



Institute for  
**Sustainable  
Futures**



UNIVERSITY OF  
TECHNOLOGY SYDNEY

**RESPONSE TO QUEENSLAND WATER COMMISSION  
REPORT “EVALUATION OF ISF/CARDNO REPORT:  
‘REVIEW OF WATER SUPPLY-DEMAND OPTIONS FOR  
SOUTH EAST QUEENSLAND’”**

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## Summary

In February 2007, the Institute for Sustainable Futures (ISF) and Cardno Australia released a *Review of Water Supply-Demand Options for South East Queensland* (the Review). The Review was submitted to the Senate Rural and Regional Affairs and Transport (RRAT) Committee Inquiry into Additional Water Supplies for South East Queensland.

The key finding of the ISF/Cardno Review is that Traveston Crossing Dam will not be useful to provide water security in the current drought and is unnecessary to ensure water security for South East Queensland after the drought and for decades to come. The suite of supply and demand options – excluding Traveston Dam – which are currently being implemented as part of the South East Queensland Regional Water Supply Strategy (SEQRWSS) are sufficient to ensure the supply-demand balance to around 2030. For the period 2030-2050, ISF/Cardno suggest a number of enhanced demand management programs that will maintain the supply-demand balance to 2050. The demand management measures suggested by ISF/Cardno are more cost effective than Traveston Dam (in terms of \$ per kilolitre) and perform significantly better than Traveston Dam when assessed on social and environmental criteria including greenhouse impact.

In the event that a period of water scarcity worse than the current drought occurs, ISF/Cardno propose that a 'readiness' strategy be adopted whereby water supply projects with relatively short construction and delivery times are planned and approved but only built *if and when* absolutely necessary to defer a crisis in water supplies. This strategy avoids investing in infrastructure that may not be needed. This represents a lower cost strategy than building capital works pre-emptively. It is important to note that the water supply projects outlined in the ISF/Cardno Review are suggestions of appropriate 'readiness' options. ISF/Cardno do not propose that these supply options be included in the supply-demand strategy for South East Queensland for pre-emptive construction.

This report reinforces the findings of the ISF/Cardno Review by clarifying a number of points raised in a response to the Review submitted by the Queensland Water Commission (QWC) on the final day of hearings of the Senate RRAT Committee Inquiry into Additional Water Supplies for South East Queensland.

Key points dealt with in this report include:

- The QWC report criticises the ISF/Cardno approach to projecting demand for water but fails to acknowledge that ISF/Cardno in fact use the Qld Government SEQRWSS projections of demand in their modelling to find that there is no need for Traveston Dam.
- The QWC report misrepresents the ISF/Cardno Review as highly critical of the SEQRWSS. ISF/Cardno in fact endorse most aspects of the SEQRWSS and particularly supports many aspects of the drought response strategy. ISF/Cardno's suggestion is that Traveston Dam does not add value to this strategy.
- The QWC report misunderstands the supply side component of the ISF/Cardno proposed strategy. As noted above, ISF/Cardno do not suggest that the supply options (indirect potable reuse and desalination) described in the Review be constructed pre-emptively, but that they be considered as emergency drought response measures in case of future extreme drought.

These issues and other points of clarification are discussed in detail in this report. The primary aspects of difference between the ISF/Cardno Review and the QWC report are discussed including approach to risk analysis, demand forecasting, issues relating to suggested demand management options and approach to economic analysis. The specific criticisms put forward by QWC in three Attachments to their report are clarified by ISF/Cardno in tabular form.

***In summary, this latest report put forward by QWC does not provide any additional evidence to alter ISF/Cardno's original assessment that, based on the Queensland Government's own figures, the supply-demand balance can be met until 2030 without Traveston Dam and to 2050 with low cost extensions to existing demand management programs.***

**CONTENTS**

1 INTRODUCTION.....1

2 UNDERSTANDING RISK.....2

3 ISSUES RELATING TO DEMAND MANAGEMENT OPTIONS.....2

3.1 Response to Attachment 2: Issues regarding participation rates for proposed extensions to Qld Govt demand options .....4

3.2 Response to Attachment 3: Issues regarding water savings for demand options.....10

4 DEMAND FORECASTING .....14

4.1 Response to Attachment 1: Issues regarding Demand Forecasts .....15

5 SUPPLY COSTS AND ASSUMPTIONS.....17

6 ECONOMIC ASSESSMENT FRAMEWORK .....18

6.1 Economic Methods .....18

6.2 Geographic disconnect.....18

6.3 Misleading reportage by QWC of flood mitigation benefits.....19

7 BASIC REPORTING STYLE .....19

7.1 Detailed response to QWC allegation of omissions.....20

8 CONCLUSION .....21

9 REFERENCES.....22

ATTACHMENT Correspondence detailing requests for cooperation and responses from the Queensland Water Commission and the Department of Natural Resources and Water .....1

# 1 Introduction

This document is a direct response to a report tabled by the Queensland Water Commission (QWC) on the final day of hearings of the Senate Inquiry into Traveston Dam, in Brisbane on 18<sup>th</sup> April 2007.

The QWC submitted a report, authored by consultants Marsden Jacobs Associates and MWH Australia, which directly criticises and calls into question the approach and findings of the Institute for Sustainable Futures (ISF) submission *Review of Water Supply-Demand Options for South East Queensland* undertaken by ISF in collaboration with Cardno Australia.

