

# **The National Plan for Water - Opportunities and Risks for the Irrigation Industry**

## **A Discussion Paper**

Prepared for

**Irrigation Australia Limited**

April 2008

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## 1 Purpose of this paper

On 25 January 2007 the then Prime Minister Howard announced funding for a National Plan for Water Security (the Plan). Prior to the recent federal election the newly elected Prime Minister Rudd committed to support the Plan in principle. Since being elected, the new government has continued action on several aspects of the Plan, but is reviewing others. In late March 2008 the Commonwealth, the Murray Darling Basin states and the ACT signed a memorandum of understanding (MOU) which established heads of agreement for several changes to how the Plan would be implemented. The MOU provides for a detailed agreement to be prepared for signature at the July 2008 COAG meeting. On 29 April 2008 The Minister for Climate Change and Water, Penny Wong, announced a modified version of the Plan rebadged as 'Water For the Future', which gives high level directions but little detail.

The implications for the irrigation sector of the Plan, taking account of the recently announced adjustments and the aspects which are still not clear, are discussed in this paper.

The Plan, as originally conceived, had a budget of \$10b which included \$5.9b for modernising irrigation in Australia, \$3.0b for addressing over allocation in the MDB and \$480m for water information. The new version of the Plan announced by Minister Wong retains the initial \$10b and adds a further \$2.9b essentially for urban water initiatives.

Carriage of the implementation of the Plan as a whole sits with the Water Group of the Australian Government Department of the Environment and Water Resources, Heritage and the Arts (DEWHA).

This Plan will have a significant impact on the water reform process. It is essential that the irrigation sector has a strong involvement in its ongoing development and implementation. The current time presents a particularly strong opportunity for the sector to exert a positive influence.

This paper identifies key opportunities and risks for the irrigation sector and the government, and possible strategies to address them. It identifies a number of matters for discussion by IAL members, with the intention of stimulating further thought and constructive advice to the federal government as it implements this very significant public investment.

With the rapidly changing policy environment, it is likely that some parts of this paper will not be fully reflective of government positions within a short time after conclusion of writing (early May 2008). However it is expected that the key principles discussed will remain important for a much longer period.

## 2 The National Plan for Water

### 2.1 Overview

The Plan as announced in Jan 2007 featured a government commitment to a sustainable irrigation industry coexisting with sustainable ecological systems. It was built on the principles set out in the National Water Initiative (the NWI) and designed to overcome obstacles to NWI implementation. It aimed to provide a framework for adaptation to a future where less water is available for irrigation, resulting from the need to retain more water in rivers and aquifers to maintain highly valued ecological

systems, and from an overall reduction in available water due to climate change. The Plan recognised that much of the adaptation required will not be easy and provided adjustment mechanisms including financial support.

The originally announced Plan featured the following elements:

1. a nationwide investment in Australia's irrigation infrastructure to line and pipe major delivery channels
2. a nationwide programme to improve on-farm irrigation technology and metering
3. the sharing of water savings on a 50:50 basis between irrigators and the Commonwealth Government leading to greater water security and increased environmental flows
4. addressing water over-allocation in the Murray-Darling Basin
5. a new set of governance arrangements for the Murray-Darling Basin
6. a sustainable cap on surface and groundwater use in the Murray-Darling Basin
7. major engineering works at key sites in the Murray-Darling Basin such as the Barmah Choke and Menindee Lakes
8. expanding the role of the Bureau of Meteorology to provide the water data necessary for good decision making by governments and industry
9. a Taskforce to explore future land and water development in northern Australia
10. completion of the restoration of the Great Artesian Basin.

This paper focuses on the first four elements, including how they are being revised and implemented by the new Federal government.

## 2.2 Objectives

In the January 2007 Plan, the primary objectives stated were to:

1. address over-allocation in the Murray Darling Basin
2. put irrigation on a more sustainable basis nationally.

'Over-allocation' can be interpreted in multiple ways. It can mean that insufficient water is available in the system to sustain the long term health of valued environmental assets (rivers, aquifers and dependent ecosystems such as wetlands). It can also mean that the reliability of extractive allocations is lower than that which is expected or required. The NWI and the Plan interpret over-allocation in the first way. A key focus of the Plan is the obtaining of existing water entitlements (by purchase or in exchange for infrastructure funding) to be re-directed to sustaining environmental assets.

The original Plan aimed to make irrigation more sustainable by investing in 'modernising' on-farm and off-farm infrastructure to improve 'efficiency of water use'. Water use efficiency has many meanings, but for the Plan it implicitly relates to saving<sup>1</sup> water through reducing evaporation and seepage, applying more water than crops need, etc.

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<sup>1</sup> There is a considerable lack of clarity about what is meant by 'water savings'. For example reduced drainage returns to rivers can be considered to be an on farm saving of water, but in terms of the system water balance it is simply taking from one place and putting it into another. For this paper we assume that water savings refers to reductions in water 'lost' from the river/groundwater system through evaporation, transpiration or movement into saline aquifers or water bodies.

In recent speeches Minister Wong stated that all projects to be funded must meet three key tests:

1. delivery of substantial and lasting returns of water to secure real improvements in river health
2. contributing towards securing regional economies and supporting the local community
3. value for money in achieving the first two.<sup>2</sup>

There is a broad similarity between these objectives and those of the original plan, though there are differences which might or might not be important. Rather than addressing over-allocation (with all the arguments about what this means) the first test is now simply to improve river health. The second test interestingly makes no specific mention of irrigation, though it is arguably vital in many rural areas to securing regional economies and supporting the local community.

In the MOU and the Minister's speeches some adjustments to implementation are evident. If anything there is a stronger emphasis on recovering water entitlements for environmental purposes. There are commitments to advancing infrastructure water saving projects, including a specific commitment of \$1b towards Victoria's Food Bowl project. There are also commitments to contribute to funding activities not mentioned in the original plan (eg contributing to development of water modelling, improving water registers, monitoring and enforcement). It is apparent that the manner in which the original plan allocated the \$10b remains broadly intact, the detail is being revised. While on-farm efficiency measures are no-where specifically excluded, there is no mention of them whatsoever, leading to the conclusion that the future of investment in this area is uncertain.

## 2.3 Programmes

Of particular interest to the irrigation sector are three programmes set out in the original Plan:

1. investing in on-farm water efficiency modernisation
2. investing in off-farm water delivery infrastructure modernisation
3. investing in buy back of irrigation water entitlements

These three programmes are discussed in detail below.

### 2.3.1 On-farm water efficiency modernisation

A total of \$1.5b was allocated to 'put rural water use on a sustainable footing' of which \$38.1m was allocated to be spent in 2007/08<sup>3</sup>. Expressions of interest were invited in late 2007 for organisations to submit proposals for pilot projects under this programme. According to a Departmental officer there were a substantial number of proposals submitted from a variety of organisations including CMAs, water delivery systems operators and regional industry groups, which were considered to be enough

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<sup>2</sup> Senator the Hon Penny Wong, Minister for Water and Climate Change, *National Leadership in Water*, Speech to CEDA/KPMG Water for the Future Forum, Hyatt Regency, Adelaide 7 April 2008.

Senator the Hon Penny Wong, Minister for Water and Climate Change, *Water for the Future*, Speech to 4<sup>th</sup> Annual Australian Water Summit, Sydney Convention Centre, 29 April 2008.

<sup>3</sup> <http://www.environment.gov.au/water/programs/on-farm/index.html> accessed 3 March 2008

to test the approach in several different circumstances. At the time of writing no announcements have been made of those successful in progressing to the second stage.

The document *Guidelines for the On-Farm Irrigation Efficiency (Pilot Projects) Programme* for those submitting EOI proposals provides a picture of the Department's approach to implementing this programme. While this relates to the pilot projects it might be expected that the same guidelines, with some modifications, would apply to future calls under this programme (should they occur). Information below is taken from this document.

#### **2.3.1.1 Purpose and objectives**

The On-farm Irrigation Efficiency Programme is aimed at modernising on-farm irrigation under the National Plan. It complements other elements of the National Plan such as improving delivery system efficiency and developing more accurate metering and monitoring of irrigation water usage.

The objectives of the Pilot Projects are to:

- trial Programme delivery arrangements through a range of Delivery Partners with direct links to on-farm irrigators to deliver the on-farm irrigation efficiency component of the National Plan; and
- provide a basis for engaging irrigation stakeholders in the development and implementation of the National Plan.

#### **2.3.1.2 Eligible applicants**

An entity is eligible to apply for Programme Funding as a Delivery Partner if it is an institution with direct links to irrigators such as:

- an Irrigation Water Provider;
- a commodity group;
- a private irrigation corporation;
- a regional irrigation body;
- a regional natural resource management organisation; or
- a State or Territory agency involved in water delivery or natural resource management.

A successful applicant must enter into agreements with individual irrigators under which those irrigators will undertake separate on-farm efficiency irrigation projects.

#### **2.3.1.3 Eligible expenditures**

The following expenditure and activities on existing irrigation properties are eligible for Programme Funding:

- installing new or upgrading existing irrigation infrastructure or technology, including sensing equipment intended to improve decision-making about irrigation, which will improve irrigation efficiency and generate water savings;
- improving farm layout or design for the purpose of improving on-farm irrigation efficiency (eg. laser levelling);
- ancillary equipment necessary for new or upgraded irrigation systems to function (eg. computer equipment);
- capital costs of new/upgraded irrigation equipment as well as the cost of installation.

