

# **Draft Interim Water Allocation Plan, Ord River**

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**Water and Rivers Commission**

**Advice to the Minister for the Environment from the  
Environmental Protection Authority under Section 16 (e) of the  
Environmental Protection Act 1986**

**This is not an assessment of the Environmental Protection Authority  
under Part IV of the Environmental Protection Act 1986**

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WITHDRAWN

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## Summary and recommendations

The Water and Rivers Commission (WRC) has prepared a 'Draft Interim Water Allocation Plan' for the use of water from the Ord River. Water from the River has been used for irrigation purposes for the last 30 years (referred to as Ord Stage 1).

In anticipation of a significant increase in water demand resulting from the Ord Stage 2 development, the Draft Interim Water Allocation Plan assigns Interim Environmental Water Provisions (EWPs) and also recognises the need to determine Environmental Water Requirements (EWRs). The Draft Interim Water Allocation Plan was released to the public for a period of 8 weeks ending on 20 August 1999. Following consideration of Draft Interim Water Allocation Plan, the issues raised within the submissions, and the proponent's response to submissions, the Environmental Protection Authority (EPA) has prepared this response to the Draft Interim Water Allocation Plan under Section 16(e) of the Environmental Protection Act. This report considers the environmental issues associated with the proposed expanded allocation of water on the Ord River environment.

The EPA has focused its review on two aspects of the Draft Interim Water Allocation Plan:

- the methodology used to identify draft EWPs; and
- the proposed research to identify EWRs.

The EPA has not examined in detail the proposed water allocations to various portions of the Stage 2 expansion, but recognises that any modification to the level of EWPs assigned in the Interim or Final Water Allocation Plan could result in changes to these allocations. This is acknowledged in the Draft Interim Water Allocation Plan.

### Conclusion

The EPA has considered the Draft Interim Water Allocation Plan for the Ord River prepared by the Water and Rivers Commission and notes that the requirement for the defining of Environmental Water Provisions in advance of detailed research to identify environmental values of the river and their Environmental Water Requirements is largely a consequence of the Government's desire for expanded irrigation development.

The EPA has concluded that the basis used for determining the Interim EWPs in the Draft Interim Water Allocation Plan may be inappropriate and should be reconsidered to ensure that it is sufficiently conservative to allow for known riparian users and is conservative enough to assume adequate flushing of drain water discharged from Ord Stage 1 operations. The EPA questions the appropriateness of the 20th percentile monthly flow volume figure, and the application of this figure on pre-dam flows, when the Ord River has been regulated for 30 years and the post-dam flow regime is fundamentally different. In addition, the selection of the 20th percentile level is understood to be based on extreme low levels, not normal maintenance levels. As a new ecological regime has prevailed for more than 30 years in the Lower Ord River, the EPA believes that the Interim and Final EWP should be based on protecting environmental values which are sustainable under post-dam flows.

It is recognised that methodologies for defining Environmental Water Provisions are going through significant development. Two years ago, when the 20<sup>th</sup> percentile level was adopted, this approach was considered to be an appropriate methodology. However, there has been more recent developments suggesting alternative approaches, including some which could be applied in situations of very limited available information on environmental values.

The EPA has recommended that the WRC should undertake a review of current best practice in defining EWPs for wet-dry tropic rivers. This review should include people with expert knowledge of tropical river ecosystems, and the outcome of that review should be used to define Interim EWPs in the Interim Water Allocation Plan.

The EPA supports the proposed detailed investigations to determine the EWRs of components of the Ord River ecosystem which may be affected by water abstraction.

As there is limited information available regarding biophysical impacts and the Draft Interim Water Allocation Plan only makes commitments to undertake research, the EPA is not in a position to endorse any water allocation volumes at this time.

It is likely that there will be applications for new water allocation licences (eg Ord Stage 2 M2 Supply Channel Irrigation Area) before the Water Allocation Plan is finalised. The EPA supports the intention of the WRC to have the ability to amend any licence issued when information gained through these investigations becomes available.

Environmental approval for the Final Water Allocation Plan will be subject to separate referral and consideration under Part IV of the Environmental Protection Act. Individual applications for significant water allocation licences lodged prior to the finalisation of the Water Allocation Plan will also be subject to assessment under Part IV of the Environmental Protection Act.

### **Recommendations**

The EPA makes the following recommendations to the Minister for the Environment:

1. That the Minister notes that this report provides advice on the Draft Interim Water Allocation Plan - Ord River, Western Australia prepared by the Water and Rivers Commission;
2. That the Minister notes that the EPA has concluded that the basis for determining Interim Environmental Water Provisions for the Ord River should be reviewed as a matter of priority, before the Interim Water Allocation Plan is finalised and prior to specific allocations to additional consumptive uses being approved;
3. That the Minister notes that the EPA strongly supports the proposed detailed investigations to determine Environmental Water Requirements for the Lower Ord River;
4. That the Minister notes that the EPA strongly supports the intention of the WRC to amend allocation licences as required following these investigations; and
5. That the Minister notes that the EPA intends to assess under Part IV of the Environmental Protection Act the WRC's Final Water Allocation Plan - Ord River and to assess applications for significant water allocation licences lodged prior to the approval of the Final Water Allocation Plan.

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WITHDRAWN

## **1. Introduction and background**

The Ord River is one of the major river systems in the Kimberley region of Western Australia. Historically, river flows were triggered by heavy monsoonal rains during the summer months, which lead to widespread flooding of the alluvial flood plains. Since construction of the Kununurra Diversion Dam in the mid 1960's, and the construction of Lake Argyle (Ord River Dam) in the 1970's, downstream river flows have been altered dramatically. Large scale downstream flooding no longer occurs and flows are now regulated. Major flood waters are now either captured in Lake Argyle, lost as lake evaporation, slowly discharged through the spillway over the dry season, or released through the existing hydro-power station. The location of the Ord River, Lake Argyle and Kununurra Diversion Dam is indicated in Figure 1.

The long term effect of the construction of the Kununurra Diversion Dam and Lake Argyle on the biophysical environment of the Lower Ord is difficult to determine as no pre-dam environmental studies were undertaken, and there has been very little monitoring of the changes to the riverine ecosystem since the dams were constructed. However there has been substantial modification in the seasonal variability and level of riverine flow, and it would be expected that there have been significant changes in the Ord riverine ecosystem as a result. Lake Argyle and the Kununurra Diversion Dam, as permanent open bodies of water, have become important waterbird habitats and are recognised as a wetlands of international importance under the Ramsar Convention. The Lower Ord floodplain is also recognised as a wetland of international importance under the Ramsar Convention. The construction of the dams and altered flood regime has also had consequences for water-related recreation, tourism and aquaculture operations and opportunities in the vicinity of Kununurra.

Water from Lake Argyle has been used for irrigation purposes for the last 30 years at Kununurra, referred to as Ord River Irrigation Area Stage 1. In recent years there has been interest in developing broad-scale agriculture in the area. This broad scale agriculture will require expanded irrigation on a large scale, and is referred to as Ord Stage 2. The Ord Stage 2 comprises several separate development areas, along the Lower Ord and on the Weaber, Keep and Knox Plains to the north-west of Kununurra.

The Water and Rivers Commission (WRC) has the statutory responsibility for managing water resources in WA under the provisions of the Right in Water and Irrigation Act (1914). The WRC has prepared a 'Draft Interim Water Allocation Plan - Ord River, Western Australia' (WRC, 1999b) for the use of water from the Ord River in anticipation of a significant increase in water demand through various components of the Ord Stage 2 development. The Draft Interim Water Allocation Plan assigns Interim EWPs. The Plan also recognises the need to prepare EWRs for water dependent communities along the Ord, including Lake Argyle, Lake Kununurra and the Lower Ord downstream of Lake Kununurra, and describes proposed investigations to determine water requirements of the riverine ecosystem which may be affected by water abstraction.

A decision was made by the EPA to assess the Draft Interim Water Allocation Plan under the provisions of Section 16(e) of the Environmental Protection Act in June 1999. This decision was made to ensure that the EPA provided clear and constructive advice to the WRC prior to finalisation of the Water Allocation Plan. The Draft Interim Water Allocation Plan was released for an 8 week public review period, ending on 20 August 1999.

Following consideration of the Draft Interim Water Allocation Plan, the issues raised within the submissions, and the proponent's response to these issues, the Environmental Protection Authority has prepared this response to the Draft Interim Water Allocation Plan under Section 16 (e) of the Environmental Protection Act.