The Institute for Sustainable Futures is concerned by the content and timing of the QWC submission. The submission explicitly misrepresents key findings of the ISF/Cardno Review and challenges the credibility of ISF as a leading Australian consultancy with particular expertise in water demand management. Of particular concern is the fact that the submission was tabled so late in the Inquiry as to prevent response and rebuttal before the close of the two days of hearings in April 2007.

This report offers a point-by-point clarification of the findings of the ISF/Cardno Review against the arguments put forward by the QWC submission. It is structured to systematically respond to each of the issues included in the body of the QWC report and in its three Attachments. The Attachments to the QWC submission outline the reasoning underpinning arguments contained in the body of the report. It follows that the legitimacy of the QWC report is contingent upon the validity of specific issues outlined in the body of that report and in the Attachments.

Through this point-by-point analysis, the misunderstandings and misrepresentations of the QWC report are illustrated. In doing so, this report reinforces the legitimacy of the key finding of the ISF/Cardno Review that Traveston Dam is not required to ensure water security for South East Queensland.

## 2 Understanding risk

*The QWC report incorrectly suggests that the ISF/Cardno review proposes a 'high risk' strategy.*

This is based on the assumption that the supply options that ISF/Cardno describe as potential 'readiness options' in a future severe drought (extended indirect potable reuse and desalination) are intended to contribute to the long term supply-demand balance and that ISF demand forecasts are unrealistic. Both of these assumptions are misinformed. In addition, the QWC analysis reveals an approach to economic analysis of water supply and demand options which fails to acknowledge the uncertain nature of the variables on which the supply demand balance calculations are based. Under these circumstances, adaptive management is the most appropriate strategy to ensure efficient allocation of resources over long time frames, rather than a fixed decision to build a large dam at very high cost

Furthermore, ISF is particularly disappointed by the specific attack on ISF's credibility implied by the criticism of ISF's contribution to Sydney's water planning. In fact, the decision to bring forward the construction of a desalination plant on a pre-emptive (rather than readiness) basis is not related to a failure to meet demand targets, and is being made by the NSW Government against the explicit advice of ISF researchers, as indicated in recent media reports (Clennell 2007).

## 3 Issues relating to demand management options

*The QWC report has made a specific attack on the credibility of ISF by challenging its expertise in the key area of water demand management. This is seriously misinformed and a deliberate attempt to mislead. The Institute for Sustainable Futures and its researchers has extensive experience in this field.*

The ISF is the leading Australian research organisation in the development and application of integrated resource planning and demand management programs in all mainland states of Australia and internationally in the Middle East and Spain. In the analysis of demand options for the South East Queensland study, program details including timing, costs and participation rates are drawn from ISF's extensive archive of program design and evaluation case studies, with the local contextual factors of South East Queensland taken into account. ISF researchers have significant national experience not only in the design of demand management programs (being involved in the earliest large scale programs in Kalgoorlie-Boulder in Western Australia and on the north coast of NSW) but also in direct implementation of these programs, and therefore have a level of practical experience that far exceeds other Australian consulting firms.

ISF staff have also been involved in the process of evaluation of demand management programs across Australia, including in South East Queensland, as extensively documented (Snelling *et al.* 2006; Turner *et al.* 2003), and have practical experience of the realities of program implementation in the SEQ region.

The ISF report acknowledges the significant achievements of the Queensland Government with regards to demand management:

*Over the recent years the Qld Government has taken leadership in setting up investigations into how much water is being used in the SEQ region, how much water is available from current supplies, what supply and demand-side initiatives need to be considered to fill the gap and how institutional arrangements should be changed to accommodate this. (p 21)*

However, ISF/Cardno illustrate how it is possible for an extended demand management program to bring reductions in water use that provide water security until at least 2050.

The QWC report claims that the ISF/Cardno demand option analysis is “optimistic”, “simplistic”, “high risk” and “unrealistic”. An Attachment to the QWC report, which tabulates QWC’s issues, attempts to substantiate these claims.

This section details how these issues are either misunderstandings or misrepresentations of the ISF’s approach. The claims made by QWC’s consultants are therefore unsubstantiated.

### 3.1 Response to Attachment 2: Issues regarding participation rates for proposed extensions to Qld Govt demand options

Proposed Program	Proposed Participation Rate	Issues Identified in QWC report	ISF/Cardno Response
<b>Residential Retrofit Program Extension</b>	75% of existing stock - 750,000 dwellings	<p>ISF/ Cardno have not taken account of the following:</p> <p>Up to 46% (2006) of SEQ households currently have water efficient showerheads (ISF/ Cardno Table 4-1)</p> <p>The current Home WaterWise Retrofit Program aims to install 200,000 showerheads by mid 2008.</p> <p>The current Home WaterWise Rebate Program will rebate 150,000 showerheads before December 2007.</p> <p>Total dwellings with efficient showerheads by 2008 will be around 70%</p>	<p>Figures from the most recent ABS (2004, Table 3.37) have been adopted. This states that 43.9% of households have water efficient showerheads.</p> <p>This is in fact specifically acknowledged in the ISF/ Cardno report in Appendix A, where 150,000 retrofits are included, consistent with recent regulation. The increase to 200,000 occurred since the Study was released.</p> <p>ISF/ Cardno assume that approximately 183 ML/a are saved under this program which is based on an evaluation of the Gold Coast program, and corresponds to approximately 244,000 showerheads by 2008 and 65% of total households.</p> <p>Also, the 70% figure appears to be rounded up, as 200,000 showerheads is approximately 18% of existing households (2006 figures), plus 46% already installed (QWC estimate) = 64% not 70%.</p>
<b>Rainwater Tank Rebate Program Extension</b>	25% of existing dwellings or 250,000 rainwater tanks	<p>ISF/ Cardno have not taken account of the following:</p> <p>Under the Home WaterWise Rebate Program a total of 28,000 rainwater tanks will be installed in SEQ.</p>	<p>ISF/ Cardno assume the Home Water Wise rebate program will install 11,598 raintanks in 2007 and 2008, based on an evaluation of a previous Gold Coast program</p>