The following projects, expenditure and activities are not eligible for Programme Funding:

- purchasing water;
- research and development proposals;
- proposals that relate to the establishment of new irrigation areas or expansion of existing areas;
- upgrading existing or installing new irrigation systems for urban or industrial land uses;

- projects generating improved irrigation efficiency and savings from application of different management
- approaches such as crop rotation or use of new plant types requiring less water;
- on-going labour costs associated with operating new infrastructure or systems;
- capacity building activities;
- planning activities and costs associated with project development including development by irrigators of on-farm water efficiency plans; and
- projects that have been completed or have already commenced (ie. Programme Funding will not be provided to cover expenditure already incurred or committed by an applicant or other project participant).

#### **2.3.1.4 Eligibility criteria**

The applicant must:

- be an incorporated entity with direct links to irrigators and capable of operating as a Delivery Partner with the Australian Government
- demonstrate it has the authority under organisational governance arrangements to be the lead proponent who is responsible for the Proposed Project and is able to enter into a Funding Agreement with the Commonwealth as well as contractual arrangements with others (eg: project participants and irrigators) to implement the Proposed Project and ensure permanent transfer of entitlements.

A proposed project must:

- be focussed on generating improved efficiency of existing agriculture-based irrigation at the farm level and delivering water savings to the Australian Government for use to improve environmental outcomes;
- for each individual irrigator project generate water savings that will return a minimum of 25 ML for each entitlement to the Commonwealth Environmental Water Holder;
- for each individual irrigator project have an accredited on-farm water efficiency plan; and
- for each property where irrigation efficiency improvement works are conducted either have a meter or will have a meter that will meet national standards.

The application must include:

- a well developed business case demonstrating the proposed project's viability, including the rationale for and cost/benefit analysis of the overall project
- detail on expected outputs and outcomes, including the anticipated level of water savings to be generated; detailed information about individual irrigator projects; capabilities and team structure; proposed budget, including level of co-funding, other complementary funding sources and in-kind support.

Selection of projects will be based on merit in relation to:

- Technical feasibility
- Appropriate linkages to other programmes eg delivery system modernisation, metering
- Demonstration of best practice
- Value for money in relation to ML of entitlement to be transferred to the government
- Capability of the applicant to deliver the project.

#### **2.3.2 Off-farm water delivery infrastructure modernisation**

The original Plan allocated \$3.6b for works to 'lift the delivery efficiency of distribution systems from the current average of 75 per cent to a new benchmark of 90 per cent'. The works programme was to include such things as piping, channel lining, system automation, reconfiguration of irrigation systems and retirement of unviable parts of irrigation schemes. It also indicated that structural adjustment assistance in support of this objective was to be included.

As an initial step the government offered funding to assist water service providers to prepare irrigation system modernisation plans, intended to 'identify and consider the range of options available to increase the efficiency of their irrigation distribution system' to be completed by Dec 2008. Applications were invited in 2007 and 14 successful irrigation water providers were announced in Feb 2008 (see Appendix for list). Total funding of \$4.6m was granted with individual grants ranging from \$16,000 to \$500,000. At least a 20% contribution towards the planning cost by the applicant was a requirement.

The *Guidelines for Irrigation Modernisation Planning Assistance* for this process gives some insights into the Department's thinking on this programme. In addition to describing and assessing proposed investments in infrastructure upgrading, replacement or reconfiguration to achieve water efficiency improvements, the modernisation plans are to consider in some detail:

- ⌘ the viability of the water provider as a business enterprise financially and in terms of governance and organisational capacity
- ⌘ compatibility of irrigation activities in the district with natural resource characteristics (including soil, climate, rainfall, biodiversity and salinity)
- ⌘ linkage with other programmes in the Plan such as on-farm efficiency, metering, and entitlement buy back
- ⌘ the future strategy for both the water service provider and the irrigation district it supports including consideration of risks and opportunities associated with climate change, urban growth and land use change.

The Guidelines note that a separate, subsequent application and assessment process will be undertaken in relation to on-ground infrastructure works. It foreshadows that conditions associated with funding of such will include:

- ⌘ completing a modernisation plan
- ⌘ providing a minimum co-contribution of 20% of total infrastructure project costs
- ⌘ meeting National Water Initiative objectives relating to water delivery charges, long-term operation of infrastructure and removing any barriers to trade
- ⌘ transfer of 50 % of expected water savings to the Australian Government.

### **2.3.3 Buy back of irrigation water entitlements**

The original Plan indicated that the Australian Government would be investing up to \$3 billion over ten years to address over-allocation in the Murray-Darling Basin. A key aspect of this was buying back entitlements from willing sellers. It could also be used to assist in the retirement of non-viable areas with other assistance, to exit the industry or relocate (the type of assistance was not stated).

On 26 February 2008 the Minister for Climate Change and Water announced a commitment of \$50 million for an initial purchase of water entitlements in the Murray-Darling Basin through a public tendering process. The tender is to close on 16 May 2008 or earlier if the available budget of \$50 million is fully committed before then.

According to the documentation associated with the tender, the tender process is in three steps:

1. The entitlement holder submits an expression of interest (EOI) form. This sets out the nature and quantity of the entitlement offered for sale and the proposed price of purchase.
2. The Department assesses the EOI and determines whether to accept or reject the offer. The assessment is to be undertaken by an expert panel from the Department, which will assess 'value for money, including consideration of cost, the priority of the targeted environmental asset(s) and its watering needs, and the capacity to deliver the water to the target asset(s)'. Current market value of

entitlements will be an important input as the stated intention is to purchase entitlements at current market prices.

3. Conveyancing. The Department's solicitor will undertake searches, prepare contracts and undertake contract exchange with the applicant's solicitor. Factors affecting the current utility of the entitlement (eg remaining water allocations, mortgages etc) will be identified and taken into account. Settlement will be subject to approval by the relevant state water authorities.

The applicant can withdraw at any time up to the point where contracts are exchanged.

Once purchased the entitlements are to be held by the Commonwealth Environmental Water Holder (a statutory position) and will retain all their current characteristics (for example in terms of reliability, ability to be traded etc). They will not be retired. The stated intention is to use the entitlements for environmental assets.

#### **2.3.4 Government's future directions**

As discussed previously, the federal government, in coordination with the states, is currently reviewing how it intends to implement the Plan. Possible signals on their directions are:

- » The definite movement on infrastructure water savings investments set out in the MOU, with greater involvement of the States in identifying and recommending proposals.
- » The granting of funding for the development of delivery system modernisation plans, suggesting support for this initiative.
- » The initiation of a \$50m buy back tender. This is an advancement of this approach compared to the previous government, which was holding this back in favour of other approaches.
- » The hold-up in announcing those successful in the EOI for on-farm efficiency schemes, and the silence on on-farm investments in the MOU and the Minister's recent speeches. This suggests that the government has reservations about the programme as a whole (perhaps favouring the buy back option).

It is evident that the government is taking small steps to 'test the water' in several areas. While the government's stated position displays optimism, there is in reality a high degree of uncertainty about how well these programmes will deliver, and what the extent of undesirable side effects will be.

There is a sense that the whole set of programmes is adaptable based on experience. So the way programmes are implemented is likely to alter over time. Also should one programme not work well, investment could well be shifted to another.

## **3 Assessment of current programs**

### **3.1 On-farm water efficiency modernisation program**

In the Plan as originally stated this programme was intended to reduce water 'lost' (through evaporation, seepage, applying more water than crops need etc) by investing in modernising on-farm infrastructure.

It was intended to contribute to the objective of reducing over-allocation by requiring that a proportion of water saved go to the government for environmental needs. It was intended to contribute to more sustainable irrigation by allowing the remainder of the water saved to remain with irrigators for enhanced production, and supporting the installation of systems which would allow irrigators to continue to produce the same or more with less water and hopefully result in savings in labour and other costs.

The expectation was that approximately 1200GL/year water savings would be generated (to be shared between irrigators and the government for the environment) for a government investment of \$1.5b plus an undefined level of private co-investment.

The details of how the government has commenced implementation of this plan were described in section 2.3.1. Key elements of this approach are:

- » Reliance on 'delivery partners' to work with groups of irrigators and come up with proposals for funding. In the initial EOI constraints were put on who delivery partners could be, which appeared to exclude organisations such as private irrigation suppliers, however Departmental staff advise that this was not intended.
- » Requiring participating irrigation enterprises to have an 'accredited' on-farm water efficiency plan and meters complying with national standards.
- » Constraining eligible expenditure to works or equipment, excluding such things as capacity building and on-farm plan development.
- » Requiring a minimum of 25ML entitlement from each participating irrigator to be returned to the Commonwealth.
- » Demonstration in the application that the proposed project is viable in the long term.

The programme was intended to work in a complementary way with the other two major programmes (off-farm water savings, buy back) to achieve the two major objectives of the Plan. Key opportunities, risks and issues for the irrigation industry are shown below and are discussed further in the sections that follow.

