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Wednesday, 9 January 2011

Committee Secretary
House of Representatives Standing Committee on Regional Australia
PO Box 6021
Parliament House
CANBERRA ACT 2600

Dear Sir/Madam,

SUBMISSION ON THE MURRAY DARLING BASIN PLAN

I make this submission in my capacity as a water management policy adviser to the private sector.

Since 2000 I have advised on a number of commercial ventures within the Murray Darling Basin including those in the industrial, agriculture and mining sectors.

Part of my strategic role has been to make representations to the State and Commonwealth governments on specific development and water management issues including applications to the Water for the Future programme.

From time to time together with commercial interests we have developed water saving and efficiency management proposals for a number of catchments in the northern and southern parts of the Murray Darling Basin.

Between 2003 and 2004 I acted as the Project Director for the Pratt Water Murrumbidgee Project.

The project was a jointly funded project by government and Pratt Water.

Details of the Pratt Water Report and specialist studies can be found at www.prattwater.com.au

The project applied private sector business principles to the Murrumbidgee catchment based on an inventory approach to water management as there was increasing concern about discrepancies in the accounting for water and the uses of that water throughout the supply chain – including the environment.

Questions that drove the project included:

- How much water is in storage?
- What and where are the inflows and losses?
- How much water is' invoiced 'for production and the environment?
- What is the scale of water losses and water saving opportunities
- What investments can be made to save water?
- How can saved water be harnessed to provide sustainable regional benefits – human and environmental?

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- How can the cost of water saving infrastructure be reduced and be privately funded?
- What reforms can governments adopt to boost investment in water efficiency and incentives for entitlement holders to share in the benefits?

The findings of the 'Business of Saving Water' project were published in December 2004 and are detailed in the submission.

The project team:

- Commissioned 40 individual projects and consulted widely with government and the community and involved 150 people from 60 organisations.
- Developed a model for Australia wide application but focussed on the Murrumbidgee River catchment

During the course of the Pratt Water study and in recent years I have had the advantage of examining water management from many different perspectives and the lessons could be a usefully applied to other catchments.

I offer the attached submission to the Committee as a practical means of integrating the objectives of the Commonwealth Government in managing the Murray Darling Basin utilising the expertise that exists with the private sector, State Governments and research academia with a view to the Commonwealth adopting a practical and realistic programme of water management for both the environment and production.

Given the timeframe for the Committee and the enormity of the task of assessing social and economic impacts of the proposed MDBA SDL's I believe it is critical that the Committee recommend a management process and the means of implementation if it is be a useful contributor to the debate.

My gravest concern is the proliferation political and ideological arguments espoused by many participants in the Murray Darling debate will lead to a further abdication of inland Australia by government focussed on 'numbers' and a diminution in the nation building policies necessary to retain 'ownership' of the most significant combined environmental and production asset in Australia.

Adaptive management is required to move away from focussing on entitlement as the principle means of policy to a range of adaptive management techniques that recognises the variability of the Basin and creates opportunities for both the environment and community.

Should you require elaboration on this submission I would be pleased to appear before the Committee.

Yours faithfully,

Ian Wisken
The Fifth Estate
Corporate Advocates

MOVES TOWARDS A PRACTICAL MURRAY DARLING BASIN PLAN

Introduction

The MDBA is tasked with an almost impossible objective of realising a Basin Plan in the absence of key elements necessary for the adoption and implementation of an effective Plan.

Government needs to take a step back and recast the role of the MDBA. The management structure and any resulting plan must recognise and cater for the climatic, social and regulatory variations that exist within the Murray Darling Basin.

Fundamental to that is recognition of the 'boom and bust' weather cycles that characterises and drives all other elements of the Basin behaviour – water, environment, production, economy and social harmony.

This single common theme must underpin policy action in any Basin Plan.

Such a Plan requires engagement with the community and most critically has the involvement and 'ownership' of key parties to any environment and production compact. A compact which is indivisible or it will fail if dealt with in parts – ideological or otherwise.

