

## To the Parliament of Australia

### Select Committee Inquiry into the Murray Darling Basin Plan 2015-16

#### Inquiry into the impact of the Murray Darling Basin Plan across the Basin.

Submission by Ken Jury. Senior Investigative Journalist, (Marine & Aquatic Ecology)

**Background: 53 years as a practicing journalist in marine & aquatic ecology.**  
Covering: 23 years as Producer/presenter of *Marine Watch* on former radio 5DN in SA.  
On invitation, Senior Journalist with the former SA Department of Fisheries (12 years)  
Presenter: SA with Seven Television, marine and aquatic subjects (5 years).  
On invitation: Journalist/columnist with Adelaide's *Advertiser Newspaper* (12 years).  
On invitation: Presenter ABC Radio 891 concerning marine & aquatic subjects, (6 years).  
On invitation: Producer/presenter 5efm radio <counterbalanceradio.com> 2 years.  
Executive Producer: Documentary "**Muddied Waters**" concerning the MDB, 2012

MDB. Work in progress for 12 years:

With a qualified Scientist BSc Hon. colleague, concerning the Murray Darling Basin crisis  
Note: many engagements above are interwoven in any one week!

## Basin Water:

### Our most precious resource - so why do we waste it?

**A note from the submitter:** I would appreciate your understanding, as the details in this submission are generally a result of my continuing professional contact, (championed for 12 yrs.) in my field as a specialist journalist with food producers and media across the basin. No less in 2012 as a result of extensive fieldwork and subsequent screening of my documentary "*Muddied Waters*" on the Seven network regarding the increasing plight of the MDB and its people. Thank you for your consideration! Ken Jury contact: Mob:

This submission is provided according to **The Terms of Reference** items (a) through to item (d) as published under the role of the **Select Committee on the Murray Darling Basin Plan, to inquire into and report, on or before 26 February 2016.**

**The Murray Darling Basin** – our largest food bowl with 23 rivers extending over a million sq. km. Home to more than 2 million people; many of whom produce around a third of Australia's vital food supplies (*MDBA*).

### It may have been the case in the past: Certainly not so today!

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## Summary.

There're many concerns with the *MDB Plan (This plan is a 'third attempt Plan' document)*, and sadly, there remains many damaging ways from what the MDBA proposes within its Plan document.

- *Murray Darling Basin Authority's (MDBA) support documentation alone, together with an extremely concentrated 'environmental only' approach taken by the MDBA throughout its recent years, is hurting decent people!*
- Herein, in an abbreviated form, I present an insight into some of what the MDBA touts, the distress it causes while it categorically refuses to suitably determine an agreed balance between human needs and the environment, in what should have been a consultative process that would otherwise advisably address longer term; and fairer national and state water management objectives.
- The Authority's ineptitude and unwillingness to deviate from its irrational, up front environmental path is not consistent with international 'best practice' and transparency expected by those it serves throughout the wider Australian community and by basin food grower groups. The Authorities single-mindedness approach has led it to fail miserably in addressing a 'best practice' path whereby it has 'deprived its own mandate' and failed to obtain an overall appreciation of the level of maturity throughout the water resource user communities and industries. The lack of 'transparency' is absolutely deafening!
- Narrow, sectional interests without an agreed, responsible approach to consultative process rarely succeed! NSW Water Minister Niall Blair told *The Land* newspaper 13<sup>th</sup> August 2015, "*CSIRO analysis released this year of the environmental health of the Basin during the last century, when dams were built and the river system was regulated, revealed little evidence of environmental decline,*" he said. Wise words and the crux of why so many basin people are seething!
- Alternatively, a rationale of close community cooperation and openness often leads to workable solutions. No less, had Australia's basin people and our food security been held squarely upfront in the MDBA's 'triple bottom line approach,' whereupon debate across the basin would have been intent but fair, it would likely have fostered a much wider and more co-operative approach with agreed resolutions.
- Particularly with what the MDBA proposed in its 'heads up' ***Determining Environmental Requirements*** (MDBA 2013) document where it admits, "*It is simply not possible to assess the environmental water needs of every individual environmental asset in an area as large as the Murray-Darling Basin. The information is not available and would be impossible to collect in any reasonable timeframe. Moreover, the relationships between hydrology and ecology mean that it is not necessary,*" the MDBA said. This raises questions about the MDBA's environmental push in parallel with its continuing lack of serious consultation.

A poor level of field investigation in what should have been a finely tuned, organised atmosphere of open consultation, has for the most, only garnered a shadowed and

un-spirited '**us and them**' acrimony for many people and the authority throughout the basin, including the Lower Lakes region. A consultative process between the authority and basin people should have been planned in the knowledge that basin growers really know and understand their own properties and those surrounding them. Growers deserve the same expected recognition. It must be a level playing field and it should be acknowledged that intellect between people doesn't always mean the knowledge base is tilted one way or another. A fixed 'us & them' way of consulting doesn't create progress, in fact it downgrades it! Being a professional researcher or scientist doesn't mean exclusiveness; in fact it is to the contrary. It's officially recognised that Australia is likely to have more citizen scientists including farmers than those with degrees and diplomas. For example:

*"Amateur naturalists and other unpaid "citizen scientists" are playing a huge and vital role in the ongoing 'discovery' of Australia and all that it contains. "Citizen scientists are unrecompensed, unsung and rarely officially acknowledged – yet they are making a genuinely profound contribution to our understanding of Australian wildlife, and the state of our environment," says Professor Hugh Possingham, of the ARC Centre of Excellence for Environmental Decisions (CEED) and The University of Queensland. Professional science, especially field-based data collection, is expensive – but tens of thousands of amateur researchers and naturalists are helping to fill the gaps in our knowledge of our own country – and often make discoveries of scientific significance, including new species, he says. Furthermore the work of these citizen scientists can be just as valuable and trustworthy as information gathered by professionals."*

The reality is the MDBA literature regularly states how it makes the ultimate decisions for what should occur across the basin! It's repeated many times in its extensive documentation. However, many of its environmentally charged derivatives arrive from an extraordinary lack of a sound knowledge base. Not quite so much from contracted science or machinations of governments; moreover from that which otherwise would have been readily found and promoted by genuine people across basin farming communities. These are people with generations of farming knowledge, who are regularly supported by substantial records.

