

RIVER, LAKES & COORONG ACTION GROUP Inc.

Keep our waters alive!



Date 22 April 2009

Director
Referrals Section (EPBC Act)
Approvals and Wildlife Division
Australian Department of Environment, Water, Heritage and the Arts'
GPO Box 787 CANBERRA ACT 2601
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Reference: - Referral 2009/4833: Emergency response for the crisis management of Acid Sulfate Soils in the Goolwa Channel, Finniss River and Currency Creek, South Australia

Dear Director,

The River, Lakes and Coorong Action Group Inc. (RLCAG) welcome the opportunity to comment on Referral 2009/4833. The RLCAG is an independent, community-based organisation that was formed to

- improve all aspects of the River Murray, Lakes and Coorong and to prevent any further degradation;
- increase the water flows in the River, Lakes and Coorong by lobbying governments and users of the River system;
- liaise with appropriate bodies over the management of the River Murray, Lakes Alexandrina and Albert and the Coorong, and their immediate surrounds;
- protect, conserve and enhance the biodiversity of the River, Lakes and Coorong.

The RLCAG is deeply concerned by the number of actions that address aspects of the management of the River Murray, Lower Lakes, Murray Mouth and Coorong. Since the proposal for a weir below Wellington was mooted in November 2006, we have addressed the

- Referral for a proposed temporary weir at Pomanda Island (EPBC 2007/3484)
- Guidelines for an EIS for the proposed weir
- Draft EIS for the proposed weir
- Referral for the Causeway to the Pomanda Island (EPBC 2008/4674)
- Independent Review of the EPBC Act
- Referral on Opening the Barrages (EPBC 2008/4618)
- Guidelines for EIS re Opening the Barrages
- Referral for a Pipeline to Currency Creek (EPBC 2009/4743)

In this submission we are addressing the proposal for weirs and regulators in the Goolwa Channel (EPBC 2009/4833).

We further note that other actions – the dredging of the Murray Mouth, the construction of a bund between Lake Albert and Lake Alexandrina, pumping and subsequent dredging (actions which were not subject to a Referral), and plans for pumping the Southern Lagoon - also impact on the Ramsar Wetlands of the River Murray, Lakes, Murray Mouth and Coorong. These impacts compound. The cumulative nature of the impacts on NES are masked by breaking a complex ecosystem into small pieces and proposing actions that are said not to be part of a larger development (s 1.11 of EPBC 2009/4833).

We submit that the SA Government approach, whereby actions are presented in isolation from the other, constitutes a threat to important Ramsar Wetlands and that the SA Government should be required to produce an integrated plan for the whole region. Only then can the objects of the s. 3 of the EPBC Act be met.

The River, Lakes and Coorong Action Group Inc, submit that, as permitted under section 74B of the EPBC Act and given the significant impacts on the matters of National Environmental Significance, the Minister reject the proposal.

Should the Minister decide not to reject the proposal outright, we submit that this action should be declared a “Controlled Action” for the purposes of the EPBC Act. The controlling provisions for this action should be:

- a) Sections 16 and 17B and 138 on the grounds that the action is a matter of National Environmental Significance and is likely to have a significant impact on the Ecological Character of the declared Coorong, Lake Alexandrina and Lake Albert Wetland.
- b) Sections 18 and 18A and 139 on the grounds that the action is a matter of National Environmental Significance and is likely to have a significant impact on the Listed Threatened Species and Ecological Communities.
- c) Sections 20 and 20A and 140 on the grounds that the action is a matter of National Environmental Significance and is likely to have a significant impact on the Listed Migratory Species under the JAMBA and CAMBA treaties.

We submit that if the Minister does not reject the Referral outright, that in declaring this a “Controlled Action”, the Minister should choose assessment by environmental impact statement under Division 6 as specified in section 87 (1)(d).

We endorse the submissions of John Yelland, Liz Yelland, the EDO, Sally Richards and Silver Moon for the Finniss Catchment Group Inc, Silver Moon, Con Boerma, Bruce and Annette Allnutt, Keith Walker, Suzy Rex, Karyn Bradford for the Milang Progress Association, Charles Irwin and Shaun Berg for the Ngarrindjeri Nation.

Yours sincerely,

Diane Bell for the River, Lakes and Coorong Action Group Inc.

Executive Summary

1. The Referral purports to be an emergency response but it is further evidence of mismanagement and lack of an integrated holistic plan for the River, Lakes and Coorong. The proposal is ill conceived and will not achieve its stated goals, rather it will exacerbate an already dire situation.
2. The impact of the proposed action on matters of NES will extend far beyond the footprint of the embankments/dams/weirs/bunds/regulators. The blocking of the fresh water flows from the Finniss River and Currency Creek, their diversion into the newly created “Barrage weir pool” and the pumping from Lake Alexandrina into the pool will effectively sacrifice Lake Alexandrina as a fresh water system.
3. The threat of Acid Sulfate Soils (ASS) is not a sufficient rationale for the action.
 - The scientific data presented on ASS do not support the action;
 - There are too many unknown factors re ASS and acidification to proceed with confidence;
 - There are alternatives that are known but have been ignored;
 - Recent independent monitoring challenges the severity of ASS.
4. In the absence of a plan for a fresh water recovery, the triggers for removal of the embankments/dams/weirs/bunds/regulators at Clayton and on the Finniss River and Currency Creek are not credible.
5. The proposal relies on fresh water coming down the Finniss River and Currency Creek. For this to be assured there would need to be action taken, including the Water Allocation Plan (WAP) for the Eastern Mt Lofty Ranges, to reduce diversions in the tributaries. Winter rains cannot be relied upon to produce the amount of water needed to fill the proposed weir pool.
6. The proposal should be explicit regarding the water that is to be pumped and impounded in terms of who has rights in that water.
7. A credible alternative to this proposal would include
 - an integrated holistic long-term plan for the Rivers, Lakes and Coorong;
 - fresh water options;
 - regulation of the upper reaches of the Finniss River and Currency Creek;
 - bio-remediation, mulching, fencing to protect potential ASS;
 - local treatments of identified ASS hot spots;
 - treatment of the water bodies to stave off acidification;
 - further research on soil and water chemistry
 - meaningful engagement with local communities.