There are some fundamental processes requiring attention before delivering worthwhile reform:

1. *Are the numbers correct?*

   The Guide to the Plan identified the amount of additional surface water required for the environment as between 3,000 and 7,600 GL/yr (long term average) - >60 percent variation in itself.

   There is sufficient doubt over the basis of the numbers and any policy reliance is therefore undermined by the lack of veracity and transparency of the modelling. This apart from the usual errors implicit in 'averaging' and 'smoothing' short term variations to create statistical meaningful outputs.

   The MDBA has also decided to include the impact of climate change in determining SDLs. However, uncertainty of the 'numbers' and uniform application across the Basin will create significant errors in the final SDL's. These errors are again compounded by the highs and lows of natural climate variability which are difficult to model.

   To apply a uniform climate change impact across the Basin is bad science and fails to deal with the reality of different weather and climatic systems between the northern and southern areas of the Basin.

   The latter is a critical element of the Basin Plan and alternative methods of equitably accounting for climate change need to be investigated in accordance with the 2010 National Water Commission on accounting for climate change in water allocation planning. To do otherwise would compound significant errors and render the resultant SDL's useless and damaging to both the environment and production.

2. *Do we know how much water is required for the environment?*

On the basis of the available technical information it is not possible for a full and transparent assessment of environmental water requirements. The science required to assess floodplain flows and groundwater assessments is not robust and brings into question the accuracy of the modelling used to determine the numbers.

Prior to determining any Basin Plan or agreement to any 'numbers' a great deal more information is required to be made publicly available to experts from State Governments, private sector and academia to determine if the additional environmental watering will deliver the outcomes forecast.

The information required is well summarised in the NSW Government Response to the Proposed Basin Plan to the MDBA (December 2010 p.6) which inter alia requires the following:

- Modelling and decision rules used to determine the environmental watering requirements
- Peer reviews to confirm the MDBA's assumptions and that this is best available science.
- Groundwater assessments and the associated modelling particularly for the groundwater systems deemed to be overdeveloped.
- Rules used to assess unregulated river flows and management in determining relevant SDL's.
- How the seven components of the flow regime (from no flows to overbank flows) are accounted for in the scenarios for additional environmental water.
- Access to all the data and modelling underpinning the analysis of environmental water in Chapter 8, Vol 1 of the Guide.

The fact is that without full access and transparency it is impossible to determine the veracity of the 'numbers', the extent additional water needed to aid the environment – both MDBA identified assets and others not identified.

The essential management problem is the inability of the modelling to accurately reflect water flows and requirements during very high flows where the environment and production has excess water and extremely low flow events where there is not enough water for either.

In other words the errors in the modelling are greatest at the extremes and begs the question about how relevant the use of long term averages are in determining the amount of water available, particularly during low flow events (droughts).

3. *How do we assess and manage all the impacts of water management regimes (both high and low flow) in an extremely variable climatic regime?*

For generations water authorities have managed droughts and water flow management from storages through the allocation system and rules based management that recognises the unique circumstances applying in various sub-catchments throughout the Basin.

During the recent Millennium Drought the management practices of the State authorities ensured some of the basic parameters.

- Water for critical human needs.
- Sufficient water to maintain the great bulk of permanent plantings and cropping that requires high levels of capital for re-establishment.
- Water for critical environmental assets.

Although the latest drought has been claimed to be equivalent to the Federation Drought (1895-1903) the simple fact is:

- Town water supplies were retained unlike the carting of town supplies during the Federation Drought.
- A combination of Commonwealth and State watering initiatives improved the availability and supply of water for environmental assets by proper management of water in storage – a privilege not available during the Federation Drought.
- River systems were maintained on a 'care and maintenance' basis protecting key environmental assets unlike the Federation Drought where anecdotal evidence suggests rivers systems and environmental assets suffered significant damage.
- Social impact of the latest drought has been ameliorated by availability of welfare payments and other non-agricultural employment opportunities compared with the Federation Drought that led to a substantial population shift from the dryer inland to the cities.

