Australian Water Association
PO Box 388
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10 April 2007

The Secretary
Senate Standing Committee on Rural and Regional Affairs and Transport
PO Box 6100
Parliament House
CANBERRA ACT 2600

Dear Secretary,

Additional Water Supplies for South East Queensland – Traveston Crossing Dam

Thank you for the opportunity offered to the Australian Water Association to make a submission to the Inquiry by the Senate Standing Committee on Rural and Regional Affairs and Transport into the Queensland Government's proposal to build a dam on the Mary River at Traveston Crossing. I am pleased to offer this submission on behalf of the AWA.

It is noted that the inquiry aims to assess: (a) the merits of all options, including the Queensland Government's proposed Traveston Crossing Dam as well as raising the Borumba Dam; and (b) the social, environmental, economic and engineering impacts of the various proposals. AWA is aware that this proposal is a sensitive issue in the SEQ community, in particular with the Mary River valley community.

AWA has not undertaken a detailed assessment of the technical aspects of the dam proposal. AWA has confidence in the engineering expertise of the water industry to design and construct an effective dam structure. Nor has AWA undertaken a detailed assessment of the merits of the options available. Such an assessment is beyond the current resources of AWA itself. It is noted that such assessments have been attempted by others. It is also noted that the full range of information on the options is not yet available. In this submission AWA offers some observations and advice on relevant matters that, hopefully, will be helpful to the inquiry. The submission is attached.

AWA has a wide membership of organisations and individuals with diverse interests and views across the whole spectrum on this proposal. There is general agreement among AWA members that dams, generally, are no longer the obvious water supply solution they once were. They are now regarded as one of many solutions. Acknowledgement of this point has firmed over the last decade or so, and there are several reasons for this:
(i) All the suitable dam-sites and river sources close to urban areas have been utilised. (The Traveston site may be the last big site in the SEQ Region). As surface water sources become more distant, their economic advantages diminish.
(ii) Recent advances in water treatment technology (particularly with membrane filters) has made closer, poorer quality water source options (desalination, recycling) economically competitive. Similarly, greater water use efficiencies have helped.
(iii) The adverse environmental impacts of dams, and the extraction of large volumes of water (barriers to fish movement, inundation of habitats and high conservation values, modification of natural flow patterns) are increasingly being recognised.
(iv) The social impacts of large dam impoundments have become more intractable.
(v) Increasingly, the realisation is emerging that, under climate change, the yields from river sources will diminish.

The single point all AWA members would agree upon is that any dam proposal, together with all other options, must be assessed comprehensively and fairly across all economic, environmental and social aspects.

I trust you find this submission of value to the inquiry. For further information and clarifying of any of the points discussed in this submission please contact me on 02 9495-9909 (or the AWA Policy Officer Mr Terry Loos on 0412 03 4455).

Yours sincerely

Chris Davis
CEO

ATTACHMENT
AWA Submission to Senate Inquiry into proposed Traveston Crossing Dam, April 2007

SUMMARY OF AWA CONCLUSIONS AND RECOMMENDATIONS:

(i) Global climate modelling, coupled with rainfall-runoff-streamflow modelling, is indicating a decrease in yields from surface sources. Past rainfall and river flow patterns are no longer a guide to the future, and dam yields must now be reassessed to take climate change into account.

(ii) We must accept that we have to plan and manage in a situation of considerable uncertainty. The only way to proceed is on an adaptive and flexible basis that learns by monitoring and is therefore resilient in the face of this uncertainty.

(iii) The diverse range of supply-side and demand-side options being proposed by the Queensland Government for SEQ (including dams) is consistent with this approach, however, it is preferred that greater emphasis be given to climate-independent sources.

(iv) This dam proposal offers another opportunity for decision-makers, and the community at large, to visit the sensitive question of how to fairly deal with the disruption to, and dislocation of, landholders resulting from the construction of new large scale infrastructure.

(v) With regard to design water usage rates per person, AWA considers that the figures proposed in the SEQ regional Plan are reasonable. However, AWA believes the time is right for a well-planned community engagement process to give urban water authorities a better understanding of appropriate levels of water supply service.

(vi) At the same time AWA considers that a review of any public health issues associated with the increased adoption of domestic water use efficiency solutions such as greywater use, water recycling for non-potable purposes, and the use of water from rainwater tanks is also warranted.

(vii) AWA has endorsed the approach by the Queensland Government to return purified recycled water to the Wivenhoe Dam, but subject to confirmation that a rigorous water quality monitoring strategy and regulatory framework is being implemented. AWA's preference at this stage would be to see this framework established and effectively implemented in the case of the large Western Corridor scheme before other smaller, and probably less well-resourced, schemes take up this recycling option.