Comments on the Referral

Project Title: Emergency response for the crisis management of Acid Sulfate Soils in the Goolwa Channel, Finniss River and Currency Creek, South Australia

The title fails to describe the scope of an action that will have wide ranging impacts on the River, Lakes and Coorong.

- The rationale for engineering works in the region has shifted. The title emphasises “crisis management of ASS” but this emphasis on ASS is recent. The Discussion Paper (DWLBC 2009:1) of 12 January, from which this Referral grew, discussed “options for managing acidification risk and establishing a freshwater ecological refuge” and claimed there would be multiple ecological, social and economic benefits. The need for a freshwater ecological refuge is no longer part of the rationale. The emphasis is now entirely on ASS.

What new evidence has emerged in the 12 weeks between the Discussion Paper of 12 January and the posting of the Referral on April 6? The bibliography does not indicate the existence of new research findings or monitoring that might support this shift in emphasis. We submit that the shift in emphasis masks the deterioration of Ramsar Wetlands, which was noted by Muller and Phillips (2006) and limits the steps that might be taken to address matters of NES.

- The title claims the Referral is an “emergency response”. The Discussion Paper (DP) of 12 January 2009 said the action was urgent and that “ecological collapse” was imminent. However, the Referral was not posted until April 6, twelve weeks after the DP notwithstanding the urgency of the Jan 12 paper¹.
- The action addresses ASS in a specific region. The action focuses on the Currency Creek, Finniss River and Goolwa Channel. Yet, by the same criteria being relied upon for this Referral, ASS threats exist in the Lakes and River Murray, which are also in danger of acidifying. The proposal should address the ASS problem holistically. The “fresh water” solution is frequently mentioned and said to be the preferred option, but nowhere it a plan for bringing fresh water to the region. The Proponent should be required to put forward a plan for treating ASS and the risk of acidification in the Lower Lakes as a region, not one isolated section.
- The Title focuses on ASS whereas the risk to be managed is the potential for acidification of the Lakes. They are different, albeit related problems and require different treatments, albeit also related.

¹ Throughout the 12 weeks, spokespersons for the SA Government declared that construction of the freshwater fresh refuge was imminent but no Referral was forthcoming. Members of the RLCAG wrote asking for details, for clarifications. The answers indicated the Referral was on the cusp of being posted.

- The options in the DP did not present the arrangement of embankments/dams/weirs/bunds/regulators at Clayton and on the Finniss River and Currency Creek as set out in the Referral. There has been no public discussion of the configuration and combination of engineering works of this proposal.
- We submit there must be a reasoned, holistic, long-term integrated plan of which this response can be shown to be a part. If there is no such plan, the Minister should reject the proposal. No short-term actions that could pre-empt long-term recovery should be approved.

1. Summary of proposed action

1.1 Short description

The construction of embankments/dams/weirs/bunds/regulators at Clayton and on the Finniss River and Currency Creek is said to be “an emergency first response” but there are already a number of actions being undertaken or under consideration (see covering letter above). We submit that the Proponent be required to produce the long-term plan of which this is a “first response” to one part of a larger problem, to specify the nature of the emergency as it exists in April 2009 and to explain why the “urgency” of the 12 January DP no longer exists.

We require an explanation of the use of the term “regulator”. The structure as presented in the Referral has no capacity to regulate. It is a rock embankment/sheet pile construction. There is no spill way or fish passage on the Clayton structure. The other “regulators” will create an impediment to the free movement of water and fish.

The short description makes no mention of the siphons in the Clayton construction.

1.3 Locality

(A) The locality is misstated. The construction will be right in the centre of township of Clayton. The location of the stockpile may be at the Hindmarsh Island side and perhaps 300 metres from Clayton but the town is at the northeast end of the construction.

(D) The location of the pumps is not given but they will be less than 100 metres from the town of Clayton.

1.4 Size of development footprint

The area that will be impacted is much larger than the footprint of the proposed actions. The three structures will have impacts on the way in which the wind moves water through the channel and into the Lake. The water polluted by the construction and newly disturbed ASS will not be confined to the footprint of the developments. Silt will build up. Increased heavy road traffic in the area will also have an impact with noise, emissions and compacting of soils.

It would appear that the Proponent had confused (B) with (C) in terms of the dimensions of the footprint. The Finniss construction is 320 x 10 m not 900m x 10m which is most likely to be the Currency Creek construction.

Who pays for the water being pumped out of Lake Alexandrina? From whose allocation does it come? We submit that the SA Govt be required to purchase the water to be pumped and not remove it from the Lake where it is maintaining a range of species. The SA Govt should be required to release water to Lake Alexandrina to replace the water being pumped into the proposed weir pool.

1.5 Lot descriptions

Does the Proponent have permission from the private landowners?

1.8. Timeframe

The timeframe is out of date. The Proponent should be required to lodge an amended work schedule that takes account of the various permissions, including funding and sourcing materials that will need to be sought.

The timeframe is critical as is the sequencing of the three constructions. If the blockage on the Finniss and Currency is designed to catch the “first flush” of the winter rains, it needs to be in place before that water comes down the tributaries. That event cannot be accurately predicted and the amount of water cannot be known with any certainty. The ground in the Adelaide Hills is very dry and the first rains will run off rather than soak in and could fill farm dams first. If so, little water will make it to the tributaries. The country needs soaking rain before the tributaries will run. If the Goolwa Channel is closed before that water (if it arrives) raises the levels of the Finniss River and Currency Creek , then the water being pumped into the newly created weir pool will flow back up the Finniss River and Currency Creek. The level of the Finniss and Currency would need to rise to 0.7 m AHD and there is good reason to believe it will be well below sea level by late winter. These low levels in the Finniss River and Currency Creek will have several impacts:

- the amount of water to be pumped to bring the weir pool to 0.7m AHD will be greater than estimated in the Referral;
- the increased pumping from Lake Alexandrina will further lower the levels of that body of water and advance the predicted date for acidification;
- the water quality in the Finniss River and Currency Creek will be further compromised by the poor quality water from the pumping and the restricted pool of water building up behind the Goolwa barrage;
- Lake Albert will be further starved of fresh water.