It is apparent that an investment in better data and management systems may deliver a more effective outcome for the environment, towns, villages and farms throughout the Basin.

Adaptive Management - Should be the Principal Driver in MDB Reforms

Basin variability in all its forms requires the adoption of 'Adaptive Management' for each and every element of the Basin Plan. This approach utilises a wide range of 'tools' necessary to maintain a water management system that deals with the highs and lows of water flows.

Undue concentration of 'clawing' back entitlement based on average historical flows adjusted for climate change or anything else is meaningless as the water is required during periods of low flow and drought and managed in effective storages during high flow events as a contingency for future periods of reduced inflow.

The artificial distinction between environment and production water needs to be removed. All water is environmental either for natural or human uses – both parts of the ecological biosphere. The natural river and overland systems act as a 'conveyor belt' for delivering water for varying uses. In many cases the same water is used for environment and production depending on where on the Murray Darling 'conveyor' water is obtained, extracted, lost and recovered.

The Water Act 2007 entrenches the 'silo' mentality of treating environmental and production water separately and, according to some legal interpretations, imposes an absolute obligation on determining environmental flows prior to extraction for human use.

Such a legal separation is not useful in terms of management and fails to recognise the plasticity of water flows and the importance of adaptive management in delivering water for varying uses at various times.

The Water Act legal interpretation will undoubtedly lead to a range of class actions and compensation claims if the MDBA Plan is not correctly formulated and implemented. The over reliance on inaccurate data and modelling in a 'numbers' based management system will be a critical component of any challenge to the Basin Plan under administrative law.

Notwithstanding the legal issues it is patently obvious that the environment is not the exclusive domain of non-human assets and water molecules don't make a distinction between any life form.

Adaptive Management recognises a self evident truth that a number of factors act on any human or non-human organism, population or ecological community. Those factors such as sunlight, water, air, soil climate, pollution etc influence survival and development and cause all organisms to respond to changes in their environment by adaption either evolutionary or otherwise in both form and behaviour.

So why do legislators, irrigators and environmentalists make the task so difficult to recognise that adaptive management is evolution to survive and thrive in variable circumstances?

- From irrigators we have heard that any proposed reduction in entitlement will lead to unsustainable losses to the social and economic fabric of regional communities.
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- From environmentalists we are bombarded with claims that more water is required to protect the environment from immediate and irreversible decline.
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- From scientists we hear that without immediate change the Murray Darling Basin will lead to major ecological changes and will be subject to catastrophic climate change.
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- From legislators we are told that we must have a hard and fast Basin Plan as a central tenant of the reform process to satisfy an artificial political timetable.

Everyone is correct to a certain degree but water management policy needs to be as variable as the climatic variability of the Murray Darling Basin itself and its implementation requires a relatively simple management regime.

All of the above have made the task too complex rather than focussing on the relatively less complex of focus of managing water flows.

The tasks are:

- Manage releases from storages and manage water flows to meet from environmental and production requirements and improve the reliability of measuring and monitoring inflows (both real and predictive).

  This requires:

  - A better understanding of the 'science' of ecological needs and hydrological processes.
  - Better empirical data on inflows and ecological needs.
  - Investment in credible predictive tools.

- Ensure that water storage is improved in terms of capacity or river management and losses minimised where those losses are real, accountable and recovered at a cost effective price.

  This requires:

  - Investment in river flow management.
  - Better understanding of groundwater and its relationship to 'conveyor' flows.
  - Empirical data to improve the outputs from theoretical modelling and provide 'just-in-time' water management options for environmental and human assets.

