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A Water Solution for Eastern Australia?

This paper outlines a scheme which would make a major contribution to overcoming water shortages in eastern Australia by moving water from Queensland's Gulf Country to the southern states down the Darling River, and contributing to development of the potential of Northern Australia.

The scheme is based on the construction of a very large fresh water storage bounded by Croydon, Cloncurry and Kynuna in Queensland's gulf country. The area is roughly triangular, around 300km x 300km x 200km. The eastern containment is the Gregory Range; the southern is the Selwyn Range. An earthen wall would be built on an alignment upstream from the Croydon to Cloncurry line – this the major cost in the development – with a shorter wall near Kynuna. If the second Option (see below) was adopted, the level of this shorter wall would be above the headwaters of the Diamantina River at Kynuna.

The capacity of this storage could be as much as 500 to 1,000 cubic kilometers, depending on the cost benefit balance of the location and height of the wall. That's up to 50 times the capacity of Lake Argyle – 500 times the capacity of Sydney Harbour. Subject to evaporation rates – a key element in testing the viability of the scheme – the storage would take several years to fill. Average annual rainfall over the catchment is approx. 600mm. If necessary, inflow could be supplemented by a "Bradfield" type diversion from the higher rainfall Tully area – a dam and tunnel or narrow channel. It's understood that scientists forecast that global warming will increase rainfall in the tropics and the recent rains have been well above average.

There are two possibilities for movement of the stored water to the Darling:

- Using the Recharge Area of The Great Artesian Basin
- Via The Diamantina River

The Great Artesian Basin Option

The northern end of the Recharge Area of The Basin lies under the proposed storage area. A key assumption is that the head created by the stored water would drive water south through the aquifer system at a sufficient rate to provide the target flow in the Darling. Several artesian channels run from the central section of the Recharge Area south west toward Darling tributaries. The captured water would be delivered into one or more of these tributaries. Downtake would be assisted by several large diameter wells – maybe 30 metres diameter - down to the sandstone layers. Similarly, uptake would be assisted by similar wells sited in the tributary or tributaries. An assessment of salinity in the sandstone would be necessary – if initially excessive, a "shandy" with the Diamantina option might resolve. Over time, any salinity would diminish.

The Diamantina Option

Downstream in the Diamantina, flow would be diverted to a tributary of the Darling. There appear to be a couple of options for this – a channel from Diamantina Lakes to Ardoch, or a channel from Innamincka to the Caryapundy Swamp – or both. It might be possible to deliver an assured regular flow to Lake Eyre but this is not a priority.

Some or all of ten or so major rivers flowing to the Gulf would each have spillways (and hydro power stations) at the wall plus downstream dams based on the Ord River irrigation concept and part of the NASY project recently under investigation. The Diamantina and channel to the Darling would provide irrigation options but probably not hydro power.

The accompanying sketch shows the key locations.

What are the benefits? They include:

