Dunmore Lakes Project Modification 2

Development of Stage 5 Extraction Areas
State Significant Development Modification Assessment Report
(DA195-8-2004 Mod 2)

September 2020

Published by the NSW Department of Planning, Industry and Environment

dpie.nsw.gov.au

Title: Dunmore Lakes Project Modification 2

Subtitle: Development of Stage 5 Extraction Areas

Cover Image: View of Dunmore Lakes Stage 2 Progressive Rehabilitation (Departmental site visit 03 September 2020)

Glossary

Abbreviation	Definition
BCD	Biodiversity Conservation Division of the Department
Consent	Development Consent
Department	Department of Planning, Industry and Environment
EA	Environmental Assessment
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
EPI	Environmental Planning Instrument
EPL	Environment Protection Licence
ESD	Ecologically Sustainable Development
LEP	Local Environmental Plan
Minister	Minister for Planning and Public Spaces
MEG	Mining, Exploration and Geoscience within Regional NSW
RMS	Roads and Maritime Services within Transport for NSW
RR	Resources Regulator within Regional NSW
RTS	Response to Submissions
Secretary	Planning Secretary of the Department
SEPP	State Environmental Planning Policy

Executive Summary

Background

The Dunmore Lakes Sand Project is an established dredge sand extraction operation at Dunmore, in the Illawarra region of New South Wales. It is owned by Dunmore Sand & Soil Pty Ltd, which is a wholly owned subsidiary of Boral Resources (NSW) Pty Ltd (Boral).

The project is an integral part of the NSW construction industry, as it supplies high quality construction sand products to the Illawarra and Greater Sydney regions.

The project has operated since 2000 after being granted Ministerial approval for its first stage by the then Minister for Urban Affairs and Planning under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). A separate Ministerial approval for further stages of the project was granted in 2005 by the then Minister for Infrastructure and Planning. This is the current operating approval for the project, which has been modified twice, and allows Boral to carry out sand extraction and processing operations until 2030.

The development consent DA 195-8-2004 as it currently stands allows Boral to:

- extract, process and transport sand products, including through the:
  - extraction of up to 800,000 tonnes of sand per annum until 2030;
  - development of extraction areas for dredging in Stages 2 to 4;
  - processing of extracted sand and up to 120,000 tonnes per annum of suitable imported Virgin Excavated Natural Material (VENM) to produce construction sand products;
  - road and rail transport of product sand, primarily to the Illawarra and Greater Sydney regions; and
  - progressive rehabilitation of the site; and
- construct and operate a range of ancillary infrastructure at the site, including:
  - a processing plant;
  - product stockpiles;
  - access roads; and
  - supporting administrative infrastructure.

With its maximum approved production rate of up to 800,000 tonnes/year and average historical production rate of 450,000 tonnes/year, the Dunmore Lakes Sand Project has historically been capable of supplying around 7.5% of the sand required for Sydney's construction industry.

Proposed Modification

On 28 February 2018, Boral lodged an application to modify the development consent under Section 75W of the EP&A Act. This proposal, known as DA 195-8-2004 Mod 2, is summarised below and shown in **Figure ES1.** A detailed description is provided in the Environmental Assessment (EA), which is attached at **Appendix A**.

Stage 5

The proposed modification is seeking approval to extract sand from two new extraction areas, known as Stages 5A (to the north) and 5B (to the south), within the existing approved life of the operations. These proposed extraction areas are situated on a private property located between the Princes Highway, Riverside Drive and the Minnamurra River, which would be leased to Boral from the landowner.

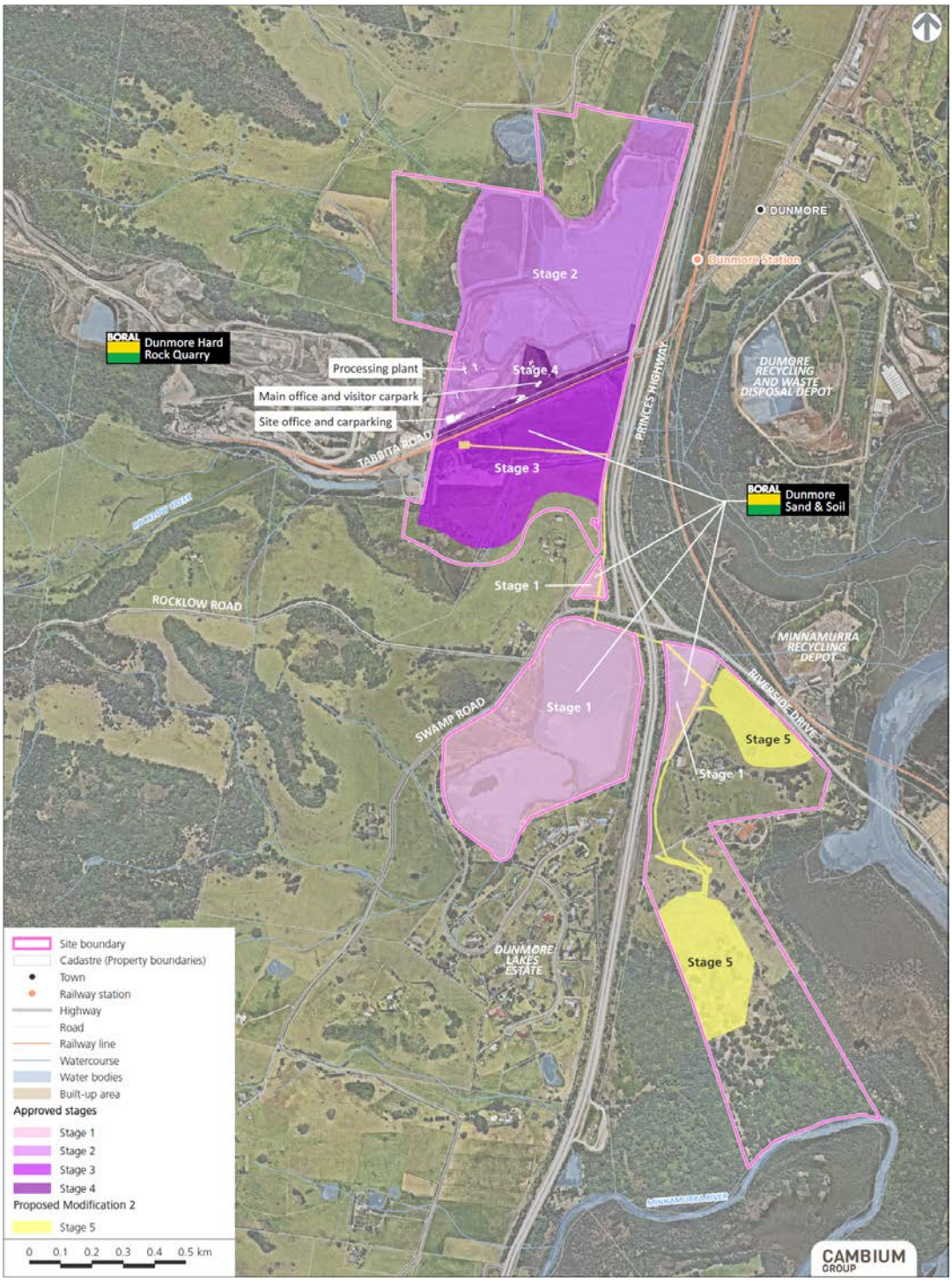

Figure ES1 | Proposed Stage 5 extraction sites – Stage 5A (north) and Stage 5B (south)

Proposed Extraction Areas

Stage 5A covers an area of 3.42 hectares (ha) and comprises a 12 metre (m) deep extraction pit that would be expected to yield around 234,000 tonnes of sand. Stage 5B covers an area of 8.12 ha and comprises a 27 m deep extraction pit that would be expected to yield around 1.12 million tonnes of sand. Extraction in the two areas would take around 3 to 4 years to complete.

Sand Delivery Pipelines

Sand would be delivered to the processing plant via two pipelines using associated pumping infrastructure. The pipelines would be laid on the surface and travel northwards and through existing culverts beneath the Princes Highway and Swamp Road to connect to the existing processing facility.

Access and Ancillary Infrastructure

To access the new extraction areas, Boral would construct an internal unsealed access road from Riverside Drive around the perimeter of the Stage 5A extraction area to connect to Fig Hill Lane. The new road would only be used by light vehicles accessing a new portable site office and 10 space car park, which would be located north of Stage 5B, and heavy vehicles delivering VENM to the extraction area during flood bund construction, access road construction and for rehabilitation. The dredge pumps and office buildings would require to be connected to the existing high voltage network which would be facilitated by a short (150 m) connection to the existing transmission line.

Rehabilitation

Boral would rehabilitate Stage 5A back to pasture by backfilling the extraction pond with VENM, which would be imported by road. Consistent with the approach approved and applied for Stages 1 to 4, Stage 5B would be stabilised after extraction is complete and rehabilitated to be left as an open pond with wetland vegetation around the verges.

Processing and Production Rates

The proposed modification only relates to the development of the proposed new extraction areas, and would not affect the existing approved extraction rate or the associated ancillary processing infrastructure, which would not require any expansion or modification.

The proposed modification is limited to the development of the two additional extraction stages and supporting infrastructure as noted above. It does not seek to change the other approved operating functions of the project, including the life of the project, its hours of operation, the extraction rate, processing rate, transportation method and limits or existing site rehabilitation commitments.

Statutory Context

The proposed modification requires approval from the Minister for Planning and Public Spaces, under former Section 75W of the EP&A Act, but will be determined by the Independent Planning Commission under delegation.

Engagement

During its assessment, the Department consulted with the community and Government agencies, and exhibited the application and Modification Report from 25 April 2019 to 23 May 2019.

The Department received 170 submissions on the proposal, which included advice from 11 Government agencies, 2 submissions from local government authorities, 7 submissions from special interest groups, 1 submission by an infrastructure provider and 149 submissions from the general public.

None of the NSW Government agencies objected to the proposal, however both local Councils and almost all of the community submissions were in objection. The reasons for objection were primarily based on the potential impacts to water resources, including the Minnamurra River and its wetland features, amenity impacts including noise, air quality and traffic impacts, and cultural heritage impacts.

Assessment and Evaluation

Surface Water

The existing Stages 2 to 4 dredge ponds are located within the Rocklow Creek Catchment, which drains into a mapped coastal wetland area immediately to the east and then into the Minnamurra River catchment around 1.2 km downstream of the project site.

The Stages 2 to 4 dredge areas have substantially modified the surface water drainage patterns within the Rocklow Creek catchment. The Stage 5 dredge ponds have therefore been designed with the intention of limiting the further incremental effects of the modified project on local drainage patterns and surface water catchments.

Stage 5A would be quite small in the context of the Rocklow Creek catchment (i.e. it covers around 0.25% of the total catchment area). Stage 5A would be operated so that clean surface water flows are diverted around the extraction area and drain to Rocklow Creek, and subsequently into the Minnamurra River. Stage 5B would be managed to ensure clean surface water flows are diverted around the extraction area and continue to drain south-east to the Minnamurra River.

The Stage 5A extraction pond would be surrounded by bunds which would divert clean surface water flows around the pond and prevent mixing of this surface water run-off with the groundwater that would accumulate in the pond. Progressive rehabilitation would allow runoff from rehabilitated areas to be restored to the natural drainage pattern of the site as quickly as possible.

Stage 5B would be retained as a pond in the longer term and rehabilitated with native vegetation around the edge. This is consistent with the rehabilitation successfully implemented at the previous Stage 1 and as underway at the Stage 2 and 3 dredge ponds.

The sand delivery and return water pipelines would not significantly affect surface water flows as they would be preferentially installed in existing culverts or float on top of the existing dredge ponds. To limit riparian and hydraulic impacts at Rocklow Creek, the pipes would be suspended across the creek on a temporary bridge with concrete pillars and a 1.5 m high gangway with a span of 12 m.

Groundwater

The removal of sand from the dredge ponds would not be expected to cause any material effect to the existing groundwater levels in the area, particularly given that Stage 5A would be completely backfilled with VENM material and rehabilitated following extraction.

As dredging operations would occur below the groundwater level of the surrounding aquifer, the ponds would fill with a limited amount of groundwater, proportionate to the amount of material extracted. These inflows are not considered sufficiently large to result in a serious or sustained impact to the current

groundwater regime. Additionally, Boral has committed to process water extracted with the wet sand slurry at the processing plant and return this water to the dredge ponds to further limit groundwater take.

Both the Stage 5 areas are set well away from mapped groundwater dependent ecosystems and that the Stage 5B pond is located outside the zone of affectation of the groundwater influence of the coastal wetland area.

Acid Sulfate Soils

The risks of oxidising potential acid sulfate soils at Stage 5A would be carefully managed as part of the extraction process, as is the case for the current operations. Water levels in the dredge ponds would be managed to mitigate the risk of exposure of potential acid sulfate material, with the majority of water extracted from the ponds in the wet sand slurry being returned after processing. Water chemistry would be regularly monitored as extraction progresses to check for the presence of these soils.

The rehabilitation of the Stage 5A pond and Stage 5B pond banks would also be undertaken in line with the existing strict protocols in place for Stages 2 and 3, which requires all VENM used in rehabilitate to be certified as non-acid sulfate soils before it is allowed on site. Monitoring of the Stage 5B pond would continue until such time that it can be demonstrated that surface water levels are in equilibrium with the surrounding environment and not facilitating oxidisation of acid sulfate soils.

With respect to the management of materials extracted during processing, Boral is proposing to continue its existing practice of sieving the wet sand slurry at the existing processing facilities to remove finer grained materials that are more prone to contain sulfides. Any fines removed as part of this processing would be emplaced below the water table in the existing fines dredge pond located adjacent to the existing Dunmore Lakes processing facilities and would be subsequently capped with inert VENM material prior to final rehabilitation.

This process is already being effectively implemented for Stages 2 and 3 of the project and provides an effective management technique to reduce the risk of oxidising finer grained sediments. The Department and EPA have recommended that an Acid Sulfate Soils Management Plan be prepared for the proposed modification to ensure the effective implementation of this management process.

Flooding

The proposed Stage 5 dredge ponds occupy a relatively small footprint in the context of the floodplain and would only result in a minor loss of floodplain storage during operations. Engineered flood bunds of sufficient height to afford 3 metres of freeboard would be installed before dredging activities occur.

Flood modelling indicates that the proposed level of freeboard would be more than sufficient to contain rainfall associated with a 1 in 100 year event within the ponds and would be sufficient to divert overland flow around the ponds, so as not to impact receiving environments.

The longer term flood impacts of Stage 5A would be mitigated by progressively backfilling of the pond during operations and returning the final landform to its pre-extraction level following the completion of sand extraction.

The Stage 5B extraction area would remain free of flooding impacts during more frequent rainfall events, but would be susceptible to flooding during a 1 in 100 year event. To manage this risk, Boral has proposed diverting surface water flows around the extraction area and installing flood bunds to a height of approximately 4.1 m AHD with a 3.9 m AHD spillway, to reduce the likelihood of flood interactions

from the surrounding Minnamurra River floodplain. The proposed carpark and office building would be constructed above the probable maximum flood level.

However, even with Boral's proposed mitigation measures in place, the flood depth in the Stage 5B area under a 100-year event would still result in a shallow connection between the extraction pond and the surrounding flood waters. The probable maximum flood scenario would also result in inundation of the site, as is already the case under current conditions. Therefore, the key consideration is whether these rare flood events could be further managed and mitigated through the implementation of additional measures or controls.

The Department also notes that these flood interactions would also have the potential to liberate additional suspended sediments beyond those already contained in existing floodwaters. While these impacts are mitigated by the depth of Stage 5B, the design of the flood bunds and the lower velocity flood flows in this area, the Department considers it important to manage the (albeit low) risk of downstream pollution and sedimentation of seagrass beds and fish habitat.

In order to mitigate the risks of potential offsite sediment transport, the Department considers that reasonable and feasible efforts should be implemented to increase the freeboard of the Stage 5B dredge pond to separate it from the river during flood events, including through the installation of bunds that could withstand and prevent interactions under the probable maximum flood event.

Accordingly, the Department has recommended a condition that requires Boral to install and maintain the Stage 5B flood bunds to sufficient heights and width to prevent inundation of the Stage 5B extraction area and carpark by flood waters associated with the probably maximum flood event. This would effectively increase the height of the bunds to around 5.5 – 6.0 m AHD and would require the bunds to be proportionately widened to ensure their long term stability.

While widening the proposed flood bunds would marginally reduce the tonnages that could be recovered from the Stage 5B area, this additional management measure is considered important to protect the surrounding wetlands and ecosystem from potential water quality impacts.

The Department has also recommended that these bunds be retained until such time as ongoing water monitoring indicates that the water quality in the final Stage 5B pond has returned to appropriate levels that do not represent a risk to the downstream environment and can be integrated back into the floodplain storage. At this time, these bunds would be able to be regraded (similar to Stages 1 to 4) and rehabilitated to create a pond with fringing vegetation and the area could be returned to the floodplain.

The Department believes that with these measures in place, the modification would represent a low risk of significantly affecting the river catchment even during a probable maximum flood event, especially given that an event of this scale would be of such magnitude as to immerse large areas of Minnamurra and would already impact the river well beyond any incremental impacts attributable to the project.

To ensure flooding impacts are appropriately managed in future, the Department has recommended conditions relating to the engineering of the flood bunds, the regular monitoring of bund stability throughout the extraction, rehabilitation and closure stages of the proposed modification and management of any potential discharges from the site in accordance with the requirements of the Environment Protection Authority's (EPA) Environment Protection Licence (EPL).

Biodiversity

The proposal would require the clearance of around 3 ha of exotic grassland in the Stage 5A area and 7.5 hectares (ha) of native vegetation in the Stage 5B area, including 4.5 ha of Bangalay Sand Forest (BSF), which is a listed endangered ecological community (EEC) under the *Biodiversity Conservation Act* 2016. The proposed clearing represents a very small proportion of the BSF EEC and would attract an offset obligation commensurate with the vegetation quality present across the site.

