Chapter 5

Possible Solutions

Introduction

5.1 The fundamental long term solution to the problems being experienced by the Lower Lakes and the Coorong is an end to the current drought, but the urgency of the current situation in the Lower Lakes requires immediate action to ensure the system survives until that time. There are only three basic options for the system, increase fresh water flows, admit sea water into the Lower Lakes or allow part or all of the lakes to dry completely and remediate the acid sulfate soil.

5.2 The focus of the inquiry's terms of reference have been on obtaining additional fresh water for the lakes, but the problem of potential acidification appears to outweigh the possible environmental damage from salinity. Consequently the committee has also examined the possibility using sea water to address the problem.

5.3 The Department of Environment, Water, Heritage and the Arts (DEWHA) submission examines, in addition to its ongoing pumping program for Lake Albert, the following options:

- releasing water from the Menindee Lakes;
- purchasing temporary and permanent water from private storages on the Darling;
- purchasing allocations and carryover water from irrigators;
- obtaining water from the Snowy scheme;
- using water from the Living Murray and other Government purchased water;
- opening the barrages to allow sea water into the lakes; and
- delivering Coorong water to Lake Albert while maintaining Lake Alexandrina with fresh water.

5.4 These options are examined below, along with the Wentworth Group's suggestion that Lake Albert be decommissioned, allowed to dry and remediated.

Increase fresh water flows

5.5 Increased fresh water flows are a solution which involves the least impact on the lakes and offers the most desirable option for local residents and water users. Increased fresh water flows, should they become available, would reduce the salinity problem, prevent the formation of acid sulfate soils and preserve the fresh water character of the lakes.

5.6 The amount of fresh water required depends on the management objective and the level of evaporation experienced by the lakes. The options for managing levels are to slow the rate at which the lakes' levels are falling to keep them above the critical acid sulfate threshold, maintain them at the current level, return the lakes to a sustainable height or to raise them back to an operating height to allow releases of water to the Murray Mouth. Options which raise the lakes' levels also increase their surface area and therefore increase the quantity of water which evaporates.

5.7 Estimates of evaporation vary. The Murray-Darling Basin Commission (MDBC) uses standard evaporation pan methodologies and a pan evaporation coefficient of 0.85 to develop its estimates.[1] However several submitters cite a paper by Bruce Brooks and Mike South which claims this over-estimates losses, leading to higher estimated requirements. A lower figure for evaporation would reduce the amount of fresh water required. As a result the MDBC figures adopt a figure appropriate for worst case scenario planning.[2]

5.8 Under current plans, the MDBC has earmarked 350GL of dilution flows for drinking water which will flow into Lake Alexandrina. The MDBC's modelling indicates that at this level of flow, the lake level will have dropped to approximately -0.75m AHD – the verge of acidification – by the end of June 2009 if the weather is an average year. Lower rainfall and runoff or higher evaporation will see lower levels reached sooner.[3]

5.9 Estimated requirements for additional fresh water inflows range from a minimum of 10GL, to keep the lakes above the indicative acidification threshold, up to approximately 950GL to get the fishways in the barrages functioning again.[4]

5.10 At this point in time and with worst case assumptions of net inflow, local rain and net losses, up to 10GL of additional fresh water would be required to hold lake levels above an indicative critical threshold, and would increase the likelihood that the level will remain above the critical threshold for acid sulfate soil until next winter.

5.11 The MDBC estimates that a total of 830GL would be required to return the lakes to sea level by June 2009, under average conditions. 1300GL would be required to raise the lake to a level where the fishways could be operated and a flow of 550GL would be required to operate them for 12 months. A further 180GL (a total of 730GL

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1 DEWHA, *Answer to question on notice,* received, 2 October 2008.

2 Bruce Brooks and Mike South, *Applying a Localised Water Balance approach to estimate losses from Lake Alexandrina and Lake Albert for the years 1970 to 2006*. Cited in several submissions, See, for example Mr M. Williams MP, *Submission* 24, and Ms Liz Yelland, *Submission* 32.

3 MDBC, *Submission* 76, p. 3.

4 See the Hon Karlene Maywald, Minister for the River Murray and Minister for Water Security, *Committee Hansard,* 19 September 2008. See also *Submission* 76.

per annum) through the barrages would be required to be sure of keeping the mouth of the Murray open to assist with tidal flows into the Coorong.[5]

5.12 The phenomenon of transmission losses complicates the issue of calculating how much water needs to acquired upstream. According to Dr William Young of the CSIRO, transmission losses are highly variable and are affected by the quantity of water released, the time of year the release takes place, the amount of water already in the system and the condition of the river system and surrounding floodplains.[6]

5.13 As a general rule of thumb, the further from the lakes water is released into the system, and the smaller the amount released, the more will be lost. Losses could be as high as 80 to 90 per cent for small quantities released into the system at the far upper reaches.[7]

5.14 Conveyancing water is a mechanism to counteract transmission losses. The New South Wales Department of Water and Energy stated that there was sufficient conveyancing water in the system to ensure that water purchased on the water market could be delivered.[8] However for the release of large volumes, the conveyancing water currently in the system would not be sufficient to cover transmission losses.

5.15 The CSIRO has developed a model which can predict transmission losses and have offered to make it available,[9] but the committee was not able to employ this resource in the time available. Table 2 in the MDBC submission also provides an indication of transmission losses for rivers in the system which draws on CSIRO modelling.[10]

Committee view

5.16 The committee notes the results of the modelling indicate that, as a result of recent increases in the lakes' levels, the Lower Lakes are likely to remain above the acidification threshold with the addition of a maximum of 10GL of either fresh water or sea water between now and next winter (June 2009).

5.17 Should the introduction of sea water be considered the committee notes that public consultation and a process of environmental impact assessment would be required. This should inform an application for approval under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act).

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5 *Submission* 76, p. 4.

6 Dr William Young, CSIRO, *Committee Hansard,* 9 September 2008, p. 24.

7 Dr Young, *Committee Hansard,* 9 September 2008, p. 24, and several other submissions and witnesses.

8 Mr David Harriss, NSW Department of Water and Energy, *Committee Hansard,* 18 September 2008, p 32.

9 Dr Thomas Hatton, CSIRO, *Committee Hansard,* 9 September 2008, p. 16.

10 *Submission* 76, p. 10.