Most basin people therefore expected consensus to stem from thorough investigation, research and consultation. Not so with the authority because its Plan and documents regularly 'pitch up-front,' its chosen 'environmental invasiveness,' as being the one to be 'out front.' Positioned well above basin people and their crucial, social and economic outcomes and concerns.

It may be a question of whether the authority has the capability and grounds for making many of 'its own MDBA decisions,' often based on questionable initiatives, without enacting balanced consultative process, consensus and thorough investigation beforehand.

**To assist the Select Committee in dissemination of the information-with solutions and conclusions:**

**The detailed information is introduced in this submission; in a genuine endeavour to greatly improve and assist the *Select Committee Inquiry into the Murray-Darling Basin Plan*.**

As per the “*Role of the Committee*” and “*the implementation of The Plan,*” where the Inquiry Committee requested coverage of ‘*positive and negative impacts*’ with particular reference, as covered herein.

**Reference. A.**

**1.** *It’s progress,* **2.** *It’s costs especially those related to further implementation,* **3.** *It’s direct and indirect effects on agriculture industries, local businesses and community wellbeing and* **4.** *And any evidence of environmental changes to-date,*

**All of the above attracting levels of concern.**

**1) *Its progress,*** The Plan is a document that passed in *The Parliament*, but fails to address the variability and long-term objectives expected for the basin. It offers very little in the way of progress for Australia’s vital food security and for the successful on-going operations and performance of our basin food growers.

It’s apparent that this Plan prepared by the Authority is couched away from growers, and towards the environment, as its most definite ‘number one ticket’ within its own ‘triple bottom line’ whereas, one would have fully expected social and economic outcomes would have preceded the authorities environmental watering plan.

The Plan will likely only move forward after The Plan document is fully scrutinised, debated and edited to where it’s socially acceptable. **Where Australia’s people and their food security actually comes first!** Those that voted for the Plan will need to seriously re-appraise their thinking on how to deal with this situation today!

**2) *its costs, especially those related to “further implementation,”*** may already be close to blowout, well before **further implementation!!!** But then, while I acknowledged the subject is huge, the MDBA of today (as against the previous, small but very professional *MDB Commission*), has several hundred employees and similarly, a distinct propensity to produce as many documents as possible, in it’s best tradition of saturation publishing or rather, they’re working on “theory induced blindness” as the maddening documentation continues to create widespread confusion and distress.

No less is the concern with the authorities level of work in the field; particularly with it’s draconian, sole destroying ‘constraints measures’ and various ad-hoc consultative appointments with growers concerning this issue and the potential outcomes. No less a concerns with authority representative appearing on site to speak with a grower(s) who gave up his or her valuable time from those otherwise more serious farming matters, to listen to MDBA proposals that are more often ‘ill conceived.’

The MDBA displays a lack of intuitiveness in its consultative process with the ‘constraints issues’ at the expense of growers across the wider basin. Its very apparent to your writer how the authority is basically ‘shooting from the hip,’ with little empathy and understanding of the basin, and how it actually works. In one example when considering wild-life and particularly the extent of birdlife officially recorded and published as a result of extensive aerial wetland studies, against huge bird numbers known but not studied on rice and other known wetter crop fields where birds are often more abundant than those recorded elsewhere across basin’s natural environments. There are recognised inefficiencies within the authority across the basin. A lack of duty of care and empathy when dealing with the technical issues of water and its engineering requirements is apparent. There’re concerns with water management knowledge and prowess when dealing with ground contour work, with soil types, water flow hydrology and hydraulics, with overbank flooding and notch erosion. In particular when engaging in a practice of forcing water movement through dry, undulating flood plain country where property damage as a result of ‘trial testing of overbank flooding’ has already

caused considerable personal hardship and property damage. Furthermore, allegations of lack of notification to growers of impending, forced floodwaters are known along the Murrumbidgee and its tributaries and anabranches. In one other recently alleged incident, a farming family were asked by the MDBA field representative to supply the financial details of the farm. This particularly outraged the farmer and his family. It's true to say that many basin growers live in absolute fear because of the ways of the Authority!

Various other concerns are presented 'verbatim,' herein, from a grower/author. Please: **Refer item B in the attachments, commencing page 16.**

The authority continues to 'go against the grain' with growers, particularly with its constraints proposal and thousands of variances in what is held as one of the most unfair **and most un-Australian** proposals.

**3) *Its direct and indirect effects on agriculture industries, local businesses and community wellbeing* - are mentioned below, in just a few examples:**

Simply, the effects are numerous and apparent. One could suggest 'the basically understood authority' environmental philosophy' extends well out into the field.

There are concerns about time and revenue cost to farmers to-date. These include telephone and travel costs as a result of MDBA organised conversations and regional 'constraints' meetings with authority representatives and/or contractors. Expenses, that one would fully expect to be 'fairly recompensed' by the authority. It's grossly unfair to expect food growers to pay for something they didn't create; to have it forced upon them with a likelihood it could conceivably destroy their farm, their infrastructure and future incomes and their choice of living amenity. No less is the potential loss and survival of nearby communities, and the losses to Australia's vital food security and exports.

The damage to surrounding private amenity has already become apparent in some eastern farming regions of the Murrumbidgee River, where its alleged, several un-notified, over bank flooding tests occurred.

