Burnett Water

Response to "Report to the Queensland Conservation Council"

June 2003

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1 Introduction

In 2001 NECG analysed the economic impacts of the proposed water infrastructure developments in the Wide Bay Burnett region.[1] This analysis, performed as a part of the EIS process, demonstrated that the project is economically robust.

Recently, these findings have been questioned in a report commissioned by the Queensland Conservation Council (QCC) entitled *A Critique of the Economic Viability of the Burnett River Dam Project: Predicted Levels of Future Water Demand According to Irrigators' Ability to Pay"* by Dr John Ward. Burnett Water's attention was drawn to the paper when it was posted on the National Competition Council (NCC) website. Dr Ward did not consult with the project principal, Burnett Water Pty Ltd, nor NECG.

The purpose of this report is to respond to several issues we consider relevant arising from Dr Ward's analysis as it presents, in our view, a most unrepresentative assessment of the beneficial economic impacts expected to arise from the proposed development.

Dr Ward's analysis did not criticise NECG's approach but rather suggested that a range of other factors should be included in the analysis. The inclusion of these changes caused a dramatic revision to the results.

The report is structured as follows:

- section 2 contains a brief overview of the original NECG report as well as subsequent material prepared by ACIL for Burnett Water and PricewaterhouseCoopers for the Department of State Development;
- section 3 provides an overview of Dr Ward's report;

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[1] NECG was assisted by Professor John Mangan, who is widely regarded as amongst the most highly respected applied economists in Queensland. Professor Mangan's reputation for modelling economic impacts has seen him regularly play a significant role in economic modelling policy in this State, including as part of Queensland Treasury's economic modelling review committee.

- section 4 outlines the relevant provisions of the COAG Water Resource Policy;
- section 5 reviews Dr Ward's approach to the estimation of the environmental costs associated with the proposed water storage infrastructure in light of the COAG Water Resource Policy;
- section 6 discusses issues associated with discount rates;
- section 7 considers the implications of higher water prices for water demand for sugar and other crops and its implications for Dr Ward's conclusions;
- section 8 outlines some factual concerns with the Dr Ward's analysis; and
- section 9 concludes this report.

2 Overview of NECG report and subsequent work

In 2001 NECG was asked to evaluate the economic consequences of the construction of water storage infrastructure in the Burnett region.[2] This exercise, a part of the public EIS process, was scoped to ascertain the economic impact and the cost/benefits of the project. The initial study released with the EIS was further refined for the Supplementary Report.

The Study was undertaken in conjunction with specialised agricultural consultants Alliance Resource Economics and Professor John Mangan, University of Queensland, whose State and Regional economic models were an indispensable tool in the job. It is worth noting that although there had been earlier economic studies, which we acknowledged and took into account, our study involved a great deal of original work and regional economic modelling.

The study found that:

- the Burnett region is characterised by variable rainfall, prolonged periods of drought, amongst the highest levels of unemployment and the lowest levels of income in the State.; and
- the construction of the water storage infrastructure is likely to have strongly positive impacts. Depending upon the assumptions concerning the speed of the take up of the water and the assumed discount rate, the net benefits of the infrastructure were estimated at between $1.7 billion and $2.9 billion.

The NECG documents were released for public comment during the EIS process and have remained in the public domain on the Burnett Water website continuously for the last eighteen months. The findings have been widely discussed and publicised.

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[2] The study considered 5 water storage facilities, being a dam on the Lower Burnett River, augmentation of the existing Walla Weir and Jones Weir, construction of new weirs on the Burnett River at Eidsvold and on Barambah Creek near Barlil.

Because the Study was designed to address the terms of reference of the EIS, it did not address the market conditions for commodities that would be produced as a result of the application of additional water to arable land nor the aspect of commercial water pricing.

These aspects were addressed in later studies by other consultants, whose conclusions reinforced the basic findings of the NECG study. The specific later studies were by well-credentialed consultants Pricewaterhouse Coopers (PWC, 2002) and ACIL (ACIL, 2002). In particular:

- PWC assessed a strong willingness and ability to pay for the enhanced water yield that would be created by the water storage infrastructure; and
- ACIL's commodity demand analysis of the agricultural production in the Burnett Region broadly confirmed a positive outlook for the region given the increased availability of water expected to emerge from the construction of the water storage infrastructure. ACIL's analysis is elaborated upon in section 7 but it is noted that ACIL observed in relation to NECG's initial report that:[3]

> The key point about the NECG projected production increases is that they are not inconsistent with the track record for horticultural production in the region which in turn reflects market opportunities and the demonstrated capacity of producers to compete against suppliers elsewhere in Australia as well as overseas. Indeed, compared to the recent past (sic) they appear to be conservative.

