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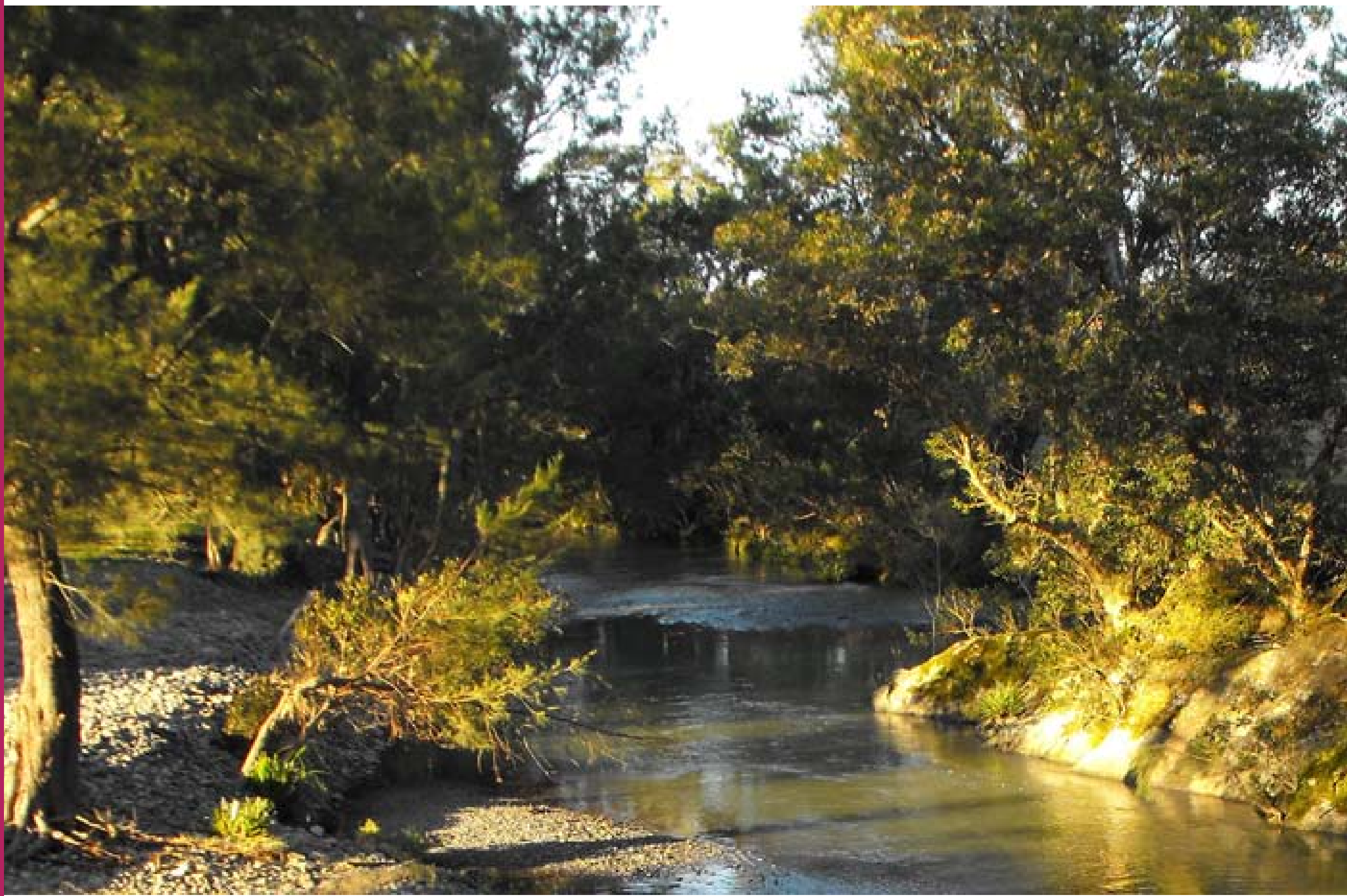

RESPONSE TO HUNTER WATER'S SUBMISSION TO THE DEPARTMENT OF PLANNING REGARDING ITS APPLICATION (07_0156) TO BUILD A DAM AT TILLEGRA ON THE WILLIAMS RIVER

INSTITUTE FOR SUSTAINABLE FUTURES
ISF: RESEARCH

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UNIVERSITY OF TECHNOLOGY SYDNEY

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April 2010

With assistance from the Wilderness Society Newcastle

Institute for Sustainable Futures, University of Technology Sydney

Disclaimer

Summary of Institute for Sustainable Futures response

Hunter Water's response to submissions has not adequately dealt with the key concerns raised or the recommendations made in the Institute for Sustainable Futures (ISF) submission to the Tillegra Environmental Assessment (EA).

