



# *Setting the Cap*

*Report of the Independent  
Audit Group*



NOVEMBER 1996

# *Setting the Cap*

---

*Report of the Independent  
Audit Group*

---

Independent Audit Group Members

Dr Wally Cox (Chair)

Paul Baxter.

---

NOVEMBER 1996

---

# *Acknowledgements*

The Independent Audit Group appreciated the tremendous support provided by officers of State and Government agencies and various stakeholder groups.

There was a universal commitment to the principles of a cap and agencies, individuals and peak stakeholder groups, although heavily committed, provided ready cooperation including the opportunity to share views on the issues faced in setting a cap.

The Independent Audit Group wish to specially acknowledge the contribution by Andrew Winsbury, Secretary and Andy Close, technical consultant.

ISBN 1 875209 96 4

# Ministerial Foreword

The Murray-Darling Basin Ministerial Council made an historic decision in June 1995 to protect the environmental integrity of the rivers and streams in the Basin and to maintain the economic and social resources of the region.

At that meeting, the Council agreed that a balance needed to be struck between consumptive and instream uses of water in the Basin and introduced an interim cap on further increases in diversions while the precise details of its implementation were established.

This required each of the participating State Governments to develop proposals for implementing the operational Cap within their own jurisdiction.

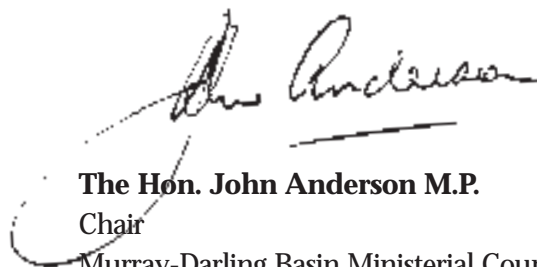
To help interpret differences in the approaches being taken by the States, an Independent Audit Group (IAG) was set up in 1996 to review progress towards implementation of an operational Cap and to consider ways to resolve inconsistencies and equity issues in water use.

The work of the IAG has been invaluable. The IAG has made recommendations which are in line with the Council's objective to achieve sustainable consumptive use while developing

and managing Basin water resources to meet ecological, economic and social needs. This has been reflected in the wide commitment to the Cap encountered by the IAG during its discussions with planners, community groups and other water users across the Basin.

The Ministerial Council has endorsed the recommendations in the Audit Group report, with some specific implementation issues involving property rights, monitoring procedures and the application of the Cap to urban communities to be further developed by the Murray-Darling Basin Commission.

Council is pleased to release the IAG report for public consideration, confident that it will broaden understanding of the Cap's significance and facilitate its implementation.



**The Hon. John Anderson M.P.**  
Chair

Murray-Darling Basin Ministerial Council

# Contents

## *Executive Summary*

**viii**

<b>1. Process and Definitions</b>	<b>1</b>
1.1 Introduction	1
1.2 Process	1
1.3 The Cap in Context	1
1.4 Primary Objectives	2
1.5 Definition of the Cap	2
1.6 Recommendations	3
<b>2. Framework for Analysis</b>	<b>4</b>
2.1 Equity and Consistency Principles	4
2.2 Priority of Property Rights	4
2.3 Water Allocation	5
2.4 Recommendations	5
<b>3. Effectiveness of States' Proposals</b>	<b>6</b>
3.1 The Issue	6
3.2 The Current Position in Each State	6
3.2.1 South Australia	6
3.2.2 Victoria	6
3.2.3 New South Wales	6
3.2.4 Queensland	7
3.3 Discussion of Issues	7
3.3.1 South Australia	7
3.3.2 Victoria	7
3.3.3 New South Wales	8
3.3.4 Queensland	9
3.4 The IAG's Proposal for Managing to a Climate Adjusted Cap	9
3.5 Conclusions	10
3.5.1 South Australia	10
3.5.2 Victoria	11
3.5.3 New South Wales	11
3.5.4 Queensland	11
3.6 Recommendations	11
<b>4. Equity Issues</b>	<b>12</b>
4.1 The Issue	12
4.2 The Current Position in Each State	12
4.2.1 South Australia	12
4.2.2 Queensland	13
4.3 Discussion of Issues	14
4.3.1 South Australia	14
4.3.2 Queensland	16
4.4 Conclusions	18
4.4.1 South Australia	18
4.4.2 Queensland	18
4.5 Recommendations	18
4.5.1 South Australia	18
4.5.2 Queensland	19

<b>5. Monitoring, Auditing and Reporting</b>	<b>20</b>
5.1 The Issue	20
5.2 Progress Towards a Monitoring Methodology	20
5.2.1 Draft Format for Annual Monitoring Report	20
5.2.2 Review of the Preparation of the 1994/95 Monitoring Report	20
5.2.3 Comparison of Diversions with 1993/94 Level of Development	20
5.2.4 Comparison of Actual and Natural Flows	20
5.2.5 Preparation of Report and Dissemination of Information	21
5.3 Conclusions	21
5.4 Recommendations	22
<b>6. Trading</b>	<b>23</b>
6.1 The Issue	23
6.2 Current Position in Each State	23
6.2.1 South Australia	23
6.2.2 Victoria	23
6.2.3 New South Wales	24
6.2.4 Queensland	24
6.3 Discussion of Issues	24
6.4 Conclusions	25
6.5 Recommendations	25
<b>7. Other Issues</b>	<b>26</b>
7.1 River Murray Pumped Districts	26
7.1.1 The Issue	26
7.1.2 Current Position in Each State	26
7.1.3 Discussion of Issues	28
7.1.4 Conclusions	30
7.1.5 Recommendations	30
7.2 Urban Water Supplies	30
7.2.1 The Issue	30
7.2.2 Current Position in Each State	30
7.2.3 Discussion of Issues	31
7.2.4 Conclusions	32
7.2.5 Recommendations	32
7.3 Ten-Hectare Licences	33
7.3.1 The Issue	33
7.3.2 The Current Position in Each State	33
7.3.3 Discussion of Issues	33
7.3.4 Conclusions	34
7.3.5 Recommendations	34
7.4 Dozers and Sleepers	34
7.4.1 The Issue	34
7.4.2 Current Position in Each State	34
7.4.3 Discussion of Issues	35
7.4.4 Conclusions	35
7.4.5 Recommendations	35

7.5	Lake Mokoan	35
7.5.1	The Issues	35
7.5.2	Current Position	35
7.5.3	Discussion of Issues	36
7.5.4	Conclusions	37
7.5.5	Recommendations	37
7.6	Pindari Dam	37
7.6.1	The Issue	37
7.6.2	Current Position	37
7.6.3	Discussion of Issues	37
7.6.4	Conclusions	38
7.6.5	Recommendations	38
<b><i>Glossary</i></b>		<b>39</b>
<b><i>Appendix A:</i></b> Cap Definition and Context		<b>41</b>
<b><i>Appendix B:</i></b> IAG's Terms of Reference		<b>42</b>
<b><i>Appendix C:</i></b> Submissions to the IAG		<b>43</b>
<b><i>Appendix D:</i></b> Attendees at Meetings with the IAG		<b>44</b>
<b><i>Appendix E:</i></b> Bewsher Consulting's Terms of Reference		<b>46</b>
<b><i>Appendix F:</i></b> Quantifying the Differences between States — Water Market Reform Working Group		<b>48</b>
<b><i>Appendix G:</i></b> Hierarchy of Rights Within Each State		<b>56</b>
<b><i>Appendix H:</i></b> IAG Recommendations by State		<b>61</b>

# Executive Summary

## INTRODUCTION

The Murray-Darling Basin Ministerial Council (the Ministerial Council) has agreed that:

- a balance needs to be struck between consumptive and instream uses of water in the rivers of the Murray-Darling Basin; and
- diversions must be capped and an immediate moratorium introduced on further increases in diversions, while the precise details of the Cap on future diversions and its implementation are established.

In July 1996 the Ministerial Council appointed the Independent Audit Group (IAG) to investigate and report on:

- the progress in implementing the Cap on water diversion in the Murray-Darling Basin;
- the effectiveness of and consistency in the approaches adopted by NSW, Victoria, Queensland and South Australia to the implementation of the Cap;
- equity issues between the States; and
- options for resolving any inconsistencies and equity issues.

In appointing the IAG, the objective of the Ministerial Council was that the original terms of the Ministerial Council cap decision be implemented and that the IAG's report provide the basis for the implementation.

This report presents the findings and recommendations of the IAG, based on its meetings with State and Commonwealth Government representatives, irrigation groups, conservation and environmental groups and other stakeholders, and its analysis and consideration of all the available data.

## CAP DEFINITION AND CONTEXT

The Ministerial Council's decision to introduce a Cap followed the Water Audit Report which indicated a significant and unsustainable growth in diversions. A cap on the volume of diversions associated with the 1993/94 levels of development was seen as an essential first step in establishing management systems to achieve healthy rivers and sustainable consumptive uses, including agriculture.

The Cap *per se*, is only a means to an end. It is not the end in itself. The IAG recognises that the overall objectives can be achieved only by identifying environmental water requirements and flow regimes and by establishing a supporting management and institutional framework, including trading of water.

All States and Territories have endorsed the COAG Water Reform Process which requires an assessment of environmental requirements for stressed rivers by 1998.

At the individual valley level, final seasonally adjusted water diversions may, following environmental allocations, be below the Cap. The IAG however envisages that State compliance with the Cap will be assessed on a whole of State basis.

The IAG believes that once effective cap arrangements are in place, priority needs to be given to identifying more fully the environmental water requirements, including flow regimes. This work needs to be integrated across valleys impacting on a common downstream point to ensure maximum benefits.

In the case of the River Murray in NSW and Victoria, this requires close cooperation between the States to achieve an integrated outcome, while for the border and northern NSW rivers similar cooperation is required between Queensland and NSW. Any delays by any of the partners will result in a delay in achieving the Cap in diversions and in the ultimate goal of achieving a balance between consumptive and environmental use.

In undertaking its task the IAG considered the two primary objectives driving the decisions to implement a cap to be:

1. to maintain and, where appropriate, improve existing flow regimes in the waterways of the Murray-Darling Basin to protect and enhance the riverine environment; and
2. to achieve sustainable consumptive use by developing and managing Basin water resources to meet ecological, commercial and social needs.

These primary objectives are seen as being consistent with the previous statements and aims enunciated by the Murray-Darling Basin Commission (MDBC), and the Ministerial Council's agreement at its June 1994 meeting to the flow policy aim encompassed in the first objective outlined above.

The second objective reflects a Ministerial Council commitment given on a number of occasions to a balanced use of water in the Murray-Darling Basin System.

Leaving equity issues aside, the IAG has adopted the following definition of the Cap on diversions:

*'The Cap is the volume of water that would have been diverted under 1993/94 levels of development.'*

*'In unregulated rivers this Cap may be expressed as an end-of-valley flow regime.'*

Again, leaving equity issues aside, the IAG believes that:

- to protect water quality and preserve the health of the river system, the Cap should ensure there is no net growth in diversions from the Murray-Darling Basin;
- the level of development against which to test for growth in water diversions be equivalent to 1993/94 levels of development;



- under the Cap, the amount of water that States would be entitled to divert from regulated streams in any year would be quantified using analytical models that incorporate weather conditions and which take into account:
  - the water supply infrastructure in place in 1993/94;
  - the water allocation and system operating rules which applied in 1993/94;
  - the entitlements that were allocated and the extent of their utilisation at 1993/94 levels of development;
  - the underlying level of demand for water in 1993/94; and
  - the system operating efficiency in 1993/94; and
- in unregulated rivers, end-of-valley flows may be used to define the Cap using analytical models incorporating the same points as above.

After considering a number of equity issues, the IAG believes that the Cap may be adjusted for certain additional developments which occurred after 1993/94.

The Cap should restrain diversions, not development. With the Cap in place, new developments should be allowed, provided that the water for them is obtained by improving water use efficiency or by purchasing water from existing developments.

Because irrigation demand varies with seasonal conditions, the diversions permitted under the Cap will vary from year to year. The system used to manage diversions within the Cap will therefore need to be flexible.

For unregulated rivers with high seasonal variability, the Cap may be described in terms of end-of-valley flows and supporting flow management rules including diversion entitlements.

## FRAMEWORK FOR ANALYSIS

### *Equity and Consistency Principles*

To help it consider the equity and consistency issues identified in the Terms of Reference, the IAG adopted the following six principles or ‘tests’ for the proposals and submissions of the various interest groups:

1. no further change be made to flow regimes that would contribute to deterioration of water quality and environment protection (instream, floodplain or estuarine);
2. water allocations be made with extreme sensitivity to the effects on the environment (Precautionary Principle);
3. water is allocated to the highest value use (allocative efficiency);
4. statutory and agreed property rights be recognised;
5. water management processes be transparent and auditable; and

6. a system of administration be implemented which is easily understood and which minimises time and costs (administrative efficiency).

### *Property Rights*

To further help its deliberations, the IAG considered the question of whether a formal ordering of property rights could be applied to the use of water and concluded that:

- all formal entitlements to access to water should be given precedence over informal forms of permission to access water (such as off-allocation and sales water);
- those with a history of use should have precedence over those with no history of use; and
- a firm promise of future access to water should have precedence over the mere ability to have requested access to water.

Based on this logic, the IAG prepared and adopted the following hierarchy of property rights to be used in the study, ranked from the highest to the lowest:

1. a statutory property right to water under existing rules which has a history of use (includes the used component of some dozer allocations);
2. a statutory property right to water under existing rules with no history of use (includes the unused component of some dozer allocations);
3. a non-statutory right<sup>a</sup> to use water under existing rules which has a history of use (includes the used component of some dozer allocations);
4. a non-statutory right<sup>1</sup> to use water under existing rules with no history of use (includes the unused component of some dozer allocations);
5. a formal promise of a right; and
6. no right to water, but would have been able to get one in the past.

As a general rule, greater priority would be given under this hierarchy of rights to those which fall into categories 1 or 2 as outlined above.

The Cap objectives and definition, together with the equity and consistency principles and hierarchy of property rights, provide the basis on which the IAG has addressed the issues raised in the Terms of Reference. Accordingly, the IAG reached the conclusions and recommendations as outlined below.

a. Usually issued under an Act but as a licence to use rather than a full property right.

## CONCLUSIONS AND RECOMMENDATIONS

### Cap Objectives and Definition

#### RECOMMENDATIONS

The IAG recommends that the Ministerial Council confirm its previous statement of aims adopted by the IAG as the primary objectives of the decision to implement the Cap, namely:

- to maintain and where appropriate, improve existing flow regimes in the waterways of the Murray-Darling Basin to protect and enhance the riverine environment; and
- to achieve sustainable consumptive use by developing and managing Basin water resources to meet ecological, commercial and social needs (**Recommendation 1**).

Aside from any equity issues, the IAG recommends adoption of the following generic definition of the Cap, namely:

*'The Cap is the volume of water that would have been diverted under 1993/94 levels of development.'*

*'In unregulated rivers this Cap may be expressed as an end-of-valley flow regime.'* (**Recommendation 2**).

In consideration of the equity issues, the IAG recommends that the definition of the Cap allow for certain additional developments which have occurred since 1993/94 or which may occur and which are more fully discussed elsewhere in this report (**Recommendation 3**).

### Equity Principles and Property Rights

#### RECOMMENDATIONS

The IAG recommends that:

- the Ministerial Council endorses the six equity and consistency principles outlined above (**Recommendation 4**); and
- the Ministerial Council endorses the property rights hierarchy as a basis for addressing intra Basin equity and consistency issues (**Recommendation 5**).

### Effectiveness of States' Proposals

On the basis of advice received from the States, the IAG believes that the States are generally supportive of the Cap and that on 30 June 1997 the States will be able to deliver on meeting the Cap, although in some circumstances it will need to be adjusted for equity considerations.

### South Australia

South Australia, under its proposed volumetric (volume measuring) capping model, will be able to meet the effectiveness requirements. South Australia will be able to measure water usage effectively. Furthermore, heavy penalties are applied to prevent use of water beyond their cap. However, if South Australia adopts its proposed allocation arrangements for urban water, it will exceed the IAG cap as there will be increases in diversions.

### Victoria

Victoria has completed the bulk entitlements (BE) for the Goulburn system and will complete the BE for the Goulburn Murray Water component of the River Murray by June 1997. These entitlements will cap 90 percent of Victorian diversions in the Basin. The BEs for the remaining diversions will be completed by June 1999.

Modelling studies on the effectiveness of Victoria's proposed capping process suggest that the constraints in the BE may not be effective in capping diversions in the Goulburn system in a trading environment. Also, tests of Victoria's proposed 10 year rolling average diversion limit for the River Murray show that it will not, by itself, hold Victorian diversions to the IAG's cap.

Victoria is committed to achieving the Cap as defined by the IAG and is examining modifications to its capping process to overcome these limitations.

Victoria will assess the effectiveness of its process each year by comparing its diversions with those expected under 1993/94 levels of development.

Victoria will be able to control diversions in its gravity districts by adjusting its rules for sales and off-allocation.

For pumped water supply systems, the Cap will be achieved by creating BEs that are close to current use and offsetting any increases in diversions by reducing entitlements to off-allocation and sales water.

The IAG is confident that, if these processes are incorporated into future BEs and appropriate trading rules are in place, Victoria will be effective in achieving the Cap.

### New South Wales

NSW is strongly committed to the Cap and its interpretation of it is similar to that adopted by the IAG. NSW, at the completion of its current work program, will be able to define the Cap on a valley-by-valley diversion basis with associated management rules.

Because of time and resource constraints, more refinement of diversions and management rules will be carried out after 30 June 1997. This should include the impacts of water harvesting. More resources will be needed to implement

detailed valley-by-valley monitoring to develop management rules and to undertake stakeholder consultations.

The IAG recognises that to achieve the Cap effectively, appropriate institutional arrangements covering property rights, pricing and trading need to be instituted. This will require substantial legislative change.

## Queensland

Queensland's proposal will comply with the IAG's definition of the Cap adjusted for equity.

It is not possible to assess fully the effectiveness of Queensland's proposals because the Cap targets and the methods to be used to achieve them are outcomes of the Water Allocation Management Planning (WAMP) process and have not yet been fully developed. These are expected to be available by 30 June 1997.

WAMP is an appropriate process. However:

- it must accommodate instream use not only in Queensland but also in the border rivers under the control of the Border River Commission and the rest of the Murray-Darling Basin; and
- a management regime needs to be developed that includes pricing, property rights and measuring and reporting.

As the Cap is proposed to be defined on the basis of end-of-valley flows and supported by a set of management rules, auditing of the implementation of the rules can determine the effectiveness of the Cap.

## RECOMMENDATIONS

The following recommendations need to be considered in the context of the recommendations on equity.

The IAG recommends that:

- where relevant, States give consideration to the IAG proposal for managing to a climate adjusted cap (**Recommendation 6**);
- South Australia cap water for domestic and urban use at levels close to historic usage (see discussions under Equity Issues & Urban Water Supplies) (**Recommendation 7**);
- future Victorian BEs contain a specific commitment to limiting diversions to the Cap as defined by the IAG (**Recommendation 8**);
- NSW needs to allocate more resources to developing models and associated management regimes and to implementing them (**Recommendation 9**);
- the results of the WAMP process in Queensland be independently audited with an interim audit performed at the draft plan stage, and a final audit

of any changes made to this draft plan before it is submitted to the Ministerial Council (**Recommendation 10**); and

- the results of the capping process for each State be independently audited and submitted to the Ministerial Council before they are implemented (**Recommendation 11**).

## Equity Issues

### South Australia

The South Australian Government proposed, on the basis of existing property rights, to include an estimated 69 GL per annum of allocated but unutilised irrigation water within the South Australian cap.

The IAG considered that this would adversely impact on downstream water quality and would normally require trade offs for inclusion in the cap. South Australia has conservatively managed its water resources setting its own cap in 1969 with two reductions in the cap since. Sales water is infrequently used at present and will be completely stopped in the future. As a consequence, trade offs are not possible and in view of the strong existing property rights the IAG considered that the 69 GL per year should be included in the cap in recognition of South Australia's conservative water management practices. In forming its view on the 69 GL, the IAG notes that the circumstances involved are unique to South Australia and do not apply in the other States.

The IAG cannot justify an additional 50 GL for economic use because of its impact on water quality and riverflow objectives. Previously, the water was not used often and remained effectively as water for the environment.

The IAG does not support the use of a five-year rolling average allocation for diversions for use in Adelaide by SA Water, but considers that an alternative approach using a ten-year rolling average representing an allocation of 1,000 GL over ten years (notional 100 GL per year) should be used. Under a five-year rolling average approach, trading through leasing or selling any of its own water allocated for urban use is not supported, whereas it would be if the ten-year rolling average approach is used.

### Queensland

The IAG recognises Queensland's equity argument to the extent that increased diversion should occur only after:

- WAMP is fully implemented, including assessment of downstream impacts in NSW;
- the Precautionary Principle is applied through the establishment of an allocation to be held in reserve to minimise the risk of over allocation for consumptive use; and

- final independent audit of the WAMP process is conducted, including modelling of impacts on downstream Basin flows.

## RECOMMENDATIONS

### South Australia

The IAG recommends that:

- the proposal to allocate an additional 50 GL per year for economic use not be approved as it is not compatible with water quality and river flow objectives (**Recommendation 12**); and
- the 69 GL per year increase in diversions expected from the uptake of water allocated for irrigation and previously not used, be included in the Cap (**Recommendation 13**).

Further recommendations in relation to urban water allocation are provided below.

### Queensland

The IAG recommends that:

- the cap for Queensland be determined after the WAMP process is completed (**Recommendation 14**);
- NSW and Queensland allocate resources on a priority basis to the WAMP process affecting border rivers (**Recommendation 15**); and
- the results of the WAMP process in Queensland be independently audited with an interim audit performed at the draft plan stage, and a final audit of any changes made to this draft plan before it is submitted to the Ministerial Council (**Recommendation 16**).

The IAG supports the separation of policy responsibility from daily operation for the Border River Commission and encourages the NSW and Queensland Governments to provide the necessary policy framework in the context of the entire Murray-Darling Basin (**Recommendation 17**).

## Monitoring, Auditing and Reporting

For the community, the Ministerial Council and the MDBC to be confident that the Cap is being achieved, there needs to be a consistent measuring, reporting and auditing framework across the Basin. Transparency and auditability of the water management process is important to ensure ongoing commitment to the Cap.

The MDBC has a role in quality management, as a repository for the monitoring data, for preparing the annual report and for arranging reviews of the Cap at about three yearly intervals. A format has been developed for a Water Audit Monitoring Report to be produced annually in hard copy and on the Internet.

To provide data appropriate for managing the Cap on diversions, robust systems will need to be established within the States and the MDBC office to collect, collate, analyse, archive, publish and disseminate the information. Resources will be needed to set up and maintain these systems.

Some diversions are not being monitored well and consideration should be given to investing in meters for some unregulated stream diversions.

The States have not yet been able to compare 1994/95 diversions with the diversions expected under the 1993/94 levels of development. It is a concern to the IAG that there appears to be insufficient resources to satisfy the monitoring requirements.

Consultation with each of the States indicates support for a monitoring and reporting framework by NSW, Victoria and South Australia. Queensland indicated that a less rigorous reporting approach, consistent with the proposed format, would be more appropriate for its largely seasonal rivers. The IAG is satisfied with the Queensland approach given the nature of flows in the Queensland region but envisages that this report process will be reviewed as part of the audit of the Queensland WAMP process recommended elsewhere in this report.

## RECOMMENDATIONS

In considering the need for a transparent reporting mechanism and the progress that has been achieved in preparing such a mechanism, the IAG recommends that:

- the draft format that has been developed for the Water Audit Monitoring Report be implemented and reports considered annually by the MDBC (**Recommendation 18**);
- a body be identified in each State which has clear responsibility for collating water audit information (**Recommendation 19**);
- information on performance against the Cap be made widely available (**Recommendation 20**); and
- all States allocate enough resources to satisfy their monitoring responsibilities (**Recommendation 21**).

## Trading

The implementation of the Cap will have no adverse impact on interstate trading provided an appropriate accounting system is used. Rather than an adverse impact, the existence of the Cap is likely to increase the pressure for growth in the opportunities for trade.

However, the trading rules can impact greatly on the success of the Cap. The trading regime needs to be formulated so that it does not provide a means whereby the Cap can be circumvented. For this reason, the definitions applied to



the Cap by each of the States need to be rigorous, as any weaknesses in the capping mechanisms could be exploited through interstate trade, making the Cap rules less effective in limiting future growth in diversions in the Basin. Rather than placing additional restrictions on interstate trade to protect the State's mechanisms for imposing the Cap, a better definition of water rights should be established throughout the Basin.

## RECOMMENDATIONS

The IAG recommends that the following actions be adopted:

- water rights be defined to ensure that the integrity of the Cap is maintained (**Recommendation 22**);
- an appropriate trading regime be implemented (**Recommendation 23**);
- the NSW and Queensland Governments agree on a set of trading rules to be applied to cross-border trade between the two States (**Recommendation 24**);
- the Victorian and NSW Governments agree on a set of working rules to apply to trade between these two States (**Recommendation 25**);
- South Australia should participate in discussions between NSW and Victoria to agree on a set of working rules to apply to these three States (**Recommendation 26**); and
- the pilot 'free trade zone' in the Mallee region should be implemented urgently as a means of beginning to resolve some of the practical difficulties identified by the Water Market Reform Working Group (**Recommendation 27**).

### River Murray Pumped Districts

There is potential for a significant increase in water diversions as a result of unutilised water in pumped districts being activated by the proposed water trading arrangements. The potential for this growth in diversions is inconsistent with the Cap objectives, and will require direct government intervention on a State-by-State basis to resolve.

## RECOMMENDATIONS

The IAG recommends that:

- the Governments in NSW and Victoria either modify the allocation to pumped districts, or identify the offsets to be put in place as unutilised water is activated (**Recommendation 28**);
- allocation be issued at a level consistent with soil and crop type, rather than on historic allocation levels (**Recommendation 29**);

- the South Australian cap include the 69 GL in historic over-allocation to irrigation in South Australia as no trade-offs are available (**Recommendation 30**); and
- after the Cap is in place, water savings from improvements in system efficiency may be reallocated for consumptive use within the Cap (to provide a return for investments in improvements in water efficiency) (**Recommendation 31**).

### Urban Water Supplies

Consistency in the treatment of urban water entitlements across the Basin will remove the possibility of dissatisfaction with water entitlements across State boundaries.

This consistency in approach should apply also to the ACT which has the largest urban development relying entirely on water from the Murray-Darling System.

The IAG recognises, however, that there will be certain circumstances where there will need to be some differences in the urban allocation process. This approach will allow States the flexibility to give greater recognition to quantification processes that recognised past investment decisions (under principles one and two of the hierarchy of rights) provided that there was no advantage in terms of the application of the Cap. These differences in allocation arrangements where necessary, can be readily accommodated in the Cap concept without undermining the integrity of the Cap or its overall objectives.

South Australia's proposed urban water requirements need special consideration. The IAG accepts that a cap of 50 GL per year be placed on diversions to South Australian country towns recognising that the high degree of security needed will discourage any long term trading of this water. However, the IAG does not accept that a five-year rolling average is appropriate for determining the allocation for Adelaide's urban use. Given the variability of usage from the River Murray, a cap should be placed on diversions for Adelaide's use, based on a ten-year rolling average. This will amount to an allocation of 1,000 GL over the ten years, or notionally, an average of 100 GL per year. This outcome is closer to the current average usage for Adelaide and would reflect any allowance for population growth to the year 2000 as proposed for other urban water allocations. Should South Australia adopt a five-year rolling average, to avoid the potential for a growth in diversions, SA Water should be prevented from trading in its own water allocated for urban use. This does not mean that SA Water will be precluded from buying or leasing water from elsewhere if demand increases. However, if a ten-year rolling average is adopted, this trading limitation could be removed.

## RECOMMENDATIONS

The IAG recommends that:

- for consistency, the level of water allocated to urban communities in all States should be capped at expected consumptive levels for the year 2000 (**Recommendation 32**), or alternatively for consistency, where States adopt other allocation rules, the allocations to urban systems should not result in a net increase in diversions (**Recommendation 33**);
- future additional water requirements will have to be obtained through water trading (**Recommendation 34**);
- for SA Water:
  - a fixed allocation of 50 GL per year be provided for country towns (**Recommendation 35**); and
  - a cap on diversions for Adelaide's urban use be based on a ten-year rolling average with full tradeability to apply to SA Water's allocations (this tradeability approval should be removed if a five-year rolling average base is used. It is noted that SA Water would not be precluded from buying or leasing water from elsewhere if demand increases.) (**Recommendation 36**);
- for the ACT:
  - a property right to support a cap for urban water use in the ACT (including associated rural areas) be agreed by 1 July 1997 based on the principles outlined under Recommendations 32 or 33 above (**Recommendation 37**); and
  - in setting the cap the ACT should consider the need for appropriate water resource studies covering all sources of water as a basis for allocating water for consumptive and environmental use in the Territory (**Recommendation 38**).