Opportunities	Risks	Equity issues
<ul style="list-style-type: none"> <li>▪ Irrigators can gain access to subsidy for modernisation of on-farm irrigation infrastructure.</li> <li>▪ Reduced infiltration to saline water tables benefits both irrigators and the environment.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Take up of the programme may be poor because of lack of capacity of irrigators and delivery partners to identify opportunities and prepare plans.</li> <li>▪ Investments may not in actuality yield the expected reductions in water loss because of poor design, commissioning or operation. Irrigators will bear this risk, since the government will receive its entitlement up front based on estimated water savings.</li> <li>▪ Investment may go into farms which are not viable for reasons unrelated to water efficiency.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Many irrigators may not have the opportunity to participate because they lack a delivery partner.</li> <li>▪ Smaller scale irrigators are excluded from programme.</li> <li>▪ Many irrigators, already financially strapped by the drought, may not have funds needed to contribute to a proposal which is viable for the government.</li> </ul>

### 3.1.1 The opportunity to obtain a subsidy for on-farm modernisation

As discussed above, the programme presents an opportunity for irrigators to obtain a subsidy for works to improve on-farm water efficiency.

For there to be a subsidy the government must be willing to pay more than the market price for water returned. Without a willingness to pay above market value, funded projects will be no different from the irrigator simply selling the government part of their entitlement and using the funds to do improvement works. In other words there is no subsidy, simply a lot of paperwork for a benefit which could otherwise be obtained.

The justification for paying above market price is that this investment would be seen to contribute to the Plan's second objective of achieving a sustainable irrigation industry (or, in terms of the Minister's recent speeches, contributing to 'securing regional economies and supporting the local community').

Interestingly the MOU commits to an expenditure of up to \$1b towards the Victorian Food Bowl project (90% of the total costs) for a projected saving of 200GL/year, half of which is to be provided to irrigators, the other half returned to the environment. The cost per unit of environmental water is thus \$10,000 per ML, far above market price. This could be read as an indication of the government's willingness to recognise the benefits to regional economies in funding water recovery.

The original plan also recognised that the capacity for delivery infrastructure improvements to save water was limited, and therefore included a substantial programme for on-farm water savings. Studies have demonstrated that the potential for on-farm water savings is very large. The Pratt water study estimated that in the Murrumbidgee alone 141GL/yr could be saved by an investment of \$158m on-farm<sup>4</sup>. More recently an MDBC sponsored study identified a potential 1480GL/yr water

<sup>4</sup> Pratt Water, *The Business of Saving Water: The Report of the Murrumbidgee Valley Water Efficiency Feasibility Project*, Pratt Water, Campbellfield Victoria, Dec 2004, p37.

savings through on-farm investment in the Northern Murray-Darling Basin<sup>5</sup>. There is thus substantial potential for genuine water savings on-farm, but it would require the government to pay more than the market rate for the water entitlements returned, in recognition of the contribution this would make to supporting rural economies. It is hard to see why the recognition of this benefit in the funding committed to Victorian water delivery infrastructure shouldn't apply to on-farm infrastructure, even if the level of contribution was not so high as that given to public infrastructure.

There is also a strong case for a combined delivery system – on-farm efficiency programme for irrigation districts. Delivery systems can be more cost effectively upgraded if they are required to handle lesser volumes which would result from reduction in on-farm water requirements. Also integration of pressurised delivery and pressurised on-farm systems where applicable is considerably more cost effective than just implementing pressurised systems on-farm.

It would seem to be in the interests of both the government and the irrigation sector to advance this programme. Despite this, as discussed previously, signals from the government are that there is hesitance about investing in this area. It may be that this hesitance relates to the risks discussed in the following sections, or a view that the government should stop getting involved at the farm gate, or simply that buying water entitlements on the market is cheaper on the public purse.

However the risks are addressable and if the government is serious about supporting regional economies then a programme for supporting on-farm modernisation is essential. Simply purchasing entitlements will not achieve this.

*Discussion point 1: How important is it that there continue to be an on-farm modernisation component of the Plan, or is it better for all if public moneys are devoted to improving public/shared water storage and delivery systems?*

### **3.1.2 Risks associated with lack of capacity**

Lack of capacity to implement and support on-farm modernisation is a very significant risk for this programme. Many states have been investing in programmes to improve on-farm water use efficiency. In 2003 a workshop of staff from across Australia identified a range of successes and lessons learned from state on-farm water use efficiency programmes. The workshop reported that there had been considerable success in these programmes, and that most success occurred where the programme runs over several years and incorporates R&D, training, planning, implementation support, financial assistance and monitoring, with a focus on profitability, time savings and other benefits to the farmer. It noted that programmes which focused on technology without building capacity were less likely to result in water use efficiency becoming part of normal practice<sup>6</sup>.

To further illustrate particular reference is made to the Queensland Rural Water Use Efficiency (RWUE) Programme, which commenced in 1999. In a four year, \$41m, Queensland Government funded programme across the major irrigation industries (sugar; fruit and vegetables; cotton and irrigated grains; and dairy and lucerne), 'an improvement in water use availability in excess of 150,000 ML per year' was

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<sup>5</sup> Baillie J, Baillie C, Heinrich N and Murray A, *On-farm water use efficiency in the Northern Murray-Darling Basin*, Murray-Darling Basin Commission, Canberra ACT, 2008

<sup>6</sup> Irrigation Association of Australia, *Water use efficiency incentive schemes: workshop report*, Irrigation Conference 2003, Dubbo NSW.

obtained<sup>7</sup>. This equates to water recovery at a rate of \$273 of government funding per ML, which is clearly highly cost effective. The experience in this programme was that irrigators were willing to contribute up to \$7 for each \$1 of direct financial contribution they received from the government.

A review of the programme<sup>8</sup> conducted after the first four years concluded that (amongst other things) the programme had been very successful in achieving real reductions in water losses because it was an integrated package of irrigator capacity building, technical support and financial subsidy. It noted that the 'changes in understanding and thinking' engendered by the programme will have the biggest long term effect. It noted also the significant lack of skills and resources in industry support and consultancy services outside of those provided by the programme, and recommended future effort in tooling up and training private irrigation consultants and equipment suppliers.

Persons interviewed who had many years experience with extension work in this area were strongly of the view that this general shortfall in technical support capacity and a lack of irrigator awareness of the operational aspects of 'modernised' irrigation equipment was a major risk to any on-farm efficiency programme. According to a NSW Department of Primary Industries officer there is no shortage of cases where high technology irrigation systems have been installed but failed to deliver either the promised water savings or productivity improvements. DPI officers have done several onsite evaluations of irrigation systems and noted a high rate of faults in either design, commissioning or operation of such systems.

A Queensland officer who worked for many years in the RWUE programme noted that trials of many systems built with subsidies from the programme demonstrated that implementation was the 'weak link'. Almost invariably, he said, irrigators who had systems installed never tested them for performance against expectations. If they turned it on and water came out where it was supposed to that was it. Because there are so many things that can go wrong in design, commissioning or operation, lack of assessment and subsequent correction or 'tuning' of installed systems meant that a large proportion of systems assessed by RWUE officers were significantly underperforming, sometimes being less water efficient than the infrastructure they replaced. An important aspect of the RWUE programme which is still very immature is providing the knowledge and tools to enable on-site testing, benchmarking and tuning of systems.

A key lesson that can be learned from the RWUE is that much more emphasis on building expert support services is needed. Farmers need access to skills and support in preparing on-farm water efficiency plans, designing irrigation systems, assessing irrigation systems and 'tuning' irrigation systems.

In adopting new technology it is well documented<sup>9</sup> that the following steps apply:

1. awareness of the opportunity or need for change
2. access to detailed information
3. ability to trial change

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<sup>7</sup> Coutts J&R, Bell K, *Evaluation of the Rural Water Use Efficiency Initiative Adoption program, Final Report*, Department of Natural Resources and Mines, Queensland, 2003, p3.

<sup>8</sup> Coutts J&R, Bell K, *Evaluation of the Rural Water Use Efficiency Initiative Adoption program, Final Report*, Department of Natural Resources and Mines, Queensland, 2003.

<sup>9</sup> Rogers EM 2003 *Diffusion of Innovation* Free Press New York; as quoted in Madden et al, *Investing in the Modernisation of Irrigation Infrastructure: the Challenges and Opportunities for Government and Agriculture* Farm Policy Journal August Quarter 2007.

4. adoption of change if overall advantage is significantly positive.

The pilot on-farm water efficiency programme initiated under the Plan specifically excludes from its funding any sort of capacity building. It implicitly assumes that the delivery partners will address the first 3 steps above and develop with irrigators an agreed plan for step 4. This is a high risk assumption. Given the solid evidence of capacity shortage to prepare on-farm plans, design on-farm systems, properly commission and test infrastructure, and train and support irrigators it is hard to see how this will work. It is very likely that a large part of the potential for water savings will not be activated, and there is a strong risk that works that are funded will not in practice deliver the projected water savings. This is not a formula for a sustainable, more water efficient, irrigation industry.

There is strong evidence then that to make a lasting improvement in on-farm water efficiency, there is a need for a broad capacity building programme. One possible approach would be to redesign the Plan's on-farm programme so it is modelled more closely on the successful components of state programmes such as the Qld RWUE programme, with explicit funding for such things as R&D, communication and facilitation of the development of private irrigation support services.

This sort of approach is far more likely to activate potential water savings than the current programme, is much more long term in its benefits, and will mobilise greater co-contribution from irrigators and the private sector. Overall it is likely to be highly cost effective in terms of investment of public funds per ML of water recovery compared to delivery system projects. The government could allocate a substantial portion of the \$1.5b notionally allocated for on-farm efficiency into a 10 year programme along the lines of the successful state water use efficiency programmes including explicit funding for capacity building (R&D, communication and education, facilitation of the development of private irrigation support services etc) in addition to funding to contribute to on farm infrastructure. This might be leveraged with contributions from state agencies engaged in this work and private industry.