The response has failed to deal substantively with the concerns surrounding the down-rating of the existing supply system yield without which the proposed dam cannot be justified.

The response also does not deal with the potentially significant methane emissions that could be generated from the dam in a reasonable manner.

The Institute therefore stands by all previous recommendations made in the ISF submission to the EA and attached reports.

Given the gravity of the concerns raised, some of which address the core issues surrounding the justification for the proposed dam, the Institute believes the Department of Planning cannot allow approval of the proposed project.

Introduction

The ISF conducted a review of Hunter Water's plans to build a dam at Tillegra on the Williams River. This review included a reassessment of Hunter Water's demand calculations and a critique of the assumptions used in the supply calculations. The results of this review were released in a report titled 'An Independent Review of the Need for Tillegra Dam' in August 2009 ISF (2009a). Following the release of the EA for Tillegra Dam in late August 2009, ISF prepared a second report regarding the treatment of greenhouse gas (GHG) emissions in the EA. This second report presented a calculation of the potential emissions based on the IPCC's recommended methodology for reservoir surface emissions ISF (2009b.) ISF also prepared a submission to the Department of Planning in November 2009 (ISF 2009c) setting out it's concerns about the proposed dam against the EA. Hunter Water has subsequently prepared a response to all submissions to the Environmental Assessment with specific reference to ISF's submission. Hunter Water's 'Submissions Report' was released in March 2010.

This document is ISF's response to Hunter Water's submissions report (HWC, 2010). ISF has not addressed every minor point raised by Hunter Water but has focused on those issues that are most substantive to the justification for the dam and the question of the net GHG emissions from the proposal.

The Institute believes that the Department of Planning should not allow the proposal to go ahead because the number of critical concerns raised in ISF in its original submission that have not been adequately addressed in Hunter Water's response.

In relation to Hunter Water's response, the substantive issues identified by ISF are:

1. The use of WSAA's occasional paper 14 (Erlanger & Neal 2005) as the defining principle behind the proposal justification

2. The retention of arbitrary and unreasonably conservative assumptions in the calculation of existing system yield and in drought simulations

3. The insufficient comparison of the costs of the proposal to the cost of the alternatives and inadequate analysis of demand management as part of an alternative strategy

4. Unbalanced consideration of the potential environmental impacts of alternative strategies. Localised possible but statistically unlikely impacts on the sand beds are discussed in detail, but not in relative comparison with the large-scale certain environmental impacts of the dam.

5. The potential for significant GHG emissions from the proposal has not been acknowledged

Background to the Tillegra dam proposal

All of Hunter Water's supply / demand planning has been based around the existence of Tillegra Dam. In Hunter Water's current water supply /demand planning document – the H250 Plan (HWC, 2008), Hunter Water cites the reasons for revising the previous 2003 IWRP and amongst these reasons; including climate change uncertainty, drought security and population growth, the report cites the announcement of Tillegra Dam by the state government as an element that had to be incorporated into their water plan,

> "*The other significant element in the water resource planning equation was the announcement in November 2006 by the New South Wales Government of the proposal to construct a new dam in the upper reaches of the Williams River valley - known as Tillegra Dam…… The impact of Tillegra Dam and the other initiatives on the supply side of the water resource planning equation is discussed in the review*" (HWC, 2008)

In other words, the announcement of Tillegra meant that water planning had to be reassessed to incorporate the Tillegra Dam proposal. From the early 1980's, when a proposal for a dam at Tillegra was last abandoned, up until the release of the H250 plan in December 2008 (two years after the NSW Govt announcement to build Tillegra Dam), Tillegra Dam was not included in Hunter Water's planned supply / demand response. In effect, the planning process has happened in reverse: the dam was announced and then planning documents were adjusted to incorporate it. This situation of 'planning in reverse' has meant that important alternatives to achieving the supply/demand balance have not been adequately or fairly assessed. Demand management options have been given only a cursory assessment. In addition, Hunter Water has used a number of arbitrary assumptions that are critical in their modelling of demand and yield, such that reasonable changes to these assumptions would cause significant shifts in the results and the subsequent justification for the dam. These assumptions are discussed in more detail below.

Significantly, over the last three decades water demand in the Lower Hunter has trended down to its current level around 70GL/yr .