(viii) The 'historical documents' on the QDNRW web site indicate that the environmental flow assessment for the Mary River Water Resource Plan was completed by the Technical Advisory Panel *prior to* the development of the current Traveston Dam proposal, although the assessment included a scenario of allowing large 'reserve' extraction. It is understood some further environmental flows assessment was undertaken subsequently, but AWA is unaware of any further recommendations. Clearly, if the dam is to proceed, it will be essential for the environmental flow rules to be included in the ROP be in accordance with the advice of the TAP. Some form of further sign-off by the TAP may be desirable.

(ix) The scientific, administrative and temporal connection between the water resource planning processes and natural resource management planning processes is not strong in the Mary, nor generally. While it is true river health is dominantly affected by large-scale water extractions, it is also affected by physical disturbance of riverine areas and their habitats, and by the quality of the water running off farms into the river. These processes need better integration – although it may be too late at this stage for the Mary.

(x) The Mary River (like the Burnett River) has certain iconic species that are categorised as 'rare and threatened'. There is now a relatively good scientific understanding of the needs of these species and, if the Traveston Dam is to proceed, it will be essential for all the recommended impact mitigating strategies be implemented to the full.

BACKGROUND

AWA understands the proposal to be that the Traveston Crossing scheme (including a raised Borumba Dam) aims to supply 150,000 ML/annum once fully developed (to Stage 2 around the year 2040) but that some aspects of the scheme are still under detailed investigation. The Stage 1 Dam is planned for completion in 2012 with the expectation that this will supply 70,000 ML/a. A significant portion of the final land acquisition, dam wall construction, road modifications and pipeline connections is to be included as part of Stage 1. The estimated cost of the dam, land acquisitions and road diversions is $1700m. The water delivery systems (with or without treatment) have yet to be decided.

With regard to an assessment of the merits of the options, AWA notes that there remains a considerable amount of information yet to emerge, in particular, the findings of the Environmental Impact Study (understood to be due in October 2007). Also, details of how the water is to be delivered southwards towards the greater population centres are not known (will this be entirely treated water or also include raw water delivery?). AWA is aware that some specialist assessments have, nevertheless, been commissioned.

THE MARY RIVER COUNCIL MAYORS' REPORT

AWA has perused the recent review of water supply options for SEQ undertaken for the Mayors of the Mary River Councils:

Turner A, Hausler G, Carrard N, Kazaglis A, White S, Hughes A and Johnson T 2007, *Review of Water Supply-Demand Options for South East Queensland*, Institute for Sustainable Futures, Sydney and Cardno, Brisbane, February.

This report draws upon the available information but notes that, "a significant number of additional reports have been undertaken by and for various Qld Government Departments, which contain more detailed data/information and updates on the costs and yields of various options and the projected supply-demand balance. The Study team has requested these key documents from both the Department of Natural Resources and Water (DNRW) and the Qld Water Commission (QWC). Unfortunately these reports have not been made available to the Study team".

Notwithstanding the limitations in information availability the study concludes that a diverse portfolio of options can ensure supply security for South East Queensland (SEQ) well into the future, certainly to 2050. Such options include: increasing water supply availability (supply-side options); decreasing the demand for water (demand-side options); and meeting water supply needs during deep droughts (drought response options). The study notes that, "A number of the elements of such a portfolio are already being implemented as part of the current Queensland Government strategy". However, it finds that, "with the extension and addition of low unit cost demand-side options and supply-side drought response 'readiness' options, a clear conclusion of this Study is that the proposed dam at Traveston Crossing on the Mary River is neither necessary nor desirable as a part of the portfolio for ensuring supply security to 2050".

[The study also concludes that, because the planned completion of the Traveston Crossing Dam Stage 1 is to be in 2012 and additional time will be needed for the Dam to fill, which could take a further two years, the yield from this source would only potentially be available in 2014. Hence the proposal could not be portrayed as a drought-response solution in the short term].

AWA notes that the study has been criticised by the Queensland Government, "Deputy Premier, Treasurer and Minister for Infrastructure Anna Bligh today dismissed the report commissioned by the Mayors saying it contained significant holes". In turn the authors of the report have responded to each of the Queensland Government's criticisms.

AWA does not wish to take any single strong position on the proposal other than to call for all the State Government's assessments to be comprehensive and fair, and to be made transparent so that the local community and the water industry generally can be satisfied that this dam is an appropriately economic option in comparison to the other alternatives.

