



CLIENTS | PEOPLE | PERFORMANCE



Shoalhaven City Council

Lake Conjola Interim Entrance Management Policy

August 2013

This interim Entrance Management Policy has been adopted by Shoalhaven City Council on 24 September 2013 (Min 13,988)



This [Lake Conjola Interim Entrance Management Policy] ("Report"):

- 1. has been prepared by [GHD Pty Ltd] ("GHD") for [Shoalhaven City Council];*
- 2. may only be used and relied on by [Shoalhaven City Council];*
- 3. must not be copied to, used by, or relied on by any person other than [Shoalhaven City Council] without the prior written consent of GHD;*
- 4. may only be used for the purpose of [discussion on Lake Conjola Entrance Management Policy] (and must not be used for any other purpose).*

GHD and its servants, employees and officers otherwise expressly disclaim responsibility to any person other than [Shoalhaven City Council] arising from or in connection with this Report.

To the maximum extent permitted by law, all implied warranties and conditions in relation to the services provided by GHD and the Report are excluded unless they are expressly stated to apply in this Report.

The services undertaken by GHD in connection with preparing this Report:

- were limited to those specifically detailed in section [1 and 2 of Appendix A] of this Report;*
- did not include [GHD undertaking testing at some parts of the site; GHD undertaking particular types of testing/analysis that could have been undertaken].*

The opinions, conclusions and any recommendations in this Report are based on assumptions made by GHD when undertaking services and preparing the Report ("Assumptions"), including (but not limited to):

- The information provided in the documents reviewed for development of this interim policy has been verified as accurate and suitable for use*

GHD expressly disclaims responsibility for any error in, or omission from, this Report arising from or in connection with any of the Assumptions being incorrect.

Subject to the paragraphs in this section of the Report, the opinions, conclusions and any recommendations in this Report are based on conditions encountered and information reviewed at the time of preparation and may not be relied on if conditions, assumptions and information on which this report is based change.



Contents

1.	Policy Name and Authorisation	1
1.1	Policy Name	1
1.2	Authorisation	1
2.	Policy Development	2
3.	Management Policy Objective	3
4.	Policy Opening Procedures and Monitoring	4
4.1	Triggers and Procedures	4
4.2	Monitoring	6
5.	Ongoing Management Actions and Policy Processes	8
5.1	Policy Process	8
5.2	Ongoing Management	8
5.3	Revised Trigger Levels	10
5.4	Long Term Targets	10

Table Index

Table 1	Ongoing Management Actions	9
---------	----------------------------	---

Figure Index

Figure 1	Policy Process	8
----------	----------------	---

Appendices

- A Interim Entrance Policy Discussion Paper
- B Monitoring Data Sheet
- C Operational Details
- D Communication charts for Planned and Emergency opening
- E draft media release



1. Policy Name and Authorisation

1.1 Policy Name

This policy is referred to as the Lake Conjola Interim Entrance Management Policy.

1.2 Authorisation

This policy was endorsed by Shoalhaven City Council on: 24 September 2013

This policy commenced on: 24 September 2013

This policy is due for review on (5 years from adoption or when NSW Government dictates).



2. Policy Development

This policy has been developed in consultation with the relevant NSW Government Authorities, Shoalhaven City Council, Consultants and the Lake Conjola Community. The policy has been developed based around consideration of the following:

- ▶ Current NSW Government Guidelines in relation to Coastal and Estuary Management, specifically;
 - *NSW Coastal Protection Act 1979, Amended in 2010 to incorporate specifics for Coastal Zone Management and Estuary Health;*
 - *NSW Coastal Policy 1997;*
 - *NSW Sea Level Rise Policy Statement 2009;*
 - *NSW Coastal Risk Management Guide 2010;*
 - *Guidelines for Preparing Coastal Zone Management Plans 2010; and,*
 - *NSW Government's Flood Prone Land Policy as detailed in NSW Floodplain Development Manual 2005.*
- ▶ Council's available resources and funding at the time of the policy development;
- ▶ Ecological diversity of the estuary and water quality; and
- ▶ Inundation as a result of catchment flooding and storm surge inundation.