### Ten-Hectare Licences

The IAG believes that new commitments cannot be agreed to if a decision has been made to cap diversions.

## RECOMMENDATIONS

The IAG recommends that:

- NSW should cease issuing new ten-hectare licences in the Murray-Darling Basin and existing ten-hectare licences usage should be included within the Cap (**Recommendation 39**).
- if the WAMP process in Queensland identifies opportunities for new ten-hectare licences, the usage by this type of licences should be met within the Cap (**Recommendation 40**); and

- once the Cap is in operation, water for ten-hectare blocks should only be available through the purchase of existing entitlements (**Recommendation 41**).

### Dozers and Sleepers

Consistency in handling sleeper and dozer allocations will require that any activation of these allocations, either by the existing entitlement holders or via traded rights, occur within the Cap. In South Australia, where a volumetric cap has been applied for more than 25 years, dozer allocations will be activated up to that cap.

In Victoria and NSW where there has been reliance upon sales and off-allocation water respectively, the honouring of the rights under the sleeper and dozer allocations should be given priority at the expense of sales and off-allocation water. Sales and off-allocation water diversions are not formal rights to water, although it is acknowledged that irrigators have come to rely on them through regular past practices. However, to remain within the Cap, and to meet the primary objectives, some form of adjustment is needed. The IAG believes that priority to water within the Cap should be given on the basis of the hierarchy of access rights. On this basis, access to sleeper and dozer allocations with high level property rights would have priority over lesser categories of rights, in particular sales and off-allocation water.

In Queensland, the WAMP process should similarly give greater priority to existing rights over available water supplies. However, in determining future water diversions, the WAMP process should adopt the Precautionary Principle to prevent over-allocation of water for consumptive use. It also should ensure that sleeper and dozer allocations are included in the allowance for consumptive use, as long as their total level used is consistent with the WAMP allocation process.

## RECOMMENDATIONS

The IAG recommends that:

- the Cap not be increased to allow for increased water diversions resulting from existing sleeper and dozer allocations (**Recommendation 42**);
- sleeper and dozer allocations with high level property rights to water be given priority over lesser categories of rights, in particular sales and off-allocation water (**Recommendation 43**); and
- the Precautionary Principle be applied by Queensland through its WAMP process to ensure that over allocation of water for consumptive use does not occur, while acknowledging the rights that are held by previously existing sleeper and dozer allocations (**Recommendation 44**).

### **Lake Mokoan**

The IAG believes the Victorian cap should be increased to allow for the completion of the Lake Mokoan scheme. The Victorian cap should include a nominal additional 22 GL per year to be adjusted once the results of a proposed water allocation process have been conducted.

#### **RECOMMENDATIONS**

The IAG recommends that:

- the Lake Mokoan system qualifies for inclusion in the 1993/94 cap (**Recommendation 45**);
- the Cap be increased by the net consumptive use determined by an appropriate water allocation study (**Recommendation 46**); and
- on an interim basis, the Victorian cap include 22 GL per year for Lake Mokoan (**Recommendation 47**).

### **Pindari Dam**

The IAG believes that Pindari Dam qualifies for inclusion in the Cap on equity grounds.

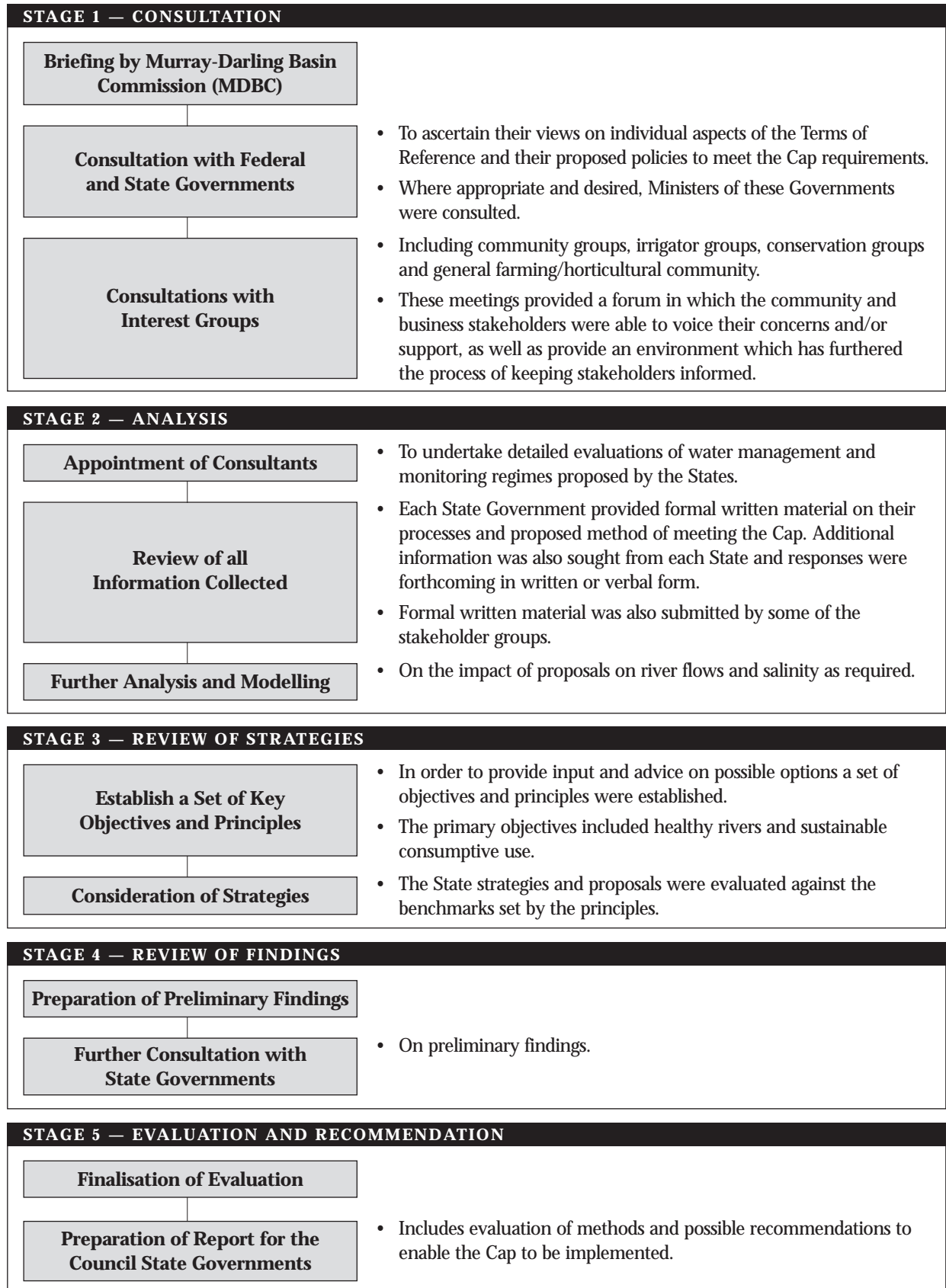
Because of growth in development and diversions since the Memorandum of Understanding was signed and because the sustainability of the current diversion levels in the MacIntyre region is questionable the proposed quantum of water should be determined by a water resource allocation study before the final additional or actual average annual diversions can be determined. This study should be subject to an independent audit before inclusion in the cap for NSW.

#### **RECOMMENDATIONS**

The IAG recommends that:

- in principle, Pindari Dam qualifies for inclusion in the Cap (**Recommendation 48**); and
- the Cap be increased by a net consumptive use determined by an appropriate water allocation study (**Recommendation 49**).

**Figure 1.1: Outline of Study Methodology**





# 1. Process and Definitions

## 1.1 INTRODUCTION

The Murray-Darling Basin Ministerial Council (the Ministerial Council) on 30 June 1995 agreed that:

- a balance needed to be struck between consumptive and instream uses of water in the rivers of the Murray-Darling Basin;
- diversions must be capped and an immediate moratorium introduced on further increases in diversions, while the precise details of the Cap and its implementation were being established;
- the Murray-Darling Basin Commission (MDBC) would establish a Working Group, with representation from all parties to the Agreement, to determine the appropriate level of development associated with a cap on diversions and to prepare the management arrangements required to implement the Cap, noting any special circumstances and the importance of equity issues in water use in all States of the Basin; and
- the Working Party should report back to Council by the end of November 1995.

While developing the rules for the Cap, a number of contentious issues arose on consistency and equity between the States. The parties have not been able to resolve these matters within the Working Group environment. Early resolution is required for the effective implementation of the Cap.

Consequently, the Independent Audit Group (IAG) comprising Dr Wally Cox (Chairman), Paul Baxter and Andrew Winsbury (Secretary), with Don Blackmore as an ex-officio member, was established by the Murray-Darling Basin Ministerial Council to investigate and report on:

- progress in implementing the Cap on water diversion in the Murray-Darling Basin;
- the effectiveness of and consistency in the approaches adopted by NSW, Victoria, Queensland and South Australia to the implementation of the Cap;
- equity issues between the relevant States; and
- options for resolving any inconsistencies and equity issues.

In appointing the IAG, the objective of the Ministerial Council was that the original terms of the Ministerial Council cap decision be implemented, and that the IAG's report provide the basis for this implementation.

The IAG's Terms of Reference were developed with the objective of achieving a balance between the consumptive and in-stream use of water in the rivers of the Murray-Darling Basin. The full Terms of Reference are at Appendix B.

## 1.2 PROCESS

### *Audit Framework*

The audit framework adopted by the IAG to address the Terms of Reference is outlined below.

## 1.3 THE CAP IN CONTEXT

The Ministerial Council's decision to introduce a Cap followed the Water Audit Report which indicated a significant and unsustainable growth in diversions. A cap on diversions associated with the 1993/94 levels of development was seen as an essential first step in establishing management systems to achieve healthy rivers and sustainable consumptive uses, including agriculture. The Cap *per se* is only a means to an end. It is not the end in itself. The IAG recognises that the overall objectives can be achieved only by identifying environmental water requirements and flow regimes and by establishing a supporting management and institutional framework, including trading of water.

All States and Territories have endorsed the COAG Water Reform process which requires an assessment of environmental requirements for stressed rivers by 1998.

At the individual valley level, final seasonally-adjusted water diversions may end up, following environmental allocations, below the Cap. The IAG however envisages that State compliance with the Cap will be assessed on a whole of State basis.

The IAG believes that once effective cap arrangements are in place, priority needs to be given to identifying more fully the environmental water requirements, including flow regimes. This work will need to be integrated across valleys impacting on a common downstream point to ensure maximum benefits. In the case of the River Murray in NSW and Victoria, this requires close cooperation between the States to achieve an integrated outcome, while for the border and northern NSW rivers, similar cooperation is required between Queensland and NSW. Any delays by any of the partners will delay achieving the Cap in diversions and the ultimate goal of a balance between consumptive and environmental use.

## 1.4 PRIMARY OBJECTIVES

In undertaking its task the IAG considered the two primary objectives driving the decisions to implement a cap to be:

- 1) to maintain and, where appropriate, improve existing flow regimes in the waterways of the Murray-Darling Basin to protect and enhance the riverine environment; and
- 2) to achieve sustainable consumptive use by developing and managing Basin water resources to meet ecological, commercial and social needs.

The primary objectives are seen as being consistent with the statements and aims previously made by the Murray-Darling Basin Commission (MDBC). The Ministerial Council in its June 1994 meeting agreed to the flow policy aim encompassed in the first objective outlined above.

This objective has received wide community support and provides the basis on which a commitment to the Cap has been made at all levels within governments, water users, environmental groups and the general community that the IAG interviewed during its deliberations.

The second objective reflects a Ministerial Council commitment given on a number of occasions to a balanced use of water in the Murray-Darling Basin System. However, such a balance can only be achieved when there is appropriate management of the resources including allocation between the competing needs. The second objective acknowledges the need for a cap as a move towards achieving a better balance between various uses while recognising that consumptive users are a legitimate and economically critical part of the use of the Murray-Darling resource.

## 1.5 DEFINITION OF THE CAP

Leaving equity issues aside, the IAG has adopted the following definition of the Cap on diversions:

*'The Cap is the volume of water that would have been diverted under 1993/94 levels of development.'*

*'In unregulated rivers this Cap may be expressed as an end-of-valley flow regime.'*

Again, leaving equity issues aside, the IAG believes that:

- to protect water quality and preserve the health of the river system, the Cap should ensure there is no net growth in diversions from the Murray-Darling Basin;
- the level of development against which to test for growth in water diversions be equivalent to 1993/94 level of development;
- under the Cap, the amount of water that States would be entitled to divert from regulated streams in any year

be quantified using analytical models that incorporate weather conditions and which take into account:

- the water supply infrastructure in place in 1993/94;
  - the water allocation and system operating rules which applied in 1993/94;
  - the entitlements that were allocated and the extent of their utilisation at 1993/94 levels of development;
  - the underlying level of demand for water in 1993/94;
  - the system operating efficiency in 1993/94; and
- in unregulated rivers, end-of-valley flows may be used to define the Cap using analytical models incorporating the same points as above.

After considering a number of equity issues, the IAG believes that the Cap may be adjusted for certain additional developments which occurred after 1993/94.

Figure 1.2 demonstrates how the IAG's proposal for the Cap, excluding adjustments for equity issues, might operate. As demonstrated in the Water Audit Report, diversions from the Basin were growing steadily before 1994. A trend line which takes into account the variations in the weather has been fitted to this growth in diversions. The aim of the Cap will be to ensure that the long term average diversion equals the value of this trend line in 1993/94.

The Cap should restrain diversions, not development. With the Cap in place, new developments should be allowed, provided that the water for them is obtained by improving water use efficiency or by purchasing water from existing developments.

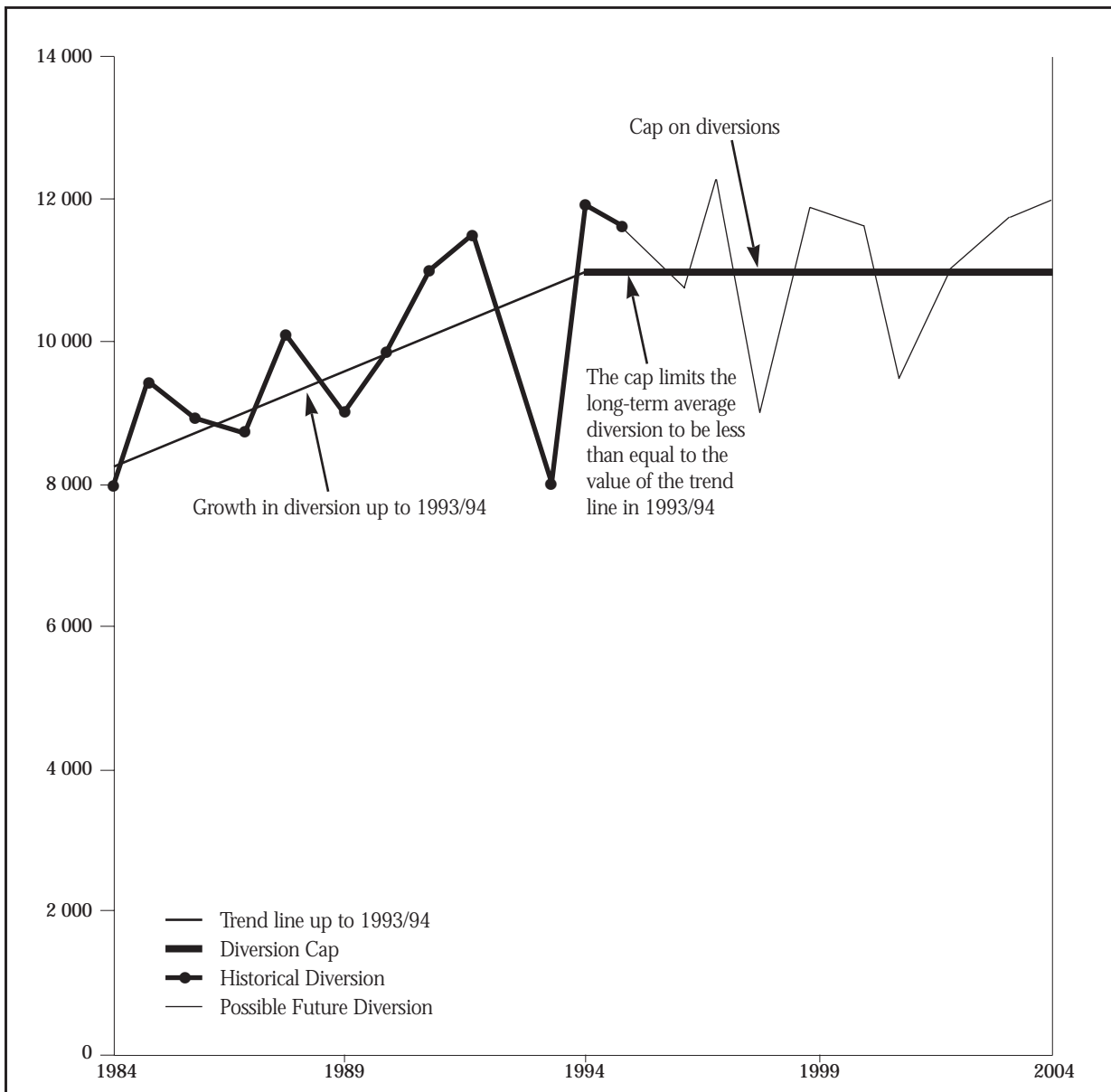
Under this definition of the Cap, if the activation of sleeper and dozer allocations are allowed, they would not be allowed to increase total diversions except as a result of equity issues.

Because irrigation demand varies with seasonal conditions, the diversions permitted under the Cap will vary from year to year. The system used to manage diversions within the Cap will therefore need to be flexible.

For unregulated rivers with high seasonal variability, the Cap may be described in terms of end-of-valley flows and supporting flow management rules including diversion entitlements.

Aside from the equity and issues for special consideration (which will be discussed separately), it is possible that actual diversion will be less than the Cap as defined above as instream and environmental water requirements are identified and allocated. This may lead to a reduction of the Cap in the future.

**Figure 1.2: The Operation of the Cap on Murray-Darling Basin Diversions**



## 1.6 RECOMMENDATIONS

The IAG recommends that the Ministerial Council confirm its previous statement of aims adopted by the IAG as the primary objectives of the decision to implement the Cap, namely:

- 1) to maintain and where appropriate, improve existing flow regimes in the waterways of the Murray-Darling Basin to protect and enhance the riverine environment; and
- 2) to achieve sustainable consumptive use by developing and managing Basin water resources to meet ecological, commercial and social needs (**Recommendation 1**).

Aside from any equity issues, the IAG recommends the following generic definition of the Cap be adopted:

*'The Cap is the volume of water that would have been diverted under 1993/94 levels of development.'*

*'In unregulated rivers this Cap may be expressed as an end-of-valley flow regime.'* (**Recommendation 2**)

In consideration of the equity issues, the IAG recommends that the definition of the Cap allow for certain additional developments which have occurred since 1993/94 or which may occur and which are more fully discussed elsewhere in this report (**Recommendation 3**).

## ***2. Framework for Analysis***

### **2.1 EQUITY AND CONSISTENCY PRINCIPLES**

The identification of the main objectives and the definition of the Cap provides a broad basis on which to examine the issues specified in the Terms of Reference. However, there is a need for a more focussed set of guidelines against which individual issues and matters of equity and consistency can be judged. Thus, in the context of the two overriding objectives, the IAG has identified six principles or 'tests' against which to assess equity and consistency issues identified in the Terms of Reference.

The six principles are:

1. no further change be made to flow regimes that would contribute to deterioration of water quality and environment protection (instream, floodplain or estuarine);
2. water allocations be made with extreme sensitivity to the effects on the environment (Precautionary Principle);
3. water is allocated to the highest value use (allocative efficiency);
4. statutory and agreed property rights be recognised;
5. water management processes be transparent and auditable; and
6. a system of administration be implemented which is easily understood and which minimises time and costs (administrative efficiency).

It is recognised that there is a degree of tension between some of the principles as outlined above.

Issues of equity and consistency in practices and policies between States lie at the heart of this study. The IAG has examined these issues mainly from an interstate perspective, in line with the focus of the IAG's Terms of Reference. However, it is readily evident from meetings with interest groups across the four States that there are a number of *intrastate* equity and consistency issues that need to be addressed and resolved.

The IAG has not sought to address these intrastate issues except where they impact on interstate issues. However, for the administration of the Cap to be successful and the objectives as outlined above achievable, individual State administrations will need to resolve these intrastate equity and consistency problems.

As discussed below, the resolution of these problems will take time and it must concern all States that there may not be sufficient time to complete the task that is before them in the remaining months before mid-1997.

### **2.2 PRIORITY OF PROPERTY RIGHTS**

Consideration of equity and consistency issues involving property rights, either at an interstate or intrastate level, also requires a framework. To further help its deliberations, the IAG considered the question of whether a formal ordering of property rights could be applied to the use of water and concluded that :

- all formal entitlements to access to water should be given precedence over informal forms of permission to access water (such as off-allocation and sales water);
- those with a history of use should have precedence over those with no history of use; and
- a firm promise of future access to water should have precedence over the mere ability to have requested access to water.

Based on this logic, the IAG prepared and adopted the following hierarchy of property rights to be used in the study, ranked from the highest to the lowest:

1. a statutory property right to use water under existing rules which has a history of use (includes the used component of some dozer allocations);
2. a statutory property right to use water under existing rules with no history of use (includes the unused component of some dozer allocations);
3. a non-statutory right<sup>2</sup> to use water under existing rules which has a history of use (includes the used component of some dozer allocations);
4. a non-statutory right<sup>1</sup> to use water under existing rules with no history of use (includes the unused component of some dozer allocations);
5. a formal promise of a right; and
6. no right to water, but would have been able to get one in the past.

As a general rule greater priority would be given under this hierarchy of rights to those rights which fall into categories 1 or 2 as outlined above.

To illustrate the application of this hierarchy of rights, each State was asked to order its water allocation instruments according to the above list. Appendix G provides a comparison between the four States.

This hierarchy of rights can be applied to individual users or groups of users, including groups of users across large areas and between States. When combined with the six principles, the basis is created for a coherent and impartial assessment of the equity and consistency issues as identified in the Terms of Reference.

- 
1. Usually issued under an Act but as a licence to use rather than a full property right.

## 2.3 WATER ALLOCATION

The Ministerial Council decision to establish a cap on diversion is set against a background of existing water use in various river catchments within the Murray-Darling Basin.

*'An Audit of Water Use in the Murray-Darling Basin'*<sup>2</sup> recognised that the present levels of growth in diversions were not sustainable. At an individual catchment level there are examples where increased consumptive use may be possible once environmental needs have been identified. A number of Queensland rivers in the Murray-Darling Basin arguably may fit into this category. However, in the majority of catchments, present levels of consumptive use may not adequately provide for instream needs and adjustments between consumptive and instream uses will be required.

Water allocation generally involves a number of steps including:

- identifying water resource characteristics;
- identifying present consumptive uses;
- assessing environmental flows and instream requirements;
- determining an acceptable balance between competing water uses to achieve sustainability;
- translating existing water entitlements and defining all rights within the agreed plan; and
- monitoring performance.

Where there is clearly an over allocation of water for consumptive purposes, ways will need to be found to return some of the water to the river or at least identify river flows to optimise river health at current levels of consumption. However, where there is unused capacity which is not required for environment purposes, the potential for further diversions for consumptive use can be sustained. The IAG would argue that any additional allocation would need to be made in the context of the six principles outlined on page 9.

## 2.4 RECOMMENDATIONS

The IAG recommends that:

- the Ministerial Council endorses the six equity and consistency principles outlined above (**Recommendation 4**); and
- the Ministerial Council endorses the property rights hierarchy as a basis for addressing intra-Basin equity and consistency issues (**Recommendation 5**).

---

2. *"An Audit of Water Use in the Murray-Darling Basin"*, Murray-Darling Basin Ministerial Council, June 1995.



## 3. Effectiveness of States' Proposals

### 3.1 THE ISSUE

Concerns have been raised that the mechanisms proposed by the States to implement the Cap will not be effective. Under its Terms of Reference the IAG needed to address the concerns by investigating the effectiveness of the States' proposals.

The IAG has assessed effectiveness against two criteria. The first, is the IAG's interpretation of the aim of the Cap as set out in Section 1 of this report. This can be summarised as:

*'To ensure that there is no net growth in diversions or reductions in end-of-valley flows from a level consistent with the development in place in 1993/94.'*

The IAG recognises that there are equity issues that may lead to the inclusion of additional diversions in the Cap. For that reason, the second criterion is the States' interpretations of the Cap. These are summarised as:

- South Australia proposes to ensure that its diversions are maintained at or below the existing level of allocations including, when finalised, a formal allocation to SA Water;
- New South Wales proposes to hold diversions at or below those equivalent to 1993/94 levels of development, adjusted for seasonal conditions;
- Victoria proposes to apply a modified Goulburn bulk water allocation model to other rivers in its part of the Basin to cap water diversions at about the long term average usage assuming 1993/94 levels of development; and
- Queensland proposes to use its Water Allocation Management Planning (WAMP) process to set end-of-river flow objectives based on limiting consumptive water use to sustainable levels.

Consideration is given below to each of the mechanisms proposed to achieve these interpretations of the Cap. In examining the effectiveness of the proposed mechanism for implementing the Cap, it is appropriate to note that the Cap as previously defined in Section 1.5 is based on modelling techniques that build on a number of assumptions. It is important to recognise that monitoring and reporting should be based on the same assumptions and variables and that where the model parameters are changed, appropriate changes also are made to the monitoring indicators.

### 3.2 THE CURRENT POSITION IN EACH STATE

#### 3.2.1 South Australia

To implement the Cap, South Australia is proposing to:

- cease the practice of allowing access to surplus flows;

- continue to implement existing penalty provisions to prevent water use in excess of individual entitlements;
- issue two entitlements to SA Water to cover its diversions for domestic water supply;
- allocate 50 GL per year for future economic development; and
- encourage existing entitlement holders to develop their allocations fully.

#### 3.2.2 Victoria

Victoria's approach to capping diversions is through the bulk entitlement (BE) conversion process. BEs are statutory agreements between the Victorian Government and the regional water authorities which establish the conditions under which water can be extracted from the river. The development of BEs has been under way for some time and the one for the Goulburn system has already been completed. There are a number of conditions in the Goulburn entitlement that restrict growth in diversions. These include:

- a cap based on the ten-year rolling average diversion from river offtakes (this cap is set at the maximum ten-year rolling average from a 100 year sequence of diversions modelled assuming the 1990/91 level of development);
- a similar cap on releases from storage;
- restrictions on offtake rates and storage capacities;
- obligations to provide specified levels of security;
- obligations to provide environmental flows; and
- other measures relating to trading, capacity sharing, etc.

The BE for the River Murray component of Goulburn Murray Water is being developed and is expected to be completed by June 1997. The BEs for the Goulburn Murray and Goulburn will cover about 90 percent of Victoria's diversions from the Basin. The remaining BEs for Sunraysia Murray Water and the Broken, Campaspe, Loddon and Wimmera Rivers will not be completed until after June 1997.

The BEs place constraints on water authorities. In the gravity districts the authorities will satisfy the BE conditions by regulating the supplies to their customers. Authorities with gravity irrigation districts will be required to do this by adjusting the announced availability of 'sales' and off-allocation water. For pumped water supply systems, the cap will be achieved by creating BEs that are close to current use and offsetting any increases in diversions by reducing entitlements to off-allocation and sales allocations.

#### 3.2.3 New South Wales

New South Wales has proposed an iterative process of continual review of valley-by-valley management practices to achieve the Cap.

There will be a range of measures to implement the Cap in NSW varying from valley-to-valley. The NSW approach will adjust the Cap for climate. The basic tool to achieve the Cap will be the adjustment of allocation in any given year to allow for over/under use in the previous year when compared with the climatically adjusted cap. The manner in which this adjustment is made has not been reduced to a formula but will be subject to consultation with stakeholders on a year-by-year basis. This will make the process transparent.

The management changes that have already been made include:

- volumetric limits to off allocation use;
- reduced allocation announcements;
- no access to off allocation by high security users; and
- increased end-of-valley target flows.