5.18 The committee notes that the Lower Lakes do not appear to have any dedicated environmental entitlement or allocation of their own, but depend on dilution flows for drinking water and the volume of this dilution flow depends on the salinity of the Murray. This is not dissimilar to environmental flow arrangements for other identified environmental assets, including Ramsar sites, across the Murray-Darling Basin.

5.19 The committee notes that the allocation of scarce environmental water often involves considerable trade offs with competing environmental uses. In determining how much water will need to be required for any environmental sites including the Lower Lakes and Coorong, transmission losses and the needs of other environmental assets need to be accurately determined and factored in to planning.

Rainfall

5.20 The problems in the Lower Lakes are primarily the result of the current drought, and management scenarios are heavily influenced by how long it will be before there is enough rain to deliver adequate flows to the Lower Lakes.

5.21 According to the BoM, neither 'la Nina' nor 'el Niño' are expected in 2009. The rainfall expectation in the north of the Basin is better than average, with a probability in excess of 70 per cent that the north will receive a wetter than average year. However, the probability of good rain drops progressively across the Basin towards the south. Across the Basin as a whole, there is at best a 50 per cent chance of reasonable rainfall and less than 50 per cent in the southern part of Basin.[11]

5.22 The committee notes the phenomenon of proportionally lower runoff currently being experienced will also reduce the flows generated by any additional rain.

5.23 A substantial increase in flows into the upper reaches of the system as a result of snowmelt appears unlikely. Both the BoM and Snowy Hydro Ltd indicated that there is limited good data on snow in Australia, but the indication is that the current snow pack is quite modest in extent, below long term averages and there has already been extensive melting.[12]

5.24 The BoM is not able to say whether the current drought is linked to human induced climate change. The BoM has identified a temperature rise consistent with climate change models across the Basin, but linking this to long term rainfall patterns is currently beyond the capability of its predictions. Long term modelling indicates southern Australia will experience a reduction in rainfall. The current drought is not

11 Dr David Jones, BoM, *Committee Hansard,* 26 September 2008, p. 3.

12 Dr Jones, *Committee Hansard,* 26 September 2008, p. 5 and Mr David Harris, Snowy Hydro Ltd, *Committee Hansard,* 26 September 2008, p. 99.

entirely consistent with the projections, but is certainly an indicator of what could be experienced.[13]

5.25 However, CSIRO expert opinion is that the current drought does have some characteristics of human induced climate change. [14]

Committee view

5.26 The committee notes that rainfall sufficient to generate enough runoff to increase flows at the lakes end of the system is unlikely in the near future. The committee accepts that human induced climate change may well be a factor in the current drought. The committee understands the current models predict a dryer future for the basin, which will make reform for the levels of diversions permitted under the Murray-Darling cap more pressing.

5.27 The committee particularly notes that current science predicts the possibility of a 25 – 50 per cent reduction in runoff in the Murray Darling Basin over the next 50 years, which could lead to 5900 to 12,000GL less water available to the river system.[15]

5.28 There are several possible sources for additional fresh water for the Lower Lakes and the Coorong. The Murray River is the most significant source, but the recent rise in lake levels indicate that other sources such as local rainfall runoff from the eastern Mt Lofty Ranges need to be considered and in the longer term even more capital intensive options such as groundwater or desalination could play a part.[16]

The Murray-Darling

5.29 The Lower Lakes receive the majority of their water from the Murray. Submissions to the inquiry indicate there is a popular perception that a major

13 Dr Jones, *Committee Hansard,* 26 September 2008, p. 8.

14 Dr Hatton, *Committee Hansard*, 9 September 2008, p. 11.

15 ABS 4610.0.55.007 *Water and the Murray-Darling Basin: A Statistical Profile 2000-01 to 2005-06*, p.13 and CSIRO *Rainfall-runoff modelling across the Murray-Darling Basin: A report to the Australian Government from the CSIRO Murray-Darling Basin Sustainable Yields Project.*

16 The committee received some submissions with alternative sources and solutions which arrived too late for detailed consideration, these included short term solutions, such as using tankers to move water from northern Australia – see Professor Allan Barton, *Submission 79* – and longer term proposals for reducing water requirements in agriculture through biodynamic techniques – see Biodynamic Agriculture Australia, *Submission 80*.

contributing factor to the lakes' current low levels is overallocation of water for irrigation and the unnecessary storage of water for 'Human critical needs' upstream.[17]

5.30 There is considerable uncertainty about how much water is actually available across the basin. An audit is under way but definitive figures are not available. DEWHA state in their submission that as at 19 September there was 4378GL in storage and 4359GL committed,[18] whereas more recent MDBC figures identify 5840GL of active storage,[19] reflecting recent rainfall. However, despite uncertainty of the likelihood of significant rainfall in coming months, there is broad consensus that storage volumes are very low and the available water will be required for high priority needs. There is unlikely to be enough water in the system to achieve the flows necessary to achieve a significant increase of fresh water flows into the Lower Lakes.

5.31 The quantity of water held in on-farm storages is unknown. The MDBC has made a rough assessment, based on estimated water harvest and estimated water use in the summer 2007-08 but this is a rough guideline only. Very little of this water is available on the water market and it would be difficult to extract it from these storages and return it to the river. In the northern Basin, transmission losses associated with any release from on-farm storages would be high. In the southern Basin, the vast majority of on-farm storages are extremely small (farm dams).

5.32 The perception that there is surplus water upstream that could be used to save the Lower Lakes appears to be unfounded. Many witness spoke of there being a case of 'robbing Peter to pay Paul' if water was to be found from within the Murray Basin. Professor Richard Kingsford told the committee:

> I think the Menindee Lakes issue is an interesting one in that we need to be careful that we are not robbing Peter to pay Paul. There are issues about trying to move water very efficiently through that system. But that could impact on the ecology of Kinchega National Park, particularly large channels that have been considered for doing that. I think ecologically Kinchega National Park and Menindee Lakes are very important from a wetland point of view and for water birds and fish and so on. They have been dry for some time as a result of less water coming to them from upstream in the same way as the Lower Lakes are feeling that pressure.[20]

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17 The committee notes the loose usage of the term 'overallocation' and believes this needs to be clarified. In the committee's view, overallocation has been used to describe the excessive issuing of water entitlements – which the current government's buyback program is intended to address; the allocation of too much actual water to high priority users – such as permanent planting and human critical needs; and over-harvesting of unregulated flows, such as overland flows.