The Proponent should be required to produce a series of schedules, volumes of water taken and predicted levels, water quality and so on for different scenario re rain. See submission of John Yelland (2009: s 4). To whom does the water belong that is being pumped into the new pool? Is it part of the 350 GL dilution flow?

1.9 Alternatives

There are alternatives of which the Proponent is aware and these options should have been mentioned in the Referral.

The Proponent has commissioned a number of reports from consultants which address the matter of management options re ASS; has been presented with alternative plans from members of the community; and has been briefed on other options. None of these are mentioned. If alternatives have been rejected, the Proponent should be required to give reasons.

In particular, we direct the Minister to the reports of Earth Systems (2008a, 2008b). We first became aware of these reports in February and immediately sought access. The reports are dated December 2008. We made repeated requests. We were particularly anxious to have access to the reports in terms of preparing our response to the Draft EIS for the proposed Pomanda weir, which was being put forward as a way of managing the threat of ASS to the water supply of Adelaide. The reports were not made available until after the due date for the EIS but are available to us in preparing this submission. We consider the recommendations of the reports offer viable alternatives.

We are aware of an alternative proposal made by Mike South and Neil Shillabeer (2009).

We also developed a Low Intervention Strategy (RLCAG 2008) which was posted on the DWLBC website along side the Discussion Paper of Feb 12, but has not received any further consideration.

The Federal Government has committed \$10 million to bioremediation as part of the economic stimulus package (February 2009) and local groups have been pursuing their own initiative with some measures of success. This should be noted in the Referral.

The Water Allocation Plan (WAP) for the Finniss River and Currency Creek must be completed. The Referral must address how the different jurisdictions of water management above and below the railway line will interact (see submissions of Sally Richards and Silver Moon for the FCG and Keith Walker).

We submit that the Minister require the Proponent to disclose all proposals and be required to give reasons for rejecting and/or accepting their recommendations.

A credible alternative would include

- an integrated holistic long term plan;
- fresh water options;
- regulation of the Finniss River and Currency Creek;
- bio-remediation, mulching, fencing to protect potential ASS;
- local treatments of identified ASS hot spots;
- treatment of the water bodies to stave off acidification;
- further research on soil and water chemistry;
- meaningful engagement with local communities.

1.10 State assessment

We submit that the EPA should be monitoring the situation and note that the EPA (2009) Draft Plan listed in the bibliography to this Referral has not been made available to the community.

1.11 Component of a larger action

It is incorrect to declare that the proposed action is not a component of a larger action. The action clearly impacts on a much wider area and the various actions (and proposed actions) in the Lower Lakes are inter-connected and impact on each other. It is correct to say the SA Government has not made available a plan that takes in all the actions but it is clearly aware that the action impact on each other (see the submission of Karyn Bradford for the Milang Progress Association).

1.12 Related actions/proposals

The list should include the bund at the Narrows between Lake Albert and Lake Alexandrina, the dredging at the Murray Mouth and management of the SE drains and Coorong. All the proposals impact on water levels and water quality.

The SA Govt is said to have “developed a strategy” with respect to the “Barrages weir pool”. No such weir pool exists. It is improper for the Govt to be developing a strategy for a pool that will only exist if this action is pursued and to not have a strategy for the River, Lakes and Coorong as a whole. Further, the SA Govt is doing nothing to avoid the “triggers” that activate engineering interventions in the River, Lakes and Coorong. Rather this proposed action will advance the timeframe to triggering other actions.

1.13 Australian Government funding

The timeline for funding should be included in 1.8 above.

2. Detailed description of proposed action

2.1 Description of proposed action

Purpose

It is within the power of the SA Govt to pursue what they state to be the “most effective management option”, i.e. re-submerge the soils and keep them covered. To achieve this they would need to address over-allocation in particular the overuse and abuse of water in the Finniss River and Currency Creek, invest in water saving measures, purchase temporary water, negotiate access to more water from upstream.

Para 1. No mention is made of the ASS in Lake Alexandrina yet this proposal will exacerbate the ASS situation for that water body (See the submission of Karyn Bradford for the Milang Progress Association).

Para 2. The assertion that sulfuric materials will be transported to the water bodies requires substantiation. This is one of the acknowledged “unknowns” of the science of ASS (see the submission of John Yelland).

Proposal

The Proponent repeatedly states that fresh water is the solution but offers no evidence of how this is being sought and then, para 1, states that sufficient water is unavailable. This needs to be substantiated. There is temporary water available on the market. It is incorrect to say there is no water. What is missing is the will to purchase that water. We would point out that temporary water would be cheaper than the various weirs, dredging, pumping and damming and it would have enormous environmental benefit.

- (A) The plans are incomplete. The final height is unknown. The Proponent should set out the criteria by which the height will be determined. 2.5m AHD will be a massive intrusion in the landscape, the habitat of the birds that live in and around the cliff on the Clayton side and the fish and plants that rely on the water moving through the cutting at Clayton.

The operation of the siphons is problematic (see submission of Con Boerma). The proposed construction between Clayton and Hindmarsh Island is actually in the Finnis River, not the Goolwa Channel.

The fresh water from the Finnis River is critical to the survival of the remaining populations of Murray Hardyhead and Pygmy perch (see submission of Charles Irwin).

The point at which the "Goolwa Channel" will disconnect is in contention.

There can be no guarantee that pumping will not have to continue to keep the newly created weir pool at the required height.

- (B) and (C) The "first flush" is problematic. It may be captured by dams before it reaches the rivers. It may be so polluted with chemicals, nutrients and salt that it will be deadly. The embankments will trap the poor quality water and destroy ecological hot spots in the Finnis River and Currency Creek. Why should the Channel be protected from toxic waters and the Finnis River and Currency Creek exposed?

We submit that the Minister should require evidence that bioremediation will occur at 0.0m AHD and require that the modeling from the University of WA re acidification be made available for scrutiny.

Approval for the addition of a limestone slurry should be sought with this Referral not at a later date.

We submit that 27.5 GL as the amount that will be required to raise the newly created weir pool to the required level cannot be known with any certainty. If the drought continues, the figure will be much higher. This uncertainty throws into doubt the claim that the pumping will only advance the trigger date for acidification of Lake Alexandrina by two weeks.