Proposed Program	Proposed Participation Rate	Issues Identified in QWC report	ISF/Cardno Response
		<p>The size of tanks being installed under the program range from 3,000 to 10,000L, with a likely average of less than 4,000 L. Notably, many tanks smaller than 3,000L are being installed.</p> <p>Uptake of tanks during non-drought periods and in non-drought areas has been much lower than for the current program. Participation rates in normal times are low due to the cost to the customer and therefore a high subsidy level is required.</p> <p>The SEQRWSS assumes a total of 100,000 tanks of 5kL capacity at maximum savings. To achieve the anticipated savings will require a higher number of smaller tanks to be installed, possibly up to 250,000 in total.</p>	<p>ISF/Cardno have assumed a saving of 70 kL/hh based on Coombes &amp; Kuczera (2003).</p> <p>The uptake of raintanks under the proposed extension program can be assured as it relies upon a point-of-sale mechanism for specific zones when houses are bought and sold. The zones of interest may include flood prone areas.</p>



<p><b>Mandatory Performance Standards for Washing Machines</b></p>	<p>90% of existing and 100% of future dwellings</p>	<p>ISF/Cardno have not taken account of the following:</p> <p>Existing efficient front and top loaders stock is 37% (ABS).</p> <p>5% of dwellings do not have washing machines (ABS).</p> <p>Participation relies on point of sale control with national regulations on Australian manufacturers to produce only efficient machines.</p> <p>The SEQRWSS allows for a natural rise in efficient washing machine ownership to around 60% at 2050.</p>	<p>The stock of front-loading washing machines is correctly accounted for in Table 4-1 (p 37) and is 10.3% (ABS, 2005).</p> <p>There has been a deliberate omission of top loading washing machines, as there are few efficient models. These have been identified as, in practice, generally having the same water use as standard top loaders.</p> <p>ABS (2005) states: "Almost all households in Australia had washing machines" (p 62). The proportion of households without washing machines was not accounted for because it was not considered to significantly affect the demand projections.</p> <p>The MWEPS option is the regulation for mandatory minimum water efficiency performance standards for all machines manufactured, imported or sold.</p> <p>Over time, the sales of front-loading washing machines are increasing (ABS, 2055) and this trend is likely to continue. The MWEPS option brings forward the water savings associated with this by mandating performance standards in 2010. An additional benefit is that this mechanism will complement retrofit programs by locking in savings.</p>
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<b>Residential Outdoor Efficiency Program</b>	100% of existing dwellings before 2020	The ISF/ Cardno report assumes that 100% of properties will be sold at least once prior to 2020. This is unsubstantiated and clearly optimistic.	<p>This option assumes that 80% of existing properties (in 2006) be sold before 2020, that is, over 13 years. This represents 6.15% of existing households being sold per year.</p> <p>The Real Estate Institute of Queensland quotes Australian Business Review figures (2002). A quarterly sales figure of 4,026 separate households sold in 2002 for Brisbane LGA, which is 16,104 in the year, compared with a total separate household stock of 254,389 in Brisbane LGA (ABS, 2001). This gives an annual turnover figure of 6.33%, consistent with the figure used in the report for this region.</p>
<b>Smart Growth - New Residential Development</b>	100% of dwellings after 2020 (except for Pimpama Coomera and Caloundra West)	<p>ISF/ Cardno have not taken account of the following:</p> <p>100% participation in Pimpama Coomera cannot be achieved due to current constraints on end uses from rainwater tanks (refer to Section 3.7.3 for further discussion).</p> <p>Report assumes that 100% of growth after 2020 will be detached dwellings in Greenfield development areas. This is likely to be around 20% based on OUM projections.</p>	<p>This is not relevant to this option as Pimpama Coomera is not included.</p> <p>There was no Section 3.7.3 in the QWC report to refer to for further discussion of this.</p> <p>This is not the case, the Smart Growth is associated with all new developments not only Greenfield developments.</p>

		<p>Of the future development after 2020, 25% is likely to be unit dwellings, which saves less water than detached dwellings.</p> <p>Potential double ups in savings between dual reticulation and Indirect Potable recycling schemes.</p>	<p>Smart Growth claims 80% savings on an average residential household, which is a weighted average of the current composition of single and multi residential households.</p> <p>Multi-residential properties typically consume less water than detached households. This option assumes the current ratio of multi to single residential properties continues. As the proportion of multi-residential households is likely to increase, this approach is conservative, and not optimistic.</p> <p>Multi-residential developments have additional opportunities for water conservation, such as greywater recycling within the building, which may result in particularly high water conservation as a percentage.</p> <p>The need for dual reticulation and IPR may be precluded by the implementation of Smart Growth, or vice versa. The likely timing of these options and their potential to overlap, as with all options, would be part of a robust decision making process. This is beyond the scope of this report.</p>
<p><b>Business Water Efficiency Program Extension</b></p>	<p>40% of existing businesses</p>	<p>The ISF/Cardno report assumes a reasonable level of uptake rates for this program.</p>	<p>As with uptake rates for the other ISF/Cardno options, these were evidence based.</p>