Problematic use of WSAA's occasional paper 14 and other principles ignored by HWC

WSAA occasional paper 14

HWC continues to put forward a single quote from WSAA occasional paper 14, "it is expected and understood that water utilities manage their water resources so that communities never run out of water" (Erlanger & Neal 2005) and uses this as the defining principle underpinning the Tillegra Dam proposal's justification.

While focusing on this particular statement from the WSAA paper, Hunter Water then ignores the following paragraph in the WSAA paper which says that "restrictions will be required … unless water supply systems are 'gold plated' through the construction of generous buffer supplies. Such buffers come at a high economic and environmental cost and are hard to justify when they may only be required once every 20 years" (Erlanger & Neal 2005). This second quote from WSAA occasional paper 14 aptly describes the Tillegra Dam proposal – a generous buffer, which comes at a high economic and environmental cost.

As far as the ISF is aware, no other water utility in Australia refers to WSAA occasional paper 14 as a principles document. The WSAA paper is not policy and furthermore, the concepts expressed in the WSAA document have been misinterpreted and in parts ignored by Hunter Water. Community participation in setting the level of service criteria is one aspect of the WSAA paper that has not been followed by Hunter Water.

National Urban Water Planning Principles

Principle No. 1

The concept of setting agreed levels of service with the community is one that is repeated in the 'National Urban Water Planning Principles', which are policy and are endorsed by state and federal governments via the Council of Australian Governments (COAG). Principle one states that water utilities must "deliver urban water supplies in accordance with agreed levels of service" and that,

> "*Levels of service should not apply uniformly, but rather should be set for each supply system and potentially for different parts of an individual supply system. Agreement on levels of service will allow the community to understand how seasonal variability and climate change will impact on supply into the future and how different levels of service relate to costs. Measures undertaken to minimise risk and maximise efficiency in supplying water should be in accordance with agreed levels of service*" (DEWHA, 2009)

The community of the Lower Hunter has not been consulted on their desired level of service (LOS) relative to the costs of alternative levels of service.

Principle no. 5

Principle number 5 of the National Urban Water Planning Principles states that water utilities should "Consider the full portfolio of water supply and demand options" (DEWHA, 2009) and specifically, that principle states that the,

> "*Selection of options for the portfolio should be made through a robust and transparent comparison of all demand and supply options, examining the social, environmental and economic costs and benefits and taking into account the specific water system characteristics. The aim is to optimise the economic, social and environmental outcomes and reduce system reliability risks, recognising that in most cases there is no one option that will provide a total solution. Readiness options should also be identified as part of contingency planning. Options considered could include the following:*
>
> - *optimising the use of existing infrastructure through efficiency measures*
> - *residential, commercial and industrial demand management initiatives*
> - *purchasing or trading water entitlements from other sectors, and*

- *development of additional centralised and/or decentralised water supply options, including manufactured water sources (such as recycling and /or desalination), where appropriate"* (DEWHA, 2009).

Hunter Water has not sufficiently assessed the opportunities to optimise the use of existing infrastructure through efficiency measures and demand management. As stated previously by the ISF in its review (ISF,2009a), Hunter Water's commitment to demand management has been no were near as extensive as utilities in other regions (e.g. Sydney, Melbourne, Brisbane, Gosford, Wyong etc) and the Lower Hunter has significant scope to make water savings through demand management.

Arbitrary and highly conservative assumptions used in yield modelling

ISF has a number of major and outstanding concerns with regards to Hunter Water's modelling of existing system yield. Hunter Water's submissions report goes into great detail to justify its yield calculations and regarding this, several issues must be noted:

- Since 2007 HWC's yield modelling has incorporated a new level of service criterion (for drought security) that is novel and innovative in it's form. However, this approach cannot be considered tried and tested and incorporates aspects of urban water management drawing on expertise beyond traditional hydrology.
- ISF primary concern is not however with the form of the new criterion, but with the arbitrary and unreasonably conservative assumptions that have been embedded within it by Hunter Water.

Minimum supply requirement

Hunter Water's assumption of a "minimum supply requirement" below which demand cannot fall, even during extreme drought, does not reflect recent experience in drought affected areas. As the ISF review report (ISF 2009a) stated, on the topic of Hunter Water's claim that the minimum restricted demand was 40% less than current demand:

> *"A 40% reduction in residential water use in the Lower Hunter would result in a daily per capita water consumption of 125 L/person/day, which was similar to Brisbane's per capita water use target during the last drought but is higher than Brisbane's actual water consumption per capita later in the last drought which got down to 112 L/person/day (Queensland Water Commission 2008)."*

As demonstrated by the residents of South –East Queensland, demand can be significantly reduced when needed, during an extreme drought. Demand for water is elastic and the use of an assumption which specifies a relatively high 'minimum' as the basis for calculating available yield is flawed. If this 'minimum' assumption (regarding water use only during extreme drought) were reduced, the yield from the Lower Hunter's existing system could be significantly increased.

