

ORDINARY COUNCIL

LATE REPORTS

Wednesday 20 May 2020

Ordinary Council Meeting

Wednesday, 20 May 2020

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4 Your Natural and Built Environment

What we are trying to achieve

A connected, sustainable, accessible community and environment that is protected now and into the future.

What the result will be

We will have:

- Effective management and maintenance of essential water, waste and sewer infrastructure
- A community that is prepared for natural events and climate change
- Sustainable and environmentally sensitive development outcomes that consider the impact on the natural environment
- Accessible transport network for our communities
- Infrastructure provision and maintenance that meets community expectations and needs
- Well planned communities that are linked to encourage and manage growth
- Accessible and protected waterways, foreshores, beaches and bushlands
- An environment that is protected and conserved for future generations
- Renewable energy options that are understood and accessible by the community

How we will get there

- 4.1 Provide (appropriate) infrastructure and services including water cycle management, waste management, and sewer management
- 4.2 Aim to minimise the impact of natural events and climate change, for example, floods, bushfires and coastal erosion
- 4.3 Facilitate development that is compatible with the natural and built environment
- 4.4 Plan for integrated transport systems that help people get around and link our communities
- 4.5 Plan for integrated and connected communities across the Port Macquarie-Hastings area
- 4.6 Restore and protect natural areas
- 4.7 Provide leadership in the development of renewable energy opportunities
- 4.8 Increase awareness of issues affecting our environment, including the preservation of flora and fauna



Planning,
Industry &
Environment

Our Ref: DOC20/357022
Your Ref: NR_P001_LC

General Manager
Port Macquarie-Hastings Council
PO Box 84
Port Macquarie NSW 2444

Attention: Ms Blayne West

Dear Mr Swift-McNair

RE: Review of Environmental Factors, Lake Cathie Opening, Flood Mitigation, (NR_P001_LC)

Further to advice received from the Department of Planning, Industry and Environment – Crown Lands about the Review of Environmental Factors (REF) and Executed Licence for the Lake Cathie opening for flood mitigation at Lake Cathie the Biodiversity and Conservation Division (BCD) of the Environment, Energy and Science Group in the Department provides the following comments.

The BCD was formerly part of the Office of Environment and Heritage, but now forms part of a Group that has responsibilities relating to biodiversity (including threatened species and ecological communities, or their habitats), Aboriginal cultural heritage, National Parks and Wildlife Service estate, climate change, sustainability, flooding, coastal and estuary matters.

We understand the project is being assessed under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). We have reviewed the REF and executed licence and advise that several issues are apparent with the assessment for biodiversity, Aboriginal cultural heritage, National Parks Estate and coastal and estuary matters. These issues are discussed in detail in **Attachment 1** to this letter.

The key issue raised by the BCD is the proposed activity has the potential to cause unintended negative indirect impacts to upstream environments. For this reason, the Port Macquarie Hastings Council could adopt a more precautionary approach and amend the activity so it only involves the alternative option of scraping the beach berm to install a 'dry notch' at a level of 1.6m AHD instead of excavating a channel to 0.8m AHD.

This approach seeks to maintain the beach berm across the scraped area at 1.6m AHD to facilitate outflow of lake waters should they exceed 1.6m AHD, therefore reducing the flood risk. This approach also seeks to minimise the potential impacts of a full (as proposed) artificial entrance opening to water levels and associated foreshore habitats and ecology in Lake Innes and Lake Cathie and prevent exposure of high-risk acid sulphate soil bed sediments. It would also allow for natural breakout to occur during a future large rainfall event.

In summary, the BCD provides the following comments:

1. The REF should consider assessing potential indirect impacts on:
 - a. threatened shorebirds recorded within the area.

- b. endangered ecological communities (EECs) within the Lake Innes Nature Reserve.
 - c. koala habitat within the Lake Innes Nature Reserve through raised salinity levels within the waterbody.
2. The test of significance should be revised to consider indirect impacts of the activity upstream of the proposed activity.
 3. The REF should consider alternatives to the activity that carry less risk of serious indirect impacts to upstream terrestrial biodiversity, such as berm scraping to install a 'dry notch' instead of channel creation.
 4. The REF should include a chance finds procedure for the discovery of Aboriginal objects during the activity as follows:

If Aboriginal objects are discovered during the course of the activity, then all works must cease immediately, and notification must be provided to the Biodiversity and Conservation Division of the Department of Planning, Industry and Environment through the Enviroline on 131 555. Works must not recommence until written advice is provided by the Department to that effect.

5. The REF should include further information on sewage infrastructure (height and risk of impact from high lake water levels), sediment dynamics, impacts to water levels, acid sulphate soils and NPWS water quality monitoring.
6. The REF should consider and describe beach berm scraping to install a dry notch as an alternative to the proposed activity.
7. The NPWS supports beach berm scraping to 1.6m AHD as proposed by DPI Fisheries as an alternative to excavation of a channel to 0.8m AHD. This is considered a more appropriate approach to managing flood risk while seeking to minimise associated ecological impacts, than a full entrance channel excavation.
8. To mitigate acid sulfate soil risks, attempts should be made through the entrance management process to retain water levels at a minimum of 1m AHD in Lake Innes.

We look forward to working with council to identify an improved longer-term solution to the management of the Lake Cathie and Lake Innes system through the development of the Coastal Management Program.

If you have any questions about this advice, please do not hesitate to contact Mr Dimitri Young, Senior Team Leader Planning, North East Branch at Dimitri.young@environment.nsw.gov.au or 6659 8272.

Yours sincerely



14.5.2020

RUSSEL MADELEY
A/Director North East
Biodiversity and Conservation

Enclosure: Attachment 1. Detailed Biodiversity and Conservation Division Comments – Lake Cathie opening REF and Executed Licence

cc: Silas Sutherland – Area Manager Far North Coast – Crown Lands

Attachment 1: Detailed BCD Comments – Lake Cathie opening Review of Environmental Factors and executed licence

The Biodiversity and Conservation Division (BCD) has reviewed the Review of Environmental Factors, Lake Cathie Opening – Flood Mitigation (9 April 2020) (REF) and the Crown Land Management Act 2016 – Section 2.20 licence (RN 618957 execution date 8 May 2020) and we provide the following comments for consideration.

Biodiversity

The REF only considers the direct impacts of the activity at the site of the lake opening. It does not consider the potentially far more serious indirect impacts to biodiversity caused by the conversion of an Intermittent Closed and Open Lagoon supporting fresh or brackish water into a potentially extended saline state. This could have major impacts on several threatened terrestrial species and ecosystems, that occupy the upstream environment, reaching potentially as far as Lake Innes.