<p><b>Non Residential Smart Growth</b></p>	<p>100% of new businesses</p>	<p>A high level of uptake is reasonable assuming that a state regulation is available requiring new accounts to develop water management plans at the building application stage. However the imposition of this requirement on small businesses will be an administration issue for both business and building certifiers.</p>	<p>The details of how this program would be implemented in conjunction with small businesses are beyond the scope of this report. Current examples of small business programs in Victoria provide a basis.</p>
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### 3.2 Response to Attachment 3: Issues regarding water savings for demand options

Proposed Program	Basis of Savings Estimate	Issues identified in QWC report	ISF/Cardno response
<b>Domestic Rebate Program</b>	Various	<p>This program will interact with a number of other programs/effects:</p> <p>Residential retrofit extension, residential outdoor efficiency, mandatory performance standards for washing machines.</p> <p>Dual flush toilet savings will reduce over time due to natural replacement of single flush toilets.</p>	<p>These have been taken into account for the residential retrofit program and the mandatory performance standards through not allowing double counting of savings.</p> <p>The interaction with the residential outdoor program is not likely to be significant.</p> <p>This will not affect the savings attributed to this program.</p>
<b>Residential Retrofit Program Extension</b>	21 kL/a saving per household	<p>ISF/Cardno has not taken account of the following:</p> <p>Lower savings in unit dwellings.</p>	<p>This was not accounted for but amounts to a small difference in absolute savings. This level of detail was considered not important due to the uncertainties in estimates for savings and program uptake.</p>
<b>Rainwater Tank Rebate Program Extension</b>	70 kL/a saving for each installation	<p>A water saving of 46 kL/a was calculated for the SEQRWSS using 5,000 L tanks. ISF/Cardno has not taken account of the following:</p>	<p>The rain tank savings are based on research by Coombes and Kuzcera ("Analysis of the performance of Rainwater Tanks in Australian Capital Cities", 2003).</p>

Proposed Program	Basis of Savings Estimate	Issues identified in QWC report	ISF/Cardno response
		<p>In many cases the connection of the tank to internal plumbing may not be feasible or cost-effective.</p> <p>The average tank size of 5,000 L is not likely to be achieved based on current program.</p> <p>Average roof area of 100 m<sup>2</sup> not likely to be achieved for retrofitted tanks.</p> <p>This measure will interact with other programs (Residential Outdoor, Mandatory Performance Standards for Washing Machines.)</p>	<p>There are relatively few properties where internal connection would not be feasible, and this is taken into account through conservative uptake estimates.</p> <p>Conservative uptake rates account for uncertainties such as possible deviations from the tank size assumed in this option.</p> <p>There are many houses with roof areas greater than 100m<sup>2</sup>. 100 m<sup>2</sup> is considered to be a reasonable assumption for average roof size. It is not clear to what extent the different combinations of roof sizes would necessarily affect the stated savings from this program. A conservative uptake rate was adopted to account for minor uncertainties such as this.</p> <p>These interactions are minor, and taken into account via conservative uptake rates.</p>
<p><b>Mandatory Performance Standards for Washing Machines</b></p>	<p>24 kL/a saving for all dwellings</p>	<p>The ISF/Cardno report:</p> <p>Assumes high average savings equating to an average improvement from existing 2 stars under WELS.</p> <p>Assumes that houses and unit dwellings save the same volume of water.</p> <p>Fails to recognise interactions with other programs.</p>	<p>This figure is based on evaluations conducted by ISF on the Gold Coast, and by Sydney Water.</p> <p>As mentioned above for retrofit program extension, this was not accounted for but is considered to amount to a small difference in terms of absolute savings.</p> <p>In fact, double counting has been accounted for where it was significant e.g. with regulations and retrofit programs.</p>

Proposed Program	Basis of Savings Estimate	Issues identified in QWC report	ISF/Cardno response
<b>Residential Outdoor Efficiency Program</b>	20% saving of outdoor use	<p>The ISF/Cardno report proposes that a certificate be required at resale to prove efficiency. Issues with this approach are:</p> <p>Program is aimed at vendor not purchaser, with no guarantee that savings will be maintained after sale.</p> <p>Very optimistic savings for a \$50 rebate.</p> <p>Fails to recognise interactions with other programs</p>	<p>The report states "To ensure the high level of uptake and the maintenance of savings the use of regulations would be used to ensure that at point of sale all households must undertake the outdoor garden program inspection and service" (p38). An ongoing program for maintenance of savings is an integral part of this option.</p> <p>These are actually conservative estimates of savings.</p> <p>The full cost of the program is \$130, \$50 of this is paid by the resident (p 38).</p> <p>Interactions with other programs were considered to be minor, and accounted for through conservative savings estimates.</p>
<b>Business Water Efficiency Program Extension</b>	20% average savings	Savings are considered reasonable.	
<b>Non Residential Smart Growth</b>	40% average savings	ISF/Cardno assumes that all current businesses are very inefficient and that new accounts will identify cost effective water savings are available from current and new technology.	The ISF/Cardno option is based upon an assessment of the conservation potential of this sector on average, and does not assume that all businesses are inefficient.