Valley-by-valley assessment is underway coordinated by the NSW EPA to determine environmental water needs.

NSW believes that, if the allocation is adjusted according to the performance against the Cap in previous years, it will be able to hold diversions to the IAG's definition of the Cap. NSW argues that, given the dynamic nature of the water market, this feedback mechanism is the only practical way of conforming to the Cap.

While considerable progress has been made with management rules and capping regimes in regulated rivers, similar progress has not been made with unregulated rivers. However, NSW have committed themselves to capping diversion limits and establishing management rules for unregulated rivers by July 1997 as part of their commitment to the Cap.

It is recognised that in the longer term, end-of-valley flow objectives may be a more appropriate management tool for unregulated rivers. However, this needs more detailed studies which are expected to be conducted after July 1997. This should also include the impact of water harvesting on the end-of-valley flows.

It is also recognised that work on unregulated rivers in NSW needs to be closely integrated with Queensland to ensure downstream river impacts include an integrated approach to environmental flows.

### **3.2.4 Queensland**

Queensland will undertake comprehensive water resource planning processes for each major valley in its part of the Basin using WAMP methodology.

This approach includes community and stakeholder involvement in:

- identifying existing uses and entitlements;
- assessing environmental flows and other instream requirements;

- determining an acceptable balance between competing uses to achieve sustainability; and
- translating existing water entitlements and defining all rights to water within the agreed plan.

The outcome of the process will be endorsed end-of-valley flow regimes.

Existing entitlements and some entitlements issued during the moratorium will be allowed to develop to their limit.

## **3.3 DISCUSSION OF ISSUES**

### **3.3.1 South Australia**

The South Australian process will result in significant growth in diversions above current levels. However, provided penalties for exceeding allocations are applied appropriately, South Australia will be effective in ensuring that water users do not exceed their entitlements.

In effect while the South Australian proposals will not be adequate for implementing the Cap as defined by the IAG, they will however be effective in meeting South Australia's interpretation of the Cap.

### **3.3.2 Victoria**

At the IAG's request, Bewsher Consulting, with the assistance of the Victorian Department of Natural Resources and Environment, tested the effectiveness of the Goulburn BE in capping Goulburn system diversions. The results of this study are shown in Table 3.1.

The study indicated that the Goulburn BE, including the additional environmental flow requirements, would reduce diversions under 1993/94 levels of demand by one percent. If demand for water was to increase by 10 percent above 1993/94 levels of development, diversions under the BE conditions would only rise to a level of 0.07 percent above 1993/94 levels of development. It would appear that the cap on diversions in the Goulburn system will be effective.

However, a 10 percent increase in demand for water without the BE constraints would increase diversions by only 1.7 percent. This suggests that channel capacity and resource availability play a greater part in constraining diversions than the BE conditions in the Goulburn system.

It is a concern to the IAG that the trading of water rights can circumvent these physical constraints. The study determined these Basin wide diversions could increase by up to 50 percent of the total water traded. Victoria has indicated that Section 40 of their Water Act requires the Minister to regulate water trades to ensure that property rights are not eroded. Inter basin trades will be subject to conversion rates to ensure that trading does not result in growth in water diversions or adverse environmental effects.

**Table 3.1: Effectiveness of Goulburn Bulk Entitlement in Capping Diversions**

	<i>Average Goulburn System Diversion GL</i>	<i>Increase in Diversions Above 93/94 Level of Development GL</i>	<i>% Increase in Diversions Above 93/94 Level of Development</i>
1993/94 level of development	1840	0	0.0
1994/94 with BE	1821	-15	-1.0
10% increase in demand — with BE	1840	3	0.07
10% increase in demand — with no BE	1872	31	1.7

A key component of the cap on diversions in the Goulburn system is the ten-year rolling average diversion limit. Bewsher Consulting used the MDBC's Murray model to test the ability of the ten-year rolling average, as used on the Goulburn, to cap Victorian diversions on the Murray. Demands for water on the Victorian Murray were increased by 10 percent and the change in diversions were determined with and without a ten-year rolling average control. The results are shown on Table 3.2.

The modelling showed that on the Murray, a ten-year rolling average cap was of limited effectiveness. A 10 percent increase in demand with no cap resulted in a 7.7 percent increase in diversions. With the proposed cap, this increase was reduced to only 5.5 percent. The ten-year rolling average cap had to be reduced to close to the long term average before the increase was restricted to low levels. These lower caps could penalise water users unnecessarily if diversions did not grow.

For this reason, a modified approach may be needed for Victoria's component of the Murray system.

Victoria is committed to achieving the Cap as defined by the IAG. It is a strong supporter of the expert panel that the MDBC has established to review River Murray operating rules to achieve better environmental outcomes. It has indicated that finalisation of the Murray BEs and therefore the cap, depends on reaching agreement and implementing

revised River Murray operating rules. There is now an urgent requirement for the expert panel to report so that changes to environmental management can be incorporated into the Goulburn Murray BE that is due to be completed by June 1997.

Victoria is proposing to assess the effectiveness of its capping mechanism by comparing diversions at the end of each year with the diversions expected under the 1993/94 level of development using the technique proposed by the consultant in Attachment B.

Finally, Victoria believes that, if necessary, it will be able to manage diversions within the Cap in the gravity districts by adjusting the rules for announcing sales and off allocations.

The IAG is confident that, if these processes are incorporated into future BEs and appropriate trading rules are in place, Victoria will be effective in achieving the Cap.

### 3.3.3 New South Wales

The NSW definition of the Cap is similar to that of the IAG. In addition, the development of river flow objectives in NSW may lead to diversion targets that are less than current levels in some valleys. NSW has made a commitment to achieve its targets. With appropriate feedback and persistence, the NSW approach should be effective in achieving the Cap.

**Table 3.2: Effectiveness of Ten-Year Rolling Average Cap on Victorian Murray**

	<i>Average Victorian Murray Diversion (Net) GL</i>	<i>Increase in Diversions Above 93/94 Level of Development GL</i>	<i>% Increase in Diversions Above 93/94 Level of Development</i>
1993/94 level of development	1622	0	0.0
10 % increase in demand — no cap	1746	124	7.7
10% increase in demand — 1762 GL cap <sup>(a)</sup>	1712	90	5.5
10% increase in demand — 1700 GL cap	1670	48	3.0
10% increase in demand — 1665 GL cap	1643	23	1.3

(a) The cap of 1762 GL was calculated using the same approach as adopted for the Goulburn BE, namely the maximum ten-year average from a model run based on the 1990/91 level of development.



However, there are concerns about the progress in setting the Cap and the lack of certainty this imposes on NSW water users, particularly crop growers.

The IAG commissioned Bewsher Consulting to also review the proposed NSW methodology. Based on progress to the end of September, the consultant concluded that:

- the rules for setting allocation announcements and other matters such as borrowing, are not written down nor are they clearly defined. Without such documentation, the approach cannot be applied by others and therefore, cannot be tested;
- the approach is still being developed and has not been modelled. Without such modelling, a proper technical assessment cannot be made;
- there is adjustment for climate, and a commitment (from Department of Land and Water Conservation officers) to achieve the Cap by adjusting allocations based on the performance of the Cap in preceding years; and
- the commitment to this process of adjustment has not been adequately documented.

The IAG also has received many representations from irrigator groups expressing dissatisfaction with the perceived inequities and uncertainties of the implementation proposals to date. Given the larger number of valleys in NSW, the ability to model the Cap is heavily constrained by the availability of resources. This will lead to Cap limits being defined on a preliminary basis with further refining proposed as resources become available. In the context of grower feedback, the IAG believes that the proposed water allocation model must provide certainty and be predictable and separate from the policy process. The IAG recognises that to achieve the Cap effectively, appropriate institutional arrangements covering property rights, pricing and trading need to be instituted. This will require substantial legislative change.

### **3.3.4 Queensland**

Queensland's ability to implement the Cap needs to be considered in the context of the equity issues relating to the use of water in that State. Before considering the equity issues, Queensland will not be effective in implementing the Cap as defined by the IAG as it is proposing to increase consumptive use above that set by 1993/94 levels of development. However, after considering equity issues, there is no reason why Queensland should not be effective in implementing the modified Cap.

At this time it is not possible to assess the effectiveness of Queensland's proposals against its own cap because neither the Cap target nor the methods to be used to achieve it have been developed. Instead, Queensland has proposed the

WAMP process for its rivers. This process allocates water to the environment and identifies potential water for consumptive use.

The IAG believes that the process is an appropriate method for water allocation. The WAMP model is, however, only valid if it considers instream use, not only in Queensland, but also including the border rivers under the control of the Border Rivers Commission and the rest of the Murray-Darling Basin. The Precautionary Principle needs to be applied by Queensland while the opportunity exists to allocate water to ensure that the over allocation decisions historically made in other rivers in the Basin are not repeated. The IAG also believes that the WAMP process needs to be complemented by a system to establish property rights, appropriate pricing signals and a management framework. Significant legislative changes are expected to achieve this.

Given the evolving nature of the present WAMP process in Queensland and the need to assure other States that the objectives of the Cap will be met, the IAG considers that the results of the WAMP processes should be independently audited before being submitted to the Ministerial Council. The timing of this audit could coincide with the public presentation and review of the draft development plan proposed through the WAMP process. However, to ensure confidence in the process, a follow-up audit of any changes to the interim plan should be undertaken before the final plan is adopted.

## **3.4 THE IAG'S PROPOSAL FOR MANAGING TO A CLIMATE ADJUSTED CAP**

The IAG has developed its own proposal for achieving the Cap which it feels should be considered for use with regulated rivers in NSW and Victoria. In developing the proposal the IAG has sought a capping mechanism that:

- effectively caps diversions at the 1993/94 level of development;
- gives water users certainty at the start of each season; and
- causes the least disruption to existing systems.

A key requirement of the IAG's proposal is the ability to estimate, at the start of each season, the volume of water that would have been diverted in the previous season under the 1993/94 level of development. There are a number of ways that these estimates might be made ranging from simple regression relationships to complicated valley models. The more confidence that all parties have in these estimates, the smoother the capping system will operate.

The steps in the IAG's system for capping diversions in a region are:

- establish a base cap for the region based on the maximum historical annual usage or the maximum expected usage under 1993/94 level of development;
- at the start of each season, calculate the difference between the water diverted in the previous season and the diversion that would have been made at the 1993/94 level of development;
- add this amount to the cumulative difference (the 'excess use') since the commencement of the Cap;
- if diversions have been greater than expected under the 1993/94 level of development (that is, the excess use is positive), the 'IAG cap' for the season will be set to the base cap, less the excess use;
- if diversions have been less than expected under the 1993/94 level of development (that is, the excess use is negative), the IAG cap for the season will be set to the base cap;
- limit diversions for the season to the IAG cap.

The IAG cap would be used in conjunction with the existing systems of water allocation. In a dry year for example, usage is more likely to be restricted by resource availability rather than by the IAG cap. In fact, if diversions never exceed those expected at the 1993/94 level of development, the IAG cap will remain at the maximum historical diversion and will never restrict water use. However, if diversions increase above the 1993/94 level of development, the IAG cap will gradually get lower and lower until it forces average diversions back to the appropriate level.

The discussion above describes how the IAG cap would apply to a river valley. It is suggested that this approach be considered for regulated rivers. The IAG has also considered how its capping process might be applied to individual users within a river valley.

The proposed steps are:

- establish the base cap for each user;
- at the start of each season, determine the IAG cap for individual water users:
  - if the river valley excess use is negative (that is, there has been no growth in diversions), zero each user's excess use and set each user's IAG cap equal to his base cap;
  - if the river valley excess use is positive (that is, diversions have grown), assign the excess use to individual users and set their IAG cap accordingly;
- limit each user's diversion for the year to his IAG cap.

There are a number of ways that individual base caps could be determined and that river valley excess use could be assigned to individuals. One option would be to:

- set individual base caps to the user's maximum historical use with the exception of sleepers and dozers who would get a cap equal to their statutory water entitlement;
- assign excess use to individuals on the basis of their use of their base caps. Calculate the percentage of their base cap that each user diverted the previous season after subtracting their purchases, adding their sales and adding their excess use from the previous season. Assign as excess use, any diversion by the user above a specified percentage which is determined so that the sum of the individual excess use equals the district excess use.

The proposal given above is only one of a number of options. The selection of these would affect the sharing of water between sleepers and high users and would need to be developed on a valley-by-valley basis, taking into account local factors.

The advantages of the IAG approach are that it:

- effectively caps diversions at the 1993/94 level of development;
- does not affect users until demand increases;
- is additional to the existing allocation and off-allocation procedures which could continue unchanged if desired;
- establishes the cap requirement at the start of the season and does not change it until the next season;
- operates gradually, restricting the high water use years first but becoming more severe if diversions are not brought back in line with the 1993/94 level of development; and
- establishes instruments related to the Cap such as base cap and excess use which could be traded without affecting the long term effectiveness of the capping mechanism.

## 3.5 CONCLUSIONS

On the basis of advice received from the States, the IAG believes that the States are generally supportive of the Cap and that on 30 June 1997 the States will be able to deliver on meeting the Cap, although in some circumstances it will need to be adjusted for equity considerations. Details for individual States are summarised below.

### 3.5.1 South Australia

South Australia under its proposed volumetric (volume measuring) capping model, will be able to meet the effectiveness requirements. South Australia will be able to measure water usage effectively. Furthermore, heavy penalties are applied to prevent use of water beyond their

cap. However, if South Australia adopts its proposed allocation arrangements for urban water, it will exceed the IAG Cap as there will be increases in diversions. This is discussed further in the next section of this report.

### 3.5.2 Victoria

Victoria has completed the BE for the Goulburn system and will complete the BE for the Goulburn Murray Water component of the River Murray by June 1997. These entitlements will cap 90 percent of Victorian diversions in the Basin. The BEs for the remaining diversions will be completed by June 1999.

In terms of the effectiveness of Victoria's proposed capping process:

- modelling studies suggest that the constraints in the Goulburn BE may not be effective in capping diversions in the Goulburn system in a trading environment; and
- the ten-year rolling average diversion limit proposed by Victoria has been tested for the River Murray and will not, by itself, hold Victorian diversions to the IAG's Cap.

Victoria is committed to achieving the Cap as defined by the IAG, and is examining modifications to its capping process to overcome these limitations.

Victoria will assess the effectiveness of its process each year by comparing its diversions with those expected under 1993/94 level of development.

Victoria will be able to control diversions in its gravity districts by adjusting its rules for sales and off-allocation.

For pumped water supply systems, the Cap will be achieved by creating BEs that are close to current use and offsetting any increases in diversions by reducing entitlements to off-allocation and sales water.

### 3.5.3 New South Wales

NSW is strongly committed to the Cap and its interpretation of it is similar to that adopted by the IAG. NSW, at the completion of its current work program, will be able to define the Cap on a valley-by-valley diversion basis with associated management rules. Because of time and resource constraints further refinement of diversions and management rules will occur after 30 June 1997. This should include the impacts of water harvesting. Additional resources will be needed to implement detailed valley-by-valley monitoring, development of management rules and stakeholder consultations.

### 3.5.4 Queensland

Queensland's proposal will comply with the IAG's definition of the Cap adjusted for equity.

It is not possible to assess fully the effectiveness of Queensland's proposals because the Cap targets and the methods to be used to achieve them are outcomes of the WAMP process and have not yet been fully developed. They are expected to be available by 30 June 1997.

WAMP is an appropriate process. However:

- it must accommodate instream use not only in Queensland but across the border rivers under the control of the Border River Commission and the rest of the Murray-Darling Basin; and
- a management regime needs to be developed that includes pricing, property rights and measuring and reporting.

As the Cap is proposed to be defined on the basis of end-of-valley flows and supported by a set of management rules, auditing of the implementation of the rules can determine the effectiveness of the Cap.

## 3.6 RECOMMENDATIONS

The following recommendations on effectiveness need to be considered in the context of the recommendations on equity.

The IAG recommends that:

- where relevant, States give consideration to the IAG proposal for managing to a climate-adjusted cap (**Recommendation 6**);
- South Australian cap water for domestic and urban use at levels close to historic usage (see discussion in Sections 4 and 7.2) (**Recommendation 7**);
- future Victorian BEs contain a specific commitment to limiting diversions to the Cap as defined by the IAG (**Recommendation 8**);
- NSW needs to allocate more resources to developing models and associated management regimes and to implementing them (**Recommendation 9**); and
- the results of the WAMP process in Queensland be independently audited with an interim audit performed at the draft development plan stage, and a final audit of any changes made to this draft plan before it is submitted to the Ministerial Council (**Recommendation 10**);
- the results of the capping process for each State be independently audited and submitted to the Ministerial Council before they are implemented (**Recommendation 11**).

# 4. Equity Issues

## 4.1 THE ISSUE

The Council, in resolving to cap diversions, saw the need to take account of any special circumstances and equity issues in examining the establishment of a cap.

The IAG is required to examine 'the special circumstances and equity issues previously noted by the Ministerial Council and advise on reasonable approaches to the Cap to take these into account'.

The equity positions argued by Queensland and South Australia should be seen in the context of the history and management of water resources in the States with rivers comprising the Basin. Early settlement and growth, including provision of infrastructure, saw significant increases in diversion in NSW and Victoria to the stage where it is now recognised that these are not sustainable. By contrast Queensland's development on its Basin rivers occurred relatively late and involved limited provision of public infrastructure. Queensland has argued that there is still scope for growth in diversions although there already has been very rapid growth in recent years.

South Australia, in recognition of environmental constraints, has historically introduced water management systems that constrained consumptive use to predominantly highly efficient crops and domestic use. It has operated under a self imposed cap since 1969 and has reduced this cap twice since 1969. It has also limited access to peak flow 'sales' or off-allocation water.

Both South Australia and Queensland have argued that in their respective States, some growth in diversions above current levels is justified under the Cap. Following is an outline of the South Australia and Queensland arguments and a review of the arguments in the context of the principles outlined in earlier sections of this report.

## 4.2 THE CURRENT POSITION IN EACH STATE

### 4.2.1 South Australia

In an average year, and given the current level of development in the Murray-Darling Basin, South Australia receives an average flow of 6,280 GL per year or a median flow of 4,100 GL per year. However, unlike Victoria and NSW, South Australian allocation policies are not based on this expected flow, but on a fixed allocation based on a minimum entitlement flow as determined in the *Murray-Darling Basin Agreement 1992*. Table 4.1 identifies the South Australian allocation against this minimum entitlement of 1,850 GL per year.

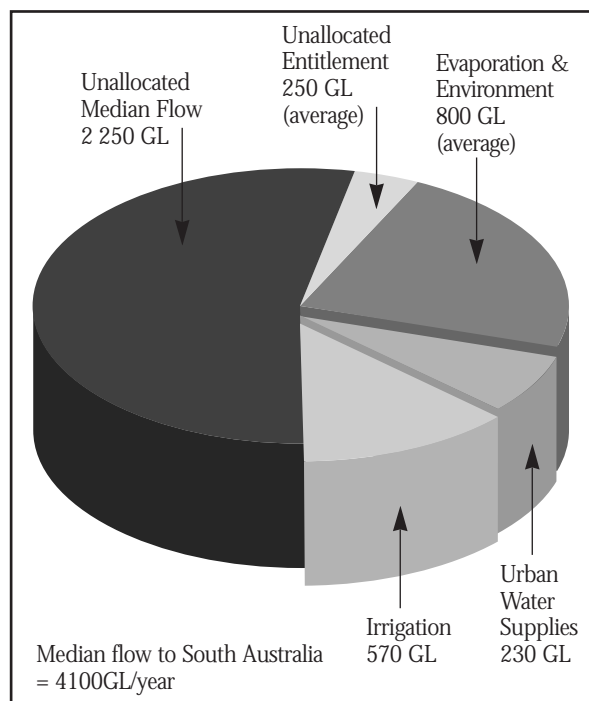
Figure 4.1 identifies the allocation of the South Australian entitlement flow in a median year. Within the economic allocation component under this regime, all South

**Table 4.1: Allocation of Entitlement Flow in South Australia**

Economic allocations	800 GL per year
Evaporation and environment	800 GL per year
Unallocated flow	250 GL per year
<b>SA entitlement flow</b>	<b>1,850 GL per year</b>

Australian irrigators have high security water entitlements which are specified as a maximum quantity of water that can be diverted in any year. This is set at 570 GL, although average use is approximately 476 GL (or about 80 percent of the allocated entitlement). South Australia has operated under a self imposed cap since 1969 which has been reduced twice, once in 1979 and again in 1991. The unallocated entitlement of 250 GL has been left in the river for environmental purposes and no property rights are attached to it.

**Figure 4.1: South Australian Allocation of Available Water Resource**



The urban water supplies allocation of 230 GL is a critical source of urban water for South Australia, supplying 100 percent of the requirements for all the river towns, the upper Spencer Gulf and York Peninsula, and between 10 percent and 90 percent of Adelaide's demands. The total demand from the River Murray by SA Water is highly variable and consists of a number of components. Where the river is the sole source of urban supply, such as the rural and regional communities, demand varies according to seasonal variability.



Adelaide relies on two sources of water supply, the Mt Lofty Ranges catchment (primary source) and the River Murray. Therefore, Adelaide's demand for water from the river not only varies with seasonal conditions, but also depends on the volume of water held in these local storages. This variable dependence explains the 10 percent to 90 percent range in demand from the River Murray for Adelaide.

The installed pumping capacity from the River Murray by SA Water to supply Adelaide and the river towns equates to 380 GL per year. Peak demand by SA Water from the River Murray for Adelaide and the rural and regional towns has been recorded at 232 GL per year and the average long term use since 1976 is 127 GL per year.

Beyond these consumptive uses, the South Australian Government has allocated the balance to evaporation and the environment. Existing legislation enables the Minister to declare a high-flow period allowing additional water to be taken by those who have existing allocations. In practice, few irrigators take advantage of those declarations. The result is that high flows are almost entirely to the benefit of the environment. During median flow periods of 4,100 GL, the remaining 2,250 GL are also left for the environment.

Pumped diverters in South Australia on average use about 80 percent of their water entitlements. A number of factors are expected to impact on this level of usage, including moves towards further piping of irrigated areas (reducing system losses) and allowing greater levels of trading in entitlements. This is expected to increase the average usage of the allocated entitlement up to around 90 percent as additional plantings occur, or as water is traded to other areas.

However, allowing existing entitlement holders to develop their existing water entitlement fully will cause an increase in usage of at least 69 GL, assuming the 90 percent entitlement usage rate applies. This effectively represents additional development and usage of water above and beyond the IAG's 1993/94 level of development cap.

As noted above, South Australia has notionally allocated 230 GL per year for its urban water supply off-takes as part of its past planning studies. It has now proposed however, to limit the allocations to 180 GL per year which represents an allocation of 50 GL per year to the country towns, the upper Spencer Gulf and York Peninsula and a notional 130 GL per year to Adelaide. The Adelaide allocation is based on a five-year rolling average offtake for Adelaide of 130 GL per year.

South Australia also has proposed to allocate the remaining 50 GL per year of this previously urban water allocation for future economic development purposes with an expected uptake of 90 percent or 45 GL per year.

#### **4.2.2 Queensland**

To date, Queensland development on the Murray-Darling Basin has been much slower than other States because of a series of circumstances, mainly the extreme natural variability of water flow in the relevant rivers.

The allocation policies in Queensland have historically been conservative, relying for many years on high security water from State assets, and over the past 15 years permitting private water harvesting from higher flows. Water harvesting has been allocated by limiting diversion rates, often in a stepped fashion proportional to flow occurring at the time. Queensland has generally retained the right to suspend pumping in circumstances where there is a need to allow a flush to pass through the river.

Notwithstanding the debate on the future of the Basin's rivers, Queensland wants to increase the level of development using the water available in its State. Queensland has argued that it should be allowed to increase its level of development on the grounds that:

- development in Queensland has been much slower than other States due to:
  - more extreme flow variability;
  - a conservative allocation policy; and
  - recent improvements in management techniques for both the crops grown and land management on the heavy black soils;
- Queensland has vast areas of high quality soils which can support very efficient, high-value irrigation if water is available;
- the significance of development in Queensland on the water regimes of the rest of the Basin is not very large;
- large flows will never be significantly diminished by diversions and the variability of losses on the flood plains are greater than the effect of diversions on those floods;
- the main effect of development in Queensland will be on southern Queensland and northern New South Wales and the impacts on these regions will be taken into account by the planning process; and
- long term sustainability of the whole Basin depends on each sub-basin being managed appropriately.

The likely water requirements that will be associated with this proposed additional development have yet to be determined.

## 4.3 DISCUSSION OF ISSUES

### 4.3.1 South Australia

South Australia has argued that on the grounds of equity it would include in the Cap:

- a bulk allocation of 570 GL per year for irrigation use. This includes an estimated 69 GL per year of water allocated but not used;
- a two part allocation to SA Water Corporation of 650 GL over a five-year period (notionally 130 GL per year) for Adelaide's use, and 50 GL per year for all other major urban, industrial and rural community water supplies in the State; and
- a reserve of 50 GL per year for possible allocation for further economic development.

The IAG tested these proposals against the objectives and principles established in Sections 1 and 2 above.

'An Audit of Water Use in the Murray-Darling Basin'<sup>3</sup> described the impact of increasing diversions on flow and revealed that median annual outflows from the Basin are around 20 percent of their pre-development levels. This has significantly affected the health of the river system including instream, flood plain, wetlands and the near coastal environment.

Low flows in particular have a severe impact on the RAMSAR wetlands near the mouth of the River Murray and closure and near closure of the mouth is now a high risk event.

South Australia has argued that further growth is justified because:

- South Australia has operated under a self imposed cap since 1969 which has been reduced twice since then and penalties exist if individual allocations are exceeded;
- the first voluntary reduction in the self imposed cap was done at the same time as South Australia's entitlement flow was increased from 1,550 GL to the current 1,850 GL in 1979. This additional 300 GL per year of very high security water was not allocated for economic diversions and therefore remained in stream for environmental purposes;
- allocation has only ever reached 44 percent of its entitlement flow;
- water is used very efficiently on high-value crops and pastures; and
- no property rights have ever been issued for above entitlement flows.

South Australia is the winner or loser in terms of success or failure of the Cap. In the lower River Murray, water quality for agriculture, drinking water, flow regimes to protect RAMSAR wetlands and keeping the mouth of the River Murray open, are extremely important to the whole Basin and particularly to the South Australian economy and community. Achieving these outcomes is a responsibility for the whole Basin. South Australia, however has a particular interest in these issues.

The notional 50 GL per year of water previously allocated for peak domestic use and now proposed for new economic development was only used as water of last resort and in the majority of years was available for environmental flows. Turning this into an allocation for regular annual use, with 90 percent diversion, effectively reduces environmental flows by a further 45 GL per year in most years.

According to Murray-Darling Basin Commission Technical Report No 96/7<sup>4</sup>, an average increase in average annual diversions of around 114 GL from within South Australia (that is 69 GL of unutilised water from all irrigation offtakes and 45 GL of additional economic activity water at 90 percent utilisation) will have a noticeable impact on low flows at the mouth of the River Murray.

Increases in diversions in South Australia will affect the flow at the bottom of the river under all conditions. The MDBC model predicts that such diversions will have a more significant impact on low flows at the mouth of the River Murray than similar size diversions in the eastern States. The effect is particularly severe in the low flow months (see Figure 4.2).