However, these findings have recently been questioned in a report commissioned by the Queensland Conservation Council (QCC) entitled *A Critique of the Economic Viability of the Burnett River Dam Project: Predicted Levels of Future Water Demand According to Irrigators' Ability to Pay"* to which we now turn.

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[3] ACIL Consulting (2002) Agricultural Production from the Burnett Region: Commodity Demand Analysis, Canberra, page 46.

3 Overview of the Ward report

Dr. John Ward attempts to cast doubt over the viability of Burnett River Dam and associated infrastructure. The major claim in the report is that the economic modelling undertaken to support the Burnett water project (Alliance Resource Economics (2000) and NECG (2001)) fails to fully allow for costs associated with environmental impact. In addition, Dr Ward contends that NECG underestimated the discount rates to be applied for its analysis. Dr Ward also assumes that the COAG Water Resource Policy requires full cost recovery.

Dr Ward argues that if water charges are set so as to achieve full cost recovery (including a commercial return for his assessed value of environmental loss), the take-up rate for the water from storage infrastructure will be below expectations due to the currently depressed state of sugar prices, which in turn will reduce the economic benefit from the project. The point is extended to other activities such as dairy and lucerne production.

As a result of the above considerations, the report argues that the Queensland Government is obliged, under the terms of the COAG framework, to reject the development on the grounds that it will fail to achieve an adequate rate of return. Instead, Dr Ward argues that lower yielding scenarios from the original WAMP would be consistent with the full take up of water.

Accordingly, the report does not question the estimates of economic benefits forecast in the earlier report(s) but rather the assumptions underpinning the economic forecasts, most noticeably, water use, crop viability, discount rates and the under-reporting of environmental loss.

In examining the report we believe it to be seriously deficient in a number of areas. Specifically, it:

- misinterprets the COAG Water Resource Policy;
- adopts a grossly inflated estimate of the costs of environmental impact to the areas affected by the dam construction;
- applies excessive discount rates;

- compounds these errors by the use of a very short-term and simplistic view of the economics of the sugar industry with the implicit assumption of fixed production functions which rule out crop or activity substitution possibilities and discounts the true value of increased water resources;
- contains a series of important factual errors.

We address these concerns in the following sections.

4 COAG Water Resource Policy

The COAG Water Resource Policy sets out the agreed framework for water reform in Australia. Dr Ward's analysis is based upon an interpretation that this framework requires new water infrastructure earn a commercial rate or return on the entire investment – so that there is no room for transparent community service obligation funding of new projects that are demonstrated to produce net economic benefit.

The COAG Guidelines for the minimal recovery of cost by a rural water provider involve:

- operational, maintenance and administrative costs;
- externalities;
- taxes or TERs (taxation equivalence regimes), but not including income tax;
- the interest cost of debt;
- dividends, at a level that reflects commercial realities; and
- make provision for future asset refurbishment/replacement.[4]

The "lower bound" benchmark, as it is better known, represents a minimum water price that a business is expected to charge to remain 'viable'.[5] Despite the lower bound not including a commercial return on capital, the Water Resource Policy encourages rural water providers to earn a positive real rate of return.

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4 Guidelines for the Application of Section 3 of the Strategic Framework and Related Recommendation in Section 12 of the Expert Group, National Competition Council, (1998) "Compendium of National Competition Policy Agreements - Second Edition 1998", page 112.

5 National Competition Council, (1998) "Compendium of National Competition Policy Agreements - Second Edition 1998", page 112.

The COAG guidelines go on to define 'externalities' as meaning environmental and natural resource management costs *attributable to and incurred by* the water business.[6] The NCC has suggested that the quantification of environmental costs occurs by reference to the level of investment in infrastructure designed to mitigate the environmental impacts of water use, the costs of environmental planning and the water provider's costs in meeting environmental conditions which would appear to include the cost of planning and managing environmental issues by water regulators.[7]

Our interpretation of the COAG Water Resource Policy is that it is necessary for any assessment of economic viability to take full account of the costs incurred in mitigating environmental impacts consistent with approval requirements as well as any costs associated with ongoing monitoring attributable to and incurred by the water business.