In a recent discussion your writer had with the CEO of one of the largest group of council organisations along our second longest river system; it was clear that local government bodies throughout the floodplain regions, are carrying varying degrees of concern about the likely collateral damage through impact on council infrastructure. In general, representatives are worried about the likely potential damage to bridges, wetlands, river foreshore and road development, to town business and infrastructure, and river tourism that may also include the need to re-locate caravan parks and overnight cabin facilities. Councils are very concerned about the extreme levels of remedial actions the MDBA proposes, that are likely to be repeated. Individual residents who are fearful of overbank flooding share this concern. Many already realise they'll become potential claimants according to conversations across the basin!

**4) item four asks for *any evidence of environmental changes to date;***

Examples of environmental change, is supported with various evidence as a result of the MDBA allegedly acting upon its 'constraint' threats; in this case during late 2012 along the Murrumbidgee system in what was since believed to be a trial of overbank flooding, apparently exercised without prior public notice or care. The incident, was reported and recorded in the Collingullie area, Upstream of the Wagga Wagga region of New South Wales

## **History reveals a significant decline in available river water across the basin!**

The MDBA's fact sheet "**All about the Barrages**",(p6)says, "*Flows to the lower reaches have been altered by significant changes in the annual flow, the distribution of flow through the year, and the duration of low flow periods. For example, under natural conditions, the median flow to the sea at the Murray Mouth was 11,880 GL per annum. By 1994, the level had declined to 21% of the flow that occurred under natural conditions. Consequently, the Lower Murray now experiences drought-like flows in over 60% of years, compared with 5% under natural conditions. (Details: "South Australian Parliament Select Committee report on the River Murray)."*

Combined, the five barrages, as barriers extend for 7.6km with 593 individual gates or stop-log bays. Lack of river flow, sulphuric mobilisation and closed barrages during the Millennium drought brought regional town communities adjacent to the lakes, to their knees. There were reported health issues and property damage at the time.

### **Ref B.**

*the effectiveness and appropriateness of the plan's Constraints Management Strategy, including 1). the progress of identifying constraints options to mitigate the identified risks and 2) environmental water flows and river channel capacity.*

**The subject of 'Constraints' with threat's of over-bank river flooding across highly fertile floodplain farm land will go down in history as one of the most 'draconian' and destructive measures' ever conceived out of politics in Australia.**

An un-dated MDBA paper, '*Managing Constraints*,' thought to be produced in 2012 as a result of a request by basin Ministers" at the time, dealt with studying basin river constraints as part of the then government pursuance of its draft **Murray Darling Basin Plan**.

A purse of \$200 million dollars was allocated "*to relax or remove physical structures along or near our basin rivers, like bridges and roads, which stop us,*"(the MDBA paper states), "*getting water to some areas in volumes and at times its most needed, constraints have been identified as a priority for basin states.*" The notion was, "*some practices or even the absence of them, "mean we don't use environmental water as efficiently as we should,"*" the MDBA wrote. Recent MDBA data suggest compensation could be well over \$1 billion dollars, although those likely to be affected say, that's falling well short of the mark.

At a constraint's meeting between growers and the MDBA near Collingullie along the Murrumbidgee during late August 2015, it's alleged the MDBA constraints manager mentioned how its unlikely that South Australia would receive additional water from this system? This subject was raised as result of up-stream Murrumbidgee farmers at that meeting, pointing out to the authority that it will be thwarted by the narrowness of the Murrumbidgee river channel a few km's back upstream of Balranald to the west, where it will find it impossible to send large volumes down through this system, when the additional flooding flows will ultimately spill over the river bank and find a path onto relatively flat, open plains country, where a greater proportion of this expensive overbank flooding water will undoubtedly become lost.

**Constraints: The MDBA fails to reveal these important points.**



1. Environmental Water is often a 'risky constraint' in itself. Particularly when storing water in headwater dams for future environmental purposes use downstream. The mountain storages were purposely built! They're designed to store water captured during times of seasonal rain and snow runoff in the mountains, and 'significantly' each dam **must have** an air space allowance to reduce the risk of downstream flooding of public and private property throughout the extensive river regions during extremely wet periods.
2. Recent comments by grower communities alleging a recent strengthening of the Burrinjuck and Blowering Dam walls by parties unknown, has raised further concerns about future, and very necessary **air space** in the dams. It is reported that both dams in Dec. 2010/Jan. 2011 were full **without airspace**, and subsequently, with the possibility of no downstream flooding security. The concern is that these dams are, on occasions being allowed to fill to the brim as a measure towards success with the connecting constraints policies regarding overbank flooding downstream. During 1937, it was "discovered that Burrinjuck dam had developed a structural weakness that required remedial action."(Wikipedia- History of Burrinjuck Dam).
3. **Seriously**, there are questions about the MDBA's ability to fully understand what it proposes given that, in various ways it regularly admits, "*its range finding and selecting 'Environmentally Sustainable Level of Take for surface water' (ESLT) in the diverse MDB is a complex task with many uncertainties.* The authority said, "*there is no simple mechanism to estimate an ESLT and ultimately it is a judgment for the MDBA to make.*"
4. The MDBA's 'triple bottom line' focuses first and foremost on widening its environmental holding across the basin by threatening to exercise a practice of piggy backing additional water, on top of existing river water flow to purposely cause overbank flooding. Literally, while creating damaging notch erosion to riverbanks as it attempts to spread water much wider, and towards soil-rich, food-growing farmland. Its ultimate, almost hidden agenda (many believe) is to push enough water downstream to clear the Murray Mouth. Damage to farmland infrastructure, stock, crops, fences and loss of amenity to growers, in some cases could be permanent and non-retractable from a continuity perspective. Many agree, man-made floodplain damage costs on rich soil farmland will reach multiple millions and quite possibly billions of dollars when destroying food producing properties, soil types, infrastructure and livelihoods.
5. Regarding the notion of constraints removal while seeking to extend its water resources onto generally dry environments, well beyond existing river flows; there is no rhyme nor reasonable reason today to proceed with this proposal (as shown on page 2, in dot point 4 under Summary), nor evidence for that matter to suggest that river environments are any worse off today than they were just under a century ago. Environmental water flows and river channel capacity basically remain the same within the main catchments and river channels. Most of us witnessed the damaging results of the Millennium drought followed by extensive rainfall that filled our storages, rivers and connecting backwaters and brought them back to life. Most of these rivers including the Murrumbidgee, the Goulburn and the Murray River and their tributaries and backwaters are just as healthy today. The exception is the Darling system that continues to struggle as a result of severe drought and perhaps water diversion activity high up in the

system! Lack of water in Menindee Lakes is a concern with water supplies for Broken Hill! Of interest, it's alleged that Cubby at the top end has no water!

