit presented in this chapter is Clause 203 part (iii) of the Business Plan, which requires an annual external audit of *registries of recovered water* as outlined in section 1.2. Additionally, Commission has agreed that the IAG can provide advice on issues related to the Living Murray.

3.2 Registers of Recovered Water

Under the Business Plan, the establishment and maintenance of three registers is required. These registers are:

- the Developmental Register³, which lists water recovery proposals in an early stage of development;
- the Eligible Measures Register⁴, which comprises proposals approved by Ministerial Council for implementation if there is sufficient investment; and
- the Environmental Water Register⁵, water recovered and available for management under the Living Murray Environmental Watering Plan.

Clause 157 of the Business Plan sets out the elements of these three registers. They are integrated into a Central Register of Water Recovery Measures maintained by the MDBC. The content of the central register is prescribed in Guidelines for proposed water recovery measures in the Living Murray, which have been approved by the MDBC and are publicly available on the MDBC website.

An overview of the total volumes of water within each jurisdiction on each register as at 30 June 2007 is provided at Table 7.

As required under the Business Plan, independent reviewers review each proposal for listing on the Eligible Measures Register and the Environmental Water Register⁶. To date, all of the applications to list on the Eligible Measures Register have been reviewed. There have been no applications to list a measure on the Environmental Water Register to date.

³ - Refer to clause 24 of the Intergovernmental Agreement

⁴ - Refer to clause 24 of the Intergovernmental Agreement and clauses 69 to 71 of the Business Plan

⁵ - Refer to clause 156 of the Business Plan

⁶ Refer to clauses 63, 99, 100, 201, and clause 43 of Annex E of the Business Plan

Table 7: Total volumes of water on each register within each jurisdiction as at 30 June 2007

	<i>New South Wales</i>	<i>Victoria</i>	<i>South Australia</i>	<i>ACT</i>	<i>Total</i>
Developmental Register	0 GL	35 GL	0 GL	0 GL	55 GL¹
Eligible Measures Register²	81.45 GL	177.60 GL	14.40 GL	0 GL	273.45GL
Environmental Water Register	0 GL	0 GL	0 GL	0 GL	0 GL

Indicative Volumetric Target	249 GL	214 GL	35 GL	2 GL	500 GL
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1 - This includes 20 GL for the Pilot Allocation Leaseback Measure. As this measure is unlikely to be implemented, no attempt has been made to predict a spatial distribution of this recovered water.

2 – Reflects individual jurisdictions water recovery programs and assumptions that the Australian Government's Water through Efficiency Request for Tenders recovered water from NSW, and the MDBC's Pilot Water Environmental Water Purchase Project recovered water from each of NSW, Victoria and S on the basis of Cap shares.

3.3 Water Recovery - Progress at a program scale

As at 30 June 2007, Victoria is closest to achieving its indicative volumetric target. There will soon be a proposal to progress the Shepparton Irrigation Modernisation Project from the Developmental Register to the Eligible Measures Register, and should this listing occur, Victoria will have over 90% of its indicative volumetric target in projects listed on the Eligible Measures Register.

South Australia and New South Wales have taken significant steps towards achieving volumetric targets. Each of these States has developed water recovery strategies that outline how each of these two jurisdictions plans to achieve its volumetric targets. Both strategies include the implementation of market-based measures of significant magnitude in the context of the State targets.

The MDBC is supporting progress by jurisdictions towards their targets by continuing to fund feasibility assessments, convening the Water Recovery Working Group which has functions that include the assessment of water recovery proposals, and being the proponent of water recovery measures.

Investment Agreements for the *Goulburn-Murray Water Recovery Package* have been signed by Victoria with the Australian Government, and with South Australia and New South Wales. Investment in this package is occurring. Whilst there have been a number of expressions of interest in investing in other water recovery measures on the Eligible Measures Register, Investment Agreements had not been signed for any other measure by 30 June 2007.

A significant step forward in 2006/07 has been that a broader range of types of water recovery measures are now being put forward for listing, including market-based measures and on-farm measures. Another significant step forward is that several of these measures have been proposed by entities that do not have indicative volumetric targets (eg. measures have been proposed by the Ricegrowers' Association of Australia, the Australian Government, and the MDBC).

3.4 Australian Government

3.4.1 2006/07 Activities

The Australian Government ran the *Water Through Efficiency Request for Tenders* in 2006/07. In May 2007, the Murray-Darling Basin Ministerial Council agreed to list the project on the Eligible Measures Register with a volume of 0.45 GL and a cost of \$765,000. The Australian Government advises that some of the tenderers will not be able to complete the transfers, resulting in a reduction in the volume and cost. All water is to be recovered from NSW, and will count against the indicative volumetric target for NSW.

The Australian Government continued to invest in the *Goulburn-Murray Water Recovery Package*.

The IAG notes that the Australian Government announced the National Plan for Water Security in 2006/07. The relationship between the implementation of this National Plan and the implementation of the Living Murray will need to be clarified.

3.4.2 Proposed 2007/08 activities:

The Australian Government intends to invest in the following water recovery measures as a minimum, in 2007/08:

- *Goulburn – Murray Water Recovery Package; the Water through Efficiency Request for Tenders;*
- *Pilot Environmental Water Purchase Project;*
- *Securing the Government Held Water for Environmental Use project; and*
- *NSW Package B.*

The Australian Government does not have an indicative volumetric target for the Living Murray and does not intend to propose new water recovery measures in 2007/08 under The Living Murray.

3.5 New South Wales

3.5.1 2006/07 activities

As part of its water recovery strategy, NSW has developed a comprehensive list of 19 possible water recovery proposals which it is currently assessing. The IAG notes the breadth of the portfolio and the inclusion of market-based proposals that should result in environmental water to be available in the near future.

Activities reported by NSW for 2006/07 include:

- Progressing *NSW Package B* by completing the construction of the Anabranch Pipeline and the Poon Boon Measure;
- Undertaking a market purchase tender in November 2006. As no complying bids were received, no purchases were made
- Developing two significant market-based measures to recover a diverse range of entitlements: the *NSW Market Purchase Measure* that will recover (up to) 125 GL, and the *MIL Supplementary Water Access Licence measure* that will recover 17.8 GL; and
- Additionally, NSW has recruited several staff, and progressed feasibility assessments of several infrastructure projects (including one that would recover water from wetlands).

As at 30 June 2007, New South Wales has two packages of water recovery measures listed on the Eligible Measures Register: *NSW Package A* and *NSW Package B*. Additionally, the *Pilot Environmental Water Purchase Project* is expected to recover some water from within NSW.