It should be noted that this is precisely the approach that we adopted in our earlier review of the economic viability of the proposed water storage infrastructure – namely, the then capital and operating costs consistent with addressing all relevant externalities were included in the assessment of the net economic benefit from the project. For example, one of the more significant capital costs apart from the dam wall itself involved the installation of a fishway to enable fish to continue upstream movements beyond the dam wall. Similarly, approximately $800,000 per annum was allowed for environmental monitoring costs.[8]

In relation to future investment in rural water supply infrastructure, clause 3(d)(iii) of the Water Resource Policy requires:

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6 National Competition Council, (1998) "Compendium of National Competition Policy Agreements - Second Edition 1998", page 113.

7 National Competition Council (2003) "Pricing rural water outside irrigation districts – Discussion Paper", page 9.

8 The capital and operating costs associated with ensuring externalities were addressed were estimated by Burnett Water at the time of the report. Subsequent to this, additional requirements have been imposed and further work undertaken in meeting environmental requirements. These costs are discussed in the following section.

> that future investment in new schemes or extensions to existing schemes be undertaken only after appraisal indicates that it is economically viable and ecologically sustainable.

Dr Ward appears to rely upon a paper released by the NCC relating to new investments in rural water infrastructure entitled *New Investment in rural water infrastructure*. This paper refers to an economic viability test that ought to be applied to new investments in water infrastructure. Dr Ward's assessment of this criterion would preclude a Government *ever* providing transparent assistance to a new rural water development. Such an outcome would be inconsistent with:

- the COAG Water Resource Policy, which explicitly allows community service obligation funding for water pricing so long as it is transparent;
- the NCC's own guidelines in new investment in rural water infrastructure, which provide that:[9]

  > Further, the Council notes that there are instances where government assistance through transparent community service obligations (CSOs) may be appropriate.

- the example of a recent water infrastructure projects cited in Dr Ward's paper, namely the recently deferred Meander Dam in Tasmania, which was to be partially funded by transparent Government assistance.

While all the evidence (including the independent assessments of ACIL and PWC) indicates a strong commercial position for the dam and associated weirs, in a general sense, it is also important that we distinguish between *economic* viability and *commercial* viability. COAG's Water Resource Policy is clear on the requirements of the latter in that it requires water infrastructure providers to cover all operating costs as well as where practicable, earning a positive real rate of return on investment. It does <u>not</u> require full cost recovery, but where

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9 National Competition Council (2001) "New Investment in Rural water infrastructure – Discussion Paper", page 2

there is any shortfall, those costs should be addressed through transparent community service obligation funding.

Accordingly, in our view, it is critical that the cost of meeting all relevant environment externalities should be incorporated in any analysis of economic benefit of a proposed water related infrastructure investment. All such costs also form part of the regulatory asset base for pricing purposes.

In our view, in order to produce COAG compliant prices, it is necessary for relevant operating costs (including relevant environmental monitoring costs) to be met as well as, *where practicable*, a real rate of return be earned on investment. This real rate of return would be relevant to the capital costs of the dam, which, in turn, would include, on our assessment, the relevant capital costs associated with mitigating environmental impacts. In other words, the capital costs associated with mitigating environmental impacts should be considered for COAG pricing purposes and commercial viability on the same basis as any other capital cost.

However, Dr Ward's approach suggests an upper bound price be recovered from water users in all situations. It is important to recognise the implication of Dr Ward's assumption – namely, there could never be community service obligation funding of any future rural water infrastructure project that would be consistent with the COAG Water Resource Policy.

We believe that economic viability should be distinguished from commercial viability and that only the former need be demonstrated for a new project to meet the COAG Water Resource Policy. This error, in our view, is further and seriously compounded by the inflation of environmental costs (recognising that the relevant costs are those necessary to mitigate adverse environmental impacts) and an excessive discount rate. The following sections address these issues.

5 Environmental costs

Dr Ward's argument concerning the economic benefits of the proposed Burnett River developments hinges on the magnitude of environmental costs attributable to the project. However, the draft tables Dr Ward[10] relies upon were apparently produced very early in the WAMP process to facilitate internal Government discussion. It should be noted that the WAMP process preceded the legislated Water Resource Plan and subsequent Resource Operating Plan for the region, which together set, inter alia, the environmental flow parameters for the Burnettt River Dam and related weir projects, as well as the project scoping and the EIS.