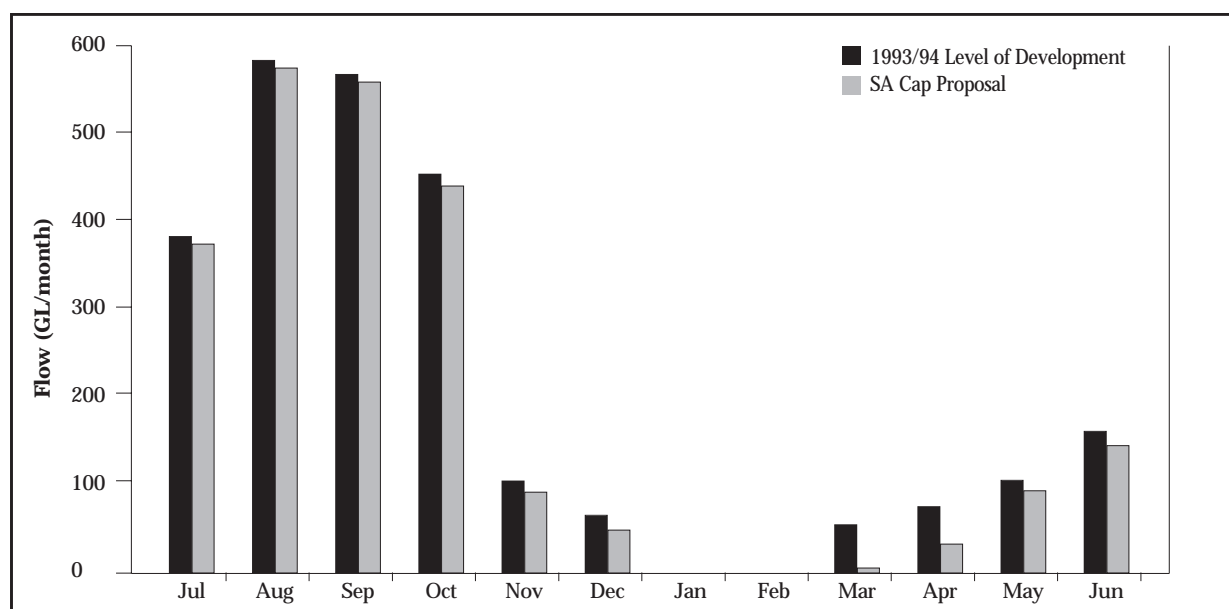
Reduced flows, assuming South Australian average annual diversions grew by 114 GL, would result in an increase in average salinity at Morgan of 4.3 EC and an increase in Lake Albert of 54 EC since there will be less flow to dilute the saline groundwater entering the river if diversions are increased (see Table 4.2). These increases in salinity are estimated to cause an increase in costs to water users in South Australia of \$0.75 million per year.

An increase in the average annual withdrawal of 114 GL from the river would represent a considerable extra burden on the lower river environment. In years of low flows, this additional diversion would be more likely to result in a closure of the mouth of the River Murray with all the consequential economic impacts on the South Australian economy. To expand the Cap by 114 GL per year would therefore not be to the advantage of the South Australian economy or the Murray-Darling Basin.

3. 'An Audit of Water Use in the Murray-Darling Basin', Murray-Darling Basin Ministerial Council, June 1995.

4. MDBC Technical Report 96/7 'South Australia's Interpretation of the Cap and its Consequences for Diversions, Flows and Salinity'.

**Figure 4.2: Median Monthly Flow Over Barrages**



**Table 4.2: Increases in Salinity in South Australia (EC)**

<i>Location</i>	<i>1993/94 Development</i>	<i>SA Cap Proposal (114 GL Increase)</i>		<i>SA Cap Proposal Without Reserve (69 GL Increase)</i>	
	<i>Mean Salinity</i>	<i>Mean Salinity</i>	<i>Salinity Increase</i>	<i>Mean Salinity</i>	<i>Salinity Increase</i>
Renmark	396.8	396.9	0.2	396.9	0.1
Berri	428.7	429.2	0.5	429.0	0.3
Morgan	545.8	550.2	4.3	548.1	2.3
Murray Bridge	587.4	593.5	6.1	590.7	3.2
Lake Alexandrina	706.2	713.7	7.5	710.4	4.2
Lake Albert	1,452.7	1,506.4	53.7	1,481.6	28.8

The IAG believes that the South Australian proposal is not supported by testing against the first two principles, that is, there is likely to be an adverse impact on the environment and the proposal does not adequately incorporate the Precautionary Principle. However, the expected growth in diversions of 69 GL comes about by increasing the utilisation of existing rights to 90 percent (currently about 80 percent utilised). That is, South Australian irrigators hold the statutory property right to water, but have not yet fully used that right. Therefore the fourth principle, that statutory and agreed property rights be recognised, applies and provides these irrigators with a very strong claim for water according to the hierarchy of rights discussed in Section 2.2 of this report. From an equity position, in terms of the irrigators themselves, these property rights should be respected.

The IAG is of the view that the Cap for SA should permit increased utilisation of existing statutory entitlements for irrigation diversions. That is, SA should be permitted to

divert up to a maximum of 570 GL for irrigation in any year provided that long term average utilisation of entitlements do not exceed 90 percent. This is calculated to be equivalent to an increase of 69 GL per year in irrigation diversions compared with 1993/94 levels of development.

In coming to this view, the IAG took into account the following special circumstances:

- SA has only allocated 800 GL of the 1,050 GL available for allocation;
- SA has already adjusted individual entitlements to match crop needs;
- the projected increase in diversions of 69 GL represents a 90 percent utilisation of existing rights and will be taken up through pre-existing allocated statutory rights; and
- the inability to offset increases in diversions against sales and off-allocations.

In addition, the IAG notes that, as for other States, the environmental impacts of diversions by South Australia must be managed according to the principles of the Murray-Darling Basin Salinity and Drainage Strategy.

The IAG does not believe that the special circumstances in South Australia can be applied to either the New South Wales or Victorian Pumped Districts.

The argument has been put by some Victorian irrigators that the Victorian pumped districts should be permitted to develop up to the Schedule 11 allocations or equivalent in the Victorian Water Act. This would require new entitlements to be issued to individuals and new irrigation development to take place. The net result would be significant increases in diversions over current levels.

Victoria's 'Schedule 11' allocations are similar to South Australia's allocation of 1,050 GL in that they have not all been on-allocated to individual entitlements and that they include a significant component for growth in diversions which Council has agreed to cap. Furthermore, Victoria has not yet adjusted individual entitlements to match crop demands. For these reasons the IAG does not consider that the special circumstances leading to a 69 GL increase in diversions in SA can be applied to the Victorian pumped districts.

The South Australian Government's proposal for an extra 50 GL per year for economic development can be achieved by Government buying back the unused allocations from growers or through new industry entrants buying water from South Australian and interstate property right holders, and the re-allocation of water saved through improved transfer efficiencies.

The former would lead to transparency in resource allocation and the latter to efficiency in resource use.

In the event that additional environmental concerns arise, the South Australian Government can also purchase unused allocated water for the environment in the market place.

With respect to the formalisation of the entitlements for SA Water, the five-year rolling allocation of 650 GL over the five-year period (notional 130 GL per year) for Adelaide is greater than the historical maximum five-year average of 120 GL per year and is much greater than the 92 GL per year average diversion since 1976. The 50 GL per year entitlement for the remaining country towns is also greater than the average diversion since 1976 of 35 GL per year and the historical peak diversion of 45 GL per year. Given an active water market and the ability to trade, SA Water is likely to be attracted to selling water in nine years out of 10, even if it has to buy back at a higher price in the tenth year. Similarly it is likely to respond to growth in demand by buying water in low runoff years in the Adelaide Hills, rather than purchasing new entitlement as

soon as that growth is observed. If it is assumed that the maximum requirements over recent years are used as a benchmark by SA Water for purposes of its own planning, this suggests that at least a further 15 GL per year would be available through trading.

With the opening up of interstate trade, this water could be traded up river on a temporary or even permanent basis, and is therefore not constrained by the high security type of development that occurs within South Australia. Rather than being returned to the river as has been the practice to date, the IAG is concerned that the proposed allocation of water to SA Water will encourage the annual diversion of up to the full cap amount to consumptive use.

On the basis of information available to the IAG, a preferred option providing the same 99 percent level of security for urban water but with less risk to the environment, would be to define the Cap for Adelaide water for SA Water on the basis of a ten-year rolling average allocation of 1,000 GL over a ten-year period (notionally 100 GL per year).

### **4.3.2 Queensland**

The Queensland proposals were assessed against the objectives and principles established in Sections 1 and 2.

The key principle is that of no further deterioration in water quality and environmental protection.

Queensland is in the unique position of having an opportunity to set environmental objectives where further change in flow regimes will occur only if they do not contribute to a deterioration in water quality and environment protection. In contrast, Victoria and NSW will have to use a 'retro-fit' approach to the environmental needs of the Murray-Darling Basin within their States.

Presently, the whole of the Murray-Darling Basin in Queensland is subject to the Border Rivers Agreements which deals with water sharing between Queensland and NSW and water development along the border streams.

The Border River Agreement sets in legislation the sharing of water to the streams which constitute the border, and provides powers whereby the Border Rivers Commission recommends water sharing to the two State Governments for the intersecting streams. The principal intersecting streams are the Condamine-Balonne, the Warrego and the Moonie Rivers.

Queensland has not proposed a volumetric cap as part of its response to the Ministerial Council decision, but has instead proposed a WAMP process for its rivers.

This process allocates water to the environment and then identifies potential water for consumptive use. It proposed to define the Cap as end-of-valley flows.



Under this system, the cap for Queensland will be determined in the following way:

- a technical Advisory Panel will determine environmental water requirements at a number of node points in the sub-catchment and downstream from the catchment;
- the environmental flow provisions will be modelled to give a flow exceedance curve for each node point. The information will be used to determine the impact of conservative water use;
- relevant parties will be included in the consultation process to provide input regarding the balance between consumptive and environmental requirements. This will include economic, social and environmental considerations;
- following agreement, the cap will be managed by applying the agreed flow management rule on an event by event basis. The cap will be monitored by comparing actual management against the requirements of the flow management rules.

This WAMP process is underway in Queensland and is expected to be concluded by mid-1997, at which time it will be possible to define the cap for the Queensland rivers. As part of the WAMP process, the opportunity exists for Queensland to apply the Precautionary Principle, allocating water to ensure that the over-allocation for consumptive use decisions historically made in other rivers in the Basin is not repeated in Queensland. As evidence of the Precautionary Principle being applied, Queensland has assured the IAG that at the conclusion of the WAMP process, an amount of water will be kept in reserve for allocation to the environment or for consumptive use based on ongoing monitoring to ensure protection of the environment.

Queensland is in the initial stages of developing its allocation policies. Comprehensive pricing arrangements are yet to be put in place, along with the flow management rules necessary in each sub-basin. It is not possible therefore, to judge the performance of the State on this criteria.

The WAMP model will, however, provide for the maintenance of existing property rights. Regardless of a person's nominal allocation, the actual amount of water they get in any one year will be determined by the application of the flow management rules to the actual flow events of that year.

Overall the WAMP process being used by Queensland is very transparent and follows a systematic process that identifies necessary environmental flow regimes and various stakeholders' needs and wants. However, the auditability of this water management process has yet to be tested with questions remaining concerning the measurement, monitoring and reporting proposals.

The IAG rejects the historic argument that Queensland should develop to the same relative level of diversion as other States. There is adequate evidence to indicate that water diversion is non-sustainable in other parts of the Basin. Furthermore, given the seasonal nature of flows and high variability in Queensland, utilisation will always be lower than that possible from more regular-flowing rivers. Queensland have advised the IAG that they only support extra diversion if sustainable.

Neither does the IAG accept the presence of large areas of soil suitable for irrigation as an argument for additional diversions. All States have areas suitable for further development, the only constraining factor is water availability.

While Queensland has provided no cap data as the WAMP process is incomplete, the IAG has estimated possible downstream impacts of various levels of Queensland diversions.

Full utilisation of existing allocations on the Condamine Balonne is estimated to reduce average flows at the Border by 75 GL per year and 49 GL per year into the Barwon. The IAG's estimates of the maximum reduction in flows that might occur as a result of future developments on the Condamine Balonne are shown in Table 4.3. Reductions of this magnitude in flow, if realised, will add to the deterioration that has already occurred to downstream flow regimes.

The IAG understands that Queensland is committed to incorporating the impact of downstream flow into the WAMP process and that there should be integrated consideration of downstream impacts from all cross-border rivers (in Queensland and NSW) on the Barwon/Darling. Close cooperation between NSW and Queensland is needed to ensure an integrated WAMP process.

The IAG is of the view that the WAMP process is an appropriate method for water allocation. The Precautionary

**Table 4.3: IAG Estimates of Potential Reductions of Flow Rates From Future Development in the Condamine Balonne(a) (GL per Year)**

<i>Location</i>	<i>Reduction in Mean Annual Flow (GL)</i>
Queensland/New South Wales Border	230
Outflows to Barwon	130
Inflow to Menindee Lakes	105
Darling at Burtundy	75
River Murray flow to South Australia	60

(a) These estimates are the IAG's alone and do not necessarily reflect the outcome of the WAMP process which is still underway.

Principle needs to be applied while the opportunity exists to allocate water to the environment and to ensure that the over-allocation decisions historically made in other parts of the Basin are not repeated in Queensland. Thus, while rejecting the argument that Queensland should be allowed to catch up with the other States' (over) allocation of water for development, the IAG supports the use of the WAMP process to determine the appropriate level of diversion that should occur in Queensland, provided there is adequate consideration of downstream impacts.

Additional water diversion use can only be supported by the IAG on the basis that diversion is not yet at a level to have significant impacts on river health. Similarly, the IAG believes that increased consumptive use should occur only where downstream environmental and other needs in Queensland and NSW have been accommodated.

As Queensland is in the early stages of the WAMP, the IAG believes that a process audit should be conducted on completion of the WAMP prior to its consideration by the Ministerial Council. The key issues to be audited include:

- allocation to the environment;
- consideration of downstream impacts;
- allocation for consumptive uses;
- application of the Precautionary Principle; and
- management rules.

The importance of these downstream environmental and other needs raises questions about the most appropriate way to handle the decision making on the allocation of the cross-border rivers. While recognising the role of the Border Rivers Commission in managing the day to day operation of the border rivers assets, the IAG supports the separation of policy responsibility from that of daily operation and encourages the NSW and Queensland Governments to provide the necessary policy framework in the context of the entire Murray-Darling Basin.

## 4.4 CONCLUSIONS

### 4.4.1 South Australia

The South Australian Government proposed, on the basis of existing property rights, to include an estimated 69 GL per annum of allocated but unutilised irrigation water within the South Australian cap.

The IAG considered that this would adversely impact on downstream water quality and would normally require trade offs for inclusion in the cap. South Australia has conservatively managed its water resources setting its own cap in 1969 with two reductions in the cap since. Sales water is infrequently used at present and will be completely stopped into the future. As a consequence trade

offs are not possible and in view of the strong existing property rights the IAG considered that the 69 GL per year should be included in the cap in recognition of South Australia's conservative water management practices. These circumstances are unique to South Australia and do not apply in the other States.

The IAG cannot justify an additional 50 GL for economic use because of its impact on water quality and riverflow objectives. Previously, the water was not used often and remained effectively as water for the environment.

The IAG does not support the use of a five-year rolling average allocation for diversions for use in Adelaide by SA Water, but considers that an alternative approach using a ten-year rolling average representing an allocation of 1,000 GL over ten years (notional 100 GL per year) should be used. Under a five-year rolling average approach trading through leasing or selling any of its own water allocated for urban use, is not supported, whereas it would be if the ten-year rolling average approach is used (see discussion in Section 7.2).

### 4.4.2 Queensland

The IAG recognises Queensland's equity argument to the extent that increased diversion should only occur after:

- WAMP is fully implemented, including assessment of downstream impacts in NSW;
- the Precautionary Principle is applied through the establishment of an allocation to be held in reserve to minimise the risk of over-allocation for consumptive use; and
- final independent audit of the WAMP process is conducted, including modelling of impacts on downstream Basin flows.

## 4.5 RECOMMENDATIONS

### 4.5.1 South Australia

The IAG recommends that:

- the proposal to allocate an additional 50 GL per year for economic use not be approved as it is not compatible with water quality and river flow objectives (**Recommendation 12**); and
- the 69 GL per year increase in diversions expected from the uptake of water allocated for pumped irrigation and previously not used be included in the Cap (**Recommendation 13**).

Further recommendations have been made in relation to urban water allocations in Section 7.2.

#### **4.5.2 Queensland**

The IAG recommends that:

- the cap for Queensland be determined after the WAMP process is completed (**Recommendation 14**);
- NSW and Queensland allocate resources on a priority basis to the WAMP process affecting border rivers (**Recommendation 15**); and
- the results of the WAMP process in Queensland be independently audited with an interim audit performed at the draft plan stage, and a final audit of any changes made to this draft plan before it is submitted to the Ministerial Council (**Recommendation 16**).

The IAG supports the separation of policy responsibilities from daily operation of the Border River Commission and encourages the NSW and Queensland Governments to provide the necessary policy framework in the context of the entire Murray-Darling Basin (**Recommendation 17**).

# 5. Monitoring, Auditing and Reporting

## 5.1 THE ISSUE

The Terms of Reference for the study require the IAG to investigate the effectiveness and suitability of the procedures to monitor, audit and report on the Cap.

The IAG has identified six principles for assessing issues listed in its Terms of Reference. The fifth principle is that:

*'The water management process should be transparent and auditable.'*

The IAG therefore believes that it is important to establish a system of monitoring for the Cap which is sufficiently detailed, accurate and punctual in order to:

- enable the Cap to be managed;
- detect any growth in diversions; and
- satisfy the community that all parties are meeting their commitments.

## 5.2 PROGRESS TOWARDS A MONITORING METHODOLOGY

Rather than seeking to develop a new monitoring and reporting methodology, the IAG has examined progress made within the MDBC towards a reporting framework.

### 5.2.1 Draft Format for Annual Monitoring Report

A draft format for the annual Water Audit Monitoring Report has been devised by the Water Audit Working Group of the MDBC and has been reviewed by the Water Policy Committee. The proposed monitoring report would contain details of the following items:

- Monthly diversion by River Valley subdivided into:
  - private diverters;
  - unregulated stream entitlements;
  - major irrigation districts;
  - urban and industrial; and
  - consumptive use of environmental allocations.
- Classifications of all diversion data into three classes of reliability:
  - Class 1 — metered, reliable — accuracy  $\pm$  10 percent;
  - Class 2 — estimate based on detailed assessment — accuracy  $\pm$  ten to 30 percent;
  - Class 3 — estimate based on regional information — accuracy  $>$   $\pm$  30 percent.
- The way diversions are being managed including:
  - issued water entitlements;
  - allocation announcements on regulated streams;
  - off-allocation announcements; and
  - water trading including:
    - permanent trades;
    - temporary trades; and
    - inter-valley transfers.

- A comparison of annual diversions with the 1993/94 levels of development.
- Graphs of actual flow and modelled natural flows at key sites throughout the Basin.

### 5.2.2 Review of the Preparation of the 1994/95 Monitoring Report

As a trial of the monitoring procedures, the Water Audit Working Group is preparing a Water Audit Monitoring Report for 1994/95. Preparation of this report commenced in October 1995 and is still incomplete. The preparation of this report has revealed that:

- the measurement of regulated system diversions is generally good;
- the measurement of unregulated system diversions is generally poor;
- the difference between an irrigation return and a tributary flow is poorly defined. This is important because, in many cases, diversion net of returns is used as the basis of water management;
- diversion data is available in the regions but the centralised collation of the data will need to be improved if the desired monitoring regime is to operate smoothly;
- the NSW unregulated river diversion figures are unreliable;
- the data for this report were collated through considerable input by the State representatives on the Working Group. The methods for estimating poorly monitored diversions were, in some instances, developed for this report. Unless these procedures are properly documented and sufficient resources are set aside by the States to manage the process each year, the probability of a consistent record of diversions being maintained once the Working Group is disbanded is not high.

### 5.2.3 Comparison of Diversions with 1993/94 Level of Development

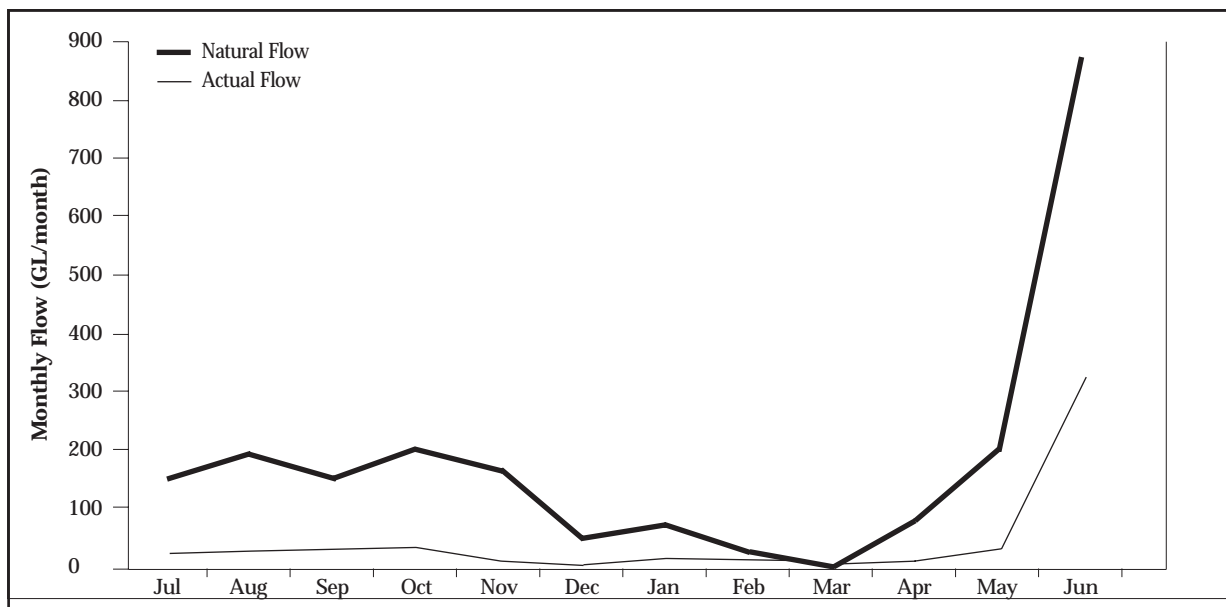
No State<sup>5</sup>, other than NSW for the Murray and Murrumbidgee, has attempted to compare 1994/95 diversions with modelled 1993/94 level of development figures. This will be a major part of the management of the Cap and will need to be addressed.

### 5.2.4 Comparison of Actual and Natural Flows

Victoria and Queensland have prepared estimates of natural flows at key sites and compared them with actual flows. NSW has made no attempt yet. An example of the Victorian Goulburn River flows is provided in Figure 5.1.

5. South Australia is not involved in this process because of the absolute nature of their cap.

**Figure 5.1: Natural and Actual Flows in Goulburn River in 1994/95**



### 5.2.5 Preparation of Report and Dissemination of Information

The method proposed by the Water Audit Working Group for preparing the Water Audit Monitoring report and making data available to interested parties is as follows:

- States collect and analyse data and forward it to the office of the MDBC;
- the MDBC office receives and archives the information on a database;
- the MDBC office prepares a Basin-wide summary and analysis;
- an annual Water Audit Monitoring Report is printed and distributed;
- monitoring information is presented for general access.

The MDBC sees water diversion data as a key part of the Basin Information Network and funds from the Natural Resource Management Strategy project are used to employ a Water Audit Data Manager to assist in setting up the system for handling and presenting water audit monitoring data on the Internet.

## 5.3 CONCLUSIONS

For the community, the Ministerial Council and the MDBC to be confident that the Cap is being achieved, there needs to be a consistent measuring, reporting and auditing framework across the Basin. Transparency and auditability of the water management process is important to ensure ongoing commitment to the Cap.

The MDBC has a role in quality management, as a repository for the monitoring data, for preparing the annual report and for arranging reviews of the Cap at about three yearly intervals. A format has been developed for a Water Audit Monitoring Report which would be produced annually and published in hard copy and on the Internet. An attempt to complete the report using data for 1994/95 has highlighted a number of difficulties, some of which have been addressed.

To provide data appropriate for managing the Cap on diversions, robust systems will need to be established within the States and the MDBC office to collect, collate, analyse, archive publish and disseminate the information. Resources will be needed to set up and maintain these systems.

Some diversions are not being well monitored and consideration should be given to investing in meters for some unregulated stream diversions.

The States have not yet been able to compare 1994/95 diversions with the diversions expected under the 1993/94 level of development. It is a concern to the IAG that there appears to be insufficient resources to satisfy the monitoring requirements.

Consultation with each of the States indicates support for a monitoring and reporting framework by NSW, Victoria and South Australia. Queensland indicated that a less rigorous reporting approach, consistent with the proposed format, would be more appropriate for its largely seasonal rivers. The IAG is satisfied with the Queensland approach given the nature of flows in the Queensland region but envisages that this report process will be reviewed as part of the audit of the Queensland WAMP process recommended elsewhere in this report.

## 5.4 RECOMMENDATIONS

In considering the need for a transparent reporting mechanism and the progress that has been achieved in preparing such a mechanism, the IAG recommends that:

- the draft format that has been developed for the Water Audit Monitoring Report be implemented and reports considered annually by the MDBC (**Recommendation 18**);
- a body be identified in each State which has clear responsibility for collating water audit information (**Recommendation 19**);
- information on performance against the Cap be made widely available (**Recommendation 20**); and
- all States allocate enough resources to satisfy their monitoring responsibilities (**Recommendation 21**).



## 6. Trading

### 6.1 THE ISSUE

The Terms of Reference for the study require the IAG to investigate the ability of the proposed rules for the Cap to provide a basis for interstate trade.

Temporary transfer is the right to transfer unused water allocations on an annual basis. Trading in water on a permanent basis, which is underpinned by clear property rights systems, means that farmers will be able to buy and sell water through a market, within the social, physical and ecological constraints of catchments, as specified by COAG. Trading will help irrigators to structure their businesses to increase profitability, or help those who wish to leave the industry to do so through the sale of water property rights.

All States have allowed temporary and/or permanent intrastate trades in water. However, intra and interstate trading is expected to become more widespread in the future within the COAG framework. Since 1982, permanent transfers equal to about one percent of the base water entitlement have been made. In the last five years, temporary water entitlement transfers have ranged between one percent and three percent of the total allocated volume.

Interstate trade is a relatively new feature, with the first temporary irrigator-to-irrigator trade between Victoria and NSW initiated in late 1995, under provisions of the Victorian Water (Amendment) Act 1995. Rather than investigate the ability of the proposed Cap rules to provide a basis for interstate trade, the key issue is whether the differences in capping mechanism being proposed by the States, combined with the opportunity for intra and interstate trade, will effectively undermine the intention of the Cap and allow diversions above and beyond the level of development in 1993/94.

The potential threat to the effectiveness of the Cap is highlighted by the availability of large levels of unused allocation across the Basin which could be activated by the opportunity to trade and the existence of a cap on overall diversions. Across the Basin between 1988/89 and 1992/93, the average total of diversions was 10,680 GL per year which is only 63 percent of the total water that was permitted to be used. This unused allocation represents a potential 6,218 GL in notionally available water under existing entitlements which could be activated by trade. These large levels of unused allocation will affect the operation of the market for temporary and permanent transfers of water entitlements, and could lead to unrealistic expectations of the water available unless appropriate management arrangements are implemented.

### 6.2 CURRENT POSITION IN EACH STATE

#### 6.2.1 South Australia

South Australia was the first of the four States to introduce permanent and temporary trading in 1982.

The South Australian Government plans to continue to encourage trade in allocations of water as a means of facilitating efficient and high value use of the allocated water in that State. This includes granting SA Water the right to trade its urban allocation. The South Australian Government also envisages extensions of the ability to trade interstate, subject to the development of appropriate rules.

#### 6.2.2 Victoria

The Victorian Government recognises that the development of water markets needs rights to water being clearly defined to ensure traded rights are a stable product which are deliverable (with a known reliability) in the future.

Temporary water entitlement trading was introduced in Victoria in 1987, followed by permanent trading in 1991.

Permanent transfers have grown rapidly from zero in 1990/91, to the stage where in each of the last two years (1994/95 and 1995/96) they have totalled about 15 GL in northern Victoria — 0.7 percent of total entitlements. The expectation is that trade may plateau somewhere around one percent of total entitlements a year.

Analysis of trading activity confirms that water has been moving to higher value uses, that is, to horticulture and dairying, and away from highly salinised, mixed farming land around Kerang and Pyramid Hill. Victoria has a limit, two percent of that area's entitlements a year, on permanent trade leaving certain areas. This is to avoid drastic financial and social impacts on the areas. At this stage, the rate of water leaving these areas is less than one percent a year.

The volume of temporary transfers in northern Victoria multiplied more than six times in the dry year 1994/95, to over 200 GL — about eight percent of total usage. Much of this went to dairy farmers who were used to high allocations in the previous wet years.

Many rights traded had never been used before. Nearly three quarters of these traded rights were extra 'sales' water. The Victorian Government has prevented trade in 'sales' by private diverters (whose base rights are normally under-utilised) as part of the interim cap on diversions. Victoria believes that further constraints on trade may be necessary as part of the Cap.

The Victorian Government has allowed some interstate trades in water, including the sale of water by the Flora and Fauna Branch to NSW and farmer-to-farmer temporary sales. Victorian irrigators who sell temporary rights forfeit their rights to sales water in Victoria. This effectively acts as a dampener to trade, but is designed to reduce the danger of unused entitlements trading.