Construction

The impact of weirs on the environment should by now be clear (see Walker 2006). The problems with the bund at the Narrows should alert the SA Govt to the folly of building more weirs (see submission of Karyn Bradford for the Milang Progress Association). The lack of precision re the plans for the Clayton structure does not instil any confidence that the weirs/regulators/embankments/dams can be built within a six-month time frame. The timing is crucial if the aim is to capture the “first flush”.

The construction will disturb ASS (see submission of Sally Richards and Silver Moon for the FCG).

There is mention of “tracked vehicles” being able to drive over the embankments (p, 9) but no details. If a connection is to be made by a road from Clayton to Hindmarsh Island, this should be made explicit. Is this why the embankment is set at the height of 2.5m AHD?

Decommissioning

According to the Referral the “trigger for decommissioning will be undertaken on an adaptive basis” but the criteria by which that basis is established or will be established is not specified. In the absence of this information, there can be no confidence that the triggers are realistic (see the submission of John Yelland). The Lakes cannot return to 0.75 AHD unless there is a change in policy, over-allocation is addressed, water bought back, and water saving measures instigated.

The stated method of removal will disturb more ASS and will not remove all the materials. Some will have sunk into the riverbeds.

Water Quality Monitoring

There is no plan in the Referral for management of water quality in the proposed weir pool. We require that the data on water quality monitoring on the Finniss River and Currency Creek available to the public. Our current source is <http://data.rivermurray.sa.gov.au/> and that does not include sufficient data.

The Referral states that the “main areas of Currency Creek and Finniss River are now dry” but as I write I am looking out over the Finniss River and there is water and there are dry patches.

We submit that the water in the Lake and tributaries is buffering the ASS quite well (see below).

Native fish management

There are no fish passages. The construction of the three embankments/dams/regulators will create isolated pools where predators like redfin will dominate and EPBC listed native fish species will be at increased risk. The constructions will completely isolate the fish in Lake Alexandrina.

Application of limestone or other neutralising material

This action should be included as part of the Referral. As I write limestone is being added to the southern shore of the Finniss River without there having been a Referral or even notification of all local residents. If used limestone needs to be carefully monitored and not used as a “one size fits all solution”.

It is incumbent on the SA Govt to be proactive in mitigating ASS and to place greater emphasis on enhancing natural processes of revegetation. Sally Richards and Silver Moon for the FCG write of thirty potential management options considered by Earth Systems (2008b:7). These options suggests that supporting continuation of the natural remediation process could primarily be achieved by:

- Limestone addition to lakes if necessary to maintain carbonate saturation; and/or
- Organic matter (\pm iron oxide) addition to lakes if necessary to maintain vigorous SRB activity in basal lake sediment.

Background and Current Situation

Those of us who live around the Lakes and on the River see the dramatic changes on a daily basis (see submission of Suzy Rex). We have watched as water levels have fallen over the past two and a half years. We have helped rescue the tube-worm encrusted turtles, have planted the foreshore, picked up the dead mussels, seen the devastated habitat, noted the absence of migratory birds and much more.

The fresh water from the Finniss River and Currency Creek has kept the Lake fresh so that fish spawned and freshwater mussels reappeared. As Henry Jones (2009) writes:

In July and August of 2008 good rains in the Eastern Mount Lofty Ranges enabled good environmental flows down both the Finniss River and Currency Creek. These flows saved the Lakes last year, provided relief for turtles from the dreaded deadly tubeworms, and induced many native species including birds, fish, invertebrates and macro invertebrates to breed.

But now Lake Alexandrina is to be cut off from these vital flows. Much of the 350 GL “dilution flow” past Wellington into the Lakes has been pumped into Lake Albert. The siphons that could put water back into Lake Alexandrina will only operate when there is excess water from the “first flush” and that will only be with the winter rains. At other times the “excess water” will be directed through the barrages. The Coorong will get some benefit, the Lakes none.

The RLCAG challenges the science cited in this Referral

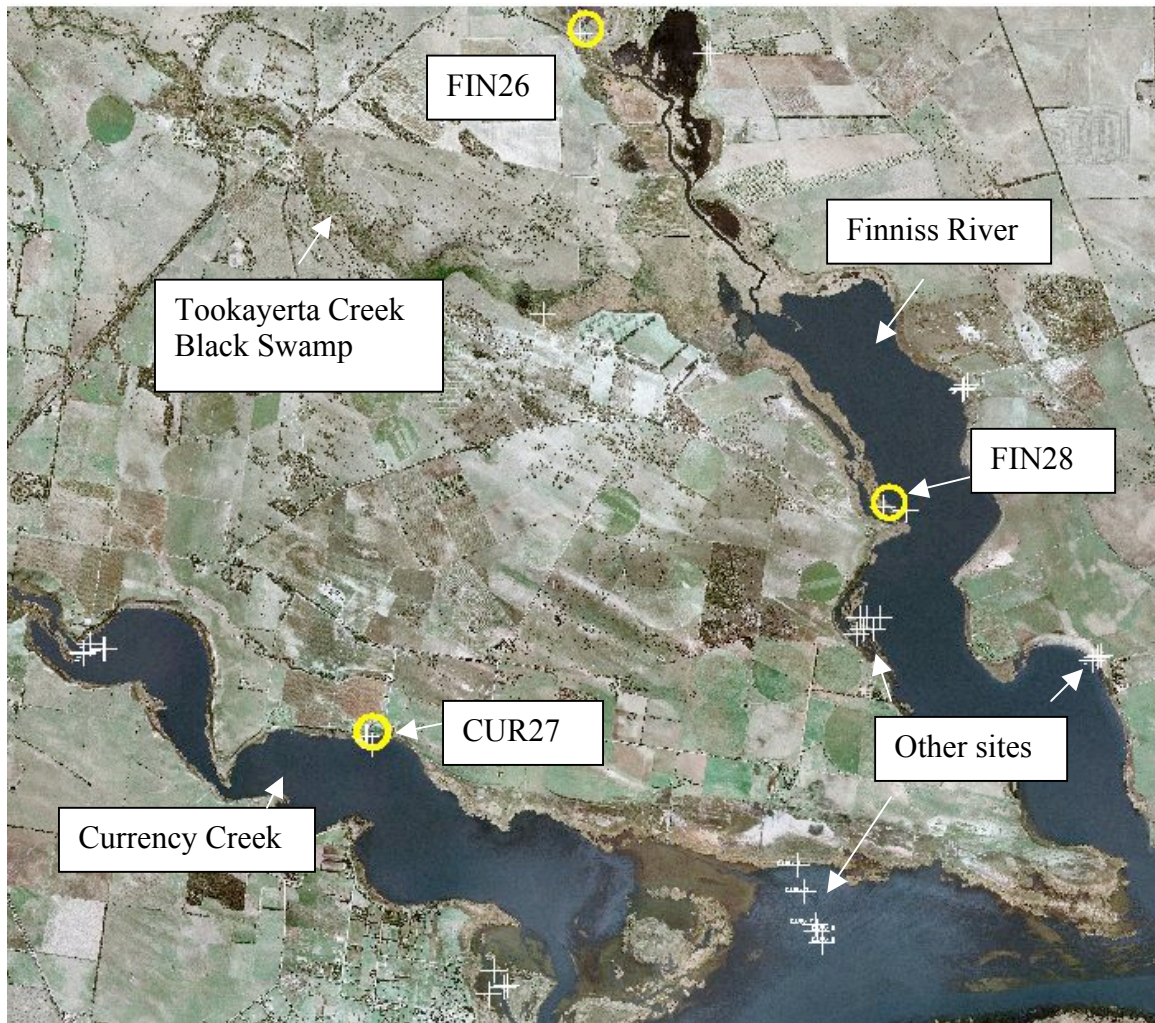
- The scientific basis for the proposed actions is thin and important materials have been ignored or omitted (Maunsell 2008 a, b). The scientific support regarding the dangers of ASS is drawn from one source and no peer reviews are cited (Fitzpatrick *et al* 2009). We understand the materials have been reviewed but we have been unsuccessful in gaining access to those materials. The Referral cites a study conducted by the University of Western Australia but the reference is not provided. There are no comparative materials on remediation