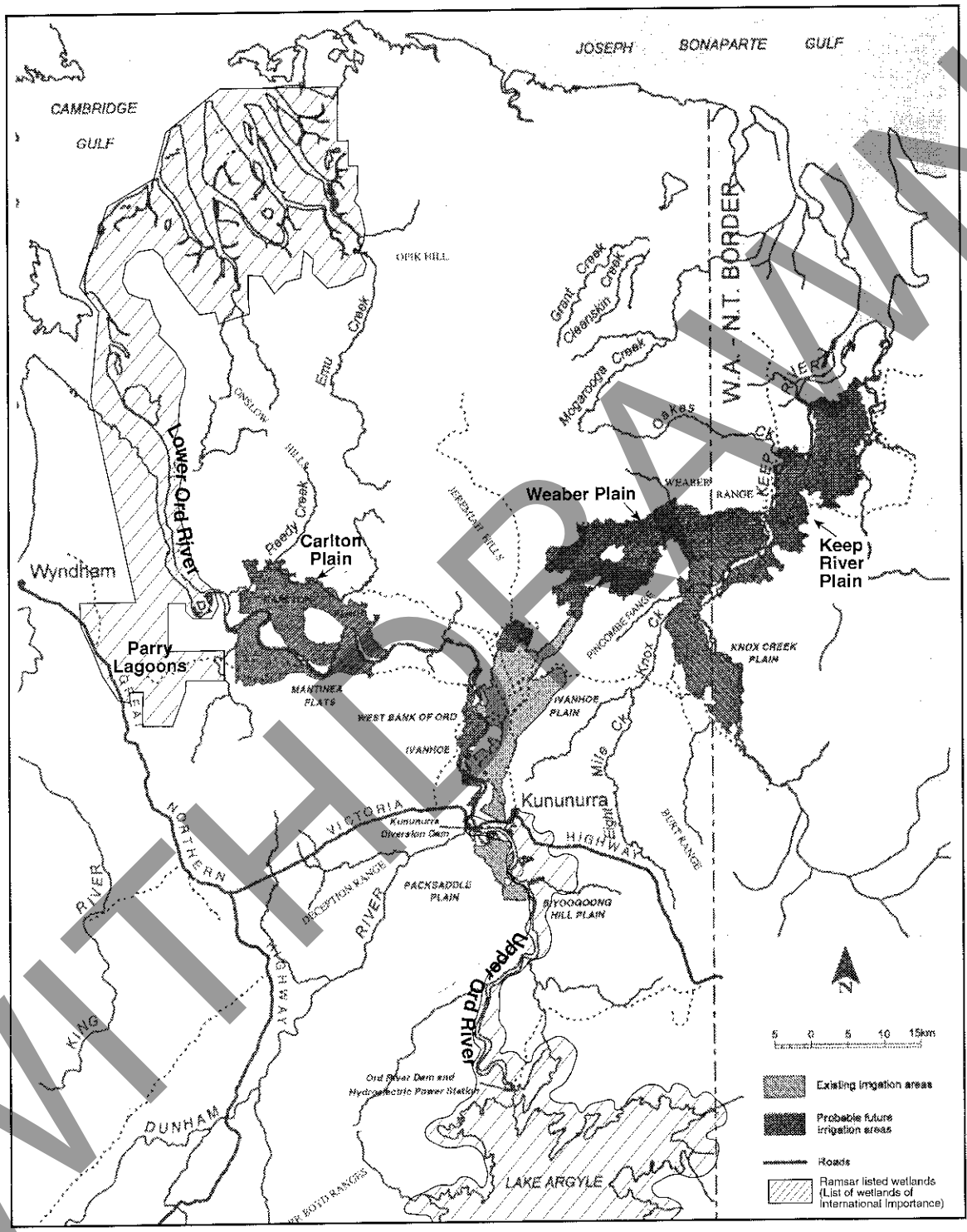


Figure 1. The location of the Upper and Lower Ord Rivers, key tributaries and Ramsar listed wetlands.



## **2. Context for advice**

As part of a broadly based restructuring of water management and service provision in Australia, the Council of Australian Governments (COAG) Framework Agreement on Water Resource Policy Reform (COAG 1994) requires a clear policy to ensure that the water needs of the environment are addressed in water allocation decision making.

In order to ensure that water resources are managed equitably to meet the needs of the environment, social needs and demands to consume water for economic benefit, and to meet the requirements of COAG, the WRC has prepared a 'Draft Environmental Water Provisions Policy for Western Australia (WRC, 1999a). This document acknowledges the need for the preparation of water allocation plans, using the concepts of Environmental Water Requirements (EWRs) which identify how much water is required to sustain key ecological values of water dependent ecosystems at a low level of risk, and Environmental Water Provisions (EWPs) which are the water regimes to be maintained, and which are based on water allocation decisions that may involve some compromise between ecological, social and economic goals

The expansion of the Ord River Irrigation Area is based on the original plans for the provision of water for irrigation from the Ord Dam. This perspective of the initiative taken in the 1960's and 70's, continues to prevail today. However, much has changed from those times and these changes need to be recognised when decisions are being made today.

For example, the creation of Lake Argyle and Lake Kununurra, along with the more consistent annual flows in the Ord River following construction of the dams, has provided enhanced waterbird areas which did not exist prior to the dams. The WA Government has acknowledged the considerable international value of the wetlands of the Ord River through the nomination of Lake Argyle, Lake Kununurra and the Lower Ord Nature Reserves as Ramsar wetlands. The State has also accepted the obligations that follow under the Ramsar Convention in terms of the protection of the environmental values of these wetlands.

These same flow conditions have created new recreational and commercial opportunities that did not exist before the dams. The WA Government is calling for expressions of interest for aquaculture development within Lake Argyle and near Wyndham, each of which rely on the environmental conditions prevailing today. This highlights the multiple and, in some cases, competing uses proposed for the waters of the Ord River.

Proposals for the allocation of water from the Ord River are not expected to result in major changes to water flows and waterbird habitat within Lake Argyle and Lake Kununurra. However, conditions in the Lower Ord, below Lake Kununurra, are likely to change.

It is in this context that the EPA has provided advice on the Draft Interim Water Allocation Plan for the Ord River, and within which decision-makers and proponents will need to consider this advice and the Draft Interim Plan.

## **3. The Draft Interim Water Allocation Plan - Ord River**

The Draft Interim Water Allocation Plan has been prepared in anticipation of applications for additional diversion of water through licences for the Ord Stage 2 irrigation scheme. The Plan acknowledges that there are several areas in which further definition of demands and improvements to irrigation practices are required. It also acknowledges that there are various views on the social and recreational values of water within the existing dams and Lower Ord River, that there is very limited information available on the environmental water requirements of the Lower Ord River, and that there is uncertainty in the crop water demands proposed as part of the Stage 2 development.

Notwithstanding these uncertainties, the Draft Interim Water Allocation Plan outlines the following:

- the existing bulk water allocations from the Ord River. The largest (in terms of volume) water users are the Ord Stage 1 irrigation scheme (composed of a number of individual companies) and the hydro-electric scheme on Lake Argyle;
- Interim EWPs for the provision of water to the Lower Ord system and its associated environment. The methodology used by the WRC to determine draft EWPs is based on monthly flow volumes (including low flow periods in the winter months) in the Ord River below the Dunham River confluence, and requires the maintenance of volumes which are at least equal to the 20<sup>th</sup> percentile of their 'pre-dam' monthly levels;
- an estimate of the remaining water available for additional diversion and consumptive use;
- an estimate of the water required for Stage 2 irrigation areas;
- the system by which licences for water use will be issued under current legislative arrangements; and
- the investigations proposed to be undertaken to accurately determine the EWRs of the riverine ecosystem which may be affected by water abstraction, that is Lake Argyle, and the Ord River ecosystem downstream of Lake Argyle.

Following receipt of advice from the EPA on the Draft Interim Water Allocation Plan, the Interim Water Allocation Plan will be completed by the WRC. The Final Water Allocation Plan is expected to be completed in approximately four years, following the completion of detailed environmental studies to determine the EWRs of the Ord River system. It is anticipated that the Final Water Allocation Plan will more accurately outline EWRs and EWPs. The Draft Interim Water Allocation Plan states that, until the EWRs and other studies are completed, the WRC cannot estimate whether more or less water will be required to meet EWPs.

It is expected that additional water licences will be sought prior to the finalisation of the Water Allocation Plan. These licences would be sought under the provisions of the Rights In Water and Irrigation Act (1914). This Act is currently being revised and proposed changes to the Act would give the WRC the powers to impose environmental restrictions on a water licence and amend and or renew a licence so that it is consistent with a Water Allocation Plan.

The WRC recognises in the Draft Interim Water Allocation Plan that these water licences will require review when the Final Water Allocation Plan is completed, or following a period of 5 years (whichever is sooner). However, until the changes to the Rights In Water and Irrigation Act occur, the WRC does not have the power to impose environmental considerations on a water licence or require its review following the completion of a Water Allocation Plan.

In view of this and its current inability to assess the Draft Interim Water Allocation Plan formally, the EPA has decided that licence applications to abstract substantial quantities of water, such as for the Ord Stage 2 (M2 Channel Supply Area) Irrigation Scheme, which are likely to be submitted prior to completion of the Final Water Allocation Plan, will require separate assessment under Part IV of the Environmental Protection Act. Formal assessment of these water licences will ensure that the water licence will comply with environmental conditions, and will be subject to review when the Water Allocation Plan is completed.

The EPA intends to assess the Final Water Allocation Plan at a future date.

## 4. Environmental Issues

In providing advice to the Minister for the Environment with respect to the Draft Interim Water Allocation Plan, the EPA has concentrated on the following key environmental issues :

- (a) whether the methodology used to identify Interim EWPs identified in the Draft Interim Water Allocation Plan is appropriate; and
- (b) whether the proposed investigations described in the Plan to determine EWRs of components of the ecosystem which may be affected by water abstraction are adequate;

The EPA has also provided comment on potential implications of the Draft Interim Water Allocation Plan on cultural and heritage values and on social surroundings.