### 6.2.3 New South Wales

In NSW, temporary transfer of allocations between irrigators on an annual basis has been operating since 1983/84. Each transfer is subject to Department of Land and Water Conservation approval which is contingent on the transfer not creating or exacerbating problems regarding water delivery, transmission losses or the environment. A temporary transfer may be repeated up to three times.

Provision for permanent transfers was introduced in 1989 as a means of allowing irrigators to make long-term adjustments to their enterprises and to allow new operators to enter the industry. As is the case of temporary transfers, a permanent transfer must not impact adversely on water delivery, transmission losses, or environment issues in the streams concerned.

In its announcement of water allocations for 1996/97<sup>6</sup>, the NSW Government has advised changes to its water trading policy, in recognition of the implementation of the Cap. Under new provisions for the allocation of water, the NSW Government has announced that it has effectively capped licensed diversions at 100 percent of allocation and provided access to up to 110 percent of allocation provided the interim cap on diversions will not be exceeded.

Trading is to be allowed up to these announced levels of allocation. Water users with access to off-allocation supplies may trade in water, but in doing so they forfeit their right to off-allocation water.

### 6.2.4 Queensland

Queensland does not allow any permanent transfers, except for water which was purchased at auction by payment of a capital charge (3,000 ML at St George and 15,900 ML in the Dumaresq River and MacIntyre Brook projects).

Temporary transfers are permitted in regulated sections of streams and in the St George Irrigation Area and there is no transfer system for water-harvesting rights.

Queensland is moving towards establishing Property Rights in water, based on the clear definition of entitlements and catchment-based hydrologic models that are being developed

through the WAMP process. In the meantime, Queensland envisages that trading existing licensed water allocations is likely to be progressively introduced within individual State Water Projects on a priority needs basis. This is to be facilitated by the existence of existing scheme-based hydrologic models and the ability to develop conditions of transfer that will not undermine requirements of a subsequent WAMP process and a full regime of property rights.

In the Border Rivers catchment, there will be a flow management plan which covers both sides of the border. This joint approach will enable a common basis for specifying water entitlements to be established.

For interstate trading to occur, the Queensland Government recognises that it is important for water entitlements to be specified on the same basis in both States. Thus, there will need to be conversion rules for measuring of entitlements up and down the Basin.

The establishment of the Cap provides the ability to establish property rights with various levels of security for all of the water included in the Cap.

## 6.3 DISCUSSION OF ISSUES

The potential threat that trading rules create in terms of the effectiveness of the States' mechanisms for imposing the Cap is most prevalent between NSW and Victoria, particularly on the River Murray, Murrumbidgee and lower Darling. The threat is widely recognised by the States and has been the subject of extensive debate and evaluation.

At the June 1996 meeting, the MDBC considered a report from its Water Market Reform Working Group (WMRWG) which identified *inter alia* the impediments to the establishment of permanent interstate trade of water property rights within the Basin. The impediments identified by the WMRWG included:

- the need for legislation reform in some States;
- the resolution of the product definition issue covering matters such as security of tenure, transmission losses and pricing differences;
- the definition of environment protection criteria for both the source and destination sites of interstate water trade;
- the physical zones in which interstate trade can occur;
- the differential pricing and subsidy arrangements between States;
- the impact of trade on the Salinity and Drainage Strategy;
- the potential impact of local government planning regulations on interstate trade;
- the development of an effective and efficient administrative arrangement for interstate trade; this will provide the basis for intra and interstate trading as soon

6. Media Release, NSW Department of Land and Water Conservation, Murray Region, 8 August 1996.



as appropriate policies, including pricing arrangements, are in place in line with the previous COAG decision;

- the future ownership and management of headworks as alternative outcomes may differentially impact upon State water prices.

At Appendix F is a summary of the differences between States identified by the WMRWG which serves to highlight the issues that need to be resolved. The IAG notes that a number of difficulties remain unresolved in relation to cross-border trade in water. For example, the different method of water allocation adopted by NSW and Queensland and the impact on the Border Rivers region has yet to be addressed. NSW has adopted a volumetric approach to the allocation of water, while Queensland will need to allow for its greater variability in river flows in its WAMP based water allocation regime. The differences will impede the opportunity for trade between the two States.

Differences in the water allocation arrangements between Victoria and NSW, and between Victoria, NSW and South Australia, will also contribute to additional diversions above the Cap. For example, Victoria's reliance on the physical constraints of its irrigation infrastructure including the size of diversion channels will not cap usage of Victoria's allocation of sales water when this water can be sold to irrigators in NSW. To prohibit trade in sales water would be contrary to the COAG objectives and is not a mechanism favoured by the IAG to ensure the operation of the Cap.

Accordingly, the IAG believes that the success of the Cap should not depend on limitations being placed on the ability to trade. Clearly, this would be inconsistent with the COAG principles and would prevent achievement of the greatest economic allocation and use of the water supplies available for consumptive use.

The IAG notes that in response to the WMRWG's report, the MDBC has agreed to the establishment as a pilot project, of a 'free trade zone' in the Mallee Region. This will involve areas in NSW, Victoria and South Australia and will provide a focus for gaining experience in dealing with cross-border trading issues.

## 6.4 CONCLUSIONS

The implementation of the Cap will have no adverse impact on interstate trading provided an appropriate accounting system is used. Rather than an adverse impact, the existence of the Cap is likely to increase the pressure for increasing the opportunities for trade.

However, the trading rules impact greatly on the success of the Cap. The trading regime needs to be formulated so that it does not provide a means whereby the Cap can be circumvented. For this reason, the definitions applied to the Cap by each of the States need to be rigorous, as any weaknesses in the capping mechanisms could be exploited through interstate trade, making the Cap rules less effective in limiting future growth in diversions in the Basin.

## 6.5 RECOMMENDATIONS

The IAG recommends that the following actions be adopted:

- water rights be defined to ensure that the integrity of the Cap is maintained (**Recommendation 22**);
- an appropriate trading regime be implemented (**Recommendation 23**);
- the NSW and Queensland Governments agree on a set of trading rules to be applied to cross-border trade between the two States (**Recommendation 24**);
- the Victorian and NSW Governments agree on a set of working rules to apply to trade between these two States (**Recommendation 25**);
- South Australia should participate in discussions between NSW and Victoria to agree on a set of working rules to apply to these three States (**Recommendation 26**); and
- the pilot 'free trade zone' in the Mallee region should be implemented urgently as a means of beginning to resolve some of the practical difficulties identified by the WMRWG (**Recommendation 27**).

## 7. Other Issues

### 7.1 RIVER MURRAY PUMPED DISTRICTS

#### 7.1.1 The Issue

The Terms of Reference require the IAG to consider the need for consistent and transparent approaches between the States for implementing the Cap, and in particular the need for consistency in handling entitlements for pumped districts in NSW, Victoria and South Australia. In examining this issue, the IAG has had to consider arrangements for establishing the caps for the pumped districts in each State that will:

- minimise the difficulties of capping in neighbouring States;
- effectively cap diversions; and
- establish an environment that facilitates interstate trade in water entitlements.

There are pumped districts on the River Murray in NSW, Victoria and South Australia that were established by the respective State Governments. In addition, there are two districts, First Mildura Irrigation Trust (FMIT) in Victoria and the Renmark Irrigation Trust (RIT)<sup>7</sup> in South Australia that were established privately but have many similarities to the Government Districts.

In these districts, water is supplied to irrigators via a communal pump and a communal distribution network and is used almost exclusively for the irrigation of permanent horticultural crops.

The water supply in these districts has always been very secure. Originally, each irrigator had a licensed area that could be irrigated and enough water was supplied to satisfy the requirements of the crop. Over time, these licensed areas have been converted to volumetric entitlements but different conversion factors have been used in each State. In most cases, the water entitlements are significantly greater than the 1993/94 level of usage. To impose the Cap it will be necessary for each State to decide whether it is going to reduce entitlements closer to the current usage or whether it will compensate for growth in pumped district diversion by reducing supplies to lower security water users elsewhere.

Because of the similarities between these districts, comparisons will be made by irrigators between the capping approaches adopted for them by the three States. A generous arrangement in one State will make it more

difficult to impose tight controls in the other States. Differences in the specification and measurement of entitlements will also make interstate trade in water entitlements more difficult as will any rules that restrain the uptake of unused entitlement by restricting trade.

#### 7.1.2 Current Position in Each State

In the following discussion, the pumped districts are divided into five groups:

- New South Wales districts  
Western Murray Irrigation (Buronga, Curlwaa, Coomealla).
- Victorian Government districts  
Robinvale, Red Cliffs and Merbein/Yelta.
- SA Government districts  
Cooltong, Ral Ral, Berri, Cobdogla, Kingston, Moorook, Waikerie, Cadell, Loxton and Mypolonga.
- FMIT  
First Mildura Irrigation Trust, Victoria.
- RIT  
Renmark Irrigation Trust, South Australia.

Table 7.1 provides details of diversions from the River Murray to these districts. In the pumped districts diversion estimates are either made by meters near the pumps or are calculated from the hours that the pumps have run. The diversion data in Table 7.1 are the average figures and have been adjusted for recent trends. Each district was analysed for trend and in all cases it was found that diversions had declined over the past ten years.

The reasons for the decline include:

- more efficient irrigation practices;
- the replacement of open channels distribution systems with pipes; and
- urban encroachment into the irrigation districts.

The figures in Table 7.1 are the average diversions adjusted for trend to 1993/94.

The intensity of the diversion (diversion divided by the district area) reveals similar types of demands in all districts.

Deliveries are defined as the water supplied to the individual growers at the farm gate. Annual data since 1982/83 have been analysed for trend and the average deliveries adjusted for trend to 1993/94 are listed in Table 7.2. Most districts have recorded a significant decrease in deliveries over the ten years to 1993/94, largely as a result of the improvement in irrigation efficiency resulting from the transition from furrow irrigation to sprinklers and drip. The application rates are similar between the districts varying from 6.4 to 9.2 ML per ha. Delivery efficiency is also similar between the districts averaging 84 percent.

7. There are a number of other privately operated pumped districts in addition to the Renmark Irrigation Trust in South Australia. They include Lyrup, Sherwood, Sunlands, Golden Heights, Pyap, Media and Greenways Irrigation Areas as well as numerous small cooperatives that share infrastructure to varying extents. However RIT is by far the largest of all the Irrigation Trusts.

**Table 7.1: Comparison of Diversions from the River**  
**Average Diversions from the River Murray Adjusted for Trend to 1993/94**

	<i>NSW Districts</i>	<i>VIC Govt Districts</i>	<i>SA Govt Districts</i>	<i>FMIT</i>	<i>RIT</i>	<i>Total</i>
Average diversion (GL per year)	35.2	94.2	126.7	57.9	36.6	350.6
% growth 1984-1994	-24%	-2%	-3%	-16%	n.a	-7%
Area of district (ha)	4,346	10,833	13,869	6,551	3,907	39,506
Intensity (ML per ha)	8.09	8.70	9.14	8.84	9.37	8.87

Note: The district area is the area currently irrigated, not the authorised area.

**Table 7.2: Comparison of Deliveries to Farm Gate**  
**Average Deliveries Adjusted for Trend to 1993/94**

	<i>NSW Districts</i>	<i>VIC Govt Districts</i>	<i>SA Govt Districts</i>	<i>FMIT</i>	<i>RIT</i>	<i>Total</i>
Average delivery (GL per year)	28.0	74.4	108.7	48.4	36.0	295.5
% growth 1984-1994	-30%	-15%	1%	-11%	n.a	-9%
Area of district (ha)	4,346	10,833	13,869	6,551	3,907	39,506
Application (ML per ha)	6.43	6.87	7.84	7.39	9.21	7.48
Delivery efficiency (%)	80%	79%	86%	84%	98%	84%

The specification of the entitlements for the pumped districts differs from State to State. Originally most of these districts were run by the government concerned without any formal entitlement and were supplied with enough water to meet their crop requirements in all years. Some districts still operate in this mode. In recent years, however, the districts in NSW have been privatised and water trading has been encouraged in South Australia. This has required formalisation of the water property rights. Different approaches have been used in NSW and SA to establish these rights.

The way that pumped district entitlements are specified in each State or irrigation area is as follows:

- *South Australia*  
 Individual irrigators in the South Australian Government districts have a water entitlement. These entitlements total 166.4 GL per year. For many years these entitlements could only be traded within a district. Since January 1995 however, it has been possible to trade these entitlements anywhere. Each district has a licence to divert an amount equal to the sum of the individual entitlements. System losses are not covered by an entitlement. South Australia has argued that the calculated loss figure of 18 GL per year based on system diversions and deliveries is an overestimate caused by inaccurate measurement of diversions. SA claims that the actual loss is nine GL per year and they expect that this loss will be eliminated once the last of the districts are rehabilitated. At that stage, the South Australian

Government is considering issuing an additional nine GL of water entitlement to the district boards.

- *New South Wales*  
 The districts in NSW were privatised in February 1995. The new body, Western Murray Irrigation, was issued an entitlement to divert 61 GL per year from the river. Individual irrigators do not have individual entitlements but own a share in the company. The company received a water entitlement that was based on the same allocation per hectare (14 ML per ha) as that originally made to neighbouring private horticultural farmers.
- *Victoria*  
 Individual irrigators in the Victorian districts hold water rights which are defined at the farm gate and these water rights total 91 GL per year compared with a District assignment of 130 GL per year under Schedule 11 of the Victorian Water Act. The assignment is not equivalent to a water right and has had little relevance to water management. Since December 1994, irrigators have been allowed to trade these water rights freely. Individual irrigators are also permitted access to sales water. Some irrigators require sales water in dry years to meet crop requirements and on average five percent of district deliveries are sales water. Losses in the distribution system are not covered by a water right. Work is progressing to establish a BE for the region which will place additional controls on district diversions.

- *First Mildura Irrigation Trust (FMIT)*  
FMIT started life as a private trust but was subsequently reorganised and supported by the Victorian Government. It differs from the other Victorian districts in that individual irrigators do not own water right and deliveries to individuals are not metered. The trust does not hold a water right either. Under the Victorian Water Act it is entitled to a minimum quantity of 40 GL per year (6.1 ML per ha). However, the district consistently uses more than this amount. It also has an assignment equivalent to that given to the other Victorian districts under Schedule 11. The assignment of 104 GL per year is not equivalent to a water right and is higher than current usage.
- *Renmark Irrigation Trust*  
Like FMIT, the RIT was established by the Chaffey Brothers and has many similarities to that trust. Although covered by its own Act of Parliament, RIT is a private trust and it is treated as a private diverter. The trust owns a water entitlement which is defined at the river and therefore covers system losses.

In summary, an overview of current entitlements for pumped districts reveals that:

- NSW, RIT and South Australian rehabilitated Government Irrigation districts have established entitlements defined at the river;
- the South Australian non-rehabilitated districts have a defined entitlement at the farm gate but no entitlement for losses (although this will revert to an entitlement defined at the river once the rehabilitation process is completed);
- the Victorian districts have a defined entitlement at the farm gate but no associated entitlement for system losses and a largely unlimited access to sales; and
- FMIT has a largely unlimited access to water but no entitlement relevant to current use.

A comparison of these entitlements is provided in Table 7.3 by converting the entitlements to:

- the equivalent diversion entitlement at the river; and
- the equivalent delivery entitlement at the farm gate.

The conversion from river to farm gate has been made using the observed delivery efficiencies in Table 7.2.

An allowance has been made for access to sales in Victoria by assuming that:

- in the future districts will have no access to sales; and
- those irrigators with a history of sales usage have their entitlement increased to include their peak sales usage.

Also, it has been assumed that FMIT is issued a water right equivalent to their peak diversion from 1984/85 to 1993/94.

Table 7.3 shows that, if the districts' entitlements were set using the assumptions described above, the Victorian districts and FMIT, at 11.5 ML per ha, would be treated less generously than their South Australian and NSW counterparts who obtained 14 ML per ha.

The generosity in allocation of entitlements for NSW and South Australian districts also provides the opportunity for growth in diversions in a free market trading environment. In estimating the possible growth in diversions in the pumped districts it has been assumed that average diversion will eventually be 90 percent of the entitlement<sup>8</sup>. In calculating the figures presented in Table 7.4, the entitlements in Table 7.3 were also assumed.

The figures in Table 7.4 indicate that there is scope for diversions in the pumped districts to grow by 29 percent.

The percent by which diversions can increase is a good measure of the generosity of the entitlement. The 56 percent increase that is possible in NSW suggests that Western Murray Irrigation was treated very favourably when it was privatised.

The table shows that the methods assumed for establishing entitlements in Victoria are less generous than those adopted for their interstate counterparts. Those assumptions were:

- setting FMIT's water right equal to its maximum diversion since 1984; and
- scrapping sales to Victorian pumped districts but increasing individual entitlements to allow for their historical use of sales.

### 7.1.3 Discussion of Issues

Water was originally allocated to pump districts on the basis of climate, soil and crop type. The intention of the allocation was to secure development on all of the available suitable soils within the district. The allocations to individual properties were a notional amount and in some cases were modified as they were not adequate to secure a particular cropping system. The 'property right', in generic terms, could be described as having adequate water in most climatic circumstances to secure the largely permanent plantings within these districts. In some districts the allocation per hectare is close to the actual usage, while in other districts the allocation is significantly higher than the historic usage. The difference between actual usage and allocation has never been used and its activation by trading would result in an increase in overall water use unless offset. The IAG believes this matter should be addressed on a State-by-State and district-by-district basis along the following lines:

- allocations should be adjusted to more closely reflect usage. An allowance should be made for climatic

8. This is the average ratio between peak and average diversion observed in South Australia.

**Table 7.3: Water Entitlements by District (GL)**

	<i>NSW Districts</i>	<i>VIC Govt Districts</i>	<i>SA Govt Districts</i>	<i>FMIT</i>	<i>RIT</i>	<i>Total</i>
Diversions entitlement	60.8	—	—	74.8	48.2	
Delivery entitlement	—	91.4	166.4	—	—	
Allowance for sales	—	7.7	—	—	—	
System losses	12.5	26.4	27.6	12.3	0.8	79.5
Equivalent diversion entitlement	61.2	125.5	194.0	74.8	48.2	503.3
Equivalent delivery entitlement	48.7	99.1	166.4	62.5	47.4	423.9
Area of district (ha)	4,346	10,833	13,869	6,551	3,907	39,506
Diversions entitlement (ML per ha)	14.0	11.6	14.0	11.4	12.3	12.7
Delivery entitlement (ML per ha)	11.1	9.1	12.0	9.5	12.1	10.7

**Table 7.4: Scope for Growth in Diversions (GL) (Above 1993/4 levels)**

	<i>NSW Districts</i>	<i>VIC Govt Districts</i>	<i>SA Govt Districts</i>	<i>FMIT</i>	<i>RIT</i>	<i>Total</i>
Diversions entitlement	60.8	—	—	74.8	48.2	
Average current diversion	35.2	94.2	126.7	57.9	36.6	350.6
Expected growth (GL)	19.6	—	—	9.4	6.8	
Adjusted delivery entitlement	—	99.1	166.4	—	—	
Average current delivery	28.0	74.4	108.7	48.4	36.0	
Expected growth (GL)	—	14.8	41.1	—	—	
Total growth	19.6	14.8	41.1	9.4	6.8	91.7
Percentage increase	56%	20%	38%	16%	19%	29%

variability and for the irrigation application technology being employed. Irrigators who have recently adopted more efficient irrigation technologies should not be disadvantaged;

- a district allocation should be made on the basis of the sum of the current individual rights plus the water needed to meet losses in the supply system; and
- any efficiency gains either at the private or public level, from the adoption of improved technologies, should be available to the property right holders for use or sale as appropriate.

If a government considers that adjusting existing statutory property rights as shown in the tables above is not possible, or considered desirable, then an offset for growth in diversions should be established. The offset is to ensure that any growth as a result of increased use from the previously unused water allocated to pump districts is offset by a reduction elsewhere. The offset in the case of South Australia is its decision not to allocate sales water (see discussion in 4.3.1 above. The unique circumstances in South Australia do not apply to other States.)

The overall approach adopted towards pumped districts should be consistent with the previously identified IAG principles, namely:

- Principle 1:  
It will result in no net increase in water use.
- Principle 2:  
It follows the Precautionary Principle.
- Principle 3:  
It will result in allocative efficiency and not distort the water market.
- Principle 4:  
It would recognise current agreed property rights, ie the right to irrigate within the pump district and secure the permanent plantings, even though there might be some amendment to individual allocations.
- Principle 5:  
The arrangements would be transparent and auditable.
- Principle 6:  
The proposals are administratively efficient.



### 7.1.4 Conclusions

There is potential for a significant increase in water diversions as a result of unutilised water in pumped districts being activated by the proposed water trading arrangements. The potential for this growth in diversions is inconsistent with the Cap objectives, and will require direct government intervention on a State-by-State basis to resolve.

### 7.1.5 Recommendations

The IAG recommends that:

- the Governments in NSW and Victoria either modify the allocation to pumped districts, or identify the offsets to be put in place as currently unutilised water is activated (**Recommendation 28**);
- allocation be issued at a level consistent with soil and crop type, rather than on historic allocation levels (**Recommendation 29**);
- the South Australian cap include the 69 GL in historic over-allocation to irrigation in South Australia as no trade-offs are available (**Recommendation 30**); and
- after the Cap is in place, water savings from improvements in system efficiency may be reallocated for consumptive use within the Cap (to provide a return for investments in improvements in water efficiency) (**Recommendation 31**).

## 7.2 URBAN WATER SUPPLIES

### 7.2.1 The Issue

The Terms of Reference for the study require the IAG to investigate the need for consistency and transparency in the handling of entitlements for urban water supplies under the Cap in all States.

Broadly, arrangements for town water supply diversions in the Basin fall into two main categories:

- metered diversion with a predetermined volumetric water entitlement; and
- metered diversion with unlimited entitlement.

Under current policy in NSW and Queensland, town water supplies have been issued with entitlements that are determined after making allowance for anticipated population growth and the capacity of the existing infrastructure. Generally these entitlements are set at a volume greater than current peak usage. In these States, there have been examples of temporary transfers of unused town water entitlement to irrigators. In South Australia, town water supplies are not based on volumetric licences, but allow unlimited diversion of water although there is a nominal maximum allowance. The situation in Victoria is

similar except for those towns supplied within the Goulburn System which have been issued with fixed bulk entitlements.

Inconsistencies in the allocation and capping of town water supplies throughout the Basin have the potential to undermine the effectiveness of the Cap.

### 7.2.2 Current Position in Each State

#### South Australia

The South Australian Government has acknowledged the importance of the River Murray as a source of urban water for the State. The River Murray is the sole source of water for the rural towns and provides between 10 percent and 90 percent of Adelaide's urban water needs, depending on season variations.

As discussed in Section 4, while the installed pumping capacity from the River Murray by SA Water equates to 380 GL per year, peak demand has only reached 232 GL per year, whereas the average demand is about 120 GL per year. There is no formal water entitlement for urban water supplies in South Australia, although the nominal allowance is for a maximum use of 230 GL per year. Unused water is effectively environmental flow.

Security of water from the River Murray for urban water use is a high priority in South Australia given the limited alternative water sources. However, urban water usage will vary considerably depending on climatic conditions and the existing water supplies in the Mt Lofty catchment. A fixed cap based upon average use would clearly create hardships for the urban population.

#### Victoria

Victorian urban water authorities, with the exception of those supplied from the Goulburn system, do not have a formal volumetric entitlement to water. Rather, the statutory right to divert water has been established by a Governor-in-Council authorisation allowing these authorities to extract water for urban use. The amount and security of this entitlement is not specified in the authorisation. In the Goulburn System, under recently issued bulk entitlements, an annual volumetric limit is imposed and a security of supply is specified for those towns supplied from the regulated system.

With the introduction of the Cap, Victoria proposes that urban water authorities' right to water will be quantified on the basis of:

*The assessed 'design intent' capacity of the works approved before 1st November 1990 with consideration given to the impacts on downstream water users and the environment. The capacity of works is assessed on the basis of daily and annual harvesting limits and a defined level of security.<sup>9</sup>*

9. Victorian Government Submission August 1996.



It is intended that growth in future demand for water will be met by these authorities buying existing water entitlements.

### **New South Wales**

In NSW the rules applying to urban water supplies are:

- all towns are required to hold a licence;
- while some towns have an allocation the process of determining allocations is still under way for others; and
- towns must justify any increase in licence capacity based on Australian Bureau of Statistics demographic predictions and Public Works Department average consumption rates.

In response to the need to cap the total diversion from the Basin, NSW agencies are considering recommending a statutory embargo on urban water diversions. This statutory embargo, other than where existing entitlement applies, will be based on the estimated urban water requirements for each town, using Year 2000 population projections. Thus, in future, towns will have to enter the market to access additional urban water resources beyond the year 2000 consumption level.

No assessment has been made of the potential increase in urban water supply requirements and likely environmental impact that this process will have. However, the additional diversions are unlikely to be significant. Despite the minor growth possibilities, the overall use of water is likely to be small in comparison with irrigation requirements.

### **Queensland**

Urban water supplies have been issued with water supply entitlements that were determined after making allowance for population growth and the capacity of the existing infrastructure.

Queensland recognises that entitlements for urban water supplies will need to be included within the Cap arrangements. Any new water entitlements desired after the Cap has been set, would have to be obtained through water trading under property rights provisions. The final allocation of urban water rights will need to wait until the WAMP process is completed.

## **7.2.3 Discussion of Issues**

### **South Australia**

The South Australian Government recognises that a formal water diversion licence will need to be issued for SA Water to divert water from the River Murray. It is proposed to issue two licences to SA Water, one to cover the three offtakes which supply water to Adelaide, while the other licence will cover the offtakes supplying water to all other towns. Each licence will have a volumetric allocation

specified in it, and will allow SA Water to trade the water allocation either temporarily or permanently.

It is proposed that the licence for all towns other than Adelaide will have a specified annual allocation of 50 GL, which is below the design intent of the pumping facilities and is designed to provide high security based on current demand levels.

It is further proposed that the allocation for the combined licence for the three offtakes for Adelaide be established on a five-year rolling average basis. It is argued that this will accommodate the high annual variability in the actual diversions which add to the local water supply from the Mt Lofty Ranges catchment. The proposed five-year rolling allocation of 650 GL over the five-year period (notionally 130 GL per year) gives high security of water supply to the Adelaide consumers. This entitlement is greater than the maximum historical five-year diversion which averaged 120 GL per year. It is also considerably greater than the long term average diversion to Adelaide which has averaged 92 GL per year since 1976/77.

The IAG notes that the proposed offtake for country towns of 50 GL per year is also marginally above the peak historical diversion of 45 GL per year.

The IAG is concerned that the South Australian proposals for its urban entitlements appear to open the door for future growth in diversions. The IAG acknowledges that, while it is proposed that NSW and Queensland be capped at year 2000 population requirements, South Australia's urban water needs will require a high degree of variability to provide a high level of security in conjunction with the Mt Lofty Ranges urban water resource. It is inconsistent with the Government's overall water allocation strategy for South Australia to propose trading in the difference between actual offtake for urban purposes and the volumetric cap which has been set in recognition of the high variability in demand (see Section 4 for more discussion). It is therefore difficult to reconcile the current proposal which the South Australian Government acknowledges will reduce flows to the river, with the Government's desire to improve the health of the river towards the mouth while ensuring high security for all South Australian users.

### **Victoria**

In many cases, Victorian urban water supply systems are operating below their design capacity. Therefore, if the urban water authorities' right to water is quantified on the basis of the assessed design capacity of the infrastructure approved before 1 November 1990, the entitlement specified will be greater than current use. Allocations on a whole of State basis are expected to grow by 30 GL per year which will result in increased diversions unless the quantity of sales water is reduced.

Furthermore, it is conceivable that this unused metered allocation could be added to water available to irrigators via the temporary transfer market. Victoria proposes to discourage such trade by preventing temporary trading in urban water.

## NSW

The NSW Government agencies are considering recommending capping the level of water allocated to urban water communities, except where existing licences have already been established. This cap needs to be operated by statutory provisions where appropriate.

## Queensland

The Queensland allocations will wait for the outcome of the WAMP process, but will place a physical volumetric limit on urban water usage. For consistency reasons and administrative efficiency, allocations, except where existing statutory rights exist, should be tied to the Year 2000 demand.

## Australian Capital Territory

The ACT is not formally part of the MDBC. However, the ACT clearly draws water from the Basin river system. Furthermore, the ACT represents the largest town on the system that depends entirely on the Basin for its water.