and management of ASS in other parts of Australia and the world included in the Referral.

- The CSIRO report stresses the preliminary nature of the data and the recommendation is for further monitoring.

Monitoring is considered an essential component of ASS risk assessments during the current drought, and will be particularly important during rewetting phases when acidity and metal mobilisation may occur. Monitoring frequency should be assessed based on a number of factors including the degree and extent of risk. This is site and scale dependent. Taking into account the area of the Currency Creek, Finniss River and Tookayerta Creek/Black Swamp catchments, it is recommended that monitoring be completed at two levels. (Fitzpatrick *et al* 2009: iv)
- In terms of details of the threat of catastrophic collapse, the Proponent (p. 14) states that, “Studies by the CSIRO (presented by Dr. Fitzpatrick 2009) found 2,000 hectares of sulfuric material has already been exposed in the Lower Lakes region”. However this statistic is not included in the 2009 CSIRO report to which we have access. It was mentioned at the Public Meetings on 15 January 2009 at Goolwa and Clayton but no hard copy or report was made available. The Proponent must provide the references to support this statistic.
- The Referral relies on data from 38 soil profiles from easily accessible sites (Fitzpatrick *et al* 2009: 5). But as Sally Richards and Silver Moon ask in their submission: “Are these truly representative of the hydrological and geomorphological conditions present throughout the area? Being accessible the sites are also likely to be subject to disturbance.”
- As Liz Yelland points out the CSIRO report (Fitzpatrick *et al* 2009: 20) recommends that

the detailed monitoring program be conducted along at least three transects in both Currency Creek and Finniss River catchments and along at least one transect in the Tookayerta Creek/Black Swamp catchment. However, we recommend that the rapid monitoring be conducted along all 12 transects, which includes all current 39 soil profile sample sites.
- Liz Yelland continues: Of the 38 sites visited as part of the Preliminary Report, 19 had no data reported and 15 were samples of water only, indicating that at the time of the measurement these sites were still submerged. Of these 15, 13 gave alkaline measurements (pH greater than seven). This leaves 4 sites, where an actual soil pH value is given. As two of these are only 5 m. apart there are essentially only three sites: one on the Finniss River flats near Black Swamp (FIN 28), one on the Currency Creek flats (CUR 27) and one at Wally’s Landing, Finniss River channel (FIN 26).



Orthophoto 2002. Fitzpatrick sites shown by crosses. Acidic soils by circles.

It would appear the basis for the construction of these three structures rests on the data from three sites. There is no reference in this referral to the detailed monitoring program recommended by the CSIRO Report (Fitzpatrick *et al* 2009) having taken place, nor to the promised following full report. No further reports, they have not been made public.

Recent pH measurements

In her submission, Liz Yelland sets out monitoring that has been undertaken since the preliminary CSIRO report (Fitzpatrick *et al* 2009) was prepared and points out that the estuaries of the Finniss River and Currency Creek have dried out in the interim.

One critical set of findings comes from site monitoring undertaken 12-19 April 2009 by an independent community-based team. Their measurements indicate that the acid sulfates do not constitute an emergency of the scale depicted by the Referral. Readings were taken on both the surface and at 10 centimetre depths in random

sites of exposed sands of both the Currency Creek and Finniss River estuary flats. A majority of the sites on the Finniss River flats gave pH readings of 8.5 to 9. A few were in the range pH 6 to 7.

The Wally's Landing sites on the Finniss River were re-visited (FIN26). Readings taken near the 0.75m high riverbank edge varied between pH 3 and 5.5. The top of the bank gave a reading of pH 9. Transects were taken both at the site featured in the CSIRO Report (Fitzpatrick et al 2009) and at another 15 m to the west, across the bed from the cliff bottom to the edge of the trickle of water still flowing.

Distance from River bank	0 m River bank	4 m	7.7 m	10.7 m	13.7 m Stream
pH top layer	3.0	5.5	8.5 to 9		
pH -10cm layer	3.5	5.0	5.5 to 6.5		
pH water			7.3	7.7	7.8

The water itself in cracks between the clods was pH 7.3 & 7.7 and in the stream was pH 7.8.)

