The Secretary
Senate Rural and Regional Affairs and Transport
Parliament House
Canberra ACT 2600

30th March, 2007

Dear Sir/Madam,

Re: Inquiry into Additional Water Supplies for South East Queensland – Traveston Crossing Dam Information

The purpose of this letter is to provide information for the Senate Inquiry.

Impacts of the Proposed Mega Dam on the Great Sandy Strait

INTRODUCTION:

The Great Sandy Strait lies between the western fringes of World Heritage Listed Fraser Island and the south-east Queensland coast. Most of its eastern side lies within the Fraser Island World Heritage Area and its beauty and unique ecology attract thousands of tourists annually. It is listed under the Ramsar Convention as a Wetland of International Significance and is also one of Australia's most important nesting sites for migratory trans-equatorial shorebirds.

As signatory to a number of binding state, national and international legislations, Australia has committed to protecting the Strait to ensure its special ecological values are maintained. Such commitments, however, would be severely compromised by the construction of a mega dam on the Mary River.

Environmental flows, largely from the Mary River and Fraser Island, play a crucial role in sustaining the marine ecosystems of this site and the extraordinary diversity of life they support. These flows have already been hindered by other forms of infrastructure upstream of the Mary, and any further reduction would be devastating for the Strait. Disrupting the natural equilibrium between fresh and saline water would spell disaster for threatened marine species, and along with them, the nature-based tourism industries of the region. This would undermine the basis of the economy and threaten the future of communities in the region.

The construction of a mega dam on the Mary River would have a devastating impact on the Great Sandy Strait.

It would:

1. Significantly impede environment flows
2. Impact on Matters of National Environmental Significance
3. Violate State and Federal Government legislation
4. Obstruct the natural equilibrium between fresh and saline water
5. Prevent natural flood events
6. Change the volume and frequency of sediment load
7. Increase the degradation of coastal deltas
8. Impact on existing tourism and fisheries industries

1. SIGNIFICANTLY IMPEDE ENVIRONMENTAL FLOWS:

Environmental flows, or flow regimes, are the key driving variable for any river's downstream aquatic ecosystems. Flood timing, duration and frequency are all critical for the survival of communities of plants and animals living downstream. Small flood events may act as biological triggers for fish and invertebrate migration: major events create and maintain habitats by scouring or transporting sediments.

The natural variability of most river systems sustains complex biological communities that may be very different from those adapted to the stable flows and conditions of a regulated river. Water temperature and chemistry are also altered as a consequence of water storage and the altered timing of downstream flows. Algal growth may occur in the reservoir and in the channel immediately downstream from dams because of the nutrient loading of the reservoir releases.

Freshwater flows help support marine fish production as many marine fish spawn in estuaries. A decrease in freshwater flow in nutrients due to dam construction would affect the nursery areas in a number of ways, including increasing salinity, allowing predatory marine fish to invade, and reducing the available food supply.

Environmental flows into the Great Sandy Strait come from a number of sources, largely the Mary River and Fraser Island. These flows play a crucial

role in sustaining the strait's marine ecosystems and the extraordinary diversity of life they support.

The Traveston Crossing Dam would most likely have significant impacts on Matters of National Environmental Significance all the way to the Great Sandy Strait Ramsar Wetlands and beyond. References to the maintenance of 85% of mean flows at the river mouth are deliberately misleading as the Mary River is characterized by occasional and extreme flood events. Most of the time the river has low flows and these would be severely impacted by the dam.

See Appendix B.

2. IMPACT ON MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE:

The Great Sandy Strait is home to a number of rare, vulnerable and endangered species of flora and fauna, and for some time the protection of these species has been considered a Matter of National Environmental Significance. Such a consideration, however, would be severely compromised if the natural flow of water into the strait was permanently obstructed. Any prevention of the natural equilibrium between fresh and saline water would spell disaster for threatened marine species, and along with them, the nature-based tourism industries of the region.

Adequate environmental flows are crucial for the health of this ecosystem. A substantial and measurable change in water quality has already been measured since 1980, which is evidence of the cumulative impact of infrastructure already existing in the Mary and Burnett River catchments. A further change in water quality would be devastating for the biodiversity and ecological integrity of the region, including the welfare of migratory birds, whales, marine turtles and dugong. All of these species use or inhabit the area, and all are protected under national law.

Ramsar Convention:

Ramsar wetlands are recognised as matters of National Environmental Significance. Any action that has, will have, or is likely to have a significant impact on their ecological character cannot proceed without approval from the Federal Environment Minister. To obtain approval, the action must undergo a rigorous environmental assessment and approval process.