## The MDBA's "Uncertainties and opportunities for future work."

*"Quantifying an 'environmentally sustainable level of take' (ESLT) volume is not an exact science according to the authority." "The MDBA says it used an extensive evidence base consisting of scientific and socio-economic studies, monitoring data, quantitative models, and expert knowledge in assessing and determining an ESLT. However, there's a range of uncertainties in this knowledge base, and the over-arching process, which contribute to the overall uncertainty in the ESLT process. To minimise the uncertainty, MDBA has focused its efforts thus far on the issues that have the greatest significance in determining an ESLT. None-the-less, uncertainties remain."* The authority said.

*"The modeling indicates that an 'environmentally sustainable level of take' for surface water of the Murray Darling Basin (ESLT) of 10,873 GL will provide enough environmental water in the Basin to improve environmental outcomes across in-stream, riparian, wetland and low level floodplain habitats."* it said, *"The ability to get water to mid and high level floodplain habitats is largely limited by delivery constraints and increases in water for the environment will not necessarily achieve better outcomes for these habitats,"* it admits. There is some certainty the 10,873GL mentioned above is most likely per annum. Nonetheless, we should be mindful about the current condition of all storages combined, and since we're near the end of winter and now in early September 2015, all storages combined, contain a total of only 10,134GL (46%) at 21/8/2015 with an extremely hot and dry summer forecast.

### Ref C.

*the management of the Coorong, Lower Lakes and Murray Mouth, including the environmental impacts of lock s, weirs and barrages of the Murray River and*

**Ref D.** any related matter.

Determining the connection between the ill conceived 'Constraint Issues' and the 'elephant in the room' concerning water type in the Lower Lakes.

The management of the Coorong, the Lower Lakes and Murray Mouth require a thorough investigation and overhaul due to massive, on-going waste of our precious water resources. Water sources throughout the basin that are diminishing as a result of climate change

Putting it in simple terms: **No longer can we live under the expectations of maintaining our most crucial basin food bowl, and protecting Australia's Food Security, while struggling to keep the degrading Lower Lakes in a freshwater state at the same time.**

The Lower Lakes in South Australia should no longer remain in the post-barrage status as 'fresh water only.' A growing number of Australian's including many from South Australia are now urging the return of the lakes to an estuarine system. A majority around the lakes openly admit they want change. Many say its wrong to maintain the



lakes fresh and waste literally billions of dollars of water. Particularly they say, when food-producing farmers are leaving the basin. They (the farmers) are disillusioned and fed up as they see food production being savaged by an environmentally hungry Government, and no less the authority as it plunders the basin during its environmental crusade, running its cause to flood growers rich floodplain land, where the best food-growing fertile soil in the nation is found, while they continue to face the unsettling situation of further reductions with sustainable diversion limits (SDL's) throughout.

Some believe that this planned flooding is possibly being done to satisfy an even wider, un-natural greenbelt along both sides of our rivers while forging ahead with a ridiculous notion to clear the Murray Mouth and keep it clear.

Conversely, a handful of people would rather have the Lower Lakes remain fresh, although others believe, its these same people that are 'holding to ransom,' all of our growers in upstream South Australia and in the other basin states, as they battle water supply cut-backs resulting in reductions in vital food production and security; certainly compounded more during times of drought and hot summer periods and with sea levels on the rise.

No wonder we're seeing more food arrive from Asian shores, on our Supermarket shelves! All the while the SA Government sits on its hands, raising them occasionally to play the same old fiddle as it signals for 'more freshwater' for the Lower Lakes, even though resource levels in the catchments are reducing. All the while they fail the public miserably with our crucial water supplies through a lack-lustre understanding of the 'wider ramifications' of water use and ultimate provisions across the basin.

**This should be reversed now, given our resource circumstances and expected climate change we're continually warned about!**

**A reversal of the way water is managed in the Lower Lakes will save our Murray Darling Basin Food Bowl, our important food security and provide otherwise wasted water back to our upstream food growers. It will make redundant any notions of continuing with the ill conceived and extensive 'constraints,' overbank flooding issues throughout!**

Commenting today about '[environmental impacts](#)' over a period of decades as a result of the introduction of Locks and Weirs within our river systems, become basically superfluous in today's water management thinking, due to the importance of these structures in securing an extensive series of weir pools to store vital freshwater for irrigating our extensive range of food and fibre throughout.

In consideration of volumes of freshwater use within the 750km<sup>2</sup> (plus) Lower Lakes, the Goolwa Channel and for flushing the Murray Mouth, on average, in years prior to our worst drought; these amounted to approx. **4,500GL**(source MDBC) per year. However, according to the MDBA "***In the past, under natural conditions, the medium flow to the sea at the Murray Mouth was 11,880 GL per year,***" the authority wrote in its Fact Sheet, "***All about the barrages.***"

It says, "By 1994, the level had declined to 21% of the flow that occurred under natural conditions. Consequently, the Lower Murray now experiences drought-like flows in over 60% of years, compared with 5% under natural conditions (***SA Parliament Select Committee report on the River Murray***), as described by the MDBA in its above

mentioned Fact Sheet. Surely, the use of freshwater only in the Lower Lakes therefore cannot be sustained!