When considering these issues, the EPA has noted the concerns raised within submissions received from State and Commonwealth Government Agencies, various interest groups and individual members of the public. The EPA is aware that a broader range of issues was raised in these submissions. However for the purposes of its advice to the Minister for the Environment on the Draft Interim Water Allocation Plan, the EPA has chosen to focus on the issues outlined above.

A list of those groups and individuals who forwarded submissions is included in Appendix 2. A summary of the issues raised within the submissions is included in Appendix 3. The proponent's response to the issues raised in submissions is included in Appendix 4.

The EPA sought the independent advice of Dr Peter Davies as part of this assessment. Dr Davies has a specialist understanding of freshwater stream and river ecology and has been closely involved in the monitoring of stream flows in the south west of WA and elsewhere in Australia.

### 4.1 Methodology used to determine Interim Environmental Water Provisions

Flows in the Lower Ord River prior to the dams were marked by high flows, including floods, during the wet summer months and low or no flows during the dry winter period, from May to November. These pre-dam flows have changed significantly as a result of the dams and diversion of water. Under the current water release regime, peak summer flows are substantially moderated and flows continue at a reduced level throughout the winter months.

The WRC has based the Interim EWPs on monthly flow volumes, including low flow periods in the winter months, in the Ord River below the Dunham River confluence. The Interim EWPs require the maintenance of monthly flow volumes which are at least equal to the 20<sup>th</sup> percentile of their 'pre-dam' monthly levels.

The WRC acknowledges that the selection of this criterion to determine Interim EWPs was arbitrary (Appendix 4). The WRC's response to submissions indicates that this approach is justified as a temporary measure on the basis that similar approaches have been used elsewhere in Australia when basic knowledge of the aquatic ecosystem in question has been limited and the EWRs studies will be substantially completed prior to the full development of Stage 2. The WRC will reassess the Interim EWPs in the Final Water Allocation Plan.

### Public submissions

A number of submissions expressed concern regarding the use of this methodology to determine the EWPs as this may result in down-stream river flows which are actually less than they currently are, particularly during the winter months. The pre-dam water regime was dominated by seasonal monsoonal rains with periods of no-flow during the winter months. Submissions suggested that a return to these conditions is likely to impact on the downstream ecosystem which has become established since the dams were constructed, which are likely to be dependent upon a flow throughout the year.

## **DEP comment**

Advice received from the DEP suggests that the primary issues of concern with respect to the assessment of the Draft Interim Water Allocation Plan are as follows :

- the process used by the WRC for determining the environmental values for which water allocation for the environment have been determined is not clearly outlined in the Plan;
- it does not appear that allocation of water for the environment has been given primacy in the preparation of this document; and
- what does the WRC propose to do if the Ord River environmental values identified for protection through the EWRs studies have been adversely affected by allocations outlined in the Draft Interim Water Allocation Plan.

It is understood that the setting of Interim EWPs is based on the need for providing an indication to prospective water users of the potential water availability from the Ord River, and that in the absence of appropriate environmental investigations it is not possible to take a strategic, holistic approach to water management. Without the completion of the environmental investigations it is not possible to develop a Water Allocation Plan consistent with the COAG Framework Agreement on Water Resource Policy and the WRC's own Draft Environmental Water Provisions Policy.

The DEP is also concerned that the document specifies EWPs in the absence of EWRs. The DEP considers that outlining EWPs prior to the completion of environmental investigations to accurately determine the allocation for the water for the environment (EWRs) is premature and is likely to lead to an expectation that this amount of water is available in the long-term, when the requirements of the environmental values of the Ord River are unknown. If, following completion of the proposed environmental investigation, the draft EWPs are found to be inaccurate and result in an over-allocation of water to consumptive uses, it could be extremely difficult to reallocate this quantity of water required to protect the environment. There needs to be an ability to review and amend the interim allocation to consumptive uses once the Environmental Water Requirements have been determined. Prospective water users need to make provision for this requirement in project design and development.

## **Advice from Dr Davies**

Dr Davies acknowledged that setting EWPs in riverine systems is inherently difficult. This difficulty is further amplified in a situation such as the Ord River where there is very little known about the specific ecological processes which are important to maintain water-dependent ecosystems at a low level of risk. Dr Davies shares the concerns expressed by the DEP that the document specifies EWPs in the absence of EWRs and he believes that this approach is inconsistent with the intent of the COAG Agreement.

Dr Davies makes reference to the importance of maintaining river-terrestrial linkages through regular flood events, such as would have originally occurred during the wet season prior to dam construction. The regular flood events, or 'flood pulse', is likely to be associated with initiating seed setting of water dependent (riparian) vegetation, initiating the upstream migration of native fish, and be significant in the maintenance of riverine food webs. The flood pulse is also likely to be important in maintaining channel morphology and alluvial sediment delivery.

Dr Davies believes that the Interim and Final Water Allocation Plans need to recognise flood flows and seasonal variation as an important ecological parameter. By setting flows at the 20th percentile as proposed, flood pulses would not occur. He considers that flows at the monthly 20th percentile range to be completely arbitrary with no inherent ecological meaning (Davies, 1999).

## **Consideration**

The EPA understands that the Draft Interim Water Allocation Plan has been prepared to comply with the Draft Environmental Provisions Policy for WA (WRC, 1999a). The WRC prepared this Draft Policy to formalise the current water allocation process and to implement the COAG

Framework Agreement on Water Resource Policy. This Agreement requires States to give priority to formally determining allocations or entitlements to water, including allocations to the environment as a legitimate user of water (COAG, 1994). The Draft Policy was designed to complement proposed amendments to the Rights In Water and Irrigation Act (1914) in which legislative backing is being sought by the WRC to apply the principles of sustainable development in its decision making, and clearly outlines the WRC's responsibility to :

*'equitably share water resources between the needs of the environment, our social needs and our water demands'* (WRC 1999a:1).

The Draft Policy goes on to say that:

*'to fulfil this task, the WRC estimates the total flow of a river, stream or through a ground water system, works out how much is needed for the environment and then shares the remainder between public, agricultural and industrial uses'* (WRC 1999a:1)

The Draft Policy also acknowledges that, where limited information is available, "interim" allocations will be made until more detailed knowledge becomes available.

The Draft Interim Water Allocation Plan has also incorporated the principles endorsed by the 'National Principles for the Provision of Water for Ecosystems' (ARMCANZ/ANZECC, 1996). The Draft Policy makes reference for the need to determine EWRs and EWPs for a water resource by the following method :

- identify key ecological values supported by a water system ;
- determine the vital components of the ecosystem and ecosystem processes which support key ecological values and which are sensitive to change in the water regime;
- determine EWRs for the most sensitive components of the ecosystem that preserve these values;
- model the water resource system to estimate water available for consumptive use without the EWRs;
- formulate management objectives for the water resource system, including social water requirements;
- propose EWPs using existing information on EWRs and consider any 'trade offs' that may be required to meet vital consumptive and social uses; and
- determine proposed quantities of water available for consumptive use after first allowing for EWPs.

These steps imply that the EWRs for a water dependent ecosystem are required before an attempt is made to determine the actual EWPs. In the absence of the necessary environmental investigations, the Draft Interim Water Allocation Plan has to propose Interim EWPs without detailed knowledge of the EWRs. The EPA is also aware that the WRC states in the Draft Environmental Water Provisions Policy (WRC, 1999a) that *'the Commission will err on the side of caution if little scientific data are available'* (WRC, 1999a:1). The extent to which the Draft Interim Water Allocation Plan takes such a precautionary approach is not obvious, nor does it identify the risk to the environmental values of the Lower Ord River of possible over-allocation to consumptive uses.

The EPA therefore shares the concerns expressed by both the DEP and Dr Davies that the approach taken by the WRC in the Draft Interim Water Allocation Plan does not demonstrate that it is consistent with the COAG Framework Agreement on Water Resource Policy and the WRC's own Draft Environmental Water Provisions Policy. In relation to the COAG Framework Agreement, the WRC is required to satisfy the following:

*"where significant future activity or dam construction is contemplated, appropriate assessments would be undertaken to, inter alia, allow natural resource managers to satisfy themselves that the environmental requirements of the river systems would be adequately met before any harvesting of the water resource occurs."* (COAG 1994)

The EPA is not satisfied that the WRC has demonstrated in the Draft Interim Water Allocation Plan nor in its response to submissions (Appendix 4) that the environmental values of the river will be protected by the Interim EWPs and that the approach adopted to defining the Interim EWPs is sufficiently conservative. In forming this view, the EPA notes that the WRC has identified an additional 265 GL/year which is being unallocated at this time, and hence would be included in flows to the Lower Ord as part of the Interim Allocation Plan. The submission from CALM also raised concerns about the risk to the environmental values of the Lower Ord resulting from the proposed allocations.

The EPA also recognises that it is proposals for additional water diversion from the Ord River that are primarily driving the timing and approach in the water allocation planning for the Ord.