Hunter Water has not addressed this fundamental concern in their submissions report. Hunter Water have not tested the sensitivity of the minimum supply requirement assumption and reported on the results. All of the following figures in the Hunter Water submissions report: 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8 3.10 3.11 3.12, 3.13 would appear to embed the minimum supply requirement assumption.

Time needed in order to build a desalination plant

Hunter Water has agued in its Submissions report that the time required to build a desalination plant can be reduced to 3 years (36 months) from their original assumption of 4 years if preplanning occurs.

Hunter Water has also provided a graph in Figure 3.9 which shows the difference this assumption would make to the storage trigger levels for the desalination plant. Changing this assumption drastically reduces the trigger levels, meaning that even at higher levels of demand, the chance of having to start building a desalination plant remains low. This assumption makes an immense difference to the outcome of the modelling. If 4 years is assumed, and demand hits 85 GL/year, the trigger level for desalination sits at 90% storage (highly likely), however if 3 years is assumed and demand hits 85 GL/year, the trigger level for desalination sits at 50% storage, which is significantly lower and considerably less likely. While displaying this one graph, Hunter Water has not provided any other results from testing the 36 month lead time, including its impact on the depletion rate and the whole supply demand balance.

Sydney's desalination plant took 30.5 months to build from signing contracts on 18th July 2007 to opening on 28th January 2010. This would indicate that the construction time for a desalination plant in the Lower Hunter could be shorter than 36 months, especially considering the complexity and size of Sydney's plant in comparison to situation in the Lower Hunter. In addition, Sydney's plant was not built as a contingency measure during on-going drought.

Analysis performed by Hunter Water in 2007, based on water demand in the region at that time, and reproduced in the ISF review report shows that there was only a 1 in 600 year chance of needing to trigger the construction of a desalination plant if the plant were to take 30 months to complete (ISF, 2009a). This equated to a trigger point for desalination construction of 35% of storage volumes. The new analysis conducted by Hunter Water and presented in its submissions report (see Figure 3.13) indicates that with water demand of 90GL/year the trigger level would be 40% of storage volumes, assuming that 30 months was required to build a desalination plant. This would increase the chance of needing to trigger the construction of a desalination plant somewhat but remains significantly less than once in 100 years. Current demand levels are similar to 2007 levels at around 70GL/yr and as the ISF review report shows, demand in the Lower Hunter can be kept well below 90GL out to 2050 through a program of demand management similar to that being carried out in Sydney. The 1 in 600 year figure is therefore likely to be more representative of the current situation.

1 in 100 year drought plan trigger

The criterion that the drought plan must only be triggered once in 100 years is an arbitrary constraint that Hunter Water have introduced into their yield modelling. This trigger refers to the beginning of the lead time to build a desalination plant and is completely arbitrary.

In their response to submissions, Hunter Water appears to acknowledge that changing the assumed triggering of the drought plan to once in 50 years would dramatically impact yield.

> *"The ISF report recommends considering whether the chance of occurrence in triggering the drought management plan should be adjusted, to once in every 50 years as an alternative.* ***Taking such action would have a dramatic impact on the resulting yield.*** *As noted previously in this chapter however, the criterion has been previously endorsed via an independent review. Adopting a low acceptable risk is especially important in the context of the extreme environmental and financial consequences of initiating emergency actions." (highlight added)(HWC, 2010)*

The result of this sensitivity testing on the yield results need to be reported by Hunter Water. If a decision to allow triggering once every 50 years has a dramatic impact on the existing system yield it also has a dramatic impact on the justification for the proposal.

Repeated drought sequence

Hunter Water uses the rainfall data from the worst drought year on record, repeated for 4 years in a row in order to simulate a drought sequence. The impact this rainfall sequence has on the depletion rate of existing water storages is repeated in all of Hunter Water's graphs and is one of the fundamental assumptions underpinning their justification of the Tillegra proposal. As previously discussed, both in ISF's submission and Hunter Water's response, repeating the worst drought year for 4 consecutive years to create a drought sequence with no historical precedent is not a reasonable approach to drought simulation. In their submission report, Hunter Water claim that this approach is valid as the resulting storage depletion reflects the 'median rate of decline' observed in their yield modelling. Hunter Water then provides a graph to illustrate this (Figure 3.10) which has been copied below for reference. However, Hunter Water does not go on to explain what this graph represents. It is presented as the 'median rate of depletion', which seems to imply a median or close to average depletion rate for the Lower Hunter's storages. However, this graph actually depicts the median depletion rate of a small number of exceptionally rare most extreme drought events that could be found in the stochastic modelling runs.