NECG's discussions with State Government officials indicate that the uncertainty and imprecision underpinning the estimates within those tables was explicitly recognised by the authors of the tables at the time:[11]

> Apart from a paucity of data on the likely environmental impacts (*as at October 2000*) and the quantification of these impacts, the complexity of the task has been compounded by the (*then*) absence of an expert assessment of the likely ecological outcomes of the scenarios -as required by the Act. The Technical Advisory Panel established for the development of the Burnett WAMP has recently been commissioned to prepare the further assessment of the likely ecological outcomes of the three water usage scenarios….A further complexity impinging on this environmental assessment is that the scenarios provide for changes in river flows only in broad terms, however, the harnessing of the additional water will, of necessity, require the construction of additional water infrastructure. A detailed

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10 In June, 2003, Dr Ward provided NECG with a copy of the tables he relied upon following a direct approach by NECG.

11 Extract from EPA (2000) Draft Burnett Water Allocation and Management Plan Socio-Economic Assessment, Environmental Impacts of proposed Water Allocation Scenarios, page 2 provided to NECG by State Government officials in June 2003 following a direct request by NECG. Comments in italics added by NECG.

> understanding of the likely water infrastructure developments (dam-sites, inundation areas etc) needed under each scenario would be an essential precursor to this analysis. This should be followed by project-specific impact assessment studies (*subsequently completed*) in order to assess the likely local adverse environmental impacts. The information on water infrastructure has not been sufficiently detailed to date.

In essence, Dr Ward's report:

- exaggerates the environmental costs associated with inundation;
- does not take account of the mitigation strategies endorsed by all relevant authorities at both Commonwealth and State levels of Government;
- overstates the costs of ongoing monitoring.

Burnett Water's estimates that the total cost of all environmental costs associated with the development of theBurnett River Dam, including approval process, are approximately $17M, a far cry from Dr Ward's estimate of $130M, with ongoing costs in the order of $1M/annum. Burnett Water's assessment allows for:

- EIS, project planning and approvals;
- Black breasted button quail habitat protection and management plan;
- Aquatic impact mitigation plan, including a fishway;
- Flora and fauna conservation and revegetation strategy;
- Land acquisition costs - environmental acquisitions; and
- Cultural heritage assessment and monitoring.

The development of the Burnett River Dam will also result in a number of positive environmental outcomes including a fish passage; revegetation and regeneration of vegetation; weed control within the inundation of the dam; recreation of pools and riffle sequences within the river; creation of a large water storage with benefits of aquatic, terrestrial and avian fauna; and management of buffer zone adjacent to the dam for environmental benefits.

The assessment of the conservation value of land inundated by the proposed water storage infrastructure is at the centre of the difference in the assessed environmental costs. Dr Ward assesses the environmental cost of the proposed water storage infrastructure by attributing a value to high conservation land of $100,000/hectare and assuming that there would be 899 hectares of high conservation land inundated by the proposed water storage infrastructure (as well as 507 hectares of medium conservation value land at $60,000/hectare).

However, the extent and value of high conservation value land affected by the proposed water storage infrastructure was confirmed to be a fraction of this value. Only one vegetation community was found to have special status under the *Vegetation Management Act* and/or requiring Commonwealth conditioning under the *Environmental Protection and Biodiversity Conservation Act* (Cth). The EIS process confirmed that all of the other main vegetation communities had no special status and that these communities will be well-represented in the areas to be secured and maintained by Burnett Water in areas adjacent to the dam's impoundment area (i.e. at full supply level) under Burnett Water's conservation strategies. Burnett Water confirms that the lost riparian vegetation will be replaced through a targeted program involving cost effective seeding, weed control, fencing, land use change and maintenance activities. The cessation of grazing in key areas to be controlled by Burnett Water will enable natural regeneration and low cost extension of Burnett Water's revegetated areas.

Section 10 of the EIS details the vegetation loss associated with the inundation of the dam. The total figure is 668 hectares. Nine hectares of this is made up of the *Eucalyptus tereticornis*, which is classed as endangered under the *Vegetation Management Act*. These nine hectares must and will be replaced by Burnett Water under its conservation strategy. The cost of this is factored into the dam construction cost figures used for all State and Commonwealth economic assessments to date. This replacement is a mandatory condition arising from the impact assessment processes and approvals endorsed in accordance with State and Commonwealth legislation. That is, the resulting development conditions require Burnett Water to replant/revegetate/regenerate an equivalent area of the blue gum community. Areas where this could occur are identified in the EIS documents.

The remaining medium to high conservation value land is confined to 475 hectares of the former Goodnight Scrub Resources Reserve, which the EPA and Burnett Water have since assessed as having a *total* conservation value of around $750 to $1500/hectare.[12] Further, two thirds of this vegetated area will in fact be retained once the dam reaches full supply level (ie will not be inundated at the full supply level). This area is to be preserved in its present condition by Burnett Water, effectively as an extension to the adjacent national park. The difference in valuation is so striking that it becomes essential to the whole debate to examine in some detail how these rival estimates were achieved.