The EPA considers that the riverine environment downstream of Lake Argyle and the Kununurra Diversion Dam is likely to have been significantly altered due to changes in seasonal flows resulting from construction and operation of the Ord and Kununurra Diversion Dams. The EPA understands that :

- present river flows are essentially regulated water releases from the dams;
- the monthly volume of water currently flowing in the Ord River is less than would have previously been experienced in the wet season as flood waters are contained within the dams, and is higher in the dry season;
- riverine vegetation which now exists downstream of the Ord Dam, for example Packsaddle Swamps and Parrys Lagoon, have adapted to this change in water regime over the last 40 years and have become regionally important wetland ecosystems. The now permanent waterbodies of Lake Argyle and Lake Kununurra and Lower Ord Wetlands are recognised as significant waterbird habitats which are protected under the Ramsar Convention;
- the change in the downstream water flow characteristics have also changed the nature of sediment delivery to the Lower Ord, and the extent of saltwater intrusion upstream along the Lower Ord River;
- recreational and tourism activities based in Kununurra have become significant uses of the Ord, and some prospective aquaculture ventures rely on the permanent down-stream water flow; and
- the 20<sup>th</sup> percentile of pre-dam monthly flows means that flows in the Lower Ord River would almost cease during August - November once the "interim" allocations for Stage 2 were diverted.

The EPA is aware that the methodology used in the Draft Interim Water Allocation Plan for determining Interim EWPs is partially based on work undertaken by Dr Angela Arthington for EWRs on a Queensland river system (Arthington et al, 1992). Advice received from Dr Davies indicates that the 20<sup>th</sup> percentile figure referred to as an EWP by Dr Arthington was not intended as a sustainable stream flow level, but was rather recommended to apply only under extreme conditions of drought. The Draft Interim Water Allocation Plan acknowledges this (WRC, 1999b). In view of this, Dr Davies suggests that this may not be an appropriate methodology to apply to achieve Interim EWPs for the Ord.

The EPA considers that the adoption of the 20<sup>th</sup> percentile monthly flow to determine Interim EWPs may not be appropriate. The EPA believes that in a riverine ecosystem such as the Ord River where very little scientific information is available on the riverine ecology, and where past land use is already having an unknown impact on the riverine ecosystem (for example discharge of water from irrigation channels, loss of riverine vegetation through grazing, and altered down-stream flows by dams) a more cautious precautionary approach is required. This view is consistent with the WRC's Draft Environmental Water Provisions Policy (WRC, 1999a).

The EPA also considers that as the riverine environment downstream of the existing dams on the Ord River are already substantially modified, there may not be value in trying to maintain a down-stream river flow which mimics pre-dam flows. In view of the significant ecological and social implications of altering the downstream environment yet again, the EPA believes it would be more appropriate to base the Interim EWPs on protecting environmental values which are sustainable under post-dam flows and so preserve the riverine ecosystem which has adapted to these changes. This is supported by the Department of Conservation and Land Management, Fisheries WA and a number of individual submissions.

Finally, the advice received from Dr Davies with respect to the significance of seasonal river flows or 'flood pulse' for the preservation of the riverine ecosystem is also an important consideration with respect to this issue. However, the EPA notes that the Draft Interim Water Allocation Plan points out that the Ord Dam now prevents flood flows (WRC, 1999b).

The EPA acknowledges that there is obviously inherent difficulty in determining appropriate Interim EWPs prior to the information being available to accurately determine EWRs. In his advice to the EPA, Dr Davies has suggested that an 'Expert Panel' be established with representatives with knowledge of tropical river ecosystems and from key Government agencies such as the Department of Conservation and Land Management, Fisheries WA, Department of Environmental Protection. This 'Panel' could work together to initially define the important water dependent ecosystems of the Lower Ord River. Flows required to maintain these systems at a low level of risk could then be estimated. Interim EWPs could then be proposed using the precautionary principle, and anticipated consumption use (for example irrigation and aquaculture requirements) and social requirements, which incorporate these flows. This suggested approach appears to the EPA to be consistent with the COAG Framework Agreement on Water Resource Policy.

The EPA recommends that the WRC should undertake a review of current best practice in defining EWPs for wet-dry tropic rivers. This review should include people with expert knowledge of tropical river ecosystems and relevant government agencies including the Department of Environmental Protection, Department of Conservation and Land Management and Fisheries WA. The outcome of this review should be used to define Interim EWPs in the Interim Water Allocation Plan.

The EPA suggests that the WRC consider incorporating into the Interim and Final Water Allocation Plans a formal environmental management system which monitors potential environmental impacts, provides mechanisms for adjustment, and which can be independently audited.

In view of the likelihood of water allocation licences being applied for prior to the Final Water Allocation Plan the EPA supports the WRC intention to make provision in any licences for amendments to water allocations.

Of primary importance to the EPA is that water allocation for the environment in the Interim and Final Water Allocation Plans is sufficient to sustain environmental values.

#### **4.2 Proposed investigations to determine Environmental Water Requirements**

No studies were undertaken of the Ord riverine environment prior to construction of Lake Argyle or the Kununurra Diversion Dam. The long term effect of the dams on the biophysical environment of the Lower Ord is therefore difficult to determine. Very little monitoring of the riverine ecosystem has been undertaken since the dams were constructed, however it is likely that the change from seasonal water flows to regulated water releases down the river system has had a significant impact on the downstream biophysical environment. Some components of the environment would have benefited from this change whereas others would have been adversely affected.

The WRC has outlined key ecological studies proposed to be undertaken to investigate and monitor the biophysical environment likely to be affected by the Water Allocation Plan and for this information to be used in the determination of EWRs for the Lower Ord River and consequential review of the Interim EWPs. The research as proposed by the WRC has been

fully assessed by Technical Advisory Committees set up by the Commonwealth Minister for the Environment. Applications for Commonwealth funding of this research have been successful, and it can therefore be assumed that they are considered to be comprehensive and realistic.

#### **Advice from Dr Davies**

Dr Davies has suggested that studies to link river flows and estuarine productivity may also be useful. This research would have implications on fish recruitment into the Ord River system, and the maintenance of healthy mangrove stands. This aspect has not been addressed by the WRC in the currently funded studies.

#### **Consideration**

Key biophysical and social issues of interest to the EPA associated with implementation of the Allocation Plan, and studies proposed to be undertaken by the WRC to address these issues have been summarised in Table 1.

The EPA considers that research proposed to be undertaken by the WRC as outlined in Table 1 is adequate and comprehensive. The EPA also suggests that consideration be given to widening the scope of studies to incorporate research into the effects of river flows on the intertidal community at the mouth of the Ord River. These intertidal wetlands areas are also listed under the Ramsar Convention as wetlands of international significance as waterbird habitat. The EPA is aware that the WRC has been working with CSIRO and other agencies to have more integrated studies undertaken to address wider issues.

#### **4.3 Impacts on cultural / heritage values**

The portion of the Ord River relevant to the Draft Interim Water Allocation Plan is located within an area within which native title has been granted to the Miriuwung Gajerrong people while the remainder is included within an area subject to native title claim by the Miriuwung Gajerrong people.

The WRC has undertaken a commitment to ensure that Aboriginal people's cultural values associated with the Ord River are considered in the development of the Final Water Allocation Plan expected in 2003. The WRC also advises that a detailed Aboriginal Cultural Values Study of the Ord River is to be developed with the local Aboriginal people over the next 6 - 12 months.

#### **Public submissions**

Several submissions were received from representatives of the Miriuwung Gajerrong people.

The submissions point out that the Draft Interim Water Allocation Plan affects lands and waters where there has been a determination of native title and where there are native title claims. Submissions stated that the Plan should acknowledge and address the economic interests and rights of the native title holders and those individuals who are members of the native title claim groups. There appears to be no accounting for these rights and interests in the Draft Plan.

A submission acknowledged that the WRC intends to broaden its community consultation, however the view was expressed that it is imperative that the premise of consultation be a document developed in a participative manner with the Aboriginal community involved. To date this has not occurred. It is suggested that the WRC should develop a clear and transparent strategy for consultation with the Aboriginal communities that the Water Allocation Plan may impact on.

Another submission suggested that a Cultural Heritage Management Plan for the Ord River should be developed by the Water and Rivers Commission.



**Table 1. Key biophysical and social issues and studies proposed to be undertaken by the Water and Rivers Commission to address these issues as per the Draft Interim Water Allocation Plan.**

POTENTIAL ISSUE		ASPECTS	WRC PROPOSED STUDIES
Vegetation	Riparian vegetation aquatic vegetation Terrestrial vegetation (floodplain) wetland ecosystems - Parry Lagoon marine flora - mangroves	Ord River Nature Reserve Australian Heritage Commission Site Red book system area Ord River Flood Plain is a listed Ramsar wetland	determine effect of flow on primary production compare relative importance of aquatic and riparian zones in primary production research vegetation requirements for regeneration and maintenance review existing literature and information study existing data on adjacent/similar rivers/permanent pools identify water dependent ecosystems
Fauna -	terrestrial fauna aquatic fauna - vertebrate invertebrate waterbirds	Lake Kununurra, Lake Argyle, and the Ord river Flood plain are listed Ramsar wetlands JAMBA & CAMBA international agreement Crocodylus porosus - salt-water crocodiles have been declared 'in need of special protection' under the <i>WA Wildlife Conservation Act</i>	research special habitat requirements for fish and waterbirds analyse aquatic food webs to gauge effect of flow on primary production review existing literature and information estimate effect of current regulation on river dependant fauna eg waterbirds, fish identify water dependent ecosystems
Landform	channel maintenance floodplain processes	Channel and floodplain already altered as a result of pastoral land use (erosion, damage to river channel). Area naturally subject to wide spread flooding, which has been modified as a result of the creation of Lake Argyle & Lake Kununurra (assoc. with Ord Stage 1 development)	work on channel morphology and flow distribution to assess off-channel ecosystem impacts hydrological monitoring - water level, volume (and salinity) at Carlton Crossing, and water level and salinity at key sites downstream of Tarrara bar model river hydraulics & flow regimes of lower Ord review existing literature and information analyse historical flow records to assess environmental risks with different flow regimes
Water quality	surface (riverine) groundwater	- surface water quality maintained by regular releases of water? Potential contamination as a result of current irrigation practices (tail water discharge) with lower flows - groundwater monitoring indicates long term rise in watertable as a result of clearing and/or past irrigation practices? raises potential salinity issues	monitoring and investigation of groundwater accession and salinity effects in the Ivanhoe and Packsaddle Plains work with the Ord Irrigation Co-operative, Water Corp. and AGWest in the establishment of improved water and land management practices within the region and where necessary making such practices a condition of new water licences
Social Issues	aboriginal heritage/cultural recreation use	Ord River & associated natural landforms known to be of significance to Aboriginal people Lake Kununurra is an important recreation site for residents and tourists - accommodation, boating, fishing, water ski-ing, diving	involve the local community and LA in establishing the management objectives for the Lower Ord River

## **Consideration**

Although submissions raised issues related to native title, the EPA has focused on the consultation process being undertaken by the WRC.

