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Your reference: DA 195-8-2004-MOD 2  
Our reference: DOC19/411796  
Contact: Calvin Houlison  
4224 4179

Jack Murphy  
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Department of Planning & Environment

Via e-mail: [jack.murphy@planning.nsw.gov.au](mailto:jack.murphy@planning.nsw.gov.au)

Dear Mr Murphy

**RE: Dunmore Lakes Sand Extraction Modification 2 (DA 195-8-2004-MOD 2) – OEH Comments**

Thank you for referring the abovementioned major project modification to us for comment. We understand that the proposed modification comprises sand extraction in two new areas to the south of Riverside Drive known as "Stage 5A" and "Stage 5B", importation of fill, access road, pipeline infrastructure and associated site works.

Our key comments on the proposed modification are summarised below and detailed at Attachment A:

**Biodiversity & Offsets**

- We recommend the proponent prepare a biodiversity offset strategy for submission at an early stage prior to determination of the modification. The strategy should outline how residual impacts will be offset in accordance with the *Biodiversity Conservation Regulation 2017* and supporting guidance, including confirmation of whether payment into the Biodiversity Conservation Fund is proposed.
- We recommend that conditions of consent be imposed requiring retirement of the requisite ecosystem and species credits as outlined in the BDAR, to be secured prior to the impact occurring. Further advice on wording of conditions can be provided at a later stage in the project assessment.

**Aboriginal Cultural Heritage**

- There are three recorded Aboriginal cultural heritage sites that would be totally and directly harmed by the modification area. Two of the sites proposed to be impacted are of high cultural and moderate to high archaeological significance. No conservation measures are proposed, and members of the Aboriginal community have raised concerns with the proposal. The archaeological deposits are in the same landforms as the sand that is proposed to be extracted. The conclusion of no 'significant impacts' arising from the proposal does not consider the loss of Aboriginal heritage through this expansion.
- We recommend that conservation options be considered for the proposed modification, given the significance of the Aboriginal heritage sites. If the proposed modification proceeds, partial conservation may be achieved by avoiding harm to the south east corner of extraction area Stage 5A and the eastern side of Stage 5B. Further consideration of the cumulative impact of development on sites of this type in the region, and an assessment of any associated archaeological deposits in

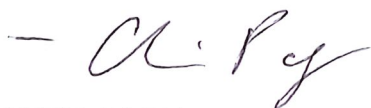
the remaining sand body at Minnamurra, would assist to fill existing gaps in the assessment and more fully establish the extent of proposed impacts.

### **Floodplain Risk Management & Water Quality**

- The flood information provided in the Surface Water Assessment Report (2019) is limited, and no flood extents maps have been provided nor have flood impacts been assessed. Furthermore, and in contrast to current operations, the proposed modification will result in a loss of floodplain storage during operation due to the proposed bunding of excavation pits. We therefore recommend that an assessment for the full range of floods up to the probable maximum flood (PMF) be undertaken in both Stages 5A and 5B. This assessment should address existing and developed scenarios, flood impacts and trafficability, including implications for accessibility for emergency services and isolation.
- Whilst the environmental assessment describes the existing environmental setting and assesses the potential direct impacts associated with the modification, it does not conclusively address potential cumulative impacts to adjoining and downstream environments. It is therefore recommended that further information be provided to characterise potential adverse cumulative impacts on adjoining coastal wetlands, including the proposal's influence on the environmental health of the Minnamurra River estuary, in accordance with the relevant coastal management and regional planning policy frameworks.

Please do not hesitate to contact Calvin Houlison, Senior Conservation Planning Officer on 4224 4179 or [calvin.houlison@environment.nsw.gov.au](mailto:calvin.houlison@environment.nsw.gov.au) should you have any further queries.

Yours sincerely



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Enclosure: Attachment A OEH Detailed Comments on Dunmore Lakes Sand Extraction Mod 2 EA

## OEH DETAILED COMMENTS ON DUNMORE LAKES SAND EXTRACTION MODIFICATION 2 (DA 195-8-2004 MOD 2)

### 1. Biodiversity & Offsets

#### *Background & legislative context*

The NSW *Biodiversity Conservation Act 2016* (BC Act) commenced on 25 August 2017. Major projects including modifications are now required to assess biodiversity impacts in a Biodiversity Development Assessment Report (BDAR) and provide offsets in accordance with the Biodiversity Assessment Method (BAM). The proposed modification has assessed biodiversity impacts by way of a BDAR and comments on this assessment are provided below.

