

*Audit of Queensland
Water Resource Plans*

*Report of the Independent
Audit Group*

Independent Audit Group Members

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Table of Contents

EXECUTIVE SUMMARY	2
1. INTRODUCTION	4
2. AUDIT PROCESS	6
3. PRELIMINARY FINDINGS	7
3.1 CONDAMINE-BALONNE WAMP	7
3.2 MOONIE WMP	11
3.3 WARREGO-PAROO-BULLOO-NEBINE WMP	13
3.4 BORDER RIVERS FLOW MANAGEMENT PLAN	15
4. CONCLUSIONS	18
5. REFERENCES	20
APPENDIX A – AUDIT CRITERIA 1998	21
APPENDIX B – DOWNSTREAM IMPACTS	22

Executive Summary

The Queensland Government released the following draft Water Resource Plans in June 2000:

- Condamine-Balonne WAMP;
- Warrego-Paroo-Nebine WMP;
- Moonie WMP; and
- Border Rivers Flow Management Plan

The IAG audited the plans in line with the principles endorsed by the Ministerial Council which includes:

- WAMP to accommodate instream use, not only in Queensland but also in the Border Rivers under the control of the Border Rivers Commission and the rest of the Murray-Darling Basin;
- The Precautionary Principle be applied through the establishment of an allocation to be held in reserve to minimise the risk of over allocation for consumptive use; and
- Modelling of impacts on downstream basin flows.

In mid 2001, the Queensland government delivered its revised water allocation proposal for the Condamine-Balonne, Moonie, Border Rivers and Warrego-Paroo-Bulloo-Nebine catchments. These proposals have arisen from the process of review and discussion of the WAMP/WMPs and Flow Management Plan prepared under a process previously endorsed by the IAG.

The water allocation arrangements proposed by Queensland have been based upon:

- A moratorium on new works effective from September 2000 with a deadline for completion of new works of 20 September 2001;
- Agreed end of valley water flows; and
- Volumetric licences.

The legislative basis for the moratorium on new works is the Integrated Planning Act. Although the Queensland government had announced a moratorium on new works in November 1999, it was not until September 2000 that legislative power existed to enforce this moratorium. The announcement of the new moratorium guidelines in June 2001 reinforced the government's commitment to limiting further growth in new works and placed a deadline on the completion of works currently under construction.

Based on its examination of the proposed caps on water diversions for each of the catchment areas the IAG has concluded that:

- The proposed cap and management regime for the Warrego, Paroo, Bulloo and Nebine catchments is unlikely to have significant downstream or river health impacts;
- There is inadequate information to justify an increase in the mean annual diversions from 14GL to 18 GL for the Moonie River and river health monitoring should be implemented to assess whether any increase is justifiable;

- Options under consideration for the Border Rivers are likely to increase diversions by between 17% and 25% over November 1999 levels and no evidence is available to the IAG of the impact of these options on river health or immediate downstream flow impacts on northern NSW; and
- The new proposal for the Condamine-Balonne result in mean annual flows that during the 10 year life of the WAMP are likely to result in further deterioration of river health including adverse impacts on the Narran Lakes.

The IAG supports the use of end of valley flows as a measure of compliance with the cap and the adoption of volumetric licences.

In terms of the specific Cap levels incorporating arrangements for the treatment of sleepers and dozers, the IAG would favour:

- adoption of the current proposed caps for the Warrego-Paroo-Bulloo-Nebine valleys;
- adoption of a 14 GL cap on the Moonie with the proviso that an increase of up to 18 GL may be warranted subject to river health monitoring outcomes;
- retention of the November 1999 diversion levels as the cap on the Border Rivers; and
- adoption of a cap of 210 GL for the Condamine-Balonne which represents the Option C outcome from the draft WAMP.

1. Introduction

The Murray-Darling Basin Ministerial Council in June 1995 agreed to introduce a Cap on diversions of water from the Murray-Darling Basin. The Cap was defined as ‘... 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.’

Queensland argued that on equity grounds a Cap for the Queensland component of the Basin should be determined on the completion of Water Resource Plans.

In 1996 Council agreed to this proposal and the Independent Audit Group (IAG) recommended that the Water Resource Plans (then known as WAMP) should:

- accommodate instream use not only in Queensland but also in the Border Rivers under the control of the Border Rivers Commission and the rest of the Murray-Darling Basin;
- include development of a management regime that includes pricing, property rights and measuring and reporting;
- include assessment of downstream impacts in New South Wales;
- apply the Precautionary Principle including the establishment of an allocation to be held in reserve to minimise the risk of over allocation for consumptive use; and
- provide for a final independent audit of the WAMP process including modelling of impacts on downstream Basin flows.