The review undertaken in the development of this interim policy is documented within the discussion paper provided in Appendix A. The discussion paper provides a summary of the processes occurring within Lake Conjola, the requirements of the NSW Government and the desires of the Lake Conjola community, all of which have played an important part in the development of this policy.

It should be noted that entrance opening in some circumstances will not prevent flooding and may increase the risk of flooding as a result of storm surge. It should also be noted that in some circumstances it may not be possible to undertake the opening works due to overarching safety concerns or timing of flood events, however if possible the below procedures outline the method to be adopted.



3. Management Policy Objective

This policy outlines the circumstances under which Shoalhaven City Council (SCC) is to artificially open Lake Conjola (the Lake) entrance and provides a rational decision making procedure for undertaking the works as described in the discussion paper in Appendix A. The policy aims to:

- Minimise risk to public safety associated with excessive inundation of foreshores and associated infrastructure as a result of low level flooding¹;
- Minimise interference with natural entrance opening processes and minimise associated impacts on ecological processes;
- Minimise risks to public health associated with excessive bacterial contamination of water;
- Minimise interference to the local ecological community;
- Satisfy local community values;
- Articulate the procedures to be initiated for entrance operations including entrance breakouts;
- Articulate key responsibilities for management of the entrance; and
- Detail the procedures for monitoring the Lake Entrance.

¹ It is important to note that an open entrance does not eliminate the risk of flooding for the Lake Conjola community refer Lake Conjola Flood Study (July 2007).



4. Policy Opening Procedures and Monitoring

4.1 Triggers and Procedures

4.1.1 Triggers

The following summarises the **triggers** that would justify mechanical opening of the entrance. The water levels adopted have been based on habitable floor level survey data available at the time of the development of this policy and community desires in relation to opening water levels. Further details of the steps taken to determine these trigger levels are provided in the discussion paper in Appendix A.

1. Planned Opening @ 1.0m AHD

At a level of 0.8 m AHD plant and equipment are to be placed on standby. If moderate or heavy rainfall is ongoing or predicated and water reaches a level of 0.9 m AHD (measured from the MHL gauge at Conjola Caravan Park) preparatory works should be undertaken to prepare the pilot channel for opening. Opening to commence when the Lake water level (measured from the MHL gauge at Conjola Caravan Park) is at or exceeding 1.0 m AHD.

The key environmental requirement is to minimise disturbance to shorebird nesting habitat. During nesting season (September – March inclusive regardless of bird nesting activity) only a northern pilot channel can be considered. Outside nesting season the design for a trial mid spit opening during April to August will be developed and approvals sought

2. Emergency Opening @ 1.2m AHD

An emergency situation where the Lake water levels are rising rapidly and a flood event is occurring or predicted. At a level above 1.2 m AHD works should be undertaken, if situation permits, to open the entrance in the shortest and quickest way possible.

4.1.2 Procedures

The following **procedures** are to be followed during opening of the entrance (refer Appendix D for Operational Details).

- Planned Opening April through to August inclusive (Non nesting season for threatened bird species):
 - Relevant authorities, Community Consultative Bodies (CCBs) and media to be informed of intent to open entrance
 - CCBs to inform local population as far as practical
 - Council's Internal Operations Manual to be adhered to
 - Preferably small ocean swells
 - Suitably qualified person to be on site to monitor shorebirds
 - Beach in immediate vicinity of entrance to be closed to the public
 - Access to be preferably gained from Manyana or Conjola Boat Ramp when feasible. Access from Cunjarong Boat Ramp to be used as last resort and remediated once works are complete