3.5.2 Proposed 2007/08 Activities

Anticipated activities by NSW for 2007/08 include:

- Completion of the *MIL Supplementary Water Access Licence* measure and its placement on the Environmental Water Register;
- Completion of *NSW Package B* and its placement on the Environmental Water Register
- Commence market purchases under the *NSW Market Purchase Measure*, subject to its listing on the Eligible Measures Register and budget being available;
- Further develop other infrastructure projects, including wetlands projects; and.
- Invest in some of the water recovery measures proposed by other jurisdictions, including the *Goulburn-Murray Water Recovery Package*.

3.6 Victoria

3.6.1 2006/07 Activities

As at 30 June 2007, Victoria has three packages of water recovery measures listed on the central register. These are: the *Goulburn-Murray Water Recovery Package*, the *Lake Mokoan Water Recovery Package* (which are both listed on the Eligible Measures Register), and the *Shepparton Irrigation Area Modernisation Project* (which is listed on the Developmental Register).

In regard to the *Goulburn-Murray Water Recovery Package*, in 2006/07, milestones achieved include:

- the development of a water register populated for trial conversions to water shares;
- arrangements for 120 GL of Long Term Cap Equivalent water (in the form of Low Reliability Water Share) to be transferred for environmental management on 1 July 2007;
- a small component of the 25 GL high reliability water (around 0.3 GL) recovered through reconfiguration of irrigation systems; and
- investments from the Australian Government, NSW and South Australia received by Victoria.

In regard to the *Lake Mokoan Water Recovery Package*, progress in 2006/07 is listed below.

- The Future Land Use Strategy for Lake Mokoan was finalised in December 2006.
- The Victorian Government agreed to an independent technical review of a proposal by irrigators for a modified storage on the Lake Mokoan site. This review is being finalised.
- Some of the works as part of the overall Lake Mokoan package (the Tungamah Domestic and Stock Pipeline Project) were completed. Approximately 5 GL per year of water from this project will be used as one of the offsets to maintain reliability of supply to irrigators once Lake Mokoan is decommissioned.
- As part of the package, a mid-Murray storage was announced in May 2007. The storage will re-regulate up to 19 GL of water recovered from the Lake Mokoan project to enable an equivalent volume of water to be released down the Snowy River (as funds for the restoration of the Snowy River comprise part of the Lake Mokoan project budget).
- Victoria has not invested TLM funds in the Lake Mokoan project to date. Victoria's investment in this project will be finalised as part of the Investment Agreement. Other funding sources for this project include the River Murray Environmental Flow Fund and the Victorian Water Trust.

In regard to the *Shepparton Irrigation Area Modernisation Project*, the following progress has been made in 2006/07.

- Approval to list the Shepparton Irrigation Area Modernisation Project on the Developmental Register was granted on 5 December 2006.
- The business case for the project has been developed with Goulburn-Murray Water, and a proposal for listing on the Eligible Measures Register is imminent.
- In May 2007, the Victorian Government announced a commitment of \$38m of complementary funding for the modernisation project.

An independently prepared audit report of financial records of funding contributions and expenditure against funding commitments under the Intergovernmental Agreement for the *Goulburn-Murray Water Recovery Package* was provided by DSE and noted by the IAG. The independent auditor tested whether the funding and expenses on the project, based on financial statements provided by DSE, were consistent with the Investment Agreement and also whether the financial accruals made during the year ending 30 June 2007 have been realised by the project. The independent auditor made positive findings on both of these matters. In addition, the figures in the DSE financial statements were reconciled by officers of the Commission and presented to the IAG as being consistent with figures provided to the IAG and included in this report. No other audit reports of financial records are required as the *Goulburn-Murray Water Recovery Package* is the only project for which an Investment Agreement has been signed.

3.6.2 Proposed activities for 2007/08

Proposed activities by Victoria in 2007/08 include progressing the three measures listed on the central register, and investing in water recovery measures proposed by other jurisdictions.

In regard to the *Goulburn-Murray Water Recovery Package*, in 2007/08, significant progress will be made towards recovering 25 GL of high reliability water share through infrastructure works following reconfiguration planning.

In regard to the *Lake Mokoan Water Recovery Package*, in 2007/08:

- the review of the proposal for a modified storage at Lake Mokoan is scheduled for completion in late 2007;
- the package of measures to offset the impact of decommissioning Lake Mokoan on the reliability of supply to irrigators is planned to be finalised in late 2007;
- funding arrangements will be finalised, and Investment Agreements will be signed off; and
- construction of the alternative supply to diverters from Lake Mokoan and the Mid-Murray Storage is scheduled to commence in late 2007.

In regard to the *Shepparton Irrigation Area Modernisation Project*, the following are scheduled to occur in 2007/08.

- An application will be submitted to list the project on the Eligible Measures Register. If the application for listing is successful, the Investment Plan will be released in late 2007 with the objective of finalising the Investment Agreement in early 2008.
- Installation of automatic regulators on the East Goulburn Main Channel is scheduled for winter 2008.

3.7 South Australia

3.7.1 2006/07 activities

As at 30 June 2007, South Australia has a water recovery measure listed under the Eligible Measures Register. This is the *Securing Government Held Water for Environmental Use* measure, and involves the transfer of 13 GL of previously government held water onto a South Australian River Murray water licence specifically for management under the The Living Murray.

This measure is part of South Australia's strategy, which identifies how the 35 GL water recovery target will be met (details outlined in the 2005/06 Audit Report). This strategy includes infrastructure measures, efficiency projects, and market-based measures.

Another element of the strategy is the *Purchase from Willing Sellers measure*, which is currently in development. The Minister for the River Murray has purchased 1GL of water entitlements from willing sellers to date. This involved 6 transactions at an average cost of \$1,368/ML. 0.47 GL was recovered in the 2006-07 financial year at a cost of \$643,095. This water will be brought forward as a water recovery measure to be placed on the Eligible Measures Register in 2008.

Assessment and investigations for other projects in the strategy were also progressed in 2006/07.

South Australia has continued to actively participate in the Water Recovery Working Group and assess interstate water recovery proposals as they arise. South Australia has committed to the Goulburn Murray Water Recovery Package and has in addition, formally expressed interest in investing in the MDBC *Pilot Environmental Water Purchase Project*.

3.7.2 Proposed 2007/08 activities

In 2007/08, South Australia will continue to develop and assess infrastructure measures, market-based measures, and efficiency measures. This should lead to clarification of projects to be put forward for listing on the Eligible Measures Register.

The *Securing Government Held Water for Environmental Use* measure is expected to be listed on the Environmental Water Register in 2007/08. The *Purchase from Willing Sellers Measure* will be further progressed taking account of when the MDBC is likely to be in the water market implementing the *Environmental Water Purchase Project*.

3.8 Australian Capital Territory

3.8.1 2006/07 activities

As at 30 June 2007, the Australian Capital Territory has no water recovery measures listed under the central register. However, on 31 March 2006, the ACT legislated for permanent water conservation measures. The ACT is of the view that these measures are capable of meeting its indicative volumetric target of 2 GL to The Living Murray.