The EPA expects that the WRC will continue to progress the proposed 'Aboriginal Cultural Values Study' of the Ord River area, and that this will be undertaken in close consultation with local Aboriginal community representatives.

The EPA also endorses the preparation of a Cultural Heritage Management Plan for the Ord River as a means of identifying and managing sites which are of social and cultural significance to the Aboriginal community.

### **4.4 Impacts on social values**

The present water flow regime has encouraged increased use of and access along the Ord River below the Ord Dam. The river's recreational values have increased as a result of the availability of permanent deep water, and there is growing interest in development opportunities associated with tourism and aquaculture.

The WRC recognises that the interim water allocations for full development will reduce river levels in the Lower Ord and has the potential to have a long term impact on current tour operators (Appendix 4).

#### **Public submissions**

Concern was raised in several submissions that a reduced flow in the Ord River may reduce existing recreational fishing opportunities and reduce the navigability of the river, which will impact on existing tourism businesses operating on the Lower Ord River. The navigability of the Lower Ord River under the current flow regime is already difficult due to numerous shallow sites, and any drop in the water level will make the Lower Ord unnavigable to all vessels.

There was also concern that existing boat ramps may become unusable if the river water level drops below the lower edge of the ramp, or because low water levels in the vicinity of the ramp are too low for boats to safely manoeuvre.

## **Consideration**

The WRC will need to ensure that the water allocation planning process includes consideration of the range of social values and opportunities that the community identifies. Many of these are not consumptive users in themselves, but which may represent constraints on other uses due their particular requirements. Others are competitors for consumptive water allocations. The WRC has outlined its approach to dealing with these in its Draft Environmental Water Provisions Policy for Western Australia (WRC, 1999a) and has undertaken a commitment to seek input from community groups during the preparation of environmental management objectives for the Lower Ord.

**Appendix 1**

**References**

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Department of Conservation and Land Management (1998) Draft Management Plan - Lower Ord Ramsar Site.

Water and Rivers Commission (1999a) Draft Environmental Water Provisions Policy for Western Australia'. A draft policy statement to support implementation of the COAG Water Reform framework Agreement (1994). Water Reform Series, WR 4.

Water and Rivers Commission (1999b) Draft Interim Water Allocation Plan, Ord River, Western Australia. Water Resource Allocation and Planning Series, WRAP 2, May 1999.

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## **Appendix 2**

**List of individuals and organisations who forwarded submissions**

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List of Individuals and Organisations who forwarded submissions

The following State and Commonwealth Government agencies and interest groups forwarded a submission on the Draft Interim Water Allocation Plan:-

Environment Australia  
Department of Conservation and Land Management  
Fisheries WA

Aboriginal Legal Service representing the Miriwung and Gajerrong people, the Kimberley Land Council, and the Northern Land Council  
Northern Land Council

Conservation Council  
Ord Development Council  
Regional Recreational Fishing Advisory Council

HCJB World Radio  
Geo-Eng  
Kimberley Produce  
Macka's Barra Camp  
Ord Irrigation Cooperative  
Oria Orchards  
Southern Cross Aquaculture  
Wesfarmers

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## **Appendix 3**

**Issues raised in public submissions**

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**SUMMARY OF ISSUES RAISED IN SUBMISSIONS  
ON  
THE DRAFT INTERIM WATER ALLOCATION PLAN - ORD RIVER  
WATER AND RIVERS COMMISSION**

The issues of concern raised by submissions are listed below in the following groupings:

1. Methodology adopted to achieve EWPs
2. Impact on downstream ecosystems
  - 2.1 Fish
  - 2.2 Wetlands
3. Water quality issues
4. Aboriginal/heritage issues
5. Land Use Issues
  - 5.1 Water Licensing arrangements
  - 5.2 Horticulture
  - 5.3 Aquaculture
6. Stage 1 Irrigation Scheme
7. Social Issues
8. Other

1. Methodology adopted to achieve EWPs

- 1.1 There are too many uncertainties for any decisions to be made on water allocation at present.
- 1.2 The contribution of the Dunham River to the environmental flow requirements of the Ord River is not adequately recognised in the Plan.
- 1.3 The Plan does not address the importance of providing environmental flows that are vital to the maintenance of wetlands.
- 1.4 The allocation plan does not assess the method of water delivery and the need for significant fluctuations and some high level flows, which are necessary to maintain healthy river systems.
- 1.5 Given the lack of information on the riverine ecology of the Lower Ord (acknowledged in the Plan), a precautionary approach should be taken to deciding on the interim EWP for the Ord River. The Plan fails to justify the selection of the 20th percentile of 'pre-dam' monthly flows for the interim EWP values.
- 1.6 The likely environmental and social impacts (reduced habitat, reduced fish populations, reduced crocodile populations, increased pressure on fish stocks, impact on riverine vegetation and wildlife habitat, changes to primary production and food chains, impact on fauna migration and breeding, impact of increased pesticide exposure, reduced navigability of river, impact on lifestyle, reduced tourist industry due to degraded environment) of a greatly reduced flow rate in the lower Ord in the dry season should be fully researched before the interim flow regimes are instituted.

1.7 The Plan should be based on current water use data, yet it does not provide any indication of the amount of water currently used by farmers, nor does it admit that water usage to date has been wasteful.

1.8 The interim water allocation do not appear to be based on sound and open analysis of a range of scenarios.

1.9 Diagrams on pages 4 and 5 of the Plan compare Lake Argyle outflows and EWPs at the current and full development. There is no explanation for the reduction of the EWP from 550 GL/year (current) to 510 GL/year at full development.

1.10 The adoption of the 20th percentile of the 'pre-dam' monthly flow at the Dunham River confluence as an interim EWP, and gauging of the flow at that point is meaningless if water is taken from the river below this point for irrigation of Mantinea Flats and Carlton Plain. Clarification of the actual proposed (interim) environmental water provisions at points on the river downstream of extraction locations are required.

1.11 The current flow regime in the Lower Ord is very different to the pre-dam situation and it is therefore inappropriate to base the interim EWPs on a percentile of pre-dam flows as this would result in a radical change in the lower Ord and its ecosystems, from year round flows to almost no flow in the dry season.

1.12 The adoption of the 20th percentile of the 'pre-dam' monthly flow at the Dunham River confluence as an interim EWP will result in a river that is drier year round than now. The likely consequence of this is a dramatically altered environment.

1.13 It may be more appropriate to base the EWPs on the post dam flow regime as much of the current ecosystem and recreational/tourist develop is a product of flow regime over the last 30 years.

1.14 The Plan cannot be in accordance with the precautionary principle until the technical and social studies and models referred to in section 1.4 are complete.

## 2. Impact on downstream ecosystems

### 2.1 Fish

2.1.1 The Plan lacks information on the potential effect on fish habitats and stocks. Given that a decline in fish stocks is a possible consequence of the Plan, the proponent should provide some form of assistance to help assess an alternative barramundi fishery in Lake Kununurra.

2.1.2 EWP calculations could include the requirements of an environmental indicator species such as Barramundi.

2.1.3 The Plan should address the disjunction of aquatic ecosystems which has resulted from the damming of the Ord River creating a barrier to the natural movement of species. For example Barramundi are no longer found upstream of Lake Kununurra.

### 2.2 Wetlands

2.2.1 There is no discussion on the potential impact on Ramsar sites including Lake Kununurra, Lake Argyle, Lower Ord Floodplain which are protected under the *Environmental Protection and Biodiversity Conservation (EPBC) Act*.

2.2.2 Variable water levels are critical for the normal functioning of wetlands. It is unclear how will these EWPs be maintained.

2.2.3 The implementation of the Plan may affect the ecological character of the whole of the Ord River Floodplain Ramsar site as well as the Lakes Kununurra and Argyle Ramsar site, with implications for Australia's international Convention obligations.

### 3 Water quality issues

3.1 The reduction in water quality in the Ord River as a result of fertilizer and chemical export from drainage from irrigation areas (existing and future), and from increased turbidity, is likely to have a significant impact on the environment downstream. This issue should be managed.

3.2 The herbicide Acriline is currently used to control weed growth in the M1 irrigation channel. Acriline is no longer used in many countries due to its environmental impact. The Plan should incorporate river health maintenance criteria and address the Acriline issue.