In November 1998, the IAG reached agreement with the Department of Natural Resources on an audit process. Each of the draft Water Management Plans would be analysed against the agreed performance criteria listed in Appendix A.

In June 2000 the IAG audited the draft Water Management Plans for the Moonie River Catchment and the Warrego-Paroo-Bulloo-Nebine Catchments; the draft Water Allocation and Management Plan for the Condamine-Balonne Basin; and the draft Border Rivers Flow Management Plan. The IAG’s findings for each plan are summarised below:

- *Draft Condamine-Balonne WAMP*

Only preliminary comments were provided by the IAG pending a review by the Queensland EPA of the draft WAMP and Environmental Flows Technical Report and an independent review of the IQQM model. The preliminary findings included that –

- i) there has been no assessment of the flow on environmental impacts downstream in the Barwon-Darling system;
- ii) the projected flows downstream of St George under all three draft plan scenarios are less than that required for environmental flows associated with healthy rivers;
- iii) there was inadequate consideration of the downstream impacts on Narran Lakes of further increases in diversion; and
- iv) an immediate moratorium be introduced to prevent further environmental degradation and significant (and unplanned) reductions in the reliability of supply of fully activated licences.

The IAG proposed a final audit once the Queensland EPA review of the draft Condamine-Balonne WAMP and the draft Environmental Flows Technical Report was available, the IQQM had been validated, and the analysis of downstream impacts had been prepared.

- *Draft Moonie WMP*

The draft WMP proposed full development of existing entitlements and a further 28% increase (5.3 GL/year) in entitlements. The IAG proposed that detailed monitoring of downstream impacts was required and that diversion of additional water should be delayed until it is clear that the existing level of diversion is sustainable.

- *Draft Warrego-Paroo-Bulloo-Nebine WMP*

The IAG considered that the draft plan had no significant downstream impacts, incorporated the Precautionary Principle, and appropriately recognised the significant ecological values associated with these catchments.

- *Draft Border Rivers Flow Management Plan*

The IAG noted that the Queensland and NSW Governments had decided in November 1999 not to allow further growth in diversions in the regulated sections of the system.

This report is the follow up audit recommended by the IAG in June 2000.

2. Audit Process

The IAG met with officers of the Queensland Department of Natural Resources and were briefed on proposed changes to the draft Condamine-Balonne Water Allocation and Management Plan as a result of submissions received during the public comment period and further investigations.

Consideration of the following reports was also undertaken:

- Audit of the Environmental Elements of the Draft Water Allocation Plan - Condamine-Balonne Basin;
- Economic and Environmental Impacts of Development on the Condamine, Moonie and Border Rivers in Queensland on the Murray and Lower Darling Rivers. MDBC Technical Report 2000/6;
- NSW Water Resource Management Agencies Submission on the draft Water Management Plan for the Moonie River Catchment; and
- New South Wales National Parks and Wildlife Service submission to Condamine-Balonne WAMP.

The revised river valley flow targets and water allocation objectives were then audited in line with the agreed plan negotiated with the Department of Natural Resources and in line with the principles endorsed by the Ministerial Council which include:

- the water allocation arrangements to accommodate instream use, not only in Queensland but also in the Border Rivers, under the control of the Border Rivers Commission and the rest of the Murray-Darling Basin ;
- the Precautionary Principle be applied through the establishment of an allocation to be held in reserve to minimise the risk of over-allocation for consumptive use; and
- modelling of impacts on downstream basin flows.

A draft report was prepared and provided to the Department of Natural Resources for comments on matters of fact. The conclusions are those of the IAG.

3. Preliminary Findings

3.1 Condamine-Balonne WAMP

Draft Plan Overview

The Condamine-Balonne Basin is the largest basin within the Queensland portion of the Murray-Darling Basin.

There has been substantial increases in off-stream storages associated with existing water harvesting licences, particularly in the lower Balonne. A moratorium, in place since the early 1990s, means no new licences have been issued. It is estimated that off-stream storages have increased from 360,000 ML in 1993/94 to 1,600,000 ML by mid-1999.

Storages for overland flow diversions which remain unlicensed are estimated to have grown from 43,000 ML in 1993/94 to 115,000 ML by mid-1999.