Based on the biodiversity offset calculator, Boral would be required to retire 71 ecosystem credits to the account for the impacts associated with the proposed clearing of BSF EEC. Boral would also be required to retire a further 161 species credits for predicted impacts on Southern Myotis (19 credits) and to conservatively account for the potential for impacts on Barking Owl and Masked Owl (71 credits each).

To satisfy its offset obligations, Boral has commenced investigations of two potential biodiversity stewardship sites that contain Bangalay Sand Forest in the locality. While these investigations are yet to be completed, Boral would be required to retire all requisite credits for Stage 5B, prior to commencing construction of Stage 5B. This would ensure that credits are appropriately timed to disturbance activities and are retired before any impacts on this habitat occur.

The likelihood of further ancillary impacts to species would be limited through the implementation of mitigation and management measures, including fencing off areas to avoid unnecessary clearing and ensuring quarry vehicles remain on designated roads and tracks. Boral would also be required to undertake pre-clearance surveys, avoid breeding seasons when clearing hollow bearing trees and install nest boxes to compensate for the removal of any tree hollows.

Aboriginal Cultural Heritage

The Stage 5 extraction areas have been highly modified and cleared over time to facilitate agricultural activities. Nonetheless, the Boral identified three sites artefact scatters of archaeological potential.

The Department has recommended that a comprehensive salvage program be undertaken in consultation with Registered Aboriginal Parties for the two primary sites, to allow further knowledge gathering on the significance of the area in terms of cultural values. The salvage program would be undertaken prior to extraction occurring in each of the stages, and any artefacts recovered would be appropriately stored in consultation with registered Aboriginal parties.

Overall, the Department considers that the proposed extraction areas would result in a relatively small footprint within the wider cultural landscape and the extraction ponds have been designed to minimise the impact on cultural values as much as possible.

Given the nature and significance of cultural sites in the vicinity, the Department considers that the most appropriate approach would be to ensure that all activities are managed in line with an approved Heritage Management Plan prepared in consultation with BCD and Registered Aboriginal Parties.

Traffic

All product haulage from the site would continue to use the existing onsite private rail line on site to load trains and send them via the South Coast Rail Line to the Greater Sydney region or via existing road transport routes from the processing plant to the Princes Highway. Nevertheless, the proposed modification would involve a proportion of additional project-related traffic travelling on a short section of Riverside Drive which heads south-east from the exit ramp from the Princes Highway at Dunmore.

These increased traffic impacts are primarily associated with construction of the Stage 5 extraction areas and development of the access road, site office and car park, and final rehabilitation of the site. As the extraction areas would be developed sequentially, construction traffic would only be required for each site on a campaign basis, meaning that increases in traffic on the local road network would be relatively minor and temporary, and could be suitable managed subject to conditions.

Given there is currently no suitable heavy vehicle access to the Stage 5 area, a new access point off Riverside Drive would also need to be constructed for the proposal. Boral has proposed a channelised right turn intersection treatment to more effectively distribute heavy vehicle movements and mitigate the impacts on local traffic flow. The Department considers that this new intersection with Riverside Drive would appropriately minimise traffic impacts and appropriately address safety considerations for public road users.

In order to complete the proposed rehabilitation of the site, Boral has identified that it would need to import around 325,000 tonnes of VENM to the site to backfill Stage 5A and to rehabilitate the regraded edges of the Stage 5B pond (subject to water quality testing). The delivery of this material would be distributed to the existing site entrances for Stages 2 to 4 as well as the proposed new access point for Stage 5 and would be used to rehabilitate previous extraction stages as well as the proposed Stage 5A and 5B areas. The Department considers that magnitude for traffic impacts at key intersections along the route to the Stage 5 areas could be appropriately managed through the preparation of a Construction Traffic Management Plan in consultation with relevant roads authorities and by ensuring Boral's drivers adhere to a strict driver code of conduct and avoid platoon deliveries of VENM.

The Shellharbour City and Kiama Municipal Councils requested that Boral pay a levy for road maintenance purposes to both Councils. The Department notes that Boral would be importing VENM material via the Riverside Drive intersection following the completion of extraction and that project traffic would only involve travel on a short length of Riverside Drive that Kiama Council has identified as being subject to management by both Councils (some of which will be upgraded as a result of the new intersection).

Rather than imposing a levy, the Department supports Council's request that a pre-construction road pavement dilapidation report be undertaken for the affected section of Riverside Drive. If this report identifies a risk of road pavement failure as a result of the modification, Boral would be required to rehabilitate and/or make good any development-related damage identified in the post-dilapidation survey along the affected section of Riverside Drive.

Noise

The noise levels associated with construction activities are predicted to comply with the noise limits in the *Interim Construction Noise Guideline* 2009 (ICNG) limits at all receivers.

The noise modelling indicates that project-related operational noise would now be audible at some additional residences west and north of Stage 5B and some residential receivers in Minnamurra. However noise levels from the project as a whole (i.e. the completion of Stages 2 to 4 and proposed Stages 5) would continue to comply with existing noise criteria in the development consent for the project at all existing assessment locations west of the Princes Highway, with the exception of 79 Fig Hill Lane, which is a vacant property with a dwelling approval adjacent to the western boundary of Stage 5B.

Noise levels at 79 Fig Hill Lane would comply with relevant operational noise limits during the extraction phase operations, but are expected to exceed the NPfI recommended limits by up to 11 dB(A) over a one month period associated with initial overburden removal and flood bund construction at Stage 5B and by up to 16 dB(A) for a one month period associated with rehabilitation activities for Stage 5B.

Boral has identified a number of mitigation and management measures that would be implemented if a dwelling were constructed on the property before the identified construction and rehabilitation activities were to occur. Together these measures would be expected to reduce noise levels at 79 Fig Hill Lane by 5 to 8 dB(A), bringing the predicted impacts to one month with levels 8 dB(A) above the PSNL during construction and one month with noise levels 11 dB(A) above the PSNL during rehabilitation.

As there is currently no dwelling built on the property and existing Princes Highway traffic would continue to have a high degree of influence over the noise environment at the property, the Department considers that these short term impacts may not be as significant as they initially seem. To address these residual impacts, Boral has proposed to enter into a negotiated agreement with the landowner to manage noise impacts generated by the development. The Department considers that a negotiated agreement would be an appropriate and proportionate mechanism to manage the noise impacts at this property and has recommended a condition that would afford the owner of 79 Fig Hill Lane with mitigation rights should a residence be built during the life of the modified project.

Rehabilitation

The Department notes that the general principles proposed to be applied in the Stage 5 area have been successful implemented as part of the rehabilitation of the previous extraction stages, which are detailed in the approved Rehabilitation Management Plan for the project.

Stage 5B would be left as a pond in the final landform, with the ultimate intention of removing the flood bunds and grading these areas to create a ribbon of riparian vegetation around the edges of the pond. This is similar to the practices that have been successfully achieved by Boral in the former Stage 1 ponds and that are currently being implemented for the Stages 2 and 3 ponds.

For the existing Stage 2 and 3 ponds, the key consideration in the rehabilitated landform was the stability of the batters adjacent to the Princes Highway embankments. To address this, the batters were shaped in a manner that would provide for long-term stability and will be densely vegetated along their length.

The same would apply to Stage 5B, where rehabilitation would be achieved by reshaping the bunds in a staged process and modifying the pond batters with dense vegetation planting to create a natural landform. The timing of the removal of the bunds would also be reliant on regular water quality monitoring in the pond and whether the water in the pond meets relevant water quality guideline levels to enable the integration of the pond back into the floodplain of the Minnamurra River.

Visual

The Department considers the visual impacts of the proposal are reasonable and manageable, due in part to their largely temporary nature, the shielding effect of local topographic features and vegetation, the presence of nearby quarrying operations and the surrounding nature of the rural landscape.

While the existing Stage 5 area can be generally characterised as an open rural landscape, it is recognized that the broader area also includes key transport routes and a range of residential, commercial and industrial land uses, including the Princes Highway and a nearby Waste Facility. As

such, the ancillary built infrastructure including the pump station, office and 10 space car park would not represent a material change to the types of land-uses and visual impacts that are already present in the local area.

The Department has considered the matters raised in submissions and the likely visual impact of the ponds from Riverside Drive. The Department recognises that the development of the dredge ponds would alter the current vista of open paddocks to that of a water filled pond. However, these ponds would look very similar to the nearby ponds associated with previous stages of the project and would not be dissimilar to large farm dams typically seen in rural settings throughout NSW and would not appear out of place for most road traffic users and tourists.

Accordingly, the Department considers that the minimal and temporary visual impacts in the Stage 5A area and the longer term visual impacts in the Stage 5B area can be appropriately managed through the implementation of the proposed visual mitigation measures and rehabilitation of the site in accordance with an updated Rehabilitation Management Plan.

Other issues

The Department also considered the air quality, historic heritage and socio-economic issues relating to the proposed modification. This assessment found that the modification would not material increase these impacts relative to the approved operations and the Department considers that these issues could be appropriately managed through recommended conditions.

Summary

The Department has considered all issues raised in submissions and assessed the impacts of the proposed modifications in detail in accordance with all relevant NSW legislation, policies and guidelines. Based on this assessment, the Department has found that the proposed modifications offer several benefits, including that they would provide:

- for the continued development and recovery of a State significant sand resource;
- high quality construction sand products to the Illawarra and Greater Sydney regions; and
- continuity of operations and employment of 10 operational staff and additional truck drivers at an established quarrying operation.

The Department's assessment has also found that subject to the imposition of suitable conditions, the proposed modification could be carried out in a manner that would not cause significant impacts to surrounding areas. To this end, the Department has prepared a recommended notice of modification that requires Boral to:

- install flood bunds around Stage 5B to withstand the probable maximum flood event;
- manage water impacts under a detailed Water Management Plan;
- implement a program to salvage affected cultural heritage items;
- minimise the clearing of native vegetation and offset residual biodiversity impacts;
- acquire 79 Fig Hill Lane if a negotiated agreement with the owner cannot be reached;
- rehabilitate the site in accordance with a detailed Rehabilitation Management Plan; and
- update all its existing site management plans.

On balance, the Department has concluded that the proposed modification is in the public interest and is approvable, subject to the recommended conditions.

Contents

1 Introduction

1.1 Background

1.1.1 The Dunmore Lakes Project is a dredge sand quarry located at Dunmore, in the Shellharbour City local government area (see **Figure 1**). The quarry supplies high quality construction sand products to the Illawarra and Greater Sydney regions. The quarry is owned by Dunmore Sand & Soil Pty Ltd, which is a wholly owned subsidiary of Boral Resources (NSW) Pty Ltd (Boral).

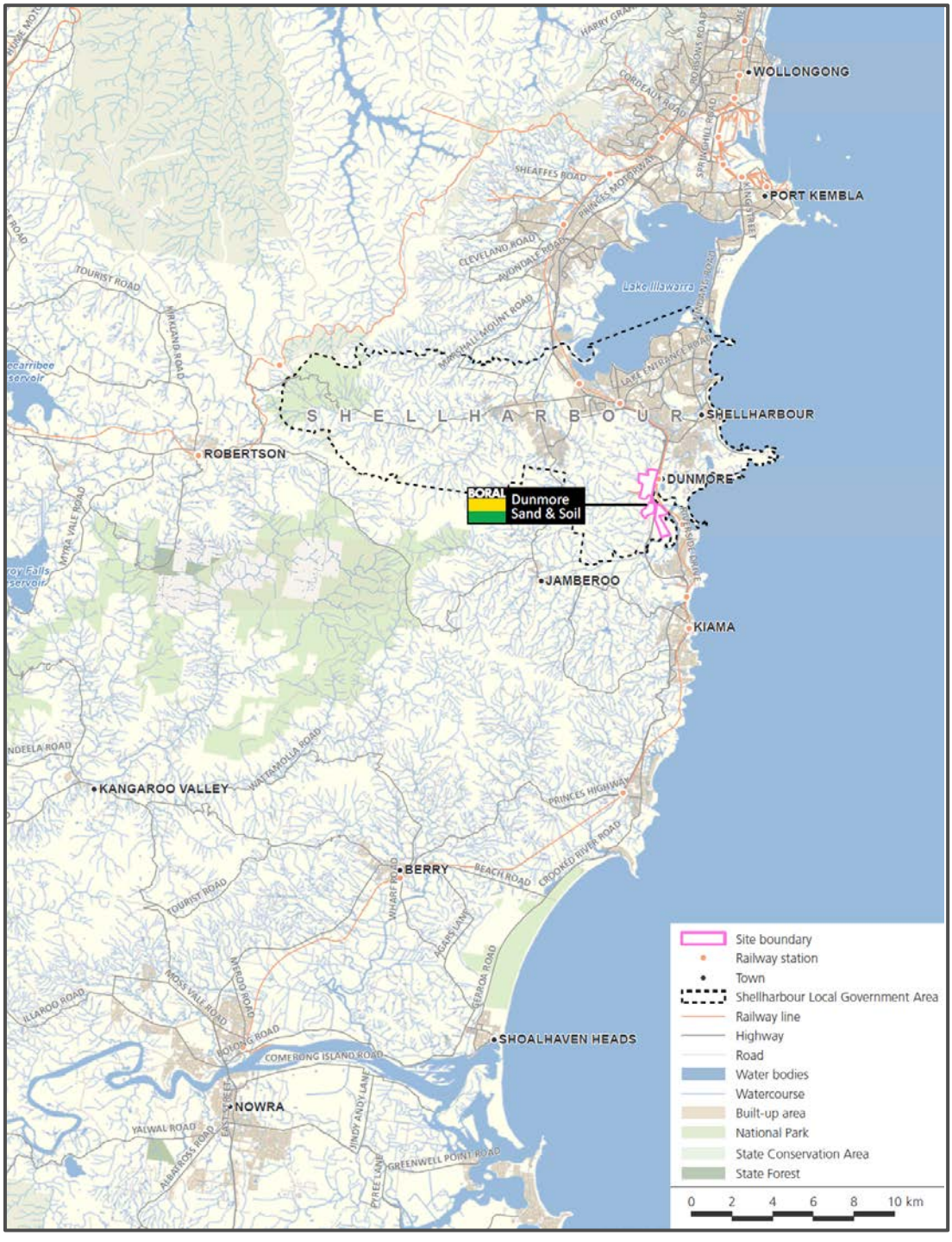

Figure 1 | Regional Location

1.2 Approval History

1.2.1 The quarry commenced operations in 2000 after it was granted development consent (DA16-01-1999) by the then Minister for Urban Affairs and Planning, following a Commission of Inquiry, under the former Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Minister's approval allowed the first dredging stage to be developed. The Stage 1 dredging operations have been completed and the Stage 1 site was rehabilitated as a series of ponds with riparian wetlands in 2013.

1.2.2 A second development consent for a further three dredging stages (Stages 2 to 4) was granted for the quarry in June 2005 (DA 195-8-2004) by the then Minister for Infrastructure and Planning. This development consent was modified in 2016 (DA 195-8-2004 Mod 1) to allow Boral to defer the re-alignment of a section of Rocklow Creek, and again in 2020 (DA 195-8-2004 Mod 3) to allow it to blend suitable Virgin Extracted Natural Material (VENM) with dredged sand to produce a blended construction sand product.

1.2.3 The development consent DA 195-8-2004 as it currently stands allows Boral to:

- extract, process and transport sand products, including through the:
  - extraction of up to 800,000 tonnes of sand per annum until 2030;
  - development of extraction areas for dredging in Stages 2 to 4;
  - processing of extracted sand and up to 120,000 tonnes per annum of suitable imported VENM to produce construction sand products;
  - road transport of product sand, primarily to destinations within the Illawarra region;
  - the use of rail transport for delivery/despatch to the Illawarra and Greater Sydney regions;
  - progressive rehabilitation of the site; and
- develop and operate a range of ancillary infrastructure at the site, including:
  - a processing plant;
  - product stockpiles;
  - access roads; and
  - supporting administrative infrastructure.

1.2.4 While the consent explicitly allows the extraction of 800,000 tonnes of sand a year, current production is around 500,000 tonnes per year, with an average annual extraction rate of 450,000 tonnes. This sand is hauled from the site using both road transport routes to the Princes Highway and an existing onsite private rail line via the South Coast Rail Line to the Greater Sydney region. This existing arrangement provides Boral with flexibility to access various markets and allows the delivery of large volumes of construction sand to Greater Sydney construction projects with minimal road transport impacts.

1.2.5 The development consent includes conditions that require Boral to comply with strict amenity standards, monitor and regularly report on environmental performance and rehabilitate the extraction stages in accordance with an approved Rehabilitation Management Plan.

1.2.6 Dredging under the current consent commenced in 2007. Stage 2 dredging operations cover an area of 37 hectares (ha) and adjoins the northern boundary of Tabbita Road. Extraction in this area has been completed and the majority of this area is now undergoing active rehabilitation. The Stage 2 area also contains a dedicated fines pond which is used to manage potential acid sulfate soil materials and the main processing infrastructure used to process sand from all approved stages.

1.2.7 The Stage 3 dredging operations are well underway and cover an area of 21 ha, adjoining the southern boundary of Tabbita Road. Boral has slowed its extraction rates in this area to extend the life of the current operations, but expects that recoverable sand resources will be exhausted by the end of 2020.

1.2.8 The approved Stage 4 extraction area covers an area of 5 ha, and currently contains supporting infrastructure for the operations, including the access road and private rail line to the site, as well as providing access to Boral's separate Dunmore Hard Rock Quarry. This stage cannot be extracted until this infrastructure is relocated.