Proposed Program	Basis of Savings Estimate	Issues identified in QWC report	ISF/Cardno response
		ISF/Cardno fail to recognise that many existing businesses in SEQ are world leaders in water efficiency, e.g. Carlton's Yatala Brewery and the Richlands Coca Cola plant.	Notwithstanding significant achievements in the non-residential sector to date, significant conservation potential still exists in this sector overall.



## 4 Demand forecasting

*Criticisms in the QWC report relating to demand estimates fail to acknowledge that ISF/Cardno in fact adopt SEQWRSS demand forecasts for the purpose of evaluating options (ISF 2007, 12).*

The objective of the ISF/Cardno demand projections was to review the SEQWRSS demand projections, and accordingly a detailed demand model was not appropriate. Whilst ISF recognise the significant body of work undertaken by SEQWRSS with regards to demand forecasting, this work has not been made public, and a key recommendation of the ISF report is that a detailed, comprehensive and transparent demand forecasting study should be conducted, including end use measurement and analysis (ISF 2007, 12).

The suggestion that ISF/Cardno demand projections are “simplistic” and plagued by “extensive double counting” are unfounded. ISF/Cardno demand projections are based on extensive experience in Australia and internationally. The assumptions behind these calculations, which explicitly avoid double counting of savings, are outlined clearly in the ISF/Cardno review.

#### 4.1 Response to Attachment 1: Issues regarding Demand Forecasts

Issue	Issues identified in QWC report	ISF Response
<p><b>Failure to take account of uncertainty in underlying trends in water use</b></p>	<p>Baseline forecasts have been undertaken in a rudimentary and simplistic manner due to the lack of data, resulting in a lower 2050 baseline demand. ISF/Cardno forecast upwards pressure on demand using a simple straight line forecast of 300 L/p/d.</p> <p>The ISF/Cardno forecast of <b>non-residential</b> growth assumes that demand will increase in proportion to the overall population growth. A more reliable approach, adopted for the SEQRWSS is to utilise employment growth and tourism forecasts.</p> <p>The ISF/Cardno report suggests that <b>residential</b> baseline demand should be falling due to the increasing efficiency in new and renovated households, falling occupancy rates and the trend towards smaller households. A review of historic data for SEQ and a number of major cities across Australia does not support this claim.</p>	<p>The ISF/Cardno review uses the SEQRWSS figures for demand. In any case, there is no evidence to suggest that the method adopted by ISF would result in lower demand projections. The ISF leads Australia in the analysis of demand and water resource planning, and have adopted best practice methods in this analysis. Recommendations made by ISF therefore draw upon a significant depth of recognised and acclaimed expertise in this area.</p> <p>A comprehensive and detailed demand analysis, such as that involving employment growth and tourism forecasts, was not appropriate for the specified purpose of this section - to review the SEQRWSS projections. It is precisely this kind of detailed analysis that ISF/Cardno recommend be conducted (p 12).</p> <p>The ISF/Cardno report uses the SEQRWSS figures for demand. The likely future trend of household water use is a contested field. ISF's view is that, while this is a complex question as a result of the multiple influences on demand, the data suggests that e.g. since the 1980's Sydney demand per capita has trended down significantly, with relatively minor shifts between the restricted periods of 1997-2002, possibly due to restrictions 'bounceback'.</p>

Issue	Issues identified in QWC report	ISF Response
	Lifestyle and discretionary use changes such as the increased use of spas, landscaping, pools and automatic sprinkler systems, are likely to offset the savings from efficient fixtures.	The effect of household income on water consumption is a contested field, and ISF's position is that the evidence for wealthier suburbs using more water, does not imply that as incomes grow, per capita water use will increase monotonically without bound. This notion is contradicted in e.g. Sydney where incomes grew significantly in the period since the 1980's and yet per capita demand decreased significantly over the same period.
<b>Failure to take account of the increase in high density housing</b>	ISF/Cardno have assumed that the current proportion of units to total dwellings will remain the same, and noted that this would result in a reduction in demand. Based on data from OUM the proportion of units will increase across the region to accommodate growth in a smaller footprint.	<p>This level of detail would be part of a more detailed analysis of demand that ISF/Cardno recommend be conducted (p 12).</p> <p>In the absence of this detail, the assumption that the proportion of units and houses stays the same is conservative and not optimistic, and would translate to higher demand estimates.</p>
<b>Failure to take account of changes in the market share of water efficient fixtures and appliances</b>	Demand forecasts for the SEQRWSS have also included an allowance for changing market share of water efficient fittings and fixtures through natural replacement. The MWH modeling package includes Fixture Models that allow for reduced water usage in households for washing machines, showerheads and toilets. These natural trends in fixture and appliance stock must be taken into account when assessing the impact of retrofit and rebate programs.	The ISF/Cardno report uses the SEQRWSS figures for demand. A comprehensive and detailed demand analysis, involving market trends, was not appropriate for the specified purpose of this section - to review the SEQRWSS projections. It is precisely this kind of detailed analysis that ISF/Cardno recommend be conducted, transparently, as part of a subsequent review (p 12).

## 5 Supply costs and assumptions

*The QWC report, in its criticism of ISF/Cardno supply cost estimates and assumptions, has misunderstood the supply side strategy advocated in the ISF/Cardno review.*

The QWC report incorrectly assumes that ISF/Cardno suggest a suite of supply options as an alternative to Traveston Dam. ISF/Cardno do not recommend that the supply options outlined in the review be constructed but rather that certain options (extended indirect potable reuse and desalination) should be considered as drought 'readiness' options in the unlikely event that a period of scarcity worse than the current drought occurs.