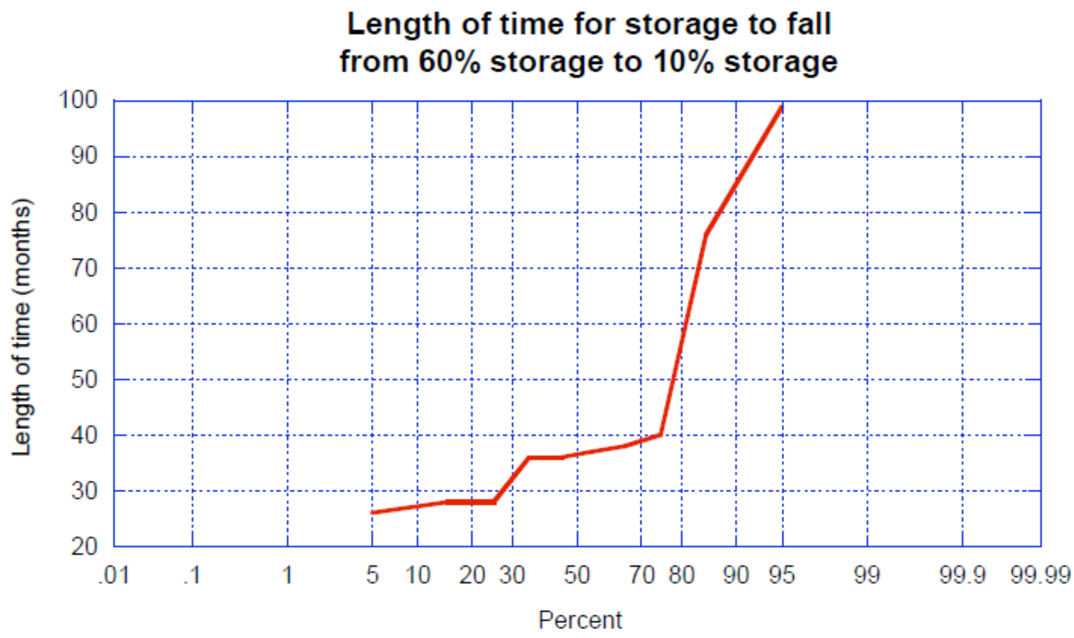


Figure 3.10 Storage depletion

A similar graph to that Hunter Water presents in their submissions report (Figure 3.10) has previously appeared in Hunter Water's closed board minutes from February 2008. The text that goes with the graph in these minutes clearly explains the relevance of this 'median rate of depletion'. It says:

> *"If one runs many (millions) of synthetic climate data sequences a small number result in storages reaching 10%. Figure 1* [the figure similar Figure 3.10 in the submissions report]*to the shows the probability distribution of the length of time it takes for storages to fall from 60% to 10% for the small number of events that make it that low. It is noted that Figure 1 is relatively coarse due to the small number of events observed in the stochastic modelling that reach 10% storage. Interpretation of the graph is thus somewhat subjective." (HWC, 2008)*

This information highlights the fact that after running the stochastic model to produce millions of years of simulated climate data there were only a very small number of events that trigger a rate of depletion that is in any way is represented by the repeat drought sequence. Hunter Water's drought sequence is therefore an extreme worst case well outside anything in the historical climate record. It is based on a few data points out selected out of millions generated in modelling simulation.

This assumption (the drought sequence) has a significant bearing on the outcome of the yield modelling because of the form of Hunter Water's new criteria. If Hunter Water were to use a more realistic drought sequence, the rate of depletion would be slower and a case for justifying the Tillegra proposal in terms of drought would not be possible.

Figures in the submission report that have appear to have embedded the drought sequence assumption include 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8 3.10 3.11 3.12 and 3.13.