The EPA has used its Forest Evaluation System (FES) to assess the ecological value of the land to be displaced from the Burnett Water Dam project.[13] Under this system, the affected forest areas by type were assessed for value according to their use in:

- Catchment Protection;
- Timber Production;
- Grazing;
- Conservation;
- Scenic Amenity; and
- Recreation.

This methodology helps meet obligations under the National Strategy for the Conservation of Australia's Biological Diversity, for example, in meeting objectives such as "to ensure that the potential impacts of any projects, programs, and policies on biological diversity are assessed and reflected in planning processes, with a view to minimising or avoiding such impacts". It also assists to promote environmental sustainability by improving

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12 EPA, Goodnight Scrub Resources Reserve Compensation Report, page 6. It is understood that Burnett Water disputes the magnitude of this valuation, however, it is adopted here for illustrative purposes.

13 This methodology has been endorsed by Dr Jack Sinden of the University of New England.

environmental valuation, pricing and incentive mechanisms in development decision-making. The methodology also satisfies the EPA's strategic goals to maintain the qualities of the EPA's lands and to safeguard natural heritage values. While there is room for some disagreement over this methodology, for example in the calculation of average prices, the detailed and transparent derivation of these estimates is in stark contrast to the lack of detail used to derive the figure of $130 million. Yet both estimates refer to essentially the same area. For example Dr Ward states:[14]

> The environmental costs employed in this analysis only estimate the direct loss of habit in the inundation zones, excluding downstream environmental impacts.

Unfortunately Dr Ward did not contact Burnett Water as part of the preparation of his report to assess the likely environmental costs associated with the development or otherwise verify his claims. Adopting a valuation of around $17M instead of $130M clearly leads to fundamentally different results, even applying Dr Ward's flawed valuation approach.

[14] Page 19.

6 Discount rates

Dr Ward adopted a 7% discount rate for his assessment of full cost recovery for pricing purposes. In this section, we compare and contrast the discount rates appropriate to assess the *economic* viability as opposed to the *commercial* viability of water infrastructure.

When assessing economic viability, the critical issue is that we are essentially comparing consumption at two points in time. For example, an investment in water storage infrastructure today foregoes consumption today in order to enable increased agricultural production (and in turn consumption) in the future. In considering the appropriate discount rate to assess economic viability, we have to compare the benefit of the consumption that is foregone today with the benefit of consumption in the future. We believe that the Arrow-Lind theorem, developed by Nobel Laureate Kenneth Arrow, provides the appropriate basis for determining the discount rate for such an assessment which implies that the appropriate discount rate for such an analysis is approximately equal to the real risk free rate.[15]

Accordingly, we again believe that in order to assess *economic* viability, the social real preference rate, as approximated by the risk free rate, ought to be applied. This is quite a

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[15] See KJ Arrow and RC Lind (1970) "Uncertainty and the evaluation of public investment decisions" Am.Ec.Rev 60, 364. The Arrow and Lind theorem suggests that where public sector investments do not simply displace private uses of resources, provide benefits that would be relatively widely spread and are mainly private and kind and are small relative to the overall revenue base of the public sector, then the required rate on those investment will approximate the risk free rate. Note, that in practice, a number of considerations may need to be taken into account in determining the required return even for public sector investments that meet the conditions set out above. As well as project specific characteristics, these include the marginal social cost of taxation, the ease (or difficulty) with which these public sector outlays can be diverted from consumption to investment (and within each of these), the nature and efficacy of private capital markets, and the degree of competition in markets. Given these considerations, the social discount rate in any specific instance may need to be higher or lower than the marginal rate of transformation.

different issue to assessing the *commercial* viability which is addressed in the PWC reports provided to the Queensland Government and the NCC.

The PWC reports address commercial viability and Community Service Obligation matters as required by the COAG Water Resource Policy. The analysis contained in the PWC reports confirms that real rates of return will be achieved by the proposed development. While requiring these commercial matters to be suitably addressed, the COAG policy clearly does not require a full commercial rate of return in all circumstances, on account of the fact that:

- it expressly acknowledges that positive real rates of return ought to be earned *wherever possible*; and
- it expressly and explicitly acknowledges the role of community service obligations in the provision of water infrastructure.