The ACT's rights to water are defined in existing Commonwealth legislation, namely the *Australian Capital Territory (Self Government) Act 1988*, the *Seat of Government Acceptance Act 1909*, and the *Canberra Water Supply (Googong Dam) Act 1974*. This legislation gives the ACT access to water from both within the Territory itself and from catchments located in NSW. Under this arrangement, the ACT sells bulk water to Queanbeyan which is on the NSW side of the border with the ACT.

Arrangements are being put in place in all other jurisdictions in the Murray-Darling Basin to provide a water allocation for urban communities. While the details of the arrangement vary from jurisdiction to jurisdiction, the intention is to put in place a clear capping arrangement with an associated water right for each urban community. This capping arrangement will be consistent with the Cap. Growth in urban demand in these communities would then have to be met by the purchase of water from other users.

In the case of the ACT, arrangements need to be initiated for a cap to be placed upon the use of water for urban purposes, including the sale of bulk water to Queanbeyan and the use of water for non-urban purposes within the ACT. This cap needs to be established by 1 July 1997.

The setting of this cap to the year 2000 anticipated demand would ensure consistency with the proposed capping arrangements for other urban areas. Alternatively, as demand

for water in the ACT has declined in recent years as a result of a significant campaign to encourage greater water use efficiency, the ACT may decide to opt for a cap based on the 1993/94 consumption levels.

## 7.2.4 Conclusions

Consistency in the treatment of urban water entitlements across the Basin will remove the possibility of dissatisfaction with water entitlements across State boundaries.

This consistency in approach should apply also to the ACT which has the largest urban development relying entirely on water from the Murray Darling System.

The IAG recognises, however, that there will be certain circumstances where there will need to be some differences in the urban allocation process. This approach will allow States the flexibility to give greater recognition to quantification processes that recognised past investment decisions (under principles one and two of the hierarchy of rights) provided that there was no advantage in terms of the application of the Cap. These differences in allocation arrangements, where necessary, can be readily accommodated in the Cap concept without undermining the integrity of the Cap or its overall objectives.

South Australia's proposed urban water requirements need special consideration. The IAG accepts that a cap of 50 GL per year be placed on diversions to South Australian country towns recognising that the high degree of security needed will discourage any long term trading of this water. However, the IAG does not accept that a five-year rolling average is appropriate for determining the allocation for Adelaide's urban use. Given the variability of usage from the River Murray, a cap should be placed on diversions for Adelaide's use, based on a ten-year rolling average. This will amount to an allocation of 1,000 GL over the 10 years, or notionally an average of 100 GL per year. This outcome is closer to the current average usage for Adelaide and would reflect any allowance for population growth to the year 2000 as proposed for other urban water allocations. Should South Australia adopt a five-year rolling average, to avoid the potential for a growth in diversions, SA Water should be prevented from trading in its own water allocated for urban use. This does not mean that SA Water will be precluded from buying or leasing water from elsewhere if demand increases. However, if a ten-year rolling average is adopted, this trading limitation could be removed.

## 7.2.5 Recommendations

The IAG recommends that:

- for consistency, the level of water allocated to urban communities in all States should be capped at expected consumptive levels for the year 2000 (**Recommendation 32**), or alternatively for consistency, where States adopt

other allocation rules, the allocations to urban systems should not result in a net increase in diversions (**Recommendation 33**);

- future additional water requirements will have to be obtained through water trading (**Recommendation 34**);
- for SA Water:
  - a fixed allocation of 50 GL per year be provided for country towns (**Recommendation 35**); and
  - a cap on diversions for Adelaide's urban use be based on a ten-year rolling average with full tradeability to apply to SA Water's allocations (this tradeability approval should be removed if a five-year rolling average base is used. It is noted that SA Water would not be precluded from buying or leasing water from elsewhere if demand increases.) (**Recommendation 36**);
- for the ACT:
  - a property right to support a cap for urban water use in the ACT (including associated rural areas) be agreed by 1 July 1997 based on the principles outlined under Recommendations 32 or 33 above (**Recommendation 37**); and
  - in setting the cap the ACT should consider the need for appropriate water resource studies covering all sources of water as a basis for allocating water for consumptive and environmental use in the Territory (**Recommendation 38**).

## 7.3 TEN-HECTARE LICENCES

### 7.3.1 The Issue

The IAG was required to investigate the need for consistent and transparent approaches between the States in issuing ten-hectare irrigation licences.

In June 1995 the NSW Government embargoed new applications for irrigation licences on all unregulated streams in the Murray-Darling Basin. However the embargo excluded applications for licences of less than ten hectares for riparian properties existing at the time of the embargo which had no other irrigation licences. Although this was originally intended as a 'drought proofing' measure, some applicants have been using the exclusion to establish new small-scale, general irrigation schemes.

Since June 1995, Queensland had refused to issue any new licences under the interim capping arrangements. However, from July 1996, it has decided to accept applications for ten-hectare licences because of the precedent that exists in NSW.

Victoria has placed a moratorium on the issue of all new irrigation entitlements. The situation in NSW and Queensland places very strong pressure on Victoria to issue these licences as well.

### 7.3.2 The Current Position in Each State

#### Victoria

Victoria believes that new ten-hectare licences are Category 6 in the hierarchy of property rights as outlined in Section 2 and should not be permitted under the Cap. Victoria argues that it is inconsistent to announce a cap of diversions while continuing to make new commitments.

It argues that the granting of new ten-hectare licences in New South Wales and Queensland:

- undermines the integrity of the Cap;
- erodes the security of existing users; and
- places extreme pressure on Victoria also to issue these licences.

#### New South Wales

NSW is currently accepting applications for new ten-hectare licences.

#### Queensland

Queensland agrees that usage by ten-hectare licences should be included in the definition of the Cap. However, since Queensland expects that its WAMP process will show there is still scope for development in Queensland, it argues that any licences it grants now will not exceed the diversion that will ultimately be permitted. It therefore argues that the granting of ten-hectare licences is only an issue for the moratorium in that the granting of new licences could be seen to conflict with the interim agreement to prevent further growth in diversions.

### 7.3.3 Discussion of Issues

#### Victoria

Victoria has argued that the granting of new ten-hectare licences in NSW and Queensland places extreme pressure on Victoria also to issue these licences. Although there is no necessity for Victoria to succumb to that pressure, the IAG's fifth principle that the water management process be transparent and auditable, would support Victoria's argument that the difference between the States on this issue is undesirable.

#### New South Wales

The NSW definition of the Cap is the level of diversion expected with the development, infrastructure, and management, both public and private that existed at the end of the 1993/94 water year. Any ten-hectare licences issued since June 1995 would not be part of the 1993/94 level of development. It follows therefore, that any water usage by ten-hectare licences would need to be balanced by

a reduction of existing uses. This corresponds to the removal of water from users with Category 3 property rights to supply to users in Category 6. This is contrary to the IAG's fourth principal to maintain existing property rights.

### **Queensland**

In Queensland the WAMP process is expected to conclude that the Cap will be at a level of diversion that is above present levels. Given this expectation, granting new ten-hectare licences need not be at the expense of existing Queensland users and therefore need not conflict with the IAG's property right principle. However the WAMP process is not yet complete and it is not clear that it will conclude that higher diversions are possible.

#### **7.3.4 Conclusions**

The IAG believes that new commitments cannot be agreed to if a decision has been made to cap diversions.

#### **7.3.5 Recommendations**

The IAG recommends that:

- NSW should cease issuing new ten-hectare licences in the Murray-Darling Basin and existing ten-hectare licences usage be included within the Cap (**Recommendation 39**);
- if the WAMP process in Queensland identifies opportunities for new ten-hectare licences, the usage by these type of licences should be met within the Cap (**Recommendation 40**); and
- once the Cap is in operation, water for ten-hectare blocks should only be available through the purchase of existing entitlements (**Recommendation 41**).

## **7.4 DOZERS AND SLEEPERS**

### **7.4.1 The Issue**

Under-utilised existing entitlements, referred to as sleeper and dozer allocations, create considerable scope for increases in demand for diversions in a tradeable market. There is also the issue of different treatment in individual States of these sleeper and dozer allocations under the Cap. The issue, therefore, is to establish a consistent and equitable arrangement for sleeper and dozer allocations across the Basin.

### **7.4.2 Current Position in Each State**

#### **South Australia**

The South Australian Government argues that high security dozer allocation holders should be allowed full use of their entitlements. Justification for this approach is argued on the

basis of the pre-existence of a self imposed volumetric cap in South Australia and the conservative approach to water allocation entitlements that has been taken in South Australia. This conservative approach has included two reductions in the capped level of water allocation over the past 17 years and the cancellation of sleeper allocations in 1979, in which unused allocations were effectively eliminated on the basis that if there had been zero use over the preceding three years, the allocation was revoked.

#### **Victoria**

The Victorian Government proposes that recognition be given to the entitlements embodied in sleeper and dozer allocations. They argue that these entitlements should be included within the Cap. Two options suggested are:

- the Cap should be increased to take into account these entitlements at the expense of the environment; or
- recognition of these entitlements could be within the definition of 1993/94 levels of development and therefore at the expense of other entitlement holders.

#### **New South Wales**

In NSW, it is recognised that activation of dozer and sleeper allocations in the State is a major issue for containing use within agreed Cap levels. This is particularly so in unregulated streams and in some regulated rivers such as the Lachlan and Murrumbidgee and smaller systems such as the Cudgegong, Peel and Manilla.

Two options are under consideration:

- revise existing entitlements according to history of use (that is, cancel all sleepers and modify all dozer entitlement); or
- balance any growth in use of sleeper and dozer entitlements by reducing fully-active entitlement holders' use through the allocation management system.

At this time no decision has been taken but it is recognised that whatever approach is taken, diversions need to remain within the Cap.

#### **Queensland**

The Queensland Government recognises that sleeper and dozer allocations should be included within the Cap.

There is a recognition that the entitlements embodied in sleeper and dozer allocations need to be addressed according to sustainable flow management in and out of sub-catchments.

The decision on translation from existing entitlements to long term property rights will be addressed through the WAMP process.



### 7.4.3 Discussion of Issues

All States generally recognise that these under-utilised existing entitlements create considerable scope for increases in demand for diversions in a tradeable market.

Allowing the possible increases in diversion to occur throughout the Basin would have significant adverse water quality and environmental implications. Such an approach is not favoured by the IAG.

In the context of the hierarchy of user rights, sleeper and dozer allocations fall into Categories 1 and 2, that is statutory property rights that could have a history of utilisation or possibly Categories 3 and 4 where the right is non-statutory. Accordingly, the IAG gives high priority to the rights held under these allocations particularly the Categories 1 and 2 allocations, while recognising that they have not been fully utilised in the past.

### 7.4.4 Conclusions

Consistency in handling sleeper and dozer allocations will require that any activation of these allocations, either by the existing entitlement holders or via traded rights, will occur within the Cap. In South Australia, where a volumetric cap has been applied for more than 25 years, dozer allocations will be activated up to that cap.

In Victoria and NSW where there has been reliance upon sales and off-allocation water respectively, the honouring of the rights under the sleeper and dozer allocations should be given priority at the expense of sales and off-allocation water. Sales and off-allocation water diversions are not formal rights to water, although it is acknowledged that irrigators have come to rely on them through regular past practices. However, to remain within the Cap, and to meet the primary objectives, some form of adjustment is needed. The IAG believes that priority to water within the Cap should be given on the basis of the hierarchy of access rights. On this basis, access to sleeper and dozer allocations with high level property rights would have priority over lesser categories of rights, in particular sales and off-allocation water.

In Queensland, the WAMP process should similarly give greater priority to existing rights over available water supplies. However, in determining future water diversions, the WAMP process should adopt the Precautionary Principle to prevent an over-allocation of water for consumptive use. It also should ensure that sleeper and dozer allocations are included in the allowance for consumptive use as long as their total level used is consistent with the WAMP allocation process.

### 7.4.5 Recommendations

The IAG recommends that:

- the Cap not be increased to allow for increased water diversions resulting from existing sleeper and dozer allocations (**Recommendation 42**);
- sleeper and dozer allocations with high level property rights to water be given priority over lesser categories of rights, in particular sales and off-allocation water (**Recommendation 43**); and
- the Precautionary Principle be applied by Queensland through its WAMP process to ensure that over allocation of water for consumptive use does not occur, while acknowledging the rights that are held by previously existing sleeper and dozer allocations (**Recommendation 44**).

## 7.5 LAKE MOKOAN

### 7.5.1 The Issues

Lake Mokoan represents an investment in a major asset in the Basin which has not been fully developed for the purposes for which it was originally intended. The question therefore arises as to whether the Cap based on 1993/94 level of development in the Basin effectively precludes the use of the water stored in the asset. This raises a number of equity and consistency issues which need to be considered in the context of the specific projects.

### 7.5.2 Current Position

Lake Mokoan was constructed in 1970. It was designed originally to supply about 10 GL per year for private diverters in the Broken River and 60 GL per year in the Goulburn System. However, before the completion of Dartmouth Dam, there were serious concerns for the security of the Victorian entitlement from the River Murray. To address these concerns it was decided, as a temporary measure, not to construct the diversion weir and pumps necessary to divert the 60 GL per year into the East Goulburn Main. Instead, Lake Mokoan was used, in part, to supply private diverters on the Broken River and in part as a reserve supply for Victorian diverters from the River Murray.

During the serious drought of 1982/83, the Lake was effectively emptied when 199 GL was released to supply the River Murray. This draw down had a severe impact on water quality in the Lake. Vegetation on the Lake bed died and the clay on the Lake bed dispersed, greatly increasing turbidity. Consequently, very serious blooms of toxic blue-green algae developed. As a result of these troubles, very little use has been made of the Lake since.

Limited quantities of water have been released from the Lake early in each season (before the algal blooms develop) to supply the River Murray. However, water quality constraints prevent releases in February and March when demand for Lake Mokoan would be greatest because of high demands and channel capacity constraints in the River Murray. In recent years, efforts have been made to rehabilitate the Lake by holding it at a lower level and limiting releases. Some improvement in water quality has been observed.

In 1988, plans to connect the Lake to the East Goulburn Main were revived and an Environmental Effects Statement was prepared. However, apart from the fabrication of the gates for the diversion weir, no progress has since been made on the \$2.5 million of works needed to connect the Lake to the Main.

Victoria believes that the cap for the Goulburn/Broken system should be adjusted upwards to account for the extra diversion that would have occurred had Lake Mokoan been operational in 1993/94. This would result in diversions increasing above the actual 1993/94 level of development but, Victoria argues, not above the level to which strong rights had been established.

Victoria was asked to estimate the quantum of the increase that might be sought from operating Lake Mokoan. To make this assessment, it conducted the following three runs of the Goulburn System model:

- a) Lake Mokoan used to supply demand in the Broken River only — operation constrained by water quality problems;
- b) Lake Mokoan operated to provide supplementary supplies to the River Murray assuming that blue green algae problems have been resolved and that the operation is constrained to prevent their recurrence;
- c) Lake Mokoan operated to supplement the East Goulburn Main as originally designed.

These runs are described in more detail in the Victorian Report to the IAG dated 26 September 1996. The Victorian paper notes that the model run (a) underestimates the use currently made of Lake Mokoan because it ignores the releases made on occasion to supply the River Murray. It also notes that model run (b) overestimates the use currently made of Lake Mokoan because, although the Lake is used to supply supplements to the River Murray, its operations are still constrained by water quality problems. Victoria has stated that current use falls between runs (a) and (b). For the purposes of this report it has been assumed that current use falls exactly half way between those runs. The difference between the actual 1993/94 development and the level sought by Victoria has therefore been estimated by subtracting the mean of the results of runs (a) and (b) from the results of run (c). These results are summarised in Table 7.5.

On the basis of these results, Victoria could claim that its Goulburn cap should be increased by 32 GL per year. Alternatively, it could be argued that the appropriate claim is only 28 GL or even 22 GL. If Victoria were to claim the full 32 GL, then it could be argued that the NSW and Victorian Murray caps should be slightly reduced because some of their rights had been reserved by the construction of Lake Mokoan.

The Victorian arguments for its position are:

- Victoria has invested \$65 million dollars in the Lake with the intention of increasing yield;
- limiting the storage yield to current water usage is therefore a poor economic and financial decision;
- the MDBC Salinity and Drainage Strategy has set a precedent on equity in accepting that past decisions, made in good faith, should be accepted by all; and
- the Environmental Effects Statement for the diversion weir was completed in 1988.

### 7.5.3 Discussion of Issues

The IAG tested the proposal to include Lake Mokoan in the Cap against the objectives and principles set out earlier in this report.

**Table 7.5: Changes If Lake Mokoan Operated As Originally Designed**

	<i>Change (GL per year)</i>
<b>Goulburn/Broken system diversion</b>	
East Goulburn Main from Goulburn River	-40
East Goulburn Main from Broken River	62
Other diversions supplied from Goulburn River	11
Other diversions supplied from Broken River	-1
<b>Total Goulburn/Broken diversion</b>	<b>32</b>
<b>River Murray diversions</b>	
Victoria	-5
NSW	-5
<b>Total River Murray</b>	<b>-10</b>
<b>Total Victorian diversion</b>	<b>28</b>
<b>Total Goulburn &amp; River Murray diversion</b>	<b>22</b>
<b>Evaporation</b>	
Eildon	0
Lake Mokoan	-6
<b>Total evaporation</b>	<b>-6</b>
<b>Goulburn River outflow</b>	<b>-23</b>



There is no evidence available to the IAG that a water allocation process has been undertaken for the Broken River Valley as currently under way in many of the river valleys within the Basin. There is evidence to indicate that there have been, and are, significant ongoing problems with algae and water quality. The application of principles 1 and 2 suggest to the IAG that an appropriate water allocation study needs to be undertaken for Lake Mokoan. Once water for the environment has been allocated, the balance of available water can be used for consumptive uses. As approximately 20 GL is already utilised, the net available increase can then be determined.

#### **7.5.4 Conclusions**

The IAG believes that the Victorian cap should be increased to allow for the completion of the Lake Mokoan scheme. The Victorian cap should include a nominal additional 22 GL per year, to be adjusted once the results of a water allocation process have been conducted.

#### **7.5.5 Recommendations**

The IAG recommends that:

- the Lake Mokoan system qualifies for inclusion in the 1993/94 cap (**Recommendation 45**);
- the Cap be increased by the net consumptive use determined by an appropriate water allocation study (**Recommendation 46**); and
- on an interim basis, the Victorian cap include 22 GL per year for Lake Mokoan (**Recommendation 47**).

## **7.6 PINDARI DAM**

### **7.6.1 The Issue**

Like Lake Mokoan in Victoria, the enlargement of Pindari Dam represents an investment in a major asset which was not fully developed for the purpose for which it was originally intended by 1993/94. The question with Pindari is whether the cap for the affected areas of the Border Rivers region supplied by the enlarged Pindari Dam should be set at the level of development current at 1993-94 or whether allowance should be made for the extra development expected to be made possible by the enlargement of the dam.

### **7.6.2 Current Position**

In 1990 the NSW Government signed a Memorandum of Understanding (MOU) with irrigators on the Border Rivers under which the irrigators agreed to pay part of the cost of enlarging Pindari Dam from 37 GL to 312 GL in return for all the enhanced supply being allocated to

existing entitlement holders. Pindari Dam on the McIntyre River is a NSW storage and is used to supply NSW irrigators.

The objective in enlarging the Pindari Dam was to improve the security of water supplies to irrigators. Previously, irrigators could expect a maximum allocation of only 45 percent and they could only expect this allocation in 50 percent of years. The Pindari agreement sought to provide a target reliability factor of 70 percent (this is a 100 percent allocation in 70 percent of years).

Although construction was completed late in 1993/94, the enlarged dam did not have available stored water until February 1996 because of prolonged drought conditions that prevailed since 1990.

The question, therefore, arises as to whether the cap for the affected areas of the border rivers region supplied by the enlarged Pindari Dam should be set at the level of development current at 1993-94 or at a level consistent with the utilisation envisaged in the MOU signed before the enlargement of the Dam. To allow acceptance of the larger capacity would be to increase the level of diversions.

It is proposed by NSW that there should be some scope for negotiating access to additional diversions within the meaning of the 1993-94 level of development, as the enlargement was within the development criteria for 1993-94. The fact that the Dam storage has only recently reached levels which will allow use of this water, reflects the more favourable climatic environment since the early 1990s drought.

Irrigators in NSW border rivers have an expectation of being able to increase their diversions up to at least the level set by the MOU benchmark. Since construction of the raised storage began, they have been paying a surcharge on their water rates that has contributed to the cost of the Dam. Capping diversions at the 1993-94 level of development could mean that these irrigators would get less benefit from the enlargement of the dam than anticipated. This might invalidate the MOU.

### **7.6.3 Discussion of Issues**

At the time the MOU was negotiated, estimates were made of the quantity of water that would be supplied when the dam was enlarged. These estimates and the assumptions on which they were based were annexed to the MOU. However, between the time these estimates were made and 1993/94, both diversions and the capacity of the privately constructed on-farm storages grew. Table 7.6 compares the on-farm storage capacity and the maximum area planted assumed for the MOU and the levels that were in place in 1993/94.

**Table 7.6: Comparison of MOU Development Assumptions With 1993/94 Development**

	<i>On Farm Storage Capacity (ML)</i>		<i>Maximum Area Planted (ha)</i>	
	<i>NSW</i>	<i>QLD</i>	<i>NSW</i>	<i>QLD</i>
MOU Assumptions — Large Pindari	66600	24300	40500	10000
1993/94 Level of Development	130100	102300	33800	20600

Because the on-farm storage capacity in 1993/94 far exceeded the assumptions for the MOU, the difference between the expected diversions with the enlarged Pindari are not greatly different from the 1993/94 level of development.

It is also clear that a decision to include the enlarged Pindari in the Cap will not significantly increase the size of the cap for the MacIntyre River Valley, as growth in development since the MOU was signed limits the potential for further diversion.

Thus, as the dam was committed and built before the interim cap was introduced by the MDBMC, the IAG believes that Pindari Dam qualifies to be included in the Cap.

However, this significant growth raises the issue of whether the present levels of diversion are sustainable and it appears to the IAG that an appropriate water resource allocation study needs to be undertaken before a final cap figure can be determined.

#### **7.6.4 Conclusions**

The IAG believes that on equity grounds Pindari Dam qualifies for inclusion in the Cap.

Because of growth in development and diversions since the Memorandum of Understanding was signed and because the sustainability of the current diversion levels in the MacIntyre region is questionable the proposed quantum of water should be determined by a water resource allocation study before the final additional or actual average annual diversions can be determined. This study should be subject to an independent audit before inclusion in the cap for NSW.

#### **7.6.5 Recommendations**

The IAG recommends that:

- in principle, Pindari Dam qualifies for inclusion in the Cap (**Recommendation 48**); and
- the Cap be increased by a net consumptive use determined by an appropriate water allocation study (**Recommendation 49**).

# Glossary

<b><i>announced allocation</i></b>	The percentage of water entitlement declared available for diversion from a regulated stream in a season.
<b><i>annual allocation</i></b>	The annual volume of water available for diversion from a regulated stream by an entitlement holder.
<b><i>border rivers</i></b>	The rivers and tributaries forming, or intersecting the border between NSW and Queensland.
<b><i>bulk entitlement</i></b>	A perpetual entitlement to water granted to water authorities by the Crown of Victoria under the Water Act 1989.
<b><i>channel capacity</i></b>	The maximum rate at which water can be delivered through a river reach or an artificial channel.
<b><i>COAG</i></b>	Council of Australian Governments.
<b><i>diversion</i></b>	The movement of water from a river system by means of pumping or gravity channels.
<b><i>diversion licence</i></b>	Specified licences issued for a specified annual volume and diversion rate.
<b><i>dozer allocation</i></b>	An allocation that is not fully utilised.
<b><i>EC (unit)</i></b>	Electrical conductivity unit 1 EC = 1 micro-Siemen per centimetre measurement at 25 <sup>0</sup> Celsius. Commonly used to indicate the salinity of water.
<b><i>end-of-valley flows</i></b>	The flow regime at the end of a valley.
<b><i>FMIT</i></b>	First Mildura Irrigation Trust.
<b><i>GL</i></b>	Gigalitre: one thousand million or 10 <sup>9</sup> litres.
<b><i>gravity districts</i></b>	Districts which use gravity to divert the flow of water from the river.
<b><i>high security entitlement</i></b>	An entitlement which does not vary from year to year and is expected to be available in all but the worst droughts.
<b><i>IAG</i></b>	Independent Audit Group
<b><i>irrigation</i></b>	Supplying land or crops with water by means of streams, channels or pipes.
<b><i>MDBC</i></b>	Murray-Darling Basin Commission.
<b><i>MDBMC</i></b>	Murray-Darling Basin Ministerial Council.
<b><i>Ministerial Council, the</i></b>	Murray-Darling Basin Ministerial Council.
<b><i>Murray-Darling Basin Agreement</i></b>	The agreement between the Governments of the four Basin States and the Commonwealth. The current Agreement is the 1992 Agreement.
<b><i>off-allocation</i></b>	When unregulated tributary inflows or spills are sufficient to supply irrigation needs and downstream obligations. On such occasions, water used by irrigators with on-farm storage is not counted against an irrigator's allocation
<b><i>on-farm storage</i></b>	Privately owned storages used to harvest surplus flows or to store unused allocations for use in the following season.
<b><i>permanent transfer</i></b>	The transfer of water entitlements on a permanent basis. The right to permanent transfers allows irrigators to make long term adjustments to their enterprise and enables new operators to enter the industry.
<b><i>private diverters</i></b>	Licensed to operate privately owned pumps or diversion channels; includes river pumpers and diverters as well as town water supplies.
<b><i>property right</i></b>	In this context, the right to ownership of allocated volumes or water.
<b><i>RAMSAR wetland</i></b>	A wetland listed on the Register of internationally significant wetlands established by the Convention at Ramsar.

<b><i>regulated streams/waterways</i></b>	Streams where users are supplied by releases from a storage. A water licence for a regulated stream specifies a base water entitlement defining the licence holder's share of the resources from a stream.
<b><i>riparian</i></b>	Of, inhabiting or situated on the bank and floodplain of a river.
<b><i>RIT</i></b>	Renmark Irrigation Trust.
<b><i>sales water</i></b>	In Victoria, water that may be purchased by an irrigator in addition to the basic water right. Access to sales water is announced each season as a percentage of water right depending on the available resource.
<b><i>salinity</i></b>	The concentration of dissolved salts in groundwater or river water, usually expressed in EC units.
<b><i>sleepier allocation</i></b>	An allocation that does not have a history of water usage.
<b><i>temporary transfer</i></b>	Water entitlements transferred on an annual basis.
<b><i>unregulated streams</i></b>	Streams which are not controlled or regulated by releases from major storages.
<b><i>water entitlement</i></b>	The legal right of a user to access a specified amount of water in a given period.
<b><i>WAMP</i></b>	Water Allocation and Management Planning. It is a process currently underway in Queensland to enable the acceptable level of allocatable water to be determined for a river system. This methodology will determine what part of the flow regime should be preserved for environmental flows, and what part can be made available for consumptive use.
<b><i>WMRWG</i></b>	Water Market Reform Working Group.

# Appendix A

## CAP DEFINITION AND CONTEXT

The Ministerial Council's decision to introduce a Cap followed the Water Audit Report which indicated a significant and unsustainable growth in diversions. A cap on the volume of diversions associated with the 1993/94 levels of development was seen as an essential first step in establishing management systems to achieve healthy rivers and sustainable consumptive uses, including agriculture.

The Cap *per se*, is only a means to an end. It is not the end in itself. The overall objectives can be achieved only by identifying environmental water requirements and flow regimes and by establishing a supporting management and institutional framework, including trading of water.

All States and Territories have endorsed the COAG Water Reform Process which requires an assessment of environmental requirements for stressed rivers by 1998.

At the individual valley level, final seasonally adjusted water diversions may, following environmental allocations, be below the Cap. It is envisaged that full compliance with the Cap will be on a whole of State basis.

The two primary objectives driving the decisions to implement a cap are:

- 1) to maintain and, where appropriate, improve existing flow regimes in the waterways of the Murray-Darling Basin to protect and enhance the riverine environment; and
- 2) to achieve sustainable consumptive use by developing and managing Basin water resources to meet economical, commercial and social needs.

