

## **Submission to Select Committee on the Murray-Darling Basin Plan**

### **The Plan and the Lower Lakes of South Australia**

The Lower Lakes in South Australia cover an area of approximately 750 km<sup>2</sup> through which the River Murray connects to the Southern Ocean via a series of barrages and the Murray Mouth

The Plan stipulates that the Lakes should be kept fresh (below 1000 EC) and the Mouth should be kept open without dredging for 95% of the time. These two objectives require vast amounts of fresh water and to date with limited success as dredging has been required since January this year.

The Plan is based on the data from last century and has not taken future predictions of climate change and sea level rise into account preferring to leave that for future generations to grapple with even though future predictions are becoming more certain as time goes by. And these predictions, if anywhere near correct, will change the nature of the Lower Lakes forever and necessitate a complete reappraisal of The Plan for this area which could in turn save or significantly reduce the vast amounts of fresh water currently used.

### **Sea Level Rise**

During the Millennium Drought automatic recorders were installed throughout the Lower Murray. Most of these recorders measured water level and salinity (EC) and showed more clearly than ever before the interaction between the River and the Ocean.

After 2010 the barrages were opened to allow the then flood waters to flow out to sea and it was observed that the main controlling factor influencing the flow in or out of the Mouth and into the Lakes was the height difference between sea and river level irrespective of the River flow. If the barrages were open at the time of high sea levels then saline intrusions could intrude upstream past Point Sturt to the northern limits of the Lakes. Even if the barrages were “closed” saline intrusions could leak through, under or around the barrages and dunes due to the permeable nature of the material.

Attachment 1 is an example of a recent saline intrusion. The upper graph shows the relative height difference between Lake level upstream of the barrages (red) and tidal downstream levels (blue-yellow). When the downstream levels are above upstream levels (In this case due to combination of spring tides, low barometric pressure and a storm with high swell) then saline intrusions will occur as shown in the lower graph where salinities rose from about 2,000 to over 30,000 EC.

It is obvious that any permanent sea level rise will make it more and more difficult to keep the Lower Lakes “fresh”. Even a small permanent rise of 0.5m will have a devastating permanent impact on Lower Lake salinity.

This probability was recognised in numerous reports (see Attachment 2) and a recent SA Govt NRM report last year recommended that planning for a change in the character of the Lower Lakes be commenced now.

## **Future River Flows**

We are constantly reminded by the MDBA that the Plan and its conclusions are based on over 100 years of data. However all that data is historic. Future climate change prediction would indicate less rainfall in the basin and as a result far less runoff and river flow. The Plan has made no allowance for such changes.

Every week the MDBA issues a report detailing inflows, river flows, salinities etc. That report includes a series of graphs comparing historic and more recent flows (see Attachment 3). The graphs clearly show a vast difference between historic average flows (on which The Plan was based) and more recent years.

If this is a sign of future changing climate then all the modelling results and conclusions in The Plan must be considered dubious.

## **Conclusions**

As at 30 June, 2015, 1950 GL or 71% of the 2750 GL has been recovered or contracted for the environment.

Since The Plan was formulated more data regarding climate change and the impact of sea level rise on the Lower Lakes has been obtained which puts in doubt many of the conclusions of the Plan. It is imperative that this newer data be evaluated now.

The initial Plan allowed for a re-evaluation of SDLs in 2016 and a 5 yearly review of the Plan in 2017. These reviews were considered necessary as part of the adaptive management of the Plan to allow for changes to be made in light of new data. In view of more recent data outlined above it is considered that these reviews are too late and should be carried out now.

It would be futile to continue implementing a Plan the conclusions of which are becoming more and more dubious as time goes by.

This review should be a scientific evaluation of the latest data with regard to The Plan and would best be carried out by an independent authority (eg CSIRO) to avoid any conflict of interest concerns between reality and previous predictions by the MDBA.

It is therefore recommended that all further physical implementation of The Plan be paused until all recent information can be re-evaluated and, with regard to the Lower Lakes and Coorong, planning be commenced now to prepare for the inevitable change in character of the area and the best way to deal with this change in character.

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