Although a moratorium on the issue of new licences has been in place for at least five years in the basin, the total combined estimated mean annual diversions from regulated, unregulated and overland flow water throughout the basin have grown from an estimated 385,000 ML in 1993/94 to 647,000 ML in mid-1999. Notwithstanding some seasonal variability with 1993/94 being a relatively dry period and 1998/99 being the most attractive waterharvesting year in the last 10 – 12 years, there is a significant real increase in diversions occurring. These increases have arisen from water users activating their “sleeper” licences, increasing their offstream storage capacities associated with their waterharvesting licences, and increasing the levels of overland flow water diversions. Over the last five years there has been increasing pressure for further allocation of water resources throughout the Condamine-Balonne Basin. This is best demonstrated by there being over 700 outstanding waterworks licence applications.

The WAMP process commenced in 1996 and included the establishment of a Community Reference Panel, a Technical Advisory Panel, the development of an IQQM model that simulates streamflows and then the impacts of various diversion scenarios over the period 1922 to 1995, the establishment of ecological health criteria and associated flow parameters, and the modelling of a range of development scenarios ranging from:

- Natural;
- 1993/94 development;
- end of 1997 development;
- Mid-1999 development (same as Draft WAMP Scenario A);
- Projected development under existing licensing arrangements;
- Draft WAMP Scenario B; and
- Draft WAMP Scenario C.

The area contains 1.3 million hectares of wetlands or 20% of total wetland areas in the Murray-Darling Basin with about half of this on the New South Wales side of the border.

The Condamine-Balonne contains the Narran Lake Nature Reserve which is on the List of Wetlands of International Importance under the Convention on Wetlands of International Importance (Ramsar wetland). The area is recognised in the plan as being internationally significant for waterbird breeding and as a habitat for species including a number of species under the Japan-Australia and China-Australia Migratory Bird Agreements.

The plan advises that 86% of storage capacity of Narran Lakes is the threshold at which waterbird breeding events are triggered and that a reduction in the frequency of filling and the duration of filling below this critical level will reduce the number of waterbird breeding events. As such, the plan acknowledges that “there is an obligation that the end of system flow regime entering Narran Lakes be sufficient to support the functioning of the Narran Lakes system.

Revised Proposal

Following public consultation and additional advice including a Queensland EPA assessment of the draft plan a revised proposal is now under consideration.

Features of the proposal are:

- Initial Mean Annual Diversion of 317 GL which represents full utilisation of existing investments including sleepers and dozers;
- Linear phase down to about a Mean Annual Diversion of 280 GL which is equivalent to an end of system flow target of 50% of natural flow. This phase down to occur over the 10 year life of the plan; and
- A further step down in the subsequent 10 years to achieve an end of system flow of 60% of natural flow.

The IAG understands that the starting point in year 1 equates to Mean Annual Flows higher than Scenario A in the draft WAMP. The Mean Annual Flow at the end of 10 years is comparable to Scenario B. It is only in year 20 that Mean Annual flows are comparable to flows under Scenario C.

The IAG was also advised that these proposals were based on increasing Mean Annual Flows to 60% of natural flows which directly equates to modelled flows for the Queensland Border Rivers which were assessed as being in moderate health.

The major impact on diversions is on the lower Balonne with a reduction in diversions and water harvesting, little impact in the mid section which would be capped at existing licence capacity and the upper section capped at June 2000 infrastructure.

The proposed flow regimes and associated diversions will not meet the flow requirements of the Narran Lakes during the life of the phase-in. Queensland officers consider that flow management and engineering solutions may be required to achieve environmental outcomes from Narran Lakes.

Downstream Impacts

The Murray-Darling Basin Commission analysed the downstream impacts of the WAMP development scenarios and compared these with a baseline equivalent to the 1993/94

levels of development. The environmental and economic impacts of these scenarios are summarised in Tables 1, 2 and 3 in Appendix B.

The flow components for development scenarios A, B, C and full development are compared below along with diversions in Tables 3.1 and 3.2 below:

Table 3.1
Mean Annual Flow Impacts of Condamine-Balonne Development
GL/year

Flow Component	Condamine Scenario C	Condamine Scenario B	Condamine Scenario A	Full Development
Outflow from Queensland	-93	-109	-137	-208
Darling River at Bourke	-79	-94	-119	-185
Inflow to Menindee	-70	-80	-99	-157
Darling River at Burtundy	-38	-44	-54	-85
Murray River at headworks	-39	-45	-55	-88
Flow to South Australia	-36	-41	-51	-79
Flow over Barrages	-37	-42	-52	-81

Table 3.2
Mean Annual Diversions
GL/year

	Condamine Scenario C	Condamine Scenario B	Condamine Scenario A	Full Development
NSW Murray	0	0	0	0.1
Victorian Murray	0	0	0	0
Anabranh	-0.6	-0.6	-1.1	-1.2
Tandou	-1.1	-1.7	-2.4	-3.3
Lower Darling	0	0	0	0
Total Diversion	-1.7	-2.2	-3.5	-4.5

An increase in diversion results in a reduction in downstream flow with the reduction declining with distance downstream due to losses.