In the Environmental Assessment Requirements (EARs) we provided to the Port Macquarie Hastings Council on 14 February 2020, the BCD indicated that particular focus needed to be given to assessing the potential impacts of the proposed activity on threatened shorebirds recorded within the area, the impacts of saline incursion on endangered ecological communities (EECs) within Lake Innes Nature Reserve and the impacts to koala habitat within the Lake Innes Nature Reserve through raised salinity and water levels within the water body.

We consider that insufficient investigation into the indirect impacts outlined above has occurred and thus the Test of Significance under the *Biodiversity Conservation Act 2016* has not been based on sufficient information. Further investigation into the matters raised in the EARs, notably how raised salinity levels will impact EECs, which exist within tight ecotonal environments, governed by salinity and water level regimes, such as Coastal Saltmarsh, Swamp Oak Floodplain Forest and Swamp Sclerophyll Forest, should be undertaken.

For Swamp Sclerophyll Forest, consideration should also be given to how raised salinity levels will impact dieback and/or leaf nutrition of important koala food trees, notably Swamp Mahogany (*Eucalyptus robusta*) which dominate this EEC. The koala population within Lake Innes is recognised as an important population for the Port Macquarie-Hastings area and further impacts on the habitat of this population could be critical given the recent bushfire impacts on koalas earlier this year.

Similarly, the Australasian Bittern favours permanent freshwater wetlands and changing salinity levels are likely to impact this species. The Green and Golden Bell Frog is another species for which salinity levels have been shown to impact tadpole growth rates and mortality (with salinity levels as low as 5.5% sw) (see Christy and Dickman, 2002). The current REF has not considered such impacts that could potentially occur from this activity.

The difficulty in quantifying indirect impacts and the potential serious implications of such impacts suggest that the REF should consider alternative precautionary approaches to the activity that carry less risks for upstream environments. This could include an approach that employs berm scraping to a level that could allow natural lake flows pending appropriate rainfall, rather than significant intervention to create a channel opening.

BCD Recommendation:

1. The REF should give further consideration to assessing potential indirect impacts to:
 - a. threatened shorebirds recorded within the area
 - b. endangered ecological communities (EECs) within the Lake Innes Nature Reserve
 - c. koala habitat within the Lake Innes Nature Reserve through raised salinity levels within the waterbody.

Attachment 1: Detailed BCD Comments – Lake Cathie Opening Review of Environmental Factors and executed licence

2. The test of significance should be revised to consider indirect impacts of the activity upstream of the proposed activity.
3. The REF should consider alternatives to the activity that carry less risk of serious indirect impacts to upstream terrestrial biodiversity as associated with artificial opening and subsequent large draw-down of lake water levels. We recommend berm scraping to install a dry notch across the beach is considered as an alternative to excavating a deeper entrance channel.

Aboriginal cultural heritage

We acknowledge the consideration of the potential for the proposed activity to impact on Aboriginal cultural heritage as documented on pages 22-24 and page 55 of the REF. We note the recently discovered midden at the southern end of Illaroo Road is outside the area of the proposed works and the access point for those works. We also note the REF considered it reasonable for the proposed activities to proceed with caution. However, the documentation provided did not include the results of the emails to engage in consultation with the respective Local Aboriginal Land Council for the proposal to consider the potential of the proposed activities to impact on significant Aboriginal cultural values within the area.

The Crown Land Management Act 2016 – Section 2.20 licence has some inconsistencies with the current terminology and section numbers on page 7 and 8. Under the heading '6. Relics' (a) refers to section 87 permits. This is incorrect as section 87 permits are no longer available. Currently there are only section 90 Aboriginal Heritage Impact Permits which allow Harm to Aboriginal objects or declared Aboriginal Places. This suggests it would not be possible for the proponent to comply with this licence condition.

The references to the Director National Parks and Wildlife Service under the heading '6. Relics' (b) and (c) relating to notification and reporting requirements under the *National Parks and Wildlife Act 1974* for newly identified Aboriginal objects is also incorrect. The Aboriginal Heritage Information Management System is maintained by Heritage NSW in the Department of Premier and Cabinet (DPC).

BCD Recommendation:

4. The REF should include a chance finds procedure for the discovery of Aboriginal objects during the activity as follows:

If Aboriginal objects are discovered during the course of the activity, then all works must cease immediately, and notification must be provided to the Biodiversity and Conservation Division of the Department of Planning, Industry and Environment through the Enviroline on 131 555. Works must not recommence until written advice is provided by the Department to that effect.

Coastal Processes

Our review of the REF indicates that further information is required on coastal processes as follows:

- I. **Sewage infrastructure** - Quantification and description of the location extent, nature and type of sewage infrastructure that may be impacted by increased lake water levels, and the risk posed to waterways if inundated.
- II. **Sediment dynamics** - More detailed description of coastal processes and sediment transport dynamics and their interaction with the entrance and its behaviour. Relevant material can be found in the councils' Lake Cathie Hazard Study Review by *Cardno* (2014).
- III. **Impacts to water levels** – The REF is misleading to say entrance opening has only a "slight impact" on water levels in Lake Innes when the activity will reduce water levels by 1m in a system that is shallow with depths less than 2.5m (e.g. the depth of water is

- only 0.8m on the wetted perimeter of Lake Innes when the water level is at 1.5m AHD, so removing anything greater than 0.8m depth of water means this whole lake bed foreshore would become dry).
- IV. *Acid Sulphate Soils (ASS)* – The REF should consider that the council opening the entrance in 2018 and dropping water levels at the onset of one of the driest periods on record exacerbated the stress and impacts on the lake system, exposing large areas of ASS bed sediments.
 - V. *NPWS water quality monitoring* – The REF must acknowledge and include NPWS water quality monitoring for the council at the Innes ruins boat ramp.

The REF should also consider alternatives to the proposed activity in more detail such as berm scraping to install a dry notch across the beach berm. The volume of sand scraped under a 'berm scraping' or 'dry notch' approach would likely be some 20-30% less than that required to achieve the nominal 6m wide channel dug to 0.8m AHD as proposed in the REF.

Assuming the current berm height averages approximately 2.2m AHD (for illustration purposes);

- Proposal in REF - If an entrance channel (as proposed in the REF) is excavated to 0.8m AHD across the 135m beach berm, then the total approximate volume requiring excavation is 135m long x 6m wide x 1.4m deep (assuming a rectangular excavation, not trapezoidal as per the REF) = 1134m³
- Berm scraping / dry notch - If a dry notch (berm swale) is scraped to 1.6m AHD across the 135m beach berm at say a nominal width of 10m, then the total approximate volume requiring excavation = 135m long x 0.6m deep x 10m wide = 810m³

Under the 'dry notch' approach, only a relatively narrow lineal area of the beach berm is scraped, not the whole lake entrance area. A swale is scraped across the beach berm to seaward, in a direction roughly perpendicular to the shoreline. The dry notch could be installed on an alignment similar to the proposed channel (as described in the REF) however only shallower and wider. The BCD would advocate that a swale some 10-12m wide should be sufficient to assist in reducing future flood risk.