In particular AWA would be keen to confirm that the methodology adopts a triple bottom line (economic/environmental/social) approach to finding the most economic and sustainable solution. It is also important that all analyses take appropriate account of the possible impact of climate change on water supply reliability.

FUTURE WATER SUPPLY OPTIONS AND CLIMATE CHANGE.

AWA accepts that the emerging evidence of climate change is absolutely convincing, but that certain aspects of the scale and timing of its likely adverse impacts remain uncertain. Confidence in the reliability of global climate modelling under enhanced CO_2 levels has increased significantly, based on tests of the ability to simulate present average and extreme climate events. This modelling indicates that, in Australia, the consequences of climate change will be higher maximum temperatures, more hot days, higher minimums, fewer frosts and cold days, reduced rainfall in the south, but more intense precipitation events, increased drought risk, increased peak winds and peak rainfall in the north, associated with cyclones and increased storm surge, causing coastal erosion.

Global climate modelling coupled with rainfall-runoff-streamflow modelling is indicating a decrease in yields from surface sources. Past rainfall and river flow patterns are no longer a guide to the future, and dam yields must now be reassessed to take climate change into account. Yield reductions of the order of 15% by 2030 appear possible and are typically greater than reductions in rainfall. Changes to river flow patterns will adversely affect river health. The 'sustainability' of water extraction strategies will need reassessment.

AWA accepts that the biggest issue for the water industry is the desire of planners and designers to have unambiguous answers. However, these are difficult to derive at present and we must accept that we have to plan and manage in a situation of considerable uncertainty. The only way to proceed is on an adaptive and flexible basis that learns by monitoring and is therefore resilient in the face of uncertainty. We need to shift our water supply planning from the simple paradigm of harvesting and using water in a profligate manner, to a paradigm where water harvesting, water production, water recycling and water use efficiency all play key parts in the water supply cycle.

Both the current strategy of the Queensland Government and the Mayors' Report acknowledge these points. They each propose a multi-element solution – with many common elements. However, the extent to which the State's strategy accepts the possibility of increased dry periods under climate change is unclear. While water recycling and water use efficiency are key elements in a diverse supply strategy, desalination is the only option that creates new water and so is climate-independent. The current proposal to construct only 125 ML/d of desalination capacity (at Tugun) out of an overall regional water demand of the order of 700 ML/d appears to still place great reliance on rainfall and riverflow. Advice offered at AWA's recent national convention, *Ozwater*, was that a greater desalination capability as a percentage of the overall suite of supply options is typically being regarded globally as an acceptable insurance strategy.

THE 'NIMBY' ISSUE

This dam proposal offers another opportunity for decision-makers, and the community at large, to visit the sensitive question of how to address the matter of the disruption to, and dislocation of, landholders resulting from the construction of new large scale infrastructure. Clearly, it is essential that all social impacts (and benefits) be costed as well as possible and included in the overall analysis of the options. It is only on this basis that fair consideration can be given to all options.

There are two anecdotal points of some interest in this context. AWA members recall that the likely 'impact on landholders' was one of the key determining factors in the decision not to proceed with the Wolffdene Dam on the Albert River in the early 1990s. That decision is now being characterised by many in the media as a mistake (although there also were, and still are, strong hydrologic factors against that proposal).

Also, AWA is aware that a few years ago when the Water Resource Plan for the Mary River was being developed, there were several rural industry groups lobbying for the construction of a large dam on the Mary River for irrigation purposes.

APPROPRIATE LEVELS OF WATER SUPPLY SERVICE

There is some debate about what the appropriate levels of water supply service to SEQ residents should be. AWA has found that it is difficult to develop a common basis for comparison of figures across the major urban centres. Often the figures are clouded by uncertainties, for instance over whether they refer to an average usage figure per person based on the city's total usage, or whether industrial and commercial usage has been excluded.

AWA considers that the Mayors' Report makes a valid point in regard to 'acceptable' levels of water supply service to the community. It states that, "In addition there is no clear evidence that these …. have been based on any surveys or community engagement processes to determine what is deemed acceptable to the community".

AWA notes that the SEQ Regional Plan released on 30 June 2005 (prior to current extreme drought concerns) adopted a policy to:
11.2.1 Ensure all urban water providers adopt minimum residential reticulated water consumption targets, excluding leakage and other system losses, of at least:

- *270 litres per person per day by 2010;*
- *250 litres per person per say by 2015; and*
- *230 litres per person per day by 2020;*

In order to achieve these figures the Regional Plan proposes no water restrictions but expects that these levels of usage, in typical residences, could be achieved through the smart use of water. AWA agrees with this proposition. It appears that there was general acceptance of these proposed usage rates following release of the plan.