#### *Review of BDAR*

The BDAR (Niche, 2019) has assessed the biodiversity impacts associated with the proposal and calculated an offset obligation for these impacts in accordance with the BAM. This includes offsetting of both ecosystem and species credit impacts associated with the development of the site.

Whilst the site contains biodiversity values, including threatened ecological communities (TECs) and threatened species habitat, the majority of the higher quality values have been avoided, and impacts minimised to a small portion of the site. These impacts are proposed to be offset to compensate for this loss. Subject to the offsetting of the identified impacts, the proposal is unlikely to result in a significant impact upon biodiversity.

#### *Securing of offsets & offset strategy*

Should the proposed modification be recommended for approval, we recommend that conditions of consent be imposed requiring retirement of the requisite credits as outlined in the BDAR. In accordance with the BAM, offsets must be secured prior to the impact occurring. We support preparation of a biodiversity offset strategy (BOS) describing how the requisite credits are to be secured at an early stage. Proposed rehabilitation measures should also be detailed as part of the BOS and finalised in consultation with OEH, prior to impacts occurring.

The BOS should outline the preferred options for offsetting residual impacts of the proposed development including confirmation whether payment into the Biodiversity Conservation Fund is proposed. Where like-for-like credit retirement is not proposed and the variation rules will be used, the BOS must provide evidence demonstrating that like-for-like credits are not available in accordance with Division 6.1 of the *Biodiversity Conservation Regulation 2017* and relevant supporting guidance:

- [Ancillary rules: Reasonable steps to seek like-for-like biodiversity credits](#) (OEH 2017)
- [Ancillary rules: Impacts on threatened entities excluded from variation](#) (OEH 2017)

Further advice on appropriate conditions of consent in accordance with the advice above can be provided to DPE at Response To Submissions stage.

## 2. Aboriginal Cultural Heritage

### *Key Aboriginal cultural heritage recommendations*

- The outcomes of the Aboriginal community consultation and Aboriginal cultural significance should be included in the Environmental Assessment (EA).
- If the expansion proceeds, options to reduce the extraction areas to conserve parts of the identified Aboriginal heritage sites should be investigated.
- An Aboriginal cultural heritage management plan should be developed if the expansion is approved.
- The ACHAR should include an assessment of cumulative impact.
- The ACHAR should consider lands adjoining the proposed extraction area, whether archaeological deposits of a similar nature are present in those lands, and if there are potential heritage conservation options on that land.

We have also included more minor recommendations in the detailed comments below.

### *Aboriginal community consultation*

Aboriginal community consultation has occurred with the nineteen Registered Aboriginal Parties (RAPs) for this project. Support of the ACHAR was received from seven of the RAPs. Woronora Plateau Gundungara Elders Council (WPGEC) has objected to the proposed sand extraction (KNC 2019, pp.76-79). The WPGEC submission includes a petition signed by 35 Aboriginal community members who oppose the quarry expansion. Some of the people who have signed the petition are also RAPs for this project.

WPGEC argue that:

- Extending the quarry for 3-4 years will cause *'irreparable and complete destruction of a rare and valuable natural and cultural landscape'*.
- The land is one of *'very few undisturbed estuarine environments remaining the Illawarra region... holds an intact and rich archaeological site and encompasses land of cultural and modern historical importance'*.
- The test excavation results provide enough archaeological information and therefore the proposed salvage excavations are not required if the expansion does not proceed.
- The proximity to the massacre site (approximately 500m south) and the Minnamurra River should result in appropriate respect for *'the site and its surrounds'*.
- The landscape is likely to contain Aboriginal burials, unconnected to the massacre site.

KNC (2019, p.7) has responded to WPGEC that the proposed salvage excavation will provide information to mitigate the loss of sites and help manage archaeology in similar sand bodies. They argue that the archaeology does not connect to the massacre site.