Leaving equity issues aside, the definition of the Cap is as follows:

*'The Cap is the volume of water that would have been diverted under 1993/94 levels of development.'*

*'In unregulated rivers this Cap may be expressed as an end-of-valley flow regime.'*

Again, leaving equity issues aside:

- to protect water quality and preserve the health of the river system, the Cap should ensure there is no net growth in diversions from the Murray-Darling Basin;
- the level of development against which to test for growth in water diversions be equivalent to 1993/94 levels of development;
- under the Cap, the amount of water that States would be entitled to divert from regulated streams in any year be quantified using analytical models that incorporate weather conditions and which take into account:
  - the water supply infrastructure in place in 1993/94;
  - the water allocation and system operating rules which applied in 1993/94;
  - the water allocation and system operating rules which applied in 1993/94;
  - the entitlements that were allocated and the extent of their utilisation at 1993/94 levels of development;
  - the underlying level of demand for water in 1993/94; and
  - the system operating efficiency in 1993/94; and
- in unregulated rivers, end-of-valley flows may be used to define the Cap using analytical models incorporating the same points as above.

After considering a number of equity issues, the Cap may be adjusted for certain additional developments which occurred after 1993/94.

The Cap should restrain diversions, not development. With the Cap in place, new developments should be allowed, provided that the water for them is obtained by improving water use efficiency or by purchasing water from existing developments.

Because irrigation demand varies with seasonal conditions, the diversions permitted under the Cap will vary from year to year. The system used to manage diversions within the Cap will therefore need to be flexible.

For unregulated rivers with high seasonal variability, the Cap may be described in terms of end-of-valley flows and supporting flow management rules including diversion entitlements.

# **Appendix B**

## **TERMS OF REFERENCE**

1. The IAG has been tasked to investigate the following terms of reference:
  - a) the special circumstances and equity issues previously noted by the Ministerial Council and to advise on reasonable approaches to the Cap to take these into account; and
  - a) the need for consistent and transparent approaches between the States for implementing the Final Cap and in particular the need for consistency in:
    - i) handling entitlements for pumped districts in New South Wales, Victoria and South Australia,
    - ii) handling entitlements for urban water supplies in all States,
    - iii) the issuing of new 10 hectare irrigation licences in New South Wales and Queensland,
    - iv) the handling of investments made but not developed including enlargement of Pindari, Lake Mokoan and dozer licences, and
    - v) the interpretation of the Final Cap in each State;
  - c) the effectiveness of the States' proposals for implementing the Final Cap;
  - d) the effectiveness and suitability of the procedures to monitor, audit and report on the Final Cap;
  - e) the ability of the proposed rules for the Final Cap to provide a basis for interstate trade;
  - f) relevant issues identified during the investigation that would impact on the effective implementation of the Final Cap.



# Appendix C

## SUBMISSIONS TO THE IAG

- South Australia, Department of Environment and Natural Resources: Presentation Slides, 25 July 1996.
- Australian Conservation Foundation: Response to the MDBC Cap, 12 August 1996.
- Victoria, Department of Natural Resources and Environment: Victoria's Approach to Capping Diversions, 6 August 1996.
- Queensland, Department of Natural Resources: Queensland Response to the IAG Terms of Reference, 13 August 1996.
- Victoria, Department of Natural Resources and Environment: Victoria Response to the IAG Terms of Reference, August 1996.
- NSW Southern Riverina Irrigation Districts' Council: Briefing Papers, 14 August 1996.
- NSW Irrigators' Council: Briefing Notes, 15 August 1996.
- Victoria, Department of Natural Resources and Environment: Response to Further Information Requested from the IAG, 23 August 1996.
- Murrumbidgee River Management Board: Response to the MDBC Cap, 26 August 1996.
- NSW, Department of Land and Water Conservation: NSW Response to the IAG Terms of Reference, 27 August 1996.
- Murray Irrigation Limited: Response to the IAG Terms of Reference, 28 August 1996.
- Queensland, Department of Natural Resources: Response to Further Information Requested from the IAG, 28 August 1996.
- Wimmera Mallee Water: Northern Mallee Pipeline Allocation, 29 August 1996.
- Victoria, Department of Natural Resources and Environment: Response to Further Information Requested from the IAG, 3 September 1996.
- Victoria, Department of Natural Resources and Environment: Response to Further Information Requested from the IAG, 6 September 1996.
- Coleambally Irrigation: The MDBC Interim Cap, 10 September 1996.
- Victoria, Department of Natural Resources and Environment: Response to the Technical Assessment of the Effectiveness of the Victorian Approach to Implementing the Final Cap on Diversions.
- Mungindi-Menindee Advisory Council: Briefing Notes, September 1996.
- Murray Irrigation Limited: Ministerial Council and the Cap, 13 September 1996.
- NSW Border Rivers Council: Response to the IAG Terms of Reference, 17 September 1996.
- Victoria, Department of Natural Resources and Environment: Modelling Results for Goulburn Bulk Water Entitlement and Lake Mokoan, 19 September 1996.
- Victoria, Department of Natural Resources and Environment: Mokoan Modelling Results — Part 2, 26 September 1996.
- South Australia, Department of Environment and Natural Resources: South Australian Response to the IAG Terms of Reference, 25 September 1996.
- Australian Conservation Foundation: Implementation and Interpretation of the 'Cap' by Victoria, 26 September 1996.
- Victoria, Department of Natural Resources and Environment: Response to IAG's Proposed Definition of the Cap, 27 September 1996.
- Queensland, Department of Natural Resources: Response to IAG's Proposed Definition of the Cap, 27 September 1996.
- Victoria, Department of Natural Resources and Environment: Mokoan Modelling, 30 September 1996.
- Queensland, Department of Natural Resources: Hierarchy of Water Rights in Queensland, 21 October 1996.
- Victoria, Department of Natural Resources and Environment: Hierarchy of Water Rights in Victoria, 21 October 1996.
- NSW, Department of Land and Water Conservation: Pindari Dam Modelling Results, 22 October 1996.
- NSW, Department of Land and Water Conservation: Hierarchy of Water Rights in NSW, 24 October 1996.
- South Australia, Department of Environment and Natural Resources: Hierarchy of Water Rights in South Australia, 28 October 1996.

# ***Appendix D***

## **ATTENDEES AT MEETINGS WITH IAG**

The IAG has met with the following stakeholders.

### ***Commonwealth***

- Ross Walker, Assistant Secretary, Community & Regional Landcare Policy Branch, Land Resources Division Department of Primary Industry and Energy (Chair Commonwealth MDB IDC).
- Onko Kingma, Assistant Secretary, Rural Policy Division, Rural Division, Department of Primary Industry and Energy and MDB Deputy Commissioner.
- Les Roberts, Director, Regional Initiative Section, Community & Regional Landcare Policy Branch, Land Resources Division, Department of Primary Industry and Energy (Commonwealth MDBI Contact Officer).
- Volker Auckens, Director, Intergovernment Relations Section, National Landcare Policy Branch, Department of Primary Industry and Energy.
- Phillip Toyne, Executive Director, Environment Strategies Directorate Department Environment Sport & Territories (MDB Commissioner).
- David Forsyth, Director, Land and Water Use Branch, Department Environment Sport & Territories.

### ***South Australia***

- Dean Brown, Premier of South Australia.
- David Wotton, Minister for the Environment and Natural Resources.
- Rob Kerin, Minister for Primary Industries.
- Dennis Mutton, Chief Executive, Department of Environment and Natural Resources.
- Peter Cooper, Director, Operations, Department of Environment and Natural Resources.
- Peter Hoey, Director, Water Resources, Department of Environment and Natural Resources.
- Mike Smith, Senior Manager Water Policy, Water Resources Group, Department of Energy and Natural Resources.
- Claus Schonfeldt, Manager Water Policy, Water Resources Group, Department of Energy and Natural Resources.
- Phil Cole, Principal Officer of Water Conservation, Soil & Water Conservation Branch, Department of Primary Industries.
- Alan Herath, Premier and Cabinet Office.
- Andrew Jessup, Operations Engineer, SA Water Corporation.
- Peter Day, Executive Officer, South Australia Farmers Federation.

- Rob McAdam, Grower Representative, Riverland Horticultural Council.
- Chris Luz Raymond, Executive Officer, SA Dairy Farmers Association.
- Leon Andrews, Grower Representative, Sunlands/Golden Heights Irrigation Boards.
- Vincent Brown, Chairman, Region 7, Murray Darling Association.
- Alan Tume, Member, Murray Darling Association.
- Brian Caddy, Chairman, River Murray Water Resources Committee.
- Joanne Pfeiffer, River Murray Water Resources Committee.

### ***Victoria***

- David Stringer, Director, Water Bureau, Department of Natural Resources and Environment.
- Jan Grieg, Manager, Water Markets, Department of Natural Resources and Environment.
- Campbell Fitzpatrick, Manager Bulk Water Entitlements, Water Bureau, Department of Natural Resources and Environment.
- Graeme Turner, Project Leader, Department of Natural Resources and Environment.
- Jane Doolan, Manager Waterways Unit, Catchment and Land Management Division, Department of Natural Resources and Environment.
- Geoff Earl, Manager, Production and Catchment, Goulburn Murray Water.
- Tim Fisher, National Resources Campaign Coordinator, Australian Conservation Foundation.
- Carol Kunert, Environment Victoria.
- Max Fehring, Member, Victorian Farmers Federation.
- Josie O'Sullivan, Member, Victorian Farmers Federation.
- Steve Mills, Director, Goulburn Murray Water
- Peter Macintosh, Chairman, Board of Management, Australian Dried Fruits Association Inc.
- James Martin, Chief Executive Officer, Ovens Water.
- Patrick Nally, Chief Executive Officer, Kiewa Murray Water.
- Ross Johnson, Planning Engineer, Coliban Water.

### ***Community Advisory Committee***

- Clive Thomas, Chairman, Community Advisory Committee of the Murray-Darling Basin Ministerial Council.

- Jeremy Gayland, Chairman, Melbourne Market Authority & Member of Community Advisory Committee of the Murray-Darling Basin Ministerial Council.

### ***New South Wales***

- Kim Yeadon, Minister for Land and Water Conservation.
- Col Gellatly, Director General, Department of Land & Water Conservation.
- Brian Haisman, Director, Water Resource Management, Department Land & Water Conservation.
- Peter Brinsley, Director, Inter State Water Management, Department of Land & Water Conservation.
- Kim Alvarez, Manager, Resource Operations & Systems Major Infrastructure Directorate, Department of Land & Water Conservation.
- Hugh Milner, Principal Hydrologist, Water Policy Division, Department of Land & Water Conservation.
- Penny Knights, Manager, Water Environment, Department of Land & Water Conservation.
- John Wood, Acting Director Water Reforms, Department of Land & Water Conservation.
- Bruce Fitzgerald, Senior Policy Analyst, Department of Land and Water Conservation.
- David Leece, Director, Water and Catchments Unit, Environment Protection Authority.
- David Dutallis, Head Regional Operations Unit, Environment Protection Authority.
- Gary Donovan, NSW Irrigators Council.
- Bill Hetherington, Chairman of Directors, Murray Irrigation Ltd.
- Denis Tinkler, Director, Murray Irrigation Ltd.
- George Warne, General Manager, Murray Irrigation Ltd.
- Warren Elsberg, Finance Officer, Murray Irrigation Ltd.
- Cedric Hoare, General Manager, Murrumbidgee Irrigation.
- Colin Thomson, Director, Western Murray Irrigation Ltd.
- Bruce Loder, Chairman, Auscott Limited.
- Mark Bramston, District Manager, Department of Water Resources, Coleambally Irrigation Area.
- Jenny McLeod, Policy Advisor, Murray Irrigation Limited and Executive Officer, Southern Riverina Irrigation Districts Council.
- Keith Coulton, Chairman, Border Rivers Council.

- Mac Ramsay, Vice Chairman, NSW Border Rivers Council.
- Evan Cilind, Delegate, NSW Border Rivers Council.
- Barry Strahan, Chairman, Mungindi-Menindee Advisory Council.
- Mike Hedditch, Executive Director, Rice Growers Association of Australia.

### ***Queensland***

- Tom Fenwick, Director General, Department of Natural Resources.
- Roly Nieper, Director General, Department of Primary Industries.
- Peter Noonan, Executive Director, Resource Management, Department of Natural Resources.
- Chris Robson, Assistant General Manager Water and Catchment Management.
- Paul Mills, Principal Policy Officer, Water Allocation Water and Catchment Management Division, Department of Natural Resources.
- Frank van Schagen, Regional Service Director South Region & Deputy Commissioner, Murray-Darling Basin Commission.
- Ross Krebs, Assistant Manager Planning, South Region.
- Greg Claydon, Assistant Operations Manager, RM, Darling Downs District.
- Ken Smith, Department of Primary Industries Representative.
- Gary Burgess, Engineer Riverine Management, Water and Catchment Management Division, Department of Natural Resources.
- John Hillier, Water Resources Division, Water Resources Commission.
- Leith Bouly, Chair Qld Murray-Darling Basin Coordinating Committee, Qld representative MDBC, Member of Community Advisory Committee, grazier.
- Clarrie Hillard, Chair Qld Border Rivers CMA, broad acre farming — grain and cotton.
- Lloyd Harth, Chair Maranoa/Balonne CMA, mixed farming — grain and cattle.
- Jeff Hewitt, Member Condamine CMA, broad acre farming — cotton and grain.
- Ken Stallman, Qld representative to MDBC — CAC committee, broad acre farming — grain, dryland cotton.

# Appendix E

## TECHNICAL ASSESSMENT OF THE EFFECTIVENESS OF THE NEW SOUTH WALES AND VICTORIAN APPROACHES TO IMPLEMENTING THE FINAL CAP DIVERSIONS

### **Terms of Reference**

#### **1. Introduction**

The Water Audit Independent Audit Group is examining a range of issues related to the Murray-Darling Basin Ministerial Council's cap on diversions. As part of that examination, the Group is seeking technical assistance to examine the effectiveness of the New South Wales and Victorian approaches to capping diversions.

The Victorian approach is to establish Bulk Entitlements for their major regions in the Basin. Diversions in these regions will be limited to a ten year rolling average specified in the Bulk Entitlement. This limit is to be determined by modelling and is to be the maximum ten year average from a sequence of 100 years of modelled diversions modelled assuming the 1990/1991 level of development. Each region will need to manage its allocations to water users such that the average annual diversion in any ten year period is not greater than this limit. Victoria believes that this mechanism will prevent long term average diversions from exceeding the 1993/94 level of development.

Concerns that have been raised with the Victorian approach are that:

- the maximum ten year rolling average is significantly higher than the 100 year average and growth in diversions could still occur despite this limit,
- the Bulk Entitlement transfers the task of cap implementing from the Victorian Government to the regional water authorities but it is unclear as to how these authorities will modify the allocations to water users to achieve the cap, and
- the water authorities are still allocating more water than the expected use under the cap and the temporary trading of this allocation could make the ten year rolling average cap less effective in holding diversions at the 1993/94 level of development.

The New South Wales approach is to develop environmental flow objectives for each river valley. To constrain diversions on its regulated streams in order to meet these objectives New South Wales intends to modify the seasonal allocations to its water users based on the climatic conditions in each season. Models will be developed relating the climatic conditions in a season with the expected diversion under the 1993/1994 level of development. These models will be based upon climatic data such as raindays, rainfall, temperature, tributary flows etc. At the start of the season an allocation will be made based

on the available resources but limited to the expected cap assuming median climatic conditions for the season. As the season progresses this allocation may be increased if the season is drier than median. Individual water users will be entitled to divert up to their allocation but will also be able to overdraw their allocation up to their share of the difference between the cap and the available resources. If an analysis at the end of the season reveals that the usage exceeds the quantity expected for 1993/94 level of development then the overusage will be subtracted from next years allocation. New South Wales believes that this approach will cap diversions at or below the 1993/1994 level of development.

Concerns that have been raised with the New South Wales approach include:

- the proposed system is complicated,
- the system is based on having models that are able to determine the diversions associated with the 1993/94 level of development given the observed climatic conditions. The accuracy of the models on annual basis means that there is a high probability that allocations will be either over or understated,
- the ability of water users to overdraw all the available resources may actually result in higher than cap usage especially if the behaviour of water users changes to make full use of this facility,
- the rules for announcing overdrafts including the limits to the maximum size of overdraw available, for cancelling overdrafts when storages fill and for trading overdrafts have not been considered in detail. These details could affect the effectiveness of the NSW approach, and
- the current New South Wales system of monitoring diversions and allocations and for enforcing restrictions may not be up to the needs of their proposed approach.

#### **2. Scope of the Work**

The major task of the consultancy is to determine whether the New South Wales and Victorian approaches are going to be effective vehicles for implementing the cap.

The Consultant will be required to analyse the New South Wales and Victorian approaches and report on their:

- strengths;
- weaknesses;
- risks;
- practicality, and
- measurability.

The Consultant will be required to test the Victorian approach on the NSW Murray and Murrumbidgee catchments.

The Consultant will be required to comment on the applicability of the New South Wales approach in Victoria.

The Consultant will be required to comment on the effectiveness of the management practices that are in place or are proposed to implement the State's approaches.

The Consultant will be required to recommend modifications that could be put in place to make the States' approaches more effective instruments for implementing the cap.

### **3. Information Provided to Consultant**

The following information will be made available to the Consultant:

- copies of all relevant descriptions of the New South Wales and Victorian approaches that have been supplied by the States to the Murray-Darling Basin Commission;
- a briefing by the Manager Water Policy of the Murray-Darling Basin Commission;
- briefings by relevant officers of the New South Wales and Victorian State Agencies.

# Appendix F

## QUANTIFYING THE DIFFERENCES BETWEEN STATES — WATER MARKET REFORM WORKING GROUP

### 1. Individual Control Over Property Rights to Water

	NSW	SA	Vic	Implications
<b>Private Diverters</b>	Property rights to water rest fully with the individual.	Property rights to water rest fully with the individual.	Property rights to water rest fully with the individual.	Interstate trade is possible.
<b>Communal Diverters</b>				
Syndicates of Private Diverters	Property rights to water rest fully with individuals (but infrastructure is shared according to a variety of legal arrangements).	Property rights to water rest fully with individuals (but infrastructure is shared according to a variety of legal arrangements).	Property rights to water rest fully with individuals (but infrastructure is shared according to a variety of legal arrangements).	Interstate trade is possible, but legal arrangements may constrain trade in some cases.
Government Districts		Property rights to water rest fully with the individual.	Property rights to water rest fully with the individual.	Interstate trade is possible.
Trusts		For the RIT property right control is shared between individual and Trust (for example, transfer is subject to mutual consent).	Property rights to water are strongly bound to land.	Interstate trade is possible, for the RIT but legal arrangements may constrain trade.
Privatised Districts	Property right control is shared between individual and Company (for example, transfer is subject to mutual consent).			Interstate trade is possible, but legal arrangements may constrain trade.

### 2. Individual Property Right Specifications

	NSW	SA	Vic	Implications
<b>All</b> <i>(Property rights to water have two dimensions security and volume.)</i>	<p>NSW offers two water “products” for Mallee irrigators: High security water and low security water.</p> <p>High security water is not fully defined but since resources are allocated to high security before low security entitlements, high security water is thought to approach 100% security.</p> <p>Low security water is not fully defined, but (depending on resource availability) irrigators in the Murray Valley expect 100% supply in 80% of years, 130% supply in 70% of years. Those on the Darling expect 100% supply in 99% of years.</p> <p>In the Murray Valley, one megalitre of low security can be converted to half a megalitre of high security water.</p>	<p>Water for irrigation is allocated from SA’s annual entitlement flow (as secured by agreement with the eastern states). They are therefore greater than 95% secure.</p> <p>(However, below entitlement flows do not necessarily mean cuts to irrigation allocations. Indeed, no irrigation licence restrictions have been applied since being generally issued in the 1960s.)</p>	<p>The security of supply on the Murray system is being defined. It is generally regarded as 99% secure, but this will be statistically tested during the establishing of Bulk Water Entitlements for each water authority. (Water rights on the Goulburn system have been statistically defined as 97% secure.)</p> <p>Above allocation usage of “Sales” water seems likely to remain relatively poorly defined.</p>	<p>Interstate trade is possible, but over-commitment of resources may result from uncertainty in conversion rates.</p> <p>Victoria’s more highly refined definition of security may provide greater certainty for investors in high value permanent crops.</p> <p>Since it allows more opportunistic use of higher water volumes, NSW’s low security water may be more attractive to investors in high value annual crops.</p>



## 2. Individual Property Right Specifications (continued)

	NSW	SA	Vic	Implications
<b>Private Diverters</b>	Private diverters have a five year licence that can be modified at any time to incorporate conditions of use.	Private diverters have a one year licence that can be modified at any time — by mutual consent — to incorporate conditions of use. In practice licences are automatically renewed.	Private diverters on regulated streams have a fifteen year licence (or a perpetual licence). Those on unregulated streams have a year licence. In theory, licences can be subjected to conditions of use on renewal. In practice, licences are automatically renewed.	Interstate trade is possible. <i>All-else-being-equal</i> , trade may favour Victoria because of its longer tenure.
<b>Communal Diverters</b>				
Syndicates of Private Diverters	As per private diverters.	As per private diverters.	As per private diverters.	
Government Districts		Individual irrigators in government irrigation districts are not licensed but a property right to water is implied in that water Authorities (who are annually licensed) grant them “allotments”. Each irrigator has a volumetric allotment. Above allotment use is discouraged through penalty tariffs.	Irrigators in government irrigation districts are not licensed but a perpetual right to water is recorded in “The Register of Lands”. The Water Act (1989) is silent on the nature of water rights other than to say that “they continue”. Nominal volumes of individual water rights vary from 7.62 ML/ha in Robinvale to 9.144 ML/ha in Red Cliffs and Merbein and for private diverters. However, the market does not expect any difference between these entitlements in the event of drought. Indeed, citrus irrigators — who must rely on ill-defined “sales” water to top-up their water right — would expect to receive 12 ML/ha even during a drought.	Interstate trade is possible, but over-commitment of resources may result from uncertainty in conversion rates.
Trusts		Each hectare of land serviced by the Renmark Irrigation Trust is endowed with a water right of 7.5 megalitres.	Each hectare of land serviced by the First Mildura Irrigation Trust is endowed with a water right of 6.113 megalitres. However, in the event of drought, the market does not expect any difference between this entitlement and those in government districts.	

## 2. Individual Property Right Specifications (continued)

	NSW	SA	Vic	Implications
Privatised Districts	Each irrigator has a volumetric allocation based on historic allocations per hectare (varying from 6 to 7.72 ML/ha). However, district irrigators also hold shares in the privatised district. These are directly linked to the District's bulk water entitlement (and in Coomealla equate to about 14 ML/ha).			Interstate trade is possible, but over-commitment of resources may result from uncertainty in conversion rates.

## 3. Communal Property Right Specifications

	NSW	SA	Vic	Implications
<b>Syndicates of Private Diverters</b>	Treated as a collection of individual private diverters each with an individual property right to water.	Treated as a collection of individual private diverters each with an individual property right to water.	Treated as a collection of individual private diverters each with an individual property right to water.	
<b>Government Districts</b>		Each district has an annual licence identical to that of private diverters. This licensed allocation is fully divided into "allotments" for individuals within the district.	Water authorities hold a perpetual property right to water (the volume and security of which is under review). Once resolved it is expected that this "Bulk Water Entitlement" will encompass all individual property rights, while also accounting for historic levels of use and established delivery system losses. As individuals trade into, or out of, a district this bulk entitlement will be adjusted accordingly.	Interstate trade is possible, but over-commitment of resources may result from uncertainty in conversion rates.
<b>Trusts</b>		Each Trust has an annual licence identical to that of private diverters. This is subdivided into "allotments" for individuals within the Trust's district.	The FMIT holds a perpetual property rights to water (the volume and security of which is under review).	
<b>Privatised Districts</b>	Each Irrigation District has a 15 year licence to take and use water. Irrigators within the district hold shares in a "mother company" (much akin to a co-operative). Shares are directly linked to the licensed volume held by the mother company. In Coomealla, for example, each irrigator's share in the mother company equates to about 14 ML/ha			Interstate trade is possible, but over-commitment of resources may result from uncertainty in conversion rates.

### 3. Communal Property Right Specifications (continued)

	NSW	SA	Vic	Implications
<b>Trade by Water Authority</b>	As supply system losses are reduced, the savings are reflected in each individual's allocation. Or, they are returned to the State depending on funding arrangements.	Authorities are able to trade entitlements "saved" by reducing supply system losses.	Authorities are expected to trade entitlements "saved" by reducing supply system losses.	<i>All-else-being-equal</i> , SA and Victorian approach should result in more rapid reallocation of water.

### 4. Water Rates and Charges

	NSW	SA	Vic	Implications
<b>All</b> (All prices quoted are for 94/95 irrigation season.)	Water prices aim at "full cost recovery". This includes 70% of the cost of running the rivers (with 30% borne by taxpayers as a community service obligation). Headworks capital costs are borne by taxpayers. This is currently set at \$0.79 per ML.	Water prices aim at "full cost recovery". This does not include any contribution towards SA's share of the operating and capital costs of MDBC headworks. (This will be reviewed during consultation with the community on SA Water Plan.)	Water prices aim at "full cost recovery". This includes 100% of Victoria's share of the operating costs and <b>new</b> capital costs of MDBC headworks. This is currently set at \$4.50 per ML but is expected to rise to \$7.00 per ML.	Interstate trade is possible. <i>All-else-being-equal</i> , trade could be expected to favour SA (particularly at Victoria's expense) because of price differences.
<b>Private Diverters</b>	Private Diverters pay a licence fee ranging from \$200 for a 300 ML licence to \$5500 for a \$10,000 ML licence. A "Delivery Fee" of \$0.79 per ML applies for high security and \$0.64 for low security water.	Private Diverters pay a flat rate annual meter fee ranging from \$105 to \$310 depending on the size of their meter. There is no charge for water up to the allotment volume. Excess use is \$50 per ML for the first 10%, \$100 per ML for 10-20% and \$250 per ML for greater than 20%.	Licence fees are currently set at \$5.54 per ML of licensed volume (whether the water is used or not). A medium term rise to \$17.00 per ML was flagged in an auction of new allocations in 1992. Use in excess of the licensed volume ("Sales" water) is subject to availability. In most years, total water use between 130-200% of licensed volume is possible. Sales water is \$5.54 per ML used.	Interstate trade is possible. All-else-being-equal, trade could be expected to favour SA and NSW (at Victoria's expense) because of price differences.
<b>Communal Diverters</b>				
Syndicates of Private Diverters	As per private diverters.	As per private diverters.	As per private diverters.	
Government Districts		Supply system infrastructure is expected to generate zero rate of return. Supply system asset replacement through annual contributions to a fund established to replace assets in perpetuity. Zero per cent dividend to Government as shareholder.	Supply system infrastructure expected to generate zero rate of return (compared with 4% for urban authorities). Supply system asset replacement must be demonstrated in the Authority's Business Plan. (Renewals accounting has been preferred.)	Interstate trade is possible. <i>All-else-being-equal</i> , trade could be expected to favour SA (particularly at Victoria's expense) because of price differences.