- Pilot channel sized to reflect width of entrance berm as far as is practical. As an example based on previous studies if a pilot channel is approximately 200 m long then it needs to be no less than 10 m wide and have a bed at an RL 0.0 m AHD
- Pilot channel to be located within the area identified in Appendix C of this document
- Pilot channel excavation to start from the ocean and finish at the lake edge with plugs left in place at either end until ready to release Lake water
- Disposed spoil to be placed and shaped as nourishment on the toe of the entrance spit dune (lake side) south of the entrance channel, on the beach face north of the entrance area and in those areas experiencing erosion when feasible –for further details refer REF
- Planned Opening September through to March inclusive (Threatened bird species nesting season):
 - Relevant authorities, Community Consultative Bodies (CCBs) and media to be informed of intent to open entrance
 - CCBs to inform local population as far as practical
 - Council's Internal Operations Manual to be adhered to
 - Preferably small ocean swells
 - Suitably qualified person to be on site to monitor shorebirds
 - Beach in immediate vicinity of entrance to be closed to the public
 - Access to not impinge on shorebird breeding areas. Access to be preferably gained from Manyana or Conjola Boat Ramp when feasible. Access from Cunjarong Boat Ramp to be used as last resort and remediated once works are complete
 - Pilot channel sized to reflect width of entrance berm as far as is practical. As an example based on previous studies if a pilot channel is approximately 200 m long then it needs to be no less than 10 m wide and have a bed at an RL 0.0 m AHD
 - Pilot channel to be located within the north position identified in Appendix C of this document
 - Pilot channel excavation to start from the ocean and finish at the lake edge with plugs left in place at either end until ready to release Lake water
 - Disposed spoil to be placed and shaped as nourishment on the northern shoreline of the entrance between Cunjarong and Green Island in order to avoid disturbance to nesting birds
- Emergency opening:
 - Relevant authorities, Community Consultative Bodies (CCBs) and media to be informed of intent to open entrance
 - CCBs to inform local population as far as practical
 - Flood situation is occurring or predicted
 - Beach in immediate vicinity of entrance to be closed to the public
 - Opening to be conducted in the shortest and quickest way possible
 - Opening only to be undertaken if safety is not compromised for all involved
 - Pilot channel to be located, positioned and sized to ensure the safety of those involved is not compromised



- Access to be gained via the safest and quickest route available
- Disposed spoil to be placed north of pilot channel if achievable

4.2 Monitoring

4.2.1 Water Level

Water levels in Lake Conjola are monitored on a continuous basis by Manly Hydraulics Laboratory (MHL), refer:

http://mhl.nsw.gov.au/htbin/map_data_display.com?SITE=CONJ

It is acknowledge that some property owners have also established their own water level monitoring gauges. It is recommended that SCC's Natural Resources and Floodplain team monitor the Lake water levels regularly, in particular after rain events. During an opening event details of water level at both the Lake Entrance and further upstream are to be recorded using the monitoring data sheet provided in Appendix B.

Council may elect to use Council's Enviromon Flood Warning System to send an automated SMS warning should water level within the Lake reach 0.8 m AHD.

4.2.2 Rainfall

Rainfall forecasts are to be regularly monitored when the Lake water levels reach approximately 0.8 m AHD. The Bureau of Meteorology website is to be referred to on a regular basis, refer:

<http://www.bom.gov.au/jsp/watl/rainfall/pme.jsp>

If forecast rainfall values are predicted to raise the Lake water level above 0.9 m AHD equipment is to be placed on standby for excavation of the pilot channel.

4.2.3 Entrance Survey

Council has established a baseline land and hydrographic survey for the entrance precinct. This information allows for improved operation design for emergency and planned intervention. It is recommended that Council continue to undertake regular survey of the entrance precinct.

4.2.4 Water Quality

A water quality monitoring program in concurrence with monitoring of the entrance regime is to be continued. When water quality levels exceed ANZECC guidelines appropriate signage is to be put in place and investigations made into a potential opening of the entrance.

If the entrance is closed during holiday periods water quality monitoring is to be undertaken on a weekly basis. Results from testing are to be updated on a monthly basis on the Shoalhaven City Council website, refer:

<http://www.shoalhaven.nsw.gov.au/soe/Region/Indicator%20homes/Surfacewaterqualitylakeconjola.htm>

Other measures to improve overall water quality within the catchment are to be continued. The include minimising impervious suburban areas, stabilising eroded banks, maintaining the buffer strip along the foreshore and upgrading sewerage systems.