Great Sandy Strait has been listed as a Ramsar Wetland of International Significance since 1999—one of five recognised sites in Queensland. This means Australia has committed to protecting the area to ensure its special ecological values are maintained. Such a task, however, would be severely compromised by the construction of a dam on the Mary River.

With inadequate downstream flows affecting salinity, as well as nutrient and sediment levels, the following scenarios would be likely to occur in the Great Sandy Ramsar area:

- Areas of the wetlands being destroyed or substantially modified;

- Substantial and measurable changes in the hydrological regime of the wetland, such as volume, timing, duration and frequency of ground and surface water flows to and within the wetland; and

- The habitat or lifecycle of native species dependent upon the wetland, including invertebrate fauna and fish species, being seriously affected.

Reduction of environmental flows will adversely affect the biodiversity and ecological integrity of this Declared Ramsar site, and in turn the survival of marine species protected under the Federal Environmental Protection and Biodiversity Conservation Act (EPBCA), including dugong, whales, migratory birds and marine turtles.

3. VIOLATE STATE AND FEDERAL GOVERNMENT LEGISLATION:

As signatory to a number of binding national, international and state legislations (see list below), Australia has committed to protecting the Great Sandy Strait to ensure its special ecological values are maintained.

Most of the eastern side of the Strait is in the Fraser Island World Heritage Area. Any action that is likely to have a significant impact on a World Heritage property or a national heritage place must be referred to the Commonwealth Environment Minister for further consideration.

The Sandy Strait has already had its fare share of abuses over the years and will inevitably face others in the future, especially in relation to climate change. Currently, increasing urban development, upstream infrastructure, recreational activities and tourism are all placing pressure on its fragile ecosystems. The Queensland Government has attempted to solve these problems in recent years, spending many dollars formulating management plans and frameworks to better protect the area. The Great Sandy is now on the register of National Estate, its fish habitats have been declared, and threatened species like dugongs and sea turtles have been protected under national law.

See Appendix A.

Federal legislation

Ramsar

Environment Protection and Biodiversity Conservation Act (EPBCA)

Endangered Species Protection Act 1993

World Heritage Properties Conservation Act 1983

State legislation

Coastal Protection and Management Act 1995

Environment Protection Act 1994

Fisheries Act 1994

Nature Conservation Act 1992

Recreation Areas Management Act 1988/2006

Beach Protection Act 1968

4. OBSTRUCT NATURAL EQUALIBRIUM BETWEEN FRESH AND SALINE WATER:

The hydrological and nutrient flows between fresh and marine wetlands are highly significant to flora and fauna in the strait and contribute to its number and diversity of species. Over time, the emptying of fresh water into the Bay has created a delicate balance in oceanic saline solutions and a number of other subtle ecological processes.

Natural processes at the mouth of the Mary are already being heavily impacted by the operation of the Mary River Tidal Barrage upstream, and any further disruption in freshwater flow patterns could have a severe cumulative effect on estuarine processes related to water quality and the limited operation of fishways. Low flows in the river would impact on the efficiencies of the fishway and the salinity levels at the barrage, thus impacting on fisheries through the Ramsar wetlands and Great Sandy Strait.

Salinity problems have already arisen from previous dams and barrages in the Mary catchment. The commissioning of Borumba Dam increased salinity in downstream waters by 8% as a result of reduction in downstream flows. The construction of the Mary River Barrage in 1979, some 56 kilometres upstream of the Great Sandy Strait, increased salinity in downstream waters by a further 17%.

The condition of the estuarine reach of the Mary River system has been compromised, with a 30 kilometre tidal reach of the river having been isolated by the barrage. Reductions in low and medium flow events will increase salinity levels within the estuarine reach and reduce the quantity of ponded water behind the barrage, and consequently the number of occasions in which it overflows. The natural flushing of the river and mixing of freshwater with the sea water that creates brackish conditions would also be reduced.

Dr Joachim Ribbe (2006), in a study on hypersalinity in Hervey Bay, has revealed that the lack of freshwater flows from both the Burnett and Mary Rivers is a contributing factor to the cumulative impacts. For the period 1980-2004 it shows freshwater discharges were mostly well below the minimum evaporation rate in June which in turn would lead to persistent hypersaline conditions throughout most of the period.

Such preliminary research may be revealing the first impacts on estuarine ecosystems (Ramsar wetlands) from infrastructure related flow reductions to the Great Sandy Strait. These findings also raise serious questions as to what effect further reductions in freshwater flows, under the Mary Water Resource Plan and the Traveston Crossing Dam proposal, would have on Matters of National Environmental Significance within the Great Sandy Strait.