Under the dry notch/berm scraping scenario, the spoil could be left on the northern side of the notch to limit the possible migration of the spoil windrow back into the notch by wind action, given the predominant SW to SE wind regime is likely to continue into the Winter months.

The dry notch may infill slowly due to aeolian transport (wind blowing sand) and wave induced transport, whereby the waves push sand up the beach and form the beach berm cap. Therefore, the dry notch may need to be maintained from time to time, to retain its 1.6m level. If the lake does not over-top the notch for some weeks (due to lack of rainfall) then the council may need to maintain it before predicted rainfall events or as needed, by returning to the entrance and scraping any accreted sand out of the notch to achieve the 1.6m depth again.

The installation of a dry notch may require follow up maintenance until either a partial or full natural opening occurs, or the lake waters lower due to evapotranspiration and other losses (under a minimal rainfall scenario). However, this increased effort is considered justified when attempting to minimise the potential impacts of a full artificial opening on the ecosystems of both the Lake Cathie and Lake Innes systems.

BCD Recommendation:

5. The REF should include further information on sewage infrastructure (height and risk of impact from high lake water levels), sediment dynamics, impacts to water levels, acid sulphate soils and NPWS water quality monitoring.
6. The REF should consider and describe berm scraping to install a dry notch as a preferred alternative to the proposed activity.

NPWS Estate

The National Parks and Wildlife Service (NPWS) in the Department of Planning, Industry and Environment has concerns about potential adverse impacts of the proposed opening of Lake Cathie to the values of Lake Innes Nature Reserve.

Nature reserves are reserved under the *National Parks and Wildlife Act 1974* to protect and conserve areas containing outstanding, unique or representative ecosystems, species, communities or natural phenomena. The primary purpose of nature reserves is to conserve nature. Under section 30J of the National Parks and Wildlife Act, nature reserves are managed to:

- conserve biodiversity, maintain ecosystem functions and protect geological and geomorphological features and natural phenomena
- conserve places, objects, features and landscapes of cultural value
- promote public appreciation, enjoyment and understanding of the reserve's natural and cultural values
- provide for appropriate research and monitoring.

Wildlife in Lake Innes Nature Reserve has survived a difficult 12 months following the driest year on record in Port Macquarie and the impact from the Crestwood Drive fire. However, there have been promising signs of recovery demonstrating the resilience of Australia's wildlife. In the last couple of weeks there have been multiple sightings of juvenile endangered Green and Golden Bell Frog's (*Litoria aurea*) at Lake Innes, Innes Swamp and Lake Cathie. The exact breeding location for this species is currently unconfirmed.

At the height of the drought, Lake Innes was reduced in area by 75% and salinity levels in the lake reached 143 parts per thousand, which is roughly 3-4 times saltier than seawater. Poor water quality, including the exposure of high-risk acid sulphate soils (ASS) on the perimeter of Lake Innes, was exacerbated by the artificial opening of Lake Cathie in July 2018 ahead of the drought.

Rain events since February 2020 have filled Lake Innes and turned the lake brackish with salinity at 5 parts per thousand. Black swans have also benefited from the current large volume of freshwater in Lake Innes and active nesting sites have recently been recorded in the foreshore habitat around Lake Innes.

The NPWS has reviewed the Port Macquarie-Hastings Council REF and it is understood the proposed opening of Lake Cathie for flood mitigation purposes will involve the excavation of the sand berm at the mouth of Lake Cathie to create a channel approximately 135m long by 6m wide to a depth 0.8m AHD. This would again result in a rapid drop in the water level in Lake Innes to 0.8m AHD.

We acknowledge the risk of inundation to public and private infrastructure at Lake Cathie when the water level rises above 1.6m AHD. However, we believe there is an alternative way to mitigate flooding while at the same time protecting the habitat and values of Lake Innes Nature Reserve.

The NPWS supports beach berm scraping to 1.6m AHD as proposed by DPI Fisheries as an alternative to excavation of a channel to 0.8m AHD. This approach would minimise the potential impacts of artificial entrance modification to water levels and associated foreshore habitats and ecology in Lake Innes and Lake Cathie and prevent exposure of high-risk ASS bed sediments. It would also allow for natural breakout to occur during a future large rainfall event. The NPWS is willing to work with the council to identify a long-term solution to the estuary issues associated with Lake Cathie through the Coastal Management Process.

BCD Recommendation:

7. The NPWS supports beach berm scraping to 1.6m AHD as proposed by DPI Fisheries as an alternative to excavation of a channel to 0.8m AHD. This is considered a more appropriate approach to managing flood risk while seeking to minimise associated ecological impacts, than a full entrance channel excavation.

Acid sulfate soils

It is understood that the proposal is for the excavation of approximately 1670 m³ of sand material from the beach berm at the mouth of Lake Cathie to form a channel approximately 135 m long by 6 m wide to a depth of 0.8 m AHD. The purpose of these works is to reduce water levels within Lake Cathie to below 1.6 m AHD which will prevent inundation of private and public infrastructure. The following comments are in relation to potential impacts on coastal acid sulfate soils (ASS).

As a consequence of the June 2018 opening and subsequent dry season and drought, large areas of ASS were exposed and acidified in the Lake Innes Nature Reserve. There is currently high acidity (low pH) in both surface and subsurface materials particularly around the north and western margins of Lake Innes. This low pH is also coupled with high dissolved aluminium at levels 4-5 times higher than the level that is known to harm juvenile marine life (0.015mg.L⁻¹).

In section 1.4 on p. 26, PMHC accepts that “rapid acidification of Monosulfidic Black Oozes (MBOs) is likely to occur after every lake opening event”. This acidity is likely to be drawn into the post-opening discharging water column. The REF considers that “It is also important to note that MBO-derived acidity is readily neutralised in the water body as carbonate levels increase with the ingress of seawater on flood tides during lake entrance opening periods”. This is pure conjecture because the relevant studies have not been completed that would inform the magnitude of the risks of ASS discharges. The report Lake Cathie and Lake Innes Acid Sulphate Soil Risk Assessment (Aaso, 2019) is preliminary and does not support the proposed activity. This preliminary report appears to be the only specific work relied on in the REF, which notes that “More studies need to be completed to understand this issue”.