In arguing that ISF/Cardno prefers modular supply systems that fail to consider economies of scale potentially associated with large infrastructure, the QWC report is comparing two strategies which aim to meet different objectives. The ISF/Cardno review does not suggest that small scale supply 'readiness' options should be used to ensure long term water security but proposes that this objective be met by the implementation of most components of the Qld Government strategy as outlined in the SEQRWSS, supplemented by a suite of enhanced demand management programs.

The allegation that ISF/Cardno arguments are not supported by economic analysis is unfounded. ISF/Cardno used the internationally accepted best practice Integrated Resource Planning (IRP) approach whereby different supply and demand options are compared using a common metric, boundary and assumptions.

The supply cost estimates for surface water storages used by the ISF/Cardno team are Qld Government figures. ISF/Cardno requested more detailed information from the Queensland Government but this was not provided to the study team. The letter sent by QWC in response to a request from ISF/Cardno for information is attached in Appendix A. In lieu of additional information, the study team used the publicly available cost estimates. These costing figures are for surface water schemes that are suggested only as "readiness" options and not for immediate construction by the ISF/ Cardno report.

The statement that "basing water supply planning on smaller surface water storages with low supply reliability" both lacks supporting evidence and misrepresents the ISF/Cardno proposed strategy. The authors of the QWC report fail to back-up their assertion that small scale dams are less reliable. Furthermore, in suggesting that ISF/Cardno have based their water planning on small surface storages the QWC report is blatantly incorrect. The ISF/Cardno strategy endorses most aspects of the SEQRWSS including desalination, water recycling and groundwater harvesting and proposes that savings can be maximised with the addition of enhanced demand management programs. The ISF/Cardno strategy for meeting the supply-demand balance does not include the supply options outlined in the review that are included to illustrate appropriate responses to future severe droughts.

## 6 Economic assessment framework

### 6.1 Economic Methods

Regarding the conclusions of the ISF/Cardno Study team with regards to the dam at Traveston Crossing, the QWC report states:

*What ISF/Cardno fail to acknowledge is that the economic advantage of Traveston Crossing is its large economies of scale (p 23)*

and

*The concept forwarded by ISF/Cardno that an economic criteria should include 'avoidance of water supply options with high up front costs' is incorrect given that efficient infrastructure is often characterised by high up-front costs and large economies of scale. This represents a very basic error in economic analysis.*

However, any potential economies of scale associated with the Traveston Crossing Dam are negated by the fact that the water is not needed before 2030 based on the Qld Governments' own assessments due to the increased investment in supply infrastructure and demand management in response to the current drought. The ISF/Cardno report does not address the economies of scale associated with the dam at Traveston Crossing because they are not relevant to the analysis of the current drought or to long-term water security.

A related point concerns the QWC report critique of the use of the levelised cost metric in comparing options. ISF/Cardno have used this widely accepted unit cost metric to compare options, and have also shown the net present value of the portfolio of options to compare Traveston Crossing Dam with an alternative strategy.

The ISF/Cardno report therefore concluded that the investment in the Traveston Crossing dam is a high risk option, because it is likely that the dam is unnecessary. In addition, the water from the proposed dam would be the most expensive water available. Assuming that the dam actually can supply the estimated yield, the high price of water from the dam may create downward pressure on demand for water from this source such that the dam will become a stranded asset. This presents a significant economic risk, regardless of the capability of the dam to supply large quantities of water.

### 6.2 Geographic disconnect

The QWC report argues against the recommendation of the ISF/Cardno study that new water sources should be located close to population growth centres. The QWC counters this by stating:

*ISF/Cardno propose new dams in the Mary River Catchment in the same general location as Traveston crossing (p 26)*

This is in fact not the case. The ISF/Cardno suite of options include only the supply options currently proposed by the Qld Government and have not added any new supply options to these.

Further, it is of note that the other weirs and dam options being considered are of much less capacity than the Traveston Crossing dam, and therefore less of a financial burden. The premise for the ISF/Cardno recommendation was, put simply, that situating a dam far from the population likely to use its water is not sensible when there are many other, cheaper and lower risk options available.

### **6.3 Misleading reportage by QWC of flood mitigation benefits**

The QWC report argues that a “significant omission” of the ISF/Cardno study is the benefit associated with flood mitigation and therefore the reduction in likely damage that a dam at Traveston Crossing would provide. Flood mitigation is not relevant to the analysis of the supply demand balance which was the primary purpose of the ISF/Cardno study.

Given the QWC focus on this issue, however, it is of interest to note some misleading statements and figures provided by the QWC report. The report states:

*During the 1999 floods .. the floods caused seven deaths, 30 injuries and left 130 people homeless (p 26-7)*

This statement is incorrect. ISF/Cardno have been advised by the Mayor and staff of Cooloola Shire that there is no evidence of any deaths, injuries or homelessness caused by the 1999 floods.

## **7 Basic reporting style**

The QWC reports a number of key omissions in the ISF/Cardno review, and concluded with regards to these omissions:

*ISF/Cardno did not adhere to normal reporting standards with regard to disclosure of key assumptions and parameters.*

However, the majority of the omissions outlined in the QWC are misrepresented or clearly beyond the scope of the Study in question. Most significant assumptions are attached to the ISF/Cardno review in a comprehensive series of fact sheets including one for each of the Qld proposed supply and demand options and for each of the ISF/Cardno proposed demand measures and supply readiness options.