1.2.9 The extraction stages and ancillary infrastructure are shown in **Figure 2.**

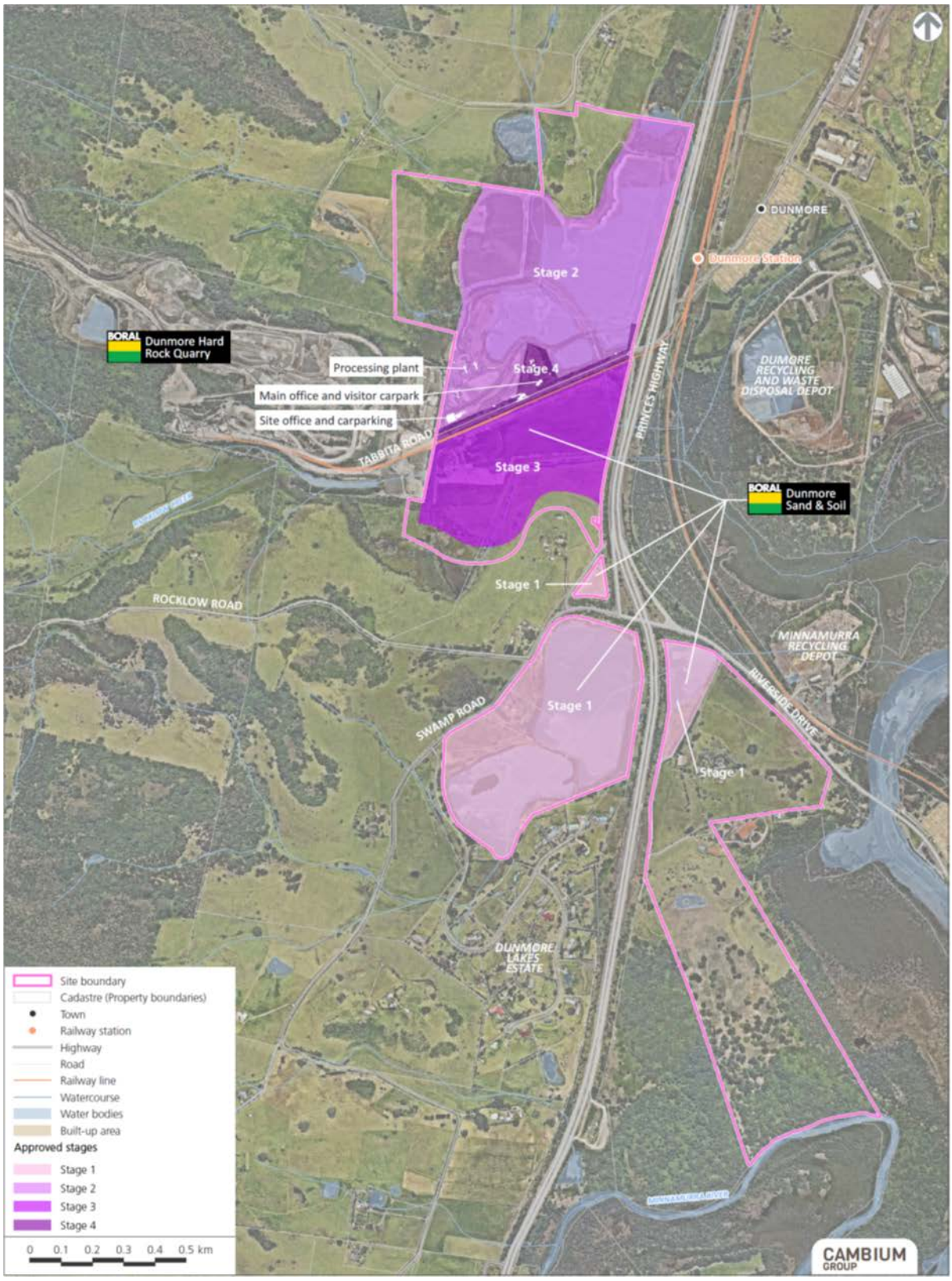

Figure 2 | Approved project layout

1.3 Local Context

1.3.1 The current project site is situated within the predominately rural suburb of Dunmore within the Shellharbour local government area (LGA). The site if fully owned by Boral and is divided into three quarrying areas, which are intersected by the Princes Highway, with different areas of the site accessed via the Princes Highway and Tabbita Road.

1.3.2 The site is located in a region which has been subject to extensive quarrying activities since the late 1800s. Boral's Dunmore Hard Rock Quarry and concrete batching plant are located directly west of the Stage 2 dredge area and sand processing plant, and are accessed via an existing road that traverses the Stage 4 area.

1.3.3 There are three other major active quarrying operations in the local area, which are Cleary Brothers' Albion Park Quarry and Holcim's Albion Park Quarry, both located 2 km north of the site, and Hanson's Bass Point Quarry, located 3 km east of the site. In addition to these active State significant quarry operations, the historic Bombo and Bombo Headland quarries are located approximately 3 km southeast of the site.

1.3.4 The proposed modification areas are located on privately owned land that would be leased to Boral for the duration of the continued operations. These lands are situated on the edge of an alluvial coastal floodplain and adjacent to the tidal reaches of the Minnamurra River, which drains to the Pacific Ocean around 1.5 km from the site.

1.3.5 While sand dredging operations commonly occur in such environments, the Minnamurra River system includes a coastal wetland area which is protected under *State Environmental Planning Policy (Coastal Management) 2018* (Coastal Management SEPP). Proximity to this wetland was previously considered in approving the consent for Stages 2 to 4, under the former SEPP 14 Coastal Wetlands.

1.3.6 The site lies on the boundary of two key catchments, which are the Rocklow Creek catchment and the Minnamurra River Catchment. Stages 2 to 4 and the proposed Stage 5A of the project are in the Rocklow Creek catchment, while the proposed Stage 5B is in the Minnamurra River catchment.

1.3.7 Land uses in the vicinity of the site are dominated by large lot rural and agricultural landholdings holdings and the abovementioned quarry operations. The local heritage listed Dunmore House is situated on a large hill adjacent to and elevated from the proposed Stage 5A area.

1.3.8 Major waste disposal and recycling centres have also been built in the area, with the Shellharbour Recycling Centre located to the northeast of the site and the Minnamurra and Kiama Community Recycling Centres located east of Stage 5A.

1.3.9 Nearby residential receivers include a single residence off Riverside Drive situated behind a large hill to the southeast of Stage 5A and the Dunmore Lakes rural residential estate located to the west of Stage 5B and around 250 metres (m) south of the completed Stage 1 area. A number of additional residential properties also occur along Dunmore Road, to the east of the existing Stage 2 extraction area and processing facilities.

1.3.10 The Kiama Golf Course, James Holt Reserve and the small-lot residential suburbs of Minnamurra and Kiama Downs are located east and southeast of the Stage 5A area. The closes houses in these suburbs are located over 400 m distant from the proposed Stage 5A area and extend along the coast and the Minnamurra River to the southeast, with many properties having frontage access to the Minnamurra River via the reserve.

1.3.11 As shown in **Figure 2**, most of these properties are physically separated for the site by the Princes Highway or the South Coast Railway Line.

1.4 Strategic Context

1.4.1 The proposed modification seeks to provide a significant and reliable source of high-quality construction sand consistent with that extracted from existing and previous Stages over the last 20 years.

1.4.2 The *Greater Sydney Region Plan* identifies that 725,000 new homes are required by 2036 to meet the needs of a growing and changing population. The *NSW State Infrastructure Strategy 2018-2038* and *Future Transport Strategy 2056* also outline significant infrastructure and transport priorities for Greater Sydney and regional NSW.

1.4.3 There is currently and will be into the future demand for construction materials for Greater Sydney, as the region grows to accommodate projected increased population, and the development of key infrastructure including strategic roads, Sydney's second airport and the planned growth of key satellite cities in Western Sydney, Newcastle and Wollongong.

1.4.4 The key strategic planning framework which sets the scene for the Illawarra region is the Illawarra Shoalhaven Regional Plan 2036. One of its key directions is to create "*A region that makes appropriate use of agricultural and resource lands"*. The regional plan highlights that urban release areas should be sequenced in the vicinity of mineral resources, to allow the continuation of working extraction activities.

1.4.5 The strategy recognises that extractive industries have been a feature of the region for well over a century and are important employment maintaining industries which can co-exist with other land-uses, if appropriately positioned to manage potential conflicts.

1.4.6 The construction of housing, non-residential buildings and roads and other engineered infrastructure within the Greater Sydney Region relies on a range of construction materials sourced from within and outside the region. High quality, consistent and reliable construction sand supplies are recognised across the construction industry as an important component of this material supply chain.

1.4.7 The Dunmore Lakes Project is located in one of four strategic "feeder" areas which adjoin the greater Sydney region. These feeder areas supply around 60% of the natural sand products required in the Sydney's construction industries (FY 2018 figures).

1.4.8 With its maximum approved production rate of up to 800,000 tonnes/year and average historical production rate of 450,000 tonnes/year, the Dunmore Lakes Project has been a substantial supplier to this supply chain network over many years and has historically been capable of supplying around 7.5% of the sand required in the Sydney construction industry.

1.4.9 The proposed modification seeks to provide continued supply chain certainty by enabling access to an addition 1.35 million tonnes of high quality sand resources, located in close proximity to the existing Dunmore Lakes operations and processing facilities. Access to these resources are expected to provide Boral with an additional 3 to 4 years worth of construction sand supplies during a period of growth and high demand for construction materials in the Greater Sydney Region.

2 Proposed Modification

2.1 Proposed Modification

2.1.1 On 28 February 2018, Boral lodged an application to modify the development consent under former Section 75W of the EP&A Act. This proposal, known as DA 195-8-2004 Mod 2, is summarised below and shown in **Figure 3.** A detailed description is provided in the Environmental Assessment (EA), which is attached at **Appendix A**.

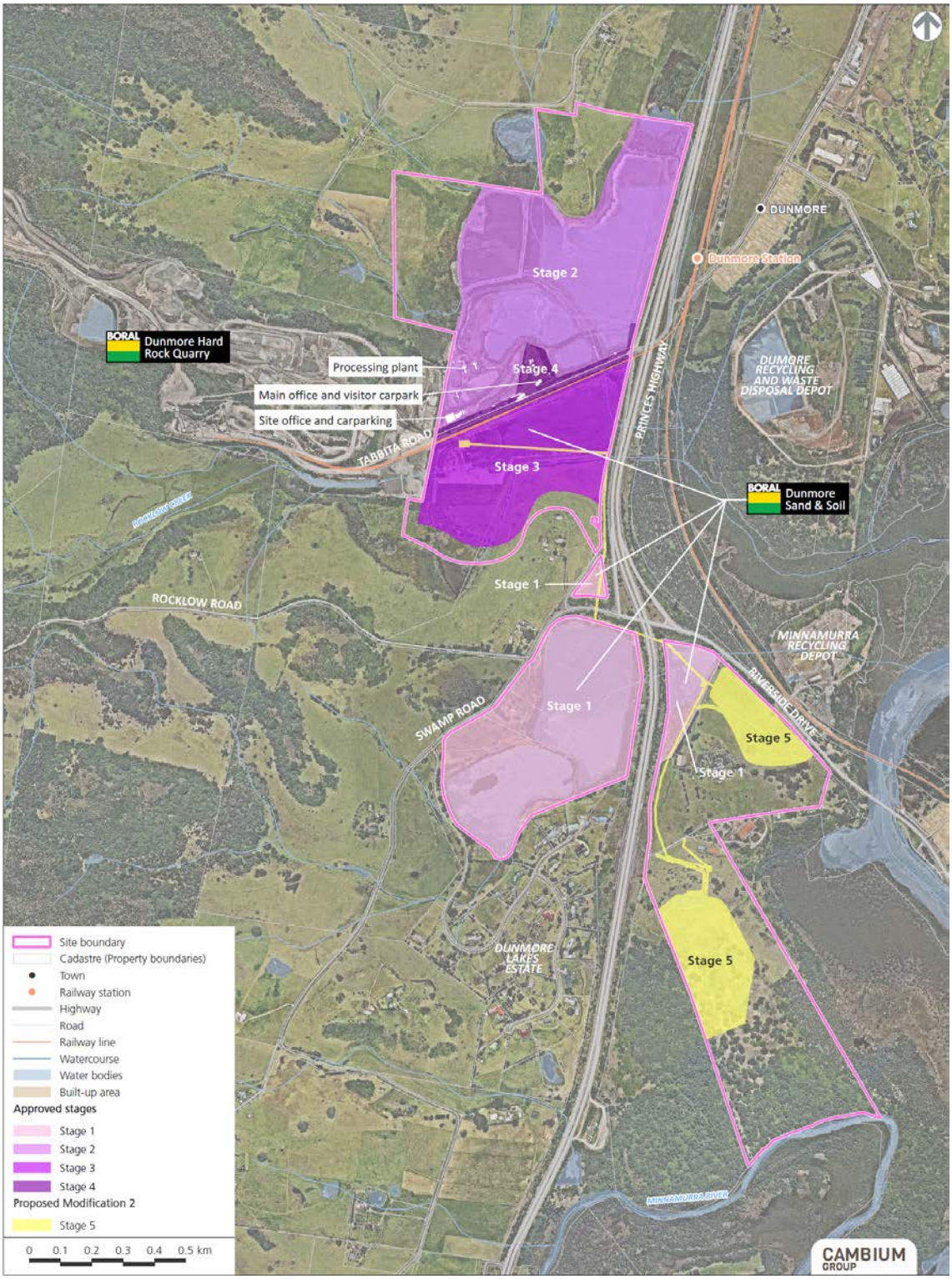

Figure 3 | Proposed modification

2.1.2 In seeking the proposed modification, Boral has identified that it has nearly depleted the resources that are currently permitted to be extracted from the Stage 3 operations and that access to Stage 4 is not currently possible due to infrastructure constraints associated with the adjacent hard rock quarry. To this end, Boral has identified a fine sand resource on an adjoining property southeast of the former Stage 1 area which it considers to be a viable resource to provide continuity for its operations.

2.1.3 The proposed modification is therefore seeking approval to extract sand from two new extraction areas, known as Stages 5A and 5B, within the existing approved life of the operations. These proposed extraction areas are situated on a private property located between the Princes Highway, Riverside Drive and the Minnamurra River, which would be leased to Boral.

2.1.4 Stage 5A covers an area of 3.42 ha and comprises a 12 m deep extraction pit that would be expected to yield around 234,000 tonnes of sand. Stage 5B covers an area of 8.12 ha and comprises a 27 m deep extraction pit that would be expected to yield around 1.12 million tonnes of sand. Extraction in the two areas would take around 3 to 4 years to complete.

2.1.5 The development of the extraction areas would initially be undertaken using an excavator and dozer, with the overburden to be stockpiled and used to develop flood protection bunding around the extraction areas. As the extraction areas fill up with water, a dredge would then be floated and used to extract the sand as a wet slurry.

2.1.6 Sand would be delivered to the processing plant via two pipelines using associated pumping infrastructure. The pipelines would be laid on the surface and travel northwards and through existing culverts beneath the Princes Highway and Swamp Road to connect to the existing processing facility.

2.1.7 To access the new extraction areas, Boral would construct an internal unsealed access road from Riverside Drive around the perimeter of the Stage 5A extraction area to connect to Fig Hill Lane. The new road would only be used by light vehicles accessing a new portable site office and car park, which would be located north of Stage 5B, and heavy vehicles delivering VENM to the extraction area during flood bund construction, access road construction and for rehabilitation.

2.1.8 The dredge pumps and office buildings would require to be connected to the existing high voltage network which would be facilitated by a short (150 m) connection to the existing transmission line.

2.1.9 In accordance with its arrangement with the landowner, Boral would rehabilitate Stage 5A back to pasture by backfilling the extraction pond with VENM, which would be imported by road. Consistent with the approach approved and applied for Stages 1 to 4, Stage 5B would be stabilised after extraction is complete and rehabilitated to be left as an open pond with wetland vegetation around the verges.

2.1.10 While the proposed modification can be considered to represent a modest increase to the project area, this increase only relates to the proposed extraction areas, and would not affect the extraction rate or the associated ancillary processing infrastructure, which would not require any expansion or modification.

2.1.11 The proposed modification is therefore limited to the development of the two additional extraction stages and supporting infrastructure as noted above. It does not seek to change the other approved operating functions of the project, including the life of the project, its hours of operation, the extraction rate, processing rate, transportation method and limits or existing site rehabilitation commitments.

2.1.12 A detailed description of the proposed modification is provided in the EA at Appendix A, with the key changes summarised in **Table 1** below.

Table 1 | Comparison of Dunmore Sand Project approved and proposed operations

Aspect	Approved Operations	Proposed Modification
Extraction Areas	Existing 63 ha of approved extraction areas: • 37 ha for Stage 2 • 21 ha for Stage 3 • 5 ha for Stage 4	Additional 11.57 ha of extraction areas: • 3.45 ha for Stage 5A • 8.12 ha for Stage 5B
Approved period of operations	Until 31 December 2030	No change
Annual Extraction Rate	Up to 800,000 tonnes of sand per annum	No change
Extraction and delivery methods	Extraction using an excavator and dredge, with extracted sand material sent to the processing facility as a wet slurry via pipelines	No change
Sand processing	Screening, processing, and stockpiling of sand at the Stage 1 processing facility	No change
Product sand transport	A maximum of 800,000 tonnes of product sand per annum on public roads	No change
VENM importation	Around 250,000 tonnes of VENM per year imported for rehabilitation 120,000 tonnes of VENM per year allowed to be processed and blended with product sand	No change in VENM annual import rates, however some imported VENM would be used for construction of flood bunds
Surface infrastructure	Existing surface infrastructure includes: • Water management system, including sediment ponds, dredge pipelines, clean water drainage; • product stockpiles; • administration and workshop facilities; and • sand washing infrastructure including conveyors and hoppers	Minor additional surface infrastructure including: • sand delivery and water return pipelines from Stage 5; • internal access roads; • administration building; and • carpark
Water Use	At an average extraction rate of 450,000 tonnes per year, up to 36 megalitres (ML) per year of water leaves the site in the sand products and around 34 ML/year is required for dust suppression	No change to water leaving the site in sand. Increase in dust suppression water use to 38 ML/year
Hours of operation	Dredging operations: • 06:00 – 18:00 Monday to Saturday • 08:00 – 16:00 Sundays and Public Holidays Excavator extraction: • 06:30 – 18:00 Monday to Saturday • At no time on Sundays and Public Holidays Delivery, distribution and maintenance: • 05:00 – 00:00 Monday to Friday • 06:00 – 18:00 Saturdays • 08:00 – 16:00 Sundays and Public Holidays Delivery and distribution via Shellharbour Road: • 07:00 – 22:00 Monday to Friday • 07:00 – 18:00 Saturdays • 08:00 – 16:00 Sundays and Public Holidays	No change
Employment	Employment of approximately 10 full-time equivalent personnel and associated truck drivers	No change
Quarry access	Existing road access from Tabbita Road and the Princes Highway	No change to access to processing site. Access to Stage 5 via a new intersection treatment at Riverside Drive
Rehabilitation	Decommissioning of processing facilities. All extraction areas rehabilitated to form ponds with wetland areas and verges	Stage 5A backfilled and rehabilitated to pasture at the request of the landowner Stage 5B rehabilitated to form a pond with wetland verges as per existing operations

3 Statutory Context

3.1 Scope of Modifications

3.1.1 The Dunmore Lakes Project (DA 195-8-2004) was originally approved under Part 4 of the EP&A Act. However, the project is considered to be a "transitional Part 3A project" in accordance with Schedule 2 to the EP&A (Savings, Transitional and Other Provisions) Regulation 2017 (STOP Regulation).