Elements of an Effective Adaptive Management Plan:

1. Leadership – 'A Matter of Intelligence, Trustworthiness, Humanity and Authority'

   Effective adoption of a Basin Plan in its current form has failed the test of leadership. The MDBA was compromised from the start in attempting to implement such a massive task within an unrealistic timeframe. It was further compromised by having to fulfil the role of independent scientific adviser and advocacy. The advocacy role of the MDBA has compromised its authority as a source of credible data and the task and complexity of collecting and validity the data is not realistic.

   The Basin Plan is cast as the output of a 'Black Box' the machinations of which are little understood by the community, lack an intellectual appreciation of the issue complexity and is silent on human impact. Trust in the MDBA process is fractured and its authority to manage compromised.

   Equally the authority of government to implement a Basin Plan is compromised by the same lack of trust and humanity raising legitimate questions of intelligent management.

2. Clear and achievable objectives – 'Realistic Objectives Lead to Tactical Success'

   Confusion over the relative legal status of the MDBA role and the reform objectives of the Government has caused undue community anxiety and suspicion about the data (or lack thereof) to support a wholesale change in the relative values of Basin assets – environment, community and regional development.

   Basin Plan objectives in their current form are too complex and require re-engineering into achievable tactical goals on a case by case or catchment by catchment basis. These objectives need to be evidence based and comprehended by and involve entitlement stakeholders.

3. Good Intelligence – 'Lack of Knowledge Leads to Defeat'

   Much of the science underpinning the Basin Plan is a collection of scientific assessments (verified or otherwise) that lack critical peer review and not subject to adequate validation by the MDBA as 'truthful' science.

   Data to support the conclusions of theoretical and conceptual hydrological and climate models must be a priority.

   The corporate knowledge and expertise of State Government water agencies in the development of the Basin Plan has not been adequately embraced and has diminished the importance of understanding water flows, water allocation and delivery mechanisms.

   Locking in the significant 'corporate history' of the States would more effectively allow the Commonwealth options to achieve 'on–the-ground' support and understanding of alternatives to entitlement 'claw back' as the principal means of implementing the Basin Plan.

   Although it is recognised that the States have questions to answer regarding past management much of this can be attributed to policymakers and elected representatives failing to invest in measuring, monitoring and auditing data necessary to underpin good decisions over a long period of time.

   Notwithstanding this the States manage water allocations, storages and river flows and are critical in providing the necessary tools to provide adaptive management of the MDB conveyor.

   Although there has been increased investment in data collection and validation by the Commonwealth including an enhanced role of the Bureau of Meteorology further investment to improve the veracity of

hydrological and climate models is a fundamental first step but not an impediment to adopting better management using other tools.

4. Realistic Scenario Analysis – 'War Games Unravel When the First Shots are Fired'

Scenarios based on unverified mathematical models run the risk of being labelled 'management by video games'. At worst they are no more than useful academic 'toys' unless used correctly and anchored to the real world by real empirical data.

The confidence of any model is beholden to the boundaries of its data and calibration.

In the past we have had a few examples of measures to redress the 'political' environment of the day.

1. Remember the 'National Action Plan on Salinity and Water Quality' – predicting a 'salty' demise of the Australian landscape within a decade. What happened to the modelled prediction and the where is the data validating the outcomes of that massive investment by the Commonwealth?
2. Where are the audited results of the Natural Heritage Trust and the models used to justify massive expenditure on a range of modelled environmental challenges?

Some of the same people and organisations are the architects of the models used to determine the future of the Murray Darling Basin.

These should be salutary lessons to policy makers and legislators.

The consequences of adopting incorrect outcomes from the Basin Plan will be more far reaching so it is incumbent upon policymakers to build in enough safeguards and failsafe mechanisms to account for badly modelled policy.

Basin Plan reductions in entitlements are based on the outputs series of mathematical models lacking various degrees of verification, validation and veracity. Significantly the models are not understood by the public and the entitlement holders and have assumed a life of their own due to their complexity are often unquestioned by policymakers uncertain of the 'science' underpinning them.