Rather, in order to mitigate potential risks, the perimeter of Lake Innes that was acidified with the last opening / drought event should be kept wet. That is, water levels in Lake Innes should be retained at a minimum of 1 m AHD. If this is achieved, it is likely that biogeochemical processes will convert labile acidity back into elemental pyrite over the next month or two. This will in turn increase pH and should help reduce the toxicity of dissolved aluminium. Retaining water by a shallow opening should greatly assist in reducing the risk of pollution within the meaning of the POEO Act 1997.

BCD Recommendation:

8. In order to mitigate acid sulfate soil risks, attempts should be made through the entrance management process to retain water levels at a minimum of 1m AHD in Lake Innes.

Department of
Primary Industries

OUR REF: C20/268

11 May 2020

Ms Hannah Frankel
Senior Property Management Officer
Department of Planning, Industry and Environment – Crown Lands
PO Box 2215
DANGAR NSW 2309
Via email: hannah.frankel@crowland.nsw.gov.au

Dear Ms Frankel

Re: s199 Referral # C20/268 for dredging and reclamation work by Port Macquarie Hastings Council associated with excavation of the sand berm at the mouth of Lake Cathie for flood mitigation purposes, Crown Land adjacent Lot 7023 DP1025315, Lake Cathie, PMHC LGA

Reference is made to Department of Planning, Industry and Environment - Crown Lands' approval of dredging and reclamation works associated with the above mentioned project forwarded to DPI Fisheries on 6 May 2020.

DPI Fisheries, a division within the Department of Primary Industries, assesses applications for dredging and reclamation works, harm marine vegetation, and obstruction of fish passage in accordance with Part 7 of the *Fisheries Management Act 1994* (FM Act) and the *Policy and Guidelines for Fish Habitat Conservation and Management (2013 Update)* (DPI Fisheries P&G).

Section 199 (s199) of the FM Act (refer to Attachment 1) is applicable to this proposal because it pertains to dredging and reclamation works to be authorised by a public authority (other than a local government authority). Section 199 requires the proposal to be referred to the Minister for Primary Industries and that the public authority considers any matters concerning the proposed works raised by the Minister, prior to works being approved or undertaken by a public authority.

It is highlighted that, as Department of Planning, Industry and Environment - Crown Lands has already provided a licence to undertake the subject works to Port Macquarie Hastings Council (the proponent), the proponent is now lawfully able to undertake works consistent with those described within the Port Macquarie Hastings Council Review of Environmental Factors (REF) dated 9 April 2020.

It is noted that the Crown Land licence includes a condition for works not to commence until after the proponent receives recommendations provided by DPI Fisheries in accordance with s199 of the FM Act. *This is not consistent with the requirements of s199 of the FM Act.* Therefore, this response is directed to Department of Planning, Industry and Environment - Crown Lands in accordance with the consultation provisions of s199. Please note that this correspondence has also been provided directly to the proponent.

Division of Primary Industries, DPI Fisheries
1243 Bruxner Highway, WOLLONGBAR NSW 2477
Ph: 02 6626 1375 ABN: 72 189 919 072 www.dpi.nsw.gov.au

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Department of Primary Industries

DPI Fisheries has reviewed the subject proposal and associated mitigation measures outlined in the application, in particular, the Port Macquarie Hastings Council REF dated 9 April 2020. It is understood that the proposal is for the excavation of approximately 1670m³ of sand material from the beach berm at the mouth of Lake Cathie to form a channel approximately 135m long by 6m wide to a depth of 0.8m AHD, and that the excavated material will be retained within the beach berm area. The purpose of these works is to reduce water levels within Lake Cathie to below 1.6m AHD which will prevent inundation of private and public infrastructure.

Lake Cathie and Lake Innes are an Intermittent Closed and Open Lake and Lagoon (ICOLL) system and, in accordance with the habitat sensitivity guidelines within the DPI Fisheries P&G, includes a mix of highly and moderately sensitive key fish habitats. The Lake system consists of a large proportion of State Environmental Planning Policy mapped Coastal Wetlands and is an important recreational fishing area. Lake Innes is also an important location for commercial fishing. It is also noted that the Lake system has been subject to past anthropogenic impacts including artificial entrance modification.

DPI Fisheries has concerns about the potential adverse ecological impacts of the current proposal. Artificial entrance openings of ICOLLs, such as that proposed in Lake Cathie, can lead to immediate unintended ecological impacts such as large scale fish kills. In addition, poorly timed artificial openings, such as those occurring before periods of drought, can cause long term low level, hypersaline, high temperature water which can also contribute to adverse ecological impacts such as fish kills and habitat loss. The latter scenario occurred within Lake Cathie/Lake Innes during the 2019-20 summer period following an artificial opening similar to the current proposal.

It is understood that the proponent has recently been working with key stakeholders to improve the management of Lake Cathie and Lake Innes through the development of a Coastal Management Program (CMP). Because of the age of the proponent's existing entrance management strategy (EMS) for the Lake system and our improved understanding of ICOLL management since the development of the original EMS, the CMP should also incorporate an updated EMS. The updated EMS will be informed by the outcomes and results of a range of yet-to-be-completed current and future monitoring and studies designed to better understand the characteristics of the Lake system.

Until the new EMS is developed, it is acknowledged that the risk of inundation to public and private infrastructure is still present and that an interim approach to entrance management that will alleviate the inundation risk is necessary. However, in the absence of necessary information to inform a best management practice approach to entrance management within the Lake system, and in light of the ecological risks of the current proposal, DPI Fisheries has and still recommends that the best interim approach is to focus on reducing the current inundation risk.

A typical lower risk action to address the risk of inundation of infrastructure associated with high water levels within ICOLLs is to scrape the beach berm to the desired elevation which allows water to drain to this level without complete draining of the entire ICOLL. Beach scraping as an interim option to prevent inundation of public and private infrastructure has previously been discussed with Port Macquarie Hastings Council and is a practice that is employed elsewhere in NSW.



Department of Primary Industries

In accordance with the submitted REF, a sufficient water level that would prevent inundation of public and private infrastructure within the Lake system catchment has been identified as 1.6m AHD. For the Lake Cathie/Lake Innes system, scraping of the beach berm to this level would provide the following benefits:

- Prevention of flooding to private and public infrastructure above 1.6m AHD;
- A reduced risk of a significant and rapid drop in water level associated with channel excavations which have the potential to cause fish kills, habitat loss and poor water quality;
- A reduced risk of extended periods of low water levels, which are associated with channel excavations, causing poor water quality;
- Allowance for a natural breakout to occur during future rain events; and
- Provision of an environmentally, socially and economically acceptable interim approach until a long term, best management practice entrance strategy is developed.