3.1.2 Despite the repeal of Part 3A of the EP&A Act, as the modification request was made before the transitional cut-off date of 1 March 2018 for Section 75W modification applications, the provisions of clause 3 of Schedule 2 of the STOP Regulation continue to apply to this application. The modification application is therefore to be assessed and determined under the former Section 75W of the EP&A Act.

3.1.3 The Department has carefully considered the application of the modification powers under Section 75W in terms of the scope of the proposal, and recognises that this was a key concern expressed by the community.

3.1.4 The Department considers that the proposal can be considered as a modification to the existing development consent, as it does not constitute a 'radical transformation' of the project. There are a number of key reasons for reaching this conclusion:

- the key approved operating functions of the quarry would not change, including the approved extraction rate, site processing infrastructure, the processing rate, hours of operation, the approved product transportation arrangements and consented quarry life;
- the proposed additional extraction areas represent a relatively small expansion (less than 20% increase in area) of the existing operations, and extraction would be sourced from the same sand resource as approved for the project (i.e. the Illawarra Coastal Plains alluvial floodplains sand resource);
- the use of VENM for site rehabilitation purposes would not change, as VENM imported for the proposed modification would not exceed the yearly amount currently permitted and VENM used for rehabilitation of Stage 5 would be managed in accordance with existing established VENM compliance protocols; and
- based on the Department's assessment, the proposed modification would not result in any significant environmental or amenity impacts, and the residual impacts can be managed, mitigated and offset by updating the existing conditions of consent for the quarry.

3.2 Approval Authority

3.2.1 The Minister for Planning and Public Spaces is the approval authority for the modification application. However, as the proposal is a modification application under former Section 75W to the existing development consent, the Independent Planning Commission can determine the modification application under the Minister's delegation dated 14 September 2011.

3.3 Mandatory Matters for Consideration

Environmental Planning Instruments

3.3.1 The Department has assessed the modifications against the relevant provisions of the following EPIs:

- SEPP (State and Regional Development) 2011;
- SEPP (Mining, Petroleum Production and Extractive Industries) 2007;
- SEPP (Coastal Management) 2018;
- SEPP No. 33 – Hazardous and Offensive Development;
- SEPP 55 – Remediation of Land; and
- Shellharbour Local Environmental Plan 2013.

3.3.2 The Department has assessed the modification application against the relevant provisions of these instruments (see Appendix F), as well as having regard to Boral's consideration of these instruments in the EA for the proposed modification. The Department considers that the proposed modification can be undertaken in a manner that is generally consistent with the aims, objectives and provisions of these instruments.

Land Zoning

3.3.3 The existing Dunmore Lakes Stages 2 to 4 extraction areas and processing facilities are located on land zoned RU1 - Primary Production under the Shellharbour Local Environmental Plan 2013 (LEP). Boral would continue to use these processing and infrastructure areas for the duration of the modification.

3.3.4 Similar to the formerly extracted and now rehabilitated Stage 1 Dunmore Lakes Project, the majority of the proposed Stage 5 extraction areas and ancillary infrastructure corridors are located on lands zoned RU2 – Rural Landscape under the LEP. A very small area in the southwestern portion of Stage 5B extraction area is zoned E3 – Environmental Management, however as discussed in Section 5 (below) the Department has recommended that Boral be required to avoid any development within this area.

3.3.5 At a broader landscape scale, the land to the east and south of the Stage 5 extraction areas includes a small area of RU2 – Rural Landscape land and larger extents of land zoned E3 – Environmental Management and E2 – Environmental Conservation. These lands are associated with environmental conservation areas of Minnamurra River and associated Coastal SEPP wetland, and are located outside of the proposed disturbance footprint.

3.3.6 The E2 zoning also runs along the northern fringe of Riverside Drive on the opposite side of the road to the Stage 5A extraction area. Riverside Drive and the Princes Highway are both zoned as SP2 – Infrastructure and provide boundaries to the site on the north and west of the extraction area. The sand delivery and water return pipelines would traverse this SP2 zoned land by way of existing culverts beneath the Princes Highway and Swamp Road.

3.3.7 The proposal is permitted with consent in the RU1, RU2 and E3 zones by way of SEPP (Mining, Petroleum Production and Extractive Industries) 2007, which allows extractive industries to be developed in zones where agriculture is permitted.

3.3.8 Under the LEP, aquaculture is permitted within SP2 zoned lands, meaning that the provisions of the Mining SEPP also apply to these lands and the installation of ancillary pipeline infrastructure associated

with extractive industry development is permissible. Further, the Department notes that this ancillary infrastructure is not inconsistent with the objectives of this zone, as it would not impact the existing infrastructure assets or detract from the provision for infrastructure, transport corridors or related uses.

3.3.9 Accordingly, while it is not strictly relevant to a Section 75W modification, all aspects of the proposed modification are permissible with consent.

Objects of the EP&A Act

3.3.10 The approval authority must consider the objects of the EP&A Act when making decisions under the Act. The Department has assessed the proposed modification against the current objects of the EP&A Act. The objects of most relevance to the decision on whether to approve the proposed modifications are found in section 1.3 of the Act. The Department has considered these objects in its assessment and considers that the modifications can be approved in a manner that is consistent with these objects, as summarised in **Table 4** below.

Table 4 | Consideration of the proposals against the relevant objects of the EP&A Act

Objects of the EP&A Act (section 1.3)	Consideration
(a) to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources;	The proposed modification would provide ongoing social benefits through continuing employment and the supply of the product sand to the construction industry to provide further community benefit. The proposal promotes proper management and development of an important sand resource, which has been determined to be significant from a State and regional perspective without significantly increasing the approved environmental impacts.
(b) to facilitate ecologically sustainable development (ESD) by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment;	The Department has considered the principles of ESD in its assessment of the proposed modification and considers that it can be carried out in a manner that is consistent with these principles. Further evaluation of these issues is provided in **Section 5**.
(c) to promote the orderly and economic use and development of land;	The proposed modification would promote the economic use of land by optimising the development of a proven high quality sand resource while utilising the existing infrastructure and workforce at the project.
(e) to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats;	The proposed modification has been designed to limit vegetation clearing where practical and is not seeking to extract resources form areas of high quality remnant vegetation. The residual vegetation clearing would be offset to ensure no net loss of biodiversity values. The Biodiversity Assessment Report indicates that subject to appropriate offsets and management measures, the proposal would be unlikely to result in significant residual impacts on biodiversity values. Consistent with the existing operations, the creation of a pond and wetland verges in the final landform would provide enhanced habitat resources for waterbirds on the long term. The Department has considered this in its assessment of biodiversity values in **Section 5**.

(f) to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage);	The Department considers that the modifications are unlikely to significantly impact heritage values. Nevertheless, the Department has recommended contemporary management conditions to ensure that any impacts are appropriately managed (see **Appendix D**).
(i) to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State;	The Department consulted widely with relevant government agencies and relevant Councils on the modifications (see **Section 4**) and has considered the advice received in **Section 5**.
(j) to provide increased opportunity for community participation in environmental planning and assessment.	The Department publicly exhibited the modification applications and consulted with the relevant Councils. The consultation outcomes are outlined in **Section 4**.

Other Statutory Requirements

Environment Protection Licence

3.3.11 Boral holds an Environment Protection Licence (EPL 11147) for the project which has been issued by the Environment Protection Authority (EPA) in accordance with the *Protection of the Environment Operations Act 1997*. After reviewing the modification application, the EPA has provided its General Terms of Approval for a variation to EPL 11147, including conditions to regulate predicted noise levels.

Water Access Licences

3.3.12 The Dunmore Lakes Project is located within the *Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources 2011* and straddles the boundary of the Sydney Basin South Groundwater Source and the Metropolitan Coastal Sands Groundwater Source. Boral is required to hold appropriate water licences to account for the groundwater it would intercept and use while extracting and processing sand and for the water that would be transported offsite with the sand.

3.3.13 Based on an average production rate of 450,000 tonnes per year, Boral would require 74 ML/year of groundwater for operational purposes to undertake the proposed modification. This comprises 38 ML/year for the purpose of dust suppression and 36 ML/year as moisture in exported product sand. The Department notes that the Stage 5A pond is located in the Sydney Basin South Groundwater Source, while the Stage 5B pond is located in the Metropolitan Coastal Sands Groundwater Source.

3.3.14 While groundwater contained in the product sand would need to be accounted for through WALs in the equivalent groundwater source, Boral could flexibility and adaptively manage the source of its take for dust suppression purposes to match available WALs by extracting groundwater from dredge ponds or bores in either water source and pumping this water the required location on site. In addition to direct groundwater take, evaporative losses from the Stage 5 dredge ponds would account for a further 14 ML/year during operations and less than 10 ML/year in the rehabilitated landform.

3.3.15 Boral currently holds a Water Access Licence (WAL 24477) under the *Water Management Act 2000* to take 65 megalitres ML/year from the Sydney Basin South Groundwater Source and has recently secured a further 35 ML per year of allocations from the Metropolitan Coastal Sands Groundwater Source, which is the source within which the proposed Stage 5B pit would extract. To date Boral has obtained a WAL for 15 ML of this additional volume and in the process of obtaining necessary WAL and Water Supply Work (WSW) approvals for the remaining allocations.

3.3.16 Once this final WAL is approved, Boral would have sufficient WALs to commence the Stage 5A dredging activities. However, Boral will need to ensure it holds sufficient licences in the Metropolitan Coastal Sands Groundwater Source prior to commencing Stage 5B extraction.

3.3.17 DPIE Water has confirmed that there is sufficient market depth in the Metropolitan Coastal Sands Groundwater Source should Boral need to acquire more shares on the open market or by controlled allocation application. At present, this groundwater source has a total allocation of 27,206 ML/year under the Water Sharing Plan and a shared component for access licences of 1,409 unit shares.

3.3.18 The Department is therefore satisfied that there is sufficient opportunity and time for Boral to acquire any residual licences that may be required to facilitate higher production rates in this groundwater source. The Department has recommended a condition, which is supported by DPIE Water, that requires Boral to hold appropriate licences for the groundwater take associated with the modified project prior to these activities occurring or scale back its operation to match its available water supply.

Roads Approvals

3.3.19 The proposed construction of an intersection for the access road from Riverside Drive would require a separate approval from Kiama Council under section 138 of the *Roads Act 1993*. The Department recognises that Kiama Council has objected to the proposal on a number of grounds including traffic generation, road pavement deterioration and recognised the site access intersection would need to be upgraded to address safety concerns. Kiama identified that it would need to be consulted on the proposed intersection upgrade design as the relevant roads authority.

3.3.20 Importantly, under the recommended conditions, Boral would be required to consult further with Kiama Council to ensure that the intersection is constructed to the required standards and satisfaction of Council, and would also be required to undertake a road dilapidation report.

Approvals that do not apply

3.3.21 Under the former Part 3A of the EP&A Act, a number of approvals are integrated into the Part 3A assessment process and are not required for an approved project. Of relevance to the proposed modification are:

- an approval under Part 4, or an excavation permit under section 139, of the *Heritage Act 1977*;
- a permit under section 201, 205 or 219 of the *Fisheries Management Act 1994*; and
- a Aboriginal Heritage Impact Permit under section 90 of the *National Parks and Wildlife Act 1974*.

3.3.22 The Department has reviewed the requirements of these approvals. While the need to obtain the above approvals does not apply, the considerations of each of the above have been considered in the Department's assessment of the proposed modification (see Section 5).

Approvals that must be applied consistently

3.3.23 Under the former Part 3A of the EP&A Act, certain statutory approvals cannot be refused if necessary for carrying out an approved project and the statutory approvals must be substantially consistent with the project approval. Of relevance to the proposed modification are:

- a consent under section 138 of the *Roads Act 1993* (see above); and
- an environment protection licence under the *Protection of the Environment Operations Act 1997*.

Environment Protection Biodiversity Conservation Act 1999

3.3.24 There are no EPBC Act listed vegetation communities that would be directly affected by the proposed modification. Boral completed an assessment of significance for EPBC Act listed fauna, which indicated that a significant impact to the Grey-headed Flying Fox is unlikely. Therefore, Boral did not refer the proposed modification the Commonwealth Department of Agriculture, Water and the Environment as no significantly impacts were predicted to occur for matters of national environmental significance.

4 Engagement

4.1 Applicant's Engagement

4.1.1 During the preparation of the EA, Boral consulted with the following groups:

- relevant State Government agencies and local government authorities;
- Registered Aboriginal Parties; and
- neighbouring residents and other community members, through the Dunmore Community Consultative Committee, the Minnamurra Progress Association and the Kiama North Precinct Community meeting.

4.2 Public Exhibition & Agency Requests

4.2.1 Under Section 75W, there is no statutory requirement to notify or publicly exhibit a modification application. However, the Department elected to publicly exhibited the modification application and EA (see **Appendix A**) by:

- placing a public exhibition notice in in the Wollongong Advertiser, Illawarra Mercury and the Kiama Independent;
- publicly exhibiting the Environmental Assessment from 25 April 2019 to 23 May 2019 (i.e. 28 days) on the Department's website, at Service NSW Centres, at the Nature Conservation Council's office in Sydney, at Shellharbour City Council's office and Kiama Municipal Council's office; and
- requesting advice from State and local government authorities, including Shellharbour City Council and Kiama Municipal Council.

4.3 Summary of Submissions

4.3.1 The Department received a total of 170 submissions during the exhibition period, comprising:

- advice from 11 State government agencies;
- objections from two local government authorities;
- one submission from a infrastructure provider (Endeavour Energy);
- 149 individual community submissions, with one in support of the modification and 148 in objection and
- seven special interest group (SIG) submissions objecting to the modification.

Copies of all advice and submissions are included in **Appendix B**.

Table 1: Summary of Government advice and community submissions.

Submitters	Object	Support	Comments	Total
Government Agencies				
Biodiversity Conservation Division (BCD), EPA, DPIE Water Group & Natural Resources Access Regulator (DPIE Water), Division of Resources and Geosciences (now known as Regional NSW - Mining, Exploration and Geoscience (MEG)), Roads and Maritime Services (RMS) and RMS Property (both now within Transport for NSW), NSW Heritage, DPI Agriculture, Fisheries NSW and Rural Fire Service			11	11
Local Government Authorities				
Shellharbour City Council and Kiama Municipal Council	2			2
Infrastructure Providers				
Endeavour Energy			1	1
Special Interest Groups				
Illawarra Local Aboriginal Land Council, Friends of Minnamurra, Gerroa Environment Protection Society, Jamberoo Valley Ratepayers, Minnamurra Progress Association, Wandering Women Kiama and Colong Foundation for Wilderness	7			7
Community				
From Shellharbour LGA	10			10
From Kiama LGA	97	1		98
From other areas of NSW	40			40
From other Australian states	1			1
Total	157	1	12	170

4.4 Government Agency Advice

4.4.1 The Department did not receive any objections to the modifications from NSW Government agencies.

4.4.2 The **Environment Protection Authority** (EPA) did not object to the proposed modification and considered that the environmental impacts of the proposed modification would be able to be managed under a variation to the site's existing EPL (EPL 11147).

4.4.3 The **EPA** noted that noise exceedances at 79 Fig Hill Lane (which is a vacant lot with a dwelling approval) would be likely to occur during initial overburden removal and final rehabilitation activities. In order to address these short term impacts, the EPA recommended that a negotiated agreement with the landowner be required to mitigate potential noise exceedances.

4.4.4 The EPA also sought further information regarding the traffic noise impacts of the proposal, including impacts from VENM importation associated with internal road construction and pond rehabilitation activities. Boral's Response to Submissions (RTS) included an updated noise impact assessment detailing the potential noise impacts at 79 Fig Hill Lane.

4.4.5 The EPA subsequently issued general terms for a variation to the EPL and has confirmed its satisfaction with the Department's recommended conditions.

4.4.6 **DPIE Water** noted that the dredge operations in Stage 5A may have the potential to mobilise acid sulfate soils which lie beneath the sand. DPIE Water requested information on the timing and preparation of an Acid Sulfate Soils Management Plan. The preparation of this plan was also requested by the EPA and is discussed in Section 5.2.

4.4.7 The **Mining, Exploration and Geoscience (MEG)** group within Regional NSW (formerly the Division of Resources and Geosciences within the Department) requested to be consulted if biodiversity offsets are required to ensure there is no reduction in access to or potential for sterilisation of mineral or extractive resources. MEG has expressed its support for the Department's recommended conditions.

4.4.8 The **Resources Regulator** (RR) within Regional NSW (formerly within the Department) did not object to the proposal.

4.4.9 The Department's **Water Group (DPIE Water)** and the **Natural Resources Access Regulator (NRAR)** (both formerly part of the Department of Primary Industries) requested additional water quality data and information on how the modification would avoid impacts on groundwater dependent ecosystems and manage potential acid sulphate soils. DPIE Water also requested an updated site water balance and noted that licences and approvals would need to be obtained to account for any groundwater take.