The outcomes of the Aboriginal community consultation should be included in the EA. The EA should also consider the Aboriginal cultural significance (EA pp.91-92).

### *No conservation measures are proposed*

No conservation measures are proposed. The WPGEC submission requests that no extraction occurs given the harm to Aboriginal heritage that will be caused.

If the development proceeds, we recommend reducing the extraction areas to conserve parts of the identified Aboriginal heritage sites. For example, conservation may be achieved by avoiding harm to the south east corner of extraction area Stage 5A and the eastern side of Stage 5B. However, this may not remove the requirement for additional archaeological excavation and salvage in the remaining parts of the extraction areas.

### *Cumulative impact*

The ACHAR should include an assessment of cumulative impact. The assessment should consider loss of sand deposits in this area and accompanying loss of Aboriginal cultural heritage.

We also suggest the assessment should consider lands adjoining the proposed extraction area, whether archaeological deposits of a similar nature are present in those lands, and if there are potential heritage conservation options on that land.

### *Archaeological test excavations*

KNC (2018) excavated 45 test pits within the proposed expansion area under the Code of Practice for Archaeological Investigation of Aboriginal objects in NSW. Three sites were identified. Two of these have high average artefact densities for this region (KNC 2019, p.50).

The test excavations have not accurately defined the bounds of the recorded sites. This means that the full nature and extent of these sites is not known. Test excavation should have continued beyond the high artefact bearing test pits on the edges of the test excavation areas to more accurately define the boundary of the archaeological deposit. However, it is likely that the archaeological deposit extends throughout the entire expansion areas.

The reliability of the test excavation program should be considered in light of Way (2017). This is given the potential for intact, clustered artefact scatters and the 20m spacing between test pits.

Additional information should be provided about the fill identified at test squares 1-3 (KNC 2019, p.31) and how this compares to areas of fill where there were intact sand deposits below. It is possible that excavating deeper than the fill may have identified underlying sand deposits, and associated archaeology. As this is in the proposed sand extraction area we presume there are sand deposits present that were simply not located by the archaeological test excavations.

### *Compliance with the Code of Practice*

Several pieces of additional information are required to comply with the Code of Practice for Archaeological Investigation of Aboriginal objects in NSW:

- Photographic and scale drawn records for the test pits must be provided in accordance with Requirement 16a (11) of the Code.
- The Code of Practice (16a, 9) requires that archaeological test pits are excavated to at least the base of Aboriginal object bearing units and must continue to confirm the soils below are culturally sterile. KNC must explain how this requirement of the Code has been met. KNC (2019, p.34) comments that it is possible that cultural material occurs in deeper sandy deposits.
- Survey coverage data in accordance with Requirements 9 and 10 of the Code is needed to help determine the effectiveness of the survey.

### *There is potential for burials to occur in this landscape*

Aboriginal burials are known to occur in sand deposits such as those at Dunmore and across the NSW South Coast. It can be very difficult to predict or identify burial locations through archaeological investigations. A procedure for the identification of Aboriginal remains is proposed, as KNC note that it is difficult to identify Aboriginal burials through test excavation (KNC 2019, p.7).

There are historic records of a massacre in 1818 at Minnamurra, thought to be approximately 500m south of the extraction area (KNC 2019, p.15). KNC (2019, p.7) report that the massacre site is not understood to be in the extraction area. However, the exact location of burials from the massacre is not known.

Consultation on a nearby AHIP application has indicated that the burial of William Walker (Woolongoolow) is near the Minnamurra River, although again the exact location is unknown (Biosis 2018, p.11).

Navin (1989, p.6) reports oral history from Mr Cedric Rutledge of 'Clevehurst', Jamberoo, that 'there is some knowledge of burials along the Minnamurra estuary near Dunmore', although no detail is provided of exact locations.

A further reference to burials in the Minnamurra region comes from Lilley (1987). Lilley reports that Mr Dick Henry of ILALC told him that almost 3000 Aboriginal people died in the Shellharbour area at the end of the eighteenth century, with the deaths caused by an epidemic (Lilley 1987, p.7). Mr Henry believes the dead were buried around the Minnamurra River.