In accordance with Section 199 (1)(b) of the FM Act, the matters raised within Attachment 2 of this notice should be considered.

However, it is again highlighted that the issued licence authorises the proponent to lawfully undertake works consistent with those described within the Port Macquarie Hastings Council Review of Environmental Factors (REF) dated 9 April 2020.

The matters raised by DPI Fisheries are intended to ensure that impacts to key fish habitats will be avoided or minimised to a level consistent with the requirements of DPI Fisheries P&G and relate to the Department's responsibilities for ensuring fish stocks are conserved and that there is "no net loss" of key fish habitats upon which they depend. The protection of key fish habitats provides for viable commercial fishing and aquaculture, quality recreational fishing and the continuation of Aboriginal cultural fishing within NSW.

If you have any queries, please contact me on 02 6626 1375 or jonathan.yantsch@dpi.nsw.gov.au.

Yours sincerely

Jonathan Yantsch

Senior Fisheries Manager – Coastal Systems (North Coast)

Authorised delegate of the Minister for Primary Industries under s199

Cc: **Scott Anderson**, Hastings District Fisheries Officer
Bradley Harrison, Fisheries Conservation Compliance Officer
Blayne West, Port Macquarie Hastings Council
Silas Sutherland, DPIE - Crown Lands
John Schmidt, DPIE - EES



Department of Primary Industries

Attachment 1

Fisheries Management Act 1994 No 38

Part 7 Division 3 Section 199

199 Circumstances in which a public authority (other than local authority) may carry out dredging or reclamation

- (1) A public authority (other than a local government authority) must, before it carries out or authorises the carrying out of dredging or reclamation work:
 - (a) give the Minister written notice of the proposed work, and
 - (b) consider any matters concerning the proposed work that are raised by the Minister within 21 days after the giving of the notice (or such other period as is agreed between the Minister and the public authority).
- (2) Any such public authority is to notify the Minister of any dredging or reclamation work that it proposes to carry out or authorise despite any matter raised by the Minister. The Minister may, within 14 days after being so notified, refer any dispute to the Minister responsible for the public authority. If the dispute cannot be resolved by those Ministers, it is to be referred to the Premier for resolution.
- (3) In this section, public authority includes the Minister administering the *Crown Land Management Act 2016*.



Department of Primary Industries

Attachment 2

MATTERS FOR CONSIDERATION UNDER s199 of the *Fisheries Management Act 1994*

The proposal

1. DPI Fisheries recommends that the artificial entrance management proposal, which is required to prevent inundation of public and private infrastructure, is amended to include scraping of the beach berm to a level of 1.6m AHD only as opposed to excavation of a channel to 0.8m AHD.
Reason – To minimise the potential impacts of artificial entrance modification to ICOLL water quality and levels and on fish and key fish habitats.

Erosion and sediment control

2. Sediment entering into waterways can directly impact on key fish habitats. DPI Fisheries recommends that, if Department of Planning, Industry and Environment - Crown Lands authorise the works, the approval incorporates a condition that ensure:
 - Erosion and sediment mitigation devices are erected and managed in accordance with all applicable requirements of the Blue Book (i.e. Landcom [2004], *Managing Urban Stormwater: Soils and Construction* [4th Edition]) (<http://www.environment.nsw.gov.au/resources/water/BlueBookVol1.pdf>); and
 - Stockpiles are located away from adjacent on water land¹, marine vegetation² (saltmarsh, mangrove, and seagrass) and riparian and aquatic vegetation³.*Reason – To ensure that sediment generated by the exposure of soil is not transported into the aquatic environment.*

Instream works

3. Instream works can impact on key fish habitats. DPI Fisheries recommends that the proponent ensures that:
 - Machinery is restricted from entering or working from the waterway unless in accordance best management practice and an agreed work method statement;
 - Machinery is appropriately cleaned, degreased and serviced prior to use at the site and entry into the waterway; and
 - Emergency Spill Kits appropriate for containing and cleaning up petroleum and solvent product spills within waterways be available on site at all times during works.*Reason – To reduce the threat of an unintended pollution incident impacting upon the aquatic environment.*

¹ "Water land" means land submerged by water:

a) whether permanently or intermittently, or
b) whether forming an artificial or natural body of water,
and includes *wetlands* and any other land prescribed by the regulations.

Wetlands include marshes, mangroves, swamps, or other areas that form a shallow body of water when inundated intermittently or permanently with fresh, brackish or salt water, and where the inundation determines the type and productivity of the soils and the plant and animal communities.

² "Marine vegetation" means any species of plant that at any time in its life must inhabit water (other than fresh water).

³ "Aquatic vegetation" is a term used to describe native vegetation that inhabits freshwater but does not include noxious weeds within the meaning of the *Noxious Weeds Act 1993*.



Department of Primary Industries

Avoiding harming marine vegetation

4. Marine vegetation including seagrass, mangroves, saltmarsh and kelp is not to be harmed or removed during the undertaking of works outlined in this s199 consultation. A separate authority under s205 of the *Fisheries Management Act* 1994 is required to harm marine vegetation.
Reason – To ensure that impacts on aquatic habitats are appropriately managed and minimised.

Fish kill contingency

5. DPI Fisheries maintains a fish kill database. To limit the potential of a fish kill incident, DPI Fisheries recommends that the proponent be advised to undertake a visual inspection of the waterway for dead or distressed fish (indicated by fish gasping at the water surface, fish crowding in pools or at the creek's banks) twice daily during the works. Observations of dead or distressed fish should be immediately reported to the Contact Officer by the proponent. If a fish kill occurs, DPI Fisheries recommend works cease until the issue causing the kill is rectified.
Reason – Fish kills are also potentially contentious incidents from the public perspective. DPI Fisheries needs to be aware of fish kills so that it can assess the cause and recommend ways to mitigate further incidents in consultation with relevant authorities. Work practices may need to be modified to reduce the impacts upon the aquatic environment.

File reference: 20/02854

Licence: RN 618957

L I C E N C E**Crown Land Management Act 2016 – Section 2.20**

The Minister administering the Crown Land Management Act 2016, (hereinafter referred to as the Minister) grants to **PORT MACQUARIE-HASTINGS COUNCIL Cnr Lord & Burrawan Sts PORT MACQUARIE NSW 2444** (licensee hereinafter referred to as You) a Licence pursuant to the provisions of Section 2.20 of the Crown Land Management Act 2016 in respect of the land described hereunder in Parts 1 and 2.