Diversions at Tandou and the Darling Anabranh are expected to be reduced. The reductions in the River Murray in NSW and Victoria are expected to be negligible although a greater severity of restrictions is expected to marginally reduce profitability to irrigators.

The IAG are of the view that development scenarios C, B and A have only small impacts as environmental flows downstream of Menindee and negligible impact on farm profitability.

Queensland EPA Report

An agreement between the Queensland EPA and the IAG led to a single audit of the draft WAMP and the Technical Advisory Panel report. The EPA report is currently undergoing some revisions following the receipt of comments from the Department of Natural Resources.

It is understood that the Queensland EPA report identifies opportunities for further improving the development of WAMPs and supporting technical studies. The EPA audit however confirms the IAG's preliminary findings that from an environmental perspective, as of June 2000, water was already over-allocated and associated with increasing risks of unacceptable degradation.

Environmental flow levels were not met for all scenarios for the Narran Lakes system and Border streams. Scenario B has lower impacts than A and C have lower impacts than B.

To the extent that the latest Queensland proposals involve higher levels of diversions than in the WAMP/WMP options which were considered by the EPA, the IAG's view is that these options have not been set with the precautionary principle in mind nor with regard to the river health and downstream impacts.

Audit Assessment

The proposals for the capping of water usage on the Condamine-Balonne were assessed against the audit criteria established by the Murray-Darling Basin Ministerial Council (Appendix A).

i) River health :

The Queensland EPA assessed the draft WAMP and concluded that scenarios A, B and C did not deliver environmental outcomes for Narran Lakes and a number of key sites. As the new proposal commences with diversions higher than Scenario A in the draft WAMP and finishes with flows comparable to Scenario B in 10 years it is evident that the new proposals will not meet environmental objectives and is likely to lead to further degradation. The proposal does not meet this audit criteria.

ii) Downstream flow impacts :

The IAG did not have access to downstream flow impacts in northern NSW to below the Condamine-Balonne system. The Murray-Darling Basin Commission modelled impacts on the Murray and Lower Darling with Mean Annual Flow reducing by 79, 94 and 119 GL/year for the Darling at Bourke for Scenarios C, B and A respectively and flow to South Australia reduced by 36, 41 and 51 GL/year for the same scenarios. The impact on diversions from the Lower Darling were negligible with total diversions reduced by 1.7, 2.2 and 3.4 GL/year. Similar impacts would be expected from the revised proposal. This audit criteria has been met; and

iii) Precautionary Principle :

The EPA report is understood to conclude that *“from an ecological perspective, water is already over-allocated, and associated with increasing risks of unacceptable degradation There is no evidence that the proposed development have been set on a precautionary basis, taking into account risks of environmental degradation”*. A similar conclusion applies to the current levels proposal and as a consequence does not meet this audit criteria.

3.2 Moonie Water Management Plan

The proposal presented to the IAG by the Queensland Department of Natural Resources regarding the Cap for the Moonie was:

- no further growth in overland flow harvesting;
- limits on development of existing water harvesting licences;
- 100 ML reserve for local government; and
- no additional water harvesting licences.

The Cap for the Moonie River under this proposal is estimated at 18,000 ML/year.

Because there are some water harvesting licences that have not developed to the proposed limits, the proposed Cap is some 4,000 ML/year higher than the estimated current usage of 14,000 ML/year.

This estimate of current usage is substantially higher than the 8,000 ML/year average diversion reported in the Murray-Darling Basin Commission Audit Monitoring Reports from 1997/98 to 1999/00. The increase is as a consequence of a more detailed survey carried out over the last six months of the Moonie which revealed previously unrecorded diversions including overland flow harvesting.

When the proposed Cap is fully developed it is expected that the end of valley flow will be 67% of the natural flows.

The proposal differs from the "Draft Water Management Plan, Moonie River Catchment May 2000" in that the previous proposal to issue additional licences equivalent to 5,290 ML/year average diversion has been dropped as a consequence of the higher than expected current levels of development.

On 9 June 2001, Queensland amended the moratorium on water resource development on the Moonie to include overland flow diversions.

