

Future demands Barrages must remain in place!

The completion of the **Federal Senate Select Committee on the Murray-Darling Basin Plan, Refreshing the Plan** document ('wrap' paper) of March 2016 includes 31 Senate Committee recommendations. In its Executive Summary, the Senate Committee considers the implementation of the Plan requires greater effort to minimise its negative impacts.

For example, in its **Recommendation 14**, (3.284) the committee recommend the government undertake cost-benefit analyses of the following options for adapting the management of the Lower Lakes and Coorong, and their social economic and environmental impacts throughout the basin, under these dot points:

- *removing the barrages;*
- *removing some of the barrages;*
- *modifying some of the barrages (such as Tauwitcherie and Mundoo);*
- *allowing the ingress of salt water into the Lower Lakes during periods of low flow;*
- *and investigating the construction of an additional lock at a location above Lake Alexandrina, such as near Wellington, SA either in concert with the above options or as a single change.*

In further recommendations: **(3.285)**, the Committee says, ***"Should such an analysis indicate that one or more of these leads to more positive social economic and environmental outcomes than the current basin plan, the committee recommends the Plan be amended accordingly."***

The five dot points above are representative of some of the proposals put forward by various Senate Inquiry witnesses, through inquiry presentations, written submissions and other supporting documents gathered during the course of nine separate senate inquiries across the Murray Darling Basin.

By seriously investigating the first two dot-point subjects, we find extensive downsides and many likely impacts on adjacent towns by removing the barrages! These towns include **Goolwa, Meningie, Milang and Clayton**.

During the Millennium drought and to assist lakeside industries, freshwater feeder pipes were introduced down both sides of the Lower Lakes from the Murray River near Tailem Bend. Currently, some lakeside irrigation continues using Lower Lakes water, depending on type of use and levels of salinity at the time.

The established lakes edge environment and infrastructure adjacent to these towns would suffer major losses when the water subsides following the removal of the barrages. The barrage barriers ordinarily maintain lakes and channel water at an approximate Australian Height Datum of AHD 0.75 above sea level

since they were completed in 1940. By controlling water levels located upstream of the barrages to Lock One; the lakes and channel surface water levels would ordinarily be maintained at a satisfactory levels to create reasonable surface water alignment with extensive, purposely built infrastructure including marinas, landings, jetties, pumps and various thoroughfares throughout the surrounding edges of the lakes and channels bordering the 840 sq km Lower Lakes system.

Removing the barrages would drastically affect both private and commercial property amenity and vessel passage from these towns. Most vessel movements located on the upside of the former barrages would be either completely neutralised or extremely limited when wanting to reach and access the Coorong. Creating a natural (barrage-free) estuary on the edge of these towns today, would not be acceptable to the residents and industry alike, and to countless thousands of tourism visitors who frequent each of the locations for respite, and recreation including numerous water activities.

Wind seiche is regular in this region where surface levels can vary up to a half metre or more during extremely windy conditions. During these periods in post-barrage times, it's not unusual to find the barrages closed to assist in limiting the impact. However, during tidal ebb and flow, without the barrages, ocean water would quickly penetrate into the Lower Lakes system, and at the turn of the tides, it would just as quickly flow back out, through the Murray Mouth. Wind seiche would on occasions add to or lower tidal ebb and flow levels.

Without the barrages in a natural tidal system, the ebb and flow of the tides in this region would conceivably last all day or all night, or part thereof which would repeatedly remove the amenity or useful water lapping features of the surrounding region where receding tides would expose putrid, acid bearing muds and leave vessels stranded for many hours until the next tidal period. Conceivably, this situation may extend upstream for 274km to Lock One at Blanchetown unless a proposed Lock Zero is built below Tailem Bend prior to dismantling the barrages. Without the barrages and Lock Zero, the affects would also be noticeable upstream in lower Murray River regional river towns including those associated with managing the water intake pipes for Adelaide's reservoir's, located at Swan Reach, Mannum and Murray Bridge, below Lock One at Blanchetown.

Given we suffered during the disastrous Millennium drought, isn't it time to seriously think about the basin holistically, about forecasts of less rainfall into the storages resulting in less for taking from basin rivers, with the dire need to protect Australia's food security, and why many have a false expectation that we have an endless river water supply that will naturally flow 2500km downriver to fill every expectation when it comes to fresh river water only for the Lower Lakes and to clear the Murray Mouth!

As a result of low rainfall over the catchments and reduced water levels in the whole of basin storages (Ref attached MDBA data, Whole of Basin Storage figures

saved by the author Oct 2012-2016), revealing reduced rainfall and river flows. While already witnessing visible signs of sea-level rise!).

The barrages most certainly should be retained and improved.