3.3 The Water and Rivers Commission are relying on the EPA's environmental assessment of the Plan to result in protection of the health of the Ord River.

3.4 The Plan acknowledges that the interim EWP is not an actual fresh water allocation and could include low quality drainage water. It is not considered acceptable to include drainage water as part of the EWP.

3.5 The Plan presents a scenario of using the environmental water provision to mitigate the potentially poor quality water re-entering the Ord River from the irrigation drainage system. Management strategies should be developed and implemented to manage tail water disposal.

3.6 The Plan does not identify a decision-making process to facilitate a rapid response to problems such as a pollution incident or necessary flow regime changes.

### 4 Aboriginal/heritage issues

4.1 The Plan should acknowledge and address Aboriginal issues, and include a clear and transparent strategy for consultation with the Aboriginal communities upon which the Plan may impact. It should also provide a framework to ensure inclusion of the Ord River's role in the lives and cosmology of the Aboriginal people in the allocation process.

4.2 A Cultural Heritage Management Plan for the Ord River should be developed by the Water and Rivers Commission.

4.3 As the Plan affects land and waters, where there has been a native title determination and there are native title claims, the rights and interests of those parties must be appropriately incorporated in the Plan. ('rights' covers to possess, occupy, use and enjoy, access, control access, use/enjoy resources, trade resources, control use/enjoyment of resources, maintain/protect places of importance under traditional law/customs/practices etc). There is currently no accounting for these rights and interests in the Plan.

### 5 Land Use Issues

#### 5.1 Water Licensing arrangements

5.1.1 The Plan should treat private irrigators equally with the Irrigation Service Providers.

5.1.2 No provision has been made in the Plan for issuing licences to those irrigators currently pumping water directly from either Lake Kununurra or from the Ord River downstream of the diversion dam.

5.1.3 The Plan should provide for 15 year water allocation licences with periodic renewal subject to satisfactory fulfilment of any licensing conditions.

5.1.4 Water allocation for future irrigation development needs to be made on a long term basis rather than short term to ensure viability.

5.1.5 The Plan does not define a process whereby irrigation allocations could be changed after they have been issued, should EWRs be such that adjustment is necessary.

5.1.6 The Plan refers to the possible modification of the Water Supply Agreement which covers the operating rules for the Ord Hydro Project. The submitter suggests that a tapered operating rule that allocates more water at higher Lake Argyle water levels, and reduced allocations at an earlier stage as lake water levels drop should be implemented, and that the current allocation process doesn't address the issues of optimising operating rules to improve project outcomes.

5.1.7 It is important to ensure that the responsibility for the water quality of irrigation water returning to the Ord River is carried by those using the water (ie the irrigators). This would be best done as part of the Water Allocation Plan.

5.1.8 The Plan makes the allocation of additional water to existing users dependant on demonstration by the user that more than 60% of the area is planted to sugarcane. Given this requirement, the Water and Rivers Commission should liaise with Agriculture Western Australia and the Sugar Industry to obtain actual water usage for sugar cane production.

## 5.2 Horticulture

5.2.1 To minimize environmental impacts, the horticulturalists should be required to address such issues prior to being issued with a water licence.

5.2.2 To ensure that suitable management techniques addressing potential groundwater and salinity problems are committed to by horticulturalists in the area, the horticulturalists should be required to address such issues prior to being issued with a water licence.

5.2.3 Further consideration is required of riparian interests potentially impacted by the Plan.

5.2.4 There are concerns that the allocation of 300 GL of water to new irrigation areas as stated in the Plan is insufficient for the area of land proposed for expansion of horticulture.

## 5.3 Aquaculture

5.3.1 Any change in flow rate in the Lower Ord resulting from the Plan is likely to affect the viability of the large scale aquaculture project planned for the alluvial flats 12 kilometres north of Wyndham.

5.3.2 The impact of water allocation Plan on aquaculture (existing and potential) on the Ord River are not directly addressed in the Plan.

5.3.3 The water requirements of aquaculture on the Lower Ord needs to be given full consideration in determining water allocations, noting the potential for significant economic contribution of aquaculture to Wyndham in particular.



5.3.4 Proposed EWRs have the potential to affect aquaculture in the Wyndham area by restricting freshwater flow downstream. River flow may more saline during periods of high evaporation and some aquaculture requires low salinity water.

## 6 Stage 1 Irrigation Scheme

6.1 Water allocation issues from the Stage One irrigation development, such as effluent from the cane plant processing, should be addressed prior to any water licensing for the Stage Two irrigation development.

6.2 Until water management in the existing Stage I irrigation area is improved and currently intractable problems such as the contamination of drainage with pesticides is solved, it is essential that the EWP be set at a level that protects the riverine environment from the impacts of low quality drainage water.

6.3 The Water and Rivers Commission should investigate upgrading the existing channel system or use of the drainage network in that area of land in the Stage 1 development that has restrictions to water because of the design of the water delivery system.

6.4 Until the full environmental effects of Stage I are known the Water and Rivers Commission should invoke the precautionary principle by recommending against further development of irrigation areas.

## 7 Social Issues

7.1 Implementation of the Plan will reduce flow rates in the Lower Ord River resulting in detrimental changes to the environment, including (but not limited to) a reduction the navigability of the river to vessels, which will impact on existing tourism businesses operating on the Lower Ord River. The navigability of the Lower Ord River under the current flow regime is already difficult due to numerous shallow sites, and the drop in the water level as a result of the Plan will make the Lower Ord unnavigable to all vessels.

7.2 Implementation of the Plan will make some existing boat ramps unusable as the river water level will be below the lower edge of the ramp, or because low water levels in the vicinity of the ramp will make it unsafe for boats to move in that area.

7.3 Further consideration is required of social impacts of implementation of the Plan.

7.4 The impact of water allocation Plan on the recreational activities and industries on Lakes Argyle and Kununurra are not directly addressed in the Plan.

7.5 Resources should be devoted to identifying and managing access to the Ord River to ensure that fishing and other recreational use is possible and sustainable as a result of any changes caused by implementation of the Plan.

7.6 Recreational fishing in the Lower Ord is a large and important part of the local economy. To help protect this industry under law a Fish Habitat Protection Area is currently being instituted on the Lower Ord. The social value of recreational fishing and boating should be fully recognised in determining EWPs.

## 8 Other

8.1 Will the Plan allow for a 2.2 MW hydroelectric plant requiring 16 - 18 cubic metres of water per second to be developed on the Kununurra Diversion Dam?

8.2 To ensure that a water provider is able to develop a water distribution operating strategy encompassing estimates of the seasonal water demand and crop type as required under the Plan, the Water and Rivers Commission and Water Corporation should install devices and programs for monitoring.

8.3 Consideration must be given to the existing and proposed economic interests that depend on the current flow regime.

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## **Appendix 4**

**Proponents response to issues raised within public submissions**

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# **Response to Summary of Issues Raised in Submissions on The Draft Interim Water Allocation Plan – Ord River Western Australia**

*by Water and Rivers Commission*

## **1 Introduction**

The Commission has prepared this response to the summary of issues raised in submissions received by the Environmental Protection Authority (EPA) by September 10, 1999. This response is based on the summary of issues prepared by Department of Environmental Protection officers and passed to the Commission on September 22, 1999. The Commission has also briefly reviewed the more substantive submissions directly. The Commission has sought to address all the key issues raised.

While some submissions have acknowledged the interim nature of the plan and the necessity for additional work to prepare a final allocation plan, many others have not. The summary of issues raised reflects many of the uncertainties that can only be addressed when the additional studies have been carried out and the allocation plan is completed (anticipated in 2003).

The key aspect for the EPA to consider therefore is the adequacy of the Commission's precautionary approach proposed in the interim plan. Consequently the Commission's response commences with re-statements of the major qualifying aspects of the Interim Plan, the actions to resolve uncertainties before 2003 and the Commission's position on changing licensed quantities and conditions when the full plan is prepared. The Commission then addresses the major issues raised in the submissions before responding to the specific issues identified by the Department of Environmental Protection in their summary of submissions.

## **2 General**

### **2.1 *Uncertainty, the precautionary principle and resource security***

The Commission is committed to promoting the sustainable use of the water resources of the Ord River in line with the Government's commitment to the expansion of the Ord Irrigation Project. It is the Commission's responsibility to ensure that the development is sustainable in its use of the water resource.

A full understanding of the ecological, social and cultural impacts of current and planned water use may not be available before significant investment decisions on further expansion of the irrigated areas are to be made. The Interim Water Allocation plan was prepared to assist the planning of Stage 2 developments but clearly recognises that some uncertainty will remain in the water available until the full allocation plan is prepared.

This uncertainty and the consequent precautionary approach to the allocation of water are clearly established in the document. The underlying principles used in proposing the interim allocations gave priority to the environment, recognised the imperfect scientific basis of current knowledge and the need for a precautionary approach (page 37). The allocations ensured that additional "un-allocated" water is available to manage the lower Ord flow regime when clear and agreed environmental values for the Lower Ord River are determined (page 47). Licenses are proposed only to be issued until the full allocation plan is completed or five years (whichever is the shorter) (page 52). The draft plan currently indicates that in the event that additional water in excess of that "un-allocated" was necessary to meet special EWPs needs

flow and water level criteria at points along the river to maintain flow regimes that meet defined water management objectives for different sections of the Lower Ord river.