Inadequate comparison of the costs of the proposal to the cost of the alternatives

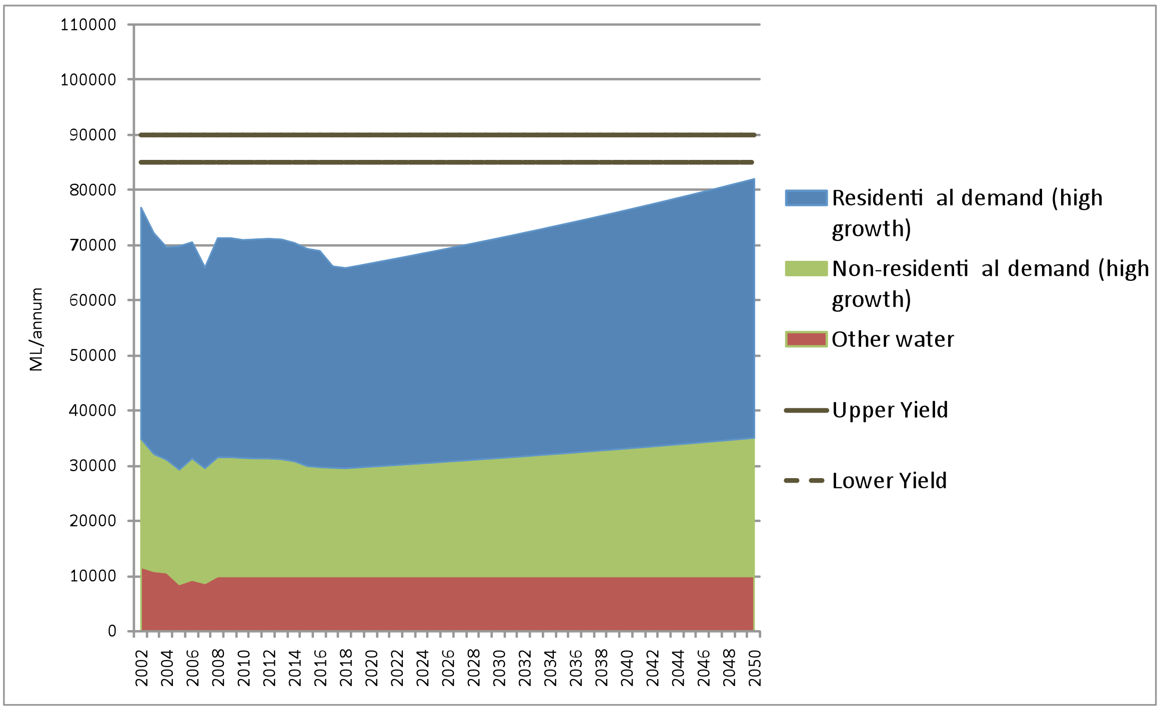
One of the ISF's major concerns presented in its review and submission was the inadequate assessment of opportunities to make significant water gains through demand management. Hunter Water has not fully explored the potential to gain water through a suite of demand management initiatives. For the initiatives that Hunter Water has explored, the costs of these options have not been compared with the supply side options. ISF's standing issues with regard to this, presented in previous reports are reiterated here.

Inadequate analysis of demand management options

Hunter Water has made only a very minor commitment to demand management, with only $5.3 million being spent on demand management programs each year for the next 5 years. While this is expected to save 10.2 GL/year by 2013/14 (HWC 2008a), Hunter Water has not considered more intensive and targeted investment in demand management as an option. If we consider that Sydney Water spent $129 million on demand management in 2007/08 alone (Sydney Water, 2008), Hunter Water's commitment looks insignificant in the comparison. This indicates that that there remains considerable potential to intensify demand management in the Hunter.

Hunter Water claim in their submission report that submissions have not quantified the degree to which demand can be reduced. However, ISF has modelled and developed a number of scenarios for improved demand management in the Lower Hunter in its review report. One scenario, where Hunter water could implement a similar suite of demand management initiatives to Sydney Water has been modelled by the ISF and is shown in the graph below. The savings gained by Sydney Water, pro-rated to population have been modelled against Hunter Water's demand. The demand management initiatives carried out by Sydney water include: washing machine rebates, rainwater tank rebates, DIY water saving kits, horticulturalist advice on garden watering, community education, recycling and partnerships with businesses and schools for water auditing and efficiency planning (savings from pressure and leakage reduction have been excluded). This straightforward example illustrates the significant potential to reduce demand and protect the lower Hunter against future drought. As we have seen, the lower the demand, the slower the depletion in water supplies during drought.

Demand forecast with demand management similar to Sydney Water's existing program (high population growth only) (ISF, 2009)



One of Hunter Water's main arguments against demand management is that it is "limited by a number of factors", such as, "the availability and uptake rate of water efficient technology by customers" and "the community's ability to change its behaviour to an extent which materially reduces demand". Hunter Water's attitude to uncertainty is highly variable. While demand management and its ability to save significant volumes of water has been proven in a number of Australian cities (Sydney, Melbourne, Brisbane etc.), Hunter Water is unwilling to accept this and considers behaviour change and uptake rates uncertain. However, with regards to drought modelling, Hunter Water is comfortable modelling a drought sequence which is highly uncertain.