They'll become increasingly important in limiting the impacts from future severe weather conditions and sea level rise. Those that advocate the removal of the barrages have obviously not studied the current and future implications of their proposal. Conversely, many deem this 'remove the barrages' proposal lacking in substance from underestimating the Lower Lakes region and the wider basin area including the far-away mountain storages. Of paramount importance to reaching any conclusions are the subjects of future climatic conditions, likely reduced rain runoff in the catchments, less water for food production and the environment and reduced future levels of downstream water availability from the mountain storages, some 2,500 km upstream. The distance alone between the mountain storages and the Murray estuary place major hurdles with river water supplies over long distances with major losses estimated up to 60% volume levels from evaporation and seepage loss alone is possible, (ref: former MDBC).

In a barrage removal scenario without Lock Zero, towns in the lower Murray River reaches up to Lock One at Blanchetown would also face dire consequences of a continuous ebb and flow tidal existence, whereby receding ocean water, would create an unsightly scene of exposed mud and debris notwithstanding inconvenience to river towns as well as the four towns fronting the Lower Lakes. River bank slumping as occurred in the lower Murray River during the drought would occur again and further destroy property close to the river edge. The loss of amenity and inconvenience to various boating organisations, including the historically famous **Goolwa Regatta Yacht Club** and the **Goolwa Aquatic Club**, its sailing craft, powerboats, canoe and kayak activities would be enormous. All would be drastically if not completely compromised in a tidal only Lower Lakes estuarine system.

For lakes towns, all have planned and developed substantial surrounding infrastructure designed to take advantage of the beauty of the attached waterways that bring property safety, delightful attractiveness and community usefulness throughout the whole lakes district.

The four towns in the region are also holiday destinations for multiple thousands and for full-time residents who have chosen these idyllic places to live and enjoy the benefits of what this unique setting naturally offers with its waterways and nature's other attractions.

Are there options for the three Senate recommended dot points below that will cater for the Lower Lakes and Channel?

- *modifying some of the barrages (such as Tauwitcherie and Mundoo);*

- *allowing the ingress of salt water into the Lower Lakes during periods of low flow;*
- *and investigating the construction of an additional lock at a location above Lake Alexandrina, such as near Wellington, SA either in concert with the above options or as a single change.*

There are options including a very progressive proposal as discussed 'in brief' below!

A Better Way-for the Murray Darling Basin, is a 13-page paper first released in early 2012 and further updated by the author, Investigative Journalist in Marine & Aquatic Ecology, Ken Jury of Goolwa in South Australia. Contact details on final page.

A Better Way –for the MDB was written following extensive investigations across the whole Murray Darling Basin, with a view to providing a suitable basin-wide solution to Australia's largest food growing crisis while enduring reduced freshwater availability throughout!

“A Better Way” for the Murray Darling Basin!

The full paper version is supplementary to the documentary *Muddied Waters - A Clear Solution* that screened in December 2012. Copies of this paper available by emailing to the author! Details page 6.

The full version describes how:

- It won't cost the earth – certainly not A\$13 billion dollars.
- It won't damage floodplain farms and force farmers from their land.
- No need for water entitlement diversion reductions to service a government wish.
- Will use only a portion of the freshwater volumes currently used for the Lower Lakes etc. with provision to hand back the balance for productive upstream use.
- No need for costly over-bank flooding and subsequent property damage.
- No disruption for growers - improved growth in Australian foodstuff production and export.
- Growers and communities throughout the basin and the nation will benefit.
- Massive sulphuric acid mobilisation below Lock One will be checked.
- Murray River environments, aquatic life and biota will benefit.
- A working estuary will reward immeasurably with huge benefits and because:
- The MDB and the Lower Lakes are within a highly variable system.

The Lakes will remain a reversible system – fresh generally during natural flooding and estuarine at other times. Climate Change with sea level rise is already upon us. It will make all of this inevitable by (circa) 2050. This will affect the 7.6km barrages and all of the island embankments between.

Briefly, with: ***A Solution for the Murray Darling Basin!***

All it will take is one more river Lock; we'll call it Lock Zero given the current first lock is located some 275km upstream of the Murray Mouth at Blanchetown in South Australia. With minor barrage adjustments and the removal (or part removal) of an unwanted island adjacent to the mouth, that grew from being a sandbar, the basin and our food security can then be saved.

Lock Zero should be built to regulate minimal freshwater flow to (40%-1800GL/per yr) into Lake Alexandrina to mix with ocean water, forming and maintaining an estuarine environment, and for the first time, provide for the control of the pool height between Lock One at Blanchetown and Lock Zero, while providing the means to greatly assist in clearing the Murray Mouth. This will create a saving of 2700GL of freshwater to grow our food!