The IAL might provide a pivotal role in facilitating the design of such a scheme. Building on the experience from previous state schemes, its broad membership base and its core expertise in training and certification, IAL could bring together representatives of government and irrigation industry sectors to identify how such a programme might be best implemented and identify opportunities for effective public-private partnerships.

*Discussion point 2: Is on-farm water efficiency capacity building (R&D, communication and education, facilitation of the development of private irrigation support services etc) a cost effective investment for the government, and should it be explicitly funded under the Plan, or should this be left to individual irrigators and the private sector?*

*Discussion point 3: What role could IAL play in a developing and implementing a national on-farm water efficiency capacity building programme?*

It is also worth considering whether government should alter the condition relating to return of water savings for funding of investment in on-farm infrastructure. Three alternative options are proposed:

1. do not require up front return of entitlement, but instead enter into a contract with the irrigator to transfer the entitlement after say two years to allow them time to implement the new systems and begin to realise the benefits

2. require the entitlement to be transferred up front, but include a lease back to the irrigator for say two years for the same reason as option 1
3. do not require any return of entitlement. Instead give a much lower payment as a subsidy (at similar levels to previous state schemes) and encourage the irrigator to sell entitlement to obtain additional funds to fund the upgrade.

The delinking proposed in the third option would separate market valuation and purchase of water entitlements from subsidies for infrastructure upgrading which are tangled together in the current programme. This would give irrigators a greater range of choice about the extent they trade off entitlement for system upgrades and greatly simplify the operation of the on-farm efficiency programme.

The risk for the government with the third option is that not enough water users choose to sell the water savings they make. It is argued though that this will be determined mostly by the price the government is willing to pay in the buy back (which would be the case whether the buy back occurs as part of a linked on-farm efficiency programme or as an independent programme) and the effectiveness of the capacity building programme in generating genuine water savings. Additionally if, as seems likely, there are more than enough willing sellers under the buy back scheme anyway (see discussion in section 3.3), there may be no need for a linkage and option 3 would be most effective.

Giving the irrigator a choice of options could deliver the best result, with different levels of funding available depending on the benefit to the government, as follows:

1. a simple government contribution for on-farm infrastructure on the same basis as previous state schemes (or slightly less), with no requirement to transfer entitlement. The irrigator may obtain additional funding by selling entitlement through the buy back scheme.
2. a government contribution for infrastructure with a commitment to transfer entitlement after two years (or transfer now, but lease back to the irrigator for two years). The contribution for this would reflect the buy back rate for the entitlement plus the option 1 contribution plus a bonus for committing to transfer entitlement.
3. a contribution for infrastructure with immediate handover of entitlement. The contribution for this would be the same as option 2 except the bonus would be higher reflecting the immediate handover.

The levels of subsidy needed to make it worthwhile for an irrigator to upgrade their systems will vary depending on industry and location, and whether the irrigator sees the farm as a long term investment or not. By setting the contributions at the right level the government can achieve a good balance between immediate and longer term return of entitlement and cost.

*Discussion point 4: How should the commitment to return entitlement be linked to funding for on-farm modernisation infrastructure? Would a better overall result be obtained if irrigators were given the choice of some contribution without entitlement return, with additional financial incentives for committing to return entitlement?*

### **3.1.3 Ensuring investment is not wasted on non-viable enterprises**

One of the risks of this programme is that investment will go into irrigation enterprises which are not viable over the longer term for reasons unrelated to water efficiency. The government's response to this issue is to use assessment of viability as one of the criteria to be considered in applications for funding. Additionally for irrigation areas the modernisation planning (see section 2.3.2 and discussion in section 3.2.1) looks at the viability of both the farms and the water delivery systems in irrigation districts.

Irrigation system decisions are in fact only one of the factors a farmer must consider. Return per ML of water is not the prime indicator of a viable irrigation enterprise. Rather it is the ongoing profitability of the business as a whole, with water related costs being only one of many. Before investing, the farmer must consider such things as implementation costs, changes in labour and energy costs, management capacity and changes in skills needed and how these will impact the overall profitability of the enterprise. They must take into account the state of their balance sheet – going into further debt to finance modernisation may not be financially viable even with a subsidy.

The requirement for a farm plan to be prepared as a condition of government contribution can provide a vehicle for demonstrating the future viability of an irrigation enterprise, taking account of natural resource issues. Assessing this sort of viability will always be difficult for government agencies. To a large extent they have to assume the farmer will act prudently.

On the other hand governments can and should take account of externalities which may not (at least in the short term) impact directly on the irrigator's balance sheet. For example, there might be strong natural resource reasons to wind back irrigation in certain areas because of such things as rising saline water tables. The same applies to reconfiguration of water delivery systems. These matters ought to be determined up front before on-farm investment occurs, so that, rather than investing in improving on-farm infrastructure the investment can be in assisting the farmers to step out of irrigation altogether at that location.

It is important then to recognise the value and importance of irrigation area and regional resource planning in informing on-farm investment strategies. The system modernisation plans currently being developed should be supported, in particular in relation to the aspect of strategic planning for the irrigation district as a whole. On-farm business planning should be aligned with these plans. The government should make it clear as early as possible, areas which are not to be invested in because of natural resource issues.

Overall the risk of public investment in enterprises that may not endure in the long term can be minimised by linking that investment to whole of farm plans which take account of natural resource issues and project a viable business case for the future. However the capacity of irrigators to develop such plans is uncertain.

*Discussion point 5: How can the government reasonably assess whether an irrigation farm where on-farm water efficiency infrastructure investment is proposed will be viable in the longer term?*

### **3.1.4 Discussion of equity issues**

The programme currently requires implementation through a delivery partner and places constraints on who can be a delivery partner. Many irrigators may not have the opportunity to participate because no delivery partner has put up their hand to cover their area or industry group. How much of an issue this may be is uncertain at this stage.

The eligibility guidelines for delivery partners appear to exclude private irrigation equipment/service suppliers from filling this role but Departmental advice is that this was not the intention. Some IAL equipment/service supplier members who were contacted did not understand that they were eligible to apply, and expressed an interest in taking on this role. Encouraging this would broaden the opportunity for irrigators to participate by expanding the number of potential delivery partners.

As time develops it would be useful to identify irrigators who are being excluded from this programme because of a lack of delivery partner.

As a whole it would be preferable to alter the programme so it is more aligned to a model which builds capacity rather than just infrastructure, as discussed in section 3.1.2, and in doing so engages a range of government and private service providers in a coordinated way. Also the integration of delivery system and on-farm water efficiency programmes into one for irrigation districts as discussed in section 3.2.1 has merit.

*Discussion point 6: Should IAL actively identify irrigators who are not being given an opportunity to participate because of a lack of delivery partner covering the area/industry, and encourage potential delivery partners to fill this role?*

In the pilot programme smaller scale irrigators are excluded by virtue of the minimum entitlement return per irrigator being 25ML. This would mean the entitlement would have to be a minimum of approximately 330 ML (assuming a total water saving of 15% is achieved). This would exclude around 80% of irrigators from the programme, though, consistent with the pareto? principle, the remaining 20% hold approximately 75% of the total water entitlement<sup>10</sup>.

When questioned about this a DEWHA officer indicated that this was put in the guidelines for the pilot on the basis that the administrative cost of conveyancing would be too high for very small entitlements. The 25ML threshold would be reviewed after the pilot.

In fact there are likely to be significant savings in conveyancing for large groups of entitlements. The Commonwealth could make arrangements for bulk approval of transfers by state agencies and searching and registration of documents with registrars could likewise be done in bulk, with reduced processing fees being negotiated.

Importantly though, the equity of excluding smaller irrigators on this basis from the programme is dubious, and wearing the additional conveyancing can be considered to be a public good, in the same way that broadband services to rural areas are being subsidised despite the low cost effectiveness.

The option discussed in section 3.1.2 of providing an explicitly funded water use efficiency support programme might be an alternative means of providing smaller scale irrigators with the ability to access support for modernisation while still retaining a minimum threshold for entitlement transfer. In many areas scheme based technical upgrades may be more effective than direct contributions to on farm infrastructure, eg providing a regionally based ETo network to support water scheduling decision making.

*Discussion point 7: What level is an appropriate minimum for entitlement transfer to the government for participating in the on-farm efficiency programme?*

*Should there be some means for smaller scale irrigators to access support for on-farm modernisation? If so what approaches are most appropriate?*

The government is looking for cost effective proposals, which means that irrigators will need to be prepared to make a substantial contribution towards the water savings works. However many irrigators are already financially strapped by the drought,

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<sup>10</sup> Figures based on NSW licence data obtained by the author.

meaning that, while they might be good candidates for the longer term, they currently do not have the cash to co-contribute.

It is important therefore to ensure that this opportunity remains open for as long as possible, as many irrigators may be much more able to participate after a year or two of improved water availability.

*Discussion point 8: To what extent is lack of cash in the short term going to limit irrigator involvement in a scheme which requires some level of co-contribution? Is this a problem provided the opportunity remains open for several years?*

### 3.2 Off-farm water delivery infrastructure modernisation

In the Plan as originally stated this programme was intended to reduce water 'lost' (through evaporation, seepage, end of system outfall etc) by investing in modernising irrigation water delivery system infrastructure.