4.4.10 **DPIE Water** and **NRAR** were consulted on the Department's recommended conditions of consent and were satisfied that these would address their concerns, subject to one minor amendment that the Department has adopted in its final recommended conditions in **Appendix D**.

4.4.11 The Department's **Biodiversity Conservation Division (BCD)** noted that the modification would require an area (i.e. 7.5 ha) of native vegetation clearing and requested a Biodiversity Offset Strategy be provided in accordance with applicable legislation, to compensate for the clearing.

4.4.12 **BCD** also requested more information on potential flood scenarios including information on the impacts for probable maximum flood events. All of BCD's information requests in this regard have been responded to in Boral's RTS and are addressed in Section 5 below.

4.4.13 The Department consulted with **BCD** on its recommended conditions and provided advice on minor amendments to the conditions, including a request that required ecosystem and species credits be retired prior to impacts occurring. The Department has done this by ensuring that offset requirements be retired prior to Stage 5B, as this area accounts for all offset credits generated by the modification. In addition, **BCD** was supportive of the Department's recommendation to stand off E3 zoned lands.

4.4.14 BCD's former **Heritage Branch** (now Heritage NSW within the Department of Premier and Cabinet) provided advice on Aboriginal cultural heritage matters and requested that Boral undertake additional test pit excavations and investigations to determine the extent of various artefact scatters in the Stage 5A and 5B areas. Heritage NSW proposed that measures be implemented to conserve the area of AHIMS 52-5-0907 located outside of the modification boundary and protect heritage values in the area surrounding the site. In response to these matters, Boral completed the requested additional test pit excavations and confirmed the limited extent of artefact scatters located within the extraction sites.

4.4.15 Heritage NSW recommended a range of updates to the Department's conditions, which the Department has adopted. Heritage NSW reiterated the need to consider the heritage impacts of the proposal and requested the Department confirm the outcomes of consultation undertaken in relation to these additional excavations. Boral has since confirmed that relevant Aboriginal Parties have been consulted on these cultural heritage matters.

4.4.16 **Fisheries NSW** noted that the site is close to key fish habitat associated with Rocklow Creek and the Minnamurra River and recommended measures to manage this impact. Fisheries NSW recommended that the flood bunds be designed to manage significant flood events in order to protect nearby fish

habitat. The Department has recognised this request in its consideration of flooding impacts in Section 5.2. NSW Fisheries has since confirmed its satisfaction that these matters have been appropriately resolved and expressed its support for the Department's recommended conditions of consent.

4.4.17 The **Department of Industry Agriculture** recommended that measures be put in place to manage the potential for any Phylloxera infestation that may result from the importation of VENM to the site. This matter is discussed in Section 5 and been considered in the recommended conditions at **Appendix D**.

4.4.18 The **Roads and Maritime Services** (RMS) and **RMS Property** (both now within Transport for NSW) commented on the proposed modification. RMS requested further information on the traffic impacts of the proposal and following consideration of Boral's RTS, confirmed that the proposed impacts on the State Road Network could be managed subject to recommended conditions. The RMS also noted that the pipeline to be constructed in the existing culverts beneath the Princes Highway was acceptable, but would need to be subject to conditions. The Department has adopted these conditions in **Appendix D**

4.4.19 At the time of exhibition **RMS Property** owned the vacant lot at 79 Fig Hill Lane and noted that it intended to sell the land on the open market as a rural-residential lifestyle property with development consent to build a residential dwelling. RMS Property requested that the impacts on this property be considered as part of Boral's modification application. The Department notes that this property was sold to a private buyer in May 2020 and has considered the potential impacts on this property in Section 5.

4.4.20 **Shellharbour City Council (SCC)** objected to the proposal on a number of grounds, including the water, biodiversity, heritage and traffic impacts of the proposal. Council also considered that the proposal represented a substantial change to the project and therefore warranted a new State significant development assessment and determination process.

4.4.21 In terms of water impacts, SCC expressed particular concerns: about:

- oxidisation of acid sulfate soils;
- water quality and sediment transport into Rocklow Creek and the Minnamurra River; and
- probable maximum flood conditions, impacts of debris in flood events and the long term stability of the proposed flood bunds around the extraction areas.

4.4.22 With respect to biodiversity, SCC was concerned about:

- the effect of the removal of native vegetation and hollow bearing trees on the site. SCC recommended that the adjacent property to the site (79 Fig Hill Lane) be considered as a Biodiversity Stewardship site to offset the biodiversity impacts; and
- the potential impact on the Coastal Management SEPP wetland area to the east of Stage 5B.

4.4.23 SCC also highlighted the potential impacts on items of local heritage significance, including the curtilage and setting of Dunmore House and the vegetation in the Minnamurra vegetation area, and asked for further clarification about the truck movements associated with the proposal.

4.4.24 **Kiama Municipal Council (KMC)** objected to the proposal on a number of grounds including:

- the permissibility of extractive industries within RU2 and E3 zoned lands;
- that the proposal does not align with the Illawarra Shoalhaven Regional Plan;
- that Boral should provide road maintenance contributions for Riverside Drive;

- the effects of the proposal on water quality in Rocklow Creek and the Minnamurra River through the oxidization of acid sulfate soils and the movement of contaminated material in groundwater;
- that in the event of flooding, flood waters would cause the mobilisation of sediments that would affect the adjacent coastal wetland system;
- the creation of the dredge ponds could impact Aboriginal cultural heritage values; and
- that clearing of native vegetation would significantly impact habitat for foraging species.

4.5 Infrastructure Providers

4.5.1 As the modification is seeking approval to connect the pumping station to the existing high voltage electricity network, the Department sought the advice of the infrastructure provider **Endeavor Energy**.

4.5.2 Endeavour Energy commented that Boral would need to apply for a load connection and that any connection works would be required to be undertaken to Endeavour Energy's standards.

4.6 Special Interest Group and Community Submissions

4.6.1 The Department recognises that the proposed modification attracted significant interest from the community and special interest groups, particularly in the local Shellharbour and Kiama LGAs.

4.6.2 Seven special interest groups expressed their objection to the proposal. This included five groups from the Illawarra Region. The concerns expressed by these groups primarily focused on:

- the effect of the proposal on the health of the wetland and the Minnamurra River, particularly in relation to the proposed extraction into the water table and the potential for the mobilisation of acid sulfate soils and pollution of the river and adjacent wetland area;
- amenity impacts on the nearby community, including visual, noise and air quality impacts;
- the biodiversity impacts, including the adequacy of surveys and clearing of Bangalay Sand Forest EEC;
- traffic impacts associated with the proposed increase in truck movements;
- the potential effect on local Aboriginal cultural heritage values; and
- statutory planning matters, including claims that the proposal should have necessitated a new development application.

4.6.3 One community submission supported the project on economic grounds, and the submitter commented that there would be an environmental benefit of turning low quality grazing pasture into a freshwater lake. All of the remaining public submissions objected to the proposed modification on a number of grounds, including:

- that the application should be subject to a new development application;
- the potential effects of the dredging operation on the Minnamurra River and associated wetlands;
- biodiversity impacts associated with the clearing of EEC and effects on avifauna from the clearing of habitat trees and hollow bearing trees;
- potential for groundwater contamination;
- traffic impacts from construction and the importation of VENM to the site for rehabilitation; and

- amenity impacts, including visual, noise and air quality impacts.

4.7 Response to Submissions

4.7.1 Boral submitted its RTS on 26 June 2019, which was published on the Department's website (see **Appendix C**). The RTS represents Boral's consideration of issues raised in submissions and included a range of supplementary assessment information to address residual issues, namely:

- an updated biodiversity assessment report and Aboriginal cultural heritage assessment, to address matters raised by BCD;
- clarification of the potential noise impacts in response to comments made by the EPA; and
- an updated surface water assessment to address concerns raised by the EPA, BCD, DPIE Water, Shellharbour City Council and Kiama Municipal Council.

4.7.2 The updated biodiversity assessment report provided additional commentary regarding the likelihood of other threatened species, including the White Bellied Sea Eagle, using the site and discussed how offset credits would be retired to account for the impacts of the proposal, including through the provision of appropriate ecosystem credits and where necessary the assumed presence of fauna species.

4.7.3 Boral's updated Aboriginal cultural heritage assessment included results from additional survey work and test pitting undertaken at the site to confirm the presence/absence of artefacts. Based on this additional work, Boral provided an updated assessment of the cultural significance of the site.

4.7.4 The updated noise impact assessment detailed the potential exceedances of project noise criteria on the then RMS owned property at 79 Fig Hill Lane.

4.7.5 The updated surface water assessment explained the processes that would be used to manage and mitigate the mobilisation of acid sulfate soils and assessed the effects of the proposed extraction ponds under the probable maximum flood scenario.

4.7.6 Following receipt of the RTS, DPIE – Water asked for further information about groundwater drawdown and how this could affect GDEs, acid sulfate soils and salinity. Boral responded to these residual matters and the DPIE Water subsequently advised that these issues could be effectively managed through the imposition of strict conditions of consent and updated management plans for the site.

5 Assessment

5.1 Assessment

5.1.1 In assessing the merits of the proposed modification, the Department has considered all the requirements of the EP&A Act and the following information:

- Environmental Impact Statement and Environmental Assessment for the original development applications;
- modification applications, Environmental Assessment, RTS reports and additional information provided by Boral;
- existing conditions of consent for the Dunmore Lakes Project, as modified;
- the environmental performance and compliance record of the current operations;
- advice from government agencies and public submissions; and
- relevant EPIs, policies and guidelines.

5.1.2 The Department considers the key assessment issues relate to water impacts (including surface water impacts, groundwater impacts and flooding), biodiversity impacts, Aboriginal cultural heritage effects, traffic impacts, noise impacts, visual amenity impacts and the rehabilitation of the site. Consideration of these issues is provided below, with other issues such as air quality impacts, historic heritage impacts and socio-economic impacts are discussed further in **Table 6**.

5.2 Water

5.2.1 The Department's assessment of water impacts has identified three key issues that require further detailed consideration:

- as extraction would take place within an alluvial water resource and result in the creation of ponds in the rehabilitated landform, the current surface water flow regime would be affected;
- dredging in these ponds has the potential to mobilise acid sulfate soils which lie beneath the sand, which may have implications for pollution of groundwater resources and leaching to adjacent wetland areas and must be appropriately managed; and
- the extraction areas would be surrounded by flood bunds and would be separated from the local floodplains, which may affect the local flooding regime. This separation and potential interactions with flooding regimes have important implications for nearby wetland areas along the Minnamurra River which are identified in the former SEPP 14 (now the Coastal Management SEPP).

Surface Water Flow

5.2.2 The Department notes that the existing Stage 2 to 4 dredge ponds are located within the Rocklow Creek Catchment, which drains into a mapped Coastal Management SEPP wetland area immediately to the east and then into the Minnamurra River Catchment around 1.2 km downstream of the project site.

5.2.3 The existing dredge ponds have substantially modified the surface water drainage patterns within the Rocklow Creek catchment, most notably by directly intersecting with and dredging through the original alignment of Rocklow Creek and it's northern and western tributaries. To enable the continued functionality of surface water flows within the Rocklow Creek catchment, Boral has installed a realigned section of Rocklow Creek to the south of the existing Stage 3 dredge pond.

5.2.4 Having considered the existing impacts of the Stage 2 to 4 dredge areas, the Department considers that the proposed Stage 5 dredge ponds have been designed with the intention of limiting the further incremental effects of the modified project on local drainage patterns and surface water catchments.

5.2.5 Stage 5A is located wholly within the Rocklow Creek catchment and Stage 5B is located wholly in the Minnamurra River catchment (see **Figure 4**). This means that the site would need to be operated so that clean surface water flows in Stage 5A are diverted around the extraction area and continue to drain north to Rocklow Creek, and subsequently into the Minnamurra River. Stage 5B would likewise need to be managed to ensure clean surface water flows are diverted around the extraction area and continue to drain south-east to the Minnamurra River.

Figure 4 | Catchment boundaries

5.2.6 The 3.42 ha disturbance area for Stage 5A would be small in the context of the Rocklow Creek catchment (around 0.25% of the total catchment area). The proposed Stage 5A extraction area is currently used for grazing and drains to Rocklow Creek via a system of catch drains and culverts beneath the Princes Highway, Riverside Drive and Fig Hill Lane.

5.2.7 The Stage 5A extraction pond would be surrounded by bunds of sufficient height and freeboard to prevent any groundwater that accumulates in the pond from mixing with the surface water run-off being diverted around the pond.

5.2.8 This system would be complemented with additional catch drains to ensure clean run-off from outside the extraction area, the topsoil stockpile area and haul road is diverted away from the pond and continues to drain to Rocklow Creek. These drains could be appropriately designed and operated to ensure that erosion and sediment movement is controlled before surface water leaves the site. Additionally, any sediment laden run-off from within the Stage 5A area, the VENM stockpile areas and the haul road would be diverted back into the dredge ponds and retained on site.

5.2.9 As progressive rehabilitation is completed and the Stage 5A area starts to return to its previous landform, the catchment diversion system could be adjusted to allow runoff from rehabilitated areas to be restored to the natural drainage pattern of the site as quickly as possible. Once Stage 5A has been completely

backfilled with VENM, topsoil replaced and rehabilitation established, the site will be able to be fully re-integrated into the Rocklow Creek catchment. This whole rehabilitation process is expected to take up to 24 months to complete.

5.2.10 By comparison, Stage 5B is located around 400 m from the Minnamurra River to its south and 500 m to its east. The intervening land contains dense vegetation including littoral forest, mangrove, saltmarsh and seagrass communities. The Stage 5B area receives surface water flows from the sloping lands to the north and west, which flows across the site and drains south-east to the river. Boral is proposing to develop earthen bunds and drains around the Stage 5B pond to divert surface run-off around the extraction pond and manage sediment laden water before it leaves the site.

5.2.11 Aside from the direction of surface water flows, the key difference between the two Stage 5 extraction areas is that Stage 5B is proposed to be retained as a pond in the longer term and rehabilitated with native vegetation around the edges of the pond. This is consistent with the rehabilitation successfully implemented at the previous Stage 1 and currently underway at the Stage 2 dredge ponds.

5.2.12 In effect, this means that any bunds and diversion drains in place for the extraction of Stage 5B would need to be designed to operate well into the future and ensure that pond waters are separated from other downstream receiving environments. Any suspended sediments in the pond would settle naturally over time and water quality in the pond would be monitored against relevant water quality guidelines.

5.2.13 While this would result in the long-term removal of around 8.12 ha of the Minnamurra River catchment area (0.015% of the total catchment area), the resultant changes in surface water or drainage patterns are not expected to be significant.

5.2.14 Furthermore, should monitoring of the Stage 5B pond indicate that the water quality has reached appropriate levels in accordance with ANZECC guidelines and that it would not detrimentally effect nearby sensitive environments, the bunds would be able to be removed, the edge of the pond regraded and rehabilitated with suitable vegetation and the 8.12 ha of deferred catchment area could be returned to the Minnamurra River catchment.

5.2.15 This process is similar to the rehabilitation successfully undertaken for Stage 1 and underway at Stage 2, where landform construction of the south eastern section of Stage 2 is well progressed with VENM infill placed to form the foundations for planting of swamp oak floodplain forest. The banks of the realigned Western Tributary channel in Stage 3 have also commenced being rehabilitated, with the laying of jute matting and the establishment of riparian vegetation.

5.2.16 In addition to the direct impacts of the dredge ponds, the modification would necessitate the operation of a delivery and return water pipeline. This 355 mm wide pipeline is not expected to significantly affect surface water flows and has been designed so that the pipeline route uses existing culverts, avoids the need for vegetation clearing and maximises the use of floated pipes on top of the existing dredge ponds.

5.2.17 The general alignment of the pipeline is shown in **Figure 3**. The pipes would be laid and secured to the ground and travel from Stage 5B along the internal access road easement, beneath the Dunmore House access road and Fig Hill Lane to the Stage 5A extraction area, before heading north-west across the Stage 1 pond east of the Princes Highway and under existing culverts beneath the Princes Highway and Swamp Road to the existing processing facility.

5.2.18 To limit riparian and hydraulic impacts at Rocklow Creek, the pipes would be suspended across the creek on a temporary bridge with concrete pillars, a 1.5 m high gangway with a span of 12 mm. Importantly, the concrete pillars would be designed to ensure that creek flows are not affected. While this section of Rocklow Creek has already been heavily modified, the use of this gangway would avoid the need for any further works to occur within the creek.

5.2.19 With respect to other surface water impacts, it is acknowledged that the establishment of the site office, parking area, transfer pipeline and access roads, along with the clearing of the proposed extraction areas and construction of diversion structures could increase the risk of localised erosion and transportation of sediment material, particularly in the short term.

5.2.20 To ensure erosion and sediment controls are effective, the Department has recommended that the Erosion and Sediment Control Plan in place for the current operations is comprehensively updated to include all proposed construction activities and drainage structures for the new extraction areas. Boral would need to consult with relevant Government agencies, including DPIE Water and the EPA, during the preparation of this update and would not be permitted to undertake any activities for the proposed modification until the updated plan has been approved by the Department.

5.2.21 Finally, the proposed modification is not seeking and would not require any changes to the existing established surface water controls at the processing site. The processing plant would continue to be used over the duration of the proposed Stage 5 extraction activities and appropriate surface water management measures are already approved and in place to control run-off and sediment at this site.

Water Quality

5.2.22 With the above controls in place to control surface water flows and sediment transport, the proposed dredging operations are unlikely to significantly affect water quality in either catchment as the water contained in the ponds would be unlikely to mix with run-off from outside the ponds.

5.2.23 The processing and washing of the sand presents a potential source of water quality impacts. However, the Department is confident these risks are low as activities at the processing facility have already been operating for many years with appropriately water quality management and controls in place.

5.2.24 As the wet sand slurry is processed, water that has been coincidentally extracted with the sand is removed and drained to an existing fines pond and a secondary settling pond. Once water from the processing system is deemed to be of an appropriate quality to be delivered back to the dredge ponds, it would be pumped back to the Stage 5 ponds from which it was originally extracted.