5. PREVENT NATURAL FLOOD EVENTS:

The Mary River needs a number of small flood events each year (2-4m high) for water quality, fish migration, turtle nesting, just to name a few. A dam would prevent these events from reaching downstream areas. The negative impact on water quality and ecology would affect everyone in the catchment.

The removal of large flood events would bring about a major reduction in fisheries productivity. Freshwater flows help support marine fish production as many marine fish spawn in estuaries.

The combination of the existing Mary River Tidal Barrage and a new barrier to fish passage along the main channel of the river if the Traveston dam goes ahead, would deplete fish populations in the Great Sandy Strait. As well as impacting on the Ramsar wetlands, this would have a social impact on the communities downstream who rely on this area for income from tourism and fisheries-related activities.

6. CHANGE VOLUME AND FREQUENCY OF SEDIMENT LOAD:

A reduction in the amount of sediment entering the strait would have a negative impact on seagrass beds, and in turn, the habitat and lifecycle of native species dependent upon them for survival.

Reduction in sediment moving downstream from a dam leads to degradation of the river channel below the facility. The consequences of reduced sediment also extend to long stretches of coastline where the erosive effect of waves is no longer sustained by sediment inputs from rivers. This could be bad news for coastal beaches on the western side of World Heritage Listed Fraser Island.

Changes to the flow and volume and frequency of sediment load within the Mary River system is likely to impact on the seagrass beds within the Great

Sandy Strait. Migratory marine mammals, *Dugong dugon* (dugong), *Caretta caretta* (loggerhead turtle), and *Chelonia mydas* (green turtle) are all known to feed on these seagrass beds.

7. INCREASE DEGRADATION OF COASTAL DELTAS:

Impounding the Mary River at Traveston Crossing would invariably result in increased degradation of coastal deltas due to a reduction in sediment input. The consequences of reduced sediment also extend to long stretches of coastline where the erosive effect of waves is no longer sustained by sediment inputs from rivers and hence would be likely to impact on the Great Sandy Strait and Fraser island by:

- modifying, altering or inhibiting processes (for example, by accelerating or increasing susceptibility to erosion on coastal beaches on the western side of Fraser Island;
- modifying or inhibiting ecological processes in a National Heritage place;
- reducing the diversity of or modifying the composition of plant and animal species in a National Heritage place due to greenhouse gas emissions that cause global warming.

The Report of the World Commission on Dams (2000) states: “The reduction in sediment and nutrient transport in rivers downstream of dams has impacts on channel, floodplain and coastal delta morphology and causes the loss of aquatic habitat for fish and other species. Changes in river water turbidity may affect biota directly. For example, plankton production is influenced by many variables, including turbidity. If this is reduced due to impoundment, plankton development may be enhanced and may occur in new sections of a river.”

Reduction in sediment moving downstream from a dam leads to degradation of the river channel below the facility. This can lead to the elimination of beaches and backwaters that provide native fish and turtle habitat, and the reduction or elimination of riparian vegetation that provides nutrients and habitat for aquatic and waterfowl species. This is likely to have a significant impact on listed threatened species.

8. IMPACT ON EXISTING TOURISM AND FISHERIES INDUSTRIES:

Any threat to the marine species of the region is a threat to its 'nature-based' tourism industries.

The extraordinary beauty and ecological significance of the Great Sandy Region attracts millions of visitors from all over the world. The Fraser Island/Great Sandy World Heritage Area is recognised as a premier Southeast Queensland tourist destination, and one of the best recreational fishing destinations on the Australian east coast. Many individuals rely on the area for income from tourism-related activities.

Tourism-related industries have become an important mainstay of the regional economy, with over 200,000 visitors to Fraser Island annually, and overnight visitor expenditure in the Hervey Bay/Maryborough Region totalling $366 million dollars (DNRM 2003).

The construction of a dam on the Mary River would decrease large existing tourism and fisheries industries in the Great Sandy Strait. Ultimately this would undermine the basis of the economy and threaten the future of communities in the region.

We trust these impacts will be thoroughly considered by the Senate Inquiry.

Yours Sincerely,

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APPENDIX A

Extract from Information Sheet on Ramsar Wetlands – Great Sandy Strait, compiled by the Department of Environment and Heritage (DEH), Brisbane, 1999.

Section 23 – Conservation measures taken:

Areas in the north and east of the wetland are protected in Woody and Great Sandy National Parks. Almost all of Fraser Island is a national park. Most of the eastern side of Great Sandy Strait is in the Fraser Island World Heritage Area which extends 500 metres seaward of the high water mark. Great Sandy Conservation Park (previously Kauri Creek, Turkey Island and South Head Mary River Environmental Parks) protects areas in the central part of the

strait. Inskip Point on the eastern side of Tin Can Inlet is a declared Recreation Area, under the jurisdiction of the Department of Environment. Wetland areas on the south-eastern side of Tin Can Inlet are protected in Great Sandy National Park (Cooloola section).