It was intended to contribute to the objective of reducing over-allocation by requiring that 50% of water saved goes to the government for environmental needs. It was intended to contribute to more sustainable irrigation by allowing the remaining 50% of water saved to remain with irrigators for enhanced production.

The expectation is approximately 1500GL/year of water savings (750 GL/yr to be returned to the government for the environment) for a government investment of \$3.0b plus \$750m from water service providers (average of \$2500/ML overall, or \$4000/ML for the government to obtain water for the environment). This represents an 80% federal government contribution in return for 50% of the water saved.

The details of how the government has commenced implementation of this plan were described in section 2.3.2. Key elements of this approach are:

- ⌘ Requirement for an irrigation system modernisation plan prior to any commitment of funding for works, and up to 80% financial assistance to do prepare it.
- ⌘ In addition to describing the proposed infrastructure changes, modernisation plans are intended to be long term strategy documents for the irrigation district addressing compatibility with natural resource characteristics and future risks and opportunities. They are to demonstrate the long term viability of both the infrastructure and the irrigation district it supports.
- ⌘ A government contribution of up to 80% of the cost of the infrastructure changes.

The programme was intended to work in a complementary way with the other two major programmes (on-farm water savings, buy back) to achieve the two major objectives of the Plan in a balanced way.

In the MOU the federal government has committed to an expenditure of up to \$1b towards the Victorian Food Bowl project (90% of the total costs) for a projected saving of 200GL/year, half of which is to be provided to irrigators, the other half returned to the environment. This represents a higher rate of government contribution than the 80% set out in the original plan. In addition the projected savings are far less than the projected amounts indicated above representing \$5555/ML total investment for water savings, or \$10,000 per ML of environmental water for the federal government.

Key opportunities, risks and issues for the irrigation industry are shown below.

Opportunities	Risks	Equity issues
<ul style="list-style-type: none"> <li>▪ Part of the water savings may be returned to individual irrigators in increased entitlements or be held by delivery service provider and used to increase reliability</li> <li>▪ Delivery service may be much improved in relation to ordering times, ability to cancel or change orders etc.</li> <li>▪ Delivery system costs per ML (and consequently average water charges) may be reduced by removal of less viable sections of a system.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Water delivery charges may increase to support new infrastructure</li> <li>▪ Investments may not in actuality yield the expected water savings</li> <li>▪ Investments resulting in reduced returns to rivers/aquifers may be ineffective in terms of the total water balance</li> </ul>	<ul style="list-style-type: none"> <li>▪ Decisions about reconfiguration and retirement may be detrimental to some irrigators</li> <li>▪ Reductions in end of system outfalls may impact irrigators who have developed, based on its historic availability</li> </ul>

### 3.2.1 Discussion

Experience in installation of modern equipment (eg total channel control, conversion to pressurised systems etc) is that there are cost increases in many areas and cost reductions in other areas. Overall there is generally an increase because capital costs must be covered, asset replacement is often higher, and maintenance and operation costs are on balance increased. In most cases this has been more than offset by improved service and water savings returned to irrigators. In this programme capital costs are offset by a subsidy of up to 80% of the cost of upgrading infrastructure (90% if the Victorian Food Bowl commitment sets a new precedent), but water savings benefits are reduced by the requirement to return 50% to the government. If water savings do not eventuate to the level expected the burden will be disproportionately borne by irrigators because the entitlement to water returned to the government is handed over at the start.

In many areas an important part of water savings has been reductions in channel system outfalls resulting from rain-rejections etc. Historically in some areas water users outside of the system have developed a reliance on this outfall water for production. However as they do not have an entitlement to the outfall water they fall out of the normal water sharing regime. Whether they should be assisted or compensated in some way is not clear and would vary depending on specific circumstances.

Reconfiguration involving retirement of channels is always going to be a difficult process because existing irrigation farms on those channels are structured around having the channel infrastructure where it is. While some irrigators may be happy to retire from irrigation others may not be well positioned or inclined to do so.

It is important that irrigators understand and are prepared for how these changes may impact their future operations and ongoing costs. Modernisation plans are required to include 'the outcomes of stakeholder consultation, including irrigators and the wider community'. To make this consultation meaningful discussion papers or draft plans used in consultation should include assessments of:

- ⌘ expected improvements in water delivery service
- ⌘ how water savings retained by the water service provider will be shared with irrigators

- » assessment of uncertainty associated with expected water savings
- » how capital co-contribution is to be funded
- » likely impact of changed maintenance and operation on water delivery charges
- » possible negative impacts on irrigator on-farm operations and how they might be mitigated
- » assessment of how the changes might impact out of system users of outfall flows
- » how irrigators impacted negatively by system reconfiguration are to be assisted or compensated.

Because of the strategic, long term aspects of modernisation plans and the fact that they look at the future of the district and not just the delivery infrastructure, they are likely to be vitally important documents for the future of their irrigation district. It is very important that the plans are done comprehensively and that irrigators affected have a substantial involvement in them. Consultation can serve many purposes. It can be used to identify further options, identify any gaps in impact and risk assessments, develop community understanding and ownership of the plan, and negotiate solutions to equity issues. Consultation should be a core part of plan development and not just a tack on.

As mentioned in section 0, there is a strong case for a combined delivery system – on-farm modernisation programmes for irrigation districts. Delivery systems can be more cost effectively upgraded if they are required to handle lesser volumes which would result from reduction in on-farm water requirements. Also integration of pressurised delivery and pressurised on-farm systems where applicable is considerably more cost effective than just implementing pressurised systems on-farm.

*Discussion point 9: What is an appropriate consultation process for system modernisation plans? Should there be more explicit guidelines published and used?*

*Discussion point 10: Would it be better if irrigation district water delivery system and on-farm modernisation programmes were done in an integrated fashion?*

### **3.3 Buy back of irrigation water entitlements**

In the initial Plan \$3b was allocated to buy back water allocations and assist irrigators in the unviable or inefficient parts of irrigation schemes to exit the industry. As discussed in section 2.3.3 the new federal government on 26 Feb 2008 launched into the buy back process with an initial \$50m tender for purchase of entitlements.

Key opportunities, risks and issues for the irrigation industry are shown below.

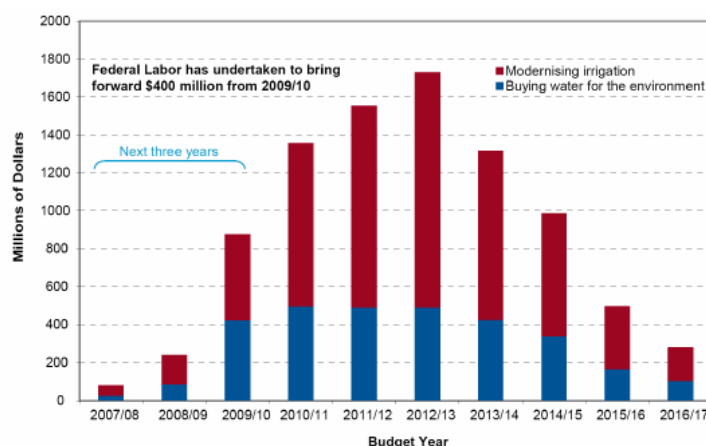
Opportunities	Risks	Equity issues
<ul style="list-style-type: none"> <li>▪ Provides irrigators wishing to leave the industry with increased opportunity to sell their water entitlement. This is particularly the case where the market is thin or non-existent</li> <li>▪ Provides fast and easy mechanism for government to obtain water for the environment.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Market price may be artificially driven up by government entering the market.</li> <li>▪ Buyers may not be able to buy because sellers are going to government or waiting to see what happens</li> <li>▪ Random sales from a viable area may reduce the viability of the area as a whole</li> <li>▪ Less viable irrigators may still not sell up.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Many irrigators will sell out of desperation because of financial stress due to the recent drought.</li> </ul>

### 3.3.1 Potential impacts on water markets

In simple terms, the water market provides a mechanism for water entitlement holders wishing to sell some or all of their entitlements to do so, and for those wishing to purchase additional entitlement to do so. Current water markets vary substantially in their depth (number of buyers and sellers at any one time). While there is a fairly deep market in seasonal water allocations (temporary trade) in the southern Murray-Darling regulated rivers and to a lesser extent in other regulated rivers, the same cannot be said of the market for water access entitlements (permanent trade), which is thin at best and almost non-existent in many river and aquifer systems.

Entry of the government into the permanent water market will provide a much greater opportunity for sellers across the whole MDB. In particular it opens up the opportunity for sale across areas of the basin where the market is thin or non-existent.

Figure 1: National Plan for Water Security budget for modernisation and the purchase of environmental water as presented in budget papers for 2007/08 (taken from Young and McColl<sup>6</sup> p25)



The risk is that the government's entry will on the other hand make it very difficult for those wishing to purchase entitlements to do so because the sales are going to government. It is also highly likely to drive up the price of water.

Figure 1 shows how the previous federal government projected total investment under the Plan over the 10 years of the plan. According to Young and McColl<sup>11</sup>, this would require the buy back of water for the environment over each of the next 10 years at an annual rate that, in all but this financial year, is greater than the value of all the water entitlements that have ever been sold in a year (estimated to be \$100m).