5.2.25 These ponds are appropriately sized to accommodate the return water without risk of spilling over the freeboard and water quality monitoring would be undertaken throughout the extraction process to ensure the return of this water would not result in detrimental effects on the water quality in the ponds.

5.2.26 The Department considers that these processes and monitoring requirements would be appropriate to manage the potential water quality impacts of the proposed operations and has recommended that they be reflected in an updated Water Management Plan for the project.

5.2.27 Notwithstanding, the Department recognises that there are two other considerations that are important from a water quality perspective, being the management of Potential Acid Sulfate Soils and interactions with the local flooding regime. These matters are discussed further below.

Groundwater

5.2.28 The groundwater impacts of the proposal would be limited and are considered manageable. As the sand extraction would occur within the water table, active dewatering of the extraction areas would not be required, although some water would be extracted coincidentally with the wet sand slurry.

5.2.29 The natural groundwater level in this area is located around 0.6 m below the surface and the removal of sand from the dredge ponds would not be expected to materially affect the existing groundwater level. Boral has committed to record the volume of water extracted from the ponds in the wet sand slurry and return the vast majority of this water to each pond after the sand has been processed, to ensure there is minimal net loss of water from the groundwater source.

5.2.30 Together with the fact that the Stage 5A area would be completely backfilled with VENM material and rehabilitated following extraction, this approach of returning process water to the dredge ponds would mean that the modification would not ultimately extract significant volumes of groundwater or result in significant drawdown of the aquifer.

5.2.31 The main source of groundwater movement into the ponds would be due to mass balance inflows to replace the volume of sand extracted from Stage 5B. As extraction would be undertaken within a flooded pond, the rate of groundwater inflow to the pond would be proportionate to the rate of sand extraction and has been assessed as unlikely to result in significant or far reaching groundwater drawdown impacts. This is supported by the fact that the aquifer underlying this area is subject to rapid recharge and the sand resource has a high infiltration rate, which would act to further prevent the potential for any lowering of the groundwater table across the site.

5.2.32 Kiama Municipal Council raised concerns about the potential for changes to groundwater flow direction as a result of the extraction. In particular, Council was concerned that the Stage 5 extraction would result in groundwater in the area of Council's waste and recycling facilities located east of Riverside Drive being drawn towards the extraction areas and mix with groundwater in the Minnamurra estuary.

5.2.33 However, the groundwater assessment identifies that the current groundwater direction in the area where the recycling facilities are located flows away from the extraction areas, meaning that there would need to be a significant alteration in the current groundwater flow regime in order for groundwater from beneath the Council's landfill and recycling facilities to reverse flows towards the proposed Stage 5 extraction areas. DPIE Water and the Department are both satisfied that the modification would not result in material groundwater drawdown and as such represents a very low risk of causing a material reversal of the current groundwater flows in the area.

5.2.34 As identified above, dredging operations would occur below the groundwater level of the surrounding aquifer and most of the water that would be temporarily removed from the ponds as moisture in the sand slurry would be captured and replaced following processing. The ponds would fill with groundwater, proportionate to the amount of material extracted. However, as Stage 5A would be fully backfilled, the majority of impacts would occur from mass balance inflows into the Stage 5B pond. These inflows are not considered sufficiently large to result in a serious or sustained reversal of the groundwater regime.

5.2.35 The Department has a high degree of confidence in the accuracy of the inflow predictions, given the Stage 5B final landform has been designed in a similar manner to the rehabilitated Stage 1 ponds and the currently operating Stage 2 and Stage 3 ponds. In fact, as part of its original assessment of the project for Stages 2 and 3, the Department commissioned specialist groundwater consultants to undertake an independent review of the potential groundwater impacts of the proposal.

5.2.36 This independent assessment concluded that while the initial excavation and dredging operation in the Stages 2 to 4 ponds would be expected to create a localised, depressed groundwater level in the short term, the high transmissivity of the aquifer sands would promote rapid recharge to the dredge pond and would have a minor and temporary impact on the regional aquifer system.

5.2.37 This report also found that the Stage 2 to 4 ponds would not be expected to result in groundwater induced impacts on the protected wetlands located about 80 m to the east of Stage 2 to 4 ponds. The Department recognises that the community's submissions on the current proposal raise similar concerns about the potential for groundwater inducted impacts on the wetlands located over 100 m to the east of Stage 5B.

5.2.38 To this end, the Groundwater Impact Assessment notes that both the Stage 5 areas are setback at a sufficient distance from mapped groundwater dependent ecosystems and that the Stage 5B pond is located outside the zone of affectation of the groundwater influence of the coastal wetland area. Having

carefully considered the successful management of impacts associated with the existing operational stages, the relatively minor drawdown effects associated with the final Stage 5B pond and the impacts predicted in the Groundwater Impact Assessment, the Department is confident that the modification would not result in unacceptable impacts to the coastal wetland areas to the east of the site.

5.2.39 Finally, the Department notes that there are no significant groundwater extraction bores in the local area that would be affected by the proposed modification.

5.2.40 Consequently, the Department and DPIE Water consider that the potential impacts of the modification on the local groundwater regime would be manageable and licensable. The Department notes nonetheless that the Water Management Plan for the project would be updated to describe how groundwater inflow impacts would be managed and minimised during extraction.

Water Balance and Water Licensing

5.2.41 The primary aspect of the modification that would influence the total water balance for the site is the amount of additional groundwater that would be extracted in the sand slurry.

5.2.42 While some of this water would be returned to the ponds following processing, any moisture contained within the processed sand leaving the site would be lost from the local groundwater source. Based on the average extraction rate of around 450,000 tonnes per year and an average product moisture content of 8%, this would mean that approximately 36 ML of water would leave the site in the sand every year.

5.2.43 Dust suppression also requires water use and is currently applied at a rate of 4.5 ML per ha per year, over an exposed area of 7.6 ha. This equates to about 34 ML a year of water being used for dust suppression at the existing site. The Stage 5A and 5B access roads and stockpile areas cover an additional 0.7 ha. Applying the same rate would increase current dust suppression water use for the modified project to around 38 ML a year.

5.2.44 As outlines in Section 3.3, these operational water demands would generate a combined groundwater take of 74 ML/year under the average extraction scenario of 450,000 tonnes a year. Evaporative loss from the surface of the dredge ponds is expected to result in the further groundwater take of up to 4.52 ML/year from Stage 5A (prior to backfilling and rehabilitation) and 9.32 ML/year from Stage 5B.

5.2.45 Boral has already secured 65 ML/year in WALs from the Sydney Basin South Groundwater Source and 35 ML/year in WALs from the Metropolitan Coastal Sands Groundwater Source subject to relevant WAL and WSW approvals as outlined in Section 3.3. Together WALs are sufficient to account for operations in the Stage 5A area and allow Boral to commence operations in Stage 5B at a lower extraction rate.

5.2.46 While the volume of water take for Stage 5B would be small in the context of the available groundwater source, Boral would need to obtain additional WALs for the Metropolitan Coastal Sands Groundwater Source on order to sustain average production rates of 450,000 tonnes per year in the Stage 5B area.

5.2.47 To this end, the Department and DPIE Water have recommended conditions requiring Boral to hold appropriate licences for the groundwater take prior to these activities occurring or scale back its operation to match its available water supply within this water source.

5.2.48 With these conditions in place, both DPIE Water and the Department are satisfied that the water take for the project including the proposed modification could be appropriately licensed in a similar manner to current water take from the project. To ensure this take is monitored, DPIE Water has recommended that Boral clarify the incidental take from groundwater sources in its updated Water Management Plan.

5.2.49 The Department notes that the Water Management Plan for the project, including the Surface Water Management Plan and groundwater monitoring program is already required to be prepared in consultation with DPIE Water and is subject to annual review and update.

Acid Sulfate Soils

5.2.50 In a similar fashion to the existing approved Stage 2 to 4 operations, the Department considers that the proposed modification presents a limited risk of oxidising acid sulfate soils. DPIE Water and the EPA requested more information on the process that would be used to determine if potential acid sulfate soils would be disturbed by altered hydrogeological conditions from dredging.

5.2.51 The potential for acid sulfate soils is restricted to the area underlying Stage 5A, where these soils have the potential to occur from a depth of 4 metres below the existing ground level. The soils underlying Stage 5B have been confirmed as being non-acid sulfate soils or no-risk non-reactive soils which would not require management through neutralisation if oxidised.

5.2.52 The risks of oxidising potential acid sulfate soils at Stage 5A would therefore need to be carefully managed as part of the extraction process, as is the case for the current operations. With respect to the management of potential acid sulfate soils materials extracted during processing, Boral is proposing to continue its existing practice of sieving the wet sand slurry through a sluicing device installed at the existing processing facilities to remove finer grained materials that are more prone to containing sulfides. Any fines removed as part of this processing would be emplaced below the water table in the existing fines dredge pond located adjacent to the existing Dunmore Lakes processing facilities and would be subsequently capped with inert VENM material prior to final rehabilitation.

5.2.53 The static water levels and water chemistry would be regularly monitored as extraction progresses to check for the presence of these soils. This process has already been effectively implemented and proven for Stages 2 and 3 of the project and provides an effective management technique during the operation of the dredge ponds.

5.2.54 In addition to these processing controls, the Department notes that the risk of potential acid sulfate impacts would be minimal during dredging operations for Stage 5A, as any fines suspended in the dredge pond would remain saturated at all times and would not be exposed to sources of oxidisation. Following the completion of extraction, the Stage 5A dredge pond would be completely backfilled with VENM and any residual fines suspended in the water body would be covered with inert material and buried at depth below the water table. This depth of cover would in turn ensure that the final landform results in a negligible risk to long term impacts on local hydrology or oxidisation risk.

5.2.55 The rehabilitation of the Stage 5A pond and Stage 5B pond banks would also be undertaken in line with the existing strict protocols in place for Stages 2 and 3, which requires all VENM used in rehabilitate to be certified as non-acid sulfate soils before it is allowed on site. Monitoring of the Stage 5B pond would continue until such time that it can be demonstrated that surface water levels are in equilibrium with the surrounding environment to avoid oxidisation of acid sulfate soils.

5.2.56 Notwithstanding that these controls would act to effectively manage this risk, Boral has also committed to preparing an Acid Sulfate Soils Management Plan for the proposed modification. The Department supports the preparation of this plan as also recommended by the EPA, and has recommended a condition of consent that it is prepared in consultation with DPIE Water and EPA, prior to extraction being undertaken in Stage 5A.

5.2.57 The Department has also recommended that the Acid Sulfate Soils Management Plan includes a detailed Trigger Action Response Plan to ensure that this issue is closely monitored and appropriate action is taken to manage any residual risks associated with acid sulfate soils.

Flooding

5.2.58 The current conditions of consent require Boral to ensure that the flood storage capacity of the site is no less than the pre-existing flood storage capacity at all stages of the development. Details of the available flood storage capacity must be reported in the Annual Review.

5.2.59 The proposed Stage 5 dredge ponds occupy a relatively small footprint in the context of the floodplain and would only result in a minor loss of floodplain storage during operations. Boral's proposed design would physically separate the ponds from the floodplain through the development of engineered flood bunds of sufficient height to provide 3 metres of freeboard before dredging activities occur.

5.2.60 Flood modelling indicates that the proposed level of freeboard in the ponds would be more than sufficient to contain a 1 in 100 year average recurring interval (ARI) event and would be sufficient to divert overland flow around the ponds to avoid any impacts on surrounding land.

5.2.61 As the Stage 5A area would be completed within the first 2 years of the modification, the Department considers that bunds capable of diverting overland flows for a 100 year ARI event are sufficient to mitigate the risks associated with flood interactions with the dredge pond.

5.2.62 The longer term impacts of Stage 5A would be further mitigated by progressively backfilling of the pond during operations and returning the final landform to its pre-extraction level following the completion of sand extraction. In effect this means that following completion of the rehabilitation for Stage 5A and removal of the flood bunds associated with this area, the operations in this area would be expected to have a negligible effect on future floods levels and velocities.

5.2.63 Stage 5B is located in a low velocity backwater area on the fringes of the Minnamurra River flood extent and would remain free of flooding impacts during more frequent rainfall events. However, in the absence of management measures, this area would be susceptible to flooding during the 1% AEP flood event where floodwaters reach levels of around 3.7 to 4.1 m AHD.

5.2.64 To manage this risk, Boral has proposed to construct a diversion channel around the northern, uphill side of the Stage 5B area to divert surface water flows around the extraction area and would install approximately 4.1 m AHD high flood bunds with a 3.9 m AHD spillway, to reduce the likelihood of flood interactions from the surrounding Minnamurra River floodplain.

5.2.65 Boral also identified that the proposed car park would be constructed at a height of 5.5 m AHD (marginally above the probable maximum flood level of 5.2 m AHD) and considered this sufficient to manage Shellharbour City Council's concerns regarding the potential for cars to be affected during significant flood events. While the Department considers this to be an appropriate mitigation measure, it has made further recommendations below regarding enclosing the car park within enlarged flood bunds.

5.2.66 Even with Boral's proposed mitigation measures in place, the flood depth in the Stage 5B area under a 100 year ARI event would result in a shallow connection between the extraction pond (near the spillway) and the surrounding flood waters. While this inundation would not be subject to high velocity flows or materially affect flood velocities in the area, the Department recognises that there would remain a relatively minor connectivity pathway with the nearby river system.

5.2.67 The probable maximum flood scenario would also result in inundation of the site, as is already the case under current conditions. **Figure 5** illustrates the flood levels in m AHD that naturally occur in this area without the implementation of flood bunds. For context, it is important to note that such events are rare and would result in widespread inundation across the region, including the suburb of Minnamurra to the east of the site, as shown in **Figure 5**.

Figure 5 | Probable Maximum Flood inundation map (existing environment)

5.2.68 Both dredge ponds incorporate spillways as a precautionary measure for flood events. The Department considers the likelihood of overtopping via these spillways to be low for Stage 5A, due in part to the short timeframe between disturbance and rehabilitation, and more likely for Stage 5B, as this pond is more susceptible to deeper flood events associated with the Minnamurra River (see **Figure 5**) and would be retained in the final landform.

5.2.69 In terms of impacts, the Department recognises that even with Boral's proposed flood mitigation measures in place, the Stage 5B area would be expected to connect with the Minnamurra River under a 100 year ARI or probable maximum flood event. Therefore, the key consideration is whether these rare flood events would increase the risk of mobilising sediment laden water from the pond and polluting the downstream environment, the significance of such impacts and whether these impacts could be further managed and mitigated through the implementation of additional measures or controls.

5.2.70 As discussed in the surface water section above, residual sediments in the Stage 5B area would be allowed to settle toward the bottom of the pond post-extraction and represent a very small risk of containing acid sulfate soils or other agricultural pollutants. However, there is the potential that flood interactions would liberate additional suspended sediments beyond those already contained in existing floodwaters. While these impacts are mitigated by the depth of Stage 5B, the design of the flood bunds and the lower velocity flood flows in this area, the Department considers it important to manage the (albeit low) risk of downstream pollution and sedimentation of seagrass beds and fish habitat.

5.2.71 In order to mitigate the risks of potential offsite sediment transport, the Department considers that reasonable and feasible efforts should be implemented to increase the freeboard of the Stage 5B dredge pond to separate it from the river during flood events. Given the pond would be retained as a feature in the long term landscape, the Department considers that the Stage 5B flood bunds should be engineered to withstand and prevent interactions under the probable maximum flood event.

5.2.72 While the Department recognises that this level of control and design criteria are beyond the standards expected of other State significant extractive industry proposals, this additional measure is considered an important and effective means of protecting the important coastal wetland ecosystems in the area. Accordingly, the Department has recommended a condition that requires Boral to construct flood bunds

around the Stage 5B extraction area and carpark to a sufficient height to avoid interactions between the dredge pond and the probably maximum flood event.

5.2.73 This would effectively increase the height of the bunds to around 5.5 – 6.0 m AHD and would require the bunds to be proportionately widened to achieve a slope that would remain stable in the long term environment. As a point of reference, the batters of these flood bunds would be about a third of the width and half the height of the batters already constructed at the Minnamurra and Kiama Community Recycling Centres located 750 m northeast of Stage 5B pond and would be effectively shielded from public viewpoints by existing dense vegetation cover and topographic features that surround the site, including an approximately 19 m deep cutting for vehicles travelling south on the Princes Highway.

5.2.74 While the widening of these bunds would marginally reduce the tonnages that could be recovered from the Stage 5B area, the Department recognises the importance of protecting the surrounding wetlands and ecosystem from potential water quality impacts. Notwithstanding, should ongoing monitoring demonstrate that the water quality in the final Stage 5B pond does not represent a risk to the downstream environment, these bunds would be able to be regraded (similar to Stages 1 to 4) to create a pond with fringing vegetation and the area could be returned to the floodplain.

5.2.75 The Department considers that with these measures in place, the modification would represent a low risk of significantly affecting the river catchment even during a probable maximum flood event, especially given that an event of this scale would be of such magnitude as to immerse the suburb of Minnamurra and would already impact the river well beyond any incremental impacts that could be attributed to the project.

5.2.76 The Department's approach to additional flood mitigation is consistent with the recommendations of BCD, EPA and Fisheries NSW to ensure biodiversity, water quality and key fish habitat is adequately protected.

5.2.77 Finally, the Department notes that the EA identifies that if ponds are inundated during a flood event, they would be subsequently drained following the flood to allow dredge operations to continue. The Department considers that the likelihood of this occurring would be markedly reduced by the above measures, but notes that in the unlikely event that the ponds need to be drained, discharges from the site would be required to be treated to meet applicable EPA criteria under the EPL for the site.

Summary of Water Recommendations

5.2.78 The Department has recommended:

- that the Water Management Plan for the project is updated to describe how groundwater inflow impacts would be managed and minimised during extraction;
- preparation of an Acid Sulfate Soils Management Plan which includes a detailed Trigger Action Response Plan;
- that flood bunds for Stage 5B are engineered to withstand the probable maximum flood level;
- that bund stability is regularly monitored throughout the extraction operations; and
- management of any offsite water discharges by way of a variation to the existing EPL.