18 DEWHA, *Submission* 1, p. 5.

19 MDBC, *Submission* 76, p. 6.

20 Professor Richard Kingsford, *Committee Hansard,* 19 September 2008, p. 6.

5.33 Professor Kingsford went on to describe some of the other areas that may be impacted in 'robbing Peter to pay Paul':

> Think of all the river Basins internally within the Murray-Darling. Most of them have a major wetland at the end of them. The Border Rivers used to have magnificent wetlands. I think they do not any more. Obviously the Gwydir used to have an important wetland system and then the Namoi less so. The Macquarie obviously has the Macquarie Marshes. The Darling has its own wetland system when the water gets up, the Menindee probably being the key one. There is a string of lakes there that are very important. The Lachlan has both the Cumbung Swamp right at the bottom and the Booligal wetlands, which is an offshoot that heads west. Then, of course, you get to the Murrumbidgee, and it has this magnificent wetland that was once near Balranald called the Lowbidgee. The River Murray obviously has all of the icon sites of Barmah and Chowilla Forest et cetera. From the north, obviously, the Condamine-Balonne has Narran Lakes and the Lower Balonne system and Culgoa National Park. If you go further west, the Warrego has the Cuttaburra and the Paroo overflow and Currawinya Lakes. So, if you like, there are as many jewels on the Lower Lakes on other river systems from an environment point of view that are probably every bit as important but have not had the attention. They may be in just as bad a state as the Lower Coorong.[21]

5.34 Dr Arlene Buchan of the Australian Conservation Foundation also highlighted the legitimacy of the claims of non-environmental water users to a water allocation. She said:

> The key users across the Murray-Darling Basin are irrigators, dryland farmers, flood plain graziers, the environment, towns and cities. Those are the categories. In terms of privatising, we are all legitimate users of that water. There is a lot of conflict within the use of that water, but they are all legitimate users. There is no room for any of those users to say that the rights of the others should be squashed. We are all legitimate users. But the level of water use currently means that the condition of the entire catchment is degrading such that the beneficial use that all of those users are taking is in decline.[22]

5.35 The committee heard extensive evidence during hearings regarding the capture of overland flows.[23] This issue is important for the future management of the river, and needs to be addressed in a systematic manner to avoid future repeats of the current situation. Excessive collection of overland flows is likely to limit the benefit of a major rainfall event on environmental sites lower down the Murray, but does not

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21 Professor Richard Kingsford, *Committee Hansard,* 19 September 2008, p. 6.

22 Dr Arlene Buchan, Australian Conservation Foundation (ACF), *Committee Hansard,* 26 September 2008, p. 26.

23 See the Queensland Department of Natural Resources and Water evidence, *Committee Hansard*, 9 September 2008; and Professor Kingsford, *Committee Hansard* 19 September 2008.

provide a potential source of additional fresh water to solve the lakes' immediate problems. It will be examined in more detail in the second phase of the inquiry.

Acquisition of water on the temporary water market

5.36 While there are a variety of programs in place to purchase water entitlements, such as the Living Murray and other Commonwealth Environmental Water Holder programs the very low allocations mean that while the purchase of these entitlements will assist in mitigating the impact of future dry years and assist in the management of the river, very little water will be available in the near future to return to the system.

> You can come to Murray Irrigation and buy 1½ million water entitlements and, sadly, carry it home in your briefcase because it is only a piece of paper.[24]

5.37 For example, while the recent acquisition of Toorale will return an average of 20GL of water to the river system, there is only a small amount of water actually stored on the property at the moment which could conceivably be returned to the river. The DEWHA submission states that as a result of low allocations across the board, the total volume of purchased water available this year was likely to be in the order of 5 to 6GL,[25] most of which is unlikely to reach the Lower Lakes, if it were decided to use this water for that purpose.

5.38 While the river is probably 'overallocated' in terms of water entitlements issued, actual allocations of water have been very low. Mr David Harriss, Deputy Director General of Water Management within the NSW Department of Water and Energy told the committee:

> For example, in New South Wales our high- security users in the Murray Valley now have 50 per cent of entitlement. Our high-security users in Murrumbidgee valley have 75 per cent of entitlement. By comparison, the Victorian Murray Valley users have six per cent of entitlement. The Victorian Goulburn valley users have four per cent of entitlement. In South Australia they have 11 per cent. At the same time, however, our general security users, which constitute most of our opportunistic water use, have zero per cent allocations. In the Murray valley this will be the third year straight of zero allocations.[26]

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24 Mr Stewart Ellis, *Committee Hansard,* 19 September 208, p. 15.

25 *Submission* 1, p. 8.

26 Mr David Harriss, NSW DWE *Committee Hansard,* 18 September 2008, p. 24.

5.39 DEWHA provided the following statistics in its submission.[27]

		Allocation (%)	**Water (GL)**
NSW Murray	High security	50	90
	General security	0	0
NSW Murrumbidgee	High security	75	259
	General security	0	0
NSW Darling	High security	100	8
	General security	0	0
Vic Murray	High reliability	6	71
	Sales water	0	0
Vic Goulburn	High reliability	4	40
	Sales water	0	0
SA Murray (effective 1 October)	All	11	63
Total water			**531GL**

5.40 Because general security allocations are extremely small, and high security allocations are less likely to be sold, the volume of water available on the market is quite low. According to a water market report from www.waterexchange.com tabled by the Bondi group, 39 983 megalitres (ML) were on the temporary market on 15 September 2008.[28] The committee did not receive any evidence as to whether and to what extent a higher price for water would lead to more water appearing on the temporary market.

5.41 Water in private storages in the Darling was identified by DEWHA as a possible source of additional fresh water.[29] A sufficiently high price for water might lead to some of this water becoming available. The committee notes, however, that

27 *Submission* 1, p. 7.

28 *Water Market Report: Spot Allocations as at 15 September 2008,* tabled by Ms Mattila, 19 September 2008.

29 *Submission* 1, p. 6.

this water would be difficult to extract from its current storages and return to the river, and would suffer badly from transmission losses before reaching the Lower Lakes.

5.42 The four per cent cap on trading presents an impediment to using the open market to obtain additional fresh water. According to the Australian Conservation Foundation the cap prevented the trade in 2007-08 of 7500GL in Victoria alone, some of which was intended for environmental purposes:

> It is an impediment to trade. It is stopping the government from rolling out its package at the rate that it needs to roll it out, at the scale and pace to address the problem, and it is a bad deal for farmers, who are trying to maximise their choices in how they deal with difficult situations.[30]

5.43 DEWHA gave evidence that there is considerable depth to the water market. This suggests that the rate of water purchased from willing sellers could be accelerated considerably with only minimal impact on the market price of water entitlements.