In conclusion, AWA believes the situation is right for a well-planned community engagement process so that urban water authorities can gain a better understanding of the acceptability of levels of service. At the same time the community could gain a better and more enduring appreciation of the value of water. At the same time, AWA considers that a review of the public health issues associated with the increased adoption of domestic water use efficiency solutions such as greywater use, recycling for non-potable purposes, and the use of water from rainwater tanks is also warranted.

COMPARISON OF UNIT COSTS

AWA recently undertook a broad estimation of the unit costs of desalination (delivered 15 km) and purified recycled water (delivered 40 km) and estimated that the unit costs of these would be of the order of $ 2.50/kL and $1.70/kL respectively. However, the capital costs of the water treatment plants involved are likely to reduce over time owing to the rapid advances in membrane technology.

It is noted that the Mayors' Report, based on the assumptions it has made, has computed the cost of the Traveston Crossing scheme to supply approximately 150 GL/a by 2050 at a unit cost of approximately $3.00/kL. It is difficult to assess what the full unit cost of the product water will be until it is decided how the water will be delivered.

INDIRECT POTABLE REUSE

AWA notes that the Mayors' Report considers the use of indirect potable reuse extended up and down the coast, including on the Sunshine Coast, as a preferable 'drought readiness' option. AWA has endorsed the approach by the Queensland Government to return purified recycled water to the Wivenhoe Dam, but subject to confirmation that a rigorous water quality monitoring strategy and regulatory framework is being implemented. Clearly, the water treatment technology being adopted to produce the purified recycled water in the case of the Western Corridor Recycling Pipeline scheme will be world's best practice. This technology will readily be repeatable in other water supply schemes 'up and down the coast'. However AWA's preference at this stage would be to first see a well established monitoring and regulatory framework established and effectively implemented in the case of the large Western Corridor scheme before other smaller, and probably less well-resourced, schemes take up this option.

THE MARY BASIN DRAFT WATER RESOURCE PLAN ENVIRONMENTAL FLOW ASSESSMENT

As indicated above, the proposal is to ultimately extract a yield of 150 000 ML/a from the Mary River system, with the majority of this to come from the Traveston Dam.

The ‘historical documents’ on the QDNRW website indicate that the environmental flow assessment for the Mary River Water Resource Plan was completed by the Technical Advisory Panel *prior to* the development of the current proposal, although this assessment included a scenario of allowing large ‘reserve’ extraction. A brief summary of the environmental issues the TAP considered is included below.

Additionally, it is understood, some expert ecologists were further commissioned by the Department to assess the environmental flow implications of the more specific Traveston Dam proposal – although it is not clear what the findings of this new assessment were. It may be that this advice is intended to be incorporated into the detailed Resource Operations Plan (ROP) for the Mary River. Clearly, if the dam is to proceed, it will be essential that the environmental flow rules included in the ROP be in accordance with the advice of the TAP. Some form of further sign-off by the TAP may be desirable.

A point of particular interest to AWA is the nexus between the natural resource management planning and water resource planning processes undertaken in many catchments across the country, including the Mary. While the two processes are expected to ‘have regard’ to each other, the scientific, administrative and temporal connection between the processes is not strong. While it is true river health is dominantly affected by large-scale water extractions, it is also affected by physical disturbance of riverine areas and their habitats, and by the quality of the water running off farms into the river. The NRM process deals (separately) with the latter issues. This same point was clearly made in a recommendation made by the ACF to the recent governmental forum to discuss the Commonwealth’s proposal for governance of the Murray-Darling Basin. “*The plan must spell out how clearly how the water plans will be linked to river health plans and ensure catchment management is fully integrated to secure and maintain river and wetland. Similarly, clearly defined governance arrangements and responsibilities are critical to effectively integrate catchment management”*.

AWA acknowledges that in the case of the Mary it may be somewhat late to bring about greater integration of these planning processes because they are both well advanced. It is, however, a desirable approach for other catchments.

In the formulation of advice on the Mary River Water Resource Plan and in terms of allowing for a large reserve for extraction upstream of Gympie, the description of what the TAP concluded are informative as far as identifying what the likely environmental impacts would be. Some of the key points are as follows:

- The overall geomorphological condition rating is predicted to increase from minor to moderate change from the reference condition in all four reaches above the Mary Barrage pondage, reflecting greater changes in sediment transport processes and likely channel contraction due to greater reductions in high flows.

- Hydraulic habitat impacts are predicted to increase from minor to moderate change from the reference condition for the Eel to Glastonbury Creek reach, but remain unchanged in the other reaches, primarily because no change is indicated in the low flow regime, which largely determines ambient aquatic habitat.