Models are a useful in decision-making but many of the hydrological models lack adequate empirical data being the basis of science and therefore policy veracity. As such they should not be portrayed as an ultimate 'truth' in predicting entitlement cutbacks. This can only be done after an engineering 'blowtorch' is applied to the assumptions and the 'science' underpinning the design and application of the models.

Various Basin models have been developed for a range of uses not necessarily for the purpose of the Basin Plan and lack the data integrity to be used to launch a major reform with such wide ranging environmental, social and economic consequences.

Hydrological modelling is no more than a mathematical representation or 'synthetic apparition' of the real thing. Some Model designers appear to have a captive view that the more sophisticated the model the less need for real data therefore making data collection obsolete.

In some cases this is code to excuse the lack of investment in proper data collection by policy makers. Where data is collected it is primarily used to calibrate modelling and 'tweaked' to fit the model where such data does not align with the model design.

The danger is that the model drives the type, quantity and form of the data collected and the model becomes the 'elephant in the room' when making informed decisions.

The fact is that data are science and the models supplement but not replace the basic science or act as a data surrogate.

Consequently the rigour of a science based or empirical observations is not sufficiently applied to Basin models rendering them to being useful mathematical guides but not useful for practical decision making affecting the lives of many for the benefit of a few modellers.

This is in no way to denigrate the use of Models and properly resourced they are a useful management tool but we must be aware of their limitations and ensure that sufficient data is collected to improve the 3 V's:

- Verification
- Validation
- Veracity

5. Execution Strategy – 'No One Size Fits All'

The MDBA having identified the objectives the Basin Plan relies on a global strategy of eliminating over allocation of entitlement. Although this may be a useful tool in some cases it has assumed an ideological status of the being the sole means of delivering effective outcomes.

Entitlement is merely a share of the available water which is allocated by policy makers according to availability, inflows and projected conditions.

Permanent reduction in entitlement based on averaging water availability from mathematical modelling with all its inherent limitations will not accurately replicate water regimes in dry periods, account for entitlement that cannot be delivered, overcome defects in measuring and auditing actual 'real time' events.

There is the ever present risk of compounding modelling errors through overlapping use of modelling sometimes developed for entirely different purposes.

Much of the Murray Darling Basin is semi-arid and presents conditions much harder to model than more humid temperate environments. Stream flow rates are low and evaporation and soil storage characteristics have a significantly greater impact on model outcomes creating potential errors. Factoring in groundwater impacts can lead to substantial errors in the modelled outcomes.

Given the disparity and variability of each catchment and sub-catchment throughout the Murray Darling Basin any execution strategy requires the adoption of different tactics for each catchment. These need to be precise and targeted and have an 'engineering' rigor applied to the outcomes so as to provide an audit trail for the expenditure of public funds.

Future Strategy for a Murray Darling Action Plan:

Pratt Water Murrumbidgee Project: A Model for Other Catchments

In early 2003 Pratt Water embarked on a programme of applying private sector business principles to the Murrumbidgee catchment based on an inventory approach to water management.

Questions driving the project included:

- How much water is in storage?
- What and where are the inflows and losses?
- How much water is' invoiced 'for production and the environment?
- What is the scale of water losses and water saving opportunities
- What investments can be made to save water?
- How can saved water be harnessed to provide sustainable regional benefits – human and environmental?
- How can the cost of water saving infrastructure be reduced and be privately funded?
- What reforms can governments adopt to boost investment in water efficiency and incentives for entitlement holders to share in the benefits?

The findings of the 'Business of Saving Water' project were published in December 2004.