All marine plants (including mangroves, seagrasses and saltwater couch) are protected under the *Fisheries Act 1994*. Five Fish Habitat Areas have been declared under the fisheries legislation. The Susan River and Maroom Fish Habitat Areas combined protect (in part) tidal lands of approximately 28,000 ha in the centre of Great Sandy Strait, while Kauri Creek and Tin Can Bay Fish Habitat Areas protect significant tidal lands of approximately 7,600 ha in the south of the Strait. The Fraser Island Fish habitat Area protects (in part) tidal lands of approximately 18,000 ha. All of Great Sandy Strait is closed to otter trawling (drag netting).

The entire area is contained in the Great Sandy Region for which a management plan emphasizing ecologically sustainable use and nature conservation has been developed and is being implemented. Great Sandy Strait is on the Register of the National Estate. The Wide Bay Military Training Area (Commonwealth Department of Defence) has an Environmental Management Program in place, and forestry operators and other industries are developing Codes of Practice and Environmental Management Plans to minimize any offsite impacts.

APPENDIX B:

The Coorong, a Ramsar wetland at the mouth of the Murray-Darling river system, is dying because it has been starved of its natural flows. Salinity and fluctuating water levels have destroyed this unique ecosystem, and such a fate lies ahead for the Great Sandy Strait if a mega dam is constructed on the Mary River.

The Great Coorong – A Biological Barometer

Jo Chandler
January 29, 2007
www.theage.com.au

At the far end of the vast Murray-Darling river system—which now so preoccupies politicians, farmers and thirsty communities in four states—is a place called the Coorong.

The old-timers say vast flocks of waterfowl once blackened the skies over this world-renowned South Australian wetland, where the last of the Murray trickles into the sea.

This year, Associate Professor David Paton, who has been counting birds at the Coorong for 20 years, recorded his lowest tallies ever of water fowl and of some migrating birds. There's little left for them there and it seems they know it.

Water levels are so depleted that, for the first time in memory, water no longer moves between the North and the South Lagoons, effectively cutting the Coorong in half, throwing delicate salinity balances out of kilter and wiping out fish.

Trawling the South Lagoon in the past month with nets, as he has for two decades, Professor Paton has not found a single fish. In past years, a sweep with a net would yield a couple of hundred.

The South Lagoon was once home to about one-quarter of the world's fairy terns. "I remember counting 1500 back in the 1980s and early '90s," says Professor Paton.

But with no fish near their breeding islands, safe from foxes, they cannot breed successfully. This year the count is down to 300 birds and Professor Paton is talking about regional extinction.

In the past, Professor Paton and his Adelaide University team would wade through thick forests of *Ruppia tuberosa*, the annual, aquatic plant that was

central to the Coorong's ecology. Now it has all but gone—there is very little to feed the ducks.

Coastal wetlands like the Coorong have been very important in periods—like now—of severe drought. "It could always be relied on to have water in it, along with abundant fish and plants. This is the place birds come to sit out the drought in inland Australia and from there recolonise the inland when the water comes back."

But this year it gave no refuge, and Professor Paton believes the consequences will soon be seen in bird populations more broadly.

The Coorong's unique environment earned it a listing as a wetland of international importance in 1985 under the Ramsar Convention. It has been home to more than 100 bird species. The latest published data revealed a two-thirds reduction in migratory bird numbers visiting the Coorong since the 1980s, and the extinction of several species of fish.

This year, initial analysis shows a further drop. The Coorong's ecosystem has been destroyed by salinity and fluctuating water levels—byproducts of years without enough environmental flow from the Murray-Darling.

Federal and state governments have agreed to put an extra 500 gigalitres of water into the Murray by 2008, but this has yet to eventuate. Now, the federal Government wants to take over the system from the states, as the Prime Minister said on Thursday (January 25).

The Commonwealth's priority is to find ways to meet the needs of the communities and economies that rely on it for survival. Professor Paton wants the survival of the Coorong to also factor in those plans, as required under international agreements.

The system could have been saved, he says, had some environmental flow been allowed through, as promised—and made it a refuge during the drought. Environmental flows had "been on the agenda for a long time and there has been no attempt to actually do it".

“The issue has been difficult to deal with because of the multitude of governments involved, and each has got a vested interest, and the environment is always the last of the issues that anybody will deal with.”

Even if there was some recognition of environmental needs, if the Commonwealth took control of the river system, any changes “will all take time, and this environment doesn’t have that time”.

“Sure, you’ll have a Coorong with water in it, but it … isn’t going to go back to what it was.”