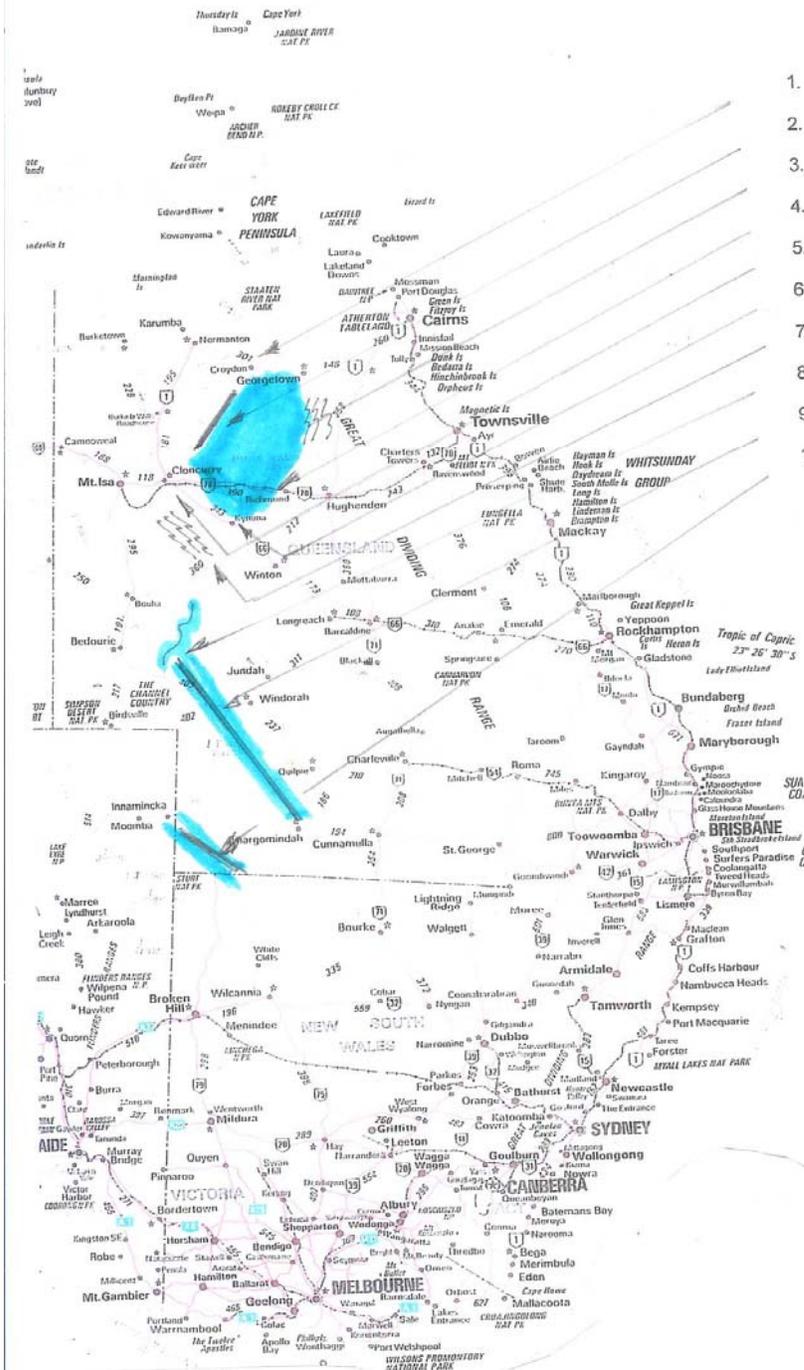
- An assured year round flow into the Darling, bringing it back to life and covering all demand downstream of Mildura, freeing the upper Murray and its tributaries' flows for local environmental and agricultural needs.
- Several new food bowls similar to the Ord, fed by gravity irrigation with massive import substitution and export capacity through Cairns and Townsville.
- Scope to build several major population centres around the existing towns with agriculture, timber, aquaculture, education, tourism, water sport and mining industries providing synergies.
- Decentralisation – a population of at least several hundred thousand would be viable – perhaps a couple of million over time.
- Major employment – skilled, semi-skilled and unskilled employment in construction, production and service industries – with potential benefit to local indigenous people.
- An iconic national infrastructure project with its spinoff benefits including the employment opportunities and spectacular tourism attraction. There would be a new road along the wall from Croydon to Cloncurry.
- An ideal area for major solar power installations to supplement the hydro power resources with potential to feed major industries – Mt Isa and possibly Gove, Macarthur River etc.
- Scope for wind turbines, possibly arrayed along the wall.
- Potential for new mining startups by reducing power costs.
- High carbon capture by extensive algal fields
- A huge contribution to reduction of greenhouse gases from thousands of hectares of agriculture including biofuels, aquaculture and plantations/afforestation, battery powered vehicles, rail electrification, phasing out of diesel based power generation etc.

The disadvantages:

- The initial cost – quite a few billions of dollars. But perhaps a good investment for the Future Fund. And substantial year in year out payback from sale of water and the tax take from ongoing business activity.
- Native Title issues would certainly need resolution
- Resumption of some pastoral properties
- Loss of some small settlements – the Hughenden to Cloncurry road and rail links would perhaps be rerouted through Winton and Kynuna or elevated to a causeway – the latter option another plus for business and tourism access to the new lake.
- Evaporative losses, mitigated by water plant coverage – a source of biofuels, fodder and fertilizer – and contour design for maximum depth to surface area ratios in storage and channels.
- Loss of some nutrient flow to the Gulf fisheries – this always a variable benefit and arguably compensated by other rivers not captured in the scheme.
- Environmental issues would no doubt be of concern – possible risk of movement of undesirable organisms, flora etc into the Darling. This would presumably not be an issue with the aquifer option.

I hope this concept at least warrants some desk based pre-feasibility work.

Leo Maher



1. Croydon
2. The Wall
3. Gregory Range
4. Hughenden Cloncurry Road & Rail
5. Cloncurry
6. Kynuna
7. Selwyn Range
8. Diamantina River
9. Diamantina Lakes to Ardoch
10. Innamincka to Caryapundy Swamp

Copy of an exchange of correspondence with Mr. Chris Schweizer of DEWR follows.



Australian Government

Department of the Environment and Water Resources

Mr Leo Maher

Dear Mr Maher

Thank you for your letter of 7 February 2007 to the Minister for the Environment and Water Resources, the Hon Malcolm Turnbull MP, concerning the diversion of water from the Queensland Gulf country to the south. I have been asked to respond.