Accordingly, in our view, in order to compare tomorrow's benefits with today's opportunities, the discount rate equivalent to the real risk free rate is the most appropriate rate to apply. Currently, this value is approximately 3% per annum (which, it should be noted, is below Dr Ward's lower value of 4%).

7 Issues relating to commodity prices and economic return

Dr Ward's report claims that sugar along with lucerne and dairy are low value crops whose anticipated market yield will be insufficient to justify the application of water that is priced to reflect its full cost (direct cost of provision plus an environmental impact levy). It is surmised that this will lead to a decline in the demand for water and a subsequent increase in the water costs borne by those producing other crops. Under both scenarios the anticipated economic benefits are reduced.

The first problem with this analysis is the fact that the user cost of water, as estimated by Dr Ward, relies on an exaggerated environment cost estimate. If this figure was made realistic, for example to a level comparable with Burnett Water's estimates, and the correct interpretation of COAG compliant pricing were adopted, the production of sugar, lucerne and dairy continue to be economically feasible and would achieve return and economic benefit levels similar to those shown in the NECG report.[16] However, leaving aside this valuation issue, there are a number of other considerations that cast doubt on Dr Ward's analysis in the area of economic feasibility.

The first is that, simple economics suggest that once the scarce resource of water is provided farmers will quickly substitute higher value crops for lower value crops. This is the nature of modern primary production. A report undertaken by PWC stressed the dynamic nature of modern horticulture with particular reference to the Wide Bay Burnett region. The governing factor in the determination of economic feasibility is not the choice of crop but rather the availability of competitively priced water.

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16 It is acknowledged that current sugar prices are extremely low by historical standards and to the extent that this continues would reduce the economic benefit associated with the proposed water storage infrastructure relative to 2001 estimates. However, it is also noted that the assessment of gross margins adopted for the 2001 report is conservative relative to other publicly available estimates (see, for example, http://www.dpi.qld.gov.au/fieldcrops/2524.html).

Were sugar returns to fall to unacceptably low levels, farmers would, in all probability, shift into other areas of production (as is readily evidenced by crop rotations that currently occur). For example, the recent ACIL report into Agricultural Production in the Burnett region found that citrus production was likely to benefit from increased water, there were demand needs for avocados, there were export opportunities for tomatoes, prices for capsicum and chilli has risen steadily and offer good returns, zucchini offered a good cash crop for canegrowers. Opportunities were also seen to exist in other areas of horticulture such as sweet potatoes, chicory and in the export of pig meat.[17] Moreover, NECG (2001) illustrated the sustained transition from cane to tree crops that is already occurring in the Burnett region.

In other words, the production choices open to sugar producers and other potential users of water are not limited to their traditional areas of operation. Land and water availability allow for quick shifts in the production function of canegrowers either to shift into other crops or to offset short-term losses in cane production by the cultivation of a number of cash crops. Dr Ward's analysis implicitly assumes a fixed production function with no substitution possibilities. This is simply bad economics.

The second point relates to sugar production itself. There is widespread agreement that the real price of sugar is low by historical standards, due mainly to the increased efficiency of production in Brazil. However, an ACIL report into the viability of sugar production in the Burnett region found that sugar could be profitably grown despite falling prices by the application of improved management practices and mechanisation. The report also concluded that:[18]

> while current sugar prices are well below the long term trend they can be expected to rise in the near term

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17 For a summary of the market opportunities for these crops in the Burnett area, see ACIL (2002) pp. 1-XIV.

18 vii

The ACIL report also examined the likely impact of increased water availability upon the viability of sugar production in the Burnett Region:[19]

> Of key significance for the project is the fact that the net return from applying additional water to cane is high

This fact was also made in the BSES report *Managing Low Sugar Prices*. This report observed that sugar production is a long-term enterprise and that growers *should* have confidence that prices will return to more viable levels in the near future. The report also concluded that reliable irrigation also has a major impact on crop yield.

The ACIL and BSES studies, both well researched and well-prepared, cut across the argument made by Dr Ward regarding the implications of low sugar prices. The current low price of sugar is not in dispute. However, the likely reaction of farmers in the Burnett region is. According to Dr Ward, sugar producers will turn their backs on increased water supply because of its cost. Both the ACIL and BSES reports see the likely response as being the opposite with farmers using the increased availability of water as a defence against falling prices by improving yield and raising productivity.

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[19] Page 11.

8 Other factual errors

In this section, we discuss other factual errors we consider are contained in Dr Ward's report, including:

- assuming the capital costs associated with the dam would be recovered over the modelling horizon;
- ignoring the contribution of high priority water to the assessment of full cost recovery;
- applying average rates to the assessment of marginal water uses;
- allowing excessive reductions to mean annual diversions on account of water reliability assessments and not taking into account changes in hydrological modelling that have occurred since 1999; and
- ignoring the positive social impacts of the proposed development.