Simple logic of supply and demand suggests that this will inevitably drive up the price of water entitlements. After the initial group of sellers who are perhaps more desperate to move on because of the effect of the drought, the Government will have to offer an ever increasing price to attract enough willing sellers to achieve the volumes required. According to Young and McColl, 'the result would be an increase in water prices to the extent that no irrigator would be able to compete with the environment's water purchaser. The entitlement market would be wrecked and any structural adjustment that required the purchase of a water entitlement financially impossible'.

The federal government's response to this is to 'test the water' with a relatively small initial offer. In response to the question 'Will the Australian Government's water purchase programme make it more difficult for other irrigators to buy water?' the government's published response is 'The impact of the Australian Government's purchases in 2007-08 on the water market is only expected to be small. Purchases in 2007-08 are only likely to account for less than half of one per cent of regulated surface water entitlements across the Murray-Darling Basin'<sup>12</sup>. This statement gives a false picture. What should be compared is the expected size of the purchase compared to the current market size, which is far smaller than the total of entitlements.

Several persons closely involved in buying and selling water entitlements (brokers, irrigators) were interviewed to obtain their views on how the government has and might affect the water market. Most felt that there was more than enough people out there willing to sell, and that there are currently plenty of willing sellers but few buyers in the open market. This situation was put down to:

- ⌘ the stress imposed by the recent long drought, resulting in many irrigators looking for the best way out
- ⌘ entitlements with small or no current allocations which are unlikely to be of much use for at least another 12-24 months being less attractive to purchasers.

A couple of those interviewed were of the opinion, however, that while there is current large supply of willing sellers this will 'dry up' well before the government's targets are met.

All those interviewed were definite that the incursions by various existing government programmes (Riverbank, Living Murray, Water for Rivers for example) into the market have already driven up market values. In the Murrumbidgee, it was reported by one person interviewed that the Water for Rivers purchases in 2006 and 2007 pushed the price of general security entitlements up to \$720/unit, and the recent tender for the Living Murray pushed it up further to \$900/unit. In another case an interviewee stated that in the recent Living Murray tender many accepted offers were at much higher prices than expected, and persons who had lower tenders accepted withdrew when they heard about the higher tenders which had been accepted (MDBC has not released any details of how the tender process worked).

All those interviewed were of the view that the various government purchase-by-tender processes were poorly conceived and executed, and that the processes could be much improved. They were unnecessarily driving up the market price, given that

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<sup>11</sup> [http://www.myyoung.net.au/water/droplets/A\\_future-proofed\\_Basin.pdf](http://www.myyoung.net.au/water/droplets/A_future-proofed_Basin.pdf) p25 accessed 3 March 2008

<sup>12</sup> <http://www.environment.gov.au/water/programs/entitlement-purchasing/faq-program.html> accessed 8 March 2008

willing sellers (at least at the current point in time) currently far exceed buyers on the market. The increasing prices are making it harder and more expensive for irrigators seeking to purchase entitlements either for new enterprises or to shore up current enterprises.

Another interviewee noted that sellers in the general market had pulled out immediately the federal government announced its initial move into the market, and there is general expectation that the federal government will pay much higher than they can currently get on the open market. This expectation has been created by the previous government incursions resulting in purchases well above market value rather than genuine market supply and demand forces.

Various people have already called for a hold on the buy back of water entitlements for various reasons including effect on water markets<sup>13</sup>. The MDBC and others are apparently reluctant to release details of how the tenders went, perhaps because they didn't work as expected. It seems clear that a bit of transparency would be enormously beneficial. In particular there is a strong case for a transparent review of the recent tender processes to analyse why they drove up market prices and how they might be better designed to have a lesser effect. As mentioned above, it appears that prices are being driven up not so much by increasing market value (as supply is much greater than demand) as by the way the tender processes are being administered.

One of the key needs for an effective water market is ready access to information on market operation. It is clear that the very lack of transparency in government tenders is resulting in irrigators speculating on what the government is willing to pay now and in the future, and hesitating to sell.

Water brokers interviewed were strongly of the view that the process could be redesigned to achieve buy backs without artificially driving up the market price. Introducing greater transparency would be one important aspect. Another would be reducing the uncertainty by being clearer about how much, where and what types of entitlements the government aims to purchase, and what price the government is willing to pay.

One possible way forward would be for the government to offer to buy entitlements at a fixed 'shelf price' based on current market values (which would vary depending on the nature of the entitlement and the area). This would make sense because the government is far and away the biggest purchaser in the market and is setting the price in any case via the processes it is using. The relatively small numbers of private buyers could then obtain entitlements on the market by offering a slightly higher price, with little impact on the government purchases.

A variant on this would be to adopt a pool pricing method similar to that used by Watermove in Victoria for temporary trading. Using this method tenders would be called and the offers ranked from lowest to highest for similar types of entitlement, then all those with offers below a cut-off price would be offered the cut-off price, with the cut-off price being set based on a target level of entitlement being sought, or a median level. Either this could be repeated periodically or the cut-off price could be used as an ongoing offer for a period afterwards. This would work well if there are a large number of similar entitlements being offered, but poorly otherwise.

The counter side of this is that higher prices are good for those irrigators wishing to sell, so it is in the interests of those irrigators to allow prices to be driven up.

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<sup>13</sup> See for example the paper by Young and McColl referenced earlier, and the recent statement by the NSW Opposition <http://theland.farmonline.com.au/news/nationalrural/agribusiness-and-general/general/article/82531.aspx> 14 March 2008

Advice from the Department is that the Minister has committed to a full review of its process for buy back after this first round. It would be important for this to be done in a way which provides for input by stakeholders and the public.

*Discussion point 11: What are the problems with the government's current method of buy back? How could it be improved?*

### **3.3.2 Drought driving sale by financially stressed irrigators who would otherwise not do so**

Several commentators have made the point that mass buy outs at the moment are unethical because the sellers are “vulnerable to exploitation and are unable to plan or think about their long term future”<sup>14</sup>.

The counter argument is that those same people may welcome the opportunity to sell out at a good price, particularly in areas where the market is thin or non-existent. They may also wish to sell part rather than all of their entitlement and downsize. It would seem inappropriate for others to dictate that these people should not have the opportunity to sell if they wish.

For those who, but for short term financial stress brought on by the unanticipated duration and impact of the drought, have sound long term prospects, short term support measures are an appropriate response. There is already a substantial drought assistance programme, the effectiveness of which is not a topic for this paper. The proposal to implement a national water use efficiency capacity building programme (see section 3.1.2) would also be beneficial for these people.

### **3.3.3 Should entitlements obtained by the government be retired?**

The government has indicated that all entitlements it obtains either through investment in water savings or through buy back will not be retired, but will be retained and held by the Commonwealth Environmental Water Holder, to be used for environmental purposes.

In a recent statement, the NSW Irrigators Council argued that this does not address ‘over-allocation’ as it does not reduce the number of entitlements. The statement proposed that purchased entitlements should be retired so that ‘the reliability of all licenses – irrigators, the environment and others – would increase’<sup>15</sup>.

While there is truth in this statement it does not give the whole picture. In simple terms, a large proportion of water used by the environment is not defined in entitlements. It is largely water excluded from extraction by various rules, which by its very nature cannot be defined in the same way that water extraction entitlements are. For example a large proportion of ‘environmental’ water is defined as that water that occurs in a river system in excess of an extraction cap. In regulated rivers, some of this water can be captured in dams and released in a controlled fashion, but most of it cannot. It is thus totally different in its characteristics to regulated river entitlements – its reliability is different, it cannot be controlled or released on demand.

Some of the ‘environmental water’ is however held in water entitlements, which have been purchased or obtained by investment in water savings through programmes such

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<sup>14</sup> For example <http://theland.farmonline.com.au/news/nationalrural/agribusiness-and-general/general/article/82531.aspx> 14 March 2008

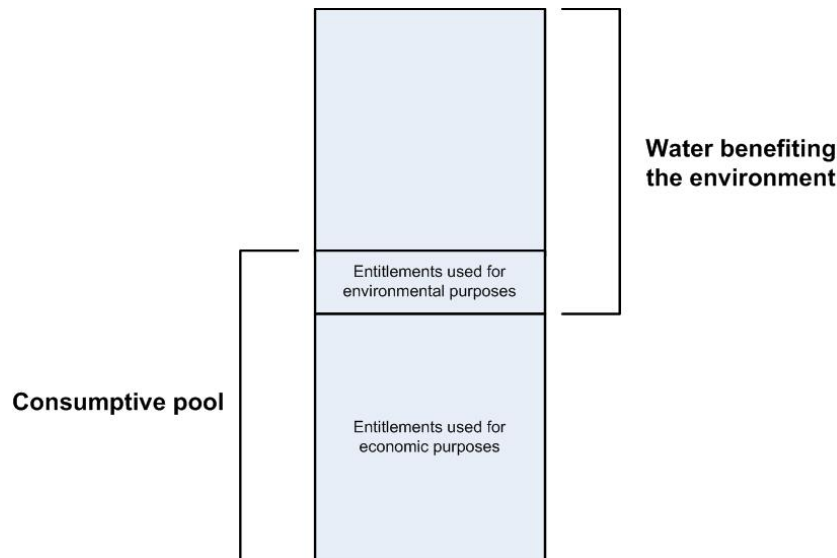
<sup>15</sup> [http://www.nswirrigators.org.au/pdf/press\\_release/Minister%20must%20take%20care.pdf](http://www.nswirrigators.org.au/pdf/press_release/Minister%20must%20take%20care.pdf) accessed 11 March 2008

as the Living Murray or NSW Riverbank. They are a small proportion of the total water committed to the environment (see Figure 2).