*Clarification of whether additional sites will be harmed is required*

- Site 52-5-0253

The pumping station / booster pad, access road extension and pipeline corridor all occur in the vicinity of site 52-5-0253. The site card states that the boundaries of the site are not known. It does not appear that any test excavation has been conducted to establish the boundaries of this site. We recommend additional archaeological investigation to determine whether the proposed works will harm site 52-5-253. Justification of the KNC (2019, p.20) conclusion that site 52-5-0253 will not contain deep or intact archaeological deposits is required.

- Site 52-5-0117

The site card for site 52-5-0117 describes several areas of exposed archaeological material. The site is mapped south of Stage 5B however we recommend further archaeological assessment to clarify the extent and nature of the site, particularly whether it continues north into the Stage 5B extraction area.

*Archaeological salvage excavation is proposed*

Archaeological salvage excavation is appropriate as mitigation where harm to Aboriginal heritage sites cannot be avoided. KNC (2019, pp.83-85) provides a methodology for the proposed archaeological salvage excavation. In relation to this methodology, we recommend:

- The excavation of squares on 20m intervals be reconsidered to provide flexibility for squares to be excavated at smaller intervals.
- The methodology should include the size of the Phase 1 test pits and the indicative number of pits.
- More than 75-100m<sup>2</sup> of open area salvage excavation may be required, based on previous salvage excavations of similar sites. A minimum of 100m<sup>2</sup> of excavation will likely be required, and this may be required at both DLS Boral AFT 1 and 2. This is based on:
  - A larger open area may be needed to step down to reach deep deposits
  - Salvage of a similar size to excavations of similar sites assists comparison between sites.
  - The test excavations have not identified the extent of the sites, which could be very large.
  - If the Modification is approved these sites will be destroyed and the salvage excavation will be the only opportunity for the recovery of archaeological information.

*An Aboriginal cultural heritage management plan should be developed*

If this modification is approved, we recommend the applicant develop an Aboriginal cultural heritage management plan (ACHMP). The plan should provide a process to manage Aboriginal cultural heritage impacts and mitigation works through the life of the quarry. The ACHMP should be prepared in consultation with the RAPs. OEHL can also provide technical advice on preparing the ACHMP.

*Long term artefact management*

We recommend the long term management of excavated Aboriginal objects is determined as soon as possible. KNC (2019, p.57) suggest two options: lodging with the Australian Museum and reburial. This must be determined in consultation with the RAPs.

*Minor corrections to the ACHAR and EA are required*

There is a typographical error in section 7.2.1 of the EA (p.84): forty-five test pits, not sites, were excavated. We recommend this is corrected to avoid confusion.

The EA and ACHAR (KNC 2019, p.5) state there are nineteen Registered Aboriginal Parties for this project, however 20 RAPs are listed in the ACHAR. KNC must clarify whether Mr Caines is a RAP on this project. Gary Caines is missing from the list of RAPs at s4.1.3 of the Consultation Log (KNC 2019, p. 62). Mr Caines is also not listed on the notification of RAPs provided to OEH on 31 July 2018. However, Mr Caines is listed in Table 1 of the ACHAR (KNC 2019, p.5).

The ACHAR statement of significance (KNC 2019, p.52) should be updated to reflect the results of consultation, as it currently states that the significance assessment will be finalised after RAP review of the ACHAR.

*References*

- Biosis. 2018. Minnamurra Boardwalk, Minnamurra: Aboriginal cultural heritage assessment report. Unpublished report prepared for Cardno, dated 7 November 2018. (AHIMs report # 104075).
- Element Environmental Pty Ltd, 2019. Dunmore Lakes Sand Extraction project, Modification 2: Environmental Assessment (EA). Prepared for Dunmore Sand and Soil Pty Ltd, dated April 2019.
- Kelleher Nightingale Consulting Pty Ltd (KNC). 2019. Dunmore Lakes Sand Project – Stage 5 Modifications, Dunmore NSW, Aboriginal Cultural Heritage Assessment Report. Unpublished report prepared for Element Environment Pty Ltd and behalf of Dunmore Sand and Soil Pty Ltd, dated February 2019.
- Lilley, I. 1987. A Reappraisal of the Archaeological Impact of the Proposed Princes Highway Reconstruction – Minnamurra River to Bombo, Kiama. Unpublished report to Dames and Moore, dated April 1987. (AHIMS report #1525).
- Navin, K. 1989. An Archaeological Investigation of Proposed development Area at Dunmore, New South Wales, Unpublished report to Martin, Morris and Jones Pty Ltd dated October 1989. (AHIMS Report #1662).
- Way, A.M. 2017. Test-pitting and the detection of sub-surface sites: an example from Lake George, NSW. Australian Archaeology, DOI: 10.1080/03122417.2017.1307317.