To help gain a perspective of 4,500GL, this volume of freshwater is equal to 4,500 sq km x one metre deep of water.

In terms of value, based on current approximate 'Class One' Tender prices for Murray River freshwater in South Australia; the 4,500GL's of freshwater used in the lakes, for the channel and to clear the Murray Mouth in a single year would be valued at over \$7 billion dollars.

Whereas, one must ponder what value would be gained back upstream when putting this same water to better use in our food bowl?

To help understand and gauge the likely value of food produced annually from the basin.

According to an ***MDBA fact sheet: "Irrigated Agriculture in the Basin – Facts and Figures"*** as the MDBA sourced from *Australian Bureau of Statistics:*

***In 2012-13, irrigated agricultural production in the Basin accounted for over 50 per cent of Australia's irrigated produce, including:***

- ***Nearly 100% of Australia's rice***
- ***96% of Australia's cotton***
- ***75% of Australia's grapes***
- ***59% of Australia's hay***
- ***54% of Australia's fruit***
- ***52% of Australia's production from sheep and livestock***
- ***45% of Australia's dairy.***

For a value of: ***\$6,837m in 2012-13.***

In essence, the approx. value of the freshwater in the Lower Lakes etc./yr. is worth more than the gross irrigation food and fibre production returns from the basin in a single year. To your writer, this highlights again the waste of water in the Lower Lakes; both expected and condoned by the SA Government.

## **[A Solution to save the basin](#)**

There's a widely held opinion by growers across the basin, that allowing the Lower Lakes to remain in a freshwater state is both **manifestly irresponsible and extremely expensive to the wider Australian communities.**

**Returning the Lower Lakes in South Australia to an estuary** will provide a healthy, and productive lakes system with a boost for local and regional basin industries including tourism and commercial and recreational fishing industries and numerous other activities. Estuaries worldwide are known for productiveness.

The previous estuarine biota (including estuarine fish) once known to the lakes will gradually return again. The fact is, inbuilt DNA continues to direct estuarine fish such as Mulloway, Coorong Mullet and Black Bream towards close proximity of the 5 barrages today, as they enter the river mouth and move towards the barrages, where they line up against the outside of these structures on the Coorong side in what is basically estuarine water, with the notion of naturally entering the previous, Lower Lakes estuary that has been closed since about 1940.

We know this today as a result of on-going catch rates with these popular species just out side, or downstream of the barrages at times when they're seasonally migrating into our system!! We know from recent science that Mulloway in particular, enter the Glenelg River (located in SA and Vic.), but do not breed in that river whereas tagging reveals they then migrate across the inshore Southern Ocean, and up to the Coorong barrages to breed. Fish ways recently introduced into the barrages are yet to fully realise expectations given the level of estuarine values with in-consistent mix of water inside the barrages. Some diadromous specie (fish that can live in ocean or freshwater) including lamprey have entered the system recently. It's a different story for Mulloway and several other important estuarine species that can survive in ocean or estuarine water.

With the Lower Lakes returning to estuarine, it will provide grower relief and huge freshwater savings with the opportunity for all basin states and their growers to greatly improve food production as a result of additional water upstream rather than growers facing reduced sustainable diversion limits, together with additional threats of constraints implementation; all the while when attempting to keep the Murray Mouth clear. This will also bring extra water for environmental purposes.

### **Significantly:**

**With the Lower Lakes estuarine again, none of the proposed, man-forced over-bank flooding of constraints down the Murray, the Goulburn and Murrumbidgee River systems and tributaries need be proceeded with!!!**

The relief by food producers and famers throughout, from threats of extensive property damage will be resounding! Many are aware today of a proposal to save precious freshwater and keep it upstream, for food production use. Many are holding out for common sense to prevail towards a positive outcome.

A return to an estuary would halt wasteful attempts to keep the Murray River mouth clear through the use of precious fresh water. Particularly now, with recent climate forecasts and likely outcomes of further drought, reduced rainfall and reduced water availability. No less, as a result of flow distances and natural, transitional loss, increasing greatly within the shallow lakes with average evaporation and seepage levels of between 840GL & 1200GL/year lost before the water reaches the Murray Mouth.

### **In pre-barrage times:**

History reveals much in the way of the interaction of the Murray River with the Lower Lakes, the Coorong and South East natural drainage system and with the Southern Ocean.

In pre-barrage times, it was a variable Lower Lakes when low flows meant the remaining fresh water trickles had to compete with Southern Ocean intrusions, as these pushed fresh water back into the upper end of the Lower Lakes and on occasions, well up into the river resulting in a mix of ocean and fresh water, becoming estuarine as naturally found upstream in all global estuaries.

Records reveal how estuarine fish populations flourished high up in Lake Alexandrina to where it supported major commercial fishing operations for some 44 or so commercial fishers who were based at Milang , some of whom fished towards the top of Lake Alexandrina area, where they harvested freshwater Murray Cod, Callop (Yellowbelly or

Golden Perch) and estuarine Mulloway, often in the same hour and often on the same day.

Each specie individually, almost plying the same water column save for the natural stratification of fresh water bodies accompanied with nearby estuarine water, at times still stratified but expected to gradually mix into estuarine water, after which the cod would follow freshwater trails while mulloway remained in estuarine water. Often within close proximity; sometimes found in areas less than a few kilometres apart. History reveals how Pioneer; Captain Charles Sturt discovered stratified lakes water following his arrival out of the River Murray into Lake Alexandrina.