5.44 Attitudes to the desirability of the government sourcing a large quantity of water on the open market appear to depend heavily on whether you are currently looking to buy or sell. With the current low allocations to high security consumers, many will be looking to purchase water on the open market to ensure their operations remain viable and with zero allocations for general security users, purchasing water may be the only option they have to generate an income. Removing a large proportion of the available water at a high price is likely to be a significant obstacle for these operations.

5.45 However, the committee notes that an increase in the price of water, and an increased ability to trade it would benefit any farmer who is able to spare the water:

> I do not have a problem with land and water being purchased…Most trade happens with land at the moment, but as the price of water goes up people will maximise their sale when they are selling their property. They will sell water and land separately, and a lot more water will be coming on the market…I have no problem with water being purchased and taken off properties. We irrigators fought for property rights, and we have them. We said, 'If you want water for the environment, come and buy it'.[31]

5.46 The committee notes that both temporary and permanent water markets play a crucial role in enabling the movement of water to its highest value end use.

Compulsory acquisition

5.47 As there does not appear to be enough water available on the open market to meet even the minimum necessary additional flows to provide life support for the

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30 Dr Arlene Buchan, ACF, *Committee Hansard,* 26 September 2008, p. 21.

31 Mr Dick Thompson, Murrumbidgee Irrigation, *Committee Hansard,* 26 September 2008, pp 32-33.

lakes, the only alternative for acquiring allocated irrigation water would be compulsory acquisition of allocations.

5.48 Compulsory acquisition of allocations is provided for in the Emergency Water (Murray-Darling Basin Rescue) Bill 2008. While the bill does not directly address the issue of allocations, the bill would give the minister power to acquire on just terms a water access entitlement or right. It is unclear to what extent this would apply to allocations and, in particular, private storage.

5.49 With little or no general security allocations the only water available for compulsory acquisition would be from high security users. The acquisition of such water would have a disproportionate impact on operations such as orcharding, where the high security allocation is necessary to keep permanent plantings alive. Compulsory acquisition of this water has the potential to cause such profound consequences on individual properties that 'just terms' would be difficult to achieve. For example, 'just terms' for water that keeps permanent plantings alive would conceivably need to compensate a grower for the lost capital value of the plantings and lost future income until the plantings could be re-established. This would not take into account the impact on local communities of the lost jobs and income for secondary and tertiary industry supported by the agriculture.

5.50 The committee notes that compulsory acquisition would be likely to be applied unevenly, as high security water allocations vary by region. The possible effect of this was highlighted by Ms Mattila:

> The water rights in the northern Murray-Darling Basin are predominantly general security rights. As you move down through the Basin, the closer you get to the Murray Mouth, the percentage starts to swing heavily towards high security entitlements. So, if you are looking for water, it is more likely to be at the bottom of the Basin than the top.[32]

5.51 It is the committee's view that compulsory acquisition is neither warranted or appropriate.

Public storage

5.52 There are a number of large scale public storages in the system that have been identified as potential sources of water. Unfortunately evidence presented to the committee indicates that the vast majority of this water is either required for other purposes or difficult to return to the river system.

5.53 Dr Blackmore summed up the situation:

> That is the issue—where are you going to get it? Let us open up all the doors—is it in the Snowy? The answer is: I do not think so; the Snowy is now below target, so that is going to be an issue. Is it in some of the Snowy

32 Ms Jenni Mattila, Bondi group coordinator, *Committee Hansard,* 19 September 2008, p. 61.

> resources? They do have one reservoir which has 500 or 600 gigalitres in it, called Talbingo, but there is no outlet to get it out because it is designed for hydropower. The outlets are high and it is designed for elevation. That is just over the back here. It is 700 gigalitres of water but it would switch off power generation at Talbingo and that would cause significant economic loss. You would have to build an outlet to get it and then you would have to transmit it down the Murrumbidgee and, by the time you did that, you would probably see about two-thirds of it at the bottom end. There is not much in dead storage in Dartmouth or Hume, and they are going to be empty, or very close, when they have met their critical human needs, and there is nothing in Lake Victoria beyond what is needed to get us through the summer. So I struggle to see where you could obtain water right now that would make more than a cosmetic difference, and that is my problem.[33]

Menindee Lakes

5.54 Menindee Lakes are frequently cited as a potential source of water for the Murray. According to DEWHA, in late August 2008 the lakes held approximately 512GL. Of this, approximately 20GL is required to supply Broken Hill for two years without rain and a further 11GL is required for high security allocations. Menindee Lakes also have a 'dead storage' volume of 34GL which can not be accessed. However, losses from the Menindee Lakes are very high. In order to ensure that Broken Hill is still able to draw the last of its 20GL in two year's time, water managers need to allow for the evaporation of 200GL.[34]

5.55 The NSW Department of Water and Energy described the commitments for water in the Menindee Lakes in its submission.

> 109GL of the volume remaining in the Menindee Lakes was previously committed by the NSW Government to underwrite the volumes required to convey water to meet the critical human needs of the communities along the Murray Valley.
>
> As inflows into the Murray Valley, above the minimum inflow sequence used in planning by the Senior Officers Group, this volume (up to 200GL) has been redirected to provide the stock and domestic needs in the NSW Murray Valley, and to contribute to the provision of unused water carried over from 2007-08 and the announced high security water allocations in the Murray and Lower Darling River Valleys of 25 percent of entitlement and 100 percent of entitlement respectively.
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> The remaining volumes in the Menindee Lakes will be required to secure water supply to Broken Hill and users in the Lower Darling until autumn 2010, allowing for approximately 200 GL of evaporation losses during that period.

33 Dr Blackmore, *Committee Hansard,* 9 September 2008, p. 99.

34 *Submission* 1, p. 5.