The ACT has not established an Environmental Water Register but does have an Environmental Water Account to which any additional environmental water would be added. It has not indicated interest in investing in proposals put forward by other States, as the ACT preference is to invest within its own jurisdiction.

3.8.2 Proposed 2007/08 activities

The ACT proposes to submit a measure for assessment based on its permanent water conservation initiative to achieve its volumetric target of 2 GL under The Living Murray. The IAG recognises that demonstration that 2 GL can be saved each year may be difficult in the context of the ACT Cap not yet being agreed. The ACT has also flagged an issue with the investment of \$5 m as their measure is intended to be achieved by permanent water restrictions.

3.9 IAG Assessment

3.9.1 Overview

Considerable progress has been made in regard to water recovery for The Living Murray in 2006/07. A range of measures are being developed and proposed by a number of proponents. However, substantial additional work still, however, remains to be completed and significant effort will be required to meet the target of 500 GL by June 2009.

Whilst the IAG notes presentations from all Governments on activities to achieve the water recovery target of The Living Murray, it concludes that significant and focused endeavours will be required in order to meet the target date of June 2009.

3.9.2 Issues Identified and Recommendations

2007.03 **Need to maintain time-frame of water recovery**

The IAG acknowledges feedback from partner governments that, with the nearing date for recovery of 500GL of water for TLM, there will be difficulty in finalising new water recovery infrastructure measures by June 2009. Given that this is set out in the Business Plan as a target date for recovery, it is questionable if there is any tolerance in meeting this deadline. While it may seem to be reasonable to expect some latitude in all 500 GL being on the Environmental Water Register by June 2009, there is a competing tension to ensure the water is available so as to limit further decline in the condition of Icon Sites.

The IAG recommends that the original timeframe for realisation of water recovery be adhered to where possible but that some latitude is considered in regard to the timing of recovered water being placed on the Environmental Water Register.

2007.04 **Need to clarify the auditing of financial records**

The need to clarify the intent of clause 204 of the Business Plan (2007) to ensure audit practicality and to avoid ambiguity in interpretation relating to the auditing of financial records specified in clause 203 of the Business Plan (2007) arose during the 2006/07 audit process.

Clause 204 of the Business Plan (2007) currently reads as follows:

Auditing referred to in clause 203 will be undertaken by the Independent Audit Group established by clause 12 of Schedule F of the Murray-Darling Basin Agreement 1992, with the first audit due by 31 July 2005. The financial records kept by jurisdictions will be subject to their standard auditing practices, with the audit report provided to the MDB Ministerial Council.

Firstly, it was found by Victoria that the auditing of financial records required the commissioning of a special audit rather than simply being “*subject to their standard auditing practices*”. This is not to say that commissioning a special independent audit is not standard practice, but is acknowledgement that the wording of clause 204 ought not to be interpreted as meaning that normal annual auditing procedures are likely to be sufficient to meet the intended requirement of this clause.

Secondly it was recognised that the audit report referred to in the words “*with the audit report provided to the MDB Ministerial Council*” may be referring to a report from the auditing of jurisdictional financial records or the report of the IAG.

The procedure adopted by Victoria and followed during the 2006/07 IAG audit process is consistent with an interpretation of clause 204 along the lines indicated by the following revised wording:

Auditing referred to in clause 203 will be undertaken by the Independent Audit Group established by clause 12 of Schedule F of the Murray-Darling Basin Agreement 1992, with the first audit due by 31 July 2005. The financial records kept by jurisdictions as specified in clause 203 i) and 203 ii) will be subject to independent audit commissioned by the jurisdictions, with the resulting audit report being provided to the IAG for it to consider and comment on in its report to the MDB Ministerial Council.

The IAG recommends that consideration be given to amending clause 204 of the Business Plan (2007) to clarify the intent of auditing financial records to be kept by jurisdictions as referred to in clause 203 i) and ii) and to facilitate practical audit procedures.

4. WATER APPLICATION

4.1 Basis for Audit

The Living Murray Business Plan 2007 commits the MDBC to apply the available recovered water in a way that maximises ecological outcomes across the six Icon Sites and achieves other environmental objectives as agreed by all parties to the Intergovernmental Agreement.

The basis for the audit presented in this section is Clause 203 (iv) of The Living Murray Business Plan 2007 as set out in the introduction to this report.

4.2 Planning for Water Application

Water application is managed through the Icon Site Environmental Management Plans (EMPs) and The Living Murray Environmental Watering Plan. Ministerial Council approved the 2006-07 versions of these documents at Meeting 41 (29 September 2006).

The Living Murray Environmental Watering Plan provides a framework to manage, and ultimately deliver, water to achieve the first step decision objectives. A range of watering options are available to managers to achieve this outcome including:

- enhancing natural peak flows to sustain water levels in floodplains;
- physically pumping water onto floodplains to alleviate drought stress in vegetation communities; and
- operating fishways to allow for native fish migration throughout the river system.

The Environmental Watering Group (EWG) was established under Clause 133 of The Living Murray Business Plan 2007 to develop the LMEWP and the River Murray Channel Environmental Management Plan. It also assesses whether the Icon Site EMPs are consistent with the LMEWP and advises the Commission of its conclusions.

4.3 Water Application Activities

Water application under The Living Murray is coordinated through The Living Murray Environmental Watering Plan drawing upon the Icon Site Management Plans for the 6 Icon Sites.

The volume of environmental water made available for use in 2006-07 totalled 34.8 GL of which:

- 27 GL was provided from savings made by Victoria and New South Wales in relation to the Snowy Scheme; and,
- 7.8 GL was provided as a donation from South Australia (originally 13 GL, but reduced when SA entitlement was reduced to 60%).

Watering priorities were identified by the Environmental Watering Group according to the framework of the Living Murray Environmental Watering Plan. These priorities were approved by Commission at Meeting 89 (29 August 2006).

The environmental water use for 2006-07 is summarised in Table 8 below:

Table 8: Environmental water use for 2006-07

	Hattah Lakes	Chowilla Floodplain / Lindsay-Walpolla Islands (LWI)	Murray Mouth, Coorong and Lower Lakes	Unallocated	TOTAL
Environmental Water Allocation	9 GL	Chowilla – 5 GL LWI – 4.5 GL	15 GL	1.3 GL	34.8 GL
Water used	8.5 GL	Chowilla – 4.2 GL LWI – 4.6 GL	4.7 GL	-	22.0 GL
Balance (unused)	0.5 GL	Chowilla – 0.8 GL LWI (-0.1 GL)	10.3 GL	1.3 GL	12.8 GL

The environmental water allocated to the Murray Mouth, Coorong and Lower Lakes could not be fully utilised as planned. It was anticipated that the water be utilised for releases through the Barrage fishways. However, due to low levels in Lake Alexandrina and Lake Albert, the potential for reverse head (i.e. intrusion of salt water into the lower lakes) was too great and the releases were stopped.