Fishers primarily established their grounds by taste-testing for fresh water and saline water in the often stratified water column. **(above details from an interview between the author of this submission, with one of the few remaining lakes Commercial Fishers, Mr Victor Woodrow (in his upper eighties today) who fished with his late father near the top of Lake Alexandrina lake in the area described above until the completion of the Goolwa Barrage. Mr Woodrow resides today at Marion, Southwest of Adelaide).**

Significantly; so long as the barrages are open to exhaust flooding freshwater, and on occasions even when they're not; during high tides, and even neap tides, and with regular and strong prevailing westerly winds, it's inevitable Southern Ocean intrusions will reverse out-flowing fresh water back through the river mouth and through the open barrages. Often pushing fresh and by now ocean and fresh (estuarine water) back upstream into Lake Alexandrina, reaching towards the entry point of the Murray River into Lake Alexandrina, often with the help of wind seiche as a result of strong west to sth-westerly prevailing winds.

Evidence collected from officially positioned automatic beacons throughout the system, stream out 'real time' electronic probe data, including salinity or (Electrical Conductivity units or (ECu's) enabling hard copy printouts that reveal the levels of salinity in the Lower Lakes, Goolwa Channel and the Coorong. At times revealing higher salinities due to ocean-water ingress, as widely recorded across the Lower Lakes system.

Beacon plot data recorded for many years by your author and a colleague scientist show how water in the lakes is often estuarine. A series of plot data also reveals ocean ingress occurrences when southern ocean water actually circumnavigates Hindmarsh Island.

Its notable, the Lower Lakes aren't lakes but leaky, shallow depressions of sand, silt and river debris culminating in the formation of extensive acidic soil beds, (in excess of 500 million tonnes) with high levels of seepage and massive evaporation.

These 'impressions' were formed by receding ocean water about 7000 yrs. ago, leaving remaining sand, silt, debris and calcareous ridges that border the lakes today, at the same time during the formation of the South East natural drains leading freshwater flows to the southern lagoon of the Coorong through Salt Creek today.

Sea level rise 'is upon us today' so its inevitable the lakes will again become totally estuarine.

**Currently, precious freshwater is being sent down river to evaporate, to be lost to seepage and for scouring the Murray Mouth. Generally, it being continually wasted!**

Worse still, the MDBA is planning to flood repeatedly, due to its constraints policy!

Others agree with our findings - and it's official! The *SA Natural Resources SA Murray Darling Basin* people, together with the Government of South Australia recently researched and prepared a document "***Building Resilience to a changing climate,***" where the authors agree that climate change will affect the Lower Lakes in two ways. "*It will reduce flows down the river and change ocean conditions. Declining average rainfall in upstream catchments will cause flows to reduce, changing salinity levels in the Lower Lakes and Coorong. The largest potential effect though may come as a result of changing conditions in the Great Southern Ocean. Perhaps the greatest concern though is the possible effect of sea level rise, which could result in more regular saltwater incursions into the Lower Lakes, and ultimately, regular failure of the barrages,*" according to the document."

**One may well ponder what the returning of about 2700 GL/yr of freshwater back upstream, would mean in terms of increased food production and value from additional food grown out of the basin over the same period?**

## A Solution to save the basin and the Murray Mouth!

(Ref:K.Jury "A Better Way" -for the Murray Darling Basin,2013).

Briefly, all it will take is one more river Lock; we'll call it Lock Zero given the current first lock, Lock One is located some 245km upstream of the Murray Mouth, at Blanchetown in South Australia plus some minor remedial work on the Goolwa Barrage towards scouring an intrusive, recently formed island opposite the Murray Mouth.

The Lower Lakes system should revert back to making better use of limited fresh water with the help of freely, available, highly oxygenated Southern Ocean water, to again become a healthy estuarine system.

Lock Zero should be built upstream of Wellington towards Tailem Bend and it should be built by applying 'friction piling' as one of today's modern foundations where bedrock is no longer a requirement.

There will be major benefits from **preventing un-controlled use and loss of River Murray water** in Lake Alexandrina, and smaller Lake Albert.

For the first time, it will provide for the control of a further weir pool between Lock One at Blanchetown and Lock Zero above Wellington and at the same time regulate 40% only (1800GL/yr.) of freshwater held upstream of Lock Zero to be drip-fed back through Lock Zero into Lake Alexandrina to keep and maintain its estuarine state most times save for exceptional flood periods when freshwater would be expected to dominate.

Currently, the Lower Lakes, the Goolwa Channel and flushing the Murray mouth annually, require about 4,500GL of freshwater.

This proposal in itself would rid this 245km section of the river up to Lock One, of acid mobilisation, so bad recently, even the authorities admitted defeat with treatment of mobilised acid-laden water, notwithstanding putting a halt to riverbank slumping. All the while, halting an acid threat in a river reach which also contains the intake pipes that feed water back to Adelaide's hill's water storages.

In what could be a near natural situation today, and certainly a natural occurrence in pre-barrage times, the use of clean, highly oxygenized water from the Southern Ocean, mixed with a percentage of stored fresh-water gradually released from upstream

through Lock Zero; then the Lower Lakes system would again gradually become estuarine.

By allowing inundation of the lakes with estuarine water, it will prevent the drying of substrates in the Lower Lakes and Goolwa channel mud while limiting acid sulphate development and mobilisation throughout the estuary. All without using massive volumes of expensive irrigation water year after year, that should otherwise be 'better utilised' to produce Australia's food.

While retaining the usefulness of 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 barrage gates to provide strong, scouring flows to begin and regulate the removal of silt and sand from the areas between the barrages and the Murray Mouth outlet to the sea.

Refurbished barrages will also regulate incoming replenishment of lake water during periods of incoming tidal movement when fresh ocean water will again make its way into the lakes to mix with a portion of freshwater fed out of Lock Zero.

Scouring the channels and mouth will require minor upgrading of the gates on the Goolwa Barrage by replacement of the current, cumbersome concrete logs. This will also assist when opening gates on other Barrages, particularly the Mundoo Barrage, where water flows from nearby Lake Alexandrina, passing through this Barrage, become restricted at the Mundoo delta facing the nearby Murray Mouth, on the opposite side of the Coorong.