> Consequently, any releases of additional volumes for the Lower Lakes would reduce the volumes already allocated for high security users, stock and domestic supplies reduce the security of supply for Broken Hill and other towns.
>
> While the current assessment is conservative and assumes no inflows into the Menindee Lakes, it must be realised that flows in the Darling River are extremely variable.[35]

5.56 As Professor Kingsford noted in his evidence the retention of water in the Menindee Lakes supports environmental values that are significant in their own right.[36]

Lake Victoria

5.57 Lake Victoria was described by the Hon Karlene Maywald, Minister for the River Murray and Minister for Water Security, as a regulating lake. All the water in it is allocated for human critical needs and conveyancing flows into South Australia. Minister Maywald told the committee that:

> Basically, what Lake Victoria does is acts as a buffer to be able to supply South Australia's needs when South Australia needs it. We have restrictions in the system, such as the Barmah choke, which means that we cannot get all the water that is needed downstream of the Barmah choke through the Barmah choke at the same time. Therefore, Lake Victoria acts as a regulating facility for New South Wales and Victoria to supply their obligations to South Australia. That water in Lake Victoria is fully allocated for those purposes….and the conveyancing and dilution flow water. The dilution flow is 696 and our critical human needs is 201. We also need that 696 and most of the 201 to get down to Murray Bridge to actually maintain the salinity levels in that reach of the river at a fit-for-purpose level. So the critical human needs amount is actually acting as a part dilution flow prior to being extracted. [37]

5.58 In effect, the water in Lake Victoria is already on its way to the lower Murray.

Snowy River

5.59 The Snowy River system is currently suffering from the same drought as the Murray and is now operating under a dry inflow sequence and has reduced the volumes that it releases to the Murray and Murrumbidgee. Snowy Hydro Ltd storages are currently at approximately 10 per cent of their design capacity and have not been on target since 1996. In 2008, the inflows have been 1692GL less than the design dry inflow sequence. The current year outlook is that it is most probable that flows will be

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35 NSW DWE, *Submission* 65, p. 18.

36 Professor Kingsford, *Committee Hansard*, 19 September 2008, pp 5-6.

37 Minister Maywald, *Committee Hansard*, 19 September 2008, p. 36.

very low again this year and there is almost no prospect of storage levels returning to average levels within the next three years. [38]

5.60 Snowy Hydro Ltd highlighted the fact that all of the water in its storages is pre-allocated, and rights to the allocations would need to be acquired from the actual owners.[39]

5.61 Snowy Hydro Ltd also pointed out that releasing water from the scheme is effectively reducing energy reserves, and the unplanned electricity generation associated with releases of additional water would have an impact on the electricity price.[40]

Weir pool levels

5.62 The lower Murray River has a number of weirs, nine in South Australia and one in New South Wales. The purpose of these weirs is to provide permanent navigation between the Murray Mouth and Wentworth and a relatively constant pool level to facilitate pumping for irrigation and water supply.[41]

5.63 Several submitters and witnesses suggested lowering the pool levels on the locks on the lower Murray between Lock 1 and Lock 9 by a small amount. One witness stated that lowering the pool level by 150mm might release 50GL of water.[42]

5.64 This option has a potential impact on water quality at drinking water off-takes below Lock 1. However, evidence was also heard from several witnesses that the ecology of impoundments in the Basin would be improved by a more natural wetting and drying cycle.[43]

5.65 It must be noted that any water released as a result of lowering weir pool levels must ultimately be replaced. This option does not provide additional water but rather may provide some greater flexibility in managing (eg. pulsing) the provision of flows to the Lower Murray, Lower Lakes and Coorong.

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38 Mr David Harris, *Committee Hansard*, 26 September 2008, p. 96.

39 Mr David Harris, *Committee Hansard*, 26 September 2008, p. 97.

40 Mr David Harris, *Committee Hansard*, 26 September 2008, p. 97.

41 http://www2.mdbc.gov.au/river_murray/river_murray_system/locks_and_weirs/locks_and_weirs.htm Weir 9 also raises the water level high enough to allow gravity diversion to Lake Victoria.

42 Mr Raymond Najar, *Committee Hansard,* 10 September 2008, p. 42. See also Mr Neil Shilabeer, p. 59 and Mayor McHugh, p. 101.

43 Professor Kingsford, *Committee Hansard,* 19 September 2008, p. 6. Minister Maywald also talked about the possibility of pumping wetlands to achieve a more natural cycle (p. 42) and Dr Matt Hipsey talked about the acid sulfate issues from permanent lying water all through the system. (p. 57)

Adelaide

5.66 The committee canvassed the opinions of several witnesses on the desirability and feasibility of reducing Adelaide's reliance on the Murray for water. General consensus was that reducing Adelaide's draw of Murray water would not provide a solution in the necessary timeframe, and a possible reduced need for dilution flows would need to be balanced against reduced consumption.[44] However, it is the committee's view that locating additional sources of water for Adelaide should be pursued as a means of reducing the magnitude of the city's impact on the lakes in future years.

5.67 In particular the committee noted that there may be considerable potential for stormwater harvesting in Adelaide that warrants further investigation and cost benefit analysis.

Goulburn River pipeline

5.68 In June 2007, the Victorian Government announced a plan for supplying Melbourne with water involving a pipeline from the Goulburn River to the Sugarloaf Reservoir where the water would be treated for use in Melbourne. The pipeline would pump 75GL and would involve taking one-third of 'new water' obtained through upgrading irrigation infrastructure.

5.69 On 12 September 2008 the Commonwealth Minister for the Environment, Heritage and the Arts approved the Victorian Government's project, subject to a number of conditions to protect matters of national environmental significance. The Minister stated that:

> I have made it a condition of my approval that all savings to be taken for the pipeline could only be taken following the assessment of their potential impact on matters of national environmental significance. These savings must be audited and available before they can be sent down the pipeline….
>
> Conditions of approval for this project include that no water come from the Living Murray initiative or the Water for Rivers entitlements.[45]

5.70 Plug the Pipe argued against the pipeline proposal claiming that it was not subject to adequate environmental assessment. Plug the Pipe claimed that the project was 'robbing' environmental water allocations. Plug the Pipe also questioned the projected 'water savings' from improved irrigation infrastructure claimed by the Victorian Government.[46]

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44 See for example, Dr Hatton, *Committee Hansard,* 9 September 2008, p. 24.

45 The Hon Peter Garrett MP, Minister for the Environment, Heritage and the Arts, 'Pipeline Approved with Environmental Conditions', *Media Release,* 12 September 2008.

46 Plug the Pipe, *Submission* 42, pp 2-6. See also Mr Pattison/Mr Richardson, Plug the Pipe, *Committee Hansard*, 26 September 2008, pp 41- 45.