5.3 Biodiversity

Terrestrial Biodiversity

5.3.1 The EA identifies that as part of stakeholder consultation for the modification, the then NSW Office of Environment and Heritage (OEH), requested that the biodiversity impacts of the modification be assessed using the Biodiversity Assessment Method (BAM). The BAM is a framework for assessment of biodiversity impacts and determination of offsetting requirements under the *Biodiversity Conservation Act 2016* (BC Act).

5.3.2 The proposed modification has been designed in a manner that seeks to minimise biodiversity impacts by focusing development in areas previously cleared for agricultural purposes. Nevertheless, the proposal would require the clearance of approximately 7.5 ha of native vegetation. The Department and BCD agree that the terrestrial biodiversity impacts associated with this clearing can be offset in accordance with the BC Act.

5.3.3 In reaching this conclusion, the Department recognises that the 7.5 ha of native vegetation that would be cleared includes 4.5 ha of Bangalay Sand Forest (BSF) in Stage 5B, which is a listed EEC under the BC Act (see **Figure 6**) and attracts an offset liability, and, 3 ha of exotic grassland in the Stage 5A area, which is not listed under state or Commonwealth legislation and therefore does not attract an offset liability. Given the flexibility of the ancillary pipeline layout, this infrastructure can be installed in a manner that avoids unnecessary clearing of native vegetation.

5.3.4 The area of EEC within the Stage 5B footprint proposed to be cleared commences with poor quality BSF derived native grasslands to the north, transitioning into moderate quality BSF EEC through the middle 40% of the Stage 5B and good quality BSF EEC in the southern section of the extraction area. The proposed clearing represents a very small proportion of this EEC, which is recorded all along the Eastern seaboard from Sydney to the Victorian Border and covers a total area of around 6,300 ha.

5.3.5 Six threatened fauna species listed under the BC Act were also recorded during field surveys, being the Dusky Woodswallow, Varied Sittella, Southern Myotis, Eastern Bentwing-bat, Eastern Freetail-bat and Grey-headed Flying Fox. The biodiversity assessment identifies that none of these six threatened bird, bat and mammal species were recorded as using the area for breeding.

5.3.6 The Department recognizes however, that the Stage 5B area contains a number of isolated trees and stands of trees that could provide important stepping stones, foraging resources and habitat (including 38 hollow bearing trees and 4 hollow bearing stags) for native fauna. Under the recommended conditions, Boral would be required to salvage hollow-bearing logs, introduce additional habitat features such as nest boxes in the final landform and promote the use of these habitat features by threatened fauna species.

5.3.7 In addition to this, there are large extents of the neighbouring landholdings that are heavily forested and could provide breeding and foraging habitat for these fauna species. It is therefore likely that the highly mobile species identified in the biodiversity surveys would utilise Stage 5B area for foraging and would be capable of relocating to other areas around the site.

5.3.8 Notwithstanding, Boral would be required to retire 71 ecosystem credits to account for the impacts associated with the proposed clearing of BSF EEC. Boral would also be required to retire a further 161 species credits comprising 19 credits for impacts on Southern Myotis and 71 credits each to account for potential impacts to Barking Owl and Masked Owl. The requirement to retire offset credits for Barking Owl and Masked Owl was adopted as field surveys were unable to be conducted during the breeding seasons for these species. As such, these species have been assumed to be present and a conservative credit obligation has been imposed.

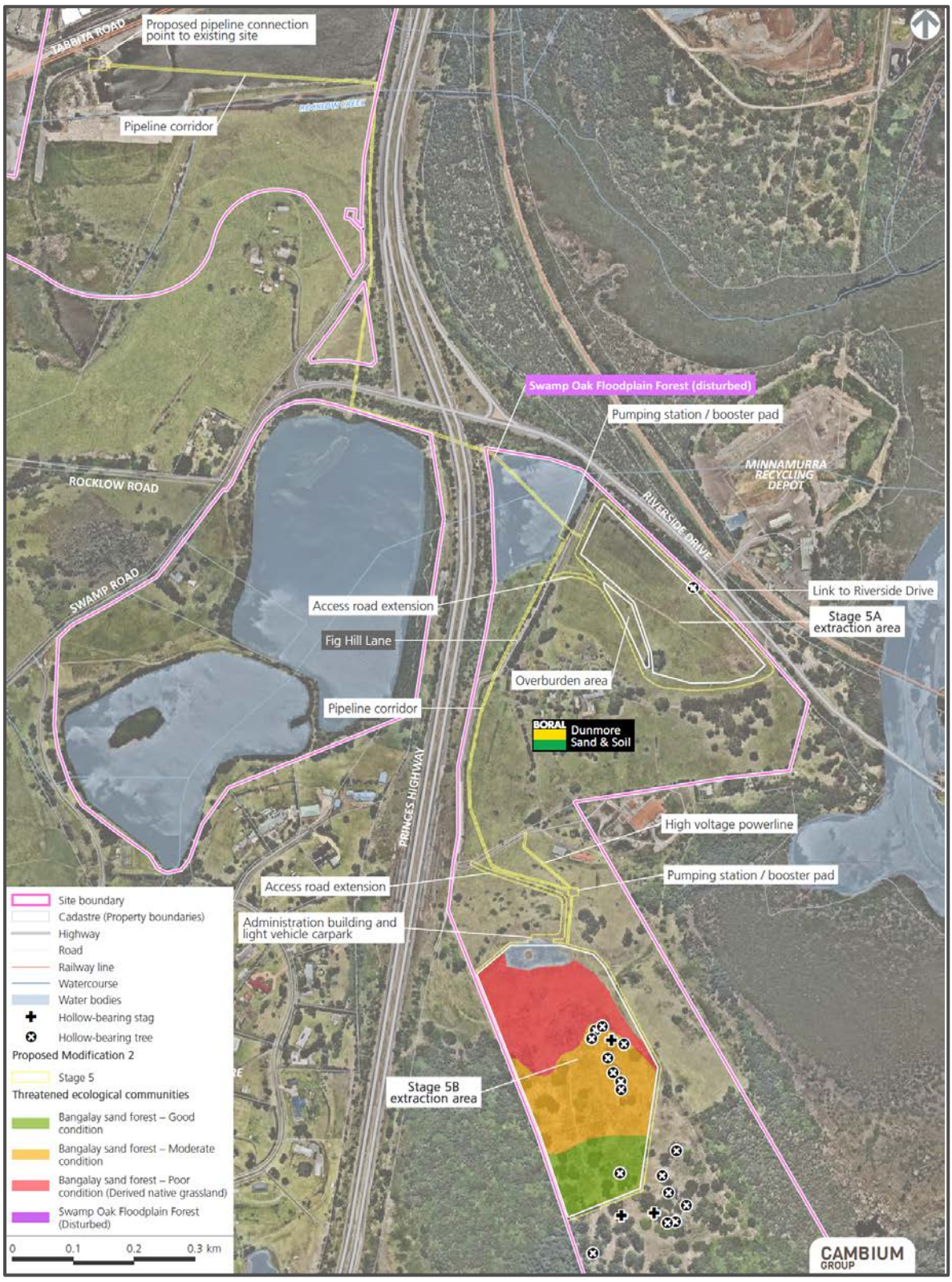

Figure 6 | Bangalay Sand Forest EEC at the site

5.3.9 The potential impacts of the modification on the remaining recorded threatened species were addressed through the assumed presence of habitat within the impacted vegetation. As such impacts on these species, along with potential impacts on Cattle Egret and the White-bellied Sea-Eagle (which has been observed perched or flying within the Stage 5B area and is known to nest around 280 m south of the site) would be offset and accounted for through the retirement of the 71 ecosystem credits already required for the BSF EEC.

5.3.10 To satisfy its offset obligations, Boral has commenced investigations of two potential biodiversity stewardship sites that contain Bangalay Sand Forest in the locality. While these investigations are yet to be completed, Boral would be required to retire all requisite credits for Stage 5B, prior to commencing construction associated with Stage 5B. This would ensure that credits are retired before any impacts on these species occur.

5.3.11 The likelihood of further impacts on species would be limited through the implementation of mitigation and management measures, including fencing off areas to avoid unnecessary clearing and ensuring quarry vehicles remain on designated roads and tracks. Boral would also be required to undertake pre-clearance surveys, avoid breeding seasons when clearing hollow bearing trees and install nest boxes to compensate for the removal of any tree hollows.

Minnamurra Wetland

5.3.12 The Department acknowledges that both Local Councils and a large number of submissions from the community and special interest groups were concerned about the impacts of the proposal on the Minnamurra wetland area, which is protected under the Coastal Management SEPP. The Department has assessed the application in accordance with the SEPP and considers that it could be carried out in a manner that is generally consistent with the aims, objectives and provisions of the SEPP.

5.3.13 While the Stage 5A area is around 50 m from the nearest extent of the mapped wetlands, this thin strip of wetlands is separated from activities within the Stage 5A area by Riverside Drive and is further separated from Rocklow Creek by the South Coast Railway Line and Council's landfill and recycling facilities. Importantly, while the proximity area for Coastal Wetlands overlaps with a 50 m wide strip of the Stage 5A area, no extraction would occur within the wetland and the Stage 5A dredge pond would be backfilled, rehabilitated and returned to its previous landform post extraction.

5.3.14 As identified in Sections 5.2 and 5.3, the Department, BCD, the EPA and Fisheries NSW are all satisfied that the biodiversity, surface and groundwater impacts of the proposal and protection of key fish habitat can be appropriately managed by way of the recommended conditions of consent. Consequently, the development and rehabilitation of the limited extent of Stage 5A that overlaps with the proximity area is not considered to represent a significant risk to the adjacent Coastal Wetlands.

5.3.15 The Stage 5B extraction area is over 100 m from the edge of the wetland area to the east (see **Figure 7**) and over 350 m from the wetland area to the south. No extraction would occur within the mapped wetland areas or the mapped proximity area for coastal wetlands buffer as a result of Stage 5B.

5.3.16 As the modification would not result in any material drawdown from the groundwater system that feeds the wetland and sedimentation risks could be appropriately managed through engineered flood bunds, the Department considers it unlikely that the modification would materially affect the hydrological regime of the local area or the water resources feeding the wetlands.

Aquatic Biodiversity

5.3.17 The Department notes that the Minnamurra River and Rocklow Creek are mapped as key fish habitat, and has consulted with Fisheries NSW on the proposal. Boral's RTS identifies that Stage 5A is located around 150 m from the mangrove areas associated with the Minnamurra River and 250 m of mangrove areas associated with Rocklow Creek. Stage 5B is located about 160 m from saltmarsh and mangrove areas on the tidal flats of the Minnamurra River.

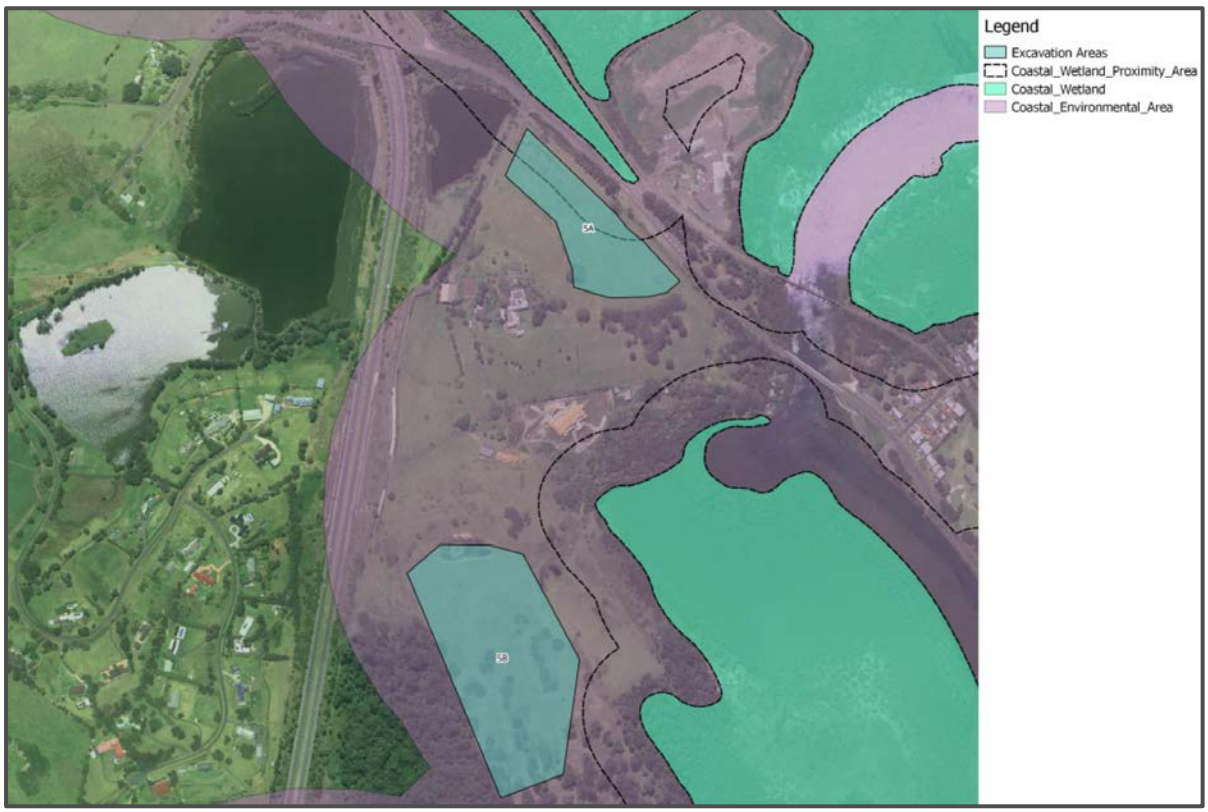

Figure 7 | Coastal Management SEPP wetland boundaries

5.3.18 Fisheries NSW did not object to the proposal on the basis of impacts to key fish habitat and noted that the proposed disturbance areas for Stage 5A and 5B are over 100 m from key fish habitat. The proposed pipeline would also be unlikely to affect key fish habitat, as it would mainly be placed on cleared land or floated on the surface of the existing rehabilitated Stage 1 pond and would avoid areas which contain key fish habitat.

5.3.19 In addition to direct disturbance risks, the Department notes that the performance of flood bunds and management of potential acid sulfate soils are important factors in potential ancillary impacts to key fish habitat. As stated above, the Department has recommended a range of strict conditions regarding the specifications of flood bunds and the management of potential acid sulfate soils.

5.3.20 With these measures in place, the Department and Fisheries NSW are confident that the modification represents a low risk of any potential impacts to fish habitat and could be appropriately managed to ensure the protection of key fish habitat.

Biodiversity Recommendations

5.3.21 To appropriately manage and offset the biodiversity impacts of the proposal, the Department has recommended that:

- Boral consults with BCD to prepare a detailed update to its current Flora and Fauna Management Plan, with appropriate controls to manage clearing impacts, edge effects and measures to ensure key fish habitat is protected throughout the extraction and rehabilitation processes;
- the offset obligations for ecosystem and species credits are retired in accordance with the BC Act prior to the commencement of Stage 5B; and
- Boral develops detailed management plans reflecting the Department's and Fisheries NSW's recommendations for the design of flood bunds and management of potential acid sulfate soils.

5.4 Aboriginal Cultural Heritage

5.4.1 Boral undertook an extensive assessment of Aboriginal cultural heritage items and values at the two extraction sites in accordance with *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (OEH 2010) and in consultation with Registered Aboriginal Parties (RAPs).

5.4.2 The Stage 5 extraction areas have been highly modified and cleared over time to facilitate agricultural activities. Nonetheless, the assessment identified three sites of archaeological potential, although these areas having been historically cleared and disturbed. These three sites are all artefact scatters and are referred to as DLS Boral AFT 1 (AHIMS 52-5-0907), AFT 2 (AHIMS 52-5-0908) and AFT 3 (AHIMS 52-5-0909) (see **Figure 8**).

5.4.3 To inform the proposed modification Boral undertook a test pit excavation program in the presence of RAPs. This involved 45 test pits (17 in the Stage 5A area and 28 in the Stage 5B area), from which a total of 1,292 artefacts were discovered, with most artefacts being flakes or broken flakes.

5.4.4 Based on the information provided in the EA, Boral's addendum to the Aboriginal Cultural Heritage Assessment Report (ACHAR) as part of the RTS dated July 2019 and comments made by the Heritage Branch, the Department notes that DLS Boral AFT 1 and DLS Boral AFT 2 could have moderate-high archaeological significance due to the high number and diversity of artefacts, and their location near estuarine environments. However, DLS Boral AFT 3 is considered to have low archaeological significance due to the low density of artefacts recovered and the disturbed nature of the site, and is not considered further in the assessment.

5.4.5 In order to inform the consideration of Aboriginal cultural heritage impacts of the proposed modification, the Heritage Branch's initial submission requested further test pit excavation to better define the nature and extent of artefact scatters within the entirety of AHIMS 52-5-0907, including substantial areas outside of the proposed disturbance boundary. The Department notes that this additional test pitting within the proposed disturbance areas was of particular importance for ascertaining the extent of two high concentration test pits in DLS Boral AFT 1 (see test pits 17 and 23 in **Figure 9**).

5.4.6 In response to Heritage NSW's request, Boral undertaking a further 37 test pits at AFT 1 in the presence of RAPs to better ascertain the extent of these artefact scatters. This additional test excavation program yielded a further 470 artefacts and the results were detailed in the ACHAR Addendum Report dated December 2019. This program included additional test pits adjacent to the proposed Stage 5B disturbance area to determine the nature and significant of AHIMS 52-5-0907, but did not extend substantially beyond the proposed DLS Boral AFT 1 distant area in order to avoid unnecessary impacts to potential archeological sites that would not be affected by the modification. The Heritage Branch subsequently advised that it was satisfied with the level of test pit excavations undertaken for the proposed modification.