4.2.5 Entrance Opening Events

During an opening event details are to be recorded including whether it was an artificial or natural opening, water level and water level recording gauge, date, location of breach, details of the channel and details of spoil placement as per the monitoring data sheet in Appendix B.

After an opening event shoreline erosion and vegetation loss is to be monitored and areas found to have experienced detrimental effects as a result of the opening reinstated. The entrance is to be monitored and the timeframe between the opening and the commencement of shoaling is to be recorded. Photographic records are to be kept on file for future use in entrance management.

4.2.6 Opening Procedure Trials

It is recommended to trial a number of different opening procedures and to monitor/document the effectiveness of each in order to continually improve the entrance opening regime. The following are all aspects to be considered in trialling the effectiveness of the opening regime:

- ▶ Opening location – north/mid/ spit (refer Appendix C – Operational Details)
- ▶ Tide level – high/low/mid tide
- ▶ Lake water level at time of opening
- ▶ Pilot channel dimensions
- ▶ Excavation sequence – i.e. working from lake to ocean and vice versa

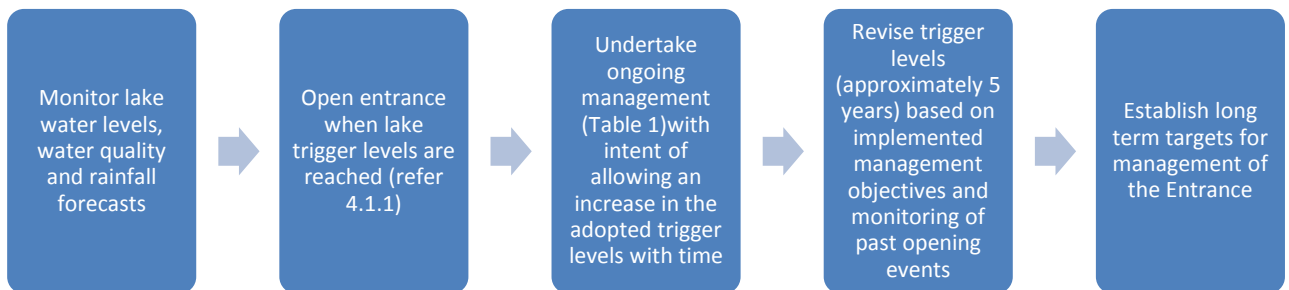


5. Ongoing Management Actions and Policy Processes

5.1 Policy Process

The Lake Conjola Interim Entrance Management Policy will be conducted in accordance with the process detailed in Figure 1.

Figure 1 Policy Process



5.2 Ongoing Management

This policy seeks to manage against the risks associated with low level flooding and impacts associated with poor water quality; it does not seek a permanently open entrance.

The long term entrance management policy is to reflect strategies intended to improve entrance stability using the natural processes of the Lake. Specifically, the entrance processes outlined in Table 1 can be managed effectively by ongoing involvement by SCC and the community through an overall entrance management strategy. A holistic approach needs to be adopted in terms of both development approvals and management of the entrance to ensure that the Lake can be restored to as natural a regime as is possible.

It needs to be outlined that opening at such low water levels means the entrance has the potential to shoal and close relatively soon after an opening event.