DESCRIPTION OF LANDS**PART 1**

Local Govt. Area	PORT MACQUARIE-HASTINGS		
County	MACQUARIE		
Parish	QUEENS LAKE, MACQUARIE		
Locality	LAKE CATHIE		
Status:	Lot	Section	DP
Crown land being part	7023		DP: 1025315
Crown land located near	17		DP: 1099133

PART 2

Plan/diagram: Schedule 3	Area: 800m2
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TEXT DESCRIPTION: Part Lot 7023 DP 1025315 (Reserve 63945 for Public Recreation notified 19 May 1933, Reserve 40302 for Drainage notified 7 March 1906 and Regional Crown Reserve 1012028 for Access, Public Requirements, Tourism Purposes, Environmental and Heritage Conservation, notified 04 August 2006 and Regional Crown Reserve 1012048 for Access, Public Requirements, Tourism Purposes, Environmental and Heritage Conservation, notified 04 August 2006), Crown Land below the mean high watermark of Lake Cathie (Reserve 1011268 for Future Public Requirements notified 3 February 2006 and Reserve 1012048), Unidentified Crown land located near Lot 7023 DP 1025315 (Reserve 1012048) and part Crown Public road located near Lot 17 DP 1099133 as shown in blue colour on Schedule 3 Diagram.

EXECUTION

Dated this 8th day of May 20 20.

THE MINISTER

Khan
as delegate of the Minister
administering the Crown Land
Management Act 2016

Kerrie Carr
name and position
A/Supervisor Business Centre
Licences & Searches

THE LICENSEE

In consideration of the grant of this Licence I / We agree to be bound by the terms, conditions and provisions of the Licence.


Certified on behalf of the corporation named below by the authorised person(s) whose signature(s) appear(s) below pursuant to the authority specified.

Corporation: PORT MACQUARIE-HASTINGS COUNCIL ABN 11 236 901 601

Authority: Section 127 of the Corporation Act 2001

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Signature of authorised person:
Name of authorised person: Craig Swift-McNair
Office held: General Manager, Port Macquarie-Hastings Council
Signature of authorised person: _____
Name of authorised person: _____
Office held: _____


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The parties acknowledge and agree that the Licence is subject to Schedule 1, Schedule 2, and any additional Schedules or documents referred to in Schedule 1 and the following conditions;

1. This Licence is subject to the provisions of the Crown Land Management Act 2016.
2. You must pay Department of Planning, Industry & Environment - Crown Lands the licence fees specified in Item 6 of Schedule 1 on or prior to the date that this licence commences.
3. The Licence remains in force for the period specified in Item 5 of Schedule 1. The Minister may in his absolute discretion revoke this Licence at any time by serving on You a notice in writing revoking this Licence. You will not be entitled to any compensation costs or damages in respect of the revocation of this Licence.
4. You must not interfere with any other person authorised by the Minister to use the licensed area referred to in Item 4 of Schedule 1 ('licensed area') or any part thereof.
5. You must not use the land specified in the licensed area except for the purpose(s) authorised by this licence as set out in Item 4 of Schedule 1.
6. You shall comply with all the special conditions set out in Schedule 2.
7. Any notice provided for in this licence shall be deemed to be validly served on You if;
 - a. it is personally served on You or where You are a corporation or association, on an officer of the corporation or association; or
 - b. it is sent by prepaid ordinary mail addressed to You at the address shown in Item 1 of Schedule 1.
8. You acknowledge and agree that the Minister does not make or give any warranty, promise or covenant to You for quiet enjoyment of the licence area and does not grant You any interest in the land.
9. You shall keep the said licensed area and buildings on the licensed area clean and tidy and all papers and other rubbish shall be collected and removed. You shall control noxious weeds. You shall immediately repair and make good, damage occasioned by Your use of the licensed area.
10. You shall indemnify and keep indemnified the Minister against all actions, suits, claims, debts, obligations and other liabilities that may arise from the activities of You during the currency of the Licence. You release the Minister from all actions, suits, claims, debts, obligations and other liabilities by You or anyone claiming through You that may arise from the activities of the licensee under the Licence or in relation to the licensed area.
11. You shall effect and maintain for the term of this licence a public risk insurance policy (whereby the Minister must be noted on the policy as an interested party) for the amount specified in Item 7 of Schedule 1 for any one claim relating to liability for death or bodily injury or damage to property arising out of Your use and occupation of the licensed area and the matters referred to in clause 10. You shall provide evidence of such insurance whenever requested by any employee of the Department of Planning, Industry & Environment - Crown Lands.
12. You shall maintain all other insurances as may be required by the Workers' Compensation Act 1987 or any other Act or Acts of Parliament in regard to the conduct of activities of You on the licensed area.
13. You acknowledge and agree that no relationship of landlord and tenant is or is intended to be created between the parties hereto by virtue of this Licence or in any way whatsoever.
14. You must comply with the Work Health and Safety Act 2011 (NSW), the Work Health and Safety Regulation 2017 (NSW) and all other requirements of any other legislation or statutory authority in this regard whilst on the licensed area.
15. The Minister reserves the right to remove from or refuse entry to the licensed area any person regardless of any arrangements or contract with You.
16. All improvements, erections and fixtures ("Improvements") now or hereafter to be erected on the licensed area are acknowledged by You to be absolute property of the Minister, but You shall maintain and repair such Improvements during the period of this licence to the same condition that the Improvements were in on the date that this Licence commenced.
17. You shall not sublet, assign or otherwise deal with this Licence or the licensed area.

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18. Despite anything else in this Licence, this Licence shall terminate in the event that the Minister or a court determines that the licensed area is claimable Crown land under Aboriginal Land Rights Act 1983. You will not be entitled to any compensation, costs or damages in respect of the termination of this Licence by operation of this clause.
19. Despite anything else in this Licence, You agree to and approve of the transfer or termination of this Licence without any further notice if an Aboriginal Land Agreement (ALA) within the meaning of section 36AA(1) of the *Aboriginal Land Rights Act 1983*, affecting the land or part thereof, provides for the transfer or termination of this Licence. Except as may be expressly provided for in this Licence, You acknowledge and agree that You will not be entitled to any compensation, costs or damages in respect of the transfer or termination of this Licence by operation of this clause. You agree that the date of transfer or termination under this clause is the date provided for in the ALA, or if it is not so provided, the date the ALA is entered into. This clause constitutes an approval by You of the transfer or termination for the purposes of section 36AA(11) of the *Aboriginal Land Rights Act 1983*. The Minister may give notice to You of the transfer or termination of this Licence under this clause but is not required to do so to effect the transfer or termination.
20. You must comply on time with all laws and requirements of authorities in connection with this Licence, the licensed area, the purposes approved by this Licence and the use or occupation of the licensed area.
21. You must not contaminate, pollute or increase toxicity in the licensed area, any building in the licensed area or their environment or do anything in or around the licensed area which may be dangerous or offensive.
22. You must ensure that Your employees, agents, contractors and invitees comply with the licensee's obligations under this Licence.
23. You must not carry out any works in or on the licensed area without the Minister's written approval (which may be conditioned).
24. On the last day of the term of this Licence You must vacate the licensed area, remove all items You have brought onto the licensed area, repair any damage You have done to the licensed area and must leave the licensed area in a clean and tidy condition.