The levelised cost of water from the Tillegra proposal

ISF re-created the cost effectiveness model for Tillegra Dam described in Working Paper G including Hunter Water's demand forecast, total costs ($37.65 million), option yield, timing and discount rate assumptions. As stated in the ISF submission to the EA, these calculations can be provided to the Department if requested. Changing only the existing system yield (called reliable system yield in table 6 of Working Paper G) to 90GL/yr rather than 67.5GL/yr the levelised cost of the tilegra proposal is **$10.08 per kilolitre**. Recalculating the Tillegra Dam levelised cost with ISF base case demand forecast; water from the proposed dam will cost $ **39 per kilolitre**.

This analysis shows that the Tillegra Dam is not cost effective when using reasonable estimates of existing system yield. It becomes highly cost-ineffective if defendable demand forecasts are used. The high likelihood of the Tillegra Dam being very cost-ineffective has not been dealt with in Hunter Water's response.

A lack of cost comparisons to alternative drought strategies

The ISF's concern about the lack of cost comparison for alternative drought strategies still stands and ISF's previous comments have been reiterated here as they have not been address in Hunter Water's submissions report.

> “*Drought security is the principle rationale given in the EA for the Tillegra Dam. The EA should therefore include an analysis of the cost of the alternative drought security scenarios with and without Tillegra Dam. This should be a risk weighted cost analysis of scenarios with and without the Tillegra dam.*
>
> *It should be noted that Hunter Water appears to have done this analysis previously. In its October 2008 pricing submission to the Independent Pricing and Regulatory Tribunal (IPART), Hunter Water identified alternative drought security measures to the Tillegra Dam (additional bores in the sand beds at North Stockton and Tomago and desalination) as having a net cost of $155 million (HWC 2008b p. 78).*
>
> *This figure is likely to be based on a risk-weighted costing as a once in a hundred year chance of building a $1 billion dollar desalination plant has a risk weight cost of 10 million per year. This is a net present value (NPV) of $143 million at a 7% discount rate. This represents a significantly higher cost effectiveness than the Tillegra proposal despite both the one billion dollar cost of a desalination plant in the Lower Hunter and the one in one hundred year chance of needing to build being highly likely to be overestimates*.”

As discussed in the ISF review report and submission to the Tillegra EA (ISF, 2009a and 2009c), to have validly assessed the alternatives to the project, the EA would need to include Hunter Water’s risk weighted cost analyses of alternative drought strategies with and without the Tillegra Dam.

Lack of balance in the consideration of environmental impacts

Hunter Water has gone to considerable lengths to highlight the negative environmental impacts of their back up water supply contingency plans – the Worrimi and Tomago sand beds. However, these impacts are not balanced with reference to the profound impacts of building Tillegra Dam. With regard to this several important points must be made:

1. If built, the environmental impacts of Tillegra are certain
2. If built, the environmental impacts of Tillegra will be profound and irreversible
3. The environmental impacts on the groundwater aquifers at Tomago and Worrimi are relatively tiny compared to the extent and impact of the Tillegra proposal
4. The environmental impacts on the groundwater aquifers would only occur in the extreme and infrequent event of a severe drought

The discussion of environmental impacts from groundwater extraction during extreme drought must be considered against the alternative, which represents profound environmental impacts on the Upper Williams River Valley, the Williams River and the Hunter estuary.

Treatment of methane emissions from the proposal and subsequent greenhouse impacts

Quote from Hunter Water response:

> “*Nonetheless, as noted in Working Paper F, while methane emissions are an important component of the total GHG emissions from decomposition, substantial amounts are only generally produced from dams within tropical regions. Due to the cooler climate at Tillegra, it was considered that methane emissions would be minimal and impossible to estimate accurately as emissions from temperate regions are yet to be sufficiently quantified through*

> *rigorous scientific research. The potential for regional specific emissions would in fact be best identified from direct measurement in the field.*

The IPCC (2006) methodologies for estimating methane emissions were considered during preparation of the EA Report. It was considered however that the adoption of such methodologies would be materially misleading as they are identified by the IPCC as only possible approaches, and that have a high degree of uncertainty and require further methodological development.

The ISF report, which formed the basis of several hundred submissions within form letters and other representations, is not considered to present a valid estimate of GHG emissions from Tillegra Dam."