Liz Yelland concludes that these combined figures of soil, water in cracks and stream water, preliminary though they are, strongly suggest that when the first flush of water comes down the Finniss River and Currency Creek there will be no problem with acid being mobilised.

The RLCAG submits that the recommendations of the Earth Systems Reports (2008 a and b) be given serious consideration.

The recommendations include trials with limestone, rigorous assessment of available water chemistry, monitoring and maintaining calcium carbonate saturation in water within the lakes, redressing imbalances as necessary, filling the knowledge gaps and pursuing suitable management strategies. There are no recommendations for weirs or embankments.

The RLCAG endorses the conclusions of the submission of Liz Yelland re ASS that the Minister should reject the Referral because

- The action is based on a single preliminary report.
- The statistics regarding the amount of acid released that are cited in the Referral do not appear in the CSIRO's preliminary report (Fitzpatrick *et al* 2009).
- There is no evidence of the recommended monitoring having taken place, nor of the promised full follow-up report.
- Nowhere in either the CSIRO or Earth Systems report are weirs or "regulators" recommended.
- Monitoring from three independent sources suggests the acid danger may be

far less than first feared.

- Adverse environmental effects.
- Nowhere in this Referral is the possibility canvassed to actually obtain more water.

A regulator on Goolwa Channel near Clayton

See above 1 and 2.

Future water levels to maintain sediment saturation at the end of summer

See above Background and Current Situation

Low level regulators on the Finniss River and Currency Creek

See above 1 and 2

Vegetation management

See submission of Silver Moon

Additional measures for a multi-faceted approach to ensure ongoing saturation of sediments

If there are multiple system optimization assessments, they should be included in the Referral.

Engineering design

The designs are not yet finalised. The Proponent should require designs where the dimensions are known.

2.2 Alternative locations, time frames or activities that form part of the referred action

See above 1.9

2.3 Context, planning framework and state /local requirements Environmental Protection and Biodiversity Conservation Act 1999 (Commonwealth)

We adopt the submission of the EDO with respect to this section.

2.5 Consultation with Indigenous stakeholders

We note that in the Ngarrindjeri Submission it is stated that the Declaration by the proponent requires consideration:

1. The Ngarrindjeri community have advised the State Government that it does not support the construction of a weir at Clayton;
2. This view is not included in the Referral but rather the following statement is made: **2.5 Consultation with Indigenous stakeholders**
The proposal is located within the traditional lands of the Ngarrindjeri people. Consultation has been sought with the Ngarrindjeri people. A Cultural

Heritage Management Plan (CHMP) is also being considered by State Government and is to be raised with the Ngarrindjeri people.

3. A declaration is made by the proponent on page 73 of the Referral, which requires explanation because on its face it appears inconsistent with the stated Ngarrindjeri position in relation to the Clayton proposal.

2.6 A staged development or component of a larger project.

See above 1.11, 1.12.

3. Description of environment and likely impacts

3.1 (c) Wetlands of International Importance (declared Ramsar wetlands)

Silver Moon writes:

The Protected Matters Search identified two other Ramsar sites but excluded them because they were distant. However, this fails to recognise that actions that are taken like the building of the weirs will have an effect on these wetlands too. Specifically with the building of the weirs and the concomitant destruction of the Lakes and Coorong there will be a loss of bird and other species to other areas. This will have affects like reduced food availability, increased competition for nesting areas, changes in predation and other effects. This will threaten the two areas excluded, as well as other areas that may contain EPBC-listed species and communities.

3.1 (d) Listed threatened species and ecological communities

Listed EPBC species have been cross-listed with the *Natural History of Strathalbyn and Goolwa Districts* (Strathalbyn Naturalists Club Inc, 2000) by Silver Moon.

Species listed as occurring in the local area are as follows: -

Table 4 Birds

Southern Giant-Petrel

This bird has been seen on Hindmarsh Island and at the Finniss Ford. (Strathalbyn Naturalists Club: 32).

Orange Bellied Parrot

This critically endangered species is assumed to forage near Hindmarsh Island and the Coorong. However it has been seen locally at Dog Lake and Ferries MacDonald Conservation Park (Strathalbyn Naturalists Club: 60).

Red-lored Whistler

This bird has been seen at Chauncey's Line, Wundersitz's Scrub, and Snake Island (Strathalbyn Naturalists Club: 75).

Painted Snipe

This bird has been seen at the Goolwa rubbish dump, Tucker's Swamp, Tolderol Game Reserve and Milang (Strathalbyn Naturalists Club: 51).

Mt Lofty Ranges Southern Emu-wren

This bird is known from the Finniss Estuary, Black Swamp, Currency Creek and Tookayerta Creek and Finniss (Strathalbyn Naturalists Club: 67).

Shy Albatross

This bird has been found at Goolwa Beach (Strathalbyn Naturalists Club: 35).

Mammals

Southern Brown Bandicoot

This mammal has been located in Strathalbyn, Cox's Scrub and McHarg's Creek (Strathalbyn Naturalists Club: 15).

Eastern Long-eared bat

This bat has been identified " in both upstream and downstream areas of the proposed temporary weir" (Draft EIS Pomanda Island 2009: 7-25)

Ray-finned fishes

Murray Hardyhead

This fish has been recorded in the Finniss River and the Angas River (Strathalbyn Naturalists Club: 99).

Yarra Pygmy Perch

Hindmarsh Island, Goolwa Channel, Finniss Estuary have been sites of this fish.

Murray Cod

Once common enough in Lake Alexandrina to sustain a commercial fishery, Murray Cod have been located in the lakes, at Pomanda Point, in the Bremer River and at Narrung (Strathalbyn Naturalists Club: 105). Also in the Finniss River (Jim Llewelyn, Finniss).

Plants

Fat-leaved Wattle

This wattle occurs near Finniss by the railway line and Nurragi Reserve (Strathalbyn Naturalists Club: 154).

Neat Wattle

This wattle occurs at Monarto, Ferries McDonald National Park, and in the Milang to Goolwa area (Strathalbyn Naturalists Club: 154).

Small Western Spider-orchid

This orchid occurs at Finniss, Hartley and the Nurragi Reserve (Strathalbyn Naturalists Club: 170).