### **3. Floodplain Risk Management & Water Quality**

*Floodplain Risk Management*

The proposed modification includes two new resource extraction sites, both of which are noted to be affected by flooding from various sources including the Minnamurra River, Rocklow Creek and local catchments. As such it will need to be considered in accordance with the NSW Government's Flood Prone Land Policy as set out in the NSW Floodplain Development Manual (2005). The flood assessment should consider the full range of floods up to the Probable Maximum Flood (PMF), and include assessment of:

- The impact of flooding on the proposal;
- The impact of the proposal on flood behaviour; and
- The impact of flooding on the safety of people for the full range of floods up to the PMF including issues linked with isolation and accessibility for emergency services.

The flood information provided in the Surface Water Assessment Report (2019) is limited. Flood extents for the 1% Annual Exceedance Probability (AEP) event are provided for the Stage 5A site only. Reference is provided to a Minnamurra River flood study (Connell Wagner, 1990) for Stage 5B, which was derived for

the North Kiama Bypass Environmental Impact Statement. While the results are of some relevance to the proposal, no flood extents maps are provided nor have flood impacts been assessed. Furthermore, results may not be suitable given changes in the catchment and modelling advancements which have occurred since the assessment was undertaken almost 30 years ago.

The flood modelling undertaken for Stage 5A indicates that Riverside Drive is inundated in a 1% AEP event, with depths predicted to increase by up to 50mm as a result of the proposal. As the main access road for Minnamurra, the potential for such increases to affect trafficability, accessibility for emergency services and isolation requires assessment for the full range of floods up to the PMF.

The modification is noted to result in a loss of floodplain storage during operation, due to the proposed bunding of excavation pits to protect surface water quality. This is inconsistent with the current project approval, which achieved no loss of floodplain storage by undertaking dredging and backfilling operations concurrently. It would be preferable to achieve a similar outcome for floodplain storage for the proposed modification, without compromising water quality outcomes.

It is therefore recommended an assessment be undertaken for the full range of floods up to the PMF at both sites for existing and developed scenarios, flood impacts and trafficability, including implications for accessibility for emergency services and isolation. The assessment should be undertaken utilising contemporary flood modelling techniques and all available topographic, rainfall and flood information covering all sources of flooding affecting the site.

#### *Coastal Wetlands and Estuary Health*

The proposed project is identified as being located within the coastal environment area and directly adjoins a location mapped as the coastal wetlands and littoral rainforest area under the *State Environmental Planning Policy (Coastal Management) 2018*. Whilst the environmental assessment describes the existing environmental setting and assesses the potential direct impacts associated with the modification, it does not conclusively address potential cumulative impacts to adjoining and downstream environments.

It is recommended that further information be provided that characterises any potential adverse cumulative impacts on adjoining coastal wetlands and how the proposal may influence the environmental health of the Minnamurra River estuary. This assessment should be consistent with the objects of the *Coastal Management Act 2016* and the objectives of the *State Environmental Planning Policy (Coastal Management) 2018* to demonstrate if the project is consistent with principles of the NSW Government's coastal management framework.

In reviewing the flood risk information as outlined above, the water quality controls (such as the bunding of excavation pits) proposed for the modification should be reviewed to ensure sustainable floodplain storage and water quality outcomes are achieved.

It is anticipated that water quality performance associated with site operations will be regulated through an environmental protection licence and managed through accompanying surface and groundwater monitoring and reporting requirements. If the project is recommended for approval, the suitability of the current environmental protection licence and how it may relate to the proposed modification should be confirmed through consultation with the Environmental Protection Authority.