At Chowilla and Lindsay-Walpolla, the recently completed regulators at Websters Lagoon and Horseshoe Lagoon, funded through the Environmental Works and Measures Program, were instrumental in achieving the watering outcomes at this icon site.

In addition to water available under The Living Murray, Victoria and New South Wales made allocations from state environmental water entitlements to provide additional water for TLM Icon Sites, including the River Murray channel and Gunbower Forest.

4.4 Environmental response to watering activities

4.4.1 Lower Lakes, Coorong and Murray Mouth

A total of 4.7 GL was used for Barrage fishway operation with good environmental outcomes. Monitoring in late 2006 indicated that fish species, such as Common Galaxias and congolli, migrated upstream following spawning. Short-headed Lampreys have also been observed in the fishways.

4.4.2 Hattah Lakes

For Hattah Lakes, 8.5 GL was delivered to supplement a Victorian Murray Flora and Fauna Entitlement (FFE) of 5 GL, resulting in a total of 13.5 GL being delivered to eleven lakes in the Hattah Lakes system between mid- September and early December 2006. Monitoring has confirmed a positive growth response in areas receiving two or more waterings, while areas receiving only a single watering maintained healthy vegetation.

In addition to River Red Gums, Lignum responded well and flowered, and the presence of water has resulted in breeding of a number of waterbird species, including Black Duck, Wood Duck, Grey Teal, Australasian Grebe, Eurasian Coot and Pied Stilts.

4.4.3 Chowilla Floodplain and Lindsay and Wallpolla Islands –

The available environmental water was distributed as follows; 4.2 GL for watering of the Chowilla Floodplain and 4.6 GL for watering of stressed River Red Gums throughout the Lindsay and Wallpolla islands. Watering focussed on both River Red Gums and Black Box communities. Monitoring has shown a positive vegetation response, including increased vigour of River Red Gums and Black Box and the development of a mosaic of flood- dependent understorey.

The environmental watering has also enabled temporary flooding of a limited number of wetlands that have been utilised by endangered species for foraging and reproduction. Thousands of waterbirds, (including, state-listed species and over 30 species of waterbirds present on Mulcra and Wallpolla islands) as well as large numbers of frogs (including the nationally vulnerable Southern Bell Frog) have benefited from environmental watering.

4.4.4 Summary

The amount of environmental water used for watering Icon Sites in 2006/07 represents approximately 4% of the 500GL to be recovered under the Living Murray Initiative. While very good localised environmental benefits were observed, the health of the vast majority of the area of many Icon Sites is continuing to decline.

4.5 Progress on long term water delivery options for Icon Sites (the Environmental Works and Measures Program)

The Living Murray Environmental Works and Measures Program aims to improve the health of the River Murray system by funding infrastructure that delivers and manages water at the six Icon Sites to achieve the environmental objectives of the Ministerial Council's First Step Decision. This infrastructure includes water regulating structures, water delivery channels and fishways as well as complementary works and measures.

To date, a great deal of activity under the Environmental Works and Measures Program has been in the form of feasibility studies, concept designs and supporting investigations for works to achieve environmental objectives at the Icon Sites (see **Table 5**). These will progress to the detailed design and construction stages over the coming years although it is clear that some projects may not be able to meet the 2011 target date for completion.

An important achievement for the year was agreement to the development of blueprints to align the delivery of works and the environmental water requirements at the Icon Sites.

The progress of EWMP activities is outlined in Annex 4.

4.6 IAG Assessment

4.6.1 Overview

The IAG notes the significant progress in planning for water application under The Living Murray and the environmental achievements in 2006/07 notwithstanding that no water recovered under The Living Murray was available. It seems apparent that there has been difficulty with accelerating the Works Program after the provision of extra funds from the Australian Government. The IAG recognises the urgency of acceleration given the condition of Icon Sites but also accepts that the works projects need to be progressed on a sound knowledge-base so that investment decisions achieve the greatest environmental outcome and maintain flexibility.

4.6.2 Issues Identified and Recommendations

2007.05 **Timely development and delivery of water application infrastructure projects augmented through additional funding**

The IAG recognises that there is concern regarding the progress of TLM infrastructure projects, particularly given that additional funding has been provided by the Australian Government to ensure timely delivery of a set of major infrastructure projects largely focussed on TLM. The IAG notes that the time for start up in planning large-scale projects can be significant but is a necessary part of responding to recent substantial increases in available funds.

IAG accepts that the lead-in phase of major works can be time-consuming but that it is generally a sound investment to ensure all aspects of investigation and design are thoroughly undertaken to optimise the operational effectiveness of works so that environmental objectives can be met throughout the life of the works.

The IAG recommends that every effort should be made to comply with previously established deadlines but that sufficient flexibility be maintained in project programming to ensure that modelling is adequate and the design of works maximises the effective use of increased funding through ensuring that works are effective in meeting the environmental objectives throughout their operational life.

2007.06 **Human Resources**

The issue of human resources continues to be a dominating factor controlling the implementation of The Living Murray, particularly in the area of experienced project managers being engaged to drive the development of works projects in [remote] Icon Sites and provide continuity to their management. This issue continues to apply more broadly in the area of natural resource management as identified by IAG last year (2006.01) and can be expected to worsen given both the institutional uncertainty prevailing and that several hundred additional staff are to be recruited to work on implementation of the National Plan for Water Security (Murray-Darling Basin Authority, Department of Environment and Water Resources and Bureau Of Meteorology.).

The IAG recommends that:

- (i) efforts continue with partner governments to address the skills shortage, and*
- (ii) the shortfall in capacity is acknowledged and planned for in timing delivery of The Living Murray. This may necessitate the recognition of a longer timeframe for complete delivery of The Living Murray as foreshadowed by IAG in 2005/06.*

2007.07 **Preservation of key relict communities at Icon Sites and monitoring of affects of continued extreme conditions.**

The encouraging array of positive ecological responses to the application of very limited volumes of water in 2006/07 indicates that availability of water is a primary limiting factor in these systems and, therefore, that the delivery of appropriate flows to Icon Sites will result in substantial outcomes from The Living Murray. However, continued dry conditions are resulting in further stress at these sites, increasing the risk that parts of the ecosystem will deteriorate to a point at which complete recovery of the targeted features of Icon Sites is not possible:- for example, for long lived plant communities. This emphasises the urgency of water recovery, the need to ensure that environmental water reserves are not re-allocated to consumptive use during droughts, and the need to monitor the condition of Icon Sites to support the prioritisation and efficacy of environmental water application through The Living Murray Environmental Watering Plan.