Barrage upgrades will enable controlled restriction of the outgoing flows through elected channel(s), to bias the movement of sand and silt during outflows; while being regulated to allow strong, outbound flows during falling tides.

**Keeping the barrages –and returning to an estuarine system:**

The barrages will be required because without them, the food bowl as we know it would be destroyed given we need the barrage barriers and equally, the river lock barriers to maintain weir pools throughout our river systems, to store river water in what are known as weir pools, to not only store, but to take water for food where required.

**Return the lakes to an estuarine system, and reap the savings elsewhere!**

During 'average river flow years,' the use of ocean water mixed with a 40% portion of freshwater/yr, would free up a minimum 2700 gigitalitres/yr of freshwater previously used in the lakes and the channels, to be re-directed back upstream as surplus freshwater for food production with some towards environmental flows for up-river environments. There's more, but first:

**Remove all or part of this sandy, highly vegetated knoll:**

**Bird Island** as it's known, faces the Murray River mouth. It's located almost directly opposite the river mouth across the narrow Coorong. Located a short distance downstream of the Mundoo Barrage in the Mundoo channel delta; it must be removed as it directly blocks about 70% of the flow from this barrage to the mouth.

This obstruction is thought to have gradually formed from a sand bar, eventually becoming vegetated, as a result of building the upstream Mundoo barrage, completed in the late 1930's.



Bird Island also impedes water movement both ways, north and south along the Coorong corridor where it restricts major water releases from the Goolwa, Tauwitchere, Ewe Island and Mundoo barrages, towards the river mouth.

The effect with removal, or part removal of the island will be the enhancing of the power of flows towards the mouth when exhausting lake water, by manipulating specific barrage gates and slightly reducing 750sq km lake levels by about 10- 20cm (to create enough flow power to reach across the narrow Coorong to where it clears the mouth.



To be expedited on occasions when exhausting older lake water out through the mouth followed by opening additional gates at times when tides are incoming, offering the opportunity to refurbish with pristine, ocean water as often as required, to be mixed with a smaller portion of freshwater through Lock Zero, into Lake Alexandrina.

Prevailing winds and wind seiche together with tidal flow will help to mix the stratified Southern Ocean water with freshwater high up in the lake.

**There is a solution – a formula for success!** Combined, the Lower Lakes hold approx. 2018GL of freshwater at capacity. Currently, the remaining balance of 2,482GL average from the original 4,500 GL/yr average used is for evaporation replacement and for scouring the channels and the river mouth.

Current success rates with scouring the Murray Mouth are minimal and almost a complete waste of time and cost. Dredging has proved to be expensive and short-lived. On occasions in the past, larger vessels have not always been able to comfortably navigate across the Coorong adjacent to the inside of the Murray Mouth.

**With change – we can do much more with our freshwater resources while gaining benefits from a local and practical means to clear the mouth while saving 2700GL plus for our upriver food security.**

**A reversal of the system to estuarine has many possibilities.**

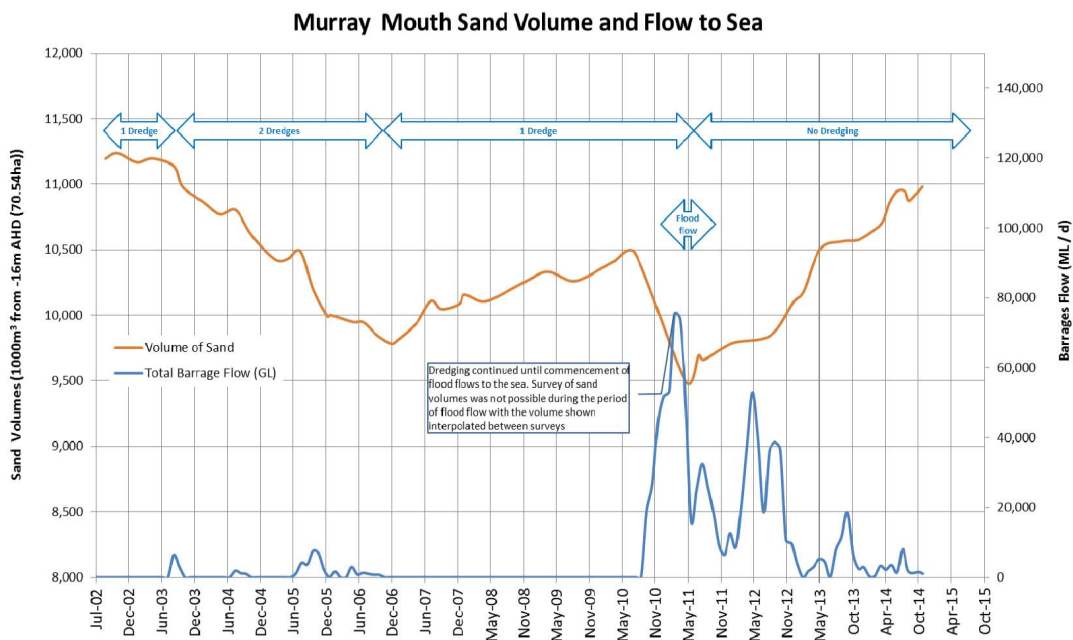
The plus concerns the nearby Mount Lofty Ranges, and the run-off water entering Lake Alexandrina that will help to increase the level of fresh water saved for food production.

Estuarine water can be made up of varying volumes of fresh and ocean water, as is naturally the case in most estuarine deltas worldwide. Contrary to claims (and alleged Govt. tests locally), estuarine water occurs at varying levels of mix in all estuaries world wide.

These are generally healthy eco-systems that provide immeasurable benefits including commercial and recreational.

The Lower Lakes, when estuarine, would once again create a very useful and beneficial environment.

Due to barrage gate control of water level in and out, marinas should not be affected to where it would be detrimental, providing suitable management strategies are agreed and exercised.