8.1 Amortisation of the property right

Dr Ward's analysis assumes that the property right associated with the purchase of the original water entitlement (covering the capital costs associated with the water infrastructure) would be amortised over a 25 year period. The inappropriateness of this assumption can be seen at 2 distinct levels:

- first, in the context of the value of the water entitlement over time; and
- second, in relation to the effective amortisation of the dam cost itself.

By amortising the capital costs associated with the purchase of the water entitlement over the modelling horizon of 25 years, Dr Ward asserts that it would be necessary for the owner of the entitlement to fully recover that capital cost over the period. This is clearly unrealistic. Perhaps the best analogy is with a home loan – a purchaser of a home may pay off the loan over a 25 year period, but at the end of that period, the home owner retains ownership of the valuable underlying asset (being the house). However, Dr Ward's analysis appears to

assume that the water entitlement (ie the home) has no value at this time (ie when it is "paid off").

However, in every basin in which water entitlements have been traded that we are aware of, the value of water entitlements have exhibited an underlying trend of increasing in value over time. Whilst there is limited trading history in Queensland, there has been several years of water trading in NSW. In this regard, The Australian Cotton Comparative Analysis 2001 Crop observed:[20]

> Water licences that in the mid-90s were trading at $400/mgl now range between $1,130/mgl and $1,450/mgl amongst the valleys.

Accordingly, in practice this would suggest that precisely the opposite approach to that adopted by Dr Ward would be appropriate in the case of the water infrastructure in question – namely, that a discount rate would be lower than the commercial rate of return to properly take account of expected growth in the value of the underlying instrument, in this case a water entitlement.[21] In essence therefore, Dr Ward's assumption that the capital cost of water entitlements is unrealistic and means that the cost of water is materially overstated in his analysis.

The amortisation of the charge for the water entitlements can be seen in another context. In practice, it would be rational for holders of water entitlements to amortise the capital charge over the life of the dam. In other words, assuming that the underlying water entitlements are fully amortised over a 25 year period is effectively equivalent to assuming that the dam has a life of 25 years. This is because the water entitlement is merely a right to share in the yield provided by the water infrastructure and a rational investor would amortise a water entitlement in accordance with the delivery of economic benefit from the underlying asset. Amortisation of the water entitlement over 25 years would therefore be consistent with an underlying life of water storage infrastructure of 25 years.

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20 Boyce Chartered Accountants, The Australian Cotton Comparative Analysis 2001 Crop, page 18.

21 Assuming that only cash returns are considered for the purposes of the analysis, which is consistent with the approach that Dr Ward has adopted.

However, we know that water infrastructure assets such as dams typically have extremely long lives - it is common to assume lives of at least 150 years in economic analysis (and, whilst there are issues of stranding risk, there is good reason to treat such assessments as conservative).

Moreover, the cost base for economic analysis explicitly allows for replacement and refurbishment costs associated with the water infrastructure. Accordingly, Dr Ward includes a form of "double counting" as he allows for the depreciation of an asset for which cash flows are explicitly included to maintain the service potential of the asset (in the form of replacement and refurbishment costs).

Accordingly, we consider that even applying Dr Ward's approach involves materially higher water charges than appropriate.[22]

8.2 High priority water

Dr Ward appears to have ignored the economic (and commercial) benefit flowing from the high priority water that is made available through the water storage infrastructure to be created on the Burnett River. High priority water is often sought for urban and industrial uses.

The hydrology modelling underpinning the original economic suggested that the water infrastructure in total would yield 20200 ML per annum of high priority water. Experience from trading in other basins suggests that where both high and medium priority water are traded, high priority water will attract a significant premium relative to the medium priority water. This is also the case for the proposed Burnett River Dam, which will service the Burnett region.

Accordingly, by ignoring the returns provided by this water, Dr Ward materially understates the economic case for the water infrastructure. In our view, based on sales for high priority water in the region and elsewhere, Burnett Water could be confident that the sale of high

[22] Quantifying the impact of this change is beyond the scope of this analysis.

priority water alone could cover the environmental costs ascribed to the proposed Burnett River Dam.[23]

8.3 Average and marginal conditions

In our view, if one were to consider whether the capacity to pay of certain crops were such that they could not support the economic viability of the water storage infrastructure, it would be appropriate to consider the *marginal* costs arising from both providing the infrastructure to yield the additional water and the *marginal* benefits from that application.