Audit

The three criteria established in the 1997/98 IAG Report are now assessed.

i) River Health

The scientific forum held in Charleville as part of the Moonie WMP process concluded that:

- the area contains high biodiversity and unique systems;
- most wetlands are dependent on river flows rather than local rainfall; and
- water resource development has implications for biodiversity, wetlands, biological productivity and rural communities.

From the evidence provided it is difficult for the IAG to reach any conclusions about the impact that the proposed Cap will have on river health. It is apparent that much of the existing development has occurred in recent years and may not yet have impacted on the river. The proposed Cap is probably twice the level of diversions that was occurring only a few years ago. The planned reduction of flows to 67% of natural conditions is comparable to the 61% figure in the Border Rivers under November 1999 conditions and the 60% long term goal proposed for the Condamine-Balonne. However there is insufficient evidence to be able to conclude that this level of disturbance will be sustainable.

ii) Downstream Impacts

The impact of the development in the Moonie proposal in the Draft WMP on the Lower Darling and the River Murray has been assessed by the Murray-Darling Basin Commission. This study concluded that, because of losses in the intervening streams, a

reduction of 6 GL in the outflow from the Moonie would represent only a 2 GL reduction in flow at the Murray Mouth. As a consequence of this and the small volumes of Moonie diversions involved a reduction in Moonie outflows will only have a small percentage impact on River Murray flows. The largest downstream impact will be observed in the Barwon river between the Moonie and the Namoi junctions. The NSW Water Resource Management Agencies Submission on the draft WMP noted that there were a number of years when the Moonie contributed over half the flow in this reach. Queensland and the IAG are awaiting a detailed assessment by NSW Department of Land and Water Conservation of the proposed Moonie Cap on the Barwon/Darling.

iii) Precautionary Principle

The impact of the proposed Cap on river health is difficult to assess. The percentage reduction in mean average flow to 67% of natural is not excessive in comparison with other Queensland streams. However the flow in the Moonie is unregulated and very variable so the consequences to the frequency of smaller flow events may be more significant than in the other streams. Given this level of uncertainty the IAG considers that the precautionary principle should be applied and that the Cap be set initially at the current average level of diversion.

Conclusion

The IAG considers that the Cap for the Moonie River should be set initially at the current average diversion level of 14,000 ML/year with the option of extension in the future to 18,000 ML/year if monitoring suggests that this increase can be made without significant environmental impact.

3.3 Warrego-Paroo-Bulloo-Nebine Water Management Plan

The offtake of water for consumptive use from the Warrego-Paroo-Bulloo-Nebine catchments is relatively minor by comparison to the overall offtake from the Queensland component of the Murray-Darling system. Current levels of authorised diversions are provided in **Table 3.3**.

**Table 3.3
Estimated Levels of Current Authorised Diversions
Warrego-Paroo-Bulloo-Nebine**

Catchment	Under Current Arrangements (ML/year)	End of Valley Flows (mean annual) %
Warrego	31200	87%
Paroo/Bulloo	25	99%
Nebine	3800	99%

Most of the land in the catchments is used for grazing and the diversions from the systems represent a minor proportion of the water flows through these valleys based on end of valley flow estimates.

Proposed Cap Arrangements

Under the proposed Cap arrangements to apply to these catchments, end of valley flow targets and diversion caps will be introduced. Existing licensed diversions will be converted into volumetric licences.

A moratorium on new water development in these catchments was introduced from 9 June 2001. This has reconfirmed the moratorium that was foreshadowed in November 1999, but was not given legislative backing until September 2000. In effect no new works will be approved under this moratorium and any works under construction must be completed by 20 September 2001. Provision exists under this moratorium for riparian stock and domestic licences and off-stream stock and domestic dams to be constructed. However, there will be close supervision of any works to ensure that the objectives of the moratorium are not subverted.

The only additional licences that have been allowed in these catchments is an additional 100 ML for industrial purposes from the Paroo and the possibility that there could be some additional managed overland flow works in the Warrego and Nebine valleys.

The new licences will be issued under the Integrated Planning Act which will give strong legislative backing to these licences. This has overcome a problem that had existed after the November 1999 moratorium announcement where Queensland found that it could not legislatively enforce its then announced moratorium on new works.

The targeted end of valley flow outcomes are shown in **Table 3.3**. The 87% end of valley flow outcome for the Warrego reflects an agreed 88% end of valley flow objective plus a further 1% allowance for urban use.

Audit

The draft Plan developed by the WMP process used by Queensland proposing authorised Caps (against actual usage) of the following:

**Table 3.4
Draft Plan for Warrego-Paroo-Bulloo-Nebine**

Catchment	Under 1999 Annual Arrangements ML/year	Draft Plan ML/year	Draft Plan % of mean annual flow
Warrego	31200	31300	6%
Paroo	25	125	0.02%
Nebine	3800	1600	1%

However, by comparing the draft WMP diversions with actual diversions as shown in Table 3.3 it can be seen that actual diversions currently exceed planned diversions.