The IAG recommends that watering of Icon Sites is strategically targeted to ensure that, in the short term, key relict populations survive the current drought; that monitoring continues to maximise learning from the extreme circumstances; and to ensure the application of environmental water to optimise recovery when greater volumes become available. It is suggested that the Environmental Watering Group makes public the reasons for selection of watering priorities.

2007.08 **Rationalisation of management arrangements in multi-jurisdictional Icon Sites to achieve holistic ecological outcomes.**

There is a need for further work to ensure that investment and allocation of water is closely linked to planned environmental outcomes –as articulated in the Ministerial Council objectives and further developed as part of the Environmental Management Plans for each Icon Site. Icon Site Blueprints have made considerable progress in this regard but, if modelling shows that all water needs cannot be met at any site, water and works proposals may need to be revised. Internal consistency should be maintained amongst the objectives particularly regarding the translation of the initial Ministerial Council objectives into the Environmental Management Plans.

Where Icon Sites overlap jurisdictional boundaries, management actions need to be coordinated to achieve planned outcomes, though it should also be noted that processes supporting these outcomes may not apply evenly across Icon Sites. For instance, successful bird recruitment would require the provision of both nesting areas and food sources which are likely to be spatially separate – perhaps in different jurisdictions.

It was apparent to the IAG that for sites located in multiple jurisdictions there was an evident risk that such sites might be managed in a fragmented manner reflecting jurisdictional boundaries, rather than as a whole. Environmental water should be managed efficiently within and between Icon Sites to meet the agreed environmental outcomes, irrespective of jurisdictional (and therefore management) boundaries. There

is an obvious need for single, integrated management arrangements with clear accountability and authority if Icon Sites are to be managed optimally. It is not intended that any review of management arrangements would change existing responsibilities for jurisdictional management functions such as forest management, but rather strengthen the integration of planned management actions and the associated accountability to make the most of available water in achieving the agreed environmental outcomes. It is essential that the deployment of scarce environmental water be timely, flexible, and provides maximum benefit to the ecosystem of the whole Icon Site.

The IAG recommends that:

- *the Living Murray Committee ensure that planned environmental outcomes reflect the developing understanding of Icon Sites and the objectives proposed by the Ministerial Council; and*
- *the management arrangements for Icon Sites, particularly in relation to the management of available environmental water, be reviewed to ensure that a single, integrated management structure is in place, with an accountable manager being appointed on merit through a joint process and with the lines of authority clearly defined, to ensure that sites are managed holistically to optimise spatially diverse ecological functions that combine to achieve planned outcomes.*

2007.09 **Accounting for continued ecological decline resulting from extended extreme climatic conditions**

It was anticipated that intervention through The Living Murray First Step would ultimately arrest the continuing ecological decline for some targeted attributes of Icon Sites through the provision of environmental water. However, the extreme drought of the past few years has not only limited the opportunity for remedial watering but appears to have greatly lowered resilience and accelerated the decline of floodplain ecosystems and the River Murray, Lower Lakes, Coorong and Murray Mouth. Some ecological communities have been affected to such an extent that managed recovery is unlikely over the coming decade. This means that the task of rehabilitation of Icon Sites has probably become significantly more difficult, emphasising the need to manage very limited water allocations strategically. There also may need to be an assessment of the achievability of the Icon Site environmental objectives in the light of the impacts of the severe drought.

The IAG recommends that the environmental objectives and milestones for managing the Icon Sites be reviewed in the light of the impacts of the severe drought to ensure realistic, planned outcomes.

5. ACCOUNTING FOR ENVIRONMENTAL WATER

5.1 Basis for Audit

The basis for the audit presented in this section is Clause 203 parts (ii) and (v) of The Living Murray Business Plan 2007 as set out in the introduction of this report.

5.2 Overview

The Living Murray Intergovernmental Agreement required that each State and the Australian Government (through the MDBC) establish registers to account for environmental water recovery. The MDBC register is the Basin wide register and should reflect in aggregate entries on the State and ACT Registers.

Schedule H of The Living Murray Business Plan 2004 – 2009 proposes that all registers will include the following information:

- Source of water recovered;
- Estimated average volume delivered to the River Murray channel;
- Long Term Cap Equivalent volumes;
- Associated Cap impact in tributaries where relevant;
- Security and reliability characteristics;
- Channel capacity sharing characteristics;
- Type of water recovered (regulated or unregulated);
- Storage / call location(s) if regulated water;
- Geographic limitations on its application to the six Icon Sites; and
- Trading of environmental water where appropriate.

Information on projects listed on the MDBC central register of water recovery measures is summarised in Table 5 and is also available from the MDBC website. Table 5 shows that there is no water listed on the Environmental Water Register as there is no recovered water as of 30 June 2007.

The IAG is aware that work is underway to develop/refine state registers. The intention is for states to provide information on the status of their registers in the 2007/08 Audit.

5.3 Trade in Recovered Water

The Living Murray Business Plan 2007 indicates that water recovered for the environment and held as a tradeable entitlement may be traded on the temporary market at times when this is consistent with the Living Murray Environmental Watering Plan. To ensure tradability, environmental entitlements will need to have the same characteristics as other tradeable entitlements. Schedule H to The Living Murray Business Plan indicates that existing rules for water trade including processes for Cap adjustment apply.

The IAG propose that state reporting to the IAG each year include, for each Valley in which trade has taken place, clear records of the current Schedule F Cap, the volume of environmental water temporarily traded and the resultant adjustment to Schedule F Cap. The temporary trade of environmental water can only add to the Cap for the valley into which the water is traded as it effectively comes from 'out of Cap' water. This perceived anomaly can be addressed only when water accounts are available for all categories of water. Revenue from temporary trades is to be accounted for separately by the investing parties and set aside for investments to achieve objectives under the Living Murray Environmental Watering Plan. The IAG propose that each Living Murray partner produce annual audited financial statements of revenue from temporary trade and expenditure in support of The Living Murray Environmental Watering Plan objectives.

As no water has been recovered to date, there were no trades in 2006/07 and no revenue from trade.

Trade and Impact on Cap

There were no measures registered on the Eligible Measures or Environmental Water Register in the 2006/07 financial year, nor was there any environmental use of water recovered for the purpose of The Living Murray initiative. As such there was no impact on the Long Term Diversion Cap from 1 July 2006 to 30 June 2007.

5.4 Impacts

The Living Murray Business Plan (Clause 203 (v)) requires that the management of the impacts on the Long Term Cap Equivalents resulting from the recovery and delivery of water will be subject to audit by the IAG.

There have been no adjustments to the Long Term Cap Equivalents in 2006/07 as no recovered water has been registered.