Given that the current flow regime has been similar since the construction of the main dam over 20 years ago, and is unlikely to change substantially prior to completion of the “final” allocation plan, the Commission believes the interim EWPs should remain until the planned studies are completed or at least substantially advanced and specific management criteria are confirmed. The Commission expects those criteria to then be subject to assessment under Part IV of the Environmental Protection Act.

### **2.3 Effects of the Main Dam on the wet season flood regime**

Concerns have been expressed about the limited consideration of the dynamics of the downstream flow regime and its potential ecological impacts on the Ramsar Wetlands of the Lower Ord Floodplain. However, the construction of the Main Dam has caused fundamental changes to the flooding regime of the Lower Ord River. It is not possible for the Commission to significantly influence some of the consequences of the Main Dam through the water allocation plan.

As stated on page 43, the lower Ord River “will never carry the large floods which occurred prior to the construction of the Ord Main Dam. Floods generated in the upper catchment are substantially reduced by the large flood storage of Lake Argyle, in turn a result of the narrow spillway of the Main Dam. The smaller peak flows in the lower Ord are now generated when floods of the un-regulated Dunham River occur at times of high spillway flows from Lake Argyle.”

There is only limited scope to add to these smaller floods by manipulating the operational practices for the Kununurra Diversion Dam during the wet season. Nevertheless, these options will be considered in the development of the final plan.

### **2.4 Native Title Issues**

Some submissions considered that the Plan did not address Native Title issues particularly in relation to legal recognition at common law and the determination of the Miriuwung and Gajerrong No. 1 claim.

The Commission is fully aware that any native title rights and interests of Aboriginal people in water are protected by the Commonwealth Native Title Act. This applies to native title claims as well as those where native title may have been determined. Allocation plans effectively foreshadow future water licensing decisions and are prepared to promote the sustainable management of water resources. The Commission will ensure that Aboriginal people’s cultural values associated with the Ord River are considered, together the rest of the community, in the development of the final allocation plan in 2003.

In addition, in compliance with the Native Title Act, the Commission will be notifying the native title holders and claimants before any licences are granted and providing them with an opportunity to comment. If any title rights or interests in water are affected by the granting of new licenses, the native titleholders are entitled to compensation from the State.

The nature and extent of “native title rights and interests”, as described in the Miriuwung and Gajerrong No. 1 determination, is subject to court appeal and is likely to take a number of years to be resolved. Whether any compensation for impairment is payable is more appropriately addressed when the “nature and extent” of native title is clarified by the courts.

- 1.5 Given the lack of information on the ecology of the Lower Ord (acknowledged in the Plan), a precautionary approach should be taken to deciding on the interim EWP for the Ord River. The Plan fails to justify the selection of the 20<sup>th</sup> percentile of 'pre-dam' flows as the interim environmental water provision

See Section 2.2

- 1.6 The likely environmental and social impacts (reduced habitat, reduced fish populations, reduced crocodile populations, increased pressure on fish stocks, impacts on riverine vegetation and wildlife habitat, changes in primary production and food chains, impact on fauna migration and breeding, impact of increased pesticide exposure, reduced navigability of the river, impact on lifestyle, reduced tourist industry due to degraded environment) of the greatly reduced flow rates of the lower Ord should be fully researched before the interim flow regimes are instituted.

The interim flow regimes described in the Draft Interim Plan will not change the current flow regime significantly before the full implementation of the Stage 2 development. The detailed EWR studies and the consideration of social impacts, both of which are necessary to allow determination of EWPs, will be required before the final plan is completed.

- 1.7 The plan should be based on current water use, and it does not admit that water usage to date has been wasteful.

Current water use figures are used in the Interim Plan but the Plan acknowledges that these figures need to be confirmed through additional monitoring which is now being established. The current use figures will therefore be updated in the final plan. The need to improve the current level of water use efficiency from the Stage 1 area is recognised in the allocation strategy (page 39) and the planned licensing arrangements (page 54). This is a significant commitment by the Commission to work with the Ord Irrigation Co-operative to improve overall water distribution efficiency in a practical timeframe.

- 1.8 The interim water allocations do not appear to be based on sound and open analysis of a range of scenarios.

The plan summarised two scenarios representing the current situation and a scenario based on a "water-efficient, sustainable irrigation industry and the continued generation of hydro-power based on Western Power's regional grid requirements" (page 27). Further details of other irrigation options simulated are available in the technical supporting documents listed in the references. The full range of irrigation water demands were tabulated (Page 24) and were based on supplying a range of future irrigated crop types on the available irrigable soils of the area. The adopted long term scenario included water demands that reflected the plans of the Government's preferred tenderer for the M2 Stage 2 Project. This is clearly the most likely future demand and should form the basis of current planning.

The approach used to ensure the EWPs were met and the reliability with which the water demand could be provided was spelt out in Section 7.2 (page 27) of the plan. The assumptions used were detailed in Section 7.3 (page 28-29)

Other scenarios, including maintenance or enhancement of navigation/recreational opportunities and consideration of a range of potential aquaculture requirements were not specifically modelled. The Current Situation scenario simulates flow regimes that would allow existing navigation and recreational use of the Lower Ord to continue and reflects the extreme case of maximum in-stream allocation and no Stage 2 Irrigation expansion. Large quantities of water are required to maintain the river navigable to Cambridge Gulf during the dry season.

Within the context of the interim consumptive use allocations, flow regimes that maintain water based recreational opportunities on separate navigable river reaches will be considered when updating the EWPs in the "final" plan. Aquaculture proposals on Lake Argyle and in the estuarine reach of the Lower Ord

## 2 Impact on Downstream ecosystems

### 2.1 Fish

- 2.1.1 The plan lacks information on the potential effect on fish habitats and stocks. Given that a decline in fish stocks is a possible consequence of the Plan, the proponent should provide some form of assistance to help assess an alternative Barramundi fishery in Lake Kununurra.

It is agreed that the Interim Plan lacks information on the potential impacts on fish habitats and stocks. It is intended that this be addressed in the final plan, as sufficient information was not available to the Commission at this stage. The EWR studies will improve the ability to estimate the potential impacts on fish habitat. If significant impacts are identified management options will be proposed in the development of the full plan. The final EWPs may well define flow regimes that seek to protect fish habitat.

- 2.1.2 EWP calculations could include the requirements of an environmental indicator species such as Barramundi

Will be considered in the final plan. See response to Point 2.1.1 above.

- 2.1.3 The Plan should address the disjunction of aquatic ecosystems, which has resulted from the damming of the Ord River creating a barrier to the natural movement of species. For example, Barramundi are no longer found upstream of Lake Kununurra

The environmental impact of the existing structures was not the focus of the interim water allocation plan. However, recreational fishing based on the waters of the Ord River is an important value of the river system. The development of management objectives for the Lower Ord River and allocation strategies to achieve them will be an important part of the development of the final plan. Water requirements of possible fish management strategies (covering options such as fish ladders and other alternatives) will need to be quantified and the implications for other allocations studied.

### 2.2 Wetlands

- 2.2.1 There is no discussion on the potential impact on Ramsar sites including Lake Kununurra, Lake Argyle, Lower Ord Floodplain which are protected under the *Environmental Protection and Biodiversity Conservation (EPBC) Act*

Changes in the water allocation strategy in the plan will not significantly affect the fluctuations in levels of Lake Kununurra and Lake Argyle. The fluctuations in Lake Argyle levels between the current and full development scenarios are similar (Figure 6 & 8) and governed by variations in the annual streamflow to the lake. Levels in Lake Kununurra are relatively stable. As both lakes were nominated as Ramsar sites under the current flow regime, their Ramsar values should not be affected by the proposed allocation strategy.

The Ramsar site of the Ord River Floodplain is essentially an estuarine environment dominated by large tidal movements. The Ord River flood regime and sediment load has clearly been altered by the construction of the Ord Main Dam and affected the seasonal input of fresh water and nutrients to the Ord River Estuary and Cambridge Gulf and will not be significantly changed by the proposed allocations during the wet season (Figure 11 – wet season months). The proposed allocations will reduce the dry season flows returning them closer to the natural flow regime (Figure 11- dry season months). While these changes will have some local impacts on the mudflats and mangrove environments of the Ord River Floodplain they are considered small relative to the changes likely to have been caused by the altered flood regime. As the likely larger environmental change occurred before the Ramsar site was nominated it is hard to see that reductions in the dry season flows will have a significant environmental impact on the ecology of the mudflats and mangrove environments (see also discussion under Section 2.3 and Point 1.3).



- 3.5 The Plan presents a scenario of using the environmental water provisions to mitigate the potentially poor quality of water re-entering the Ord River from the irrigation drainage system. Management strategies should be developed and implemented to manage tail water disposal.

Agreed. The Commission recognises the need to reduce the quantity and reduce the risk of downstream contamination from drainage return flows from the Stage 1 area (see page 39 and 46). The Plan foreshadowed the necessary licensing regime (pages 54 and 55 and comments under Point 2.2.1 above) to implement the required management.

- 3.6 The Plan does not identify a decision-making process to facilitate a rapid response to problems such as a pollution incident or necessary flow regime changes

A rapid response to a pollution incident is outside the scope of the allocation plan. The current EWRs study has as one of its objectives the development of an adaptive monitoring and management program to ensure that agreed ecological objectives are met.