	Actual Diversions	Planned Diversions
Warrego	13%	6%
Paroo	1%	0.02%
Nebine	1%	1%

The adoption of a moratorium on further development effectively now sets the cap for these river systems at current usage levels.

These proposed outcomes need to be considered in the context of the IAG's Audit Criteria as established in its 1997/98 report:

i) **River Health :**

The Draft Water Management Plan for these catchments, reflecting the scientific forum, identified a number of environmental values in these catchments and proposed a cautious approach to be taken to extra water allocation. Provision has been made in the proposed end of valley flow outcomes for an additional 100 ML/year for industrial purposes, and for an additional 1% of end of valley flow from the Warrego for consumptive use. While these additional proposed usage requirements will have no significant impact on mean annual flows, the IAG notes that the usage from the Warrego has doubled from 6% to 13% of mean average flows in the last 12 months. Thus, although Queensland's action will now be to cap any further growth in usage, effectively there has been significant growth since 2000;

ii) **Downstream Impacts :**

The IAG does not have up to date information available on potential downstream impacts, especially now that there has been some increase in the diversions from the Warrego. However, the IAG does note that the absolute value of water being diverted for consumptive use is relatively small, and in terms of downstream impacts would be of little consequence; and

iii) **Precautionary Principle :**

This principle has in general been applied, although only after further increase in actual diversions over the last 12 months.

Conclusion

The IAG endorsed the Draft WMP for the Warrego-Paroo-Bulloo and Nebine. The revised proposal which effectively caps further diversions from these catchments at current levels will see some increase in the absolute level of diversions, particularly from the Warrego. In terms of the audit criteria, there is insufficient evidence available to assess whether the impact of this additional level of diversion will result in reduced river health or adverse downstream repercussions. However, given the absolute size of these diversions, the IAG is of the view that any adverse impact is likely to be minimal.

3.4 Border Rivers Flow Management Plan

Overview

In December 1996 the Ministerial Council accepted the following IAG recommendations related to the Border Rivers:

- that the Queensland Cap for the Border Rivers be determined after a Flow Management Plan process is completed; and
- that the NSW Cap for the Border Rivers should include an allowance for Pindari Dam enlargement and should be determined by an appropriate water allocation study.

The Cap for NSW Border Rivers users therefore remains a “1993/94 development” Cap, with the addition of the Pindari enlargement allowance. Progress with its determination is detailed in the Queensland Border Rivers Flow Management Plan which is being prepared jointly by Queensland and New South Wales.

The growth in diversions and on farm storage in the Border Rivers between 1993/94 and 1998/99 is summarised in Table 3.5.

Table 3.5
Growth in diversions and on farm storage in the
Border Rivers between 1993/94 and 1998/99

	Diversion (GL/year)		
	1993/94	1998/99	Change
NSW	152	204 ¹	52
Queensland	122	167	45
Total	274	371	97

	On Farm Storage (GL)		
	1993/94	1998/99	Change
NSW	131	140	9
Queensland	99	165	66
Total	230	305	75

- ¹. The growth in NSW diversions reflects to a large extent the impact of Pindari Dam enlargement.

The growth in diversions since 1993/94 in the Border has occurred in both jurisdictions.

Progress with the Flow Management Plan

The draft flow management plan and subsequent determination of the Queensland Border River’s Cap was expected at the end of 2000. While considerable progress has been made including:

- a report on current ecological conditions of streams in the Border Rivers Catchment;
- a report on water use and flow performance;
- the nine meetings of the Community Reference Panel;
- four meetings of the Indigenous Working Party;

- the finalisation of the IQQM model of the Border Rivers;
 - the use of the model to test a range of development scenarios;
 - a draft Information paper on Border Rivers flow management planning;
- no flow management plans have been completed for audit.

The information paper prepared in 1999 notes that the mean annual end of system flow at Mungindi with current levels of development is 60% of natural. Based on the criteria developed by the Condamine-Balonne TAP, and comparisons with flow changes in other Murray-Darling rivers, the analysis of the long-term flow regime indicates that at Mungindi flows are currently at or below the limits of acceptable environmental risk and they would worsen if there were further growth in upstream water use. As a result, in November 1999 the Queensland and NSW Governments decided not to support increases in water use in the Border Rivers that will cause further deterioration in the flow regime at Mungindi and not to allow further growth in diversions in the regulated sections of the system.