‘Over-allocation’ can be interpreted in multiple ways. It can mean that insufficient water is available in the system to sustain the long term health of valued environmental assets (rivers, aquifers and dependent ecosystems such as wetlands). It can also mean that the reliability of extractive allocations is lower than that which is expected or required. The NWI and the Plan interpret over-allocation in the first way.

The NWI aims to ‘ensure the health of river and groundwater systems by establishing

*Figure 2: representation of relationship between entitlements, the consumptive pool and environmental water*



clear pathways to return all systems to environmentally sustainable levels of extraction’ (cl 5). Over-allocation under the NWI relates to not meeting desired ‘environmental or other public benefit outcomes’ (see cl 43). It talks in terms of a ‘consumptive pool’ for water entitlements which reflects water available after the establishment of system rules to meet essential environmental outcomes. The NWI does not overtly aim to bolster the reliability of entitlements. Rather it aims to establish entitlements as shares in the consumptive pool, where security is provided by limiting the number of shares and transparently operating to known rules which define the consumptive pool.

While the Plan is consistent with the NWI, it adds to it support for improved entitlement reliability through sharing of water savings. The government’s share of water savings is explicitly intended to achieve the environmental purposes of the NWI.

With entitlements obtained by the government for environmental purposes, there are three options:

1. To retire the entitlement without altering the consumptive pool. This would bolster the reliability of all other water entitlements (including those held for the environment). Most of the benefit would accrue to irrigators, as the proportion of entitlements which are environmental is small.
2. To retire the entitlement and reduce the consumptive pool correspondingly. In this case the water would become part of the environmental rules water, and would have the effect of marginally increasing existing flow events in the system. The reliability of irrigation entitlements would be neither improved nor reduced.
3. To hold the entitlement and deploy it in a controlled way for environmental purposes. The entitlement maintains its characteristics (same seasonal

allocations etc). Like the second option, this ensures all the water goes to the environment, but allows its benefit to be increased because it can be targeted to particular environmental assets at times when it would achieve the maximum benefit.

It is clear that the most efficient way to use purchased entitlements to move towards environmental sustainability is the third. Compared to the second option, it has the additional advantage for irrigators that water allocations under environmental water entitlements which are not needed in a particular year for environmental purposes may be placed on the market and purchased by irrigators for their use. To ask the government to go with the first option is to ask it to fail in its environmental objectives.

Additionally, given the public investment involved it is reasonable to expect that there should be public accountability for use of these entitlements. Several persons interviewed expressed lack of confidence that the entitlements would be effectively used to achieve environmental benefits. There is a need for:

- » clarity and transparency about the environmental objectives being targeted
- » published strategies indicating how the entitlements are to be used to achieve these objectives
- » periodic (annual or biannual) public reporting of implementation and effectiveness in achieving objectives
- » periodic reviews of the strategies.

### **3.3.4 Risks in a poorly targeted approach**

The initial federal government buy back tender applies across the whole Murray-Darling Basin, to regulated and unregulated rivers and both surface and groundwater. There are general statements in the documentation about assessment of applications based on ability to use the entitlement for environmental assets. There is no mention of any particular areas which would be given priority because they are less viable or should be retired for environmental reasons.

There was an expectation in the Plan that the CSIRO sustainable yield studies would define the 'level of over-allocation and over-use' in the MDB. What the studies are doing is reporting the likely water availability in the future under a range of scenarios considering climate change, growth in use of entitlements, growth in 'interception' activities such as farm dams and plantation forestry and interaction between surface and groundwater. They provide information on how the future scenarios are likely to change hydrology relating to environmental assets, but provide no information on how much additional water is needed to sustain those assets indefinitely. Victoria's recently released Northern Sustainable Water Strategy Discussion Paper goes a step further to provide quantitative estimates of volumes required under different future climatic scenarios to sustain environmental assets.

There is a need for the federal government to set out specific desired environmental outcomes and develop and publish targets for obtaining water entitlements to achieve them. While a few environmental objectives are well known (eg Murray icon sites, Macquarie Marshes) there is little information beyond this. It is also unclear to what extent the federal government will be contributing to the target quantities specified in Victoria's Northern Sustainable Water Strategy Discussion Paper, and how it will share with other programmes such as the Living Murray and Riverbank in achieving targets.

This is important information for the government to ensure investment is targeted correctly and is also important to provide some transparency for irrigators and the community. Lack of clear information facilitates uncertainty for irrigators regarding the value of their entitlements and when they should look to sell should they wish to. It encourages price increases driven by speculation rather than hard information.

A DEWHA officer has indicated that the government will be publishing information on this shortly. It is hoped the information will be sufficiently detailed to provide clarity as to which entitlements will be of interest to the government, and of those which would be most valued.

The published information should also include quantitative targets. Such targets, once published, need not stand indefinitely. They could be subject to review after say 3 years to take into account changes in information and science and experience in implementing the programmes.

Irrigators might be benefited if the government were to give preference to buy backs in areas where the market is thin or non-existent so as to give these people an opportunity to sell, which they might not otherwise have (subject to there being an environmental need for the water purchased).

Additionally it is important for some transparency in determining areas where there is to be a programme of reducing irrigation. Hopefully these areas will be identified in the modernisation plans mentioned earlier, but there will likely be other areas. In such areas there is a need for an approach to assisting affected landholders to phase out of irrigation involving more than just purchase of water entitlements.

*Discussion point 12: How important is it for the government to be more transparent and specific in stating the environmental outcomes it is seeking, and the targets for buy back/recovery of water entitlements in relation to location, quantity and types of entitlement?*

## 4 Possible alternative strategies

In addition to the 3 programs discussed above there are different approaches to achieving the objectives of the Plan which warrant consideration. These are discussed below.

### 4.1 Compulsory acquisition

In their recent widely distributed paper *A Future-Proofed Basin*<sup>16</sup> Mike Young and Jim McColl have proposed that the water entitlement system in the Southern Murray-Darling Basin be fundamentally re-structured. All water entitlements are to be replaced and the sharing of water between the environment and economic uses reset in a single step change. The plans for investing directly into on-farm and supply system water savings are to be scrapped and the moneys used largely for upfront compensation payment with some set aside for reconfiguration of supply infrastructure where necessary after adjustment. In effect this is a compulsory acquisition of water entitlements, as this process redistributes water to the environment in a single hit rather than shifting it by purchase from willing sellers. In return for this the proposal suggests an upfront payment to all entitlement holders, the promise of an entitlement regime which is no-longer over-allocated and is more adaptable to change, and a changeover which happens rapidly rather than dragging on for years.

Young and McColl argue that the current proposed process of stepping into the market to purchase entitlements for the environment is far beyond the market's capacity to bear and will not work. They argue that it is better to impose a cross the board cut in

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<sup>16</sup> [http://www.myoung.net.au/water/droplets/A\\_future-proofed\\_Basin.pdf](http://www.myoung.net.au/water/droplets/A_future-proofed_Basin.pdf) accessed 3 March 2008

return for cash and then let the cashed up entitlement holders regain what they need or sell up using the market.

For irrigators, the headline concern in this proposal is that it incorporates an across the board compulsory acquisition of entitlement. Whether this should be a flat percentage applied everywhere, or different percentages based on water system and entitlement type is not addressed, and is a significant issue in itself. Generally compulsory acquisition has been opposed by irrigators on equity grounds. Recently the NSW Irrigators Council sought confirmation from the federal government that it would not proceed down the path of compulsory acquisition<sup>17</sup> and the Minister has reaffirmed that this is the case in several statements to the press.

The paper as a whole puts great reliance on market mechanisms as the best means to deliver outcomes. It implicitly argues that it is better to force the redistribution of water to the environment in a single step then let the market deal with structural change, modernizing irrigation systems etc, instead of having the government directly picking and funding upgrade of on-farm and off-farm irrigation systems. However persons interviewed who are involved in irrigation extension doubt that the market on its own could achieve the desired outcomes. There is a strong risk of market failure in respect to:

- ⌘ Irrigators acting in a way which is far different from ideal market responsiveness due to lack of knowledge and technical support.
- ⌘ Irrigators wishing to purchase entitlement to regain volumes lost not being able to or paying a high premium because of insufficient market capacity (for example in groundwater areas).

Many of the factors that make for an ongoing viable irrigation industry are beyond the capacity of individual entitlement holders to deal with. They require coordinated planning effort which takes into account natural resource and land capacity, viability of large scale delivery infrastructure and the associated irrigation farms, and efficiencies of integrated and coordinated implementation of technology. Markets focus on individuals and, without a layer of broader scale planning, significant opportunities will be missed and the overall investment will be much less effective.

In summary then, the advantage of compulsory acquisition as proposed is it gets the 'pain' of redeployment to the environment over in one hit rather than having it drag out over several years with all the uncertainty of the current process. It also delivers water to the environment more quickly reducing the risk of permanent degradation. The disadvantages are that many irrigators may not be able to recover water lost through market mechanisms, and the reliance on market mechanisms solely to achieve efficiencies in water use is likely to fail due to lack of capacity and absence of broader planning.