It is envisaged that adjustments will need to be made in 2007/08 as measures including 13 GL from South Australia (Securing Government Held Water) and 120 GL (Sales component of the *Goulburn-Murray Water Recovery Package*) are added to the Environmental Water Register.

The IAG is aware of a process underway through the MDBC to address this issue. Upon its resolution the IAG will report on its implementation and provide advice on any issues arising.

5.5 IAG Assessment

5.5.1 Overview

The IAG notes that no water has been recovered under The Living Murray to 30 June 2007. Accordingly, there have been no trades recorded or adjustments to Long Term Cap Equivalents approved.

The IAG made a recommendation on Water Accounting in the 2005/06 Audit (see **Annex 2**). The IAG notes the progress against this recommendation including that a pilot project 'River Murray Shared Water Resources Water Accounting Pilot' has been initiated. The IAG also encourages adoption of a uniform protocol in accounting for environmental water in relation to the Cap which has now been initiated by the Commission.

ANNEX 1 – SPECIFIC ENVIRONMENTAL OUTCOMES

As part of the *First Step Decision*, the Council identified six Icon Sites and the environmental value objectives for each site.

Icon Site	Environmental objectives, and expected outcomes
Barmah–Millewa Forest	<p>Enhance forest, fish and wildlife values:</p> <p>Successful breeding of thousands of colonial waterbirds in at least three years in ten.</p> <p>Healthy vegetation in at least 55% of the area of the forest (including virtually all of the Giant Rush, Moira Grass, River Red Gum forest, and some River Red Gum woodland).</p>
Gunbower and Koondrook–Perricoota Forests	<p>Maintain and restore a mosaic of healthy floodplain communities:</p> <p>80% of permanent and semi-permanent wetlands in healthy condition.</p> <p>30% of River Red Gum forest in healthy condition.</p> <p>Successful breeding of thousands of colonial waterbirds in at least three years in ten.</p> <p>Healthy populations of resident native fish in wetlands.</p>
Hattah Lakes	<p>Restore healthy examples of all original wetland and floodplain communities</p> <p>Restore the aquatic vegetation zone in and around at least 50% of the lakes to increase fish and bird breeding and survival</p> <p>Increase successful breeding events of threatened colonial water birds to at least two in ten years (Spoonbills, Little, Intermediate and Great Egrets, Night Herons and Bitterns).</p> <p>Increase the population size of and breeding events of the endangered Murray Hardyhead, Australian Smelt, Gudgeons and other wetland fish</p>
Chowilla Floodplain (including the Lindsay–Wallpolla system)	<p>Maintain high biodiversity values of the Chowilla Floodplain:</p> <p>High value wetlands maintained.</p> <p>Current area of River Red Gum maintained.</p> <p>At least 20% of the original area of Black Box vegetation maintained.</p>
Murray Mouth, Coorong and Lower Lakes	<p>A healthier Lower Lakes and Coorong estuarine environment:</p> <p>Open Murray Mouth.</p> <p>More frequent estuarine fish spawning.</p> <p>Enhanced migratory wader bird habitat in the Lower Lakes.</p>
River Murray Channel	<p>To increase the frequency of higher flows in spring that are ecologically significant.</p> <p>To overcome barriers to migration of native fish species between the sea and Hume Dam.</p> <p>To maintain current levels of channel stability.</p> <p>Expanded ranges of many species of migratory fishes.</p> <p>Similar or lesser levels of channel erosion to those currently observed.</p>

ANNEX 2 – PROGRESS REPORT ON ISSUES IDENTIFIED IN 2005/06 and 2006/07 AUDITS

Table 9: 2006/07 Issues and Progress Report

2006 ISSUE	PROGRESS REPORT (October 2007)
<p><u>Issue 2006.01</u></p> <p><i>Recommendation: The IAG recommends that the Ministerial Council:</i></p> <p>1. <i>note that skills shortages are affecting the rate of water reform implementation including The Living Murray; and</i></p> <p>2. <i>develops a strategy in partnership with other stakeholders to attract additional skilled resources into the water sector for both the short and long term.</i></p> <p><i>The Ministerial Council may wish to consider the timeframes for the delivery of The Living Murray given this significant and ongoing constraint.</i></p>	<p>Continuing to be addressed: Measures to increase the capacity of both the jurisdictions and the office to implement the agreed TLM program have been identified by some Taskforces and Working Groups. Additional support has been provided to partners governments by way of:</p> <ul style="list-style-type: none"> • additional funding for staff; • placement of a Commission officer in one Icon Site; and • regional forums to progress planning for and integration/learning across Icon Sites. <p>The MDBC office is also undertaking a major workforce planning initiative.</p> <p>The drought has diverted experienced TLM staff onto tasks associated with contingency planning and drought measures.</p> <p>A developing tight market for attracting experienced staff has also reduced the opportunities to build capacity.</p>
<p><u>Issue 2006.02</u></p> <p><i>Recommendation: The IAG recommends that the full suite of water recovery measures, including market-based measures, be utilised in order to maximise the likelihood that the 500 GL water recovery target is met by June 2009.</i></p>	<p>In progress: An expanded suite of water recovery products has been developed, in particular the Pilot Environmental Water Purchase Project. With the expanded suite of water recovery products now coming forward the likelihood of recovering the 500 GL target is looking more optimistic.</p>

<p><u>Issue 2006.03</u></p> <p><i>Recommendation: The IAG recommends that the Ministerial Council considers the wider context in which The Living Murray is being implemented, in particular the considerable threats to water availability and considers the need to review the achievability and the possible adjustment of the environmental objectives for all Icon Sites and The Living Murray overall.</i></p>	<p>In progress: Modelling is now underway to ascertain if the water requirements identified by jurisdictions in blueprints can be delivered within the boundaries of the first step decision (500 GL water recovery). These requirements are the currently the best estimate of what is required to meet the environmental objectives. The Living Murray Committee has formally requested that the achievability of the objectives is reviewed and this task has been scheduled to occur once modelling results are available.</p> <p>The Scientific Reference Panel has recently been and will be convened to review this issue as soon as possible.</p>
<p><u>Issue 2006.04</u></p> <p><i>Recommendation: The IAG recommends that jurisdictions apply very diligent project management arrangements to water recovery activities in order to meet The Living Murray target of 500 GL by June 2009.</i></p>	<p>In progress: See status of 2006.02 above.</p>
<p><u>Issue 2006.05</u></p> <p><i>Recommendation: The IAG recommends that in any assessment of the achievability of the outcomes identified under The Living Murray First Step Decision that assessments of timelines for outputs delivery as well as when expected environmental outcomes become apparent also be prepared.</i></p>	<p>In progress: action against this recommendation is integrated into the modelling and review of the objectives outlined at 2006.03 above. A mid term review of the Environmental Works and Measures Program has also been scheduled which will determine if the planned works can be delivered within the timeframe.</p> <p>The Scientific Reference Panel has recently been and will be convened to review this issue as soon as possible.</p>