Over the years studies have been undertaken into the opportunities and impacts of projects which proposed moving water from one part of Australia to another. While such projects may be technically possible they often have very high economic, social and environmental costs. The general approach the Commonwealth Government has been taking is to work on ways to use the water we have more efficiently rather than developing new supplies through large-scale infrastructure projects. Nevertheless, the Commonwealth Government is always prepared to consider innovative ideas for ensuring future water supplies where this is feasible.

You may be aware that the Prime Minister announced the establishment of a Commonwealth Northern Australia Taskforce on 25 January 2007, as part of the National Plan for Water Security. The Taskforce, to be chaired by Senator the Hon Bill Heffernan, will examine the potential for developing land and water resources in northern Australia. In regards to moving water from northern Australia to the south, the Queensland Premier, the Hon Peter Beattie MP asked the Prime Minister to examine if water can be diverted from rivers in northern Queensland to recharge the Murray-Darling Basin. At the 23 February Water Summit the Prime Minister and State Premiers agreed that Senator Heffernan's Taskforce would explore this option.

Yours sincerely

Chris Schweizer
Assistant Secretary
Environmental Water Branch

24 April 2007



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Australian Government

Department of the Environment, Water, Heritage and the Arts

C09/1814

Mr Leo Maher

Dear Mr Maher

Thank you for your letter of 23 January 2009 to the Minister for Climate Change and Water, Senator the Hon Penny Wong, concerning transferring water from Queensland's Gulf Country to the Murray-Darling Basin. The Minister has passed your letter to me for reply.

The Australian Government recognises the immense challenge in tackling Australia's water scarcity and the impact of climate change. 'Water for the Future' is the Government's \$12.9 billion strategy that aims to secure the long term water supply of all Australians. 'Water for the Future' is built on four key priorities: taking action on climate change, using water wisely, securing water supplies and supporting healthy rivers.

In this context, improving the management of Australia's water resources is a high priority. To improve the reliability of water supplies governments are implementing planning practices that consider the full range of water supply and demand options on their merits, including recycling, desalination, urban rain water harvesting and improving water use efficiency. It is also likely that this will, from time to time and in specific locations, include new storage, pipeline or canal options.

As a general principle, using the water we have more efficiently and developing new local water supply sources are considered better options than transporting water long distances from one part of Australia to another. While such projects may be technically possible they typically have very high economic, energy, social and environmental costs.

With respect to diverting water from the north, you may be interested in the Western Australian Government report into a similar proposal to bring water from the Kimberley to Perth, available at <http://portal.water.wa.gov.au/portal/page/portal/PlanningWaterFuture/Publications/KimberleyWaterSource>. The Report examines a range of options and finds that, in this case, the cost, reliability and environmental consequences of large-scale water transport outweigh the potential benefits.



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Recently the Council of Australian Governments agreed to extend the CSIRO work on Sustainable Yields and water availability that has been completed in the catchments of the Murray-Darling Basin to the key catchments of northern Australia. When this further work is completed, governments and the community will have a shared understanding, based on the best available science, of the true capacity of the water resources in the north to support increased consumptive use.

I have attached a flyer on this project for your information, which lists contact details should you wish to find out more about the project.

Yours sincerely

Chris Schweizer
Assistant Secretary
Environmental Water and Natural Resources Branch

24 February 2009

28th February 2008

Mr. Chris Schweizer,
Assistant Secretary,
Environmental Water and Natural Resources Branch,
Department of the Environment, Water, Heritage and the Arts,
GPO Box 787
Canberra ACT 2601

Dear Mr. Schweizer,

Thank you for your letter of 24 February responding to mine of 23 January, which outlined a concept for transfer of water from the Gulf Country to the Murray-Darling Basin. I do appreciate receiving a considered response.

I note and understand the cost-benefit issues and the reference to the Kimberley Perth proposal. I did in fact work for some years in north western Australia and was involved in the first major transfer infrastructure project – the Dampier to Perth Gas Pipeline built in the 1980s.

However, I suggest the concept I've submitted has several key differences to the Kimberley concept and is far more practical both in engineering and cost-benefit terms. Note the differences:

- Fully gravity driven
- Over 80% of the "conduit" exists – the Darling system
- Benefits over the entire Murray-Darling system, not just at the delivery end
- Highly complementary to development of the NASY project in the Gulf Country
- Plus the other benefits noted in the concept paper.

I'm optimistic enough to believe that the time will come when water is transferred from the north. I note the current situation with Lake Eyre, unassisted by any dams or diversions.

Yours sincerely,

D L Maher