In no way does this quote deal adequately with the fact that the Tillegra EA has not accounted for potentially significant methane emissions from the proposed dam. That Hunter Water has considered the IPCC guideline during preparation of the EA Report and then dismissed them would seem to indicate that a deliberate decision not account for Methane has been made. ISF's calculations use figures from temperate dams not tropical as tropical dams could be expected to release more methane.

Hall et al (2009) state in their study of energy and GHG emissions for the South East Queensland (SEQ) Water Strategy "Diffuse greenhouse gas emissions are potentially much greater than emissions from energy use for the (urban water) sector – although the data currently has a very high level of uncertainty. Estimates for the reservoirs serving SEQ by Hall et al (2009) for example ranged from over 1,800,000 tonnes of CO2-eq per year to approximately 100,000 tonnes of CO2-eq per year. What is known is that reservoir surface emissions will initially be higher from a new storage and then decrease with the age of a reservoir. Despite the uncertainty, reservoir surface emissions (particularly methane) are potentially a very significant source of GHG emissions for urban water It is critical that the potential is assessed when new water supply dams are proposed in Australia.

Hunter Water indicates that regional specific emissions from direct measurement in the field would be best indicator and ISF agree. Because of their potential significance a direct field study of reservoir emission in Hunter Water's existing storages should occur to derive a ratio of methane to carbon dioxide. This should occur before any approval of the Tillegra proposal.

Hunter Water claims that they have excluded land use changes in calculating methane emissions and that "*Construction of the dam would therefore result in a net decrease in methane emissions as opposed to that originating from the current land use*." is farcical. For Hunter Water claim to be true building Tillegra would have to reduce the amount of milk produced and consumed in Australia. How can this assertion be sustained?

Recommendations

The Institute stands by all previous recommendations made in the ISF previous reports. The September 2009 GHG emissions report recommended that:

i. The Tillegra Dam EAR should be amended to include methane emission from the water storage.

ii. Tillegra Dam EAR should be amended by removing the offset claimed for renewable energy generated by the mini hydroelectric plant

iii. The Tillegra Dam EAR should be amended to account for current understandings of the soil carbon dynamics associated with tree plantings.

iv. The Tillegra Dam EAR should be amended to include the GHG emissions from the manufacture of materials used in the construction of the Tillegra Dam, particularly steel and cement.

v. All actions towards building the Tillegra Dam should be halted until a carbon neutral strategy that accounts for Recommendations I, ii, ii, iv above can be defined.

Expanding on the recommendations made in the August 2009 review report, the Institute recommends that:

1) the NSW Government direct Hunter Water to immediately halt all planning and construction activities for building the Tillegra Dam
2) the NSW Government revoke its directives to IPART concerning the Tillegra Dam and allow the economic regulator to assess the need for the dam. IPART should then reconsider its price determination for the Lower Hunter unencumbered
3) Hunter Water should adopt standard industry practice with respect to estimating its available water supplies
    a. The desalination lead time assumption should be adjusted to 36 months or less
    b. The drought trigger assumption should be adjusted to optimise yield. The results of sensitivity testing should be made public so that impact of a 1 in 50 year drought criterion can be assessed by the public
4) Hunter Water should adopt demand forecasting that reflects industry practice for water utilities of a similar scale across Australia
    a. Input should be sought from water utilities that have implemented extensive demand management programs
    b. Advice should be sought from water utilities that have recently managed drought
5) A third party should lead a comprehensive and consultative integrated water resource planning process to develop a sustainable urban water strategy for the Lower Hunter
    a. this process should include genuine public engagement on all key urban water decisions and consideration of all the options.
    b. Fair and balanced analyses of alternatives to drought management options should be undertaken

References

ISF is happy to provide electronic copies of any of the following references to the Department if requested (and where copyright allows).

Erlanger, P. & Neal, B. (2005), Framework for Urban Water Resource Planning – Occasional Paper no. 14, Water Services Association of Australia

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HWC (2008a), H250 Plan - Securing our water future: A long term strategy to meet water supply needs for the Lower Hunter.

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ISF (2009a) 'An independent review of supply-demand planning in the Lower Hunter and the need for the Tillegra Dam'. Prepared for The Wilderness Society Newcastle Inc. by the Institute for Sustainable Futures, University of Technology, Sydney.

ISF (2009b), AN ASSESSMENT OF GREENHOUSE GAS EMISSIONS FROM THE PROPOSED TILLEGRA DAM Prepared for The Wilderness Society Newcastle Inc. by the Institute for Sustainable Futures, University of Technology, Sydney.

ISF (2009c) Submission to the Department of Planning regarding application number 07_0156: Tillegra Dam proposal environmental assessment report by the Institute for Sustainable Futures, University of Technology, Sydney.