<p><u>Issue 2006.06</u></p> <p><i>Recommendation: The IAG recommends that the Ministerial Council ensure sufficient priority and resources are committed to the hydrologic modelling of The Living Murray such that this information is available no later than October 2007.</i></p>	<p>In progress: Initiated in 2006-07 with major work planned for early 2007-08. Refer to discussion of 2006.03</p>
<p><u>Issue 2006.07</u></p> <p><i>Recommendation: The IAG recommends that the outstanding tasks identified in relation to the management of unregulated flows be addressed as soon as possible.</i></p>	<p>In progress: Ongoing negotiation of the management of unregulated flows is underway. Some progress has been made and future management of unregulated flows may be further determined by the modelling underway to scope water delivery requirements of Icon Sites.</p>
<p><u>Issue 2006.08</u></p> <p><i>Recommendation: The IAG recommends that a high priority be assigned to the completion of environmental water accounting, including arrangements for tracking and reporting interdependencies with the Cap on diversions.</i></p>	<p>Pending: Internal discussions have scoped this issue and accounting for environmental water use over 2005-06 and 2006-07 will provide a learning platform for future work. A steering committee has been established and planning has commenced to further address these issues in 2007-08. The National Water Accounting initiatives, Agenda Item 14 of Commission Meeting 93 and Tab 5 of this year's MDBC IAG Cap Submission provide additional information on progress on the issue.</p>

Table 10: 2005/06 Issues and Progress Report

2005 ISSUE	PROGRESS REPORT (October 2007)
<p><u>Issue 2005.01</u></p> <p><i>Recommendation: The IAG recommends that consideration be given to revision of its terms of reference to permit the provision of advice on any issues related to The Living Murray of which it becomes aware during the course of its annual audit. Specifically add the following subclause: '(f) advice on issues relating to The Living Murray arising from the audit'.</i></p>	<p>Action completed: The terms of reference for the IAG were updated by the Murray-Darling Basin Commission in February 2006 incorporating this recommendation.</p>
<p><u>Issue 2005.02</u></p> <p><i>Recommendation: The IAG recommends that jurisdictions provide comment on the format of the tabular presentations as a standard framework for reporting.</i></p>	<p>Action completed: The 2005 report format has been adopted and enhanced for the 2006 report (and is intended to be used for future reports).</p>
<p><u>Issue 2005.03</u></p> <p><i>Recommendation: The IAG recommends that a process be developed to ascertain the permanency of recovered water for innovative water measures where this has not already been established.</i></p>	<p>Action completed: The Supplementary Intergovernmental Agreement of 14 July 2006 Clause 16) addressed this issue whereby “99-year options ... will be considered to meet the requirements of ‘permanently secured’”.</p>
<p><u>Issue 2005.04</u></p> <p><i>Recommendation: The IAG recommends that jurisdictions move to establish Environmental Water Registers as soon as possible.</i></p>	<p>Completion pending: As of October 2006 jurisdictions had not established Environmental Water Registers. The register should be in place in each jurisdiction by the time that the first water is recovered..</p>
<p><u>Issue 2005.05</u></p> <p><i>Recommendation: To avoid confusion it is suggested that audit be used in TLM context to refer exclusively to the role of the IAG and that “post-implementation review” be used in relation to eligible measure projects.</i></p>	<p>Action completed: Changes have been made in the version of the Living Murray Business Plan adopted at Council meeting 42 – 25 May 2007. (example: clause 99).</p>

2005 ISSUE	PROGRESS REPORT (October 2007)
<p><u>Issue 2005.06</u></p> <p><i>Recommendation: The IAG recommends consideration be given to the refinement of the appropriate accuracy of cost estimates at various stages in the development of water recovery measures and that final allocation be based on tender costs.</i></p>	<p>Action completed: Proponents of water recovery measures are aware that (under Annex B of the Living Murray Business Plan 2007), the pre-implementation estimate of cost and volume at the Eligible Measures Register Stage is expected to be within $\pm 10\%$ of the post-implementation cost and volume. At the Developmental Register stage, proponents are now to provide confidence levels around costs and volumes. In regard to the actual investment, the risk of any inaccuracy in cost estimates is distributed among the investors in a project under Investment Agreements.</p> <p>The final expenditure will be decided by Ministerial Council – in nearly all cases it is expected to be on the basis of actual costs. (Reference: clause 99 – 103 of the Living Murray Business Plan 2007).</p>
<p><u>Issue 2005.07</u></p> <p><i>Recommendation: The IAG recommends acknowledgement of environmental initiatives post-Cap and pre-The Living Murray in future editions of The Living Murray Environmental Watering Plan and in the Environmental Water Register. These would, however, not be part of the 500 GL target.</i></p>	<p>Action in progress: This issue has been addressed in the new edition of The Living Murray Environmental Watering Plan. Other ‘environmental water’ is publicly acknowledged on the MDBC website.</p>

ANNEX 3 – GLOSSARY OF TERMS

This *Glossary of Terms* has been taken directly from The Living Murray Business Plan. It is reproduced here in full to assist in interpretation of this audit.

Access characteristics – The conditions under which the entitlement holder can access water. These will vary across States and the Territories, water management areas or source. Characteristics may govern timing and volume and other circumstances as required.

Bulk entitlement (Vic) – The right to water held by water and other authorities defined in the Water Act. The Bulk Entitlement defines the amount of water that an authority is entitled to from a river or storage, and may include the rate at which it may be taken and the reliability of the entitlement.

Crediting amount – Cost and volume at which the MDB Ministerial Council agrees to accredit investment in water recovery measures against the financial and volumetric commitments of jurisdictions under the Intergovernmental Agreement.

Developmental Register – Register of water recovery measures which have undergone a feasibility assessment, 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 for investment under the Intergovernmental Agreement.

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 meet the agreed environmental objectives held by the jurisdiction in which the water was recovered.

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 this Business Plan.

General security (NSW) – NSW water access entitlements that vary from year to year depending on inflows and storage levels (regulated rivers) and river flows (unregulated years).

High security (NSW) – NSW water access entitlements drawn from a regulated system that provides 100% allocation in all but years of extreme drought.

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 this Business Plan up until a final crediting amount is established.

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.

Intergovernmental Agreement – The *Intergovernmental Agreement on Addressing Water Overallocation and Achieving Environmental Objectives in the Murray-Darling Basin* between the Australian Government 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.

Jurisdictions – The Parties to the Intergovernmental Agreement, specifically the Australian Government, the State of New South Wales, the State of Victoria, the State of South Australia and the Australian Capital Territory.

Living Murray Committee – Advisory committee to the MurrayDarling Basin Commission.