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Schedule 1

Item	Column 1 (description of variable particulars)	Column 2 (particulars)
1	Licensee's Address for service of notices	C/- Craig Swift-McNair PO Box 84 PORT MACQUARIE NSW 2444
2	Minister's Address for service of notices	Department of Planning, Industry & Environment - Crown Lands PO Box 2185 DANGAR NSW 2309
3	Address for payment of Licence Fee	Department of Planning, Industry & Environment - Crown Lands PO Box 2155 Dangar NSW 2309
4	Purpose for which the licensed area may be used	You shall have the use of the area described in Part 1 and Part 2 and as shown by red edge on the diagram attached as Schedule 3 (hereinafter called "the licensed area" for the purpose of Environmental Protection - Urgent opening of Lake Cathie for flood mitigation
5	Licence Period	The licence period shall be from 11th May 2020 to 10th May 2021. The Minister reserves the right to terminate the Licence without prior notice if there is a breach by You of any of the licence conditions.
6	Licence Fee	\$0.00
7	Insurance - Public Risk	Twenty Million Dollars (\$20,000,000.00)
8	Additional special terms and conditions	Annexed as Schedule 2

***** End of Schedule 1 *****

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Schedule 2

ADDITIONAL TERMS AND CONDITIONS

1. Native Title (Subdivision 24LA - Low Impact Future Act)

Restrictions on the grant of this Licence

- (a) Notwithstanding any other provision in this Licence, this Licence does not permit or authorise any of the following:
- (i) the excavation or clearing of any of the land or waters except for:
 - a. excavation or clearing that is reasonably necessary for the protection of public health or public safety; or
 - b. tree lopping, clearing of noxious or introduced animal or plant species, foreshore reclamation, regeneration or environmental assessment or protection activities; or
 - (ii) mining (other than fossicking by using hand-held implements); or
 - (iii) the construction or placing on the land, or in the waters, of any building, structure, or other thing (other than fencing or a gate), that is a fixture; or
 - (iv) the disposal or storing, on the land or in the waters, of any garbage or any poisonous, toxic or hazardous substance; or
 - (v) the conferral of a right of exclusive possession over any of the land or waters.

Termination of this Licence upon approved determination of native title

- (b) This Licence terminates immediately on the making of an approved determination under the Native Title Act 1993 (Commonwealth) ("NT Act") that native title exists in relation to the licensed area, in part or in whole, without any further notice or action.

Indigenous Land Use Agreement - New Licence

- (c) The Holder agrees that, if, prior to an approved determination under the NT Act that native title exists over the licensed area (in part or in whole):
- (i) an indigenous land use agreement ("ILUA") is registered on the Register of Indigenous Land Use Agreements and the area of land described in the ILUA includes the whole or the part of the licensed area of this Licence, and
 - (ii) the ILUA expressly provides that a new licence on the same or similar terms and conditions as this Licence is valid,
- then a new licence will take effect on the same terms and conditions as this Licence, without the need for the Holder to enter into any further documentation or take any other action, except that:
- (iii) the commencement date of the new licence will be the date the ILUA is registered on the Register of Indigenous Land Use Agreements;
 - (iv) (if applicable) the new licence will only be over that part of the licensed area of this Licence affected by the ILUA;
 - (v) clauses (b), (c), (d) and (e) of this special condition will not be terms of the new licence.

Terms of Native Title Determination - New Licence

- (d) The Holder agrees that if:
- (i) an approved determination under the NT Act is made that native title exists over the licensed area (in part or in whole); and
 - (ii) The terms of the approved determination under the NT Act expressly provides that a new licence on the same or similar terms and conditions as this Licence is valid,
- then a new licence will take effect on the same terms and conditions as this Licence, without the need for the Holder to enter into any further documentation or take any other action, except that:
- (iii) the commencement date of the new licence will be the date the determination is made;
 - (iv) (if applicable) the new licence will only be over that part of the licensed area of this Licence affected by the terms of the determination; and

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(v) clauses (b), (c), (d) and (e) of this special condition will not be terms of the new licence.

Avoidance of Doubt

- (e) For the avoidance of doubt, if a new licence takes effect due to the operation of clauses (c) or (d), the fact that the licence takes effect without the need for the Holder and the Minister to enter into any further documentation or take any other action includes that the licence takes effect without the Licensee being required to make a new licence application and without a new licence being issued.

2. Crown Road Access to be Provided

- (a) The Holder acknowledges that nothing in this Licence is inconsistent with the rights of passage and access that exist with respect to the part of the Land that is a Crown road.
- (b) The actions of the Holder under this Licence must not be inconsistent with the rights of passage and access that exist with respect to the part of the Land that is a Crown road.

3. Work Health and Safety

The Holder is responsible for safety induction of all persons onto the site. The Holder is responsible at all times for ensuring safe systems of work and that the site poses no work, health or safety risks to workers or the public. All persons engaged in the activity relative to this approval must be qualified, trained or appropriately experienced or supervised in the running of the event including the safe operation of associated equipment, tools or machinery. Relevant advice should be obtained from NSW WorkCover.

4. Approvals

The Holder must ensure that all licences, permits and approvals are obtained and maintained as required throughout the life of the event. No condition of this Licence removes the obligation for the Holder to obtain, renew or comply with such licences, permits or approvals. The Holder must ensure that a copy of this Licence and all relevant approvals are available during the Licence term. The requirements of all relevant approvals including consent issued by local government must be met by the Holder.

5. Site

The licence holder shall ensure that the sites will be left clean and tidy on completion of works.