5.71 The committee questioned the MDBC on the proposal. Dr Wendy Craik, Chief Executive of the Commission stated that the Commission did not have a view on the project. Dr Craik added that:

> Victoria have always had a good history of not exceeding their caps on any of the valleys in the system. They have been quite responsible in all that. I do not imagine they are proposing to do that at the moment. Certainly, with the new Basin Plan, all the water in the system will be taken into account in terms of extractions
>
> …whatever is extracted it is going to have to be sustainable from the Basin and the plans for each valley will determine that.[47]

5.72 The committee considers that, given the dire predicament of the Murray-Darling Basin generally and the significant environmental issues facing the Basin, any new projects need to ensure that there will be no adverse impact on environmental flows.

5.73 On the basis of evidence received, some members of the committee feel strongly that claimed water savings of up to 75GL of water intended to be delivered to Melbourne via the Sugarloaf pipeline may not be real savings and may therefore impact adversely on flows on the Murray River.[48]

5.74 There is also a view among some members of the committee that it is inappropriate for Melbourne to be taking water from the Murray-Darling Basin when alternative water supply options, such as recycled waste water, may be available.

5.75 Some other committee members noted the critical water supply situation facing greater Melbourne and the likelihood that the pipeline will be vital in providing water to Melbourne when it is complete in 2010.

5.76 The committee emphasised the importance of the Minister for Environment, Heritage and the Arts' conditions of approval for the SugarLoaf Pipeline, and believes it would be inappropriate for the Victorian Government to use this pipeline in ways that would reduce flows in the River Murray.

Eastern Mt Lofty Ranges

5.77 According to some estimates, runoff from the Mt Lofty Ranges contributes over 100GL of water per year to the Lower Lakes.[49] It is the committee's view that this can be expected to be a much lesser volume during periods of drought.

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47 Dr Craik, MDBC, *Committee Hansard*, 26 September 2008, p. 62.

48 Mr Kenneth Pattison, Plug the Pipe, *Committee Hansard,* 26 September 2008, p. 44.

49 Bruce Brooks and Mike South, *Applying a Localised Water Balance approach to estimate losses from Lake Alexandrina and Lake Albert for the years 1970 to 2006*.

Groundwater

5.78 The committee received one submission that indicated an artesian flow of 7ML per day could be available from the Penola area which could be piped to the Murray in the vicinity of Tailem bend.[50] The committee notes that 7ML per day is unlikely to be enough water to resolve the Lower Lakes issues. The committee also notes that a pipeline would be prohibitively expensive and the environmental and water resource impacts of employing this resource is untested. However, the proposal does indicate that other possibilities exist in terms of utilising groundwater to mitigate the current situation in the lakes.

5.79 The committee also heard that the problem of hypersalinity in the southern Coorong has probably been exacerbated by reduced inflow from the former wetlands of the Upper South East Drainage Scheme area. Dr Bill Phillips told the committee:

> As for waters coming in from the south-east of South Australia, in documenting the history of the Ngarrindjeri people and some of the older fisherman of this region in our 2006 report, they all related stories of how during periods of high rainfall waters would flow very strongly from the south-east through the lagoons down to the mouth of the Murray. That came to an end many years ago with the loss of wetlands in the south-east of the state. That has now been replaced by the Upper South-East Drainage Scheme to intercept rising groundwater problems.[51]

5.80 While saline, this water is far less salty than the Coorong and diverting as much as possible of the groundwater drained by this scheme back to the southern Coorong has the potential to contribute to alleviating the hypersalinity problem.

> There are some options to recover water from the south-east of South Australia. Wetlands such as Piccaninnie Ponds are currently draining to the ocean. That is not a natural situation. Those wetlands should be contained and should be flowing back towards the Coorong.[52]

5.81 The committee has not had time to assess the potential impacts of increased groundwater utilisation on surface water flows in the Murray-Darling Basin.

Treated effluent

5.82 The use of treated effluent was not raised in evidence presented to the committee during this inquiry. The committee notes that in the long term, treated effluent could be used to reduce the reliance of capital cities on the Basin if such water were made available for secondary purposes.

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50 Mr John King, *Submission* 4.

51 Dr Bill Phillips, *Committee Hansard,* 9 September 2008, p. 103.

52 Dr Kerri Muller, *Committee Hansard,* 10 September 2008, p. 12.

5.83 In theory a significant fraction of what Adelaide takes out could be returned. The quality of the returned water would need to meet strict guidelines but is technically possible. However timeframe would rule this out as an immediate contribution to a solution for the Coorong and Lower Lakes.

Committee view

5.84 The committee acknowledges that quantities of water in storage right through the Basin are very low. Obtaining any additional water for the Lower Lakes will need to be acquired from water set aside for some other high priority purpose.

5.85 With so little water available at this time to provide for urban water needs and to maintain permanent plantings and stock and domestic supplies it is not reasonable to expect that purchase of water on temporary markets will be undertaken to maintain water levels in the Lower Lakes.

5.86 It is important to note that purchase of water on temporary markets for the Lower Lakes may reduce funds available to purchase permanent water entitlements to return to the rivers.

5.87 The committee does not believe that compulsory acquisition of water allocations or entitlements is either necessary or desirable at this stage.

5.88 The committee feels that there may be scope to re-examine the extent of the impact of manipulating weir pool levels in improving the management of fresh water inflows to the Lower Lakes, but not as a means on maintaining lake levels for any extended period of time. In the view of the committee, the salinity impacts of lowering weir pool levels on drinking water has not been adequately proved and the potential of this option should be investigated further.

5.89 The committee notes the unsatisfactory timeframes which currently exist for the transfer of water which arise out of existing barriers to trade and inefficient water registers.[53]

5.90 The committee believes that in view of the relatively small quantities of water required, the state governments should re-examine the assumptions behind the volumes of water needed to secure water supplies to determine if other small quantities could be released.

5.91 The committee notes the gesture of the Queensland government in pledging to donate unallocated water entitlements to the Commonwealth Environmental Water Holder.

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53 *Water Market Report: Spot Allocations as at 15 September 2008,* tabled by Ms Mattila, 19 September 2008.

5.92 The committee notes that there is potential to accelerate the purchase of water entitlements from willing sellers.

Sea water

5.93 An alternative to increasing fresh water flows into the Lower Lakes is to admit sea water into the lakes. This would stave off the problem of potential acid sulfate soils, but would have an as yet unquantified impact on the fresh water ecosystem of the Lower Lakes.

5.94 No options for the introduction of sea water involve cutting off fresh water flows into the lakes entirely. Under the current arrangement, there will always be the dilution flow for Adelaide's drinking water flowing into the lakes from the Murray, in addition to the Mt Lofty Ranges runoff and direct rainfall onto the surface of the lakes.