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 – the volume registered for a particular recovery work or measure calculated using the accepted best practice Cap computer model for that system as the:

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

Murray-Darling Basin Commission Office – The Office of the Murray-Darling Basin Commission provides the Commission with support services necessary for administering the Murray-Darling Basin Agreement and helping to deliver the Commission's programs. This includes support for technical matters and policy formulation, and secretariat and administrative services to the Ministerial Council, Commission, Project Boards and the various committees advising the Commission.

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 Australia, New South Wales, Victoria, South Australia and Queensland with prime responsibility for matters relating to water, land and environment.

National Water Initiative – The *Intergovernmental Agreement on a National Water Initiative* between the Australian Government of Australia and the Governments of New South Wales, Victoria, Queensland, South Australia, the Australian Capital Territory and the Northern Territory, signed at the Council of Australia Governments meeting on 25 June 2004.

New environmental water (“new e-water”) – water recovered for the environment through investment under the Intergovernmental Agreement.

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.

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

Overallocation – 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.

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

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.

Sales water (Vic) – the volume of water available in a particular season over and above Water Right. Access to Sales Water is announced each season as a percentage of Water Right depending on the available resource.

Translation factor – (for the purpose of paragraph 83 of the Business Plan) – is the ratio of environmental water delivered to the River Murray Channel to the volume of environmental water accounted at source.

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.

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.

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.

Water Right (Vic) – High Security entitlement held by irrigators within the Victorian Irrigation Districts.

ANNEX 4 – 2006/07 Environmental Works and Measures Program achievements

Investigations and planning

Table 14 identifies the main planning and investigations activities undertaken in 2006/07 for each Icon Site.

Table 14: 2006/07 planning and investigations activities at Icon Sites.

Barmah-Millewa	<ul style="list-style-type: none"> Continued feasibility studies and hydraulic modelling for flow management in the Barmah-Millewa Forest Assessment of fish passage requirements at Gulf Creek, Black Engine Creek and for the Mary Ada regulators Development of concept designs for Moira Lake Stage 3 works
Gunbower, Koondrook-Perricoota	<ul style="list-style-type: none"> Completion of detailed hydraulic models for Gunbower and Koondrook-Perricoota forests Continued feasibility studies for water delivery options for Gunbower Forest, including the Upper Forest Channel and Hipwell Road regulators Continued feasibility studies for the Koondrook-Perricoota flood enhancement project (including the Torrumbarry cutting)
Hattah Lakes	<ul style="list-style-type: none"> Feasibility study into the effectiveness of lowering the commence-to-flow threshold of the main inlet (Chalka Creek) and regulators to improve the frequency and duration of wetland and floodplain inundation
Chowilla, Lindsay-Wallpolla	<ul style="list-style-type: none"> Feasibility studies for regulators on Lindsay River and Potterwalkagee Creek to enhance wetland and floodplain inundation Feasibility study of a bypass channel around Lock 9 to increase the extent of flowing aquatic habitats in Wallpolla Creek and associated anabranches on Wallpolla Island Refinement of concept designs for the proposed Chowilla Creek environmental regulator and ancillary structures Detailed hydraulic modelling and completion of ecological risk assessments for the proposed Chowilla Creek environmental regulator Detailed salinity and groundwater impact assessment for the proposed Chowilla Creek environmental regulator Completion of concept designs for the replacement of Bank E and Boat Creek Bridge, replacement of Werta Wert regulator and the repair and provision of fish passage at Pipeclay and Slaney Creek weirs Drilling to investigate the feasibility of deep aquifer disposal of saline groundwater
Lower Lakes, Coorong, Murray Mouth	<ul style="list-style-type: none"> Assessment of the ecological benefits of a connecting channel between Lake Albert and the Coorong Concept designs for small fish lock and small vertical slot fishway at Goolwa Barrage Concept designs for three rock-ramp fishways and a small vertical slot fishway at Tauwitschere Barrage Concept design for a small vertical slot fishway at Boundary Creek Barrage Concept design for a fish-friendly regulator at Hunters Creek
River Murray Channel	<ul style="list-style-type: none"> Concept designs for fishways at Stevens Weir and the Edward River Offtake Regulator Concept designs for fish passage at the Lake Victoria Inlet and control regulators Pump surveys between Locks 1 and 2, and 6 and 7, to assess the impacts and feasibility of weir pool lowering Assessment of the ability of secondary regulating structures between Locks 1 and 7 to accommodate weir pool raising Documentation of past weir pool manipulation activities

Temporary works and measures

The focus of the Environmental Works and Measures Program is the development of long-term, icon site-scale packages to achieve the environmental objectives of the program. The program therefore funds temporary works and measures only where these are critical to the delivery of the overall Living Murray objectives. The temporary works and measures funded through the program in 2006/07 are summarised in Table 15.

Table 15: Temporary works and measures activities in 2006/07

Chowilla, Lindsay–Wallpolla	<ul style="list-style-type: none"> • implementation and operation of four ground and surface water management trials at Bookpurnong to inform long-term management options at Chowilla and other Icon Sites • investigative drilling and analysis to contribute to the feasibility assessment of a deep aquifer, saline groundwater disposal scheme associated with a potential groundwater management scheme at Chowilla
River Murray Channel	<ul style="list-style-type: none"> • coordination of weir pool manipulation activities and investigations in South Australia to inform future weir pool manipulations elsewhere in the system.

Capital works

In 2006–07, design and construction activities were concentrated at the Chowilla (including Lindsay–Wallpolla) and River Murray Channel icon sites (see **Table 16**).

A key achievement was the placement of more than 1,200 River Red Gum snags at three priority sites in the Hume to Yarrawonga reach of the River Murray Channel. Snags are submerged dead trees that provide important habitat and refugia for native fish and aquatic invertebrates. The replacement of snags that had previously been removed is expected to provide significant benefits for fish populations in the area.

Table 16: EWMP capital investment including works designed and/or constructed, 2006–07

Gunbower, Koondrook–Perricoota	<ul style="list-style-type: none"> • Purchase of Toorangabby Station to contribute to the implementation of the Koondrook-Perricoota flood enhancement project
Chowilla, Lindsay–Wallpolla	<ul style="list-style-type: none"> • Completion of Stage 1 Lindsay–Wallpolla works including the construction of regulators at Horseshoe and Webster’s lagoons and Lake Wallawalla (including raising the level of the Old Mail Route Road to retain a higher water level in the lake following flooding) • Detailed design for the replacement of Bank E and Boat Creek Bridge at Chowilla
Lower Lakes, Coorong, Murray Mouth	Detailed design of Hunters Creek fish-friendly regulator on Hindmarsh Island
River Murray Channel	Resnagging: over 1,200 snags were reinstated into three high-priority sites in the Hume to Yarrawonga reach to provide native fish habitat