The federal government however has excluded compulsory acquisition by legislation and has not indicated any interest in changing that position, so perhaps the whole discussion is unlikely to progress in any case.

## 4.2 Buy back only

Several economists have argued that government involvement in subsidising agricultural infrastructure will distort markets and on-farm decision making and is

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<sup>17</sup> See <http://theland.farmonline.com.au/news/nationalrural/agribusiness-and-general/general/article/81724.aspx> and [http://www.nswirrigators.org.au/pdf/press\\_release/Irrigators%20Unanimous%20No%20to%20Compulsory%20Acquisition.pdf](http://www.nswirrigators.org.au/pdf/press_release/Irrigators%20Unanimous%20No%20to%20Compulsory%20Acquisition.pdf) accessed 8 March 2008

inequitable to those who have acted already<sup>18</sup>. They argue that the government should simply obtain the water for the environment by buy back or compulsory acquisition.

As in the Young and McColl proposal, the proponents of this view put great trust in the market, arguing that markets are far more likely to deliver fair and efficient outcomes than government officers 'picking winners' through administrative processes which inherently do not take account of the whole of farm production cost structures. Against this is the likelihood of market failure; the probability that irrigators will not act in the way economics suggests they should due to factors such as capacity for change as discussed in section 3.1.2; the likelihood that irrigators in an area acting individually will not access the opportunities that might be present from coordinated, planned action at the whole of area level; the difficulties in including externalities such as environmental and third party effects into market operation.

Retreating to buy back only may be simpler for the government, but it would do nothing to maintain the long term economic production base on which regional communities rely.

### 4.3 Use of tax incentives

Some irrigators have suggested that tax incentives could be used to a greater extent as a means to assist in modernising irrigation. Any investment by an irrigator in on-farm infrastructure is already going to be a legitimate business expense or capital outlay. A DEWHA officer interviewed stated that they did not favour tax incentives since they tended to be beneficial for irrigators making substantial profits but of much less or no benefit to irrigators with small or zero taxable income. On the other hand those with low taxable incomes are probably most in need of assistance to either modernise or sell out.

There seems little advantage in replacing a direct funding contribution scheme with a more complex tax incentive scheme.

*Discussion point 13: Are there any specific taxation incentives that would be preferable to the approach of direct government contributions for water efficiency infrastructure?*

## 5 Conclusion

This paper has presented an analysis of the government's programmes under the National Plan for Water, highlighting issues, risks and opportunities for irrigators. It includes consideration of alternative approaches which might deliver improved results for irrigators and regional communities, while still meeting environmental objectives.

Two matters stand out as being most important. The first is the over-emphasis on infrastructure and lack of any on-farm water efficiency capacity building component in the Plan. A broad bank of experience in state sponsored water used efficiency programmes has shown this is highly unlikely to deliver long term on-farm water savings. Explicit funding of a capacity building programme based on successful state

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<sup>18</sup> See for example Watson, A, *A National Plan for Water Security: Pluses and Minuses* Farm Policy Journal Vol 4 No 3 August Quarter 2007.

programmes would appear to be vital if the government is serious about improving long term sustainability of the irrigation industry.

The second is the manner in which the approach to buy backs being taken by government agencies is impacting on water markets, unnecessarily driving up prices and creating uncertainty about value. It is proposed that alternative approaches to the current tender methodology might deliver a better result.

A number of specific points are highlighted for further discussion by IAL members:

1. How important is it that there continue to be an on-farm modernisation component of the Plan, or is it better for all if public moneys are devoted to improving public/shared water storage and delivery systems?
2. Is on-farm water efficiency capacity building (R&D, communication and education, facilitation of the development of private irrigation support services etc) a cost effective investment for the government, and should it be explicitly funded under the Plan, or should this be left to individual irrigators and the private sector?
3. What role could IAL play in a developing and implementing a national capacity building program?
4. How should the commitment to return entitlement be linked to funding for on-farm modernisation infrastructure? Would a better overall result be obtained if irrigators were given the choice of some contribution without entitlement return, with additional financial incentives for committing to return entitlement?
5. How can the government reasonably assess whether an irrigation farm, where on-farm water efficiency infrastructure investment is proposed, will be viable in the longer term?
6. Should IAL actively identify irrigators who are not being given an opportunity to participate because of a lack of delivery partner covering the area/industry, and encourage potential delivery partners to fill this role?
7. What level is an appropriate minimum for entitlement transfer to the government for participating in the on-farm efficiency programme? Should there be some means for smaller scale irrigators to access support for on-farm modernisation? If so what approaches are most appropriate?
8. To what extent is lack of cash in the short term going to limit irrigator involvement in a scheme which requires some level of co-contribution? Is this a problem provided the opportunity remains open for several years?
9. What is an appropriate consultation process for system modernisation plans? Should there be more explicit guidelines published and used?
10. Would it be better if irrigation district water delivery system and on-farm modernisation programmes were done in an integrated fashion?
11. What are the problems with the government's current method of buy back? How could it be improved?
12. How important is it for the government to be more transparent and specific in stating the environmental outcomes it is seeking, and the targets for buy back/recovery of water entitlements in relation to location, quantity and types of entitlement?
13. Are there any specific taxation incentives that would be preferable to the approach of direct government contributions for water efficiency infrastructure?

There are aspects of the how the government will implement the Plan that remain unclear, in particular the on-farm water efficiency programme. With the federal budget

due to be delivered shortly (13 May) and the detailed COAG agreement in July, it is likely that further detail will be appearing even as this paper is being discussed.

## Appendix: Irrigation Modernisation Planning – successful applicants

(Taken from press release by Minister for Climate Change and Water, 11 February 2008)

Applicant	Location	Funding	Irrigators (holdings)	Area (hectares)	Water Entitlement	Main Business	Proposed Modernisation Activity
Southern Rural Water	Maffra, Gippsland, VIC	\$500,000	971	40,000	274.8 GL	Dairy industry	Consideration of options to replace 90 year old infrastructure with a modern supply system
Murray Irrigation Ltd	Deniliquin, NSW	\$500,000	1,600	748,000	1,615 GL	Rice, pasture (for dairy), winter cereal crops, fruit and vegetables	Three stage analysis of options and development of a business case for investment in modernisation
Goulburn-Murray Water	Tatura, VIC	\$490,000	32,886	6,800,000	1,761 GL	Dairy farming, horticulture and viticulture	Modernisation planning, including considering soil types and infrastructure usage, with the objective to secure water saving and provide a more efficient, modern and cost effective service
Murrumbidgee Irrigation Limited	Griffith / Leeton, NSW	\$500,000	3,200	660,000	1,476 GL	Horticulture (citrus, viticulture), vegetables, rice, winter cereals crops	Planning to ensure the long-term viability of the company and sustainability of the irrigation area
SunWater	SunWater channel irrigation systems at Theodore, Mareeba, St George, Emerald, Bundaberg, Mackay, Maryborough and Ayr, QLD	\$500,000	2,750	200,000	1,398 GL	Cotton, sugar cane, cereals, irrigated pasture, tropical tree crops and annual horticultural crops	The project will build on existing plans for the management of water loss from open channels and develop strategies for improving the efficiency of water delivery
Harvey Water	Harvey, WA	\$320,000	-	112,000	68 GL	Dairy farming, beef grazing and horticulture	Planning for irrigation distribution system upgrade and the application of modern water technology in the Collie River Irrigation District
Trangie-Nevertire Co-operative Ltd	Trangie, NSW	\$300,000	70	102,000	68 GL	Irrigation for dry land agriculture, horticulture and livestock production	Development of strategies to achieve sustainable water use outcomes through modernisation of water delivery infrastructure and increased water use efficiency
Tenandra Irrigation Scheme	Warren, NSW	\$120,000	18	7,600	35.5 GL	Cotton with winter cereals, irrigated lucerne and pasture	Evaluation of options to reduce water transmission losses
Wimmera-Mallee Water	Horsham, VIC	\$80,000	216	3,000	28 GL	Livestock production	An investigation of issues affecting modernisation of the water delivery system, including an assessment of water losses, to assist with planning future supply reconfiguration options

The Renmark Irrigation Trust	Renmark, SA	\$500,000	260	4,700	47.5 GL	Viticulture, stone fruits, citrus, nuts, pomefruit, tropical fruits and pasture	The project will involve the development of a range of options for the rehabilitation of irrigation infrastructure and greater water use efficiency
Jemalong Irrigation Limited	Forbes, NSW	\$300,000	100	90,000	82 GL	Irrigation for dry land agriculture, horticulture and livestock production	Explore alternative strategies to increase water use efficiency, including options for the modernisation of ageing water delivery infrastructure
Tatalia Water Supply Inc.	Moama, NS W	\$16,000	20	N/A	1.1 GL	Viticulture, horticulture, stone fruits, general farming	Replace an old existing pipe and open earth channel distribution system with a fully piped delivery system
North Burdekin Water Board	Ayr, QLD	\$300,000	600	15,658	156 GL	Sugar cane, horticulture and livestock production	This is a joint venture project with the South Burdekin Water Board and will involve an assessment of current water delivery systems, related water use efficiency and an analysis of alternative infrastructure, water application and crop production options
South Burdekin Water Board	Home Hill, QLD	\$200,000	1000	26,222	99 GL	Sugar cane, horticulture and livestock production	See comment above