The single case of an omission reasonably identified (the discount rate) does not amount to a failure to meet reporting standards. The QWC claim is an exaggeration, unsubstantiated by evidence and does not bear any relevance to the high quality and transparent study conducted by ISF and Cardno.

The following table provides more detailed responses from ISF/Cardno regarding these claims by QWC.

## 7.1 Detailed response to QWC allegation of omissions

Omissions Identified in QWC report (p 27)	ISF Response
Assumptions regarding demand uptake rate are not reported;	This is not the case, in the attached fact sheets to the review (Appendix B), the following information is included: <ul style="list-style-type: none"> <li>• Domestic Retrofit extension: 75% of existing properties (1,095,923) over 14 years</li> <li>• Raintank extension: 18,000 households per year over 14 years</li> <li>• MWEPS : all new households and 90% of existing households</li> <li>• Outdoor program: 80% of existing households by 2020</li> <li>• Smart Growth: begins in 2020 for all new houses</li> <li>• BWEPS: 25% reduction in water use for 50% of businesses over 10 years</li> <li>• Non-Res New: 40% reduction in all new businesses</li> </ul>
Discount rate applied in calculating present value of costs and levelised costs is not specified;	The discount rate used was 7% (widely accepted for studies of this type).
Cost allocation issues and effect on the economic cost of options has not been assessed;	Detailed cash flow analysis was not part of the scope of this Review and would not alter the conclusions, as these are based, appropriately on the Total Resource Cost .
There is no adjustment for the time period before dams fill and lags following construction to achieve full system yields. This is a critical factor, given high variance in expected time to reach system yields following construction of surface water storages.	This is not the case, the modeling took into account the progressively filling time lag and lags following construction, and for many options this level of detail was included in the Attached fact sheets. For example, the option 'Raising of Mount Crosby Weir' shows the construction from 2006-2008, and only shows the yield beginning in 2009.  The fact sheets also reported an additional 'unit cost to meet demand', which adjusts the cost such that only water that is being used is included in the unit cost.
There is no sensitivity analysis to test how the ranking of options changes given changes in key parameters such as discount rates, demand assumptions, cost estimates etc. Cost rankings can be highly sensitive to key assumptions, particularly when comparing small dams with large dams. Hence, this is a major flaw of the study.	The primary conclusions of the ISF/ Cardno study are that the supply-demand balance can be met until at least 2030 with the existing drought response initiatives of the Qld Government. This conclusion is based on the Qld Government's own data and is not altered by changed assumptions on discount rates etc. For the period 2030 onwards, the magnitude of the difference in unit costs between the Traveston Crossing scheme and extended demand management is so large that sensitivity testing would be superfluous even if it were within the scope of the Review.

## 8 Conclusion

After a detailed consideration of the QWC evaluation of the ISF/Cardno report “Review of Water Supply-Demand Options for South East Queensland”, ISF/Cardno find no new information to challenge the key recommendations of the original Review.

ISF/Cardno reiterate all recommendations offered in the original Review and stand by the original assessment that Traveston Dam is a high risk, highly vulnerable strategy that is not needed to ensure the supply demand balance to 2050 in SEQ.

Instead ISF/Cardno recommend that the most desirable strategy is an extension and augmentation of the Qld Governments’ demand management program combined with a selection of “readiness” options in the event of a drought worse the current drought in SEQ.



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# Attachment Correspondence detailing requests for cooperation and responses from the Queensland Water Commission and the Department of Natural Resources and Water

Director of Engineering

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Fax: (07) 5481 0801

Our Ref: RAF:JAL00501

Your Ref:

19<sup>th</sup> September 2006

The CEO  
Queensland Water Commission  
PO Box 15087  
CITY EAST QLD 4002

Dear Sir,

**RE: Proposed Study**

Thank you for the opportunity to discuss the Study proposed by the Mary River Council of Mayors with your Mr Barry Dennien on 15<sup>th</sup> September 2006.

The Study will examine the bulk water supply options available to South East Queensland, with a view to determining the lowest cost options for providing the yield of 150,000 ML/annum previously predicted from a dam at Traveston Crossing. It is planned that the Study will examine dam options, desalination, or a combination of both. All options will be examined from economic, social and environmental perspectives to determine their true cost.

The Council of Mayors wishes to ensure that the work for the study aligns with and supplements the work being done by the Queensland Water Commission. Consequently, you are requested to authorise an officer of the Commission to be a liaison officer for the Study team. The Study team will direct an engineering consultancy yet to be appointed, and will comprise the Engineers from Cooloola and Noosa Shires, and others as necessary.

It is proposed that consultancy will be of six months duration, after which a Report on bulk water supply options for South East Queensland will be released.

Yours faithfully,

**K.A. MASON**  
**CHIEF EXECUTIVE OFFICER**

B/C: Cr Mayor Venardos OAM  
The Mayor

Yours faithfully

**K.A. MASON**  
**CHIEF EXECUTIVE OFFICER**

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Our Ref: QWC/0023  
Your Ref: RAF: JAL000501

11 OCT 2006

Mr K A Mason  
Chief Executive Officer  
Cooloola Shire Council  
PO Box 155  
GYMPIE QLD 4570

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Dear Mr Mason

Thank you for your letter of 19 September 2006 informing me of the Mary River Council of Mayors study into bulk supply options for South East Queensland (SEQ).