5.95 Given the environmental character of the lakes, the introduction of salt water would certainly have an impact on the current environment in the Lower Lakes. While there have almost certainly been periods in the past when the lakes have contained salt water, these periods have probably been short and were likely the result of a gradual shift in the salinity of the water and tidal exchange, rather than a sudden inundation with sea water.[54] There is also the likelihood that the lake ecosystem was better adapted to brackish or saline water in its original state than it is now, after over 60 years of being exclusively fresh water.

5.96 Dr Matt Hipsey described the effect of a sudden influx of sea water and how it could be managed:

> If you just open the barrages and let a flux of sea water straight in, you are going to get a massive shock to the ecology of the lakes. It is these sorts of shocks that can result in negative impacts. So what I would foresee is that you have a gradual management change, where you have some salt water coming in, say, through Goolwa barrage, to maintain water levels. This would be guided in part by monitoring the alkalinity and water quality of the lakes. Then you would also supplement the other end of the lakes with fresh water.[55]

5.97 In the committee's opinion, the question which needs to be answered in considering this option is 'would the damage from sea water outweigh acid sulfate soil formation?'. The general consensus of experts was that sea water is the less damaging option.[56]

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54 Dr Matt Hipsey, *Committee Hansard,* 19 September 2008, p. 57.

55 Dr Matt Hipsey, *Committee Hansard,* 19 September 2008, p. 57.

56 See for example, the South Australian Government, *Submission* 73 and Wentworth Group, *Submission* 71.

5.98 An unresolved issue that the committee was not able to get expert advice on was the potential impact of salt on groundwater. There was some concern from witnesses that sea water could contaminate the groundwater of the region.

> We know that the eastern Mt Lofty Ranges and the lakes are connected through groundwater. We know that the head levels of the groundwater are dropping because of the lakes having dropped…. What we do not understand is how the salt may move through the aquifers that feed the EPBC-listed wetlands at the bottom of Currency Creek, Tookayerta Creek and the Finniss River.[57]

5.99 This issue needs to be investigated further before any sea water is admitted to the lakes. The committee also notes that regardless of whether the option of sea water eventually becomes necessary, the increasing salinity of the lakes means the impact of salt on the ecosystem will need to be investigated.

5.100 There was also concern for the potential for the intrusion of salt water up-stream, where it could contaminate drinking and irrigation water. If sea water were admitted to the lakes, a temporary weir may be need to be constructed to prevent this flow. The committee notes that the South Australian government has already commenced 'no regrets' preliminary work which would enable the construction of such a weir, should it be required.[58]

5.101 There are a number of proponents for returning the lakes to their pre-barrage state and allowing sea water to flow in and out of the lakes as conditions dictate,[59] but community opinions vary.

> To give you a snapshot of the reaction of both the Murray Bridge meeting and the Moama meeting, at Murray Bridge there was a very strong view that salt water was not an option and that only fresh water could be used. There was a very strong view that it was about protecting the environment, protecting a critical habitat area, a Ramsar wetland. The meeting at Murray Bridge was also amenable to looking at a range of other options, but it was not going to countenance the saltwater option.[60]

Sea water options

5.102 Proposals for admitting sea water potentially cover a range of options, including:

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57 Dr Kerri Muller, *Committee Hansard,* 10 September 2008, p. 15. (EPBC - Environment Protection and Biodiversity Conservation, refers to the 1999 Act)

58 There has been some concern that salt will accumulate above this weir and contaminate drinking water, however dilution flows will carry salt on into the Lower Lakes.

59 See, for example, the NSW Farmers Federation *Submission* 63 and *Committee Hansard*, 9 September 2008; and Dr Peter Marsh, *Submission 38*.

60 Mr Lee O' Brien, *Committee Hansard*, 9 September 2008, p. 64. See also the Coorong Council *Submission 66*, p. 8.

- temporarily admit a small quantity of sea water to stave off the formation of acid sulfate soils;
- divide the lakes in two and admit sea water to one section; or
- remove the barrages and return the lake system to an open estuarine system.

Temporary additions

5.103 Allowing a small quantity of sea water in to Lake Alexandrina would assist in preventing the formation of acid sulfate soils, but it would exacerbate the problem of rising salinity in the lakes. Ongoing evaporation and the continued deposition of salt from the Murray and from seepage under the barrage at Goolwa would result in steadily increasing salinity. This could be acceptable if the situation were envisaged to be of short duration. But if prolonged, it would eventually result in a hypersaline situation developing in the lakes unless salt water could be recirculated through the system. The environmental impact of this scenario is obvious, but, additionally, under these conditions the problem of potential acid sulfate soils would be worse if the lakes were allowed to dry again. Professor Fitzpatrick of the CSIRO highlighted this problem:

> For example, we know that sea water can neutralise acid sulfate soils. It is a common practice on the east coast, but that is in the situation where you can get sea water in and you can get the sea water out quickly. Here is a situation where we know, if we get sea water in, we can predict what may happen in terms of further formation of the sulfidic material, … If you can get it out, that is not a problem, but if you cannot get it out, you will create a hypersaline situation, with the formation of potential acid sulfate soil conditions that we call monosulfidic black ooze gels.[61]

5.104 Salt water could only be removed by increasing flows to the point where the system could be repeatedly surcharged to a high level and allowed to recirculate back to the sea, or flushed, or during a major flood event. Although several witness claimed that it would be impossible to get sea water out of the lakes once it was admitted the committee notes that the original construction of the barrages did require the same process.[62] However, it would require substantially greater flows than are currently available, so the lakes would probably be saline for a considerable period before such a process could be initiated.

5.105 No evidence was presented to the committee on the potential to recirculate sea water in absence of flushing fresh water inflows. This would require further investigation.

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61 Professor Robert Fitzpatrick, *Committee Hansard,* 10 September 2008, p. 74.

62 R.P. Bourman and E. J. Barnett, *Impacts of River Regulation on the Terminal Lakes and Mouth of the River Murray, South Australia,* Australian Geographical Studies, 33(1), p. 104.

5.106 The committee did not receive evidence of exactly how saline the lake would become immediately if some fraction of the minimum 10GL necessary to prevent excessive acidification were to come from sea water. This kind of modelling would need to be done to fully inform any decision to take this option. The committee notes that some preliminary modelling of this has already been done.[63]

5.107 As was previously noted, any addition of sea water into the Lower Lakes would require thorough environmental impact assessment and community consultation.