Outstanding Issues

The information paper also listed the following outstanding items to be determined by the two States:

- environmental flow targets;
- diversion limits – within the bounds set by the November 1999 inter-state agreement and, for NSW, by the NSW Border Rivers Cap process;
- mechanisms for protecting tributary streams;
- monitoring and auditing processes;
- dam and weir operating rules; and
- review of barriers to fish passage.

For this years audit no additional material has been provided on progress with these issues.

Queensland has advised that there are now three options for setting the Cap:

- the November 1999 benchmark which would result in an end of valley flow of 63.6%;
- utilisation of current infrastructure which would result in a 17% increase over the November 1999 diversion and result in an end of valley flow of 61%; and
- utilisation of all existing licences which would result in a further 8% increase in diversions and an end of valley flow of 59.3%.

Conclusion

Given that the best scientific advice indicates that with the November 1999 level of development environmental indicators were at or below acceptable limits further increases in diversions would breach all IAG audit principles.

Resolution of the cross border issues should receive a high priority in the work program for both NSW and Queensland and the Commission should be requested to convene the necessary meetings to assist in resolution of the outstanding issues.

4. Conclusions

The IAG audit of the revised Queensland Department of Natural Resources proposals indicates that the proposed Cap and management regime for the Warrego, Paroo and Nebine is unlikely to have significant downstream or river health impacts.

In the case of the Moonie River it is the view of the IAG that there is inadequate information to justify an increase in Mean Annual Diversions from 14 to 18 GL/year and that river health monitoring should be implemented. The increase may be justified if monitoring indicates no adverse impacts.

The new proposal for the Condamine-Balonne results in Mean Annual flows that during the 10 year life of the WAMP are likely to result in further deterioration of river health including adverse impacts on the Narran Lakes.

Options under consideration for the Border Rivers are likely to increase diversions by 17% to 25% over November 1999 levels coinciding with the agreement between the Queensland Minister for Natural Resources and Mines and the NSW Ministers for Land and Water Conservation and Environment.

No evidence was available to the IAG of the impact of these options on river health or immediate downstream flow impacts in northern New South Wales.

Equity Argument

Debate within the Murray-Darling Basin Ministerial Council on establishing the Cap resulted in Queensland and South Australia arguing for special consideration on equity grounds. The Cap for South Australia has now been finalised.

Queensland proposed that its Cap should be determined following the development of Water Allocation and Management Plans or Water Management Plans.

This process was expected to provide a balance between diversions for consumptive use and environmental flows.

The expectation was that the WAMPs and WMPs would be completed in 1997. A moratorium on the issue of new licences was in place although floodplain harvesting remained unregulated.

With this background, advice from the IAG on the issue of equity between States is heavily constrained by events since 1996. In this context the IAG's advice to the Ministerial Council is one of guidance on principles to facilitate decision making.

It is the view of the IAG that where options are under consideration the option that achieves the most equitable outcome, recognising post 1996 events is the one that:

- i) provides the best outcome for the environment;
- ii) constrains consumptive use as close to 1997 levels of development (when the WAMP was to be finalised) as possible; and
- iii) recognises agreements made between NSW and Queensland over Border Rivers.

Thus, in the context of the equity argument advanced by Queensland and adopted by the IAG, it is necessary to look again at the options that are available in terms of the Cap to be applied to the Queensland valleys. The IAG supports the use of end of valley flows as a measure of performance against the Cap. This is consistent with previous advice given by the IAG.

The IAG also supports the adoption of volumetric licences which clearly establish the entitlements of licence holders. Clearly there will still need to be a series of management rules to be established for each of the valley catchment areas. However, a commitment to clearly defined rights is consistent with cap principles applied in other states.

In terms of the specific cap levels and the treatment of sleepers and dozers across these Queensland valleys, the IAG would favour:

- adoption of the current proposed caps for the Warrego-Paroo-Bulloo-Nebine valleys;
- adoption of a 14GL cap on the Moonie with the proviso that an increase of up to 18GL may be warranted subject to river health monitoring outcomes;
- retention of the November 1999 diversion levels as the cap on the Border Rivers; and
- adoption of a Cap of 210 GL for the Condamine-Balonne which represents the Option C outcome from the draft WAMP.

5. *References*

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Appendix A – Audit Criteria 1998

Extract from the “1997/98 Review Of Cap Implementation” by the Independent Audit Group (IAG), November 1998

- ***Auditing WAMP and WMP***

The MDBMC resolved at its July 1997 meeting for the IAG to undertake an Audit of the WAMP (and by inference the WMP) processes and outcomes.