Greencomb Spider-orchid

This orchid occurs at Dunn Heritage Area and Nurragi Reserve (Strathalbyn Naturalists Club: 170).

Osborn's Eyebright

This *Euphrasia* is recorded in two peat bog swamps (Strathalbyn Naturalists Club: 188).

Silver Daisy-bush

This bush occurs at "20 locations, half of them in the vicinity of Milang", Nurragi Reserve and heritage Areas near Hartley and Finniss (Strathalbyn Naturalists Club: 126).

Maroon Leek-orchid

This orchid is located at the mouth of the Finniss River and at Nangkita (Strathalbyn Naturalists Club: 174).

Fleurieu Leek-orchid

This has been found at the mouth of the Finniss River (Strathalbyn Naturalists Club: 174).

Pale Leek-orchid

This occurs at Scott Conservation Park (Strathalbyn Naturalists Club: 74)

Sandhill greenhood orchid (Pterostylis arenicola)

This has been found at Taillem Bend. Langhorne Creek and Potter's Scrub in the Coorong (Strathalbyn Naturalists Club: 175).

Metallic Sun-orchid

This plant has been located at Wundersitz Heritage Area (Strathalbyn Naturalists Club: 178).

Amphibians

Southern Bell Frog

This frog has been seen and heard at Langhorne Creek, Mosquito Creek, Tolderol game Reserve (Strathalbyn Naturalists Club: 94). Also Narrung and Wellington and Pelican Lagoon.

In her submission Silver Moon writes: "It is stated on page 40 that you do not know much about the Southern Bell Frog or the effects of "low quality water" on the seed bank. These two facts on their own should be enough for the Minister to reject this proposal. "

Ecological Communities

Table 5: The following are known in this area

Iron-grass natural temperate grassland of South Australia

Iron grass (and its associate plants) is described as common throughout many areas around the Lakes and Coorong, including Black Swamp, Hindmarsh Island, Goolwa Swamp, Sir Richard Peninsula, lower Finniss River, Tookayerta Creek, Milang, Chauncey's Line, Langhorne Creek (Strathalbyn Naturalists Club: 162).

Peppermint box grassy woodland of South Australia

Peppermint box is described as "the most common tree in dry woodland in this area" and occurs with its associates from Goolwa to Ashbourne, Milang to Strathalbyn, Chauncey's Line to Langhorne Creek (Strathalbyn Naturalists Club:167).

3.1 (e) Listed Migratory Species

The following are a list of listed migratory species seen in the local area.

White Bellied Sea Eagle

This bird has been sighted at Snake Island, the Finniss Estuary, the northern side of the lake, red gum swamps south-east of Langhorne Creek, and over Strathalbyn. "There have been suspicions of breeding in Borrett's Swamp and at 'Nalpa' (Strathalbyn Naturalists Club: 41). This bird is on the list of birds sighted from Wellington Lodge (Email, K McFarlane)

White-throated Needletail

This bird has been seen at Milang, Langhorne Creek and Woodchester (Strathalbyn Naturalists Club: 65).

Rainbow bee-eater

"This is the most regular and reliable of our migratory bush birds, arriving in most springs during the last week of September or the first week of October.....In most years sufficient birds come in the next few weeks for them to be fairly common throughout much of the district." Seen in Belvidere, Langhorne Creek, Mulgundawa through to Ashbourne, Paris Creek, Strathalbyn (Strathalbyn Naturalists Club: 66).

Orange Bellied Parrot

This critically endangered species is assumed to forage near Hindmarsh Island and the Coorong. However it has been seen locally at Dog Lake and Ferries MacDonald Conservation Park (Strathalbyn Naturalists Club: 60).

Mt Lofty Ranges Southern Emu-wren

This bird is known from the Finniss Estuary, Black Swamp, Currency Creek and Tookayerta Creek and Finniss (Strathalbyn Naturalists Club: 67).

Great Egret

This bird is described as "still widespread" (Strathalbyn Naturalists Club: 38). This bird is on the list of birds seen at Wellington Lodge over the last four years (Email, K.McFarlane).

Cattle Egret

Sighted at Finniss, Milang, Langhorne Creek (Strathalbyn Naturalists Club: 38).

Sharp-tailed Sandpiper

This bird is described at Tolderol Game Reserve, Goolwa Barrage, Murray Mouth and most of the wetlands (Strathalbyn Naturalists Club: 50).

Sanderling

Seen at the Murray Mouth and Goolwa Beach (Strathalbyn Naturalists Club: 50).

Curlew Sandpiper

This bird is seen at Tolderol Game Reserve, Mosquito Point and the lake margins (Strathalbyn Naturalists Club: 50).

Red-necked Stint

Seen at Tolderol Game Reserve (Strathalbyn Naturalists Club: 51).

Latham's Snipe

Found at Mosquito Point and in the wetland adjacent to the shacks at Milang, ("where they can be found every summer") and once at Tooperang Hall (Strathalbyn Naturalists Club: 47). Definite sightings by locals in Milang last summer. Latham's Snipe is on the list of birds seen at Wellington Lodge in the last four years. (email. K. McFarlane)

Pacific Golden Plover

This bird has been seen at the Tolderol Game Reserve and Mosquito point, Goolwa Barrage and the Murray Mouth (Strathalbyn Naturalists Club: 54).

Painted Snipe

This bird has visited locally at Milang, Tolderol game Reserve, Tucker's Swamp, Finnis and the Goolwa rubbish dump (Strathalbyn Naturalists Club: 51).

Common Greenshank

Described as "moderately common" (Strathalbyn Naturalists Club: 50).

Fork-tailed Swift

Has been sighted at Milang and Langhorne Creek (Strathalbyn Naturalists Club: 65).

Southern Giant Petrel

This bird has been seen on Hindmarsh Island and at the Finnis Ford (Strathalbyn Naturalists Club: 32).

Caspian Tern

This bird is described as "ranging widely throughout the area", breeding at the Nalpa salt lake, and Bird Island (Strathalbyn Naturalists Club: 57).

Little tern

This bird has favoured the Murray Mouth and breeding on Bird Island. Also inland at Mosquito Point (Strathalbyn Naturalists Club: 56).