Divide the lakes

5.108 The following suggestions aim to reduce the amount of fresh water flow needed to bring the lakes up to a safe level and counter evaporation by replacing a section of the lakes with sea water.

5.109 The DEWHA submission describes a proposal to cease pumping fresh water from Lake Alexandrina in to Lake Albert and admit sea water into the Lake Albert via the Coorong. Lake Albert and Alexandrina are already separated by a bund, so this option would be relatively easy to implement. Lake Alexandrina would evaporate slower and fill more easily and the Coorong would get a flow of less saline water via the mouth.

5.110 There is a secondary proposal is to temporarily divide Lake Alexandrina in the vicinity of Goolwa. This proposal suggests a temporary barrier across the narrow section of the lake upstream of the town. This would allow flooding of this region with sea water. This is not intended as a solution to the environmental problems facing the lake, but would allow enough water in the channel to allow the lock in the barrage to open and revive the area's boating based economy.[64]

5.111 As the water in this channel is already highly saline, flooding with sea water would not have a dramatic impact on the environment, however the issue of salt water seepage would probably be increased. The committee is also aware of another proposal entitled 'Twin Lakes' where Lake Alexandrina would be segmented into separate fresh water and sea water sections.

5.112 The committee considers that it does not have sufficient information to properly assess the environmental impacts and cost effectiveness of any of these proposals.

Long term management arrangements

5.113 Few submissions addressed the longer term management challenges for the Lower Lakes and Coorong. The committee notes however that the likely impacts of

63 Mr David Wainwright, WBM Consulting, *Committee Hansard,* 19 September 2008, p. 54.

64 Minister Maywald, *Committee Hansard,* 19 September 2008, p. 45

climate change may require a review of the long term viability of current management arrangements.

Permanently open the barrages

5.114 Without question opening the barrages and allowing sea water to flow in would permanently solve the problem of potential acid sulfate soils.[65] However, other impacts, including on Ramsar values, would require detailed evaluation.

5.115 The committee notes that the Australian Government has committed $200 million to the South Australian Government towards the development and implementation of a plan that addresses the long term threats to the environmental values of the Lower Lakes and Coorong Ramsar site.

The Coorong

5.116 The Coorong has distinctly different management issues and sea water is a viable solution the immediate problem of hypersalinity in the South Lagoon. The committee heard evidence that pumping hypersaline water out of the Lagoon into the ocean would substantially reduce salinity in the area and might lower the level to a point where a specialised ecosystem would remain viable. Dr Ian Webster told the committee:

> There is a proposition on the table that has been suggested…that we can ameliorate the problem in the South Lagoon by pumping water out of the South Lagoon. Effectively what that causes to happen is you get an increased amount of sea water coming in through the mouth and ultimately winding up in the South Lagoon and lowering the salinity. I think the preliminary modelling we have done on this suggests that this is an option that could lower salinity to the point within range of being ecologically viable for the South Lagoon….
>
> Sea water would flow in through the mouth and down through the north lagoon and enter the South Lagoon and replenish the water level in the South Lagoon…..
>
> So what you are doing is pumping salt out. The concentration of salt in the South Lagoon at the moment is something like five times sea water. So for every litre of water that you pump out, you pump out five times as much salt as there would be in the same volume of sea water. But you are bringing in a volume of salt which is equal to the volume that is in sea water. So, in effect, by pumping the South Lagoon, you are causing a net loss of salt to the system.[66]

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65 Although the sediments would be accumulating more *sulfate* ions, they would remain waterlogged permanently and the volume of water would be better able to buffer any existing acid.

66 Dr Ian Webster, *Committee Hansard,* 19 September 2008, pp 54, 57

Committee view

5.117 The committee believes that pumping the South Lagoon is an option that warrants serious consideration subject to further investigation

Drying and remediation

5.118 The committee also heard proposals that part or all of the lakes should be allowed to dry out. The most concrete form of this proposal was to allow Lake Albert to dry and remediate the acid sulfate soil.

> Another option is to decommission Lake Albert as a permanent lake, converting it into an ephemeral wetland or swamp, perhaps with areas of paperbark ti-tree, reeds and/or samphire established within the lake's footprint. The freshwater (sic) saved from Lake Albert (which could be as much as 200GL) might then be used to increase the volume of fresh water available to Lake Alexandrina, and the Coorong and Murray Mouth.[67]

5.119 This would reduce the surface area of the lakes by up to 16 800ha and substantially reduce water lost through evaporation, but would result in the formation of acid sulfate soils which would be extremely difficult to adequately remediate.

5.120 Bioremediation of acidic areas is one option. The committee heard that mulching the drying areas to prevent drying and wind erosion and provide some alkalinity, together with planting acid tolerant species such as Phragmites, has shown promise as a means of limiting the acidification of the sediments.[68]

5.121 Remediation with lime to neutralise the acidity is another possibility, but the committee heard evidence that the soils could be extremely acidic, far beyond the usual levels controlled by lime in agricultural situation, and could take over 100 tons of lime per hectare.[69] As there are thousands of hectares requiring remediation, and the usual methods of spreading lime best adapted to dry agricultural land rather than drying lake bottom sediments with potentially hazardous levels of acidity, lime would be an extremely expensive and technically difficult solution. [70]

5.122 There does not appear to have been a great deal of community consultation on the option of decommissioning the lake. The Mayor of Coorong stated that the council has not really looked at proposals for decommissioning Lake Albert:

> We have been relying on what the scientists have been telling us. The information we are receiving really concerns us. If you decommissioned Lake Albert particularly, the results would be catastrophic for the environment and potentially even for the people living around that lake….I

67 Wentworth Group*, Submission 71,* p. 5.

68 Professor Fitzpatrick, *Committee Hansard*, 10 September 2008, p. 73.

69 Professor Fitzpatrick, *Committee Hansard*, 10 September 2008, p. 71.

70 The committee is not aware of any previous remediation project on this scale elsewhere.

> understand that if it were decommissioned, assuming that you allowed acid sulfates to become active, it would become uninhabitable around the lake shores. So that means people would need to be moved away from the affected areas.[71]

5.123 Unfortunately the committee did not have the opportunity to consult with the local Ngarrindjeri people on their views.

Committee views

5.124 The committee is not in a position to evaluate any of these drying and remediation options. In any event such options should be subject to further environmental impact assessment and community consultation.

71 Councillor Roger Strother, *Committee Hansard*, 19 September 2008, p. 49.