The project team:

- Commissioned 40 individual projects and consulted widely with government and the community and involved 150 people from 60 organisations.
- Developed a model for Australia wide application but focussed on the Murrumbidgee River catchment

Details of the Pratt Water Report and specialist studies can be found at www.prattwater.com.au

Key Findings were:

- 1334GL of water per year in the Murrumbidgee Valley was unaccounted water flows, water losses and water identified for potential savings.
- 945GL of water identified for savings through investments, reforms and matching crops to soils.
- $845m worth of new investments identified to save water in the Murrumbidgee Valley
- A minimum of an additional $293m per year of farm gate production income.
- $421m of new capital investment opportunities can be realised within the Murrumbidgee Valley.
- Identified water saving investments and new water efficient production could provide 4,500 employment opportunities and boost regional income by up to $245m.

The Pratt Water Project recast the environment as a core customer by engaging agricultural producers to share in the savings gained by private investment on and off farm. Additional water would be returned to the environment and additional production achieved where demonstrated savings could be made. Environmental allocations would be enhanced by extensive investments in creating saved water.

The execution strategy involved a 17 Step Action Plan:

- Major investment in water measurement and auditing to validate hydrological modelling and provide a data based information system necessary to attract private sector capital.
- Promote and facilitate just-in-time water delivery capacity to match market and environmental demands.
- Refurbishment of irrigation channels.
- Introduce market based instruments to drive water saving investments through Water Efficiency Certificates.
- Implement a Water Efficiency Compliance Scheme.
- Match production areas and crops to soil and sub-soil conditions.
- Streamline water trading administration.
- Create a 'saved water' title.

- Implement business based contractual mechanisms to underpin public –private –community alliances for water efficiency investment.
- Incorporate the costs of storage and transmission in water charges.
- Promote strategic environmental watering with appropriately sited new storages.
- Enhance water security for regional communities.
- Mandate water efficiency and new investment criteria in the licensing of governmental owned water businesses.
- Review the Murray Darling Cap to create incentives for major water saving initiatives.
- Streamline approval regimes for water efficiency works.

Some of the outcomes of the Pratt Water project were included in varying degrees in the National Water Reform process and have been effectively implemented by a range of organisations in government and the private sector.

Pratt Water also developed the basic structure of an environmental water options regime that would allow entitlement ownership to remain with the owner and for the environmental water manager to enter into an option contract to supply environmental target water.

Pratt Water Environmental Water Option Regime

The Pratt Water project in conjunction with ABARE examined the benefits of irrigators having an option to supply environmental water in return for an option fee. Irrigators could enter a contract to sell a part of their allocation that is excess of requirements in any year.

An example would be where an irrigator holding a licenced entitlement of 100ML could write an option to sell any allocation announced above 90ML. In years with limited water resources this threshold may not be reached but in other years up to 10 percent of their entitlement may be transferred to the environment.

Its advantages are:

- Irrigators retain their right to their permanent entitlements. Permanent water entitlements are a natural hedge against risk of a future decline in the overall pool of water resources and provide more invest security for irrigators and investors to make investment decisions.
- The options contract allows governments to acquire environmental water without the need to make an upfront capital outlay to acquire entitlement or having to manage those entitlements once acquired, and
- An option offers environmental managers a greater degree of certainty in planning releases and lowers transaction costs involved in operating in the temporary trading market.

The option price would be pre-specified and the conditions of access detailed. An option fee negotiated which would be paid to the irrigator even if the option is not exercised. The environmental manager would have the right to exercise the option if the announced allocation exceeded the nominated threshold.

This alternative is a valuable supplement to acquiring water in times where environmental assets already have some water and need 'topping up' to meet environmental objectives at a critical part of the year.

Application of the environmental water option has particular relevance to accessing overland flow or supplementary water readily available in some catchments and not the focus of the general 'Water for the Future' buyback scheme.

Substantial credit must be given to irrigation corporations, farmers and others for making major improvements in water savings and provide a model for future implementation. Such a group is 'Water for Rivers'.

Water for Rivers

'Water for Rivers'- established as a private company owned by the Commonwealth, NSW and Victorian Governments has made a significant contribution to water savings.