Graph: South Australian Government, December, 2014. Murray Sand Pumping Project Update PWC Meeting

**Attachments:** These attachments represent only a few examples of evidence and concern, as requested under item 4):

Attachment **A**. Details collated by the submitter!

MY TABLE BELOW, IS A RUNNING TOTAL from 24/10/2012 THROUGH TO 27/2/15 OF OFFICIALLY RECORDED, FORTNIGHTLY “WHOLE OF BASIN STORAGE” VOLUMES AS RECORDED every two weeks IN THE MDBA HEADWATER DAM’S BY THE MDBA. ALL STORAGES COMBINED, IN THE MDB ARE ABLE TO STORE A COMBINED TOTAL OF 22,214GL OF FRESHWATER - less a portion for mandatory air space.

As an example: the Whole of Basin Storages at 06/08/2015 (not shown below) was 44% or just 9,885GL in the dams combined at that date. Volumes shown on the right hand side of both columns below are in gigitalitres. Note: 23/06/2014 when the basin storages contained only 8,152.711 GL's. (Figures collated by Ken Jury).

MDB- WHOLE of BASIN storages			
Date	Time	Volume (GL)	
24/10/2012	8:00	21547.257	16/05/2014 8:00 11447.278
7/11/2012	8:00	21139.145	16/05/2014 8:00 11447.278
21/11/2012	8:00	20784.276	5/06/2014 8:00 11772.1
7/12/2012	8:00	19969.031	23/06/2014 8:00 8152.711*
20/12/2012	8:00	19224.079	24/06/2014 8:00 12072.475*
10/01/2013	8:00	17683.759	9/07/2014 8:00 12822.684
23/01/2013	8:00	16455.226	23/07/2014 8:00 13623.826
6/02/2013	8:00	15933.364	6/08/2014 8:00 14087.897
20/02/2013	8:00	15284.956	25/08/2014 8:00 14522.222
7/03/2013	8:00	15102.22	18/09/2014 8:00 14691.259
22/03/2013	8:00	14658.116	1/10/2014 8:00 14788.503
4/04/2013	8:00	14557.579	15/10/2014 8:00 14387.646
17/04/2013	8:00	14745.102	24/10/2014 8:00 14028.817
3/05/2013	8:00	14638.823	7/11/2014 8:00 13528.000
14/05/2013	8:00	14555.909	25/11/2014 8:00 12848.000
29/05/2013	8:00	14754.105	10/12/2014 8:00 12454.000
12/06/2013	8:00	15116.062	24/12/2014 8:00 11890.000
27/06/2013	8:00	15570.883	7/01/2015 8:00 11293.000
11/07/2013	8:00	15952.079	21/01/2015 8:00 11033.000
24/07/2013	8:00	16624.583	10/02/2015 8:00 10267.000
13/08/2013	8:00	17486.373	27/02/2015 8:00 9739.000
2/09/2013	8:00	18366.222	
18/09/2013	8:00	18446.394	With a 'Whole of Basin storage capacity' of 22,214GL, less a GL or two for airspace, these MDBA figures for the period 24/10/2012 to 27/2/2015 reveal a gradual decline in volumes stored. Conversely, the first two readings Oct/Nov.2012 at the LH top indicate healthy, near full storages in the headwaters, with reductions in volumes as low as 8,152GL recorded on 23/06/2014.
2/10/2013	8:00	17469.951	
16/10/2013	8:00	18400.679	Storage capacities again increased up to 24/10/2014 only to fall again to 11,293GL at the beginning of 2015 with further reductions of water in storages at the end of February, 2015.
30/10/2013	8:00	18099.019	
13/11/2013	8:00	17635.385	Of interest, the BOM (Bureau of Meteorology) confirmed that for Australia, 2014 was the third warmest calendar year since records began in 1910.
27/11/2013	8:00	17140.121	<b>Edited by Ken Jury</b> *As supplied by MDBA.
18/12/2013	8:00	16296.847	<b>Created: 03/03/1015</b>
6/01/2014	8:00	14941.389	
22/01/2014	8:00	13864.649	
4/02/2014	8:00	13086.744	
21/02/2014	8:00	12240.751	
4/03/2014	8:00	11895.388	
19/03/2014	8:00	11459.297	
2/04/2014	8:00	11288.36	
11/04/2014	8:00	11297.987	
24/04/2014	8:00	11370.964	
2/05/2014	8:00	11363.125	

**B. The Goulburn River : by a respected farmer from Yea in Victoria.** (Name supplied)Of particular concern in brief: The main issue for the Upper Goulburn River catchment between Eildon Weir and Seymour concerns proposed environmental flows of 12, 15 and 20,000ML/day in the Upper Goulburn Catchment, whereby Eildon to Seymour are NOT “small overbank flows”, as continually stated in MDBA documents. The river channel capacity at historic Molesworth is 9,500ML/day, where flows of 20,000ML/day are more than double the bank full volume, which completely

inundates the agricultural floodplain at Molesworth, below Eildon, and cuts access in many other properties downstream. Even The lower flows of 12,000ML/day and 15,000ML/day completely inundate several properties and cut access to many other properties.

A flow of 20,000ML/day is totally untenable as the impacts are too severe, particularly when these flows are proposed to occur 6 years out of every 10.

The MDBA's intent of increased frequency or return occurrence of flooding, and timing during the peak Spring Production Period and the duration of these environmental flows will devalue these high value agricultural river flats and cause a huge reduction in productivity on the most valuable component of properties adjacent to the Goulburn River and its tributaries.

Please note, the MDBA defines constraints as "river management practices and structures that govern the volume and timing of regulated water delivery through the river system" (Page vii *Constraints Management Strategy*). **Please note:** The MDBA never acknowledges the physical landscape, river channel capacity and topography when defining constraints.

Ends.