- Implications for water quality are significantly affected by the nature and location(s) of the associated dam storage(s). If residence times are long, blue–green algal blooms are a significant possibility.

- Riparian vegetation condition in the river reaches from Eel Creek to Wide Bay Creek is currently highly variable due to land use pressures. Water resource development impacts are predicted to increase from minor to moderate for the reaches between Eel Creek and the Mary Barrage pondage, but no change in overall condition rating is predicted, as it is already shows major change in the reaches upstream of Wide Bay Creek.

- The aquatic vegetation in the reaches between Eel Creek and Mary Barrage pondage has been rated as having undergone moderate change from reference condition.

- A large dam above Gympie could significantly affect the condition of downstream reaches (particularly those closest to the dam) if the pondage becomes invaded by exotic species such as water hyacinth or salvinia and becomes a source of propagules for downstream colonisation.

- The macroinvertebrate and fish populations in the reaches between Eel Creek and the Mary Barrage pondage would be affected by changes in habitat and water quality. Reductions in medium and high flows would lead to reduced triggers for life history events and reduced opportunities for movement onto floodplains.

- In short, the greatest total water resource development impacts would arise from a single large dam above Gympie. This is what is now proposed and the focus now shifts to the detailed ROP and the EIS to determine if the impacts of the proposed dam will be manageable.

RARE AND THREATENED AQUATIC SPECIES IN THE MARY RIVER.

In AWA's understanding, both the Mary and Burnett Rivers are the habitat of certain rare and threatened aquatic species. These species would have been adversely affected on the Burnett River by the newly constructed Paradise Dam. AWA understands that:

(i) The Mary River Cod and the Australian lungfish are listed as nationally threatened species under the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). Mary River Cod are classified as 'endangered' and the lungfish are classified as 'vulnerable' under this Act.

(ii) Additionally, the Mary River Cod and lungfish are protected from recreational and commercial harvesting under the Queensland *Fisheries Act 1999*.

(iii) The Mary River Turtle is listed as an endangered species under both the Queensland *Nature Conservation Act 1992* and the EPBC Act.

(iv) A Recovery Plan is in place for Mary River Cod. This species is endemic to the Mary River and its tributaries. A restocking program is in place, where hatchery-reared Mary River Cod fingerlings have been released into sections of the Mary River for several years. Fingerlings have also been released into sections of the former range of the species including the Logan, Albert, Coomera, Stanley and Brisbane Rivers.

(v) The Recovery Plan was completed in 1996, and is now recognised under the provisions of the EPBC Act. Mary River Cod are listed as a 'no take' species throughout Queensland, except in designated areas upstream of 10 dams stocked with Cod to create recreational fishing opportunities. In these areas a 'take and possession' limit of 1 Cod (minimum length 50cm) is allowed.

(vi) A Draft Lungfish Recovery Plan was completed in January 2007 and is currently being reviewed by experts. This plan will be released for review by June 2007.

The AWA understands that a considerable expertise has been gained by experts working in, and with, the Queensland EPA in regard to the Mary River Turtle, and the Queensland Department of Primary Industries and Fisheries in regard to the Mary River Cod and the Australian lungfish. In particular, recent studies on the Burnett River as part of the development approval conditions of the Walla Weir and the Paradise Dam are understood to have yielded a good understanding of the population dynamics and habitat of all three species.

The Mary River WRP TAP noted that a key issue associated with the construction of a large dam will be the impact of reduced sediment transport and increased vegetation encroachment on the sand banks that provide critical habitat for turtle nesting, including the endangered Mary River turtle. The risk of loss of turtle habitat is higher for infrastructure option R2.

A sediment transport study should be carried out as part of the assessment process for any more detailed proposal to determine implications for turtle habitat. Turtle population ecology should also be investigated in relation to changes in habitat, food supplies and nesting areas. Implications for other species of vertebrates would also arise from reduced triggers for life history events, reduced opportunities for movement onto floodplains and loss of connectivity to the upstream catchment because of the barrier effect of a large on-stream dam (infrastructure option R2).

Clearly, the listing of these species as ‘rare and threatened’ indicates that catchment and riverine actions, river barrier infrastructure and over-fishing have adversely affected the populations of these species over many years. It will be important for the forthcoming EIS to clearly assess if the likely adverse impacts on the populations of these species can be sustainably managed. If the Traveston dam is to proceed, it will be essential that all the recommended impact mitigating strategies such as a fish lift, re-creation of ripple zones and sand bank habitats and ‘trap and transport’ procedures etc be implemented to the full.