Table 1 Ongoing Management Actions

Process/Development	Issue	Management	Action & Timeframe
Storm Washover	Susceptibility of the entrance channel to close as a result of storm washover	Increase height of the dune on the southern side of the entrance and provide dense vegetation cover to prevent sand being remobilised NB: dune to be of sufficient height to prevent wave overtopping otherwise has the potential to act as a sand source to infill the entrance channel	Dune Nourishment and vegetation – Ongoing
Wind Blown Sand	Tendency for wind blown sand to significantly contribute to the sand supply to the entrance shoals.	Vegetate dunes along Conjola Beach in order to minimise the impact of wind blown sand	Dune Vegetation – Ongoing
Water Quality	Potential for water quality to decline if effective management is not maintained	Community awareness, vegetation and bank stabilisation	Water quality monitoring, Vegetation, Bank Stabilisation - Ongoing
Flooding	Low lying land is susceptible to inundation	Development controls to include increased minimum floor levels to accommodate minor flooding and allow the entrance to return to a natural regime as possible Flood Risk Management Plan will outline ongoing management requirements	Flood Risk Management Plan – Currently being developed Flood DCP minimum floor levels updated – 2 years Develop evacuation plan – 12 months
Wastewater and Sewage Overflows	Wastewater and sewage overflows into Lake Conjola	Continue improvements to the sewerage system to adequately minimise the potential for wastewater and sewage overflows	Establish emergency measures to be put in place during times of power outage and pump problems to avoid overflow entering the Lake
Community Awareness	Lack of factual understanding	Community awareness sessions, community signage, community newsletters, a Lake Conjola webpage and notice board	Provide newsletters to the local community with ongoing information on the state of the Lake and the processes occurring within the Lake – Ongoing



Process/Development	Issue	Management	Action & Timeframe
			Develop a community noticeboard with snapshots of the processes occurring within Lake Conjola and the ongoing management objectives – Ongoing Continued updating of Lake Conjola webpage - Ongoing
Development Consent and Lake Entrance Management	Discrepancies between development approval and Lake entrance management	A wholistic approach needs to be adopted to facilitate complementary ongoing development that will support restoring the Lake to as natural a regime as possible that is in keeping with ensuring ongoing development takes place as well as ensuring the Lake is restored to as natural a regime as is possible	Implement Flood Risk Management Plan's recommended development controls - 2 years
Opening Protocol	Resources and funding	Make ongoing improvements to the protocols adopted for opening the entrance. Investigate the possibility of an environmental levy to support the community's partnership with SCC in the opening of the entrance. Investigate possibility of further government funding.	Inform on site contractors of alternate methods for pilot channel excavation – Ongoing Investigate environmental levy to obtain increased funding for entrance opening procedures – 12 months Investigate government funding options – 12 months

5.3 Revised Trigger Levels

This policy is to be updated in 5 years from the date of commencement or when NSW Government Guidelines dictate (whichever occurs first). The updated policy is to include considerations of increased trigger levels as a result of future climate change and to progressively return the Lake to as natural a regime as is possible with fewer artificial entrance openings.

5.4 Long Term Targets

In the long term, the policy seeks to restore the Lake to a point where natural breakouts occur and artificial entrance interference is unnecessary.



Appendix A
Interim Entrance Policy Discussion Paper



Appendix B
Monitoring Data Sheet



Appendix C
Operational Details



Appendix D

Communications charts for Planned and Emergency Opening



Appendix E
Draft media release



Appendix F
REF





GHD

2/57 Graham St Nowra NSW 2541
PO BOX 621 Nowra NSW 2541
T: 61 2 4424 4900 F: 61 2 4424 4999 E: noamail@ghd.com.au

© GHD 2011

This document is and shall remain the property of GHD. The document may only be used for the purpose for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.

Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
A	E.Lockett	K.O'Malley-Jones	K.O'Malley-Jones*	K.O'Malley-Jones		
B	E.Lockett	K.O'Malley-Jones	K.O'Malley-Jones*	K.O'Malley-Jones		22/01/2012
C	A Schofield	I Ghetti	I Ghetti	I ghetti		01/09/2013

-Removal of the pre holiday opening @ 0.8m-1.0mAHD. This option was not supported by State Government Agencies and the REF. In addition, it was not supported at workshops with community members.

-Preferred access to be from Manyana or Conjola boat ramp when feasible. Access from Cunjurong boat ramp to be used as a last resort or in an emergency situation.

- Soil disposal location outside of shorebird nesting season to include the toe of the entrance spit dune (on the lake side), the beach face north of the entrance and in areas experiencing erosion (details of sand disposal are provided in the REF).

- Inclusion of the role of CCB to advise locals of the works.

- Inclusion of Appendix D –communication charts for planned and emergency opening , Appendix E –draft media release and Appendix F- REF prepared by consultant Peter Spurway