#### 4. Water Rates and Charges (continued)

	NSW	SA	Vic	Implications
Government Districts (continued)		<p>Tax equivalence regime is under review.</p> <p>Each irrigator has a volumetric allotment. Above allotment use is discouraged through penalty tariffs.</p> <ol style="list-style-type: none"> <li>1. Fixed charges per ML of allotment range from \$39.80 to \$47.21.</li> <li>2. Up to 20% above allotment, charges range from \$72.60 to \$94.42 per ML.</li> <li>3. More than 20% above allotment, charges range from \$159.20 to \$188.84 per ML.</li> </ol>	<p>Policy aims for fifty per cent dividend to Government (as shareholder) on any after tax profits.</p> <p>Tax equivalence regime is being pursued for urban authorities, but not yet clear whether this will apply to Rural Water Authorities.</p> <ol style="list-style-type: none"> <li>1. "Access &amp; Drainage Fees" for each ML of water right range from \$27.02 to \$42.22.</li> <li>2. "Delivery Fees" for each ML used range from \$36.75 to \$46.65.</li> </ol>	
Trusts		<p>Fixed charges apply for each individuals allotment (7.5 ML/ha) whether it is used or not.</p> <ol style="list-style-type: none"> <li>1. Fixed charge are \$43.40 per ML.</li> <li>2. Additional use up to 15 ML/ha is \$43.40 per ML.</li> <li>3. Use beyond 15 ML/ha is \$50.00 per ML.</li> </ol>	<p>As per Government Irrigation Districts.</p> <ol style="list-style-type: none"> <li>1. "Access Fee for each ML of water right is \$12.70 per ML.</li> <li>2. "Delivery Fee for each ML used is \$50.80.</li> </ol>	
Privatised Districts	<p>Supply system infrastructure expected to generate zero rate of return.</p> <p>Supply system asset replacement is a responsibility of the water authority. "Sinking fund" reserves are being used.</p> <p>Zero per cent dividend to shareholders.</p> <p>Tax equivalence regime is part of COAG agreement.</p> <p>Water charges are based on use or allocation whichever is greater. (Allocations vary from 6 to 7.72 ML/ha.)</p> <ol style="list-style-type: none"> <li>1. Delivery charges are \$0.79 per ML.</li> <li>2. Asset levies are \$1.21 per ML.</li> <li>3. Water Distribution charges range from \$43.75 to \$57.61 per ML.</li> <li>4. Beyond 14 ML/ha the water distribution charge is increased to 150% of the standard rate as a de facto drainage charge.</li> </ol>			<p>Interstate trade is possible. All-else-being-equal, trade could be expected to favour SA (particularly at Victoria's expense) because of price differences.</p>

## 5. “Property Rights” to Water for the Environment

	NSW	SA	Vic	Implications
<b>Rules on holding environmental water entitlements</b>	Management of environmental flow entitlements rests with Department of Land & Water Conservation. The Environment Protection Agency sets guidelines and monitors effectiveness.	Environmental flow entitlements rest with Environment and Natural Resources Dept. Operational strategies are modified to help mimic natural wet and dry cycles.	One of the main incentives for better defining the water rights of irrigators and authorities is to determine how much is presently allocated to the environment. Passing flows are an obligation on storage operators. Environmental allocations (ie for abstractive use) rest with Department of Conservation and Natural Resources.	
<b>Rules on trading environmental water entitlements</b>	Volumetric allocations can be temporarily traded to help mimic natural wet and dry cycles.	Environmental requirements are being recognised as equivalent to allocated licence. But so far these are not tradeable licences.	Volumetric allocations can be temporarily traded to help mimic natural wet and dry cycles.	

## 6. Intrastate Trading Arrangements

	NSW	SA	Vic	Implications
<b>Resource Management</b>	Monthly flow computer models are available for Murrumbidgee, daily models being developed. Murray MSM used for Murray Valley and Lower Darling.	Monthly flow model of the river is used and adopted by MDBC for River downstream from Lock 9. Software has also been developed to model area of floodplain flooded by varying flows.	MDBC hydrologic computer models are fundamental planning tools. Other models are created as required. Water resource allocation models have been developed for all major tributaries and Murray main stem. These models help characterise the hydrologic regime and access water allocation and management decisions.	Model compatibility will be important in achieving interstate trade within the MDBC cap on diversions.
<b>Environmental Protection</b>	Native vegetation clearance controls apply. The Dept of Land & Water Conservation is keen to facilitate the transfer of currently used water from low value to high value uses, provided any degradation caused by existing irrigation is rehabilitated and there is a net environmental improvement. Transfers are subject to: 1. The completion of environmental impact statements (including fauna impact assessments)	Native vegetation clearance controls apply. Transfers are subject to: 1. The completion of an “irrigation and drainage management plan” (IDMP). 2. A licence condition requiring a commitment to operate under the IDMP including monitoring and reporting.	Native vegetation clearance controls apply. Transfers are subject to conditions outlined in the Nyah to SA Border Salinity Management Plan. These include: 1. Completion and adoption of an irrigation management plan. 2. Demonstrating adequate provision for drainage. 3. Demonstrating the proposed development will not degrade the environment.	Interstate trade is possible. <b>All-else-being-equal</b> , trade could be expected to favour SA (particularly at NSW’s expense) because of differences in compliance costs with environment protection guidelines.



**6. Intrastate Trading Arrangements** (continued)

	NSW	SA	Vic	Implications
<p><b>Environmental Protection</b> <i>(continued)</i></p>	<p>2. Physical delivery constraints</p> <p>3. Environmental protocols under Section 2 of the Water Act.</p> <p>4. Zone limits (includes inter-valley transfers where the defined volumetric allocation schemes join. No permanent inter-valley transfers have yet been allowed).</p> <p>The cost of compliance with environmental regulations is not monitored.</p>	<p>The cost of compliance with environmental regulations is not monitored.</p>	<p>4. Ongoing, joint, community and government review of environmental protection guidelines.</p> <p>The cost of compliance with environmental regulations is not monitored.</p>	
<p><b>Salinity Management</b> <i>The MDBC Salinity &amp; Drainage Strategy makes each state accountable for any increases in river salinity resulting from water transfers</i></p>	<p>NSW must offset any such increases by using existing “salt disposal entitlements” or by creating new ones.</p>	<p>Unlike the other States, SA does not have a reserve of “salt disposal entitlements”.</p> <p>Transfers greater than 100 ML must be reviewed by the River Murray Water Resources Committee with a view to ensuring no net increase in River Murray salinity. (Where necessary, this can be assured by the developed investing in off-setting salt interception works now or in the future.)</p>	<p>Victoria must offset any such increases by using existing “salt disposal entitlements” or by creating new ones. It minimises the need for salt disposal entitlements by differentiating between low and high salinity impact zones.</p> <p>1. Water cannot be transferred into designated high salinity impact zones.</p> <p>2. Only water entitlements already being used in the high impact zone can be transferred within that zone.</p> <p>3. Transfers out of the high impact zone are subsidised.</p> <p>4. Water transferred into the low salinity impact zone from outside the Mallee attracts a special levy. Currently set at \$10 per ML for ten years, plus an additional \$2.30 per ML in perpetuity, the levy aims to “internalise” the cost of increased river salinity.</p>	<p>Interstate trade is possible. <b>All-else-being-equal</b>, trade could be expected to favour NSW (particularly at SA’s expense) because of uncertainty about costs of compliance.</p>

## 6. Intrastate Trading Arrangements (continued)

	NSW	SA	Vic	Implications
<b>Managing Social Costs of Water Transfers</b>				
Private diverters	Not considered.	Not considered.	Not considered.	
Syndicates of Private Diverters	A matter for negotiation between members of the syndicate.	A matter for negotiation between members of the syndicate.	A matter for negotiation between members of the syndicate.	
Government Districts		Water transfers are now occurring into, out of and within government irrigation districts. However this is subject to a review if, in any year, net transfers out of any district reach 1% of the total allocation (excepting those transfers resulting from rural adjustment).	Water transfers are possible into, out of, and within government irrigation districts (subject to conditions outlined in the Nyah to SA Border Salinity Management Plan). The Authority <i>servicing the entitlement buyer</i> can restrict the transfer, but only on delivery constraint and environmental impact grounds. However, the Minister for Natural Resources has limited transfers out of any district to 2% of the district's bulk entitlement per year. At 2% per year, the extra cost to remaining irrigators (ie having the same fixed costs spread amongst fewer irrigators) is thought manageable through productivity and efficiency improvements.	Interstate trade is possible. <b>All-else-being-equal</b> , trade could be expected to favour NSW (particularly at Victoria's expense) because of trade constraints.
Trusts		Water allotment transfer subject to mutual consent of individual and Trust.	Individuals' water rights are bound to land and therefore cannot be separately transferred.	
Privatised Districts	Transfers subject to approved by mother company, but individuals are company shareholders. Western Murray Irrigation Pty Ltd envisages temporary transfers in and out of its districts. Permanent transfers out will be discouraged except to accommodate urban encroachment in some districts.			Interstate trade is possible. All-else-being-equal, trade could be expected to favour NSW (particularly at Victoria's expense) because of trade constraints.

# Appendix G

## HIERARCHY OF RIGHTS WITHIN SOUTH AUSTRALIA

Hierarchy Level	IAG Definition	User Type
1.	Statutory property right to water under existing rules — history of use.	<ul style="list-style-type: none"> <li>• The used component of all private pumped licences.</li> <li>• The used component of all Government Highland Irrigation Districts.</li> <li>• The used component of all industrial licences.</li> <li>• The used component of all Recreation and Environment licences.</li> <li>• The full allocation to all private and government reclaimed swamps (excluding the drainage allowance).</li> <li>• All stock and domestic allocations.</li> <li>• All water currently used by SA Water for urban/country lands consumption</li> </ul>
2.	Statutory property right to water — no history of use.	<ul style="list-style-type: none"> <li>• The unused component of all private pumped licences.</li> <li>• The unused component of all Government Highland Irrigation Districts.</li> <li>• The unused component of all industrial licences.</li> <li>• The unused component of all Recreation and Environment licences.</li> </ul>
3.	Non-statutory right <sup>a</sup> to use water — history of use.	<ul style="list-style-type: none"> <li>• Ministerial announcements of access to 'Surplus Flows' would have fallen into this category however, such announcements will now cease as detailed in South Australia's response to the capping initiative.</li> </ul>
4.	Non-statutory right <sup>1</sup> to use water — no history of use.	<ul style="list-style-type: none"> <li>• Not applicable.</li> </ul>
5.	A formal promise of a right.	<ul style="list-style-type: none"> <li>• Not applicable.</li> </ul>
6.	No right to water, but would have been able to get one in the past.	<ul style="list-style-type: none"> <li>• Not applicable.</li> </ul>

\* The States have indicated that their perceptions of property rights in accordance to the IAG definitions may be subject to change.

a. Usually issued under an Act but as a licence rather than a full property right.

## HIERARCHY OF RIGHTS WITHIN VICTORIA

Hierarchy Level	IAG Definition	User Type
1.	Statutory property right to water under existing rules — history of use.	<p><b>Bulk Rights</b></p> <ul style="list-style-type: none"> <li>• Bulk entitlements (BEs) to Rural Water Authorities (provides a bulk allowance for individual rights, sales allocations, other supplies and losses).</li> <li>• Schedule 11/Water Assignments (part to be converted to BE).</li> <li>• BEs to Urban Authorities.</li> <li>• Urban rights not converted to a BE (not quantified).</li> </ul> <p><b>Individual Rights Incorporated Within Bulk Rights</b></p> <ul style="list-style-type: none"> <li>• Domestic and Stock Allowances inside an irrigation district.</li> <li>• Water rights inside an irrigation district.</li> <li>• Licences to take and use water (irrigation and other) direct from a regulated waterway.</li> </ul> <p><b>Individual Rights Not Incorporated Within a Bulk Right</b></p> <ul style="list-style-type: none"> <li>• Private Rights (Section 8 of Water Act) for Domestic and Stock (where land directly abuts a waterway).</li> <li>• Domestic and Stock Licences outside an irrigation district.</li> <li>• Licences to take and use water (irrigation and other) direct from a waterway (unregulated).</li> </ul>
2.	Statutory property right to water — no history of use.	<p><b>Bulk Rights</b></p> <ul style="list-style-type: none"> <li>• BE (as above).</li> <li>• Schedule 11/Water Assignments (part not proposed for conversion to BE)</li> <li>• BEs to Urban Authorities (growth component not yet used).</li> </ul> <p><b>Individual Rights Incorporated Within Bulk Rights</b></p> <ul style="list-style-type: none"> <li>• Water rights inside an irrigation district (dozer component — very small).</li> <li>• Domestic and Stock Allowances inside an irrigation district (dozer component — very small).</li> <li>• Licences to take and use water (irrigation and other) direct from a regulated waterway (dozer component).</li> </ul> <p><b>Individual Rights Not Incorporated Within a Bulk Right (Dozer Component)</b></p> <ul style="list-style-type: none"> <li>• Private Rights (Section 8 of Water Act) for Domestic and Stock (where land directly abuts a waterway).</li> <li>• Domestic and Stock Licences outside an irrigation district.</li> <li>• Licences to take and use water (irrigation and other) direct from a waterway.</li> </ul>
3.	Non-statutory right <sup>a</sup> to use water — history of use.	<p><b>Bulk Rights</b></p> <ul style="list-style-type: none"> <li>• Allocation for wetlands (27.5 GL)</li> </ul> <p><b>Individual Rights Incorporated Within Bulk Rights</b></p> <ul style="list-style-type: none"> <li>• Sales<sup>b</sup> allocations attached to water rights (regulated systems only).</li> <li>• Sales<sup>a</sup> allocations attached to licences (regulated systems only).</li> <li>• Sales water used under off-allocation policy.</li> <li>• Sales by agreement.</li> <li>• Supply by Agreement (Contract).</li> </ul>

a. Usually issued under an Act but as a licence rather than a full property right.

b. Sales — has been shown in the table as a non-statutory right however it could be argued under Common Law that a long history of allocation and use would constitute sales as a statutory right. It should also be noted that the actual level of sales use is being incorporated in the statutory bulk entitlement granted to the relevant water authority.

## HIERARCHY OF RIGHTS WITHIN VICTORIA (continued)

Hierarchy Level	IAG Definition	User Type
4.	Non-statutory right <sup>a</sup> to use water — no history of use.	<p><b>Bulk Rights</b></p> <ul style="list-style-type: none"> <li>• Allocation for Barmah Forest.</li> </ul> <p><b>Individual Rights Incorporated Within Bulk Rights</b></p> <ul style="list-style-type: none"> <li>• Sales allocations attached to water rights (regulated systems only).</li> <li>• Sales allocations attached to licences (regulated systems only).</li> </ul>
5.	A formal promise of a right.	<p><b>Individual Rights Incorporated Within Bulk Rights</b></p> <ul style="list-style-type: none"> <li>• Entitlements to be issued resulting from previous amnesty.</li> </ul>
6.	No right to water, but would have been able to get one in the past.	<p><b>Individual Rights Incorporated Within Bulk Rights</b></p> <ul style="list-style-type: none"> <li>• New Domestic and Stock licences.</li> <li>• New 'winter fill' irrigation licences on some unregulated streams.</li> </ul>

\* The States have indicated that their perceptions of property rights in accordance to the IAG definitions may be subject to change.

\*\* The table separates bulk rights from individual rights. A program is currently underway to convert the various bulk rights of water authorities to clearly defined 'bulk entitlements'. Individual rights, where these exist on regulated systems, will be supplied from within the bulk entitlement held by the relevant Rural Water Authority. In the short to medium term licences on unregulated streams will not be covered by a bulk entitlement.

a. Usually issued under an Act but as a licence rather than a full property right.



## HIERARCHY OF RIGHTS WITHIN NEW SOUTH WALES

Hierarchy Level	IAG Definition	User Type <sup>a</sup>
1. and 2.	Statutory property right to water under existing rules — history of use. Statutory property right to water — no history of use.	Riparian rights for stock and domestic (S&D) supplies to river front dwellers without the need for a licence: <ul style="list-style-type: none"> <li>As difficulties exist in determining used and unused components this distinction is unlikely in NSW.</li> </ul>
3.	Non-statutory right <sup>b</sup> to use water — history of use.	<p>a) Used component of water licences issued under the Water Act (including urban supply licences) and rights issued under the Irrigation Corporations Act up to the limit applicable under announced allocations and/or licence conditions: <ul style="list-style-type: none"> <li>conditions (including announced allocations on regulated systems) can be varied at any time;</li> <li>appeal mechanism exists for Water Act licences;</li> <li>no appeal for Irrigation Corporation rights.</li> </ul> </p> <p>b) Used components of water licences issued under Water Act and Irrigation Corporations Act taken beyond the limit applicable such as a history of use of 'off-allocation' and 'overdraw'.</p>
4.	Non-statutory right <sup>b</sup> to use water — no history of use.	a) Unused components of a) in 3 up to the limit applicable.
5.	A formal promise of a right <sup>c</sup> .	<p>Expectations of right holders to gain access beyond the limit applicable (eg. through off-allocation) where there is no history of use or where expectations are created through a Memorandum of Understanding.</p> <p>For example, the MOU for Pindari enlargement where existing right holders have an expectation of use beyond their history of use.</p>
6.	No right to water, but would have been able to get one in the past.	<ul style="list-style-type: none"> <li>Non statutory right with no history of use seeking access to use above the limit applicable through off-allocation or overdraw.</li> <li>An individual who seeks but does not presently hold a right (for example, through lifting of an administrative embargo).</li> <li>An individual who seeks to maintain benefits of use which do not require a right eg. wild flooding.</li> </ul>

\* The States have indicated that their perceptions of property rights in accordance to the IAG definitions may be subject to change.

- a. In law, a water licence in NSW is effectively a temporary permit to take water issued for a five year period. The conditions and the amount of water, however, can be varied at any time during this period at the discretion of the Ministerial Water Corporation.
- b. Usually issued under an Act but as a licence rather than a full property right.
- c. The case for increased access to an existing right holder is greater if they have a formal promise of additional supply than if they simply have an expectation of increased access because, in the past their neighbour was able to get increased supply.

## HIERARCHY OF RIGHTS WITHIN QUEENSLAND

Hierarchy Level	IAG Definition	User Type
1.	Statutory property right to water under existing rules — history of use.	a) Riparian right formalised with a Section 9/Section 4.31 permit for stock and domestic purposes. b) Riparian right which is enjoyed but not formalised with a permit.
2.	Statutory property	Riparian rights yet to be taken up.
3.	Non-statutory right <sup>a</sup> to use water — history of use <sup>b c</sup> .	a) Urban and industrial needs conveyed by Order in Council, licence or agreement. b) Urban and industrial uses existing which are yet to be formally accounted. c) Regulated allocations for irrigation. d) Unregulated entitlements for irrigation viz area licences/storage licences. e) Waterharvest licences.
4.	Non-statutory right <sup>a</sup> to use water — no history of use <sup>d</sup> .	Refer to (a), (b), (c), (d) and (e) in 3 above — entitlement not yet taken up or used.
5.	A formal promise of a right.	Perhaps not so much a promise as an <i>'expectation'</i> relating to group water supply project proposals viz: <ul style="list-style-type: none"> <li>• Condamine Weir</li> <li>• St George Offstream Storage</li> <li>• DanPork Weir</li> <li>• Broadwater Dam</li> </ul>
6.	No right to water, but would have been able to get one in the past.	Applications held under administrative holds.

\* The States have indicated that their perceptions of property rights in accordance to the IAG definitions may be subject to change.

- a. Usually issued under an Act but as a licence rather than a full property right.  
b. In Queensland these rights are underwritten by an authority conveyed by an Act.  
c. It is important to recognise that within the Level 3 category the listing of uses (a) to (e) in themselves represent a further prioritisation of right.  
d. Level 4 is of lower right to Level 3 only if the beneficial use condition is strictly applied — this may not eventuate in Queensland.

# Appendix H

## IAG RECOMMENDATIONS BY STATE

### **General<sup>1</sup>**

#### Cap Objectives and Definition

The IAG recommends that the Ministerial Council confirm its previous statement of aims adopted by the IAG as the primary objectives of the decision to implement the Cap, namely:

- to maintain and where appropriate, improve existing flow regimes in the waterways of the Murray-Darling Basin to protect and enhance the riverine environment; and
- to achieve sustainable consumptive use by developing and managing Basin water resources to meet ecological, commercial and social needs (**Recommendation 1**).

Aside from any equity issues, the IAG recommends adoption of the following generic definition of the Cap, namely:

*'The Cap is the volume of water that would have been diverted under 1993/94 levels of development.'*

*'In unregulated rivers this Cap may be expressed as an end-of-valley flow regime.'* (**Recommendation 2**).

In consideration of the equity issues, the IAG recommends that the definition of the Cap allow for certain additional developments which have occurred since 1993/94 and which are more fully discussed elsewhere in this report (**Recommendation 3**).

The IAG recommends that:

#### Equity Principles and Property Rights

- the Ministerial Council endorses the six equity and consistency principles (**Recommendation 4**);
- the Ministerial Council endorses the property rights hierarchy as a basis for addressing intra Basin equity and consistency issues (**Recommendation 5**);

#### Effectiveness of States' Proposals

- where relevant, States give consideration to the IAG proposal for managing to a climate adjusted cap (**Recommendation 6**);
- the results of the capping process for each State be independently audited and submitted to the Ministerial Council before they are implemented (**Recommendation 11**);

#### Monitoring, Auditing and Reporting

- the draft format that has been developed for the Water Audit Monitoring Report be implemented and reports considered by the MDBC (**Recommendation 18**);
- a body be identified in each State which has clear responsibility for collating water audit information (**Recommendation 19**);
- information on performance against the Cap be made widely available (**Recommendation 20**);
- all States allocate enough resources to satisfy their monitoring responsibilities (**Recommendation 21**);

#### Trading

- water rights be defined to ensure that the integrity of the Cap is maintained (**Recommendation 22**);
- an appropriate trading regime be implemented (**Recommendation 23**);

#### River Murray Pumped Districts

- allocation be issued at a level consistent with soil and crop type, rather than on historic allocation levels (**Recommendation 29**);
- after the Cap is in place, water savings from improvements in system efficiency may be reallocated for consumptive use within the Cap (to provide a return for investments in improvements in water efficiency) (**Recommendation 31**);

#### Urban Water Supplies

- for consistency, the level of water allocated to urban communities in all States should be capped at expected consumptive levels for the year 2000 (**Recommendation 32**), or alternatively for consistency, where States adopt other allocative rules, the allocations to urban systems should not result in a net increase in diversions (**Recommendation 33**);
- future additional water requirements will have to be obtained through water trading (**Recommendation 34**);

\* Applying to all States & Territories

- Ten-Hectare Licences
  - once the Cap is in operation, water for ten-hectare blocks should only be available through the purchase of existing entitlements (**Recommendation 41**);
- Dozers and Sleepers
  - the Cap not be increased to allow for increased water diversions resulting from existing sleeper and dozer allocations (**Recommendation 42**); and
  - sleeper and dozer allocations with high level property rights to water be given priority over lesser categories of rights, in particular sales and off-allocation water (**Recommendation 43**).

## **South Australia**

The IAG recommends that:

- Effectiveness of State Proposals
  - South Australia cap water for domestic and urban use at levels close to historic usage (see discussions under Equity Issues & Urban Water Supplies) (**Recommendation 7**);
- Equity Issues
  - the proposal to allocate an additional 50 GL per year for economic use not be approved as it is not compatible with water quality and river flow objectives (**Recommendation 12**);
  - the 69 GL per year increase in diversions expected from the uptake of water allocated for irrigation and previously not used, be included in the Cap (**Recommendation 13**);
- Trading
  - South Australia should participate in discussions between NSW and Victoria to agree on a set of working rules to apply to these three States (**Recommendation 26**);
  - the pilot 'free trade zone' in the Mallee region should be implemented urgently as a means of beginning to resolve some of the practical difficulties identified by the Water Market Reform Working Group (**Recommendation 27**);
- River Murray Pumped Districts
  - the South Australian cap include the 69 GL in historic over-allocation to irrigation in South Australia as no trade-offs are available (**Recommendation 30**);
- Urban Water Supplies
  - for SA Water:
    - a fixed allocation of 50 GL per year be provided for country towns (**Recommendation 35**);
    - a cap on diversions for Adelaide's urban use be based on a ten-year rolling average with full tradeability to apply to SA Water's allocations (this tradeability approval should be removed if a five-year rolling average base is used. It is noted that SA Water would not be precluded from buying or leasing water from elsewhere if demand increases.) (**Recommendation 36**).

## **Victoria**

The IAG recommends that:

- Effectiveness of State's
  - future Victorian BEs contain a specific commitment to limiting diversions to the Cap as defined by the IAG (**Recommendation 8**);
- Trading
  - the Victorian and NSW Governments should agree on a set of working rules to apply to trade between these two States (**Recommendation 25**);
  - South Australia should participate in discussions between NSW and Victoria to agree on a set of working rules to apply to these three States (**Recommendation 26**);
  - the pilot 'free trade zone' in the Mallee region should be implemented urgently as a means of beginning to resolve some of the practical difficulties identified by the Water Market Reform Working Group (**Recommendation 27**);
- River Murray Pumped Districts
  - the Governments in NSW and Victoria either modify the allocation to pumped districts, or identify the offsets to be put in place as unutilised water is activated (**Recommendation 28**);
- Lake Mokoan
  - the Lake Mokoan system qualifies for inclusion in the 1993/94 cap (**Recommendation 45**);
  - the Cap be increased by the net consumptive use determined by an appropriate water allocation study (**Recommendation 46**); and
  - on an interim basis, the Victorian cap include 22 GL per year for Lake Mokoan. (**Recommendation 47**).

## ***New South Wales***

The IAG recommends that:

- |                                    |  |
|------------------------------------|--|
| Effectiveness of States' Proposals | <ul style="list-style-type: none"><li>• NSW needs to allocate more resources to developing models and associated management regimes and to implementing them (<b><i>Recommendation 9</i></b>);</li></ul>   |
| Equity Issues                      | <ul style="list-style-type: none"><li>• NSW and Queensland allocate resources on a priority basis to the WAMP process affecting border rivers (<b><i>Recommendation 15</i></b>);</li><li>• the IAG supports the separation of policy responsibility from daily operation for the Border River Commission and encourages the NSW and Queensland Governments to provide the necessary policy framework in the context of the entire Murray-Darling Basin (<b><i>Recommendation 17</i></b>);</li></ul>  |
| Trading                            | <ul style="list-style-type: none"><li>• the NSW and Queensland Governments agree on a set of trading rules to be applied to cross-border trade between the two States (<b><i>Recommendation 24</i></b>);</li><li>• the Victorian and NSW Governments should agree on a set of working rules to apply to trade between these two States (<b><i>Recommendation 25</i></b>);</li><li>• South Australia should participate in discussions between NSW and Victoria to agree on a set of working rules to apply to these three States (<b><i>Recommendation 26</i></b>);</li><li>• the pilot 'free trade zone' in the Mallee region should be implemented urgently as a means of beginning to resolve some of the practical difficulties identified by the Water Market Reform Working Group (<b><i>Recommendation 27</i></b>);</li></ul> |
| River Murray Pumped Districts      | <ul style="list-style-type: none"><li>• the Governments in NSW and Victoria either modify the allocation to pumped districts, or identify the offsets to be put in place as unutilised water is activated (<b><i>Recommendation 28</i></b>);</li></ul>   |
| Ten-Hectare Licences               | <ul style="list-style-type: none"><li>• NSW should cease issuing new ten-hectare licences in the Murray-Darling Basin and existing ten-hectare licences usage should be included within the Cap (<b><i>Recommendation 39</i></b>);</li></ul>   |
| Pindari Dam                        | <ul style="list-style-type: none"><li>• in principle, Pindari Dam qualifies for inclusion in the Cap (<b><i>Recommendation 48</i></b>); and</li><li>• the Cap be increased by a net consumptive use determined by an appropriate water allocation study (<b><i>Recommendation 49</i></b>).</li></ul>   |

## ***Queensland***

The IAG recommends that:

- |                                    |   |
|------------------------------------|---|
| Effectiveness of States' Proposals | <ul style="list-style-type: none"><li>• the results of the WAMP process in Queensland be independently audited with an interim audit performed at the draft plan stage, and a final audit of any changes made to this draft plan before it is submitted to the Ministerial Council (<b><i>Recommendation 10</i></b>);</li></ul>   |
| Equity Issues                      | <ul style="list-style-type: none"><li>• the cap for Queensland be determined after the WAMP process is completed (<b><i>Recommendation 14</i></b>);</li><li>• NSW and Queensland allocate resources on a priority basis to the WAMP process affecting border rivers (<b><i>Recommendation 15</i></b>);</li><li>• the results of the WAMP process in Queensland be independently audited with an interim audit performed at the draft plan stage, and a final audit of any changes made to this draft plan before it is submitted to the Ministerial Council (<b><i>Recommendation 16</i></b>);</li><li>• the IAG supports the separation of policy responsibility from daily operation for the Border River Commission and encourages the NSW and Queensland Governments to provide the necessary policy framework in the context of the entire Murray-Darling Basin (<b><i>Recommendation 17</i></b>);</li></ul> |
| Trading                            | <ul style="list-style-type: none"><li>• the NSW and Queensland Governments agree on a set of trading rules to be applied to cross-border trade between the two States (<b><i>Recommendation 24</i></b>);</li></ul>  |



- Ten-Hectare Licences • if the WAMP process in Queensland identifies opportunities for new ten-hectare licences, the usage by this type of licences should be met within the Cap (**Recommendation 40**); and
- Dozers and Sleepers • the Precautionary Principle be applied by Queensland through its WAMP process to ensure that over allocation of water for consumptive use does not occur, while acknowledging the rights that are held by previously existing sleeper and dozer allocations (**Recommendation 44**).

### ***Australian Capital Territory***

The IAG recommends that:

- Urban Water Supplies • for the ACT:
  - a property right to support a cap for urban water use in the ACT (including associated rural areas) be agreed by 1 July 1997 based on the principles outlined under Recommendations 32 or 33 above (**Recommendation 37**); and
  - in setting the cap the ACT should consider the need for appropriate water resource studies covering all sources of water as a basis for allocating water for consumptive and environmental use in the Territory (**Recommendation 38**).