However, Dr Ward simply applies an average water price to assess outcomes without paying regard to these marginal conditions. Yet water infrastructure is known to typically exhibit strong economies of scale (so that average costs decline as output increases). Hence, even leaving aside all of the other concerns with Dr Ward's report, we believe that one cannot refute the economic benefit of the provision of additional water on the basis of average costs.

8.4 The impact of hydrology changes

We have two concerns with Dr Ward's treatment of hydrology. First, Dr Ward applied the assumptions that were relevant at the time of the WAMP, which are now of only historic relevance. The dramatic changes to hydrology modelling since that time seriously undermines the credibility of his assessment.

Second, his approach to assessing the impact of reliability is factually incorrect. For example, a water entitlement with 90% reliability indicates that in 9 years out of 10, a full entitlement will be delivered, and only in that other year would there be some reduction in availability relative to nominal allocation which may be relatively minor (say, for the sake of argument, 5%). However, Dr Ward's assessment of reliability is set out in his report as follows:[24]

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[23] Nevertheless, for the reasons expressed above, we do not consider that this is necessary or appropriate in order for COAG compliance to be observed.

[24] Page 12.

> Thus a water storage yield of 18,000 ML, with a supply reliability of 50% is imputed as 9,000 ML per annum compared to 18,000 ML and 0 ML in alternate years.

Dr Ward's interpretation therefore seems to be more closely aligned with an assessment of mean annual diversion rather than reliability per se – 50% reliability would suggest that in every second year a holder of a water entitlement would secure something less than 100% of its nominal allocation – not that it would secure no allocation at all in those years. To the extent that Dr Ward adopted this approach for the purposes of assessing the viability of proposed water storage infrastructure, he materially misstates (and understates) yield.

8.5 Failure to consider positive benefits emerging from the investment

Dr Ward pays no regard whatsoever to the social and economic benefits provided by the proposed water storage infrastructure. However, even a cursory examination of the social and economic conditions in the Burnett region relative to the rest of the State indicates a picture of a regional labour market that has not grown as strongly as other areas of the State, either in terms of participants or job creation.

The economic performance of Wide-Bay region has failed to converge towards the rest of the Queensland economy, as standard economic theory would suggest. The reasons behind this are a narrow industry base, in particular, spare capacity in agriculture, relative under-development in services, slower levels of population growth in most areas and higher concentration of demographic groups that traditionally experience labour market difficulties and lower overall levels of post-school qualifications. This challenging environment is highlighted by the region's unemployment rate of 13%.[25] This indicates that the area is

[25] April 2003, Source: Office of Economic and Statistical Research, 2003; ABS Catalogue 6202.0. For individual regions, such as the Wide Bay Burnett region, the OESR quotes unemployment rates on the basis of a 12 month average because monthly unemployment rates historically exhibit high volatility. Queensland's unemployment rate for April 2003 was 7.1%.

lacking sufficient drivers of growth, particularly in terms of infrastructure, both physical and social and in a sufficiently strong export base.

PWC's review of the region and the economic development initiatives confirmed that the provision of additional water storage infrastructure provided an efficient and effective means of addressing the horizontal equity concerns presented by these economic realities. Moreover, the provision of the water storage infrastructure will generate positive externalities for recreational purposes, including enabling enhanced access to the region, improved flood mitigation and reduced salinity in the Moore Park area.[26] However, these benefits were totally ignored in Dr Ward's report.

[26] These positive externalities were discussed in NECG (2001).

9 Concluding comment

There have now been several economic studies of the Burnett Water infrastructure conducted over several years. These included studies during the 1990's that highlighted the need for additional water and the socio-economic disadvantages of the region compared to the rest of Queensland and Australia.

With the Burnett River Dam and weir projects entering the EIA stage in 2001, project specific studies were undertaken by leading consultants on the socio-economic impact, economic cost-benefit, commodity markets and the water market. All have demonstrated that the project is economically robust. The sole dissenting voice is the QCC-commissioned paper, prepared without reference to Burnett Water. It suffers from fatal errors in its data and technical approach.

The Burnett River Dam is an economically and commercially robust project. The detailed commercial arrangements for the downstream sale of water, including the part (if any) to be played by community service obligations, are yet to be finalised. However, the assessment work completed to date clearly demonstrates that the commercial framework will comply with COAG principles.

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* not yet published for commercial in confidence reasons, although these reports have been provided to Burnett Water and the NCC for review.