Shy Albatross

This bird has been found at Goolwa Beach (Strathalbyn Naturalists Club: 35).

4. Measures to avoid or reduce impacts

The measures are inadequate, do not cover the area that will be impacted and important details are missing. For example

- Where is the Environmental Management Plan?
- What check is there on imported materials being weed/pest free?
- What water is available to wash down equipment?
- Who maintains the register and responds to complaints?
- Who is the environmental management group?

5. Conclusion on the likelihood of significant impacts

5.1 We submit the Proponent is in error and the proposal, if not rejected outright, should be declared a “Controlled Action”

5.2 The proposal should be a “Controlled Action”.

- The choice is not between do nothing and the actions of the Referral. There are alternatives as outlined above.
- The actions will impact on a much wider area than the footprint of the development.
- It is a nonsense to say the impacts will be “overwhelmingly positive”.
- The Referral ignores the impacts on Lake Alexandrina which will be significant.
- The “minor adverse impacts” include the sacrifice of Lake Alexandrina and hence Lake Albert.
- All the dot points under “Significant impact criteria” ignore the impact on Lakes Alexandrina and Albert.

5.3 Matters likely to be impacted.

The Proponent should tick sections 16 and 17B;18 and 18A, 20 and 20A; 26 and 27A, 288.

6. Environmental history of the responsible party

6.1 Does the party taking the action have a satisfactory record of responsible environmental management?

The report of Muller and Phillips (2006) is witness to the poor management of Ramsar Sites.

6.4 Has the person proposing to take the action previously referred an action under the EPBC Act?

Given the suite of actions listed here, the Proponent should be aware that the various actions will have cumulative impacts and that this Referral is not a “first response”.

7.2 Reliability and date of information

Significant disclaimers are attached to the CSIRO ASS Report on which we are being asked to rely.

CSIRO advises that the information contained in this publication comprises general statements based on scientific research. The reader is advised and needs to be aware that such information may be incomplete or unable to be

used in any specific situation. No reliance or actions must therefore be made on that information without seeking prior expert professional, scientific and technical advice. To the extent permitted by law, CSIRO (including its employees and consultants) excludes all liability to any person for any consequences, including but not limited to all losses, damages, costs, expenses and any other compensation, arising directly or indirectly from using this publication (in part or in whole) and any information or material contained in it. (Fitzpatrick *et al* 2009)

Relevant information has been omitted (e.g. Earth Systems 2008a, b; South and Shillabeer 2009; RLCAG 2008).

We submit that the Minister should reject the Referral as the sources supplied are deficient and cannot be relied upon.

7.3 Attachments

State approvals should be attached 2.3

Appendix K

Public consultation has been misrepresented. As John Yelland in his submission writes:

The proposed works were presented to the public at workshops in Goolwa and Clayton in January 2009. The advertising flyer states: "The workshops will focus on possible options for protecting the freshwater wetlands in and around the Goolwa Channel, Currency Creek and Finniss River. The workshops will provide the latest information on:

- key threats to these wetland environments from acid sulfate soils, rising salinity and falling water levels; and
- a range of possible options to address these threats."

Public Notice for Workshops on 15 Jan 08-Final.pdf (sic)

The reported public responses in the referral, Appendix K, relates to these workshop, and the comments in the appendix are about the presented data at that time.

However, the referral is titled: Emergency response for the crisis management of Acid Sulfate Soils in the Goolwa Channel, Finniss River and Currency Creek, South Australia There is no mention of "protecting the freshwater wetlands". Wetlands are not mentioned until page 8 of the referral.

The Public consultation in Appendix K is therefore not valid, since the aim of the works has been changed to acidification protection, not wetland protection.

It is also noted that the EPBC website describes the project as "... the proposed blocking banks in the Goolwa Channel and tributaries, SA"

<http://www.environment.gov.au/epbc/notices/assessments/lower-lakes.html>

References

DWLBC. (2009) Discussion: Options for managing acidification risk and establishing a freshwater ecological refuge in the Goolwa Channel and Tributaries, 12 January.

Earth Systems. (2008a). *Lower Murray Lakes Project, Management Options for Acid Sulfate Soils in the Lower Murray Lakes, South Australia, Stage 1 - Preliminary Assessment of Treatment Options*. December.

Earth Systems. (2008b). *Lower Murray Lakes Project, Management Options for Acid Sulfate Soils in the Lower Murray Lakes, South Australia, Stage 2 - Preliminary Assessment of Prevention, Control and Treatment Options*, December.

Fitzpatrick, Rob, Gerard Grealish, Paul Shand, Steve Marvanek, Brett Thomas, Nathan Creeper, Richard Merry and Mark Raven (2009). *Preliminary Assessment of Acid Sulfate Soil Materials in Currency Creek, Finniss River, Tookayerta Creek and Black Swamp Region, South Australia* CSIRO Land and Water Science Report CLW 01/09, January.

Jones, Henry. (2009). *Madness. Australia's River: A special local knowledge edition of the Lakes News*. www.hurrysavethemurray.com

Maunsell Australia. (2008a). *Literature Review: Seawater Incursion Lake Alexandrina*. Unpublished report. June.

Maunsell Australia. (2008b). *Literature Review: Acid Sulfate Soil Mitigation Using Organic Mulch*. Unpublished report. June.

Phillips, W. and Muller, K.L. (2006). *Ecological Character Description of the Coorong, Lakes Alexandrina and Albert Wetlands Environment and Heritage*.

RLCAG. (2008). *Low Intervention Strategy. Australia's River: A special local knowledge edition of the Lakes News*. www.hurrysavethemurray.com

Strathalbyn Naturalists Club Inc. (2000) *Natural History of Strathalbyn and Goolwa Districts*, Strathalbyn Naturalists Club Inc.

South, Mike and Neil Shillabeer. (2009). *An Alternative Strategy to combat acidification in the Lower Murray (Goolwa reach), Currency Creek, Tookayerta and Finniss River*. February 27.

Walker, K.F. (2006). *Serial weirs, cumulative effects: the Lower River Murray, Australia*. In R.T. Kingsford (ed.), *Ecology of Desert Rivers*, pp. 248-279, Cambridge University Press.