The State Government's decision to proceed with Traveston Dam was based on work being conducted under the South East Queensland Regional Water Supply Strategy (SEQRWSS). The SEQRWSS is being funded and conducted in partnership with the Council of Mayors SEQ and the State.

The SEQRWSS was established in 2003. Stage 1 of the SEQRWSS was completed in mid 2004 and Stage 2 began in early 2005. On its establishment in June of this year, the Queensland Water Commission (QWC) took on the oversight of the administration and preparation of the SEQRWSS. It is currently anticipated the SEQRWSS will be completed in December 2006, with a public consultation draft ready for release early in 2007.

The aims of the SEQRWSS are to:

- assess future needs for the safe and reliable supply of water in SEQ — 2056.
- establish the processes and mechanisms required to meet those needs; and
- obtain agreement for an implementation framework for the strategy that achieves optimum outcomes in social, environmental and economic terms.

A major task of the SEQRWSS has been to identify least cost options for reducing demand and providing additional bulk supplies to ensure the region's needs are met up to 2056.

The Bulk Supply Infrastructure Task Group (BSI) of the SEQRWSS has the responsibility of identifying the bulk supply options available to SEQ. A major finding of the BSI is that there are very few locations in and around SEQ capable of supplying the volumes of water needed to 2056, and that no one source alone can meet future demand. When considering practicalities of implementation, this finding applies generally to both climatically dependent and climatically independent sources. Importantly, operation and maintenance costs of climatically dependent sources are considerably cheaper than climatically independent sources.

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ABN: 65 242 9 08 036

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The Government's decision to investigate the feasibility of the Traveston Dam site was based on work done by the BSI and additional assessments organised by the State Government. The State Government made the decision to proceed with Traveston after field investigations demonstrated the feasibility of the project and following consideration of dam and desalination options. The Government's decision is one which takes into account the region's water needs well beyond 2050. It will be difficult for a narrowly focussed study to address all the technical, social, economic and environmental issues that led to the decision to build Traveston Dam.

As you are aware, the State Government has established Queensland Water Infrastructure Pty Ltd to progress the design and construction of Traveston Dam.

Once again I would like to thank you for advising me of the study you refer to and inviting the QWC to participate. However, given the Commission's role in the SEQRWSS, and that work associated with Traveston Dam will be well underway before the end of the study, the Commission is unable to accept the invitation to participate in the study.

Thank you for your advice on this matter.

Yours sincerely

  
John Bradley  
Chief Executive Officer  
Queensland Water Commission

**Bob Abbot (07) 5449 5212**

Customer/Dept Natural Resources

Email: sec1@noosa.qld.gov.au

20 November 2006

SCOTT SPENCER  
DIRECTOR-GENERAL  
DEPARTMENT OF NATURAL RESOURCES AND  
WATER  
GPO BOX 2454  
BRISBANE QLD 4001

Dear Mr Spencer,

Noosa Council, acting on behalf of the Mary River Council of Mayors, has commissioned a Review of Water Supply-Demand Options for South East Queensland. The review is being undertaken by the Institute for Sustainable Futures (ISF) and Cardno Ltd.

The review will determine the supply-demand balance in South East Queensland before identifying a full suite of options and analysing them both individually and as grouped options to determine a response that can be adapted over time. The demand and supply-side options (demand, source substitution, reuse and supply) will be assessed using a consistent economic assessment methodology that enables fair comparison of options and the total costs to be considered (i.e. a whole of society perspective including government, utility and customer).

The review team is being led by Professor Stuart White who recently undertook a similar review of the Metropolitan Water Plan for Sydney. Dr Trevor Johnston of Cardno Ltd is also working on this project along with other senior engineering staff – Greg Hausler and Aneurin Hughes – who have a strong understanding of SEQ water resources.

In undertaking the review, ISF and Cardno seek to draw from, and build on, the extensive research already undertaken by the QLD Department of Natural Resources and Water. As such, we are seeking your cooperation in providing ISF and Cardno with relevant documents/reports. We have attached a preliminary list and would welcome the opportunity to discuss possible access to these documents.

We greatly appreciate your cooperation and look forward to sharing the results of this study with NRW.

Yours faithfully

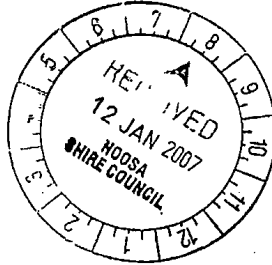
Bob Abbot  
MAYOR - NOOSA COUNCIL

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Please quote: CTS 12370/06  
Contact officer: Peter Sommer  
Contact telephone: 322 47498

09 JAN 2007

Councillor Bob Abbott  
Mayor Noosa Council  
PO Box 141  
Tewantin QLD 4563



*Bob*  
Dear Councillor Abbott

Thank you for your letter of 20 November 2006 seeking documents by the Mary River Council of Mayors on a Review of Water Supply-Demand Options for South East Queensland.

As this issue now falls within the responsibility of the Queensland Water Commission I have forwarded your letter to the Commission for assistance.

If you require further information about this matter please contact the Queensland Water Commission on 3033 0883 or [gwcenquiries@qwc.qld.gov.au](mailto:gwcenquiries@qwc.qld.gov.au).

Yours sincerely



Scott Spencer  
Director-General