6. Relics

- (a) Unless authorised to do so by a permit under Section 87 or a consent under Section 90 of the National Parks and Wildlife Act 1974 and subject to observance and compliance with any conditions imposed on the grant of such permit or consent the Holder will not knowingly disturb destroy deface or damage any aboriginal relic or place or other item of archaeological significance within the land and shall take every precaution in drilling excavating or carrying out other operations or works in the Land against any such disturbance destruction defacement or damage.
- (b) If the Holder becomes aware of any aboriginal relic or place or other item of archaeological significance within the Land the Holder will within 24 hours notify the Director National Parks and Wildlife Service of the existence of such relic place or item.
- (c) The Holder will not continue any operations or works on the Land likely to interfere with or disturb any relic place or item referred to in subclause (b) without the approval of the Director National Parks and Wildlife

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Service and the Holder will observe and comply with all reasonable requirements of the Director in relation to the carrying out of the operations or works.

7. Artefacts

All fossils artefacts coins articles of value articles of antiquity structure and other remains or things of geological historical or archaeological interest discovered on or under the surface of the Premises shall as between the Minister and the Holder be deemed to be the absolute property of the Minister and the Holder will as authorised by the Minister watch or examine any excavations and the Holder will take every precaution to prevent such articles or things being removed or damaged and shall immediately upon discovery thereof notify the Minister of such discovery and carry out at the reasonable expense of the Holder the Minister's orders as to the delivery up or disposal of such articles or things.

8. Environmental Mitigations

All works are to be undertaken in accordance with the Review of Environmental Factors - Lake Cathie Opening - Flood Mitigation document dated 09/04/2020, prepared by Port Macquarie-Hastings Council.

9. Fisheries Consent

Works are not permitted to commence until recommendations are provided by DPI Fisheries, under Section 199 of the Fisheries Management Act 1994 for the proposal, as described in the referenced Review of Environmental Factors. If works are required to be undertaken prior to the response being received, the holder must consult with DPI Fisheries before undertaking any works.

10. Working near waterways

All machinery working adjacent to, or within waterways will have doubled-sheathed hydraulic lines, and where possible, use biodegradable oil, such as Panolin.

11. Spill Management

A spill kit must be readily available at the immediate worksite, with all crew members trained in its appropriate use.

12. Refuelling of Machinery

All refuelling of machinery must occur on the existing sealed carpark in vicinity of the lake. No refuelling is permitted to occur on the beach or within 20m of a waterway.

13. Threatened Species

The holder is to consult with NSW National Parks and Wildlife Service regarding any additional Threatened Species considerations prior to undertaking any works.

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Schedule 3



End of Schedule 3

Table 1: Environmental/Social Constraints and Benefits

Method of management	Environmental benefits	Environmental constraints/impacts	Social benefits	Social constraints/impacts
OPTION 1 (ORIGINAL COUNCIL PROPOSAL) Open channel excavation 0.8m AHD	<ul style="list-style-type: none"> - Reduces the likelihood and risk of sewer infrastructure flood water inundation - Allows aquatic life to leave the lake system into the ocean - Reduced flood water inundation of public infrastructure - Reduced risk of flood water inundation of private property 	<ul style="list-style-type: none"> - Impacts of foreshore habitats including habitat for the Green and Golden Bell Frog and Black Swans. - Exposure of Acid Sulphate soils (recommendation is to keep Lake Innes water levels at a minimum of 1m AHD). - A risk of a significant and rapid drop in water level associated with channel excavations which have the potential to cause fish kills, habitat loss and poor water quality. - The lake closing quickly due to sand inundation to the mouth. - Lack of substantial rainfall received after an opening to this depth may result in a water level remaining at a low level, which may result in a situation similar to that in late 2019 where water quality declined significantly and acid sulphate soils were exposed. 	<ul style="list-style-type: none"> - Provides a perceived social and economic benefit - Responds to community expectations and desire 	<p>Negative impacts of the lake emptying may include:</p> <ul style="list-style-type: none"> - Possible increase in mosquitoes - Low water level impacts recreational use and amenity - Decline in water quality impacts recreational use - Smell from fish kills and decaying vegetation that was previously inundated - Closing of the lake quickly may reignite community concern - Reduction of commercial and recreational fishing opportunities

		<ul style="list-style-type: none"> - The full flush of the Lake with fresh ocean water is highly unlikely. - Unknown impacts of raising salinity levels on the existing EECs, which exist within tight ecotonal environments, governed by salinity and water level regimes, such as Coastal Saltmarsh, Swamp Oak Floodplain Forest and Swamp Sclerophyll Forest. - Consideration should also be given to how raised salinity levels will impact dieback and/or leaf nutrition of important koala food trees. - Australasian Bittern favours permanent freshwater wetlands and changing salinity levels are likely to impact this species - Potential risk of pollution as defined by the POEO Act. 			<ul style="list-style-type: none"> - Higher water level allows recreational use to be retained - Greater amenity value from high water level 	<ul style="list-style-type: none"> - May not meet community expectations - Relies more heavily on natural processes to provide the 'full
		<ul style="list-style-type: none"> - The full flush of the Lake with fresh ocean water is highly unlikely. - Inundation of minor infrastructure such as footpaths may remain for a longer period 				
OPTION 2 (DPIE and DPI PROPOSAL)	<ul style="list-style-type: none"> - This activity carries less risks for upstream environments. - The opening process will occur naturally and 					

Berm Scraping 1.6m AHD	<p>the resulting lake level is determined naturally</p> <ul style="list-style-type: none"> - Retaining water by a shallow opening should greatly assist in reducing the risk of pollution within the meaning of the POEO Act 1997. - Reduces the risk of Acid Sulphate Soil exposure and associated decline in water quality - Reduces the likelihood and risk of sewer infrastructure inundation - Less sand requiring displacement 		<p>Retention of environmental values and tourism</p> <ul style="list-style-type: none"> - 	<p>lake flush' that a portion of the community desires.</p> <ul style="list-style-type: none"> - Full use of the lake foreshore may be delayed until natural opening occurs - Delayed alleviation of flooding of minor infrastructure such as stormwater drains - Risk of community instigated opening occurring and associated safety concerns - Commercial and recreational fishing opportunities
<p>Option 3 Do nothing</p>	<p>The opening process will occur naturally and the resulting lake level is determined naturally</p> <ul style="list-style-type: none"> - Reduces the risk of Acid Sulphate Soil exposure and associated decline in water quality 	<ul style="list-style-type: none"> - Increases the likelihood and risk of sewer infrastructure and flood water inundation of public and private infrastructure - Inundation of minor infrastructure such as footpaths may remain for a longer period 	<ul style="list-style-type: none"> - Higher water level allows recreational use to be retained - Greater amenity value from high water level - Retention of environmental values and tourism 	<ul style="list-style-type: none"> - May not meet community expectations - Risk of community instigated opening occurring and associated safety concerns - Delayed alleviation of flooding of minor

infrastructure such as stormwater drains Full use of the lake foreshore may be delayed until natural opening occurs -				
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