- Recovered 267GL of water savings - 212GL for the Snowy and 70GL for the Murray at a cost of $425m over 10 years.
- Infrastructure investment is achieving water savings at a cost effective hurdle rate of $1,500/ML.
- 80% of investment has been in water infrastructure water delivery systems on and off farm.
- 20% of investment has been in direct water purchase as a risk management approach to meeting targets.

It is recommended that the Commonwealth Government re-engineer its focus on the MDBA Plan to incorporate Adaptive Management projects on a catchment by catchment basis based on the model developed by 'Water for Rivers'.

The Murray Darling Sustainable Water Action Management Plan (SWAMP)

In order to move beyond the current Basin Plan and to implement some form of adaptive management the following recommendations are offered for consideration:

Key Components:

- Implement a structural review of the MDBA to conduct a 'Pratt Water style' of project management of each priority catchment within the Murray Darling Basin.

  This would involve the adoption of a new adaptive management approach beyond the narrow 'entitlement' focus of the MDBA SDL based Basin Plan.

  Given the lack of veracity on the 'numbers' and the science of the MDBA management system at this time it is recommended that individual action plans be developed for each catchment to determine the level of entitlement reduction required or managed to achieve local objectives.

  It is recommended that the Pratt Water model of involving all key players (particular those responsible for allocation planning and management) in developing a Sustainable Water Action Management Plan (SWAMP) for each catchment.

  Each Plan would look beyond water alone to environmental and production water flows, storage and delivery systems and production systems. Policy tools of environmental water buy back and infrastructure investment could be more carefully applied.

  Such an approach would 'buy time' invest in and the data, modelling and other management tactics required to deliver water management outcomes.

  Given the importance of allocation planning, storage capacity and deliver, river flow and environmental management it is recommended that the Commonwealth move place less emphasis on 'entitlement claw back' and more on allocation planning to allow for greater flexibility in meeting variable events.

- Appoint a 'hard-nosed' implementation executive to focus MDBA priorities on implementation projects to return water to meet environmental and production objectives using the 'Water for Rivers' management

system. This would require changes to its constitution and shareholding to include Queensland and South Australia.

- Review hydrological modelling and data validation on a priority catchment basis to determine catchment contribution to the overall water balance and identify opportunities for water saving initiatives and effective delivery to environmental assets during dry and shoulder periods.

- Determine water losses and the scale of water saving opportunities in each catchment and tailor policy instruments such as water buyback and infrastructure investments to each catchment according to importance of environmental outcomes, social and economic impacts.

  The process would involve identifying business opportunities for private water savings, new more efficient production systems and 'structural adjustment' for overdeveloped systems or inappropriate areas of water management where investment returns are suboptimal.

- Identify specific water saving projects to be implemented through a 'Water for Rivers' type delivery vehicle with individual implementation project teams in each priority catchment.

- Implement opportunities for infrastructure and other water saving initiatives involving local entitlement holders as key component of the environmental water delivery mechanisms. Make it economically attractive for entitlement holders to deliver environmental water from on-farm storages and through a water options arrangement.

- Take a commercial approach to producing cost effective outcomes by utilising existing experts and project management skills from outside government and re-integrating State government water expertise into the Basin process.

  Effective management requires the use of water allocation and delivery expertise from the States. The absence of water allocation and delivery planning expertise in the development of the Basin Plan will doom it to failure. Whilst there are examples of State failures many of these can be attributed to a lack of investment in water management over many years the States and political and ideological decisions dictated by the election cycle.

- Provide investment for scoping and feasibility studies for major water saving infrastructure and improved environmental and production projects.

Although many of the catchment by catchment projects will be accommodated within the SWAP process some projects such as additional surface and aquifer water storages, water management systems and re-engineering of ineffective irrigation areas will require independent project management and by their scale and nature won't be implemented within the timeframe of SWAMPs and any resulting Water Management Plans.

FOR FURTHER INFORMATION:

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