The IAG in 1997 discussed the proposed audit of the WAMP (WMP) process and outcomes with the Queensland Department of Natural Resources officers and agreed on an audit methodology.

The proposed process comprises audits of key stages of the WAMP against the criteria summarised in Table 1.

Table 1
Preferred Audit Process for WAMP/WMP

WAMP Output/Process	Audit Criteria
Technical Reports	Quality of expertise Range of environmental, economic and other indicators used
River Modelling	Validity of model
Information Paper	Are the full range of issues covered? Does implied value system cover full range? Downstream impacts been considered?
Community Consultation Process and Report	Did Panel adequately represent all community interests? Was a representative and transparent value system used by the Panel?
Preliminary Draft Plan	Does plan reflect TAP and Community Consultation? Have downstream impacts been considered? Has the precautionary principle been applied?
Modified draft plan	Do changes reflect previous principles?
Final Plan	Does the final plan reflect previous principles?

Appendix B – Downstream Impacts

Table 1. Changes in flow, diversions and river losses

Mean Annual Flow (Run minus benchmark) in GL/year						
Flow component	Benchmark 93/94 C1	Moonie only C2	Moonie plus Border rivers C3	Condamine scenario C C4	Conda Scenar C5	
Outflow from Queensland	1330	-6	-43	-93		
Darling River at Bourke	2200	-5	-34	-79		
Inflow to Menindee lakes	2035	-4	-28	-70		
Darling river at Weir 32	1512	-3	-20	-56		
Cawndilla Outlet to Anabran	122	0	-1	-3		
Darling River at Burtundy	1016	-2	-15	-38		
Murray River at Wentworth	7731	-3	-15	-39		
Flow to SA	6941	-2	-14	-36		
Lock 1 Flow	6560	-2	-14	-36		
Flow over barrages	5682	-3	-14	-37		
Mean Annual Diversions (Run minus benchmark) in GL/year						
NSW Murray	1950	0.0	0.0	0.0		
Victorian Murray	1604	0.0	0.0	0.0		
Anabran	50	-0.1	-0.2	-0.6		
Tandou	49	-0.1	-0.9	-1.1		
Lower Darling	29	0.0	0.0	0.0		
Total diversion	3682	-0.2	-1.1	-1.7		
Mean Annual Losses (Run minus benchmark) in GL/year						
Murray losses	1137	0.0	-1.0	-3.0		
Darling losses	493	-1.0	-6.0	-18.0		
Menindee evaporation	396	-1.0	-6.0	-10.0		
Losses in Anabran	23	0.2	0.1	-1.3		
Losses in SA	799	1.0	1.0	1.0		
Total loss	2848	-0.8	-11.9	-31.3		

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Table 2 Economic Impact on River Murray Irrigators (\$million/year)

Economic component	Benchmark 93/94 C1	Moonie only C2	Moonie plus Border rivers C3	Condamine scenario C C4	Condamine Scenar C5		
NSW	231.5	0.0	-0.1	-0.1			
Victoria	335.0	0.0	0.0	0.0			
Total	566.5	0.0	-0.1	-0.1			

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Table 3 Environmental Impacts

Environmental Indicators u/s of SA	Benchmark 93/94 C1	Moonie only C2	Moonie plus Border rivers C3	Condamine scenario C C4	Condamine Scenar C5		
Hattah Lakes Watering							
% of Years lakes wet	45.1	0.0	0.0	0.0			
% of Years lakes fully inundated	32.4	0.0	0.0	-1.4			
Walpolla/Lindsay wetlands							
% of Years wet	23.9	0.0	0.0	0.0			
Darling Flow as a time weighted % of total flow (surrogate index of turbidity)	14.7	0.0	-0.2	-0.5			
% of Years with Flow to SA in Peak Month							
> 15000 ML/day	76.1	0.0	0.0	-1.4			
> 35000 ML/day	49.3	0.0	0.0	0.0			
> 50000 ML/day	29.6	0.0	0.0	0.0			
> 80000 ML/day	12.7	0.0	0.0	0.0			
> 100000 ML/day	7.0	0.0	0.0	0.0			
Fish Passage at Lock 1 - Blanchetown							
% of Years Drowned out (Sep-Mar)	29.6	0.0	0.0	0.0			
% of Months Drowned out (Sep-Mar)	5.6	0.0	0.0	0.0			
Salinity (EC) at Merbein	350.2	-0.2	-0.9	-0.7			
Salinity (EC) at Morgan	547.3	0.0	0.0	1.2			

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