This will rid the lower river section below Blanchetown of acid mobilization, so bad at times that even the authorities openly admit defeat with treatment of mobilised acid-laden water, notwithstanding a possible threat to the intake pipes that feed potable water back to Adelaide hills reservoir storages.

By retaining the barrages, freshly mixed estuarine water would be held within the lakes system for extended periods, and released out of the lakes/channels, from selected barrages occasionally to refurbish and provide strong scouring flows, to regulate the removal of silt and sand from the areas between the barrages and the Murray Mouth outlet to the sea.

Using lakes stored estuarine water, the system could be flushed at will through the barrages while replenishment for the lakes would be activated with free ocean water on the next incoming tide, followed by mixing with a small portion of freshwater stored behind Lock Zero to be naturally mixed by wind seiche!

In flushing the lakes; by allowing lake levels to recede by up to a maximum of 20cm only by opening selective barrage gates, estuarine water from the 840 sq km surface of the lakes will provide flushing volumes of scouring water for the river mouth at a rate in the order of 150GL used in one single out going tidal session to successfully scour and clear the mouth.

To enable selective flushing, an upgrading of the logs in the Goolwa Barrage is recommended given the lifting of the current single barrage concrete logs stacked on top of each other is both cumbersome and time consuming as they're handled individually - one by one as commonly seen at this barrage today.

The alternative in each of the Goolwa barrage compartment bays is for single, thick walled poly tanks to fit the overall slot in each bay, to operate by using nearby water through a single pump to each tank as the hydraulic in one 'single lift and fall motion' to enable necessary increased flow pressure with outflows to assist in clearing the mouth and keeping it clear. Equally, to provide opportunity to direct outflows of estuarine water towards the mouth with a view to a portion of this water flowing though to the southern section of the northern lagoon of the Coorong.

The removal of a sandy, highly vegetated knoll that badly restricts outgoing water passage through the Mundoo Channel, located directly opposite the Murray Mouth. Bird Island as its known faces the river mouth, is located downstream of the Mundoo Barrage in the Mundoo delta on the edge of the Coorong. Its removal is necessary as it blocks about 70% of the flow from this barrage to the mouth. This obstruction and a minor connected peninsula gradually formed and vegetated as a result of building the

Mundoo barrage. It also impedes movement both ways of Coorong water, and water released from the Mundoo Barrage and 3 other barrages within the area that would otherwise clear the mouth of sand and silt. These changes are necessary for allowing the Lower Lakes system to require much less freshwater.

Simplistic perhaps, but logically there's a view to reduce the fresh water maintenance volume for the Lower Lakes to 40%, (about 1800GL/yr) as a freshwater allowance required to mix with barrage entrapped, highly oxygenated Southern Ocean water for the return of a healthy estuarine system within the Lower Lakes.

A Reversal of the system has many possibilities:

There're often seasonal periods when the elected 40% or 1800GL/yr of freshwater required for mixing in the lakes may be further reduced due to seasonal Lofty Ranges rain run-off reaching the lakes. A handful of streams actually reach the Lower Lakes including Currency Creek and the Finnis and Angus River's that yield significant winter freshwater flows that often reach Lake Alexandrina. This Lofty Ranges run-off water will again help compensate growers or it could be held as future fresh water meant for the lakes (to mix with ocean water), being held upstream of Lock Zero for this purpose. Moreover in an adaptive way of thinking, to suit the situation at the time when ensuring the continuity of the estuary or, if additional fresh flows persist through flood or minor flood, then ocean water and flood water would be adjusted by way of the now rejuvenated barrages and through Lock Zero to suit the situation. An upgraded Lower Lakes system as proposed would still be a reversible system. During low river flows it should be estuarine while river flood times may enable the river to completely fill the confines of the Lower Lakes as was generally the case. In all circumstances the freshwater or estuarine water biota throughout will adjust both ways as it most certainly always does in an estuarine environment!

Estuarine water:

Importantly, estuarine water can be made up of varying degrees of fresh and ocean water as is naturally the case in most estuarine deltas worldwide. Contrary to claims (and alleged state Govt. tests and claims in the Lower Lakes), estuarine water occurs at varying levels in deltas of most estuaries worldwide. These are often healthy ecosystems that provide immeasurable benefits to communities and governments alike.

Returning the Lower Lakes to estuarine would once again create a highly productive and useful environment. **However, the barrages are necessary in this case!**

Estuaries 'the world over' are known for their productiveness!

Such the case with viable fisheries known to exist in the Lower Lakes in pre-barrage times! It's a known fact that Mulloway (one of many examples of quality commercial fish known to the region) would gradually return to the Lower Lakes again to become part of a major fishery and fisheries nursery and breeding ground, for the return of large, productive fishery. In turn, tourism throughout would surge ahead and so would development!

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