The Department of Environmental Protection (DEP) has legal responsibility for pollution incidents under the Environmental Protection Act. A partnering arrangement has been established for the investigation of water related pollution incidents between Fisheries WA, Water and Rivers Commission and the DEP

A joint Ord Irrigation Cooperative (OIC) and the Water and Rivers Commission water-sampling program of drainage waters from the Stage 1 irrigation area is also in operation. This covers key pesticides and nutrients levels and includes alert levels and follow-up investigation protocols. Fisheries WA, Water and Rivers Commission and the Department of Environmental Protection are developing an overall protocol for responding to fish kills.

#### **4 Aboriginal/heritage issues**

- 4.1 The Plan should acknowledge and address aboriginal issues, develop a clear and transparent strategy for consultation with the aboriginal communities upon which the Plan may impact, and provide a framework to ensure the inclusion of the Ord River's role in the lives and cosmology of the Aboriginal people in the allocation process.

This is planned as an integral part of the development of the final allocation plan in 2003. Planning for a detailed Aboriginal social and cultural values study of the Ord River area has commenced and will be developed with the local Aboriginal people over the next 6 –12months.

- 4.2 A Cultural Heritage Management Plan for the Ord River should be developed by the Water and River Commission

The Commission is committed to considering Aboriginal cultural and heritage values in determining of the flow and water level regimes to be maintained along the lower Ord River. The Commission will ensure that the flow regime will be implemented through licensing under the *Rights in Water and Irrigation Act (1914)*. A Cultural Heritage Management Plan incorporating riparian land and waterway management as well as flow regime management has considerable merit, but is beyond the scope of the allocation plan. Development of an integrated management plan may emerge from the Community's Land and Water Management planning process, the Shire's structure planning and land management responsibilities and the Commission's work in establishing environmental management objectives for the Lower Ord as part of the development of the Ord Allocation Plan by 2003.

The way the reduction would be introduced would depend on circumstances at the time. If the reduction were to be introduced by equitably across existing users, the degree to which best practice water management was being applied would be an important consideration.

5.1.6 The Plan refers to the possible modification of the Water Supply Agreement that covers the operating rules for the Ord Hydro Project. The submitter suggests that a tapered operating rule that reduces allocations at an earlier stage as lake levels drop should be implemented, and that the current allocation process doesn't address the issues of optimising operating rules to improve project outcomes.

Agreed. Initial discussions with Ord Hydro have been held to address this issue. They need to be followed through as part of the detailed discussions on reviewing the Water Supply Agreement.

5.1.7 It is important to ensure that the responsibility for the quality of irrigation water returning to the Ord River is carried out by those using the water (ie irrigators). This would be best done as part of the Water Allocation Plan.

Agreed. See response to Point 3.1.

5.1.8 The Plan makes the allocation of additional water to existing users dependent on demonstration by the user that more than 60% of the area is planted to sugarcane. Given this requirement the Water and Rivers Commission should liaise with Agriculture WA and the sugar industry to obtain actual water usage for sugar cane production.

Agreed. This is to occur as part of the studies associated with the development of the full allocation plan in 2003.

## 5.2 Horticulture

5.2.1 To minimise environmental impacts, horticulturalists should be required to address such issues prior to being issued with a water licence

The Stage 2 development (mainly sugarcane) is being formally assessed under the EP Act. As discussed under Point 3.1 licence conditions relating to return flows are signalled in the draft plan. However, not all the environmental risks associated with horticulture can or should be addressed through water licence conditions. The application of herbicides, for example, is regulated under other statutes.

5.2.2 To ensure that suitable management techniques addressing potential groundwater and salinity problems are committed to by horticulturalists in the area, the horticulturalists should be required to address such issues prior to being issued with a water licence.

See Points 3.1 and 5.2.1

5.2.3 Further consideration is required of riparian interests potentially impacted by the Plan.

As indicated in 5.1.1 above, the Interim Plan will be amended to indicate that riparian users that do not receive water via the water distribution works of others will be separately licensed. Further consideration of riparian issues, including the social and cultural values of the indigenous and non-indigenous communities, will be central to developing the final allocation plan (see points 4.1, 7.1 and 7.3).

5.2.4 There are concerns that the allocations of 300 GL of water to new irrigation areas as stated in the Plan is insufficient for the area of land proposed for expansion of horticulture.

The uncertainties in crop water demands is described in the plan (Page 23) and actions to update the estimates in developing the final plan are described in Section 9.5 (Pages 48 and 49).

## 6 Stage 1 Irrigation Scheme

- 6.1 Water allocation issues from Stage One irrigation development, such as effluent from the cane plant processing, should be addressed prior to any water licensing for the Stage Two irrigation developments.

Water use issues that arise from Stage One are addressed as part of the regular reviews of the Stage 1 licence.

As stated in the Draft Interim Plan “ The Commission sets a high priority on reducing the risk of water borne contamination in the lower Ord River from drainage return flow from the Stage 1 area (Section 9.2) and on promoting the efficient use of water from the Ord River. A timetable for the introduction of measures to improve the distribution and on-farm efficiency will be negotiated between the OIC and the Commission before the irrigation distribution assets are transferred and the licence conditions finalised.” (Page 54). The plan goes on to identify terms of the licence including requirements to reduce drainage return flows from the district over an agreed timeframe and manage return flow quality to agreed targets.

No licences are to be issued to Stage 2 developments until each development receives environmental approval under the EP Act.

- 6.2 Until water management in the existing Stage 1 irrigation area is improved and currently intractable problems such as the contamination of drainage with pesticides is solved, it is essential that the EWP be set at a level that protects the riverine environment from the impacts of low quality drainage water.

Maintenance of adequate water quality to meet adopted management objectives for the lower Ord is likely to form a key criterion in the establishment of the final EWPs. These are expected to be set before the full Stage Two water demand is diverted. As noted in point 6.1 above, the Commission is to directly address management of the irrigation return flows with OIC, including the setting of new Stage 1 licensing conditions.

- 6.3 The Water and Rivers Commission should investigate upgrading the existing channel system or use of the drainage network in that area of land in the Stage One development that has restrictions to water because of the design of the water delivery system.

Improving the service delivery of water to farmers is the responsibility of the Water Corporation (the service provider) and its contractor (OIC). The Commission will work these bodies to investigate ways to improve the efficiency of overall water application and to reduce the risks of downstream contamination.

- 6.4 Until the full environmental effects of Stage I are known, the Water and Rivers Commission should invoke the precautionary principle by recommending against further development of irrigation areas.

As noted under Point 6.1, current Stage Two development proposals are subject to full environmental assessment and will only be approved if considered environmentally acceptable.

The Plan acknowledges that without improved management of the return flows from Stage One there is an increased risk of downstream water quality problems emerging as water is diverted for the Stage Two developments. It is for the reason that the new water licensing conditions on Stage 1 (Page 54 and Point 6.1 above) have been proposed. The Commission considers that there is time to implement reductions in Stage 1 return flows as the water diverted for Stage 2 developments increases over time.

Act to enable water allocations and licences to be issued for water based recreational purposes. These provisions would be used where a dedicated water allocation is required to meet recreation or navigational needs that cannot be accommodated through other EWP provisions or other allocations. While this is unlikely to be necessary here, the legislative changes provide the necessary flexibility when developing the final water allocations.

- 7.5 Resources should be devoted to identifying and managing access to the Ord River to ensure that fishing and other recreational use is sustainable as a result of any changes caused by implementation of the Plan

Agreed. Significant changes in land and river access will occur if and when the Stage 2 developments proceed. Funding from State and local Government sources and possibly the developers would be required to implement any overall integrated water based recreational plan.

- 7.6 Recreational fishing in the Lower Ord is a large and important part of the local economy. To help protect this industry under law a Fish Habitat Protection Area is currently being instituted on the Lower Ord. The social value of recreational fishing and boating should be fully recognised in determining EWPs

Agreed. This will be an important part of the development of the final EWPs. Work is commencing this year to include the significance of recreational fishing into an overall economic model of different water allocation decisions for the Ord River.

## 8 Other

- 8.1 Will the Plan allow for a 2.2 MW hydro-electric plant requiring 16 to 18 cubic metres per second to be developed on the Kununurra Diversion Dam.

No explicit allocation has been made for water to supply a 2.2 MW Hydro-power plant at the Kununurra Diversion Dam. However, water released to meet downstream irrigation allocations represents about one-third of this demand. Additional water may be available to meet the full demand depending if the final EWPs allocate water during the months of lowest flow.

In line with the principles of water allocation included in the Plan, no firm commitment can be given to this water demand until the EWP studies have been finalised and the interim allocations updated.

- 8.2 To ensure that a water provider is able to develop a water distribution operating strategy encompassing estimates of the season water demand and crop type as required under the Plan, the Water and Rivers Commission and Water Corporation should install devices and programs for monitoring.

The Commission is expecting the distribution agency to collate information from its customers on planned crop types and, with input from agencies such as Agriculture WA, estimate likely average total on-farm water needs and quantity of water expected to be diverted in the forthcoming year. This will facilitate planning of the headworks operation over the following 12 months, enable comparisons between actual and expected diversions to be assessed through the year, and assist in ensuring compliance against licence conditions. While this aspect will not require additional on-farm monitoring devices, further improved accuracy of monitoring of flows within the distribution and drainage systems is planned.