5.4.7 Overall the additional test pit excavations at site DLS Boral AFT 1 confirmed the findings of the previous test program, that archaeological deposits of varying density are present across the former beach ridge landform which also extends outside of the proposed Stage 5B disturbance area. The additional test pits also confirm that high artefact densities only occur over a limited lateral range of DLS Boral AFT 1.

5.4.8 The ACHAR documents that DLS Boral AFT 1 reflects the preference for occupation due to its elevated location at the beach ridge landform area, with the presence of higher artefacts densities in the beach ridge landform area confirming this position.

Figure 8 | Aboriginal cultural heritage sites

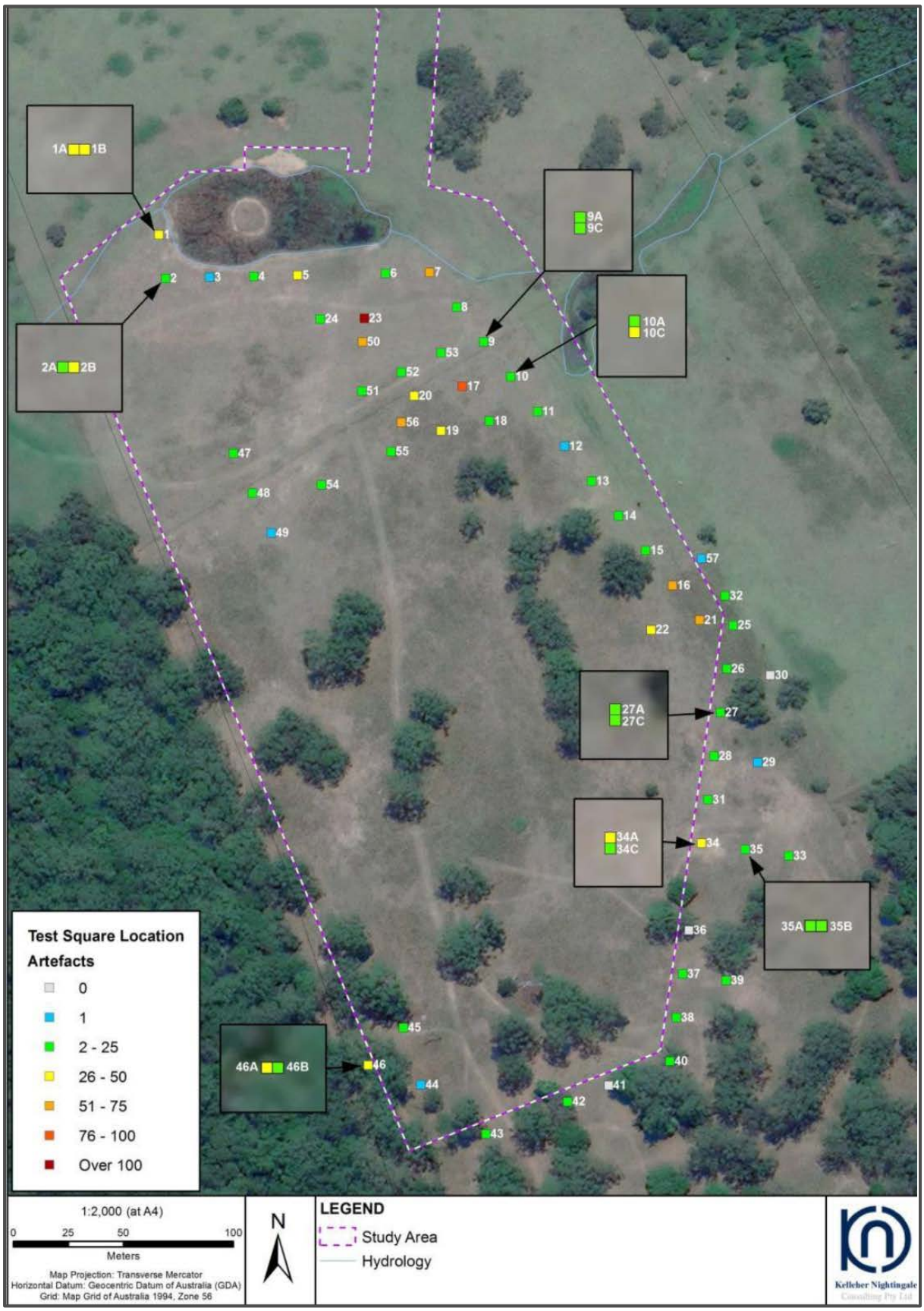

Figure 9 | AFT 1 Test pit excavation sites

5.4.9 The Heritage Branch sought further information on Boral's consultation processes and clarification of whether the December 2019 Addendum Report had been provided to RAPs. Boral confirmed that the report had been provided to RAPs and that no comments had been received in response to this report.

5.4.10 In terms of consultation on the potential impacts to Aboriginal heritage values, the Department is satisfied that appropriate consultation with RAPs has been undertaken. RAPs were consulted on the initial test excavations and additional test excavations and were present when both excavation programs were undertaken. They have also been provided with (and have taken) the opportunity to raise concerns after receiving the various assessment reports.

5.4.11 As advised by the Heritage Branch in its comments on the RTS, eight of the 19 RAPs were supportive of the proposal, while three RAPs within the Aboriginal Community took the opportunity to express their concerns and objections about the proposal via the ACHAR process.

5.4.12 While the Illawarra Local Aboriginal Land Council was the only RAP to lodge an objection to the proposal during the exhibition period for the proposal, the Department nonetheless notes the concerns that were raised by these RAPs directly with Boral in the ACHAR process, which stress the importance of avoiding significant impacts on local and regional Aboriginal cultural heritage values.

5.4.13 To this end, the Department notes that the extraction areas have been designed to avoid where possible the risk of significant impacts to Aboriginal cultural values. The Stage 5 dredge ponds have been located some distance from the Minnamurra River, with the Stage 5B pond in particular being designed to avoid encroaching further into the archaeological site area shown in **Figure 8** and forgo extraction of the sand resources that occur between the extraction area and the Minnamurra River.

5.4.14 Nevertheless, the development of the dredge ponds would necessitate the disturbance of artefact scatters within those areas of AFT 1 and AFT 2 within the disturbance footprint. It is therefore important that a comprehensive salvage program is undertaken in consultation with RAPs to ensure artefacts can be salvaged and protected.

5.4.15 The Department has therefore recommended conditions of consent which require that a comprehensive salvage program be undertaken in consultation with RAPs for DLS Boral AFT 1 and AFT 2, to allow further knowledge gathering on the significance of the area in terms of cultural values. The salvage program would be undertaken prior to extraction occurring in each of the stages, and any artefacts that are recovered would be appropriately conserved in consultation with RAPs.

5.4.16 As an additional protection measure, and to make sure that artefacts and sites outside of the extraction areas are fully protected from ancillary impacts of the development, Boral would be required to clearly mark and fence all proposed disturbance areas.

5.4.17 The Department has also recommended that these mitigation measures are detailed in an Aboriginal Cultural Heritage Management Plan, to be prepared in consultation with BCD and registered Aboriginal parties, and approved by the Secretary prior to any disturbance of DLS Boral AFT 1 and AFT 2.

5.4.18 In addition to these measures, Heritage NSW has suggested that further conservation and protection measures should be considered for the remainder of AHIMS 52-5-0907. This area includes a substantial area of private land outside of the proposed disturbance boundary that is not owned by Boral.

5.4.19 In this regard, the Department considers that the existing legislative frameworks and recommended consolidated conditions of approval provide appropriate protection against any further impacts to heritage values beyond those proposed in the EA. Under the Department's recommended conditions, the limited area of approved disturbance associated with the modification must be clearly demarcated to protect any Aboriginal objects and places located outside of this area from unintended impacts, all

workers staff must receive suitable Aboriginal cultural heritage inductions prior to carrying out work on the site and relevant RAPs must be consulted and involved in the ongoing management of the site.

5.4.20 The Department considers these conditions to be directly relevant and proportionate to the impacts of the modification being proposed. In addition, the NSW planning system provides further protection by ensuring that any potential future proposal to disturb lands located outside of the currently proposed disturbance area (be that by Boral or any other Applicant) would be assessed on its merits as part of a separate application process, in accordance with relevant legislative provisions.

5.4.21 In addition to the proposed impacts of the modification on known Aboriginal cultural heritage places and objects, the Department acknowledges that a massacre of Aboriginal people has been recorded as occurring in the broader area connected with the Minnamurra River in the early 1800s. The potential for this massacre site to be located in the broad area surrounding the proposal was raised by the community and in the Heritage Branch's advice on the proposal.

5.4.22 The Department recognises the concerns expressed by the community and has carefully considered this issue. The records indicate that the massacre may have occurred closer to the river than the proposed Stage 5 extraction areas. Furthermore, the Aboriginal cultural heritage assessment identifies that the surveys and archaeology of the project area have shown no connection to the massacre event.

5.4.23 Overall, the Department considers that the proposed extraction areas would result in a relatively small footprint within the wider cultural landscape and the extraction ponds, particularly Stage 5B, have been designed to minimise impacts on cultural values where possible. A salvage program is proposed to occur at the extraction sites prior to extraction, in consultation with Registered Aboriginal Parties, in order to preserve the artefacts that would be uncovered.

5.4.24 In terms of mechanisms to protect and conserve cultural heritage sites and values, the Department considers that the current legislative frameworks and conditions of approval already provide appropriate protection against any further impacts to heritage values, and notes that the project area would be clearly demarcated to ensure no potential cultural heritage sites are damaged outside of the approved project disturbance area.

5.4.25 Given the nature and significance of cultural sites in the vicinity, the Department considers that the most appropriate approach would be to ensure that all activities are managed in line with an Aboriginal Cultural Heritage Management Plan. The Department has therefore recommended that the plan:

- is prepared in consultation with BCD and Registered Aboriginal Parties,
- details the artefact salvage and storage procedures; and
- includes a chance finds protocol and stop work procedures if any significant and unforeseen cultural heritage items are discovered during the construction and operation of the Stage 5 areas.

5.5 Traffic and Transport

5.5.1 Sand products are currently exported from the site by rail to the South Coast Rail Line and by road using Tabbita Road and the interchange with the Princes Highway, to access the State road network and markets to the north and south. The proposed modification is not seeking to change the existing production rate or the road and rail product haulage arrangements, and therefore product haulage movements would not increase over that previously assessed and approved for the project as a whole.

5.5.2 The proposed modification would however require project-related traffic to travel on a short section of Riverside Drive which heads south-east from the exit ramp from the Prince Highway at Dunmore (see **Figure 10**).

Figure 10 | Riverside Drive and proposed site access location

5.5.3 An initial, temporary increase in traffic movements would be required to construct the Stage 5A extraction area and develop the access road, site office, car park and intersection with Riverside Drive. The majority of this additional traffic would cease once extraction commences, however a small number of light vehicles would continue to travel to the site office on a daily basis. These ongoing light vehicle movements would be easily accommodated within the capacity of the local road network.

5.5.4 As the extraction areas are proposed to be developed sequentially, construction traffic would only be required for each site on a campaign basis, meaning that increases in traffic on the local road network would be relatively minor and temporary. The traffic impact assessment shows that this temporary traffic increase is unlikely to cause exceedances of the current level of service at any of the roads and intersections near the Stage 5 area.

5.5.5 As there is currently no suitable heavy vehicle access to the Stage 5 area, a new access point off Riverside Drive would also need to be constructed for the proposal (see **Figure 11**). An intersection treatment has been proposed to more effectively distribute heavy vehicle movements and mitigate the impacts on local traffic flow. The Department considers that this new channelised right turn intersection with Riverside Drive would appropriately minimise traffic impacts and appropriately address safety considerations as it:

- ensures Riverside Drive traffic flows are not impacted by trucks turning into the site;
- produces a dedicated right-hand lane with line markings to appropriate manage safety risks of rear end collisions with stopped trucks queuing to enter the site;
- is well placed with satisfactory sightline distances for vehicles approaching the intersection from all directions; and
- does not require a left-turn acceleration lane to be developed for trucks leaving the site from Fig Tree Lane.

Figure 11 | Proposed Riverside Drive/site access intersection treatment

5.5.6 The key traffic impacts of the proposal would occur as extraction operations are winding down, as Boral would need to import around 325,000 tonnes of VENM to the site to backfill Stage 5A and rehabilitate the regraded edges of the Stage 5B pond (subject to water quality testing).

5.5.7 The Department recognises that members of the community and Kiama Municipal Council have raised concerns about VENM truck movements, as the traffic impact assessment indicates that there would be an average of 3 trucks per hour delivering VENM to the site for at least 2 years following the completion of the extraction operations.

5.5.8 Importantly, as this material would be used to rehabilitate previous extraction stages as well as the proposed Stage 5A and 5B areas, these trucks would be distributed to the existing site entrances for Stages 2 to 4 as well as the proposed new access point for Stage 5A-5B. To put this in context, the importation of VENM to Stage 5 areas represents around 0.6% of predicted heavy vehicle traffic movements on Riverside Drive for the period when rehabilitation would be occurring at the sites.

5.5.9 The Department considers this to be a manageable volume of trucks on the road network, and traffic impacts at key intersections along the route to the Stage 5 areas could also be managed by ensuring Boral's drivers adhere to a strict driver code of conduct and avoid convoys of trucks delivering VENM to the site.

5.5.10 Kiama Municipal Council noted that the section of Riverside Drive near the proposed new site entry is jointly managed by both Shellharbour City and Kiama Municipal Councils and requested Boral to pay a per tonne levy for road maintenance to both Councils.

5.5.11 The Department notes that Boral would be importing VENM material via the Riverside Drive intersection following the completion of extraction and that project traffic would only involve travel on a short length (around 250 m) of Riverside Drive that Kiama Council has identified as being subject to management by the two Councils. This road has already been constructed to support existing heavy industries including the waste disposal and recycling facilities on the eastern side of Riverside Drive and as such

the modification's contribute to impact on this road would be related to dilapidation effects as a result of heavy vehicle movements (i.e. due to acceleration/deceleration at the intersection).

5.5.12 Given the lifespan of the proposed modification, the short duration of impacts and the fact that Boral would need to upgrade the stretch of road associated with the new Stage 5 intersection with Riverside Drive to the satisfaction of Council, the Department does not consider that a per tonne levy on VENM importation is an appropriate measure for managing road traffic impacts.

5.5.13 Notwithstanding, the Department supports Council's request that a pre-construction road pavement dilapidation report be undertaken for the affected section of Riverside Drive. If this report identifies a risk of road pavement failure as a result of the modification, Boral would be required to compensate the roads authority for maintenance of this section of Riverside Drive, proportionate to its impacts relative to other road users on this section of road.

5.5.14 The proposal is not expected to affect the structural integrity of the Princes Highway, given the significant distance between the highway and the proposed Stage 5 extraction areas. Nevertheless, the Department has adopted the RMS's requested conditions requiring Boral to monitor the stability of the Stage 5B operations. The Department also notes that the State road and rail networks are capable of handling the existing level of product dispatch, which would not increase as a result of the proposed modification.

5.5.15 To ensure the traffic impacts of the proposal are properly managed, the Department has also recommended that Boral undertakes a road pavement dilapidation report prior to the construction of the Riverside Drive access, and prepares a Construction Traffic Management Plan for the proposed modification in consultation with RMS and Shellharbour City Council. The Construction Traffic Management Plan would include:

- protocols to be observed for the construction of ancillary site infrastructure and site preparation works, including hours of operation, traffic controls and mitigation measures to ensure traffic on Riverside Drive is not significantly impeded by site traffic during construction; and
- a driver code of conduct.

5.6 Noise

5.6.1 The key noise impacts of the proposal would arise from temporary construction activities associated with the development of the access intersection, internal access road and car park, and operational noise impacts from the establishment of the extraction areas, the operation of the dredge and rehabilitation activities.

5.6.2 The noise environment around the Stage 5 extraction areas is substantially dominated by traffic noise on the Princes Highway, which is located around 200 m from Stage 5B as well as by existing industry in the local area such as the Minnamurra Recycling Centre.

5.6.3 Construction activities for the internal road, site offices, car park and extraction area preparation would occur during standard construction hours and be subject to the noise limits in the *Interim Construction Noise Guideline* 2009 (ICNG). The noise levels associated with construction activities are predicted to comply with ICNG limits at all receivers. In fact, in most cases, construction noise would be sufficiently low to also meet the more conservative operational noise limits that would apply to the project.

5.6.4 In terms of operational noise impacts, the noise modelling indicates that the project would now be audible for additional residences west and north of Stage 5B and residential receivers in Minnamurra

(see **Figure 12**). Nevertheless, the noise impact assessment, which was conducted in accordance with the contemporary *Noise Policy for Industry* (NPfI) found:

- that noise levels from the project as a whole (i.e. Stages 2 to 4 and Stage 5) would continue to comply with existing noise criteria in the development consent for the project at the existing assessment locations west of the Princes Highway; and
- noise levels would comply with noise limits derived in accordance with the NPfI for all receivers shown in **Figure 12**, with the exception of 79 Fig Hill Lane, which is currently a vacant property with a dwelling approval located adjacent to the western boundary of Stage 5B. The Department notes that this property was previously owned by RMS Property and was sold on the open market in May 2020.

5.6.5 Noise impacts on all surrounding receivers would be mitigated by restricting overburden removal and rehabilitation activities to 7.00 am – 6.00 pm (on Monday to Saturday only), erecting noise barriers around noisy construction equipment if it is safe to do so and by offering to install double glazing at a future dwelling if one is constructed on the property during the operation of Stage 5B.

5.6.6 In its review of the EA, the EPA identified that the initial noise assessment did not consider impacts to 79 Fig Hill Lane as it was RMS owned and did not contain an existing dwelling. At that time this vacant lot was considered to government owner commercial property asset associated with the Princes Highway and would have complied with the relevant amenity noise impact criteria in the NPfI. Nevertheless, in response to the EPA's request for an assessment of this location, Boral prepared further noise assessments and predicted the potential noise impacts at this property.

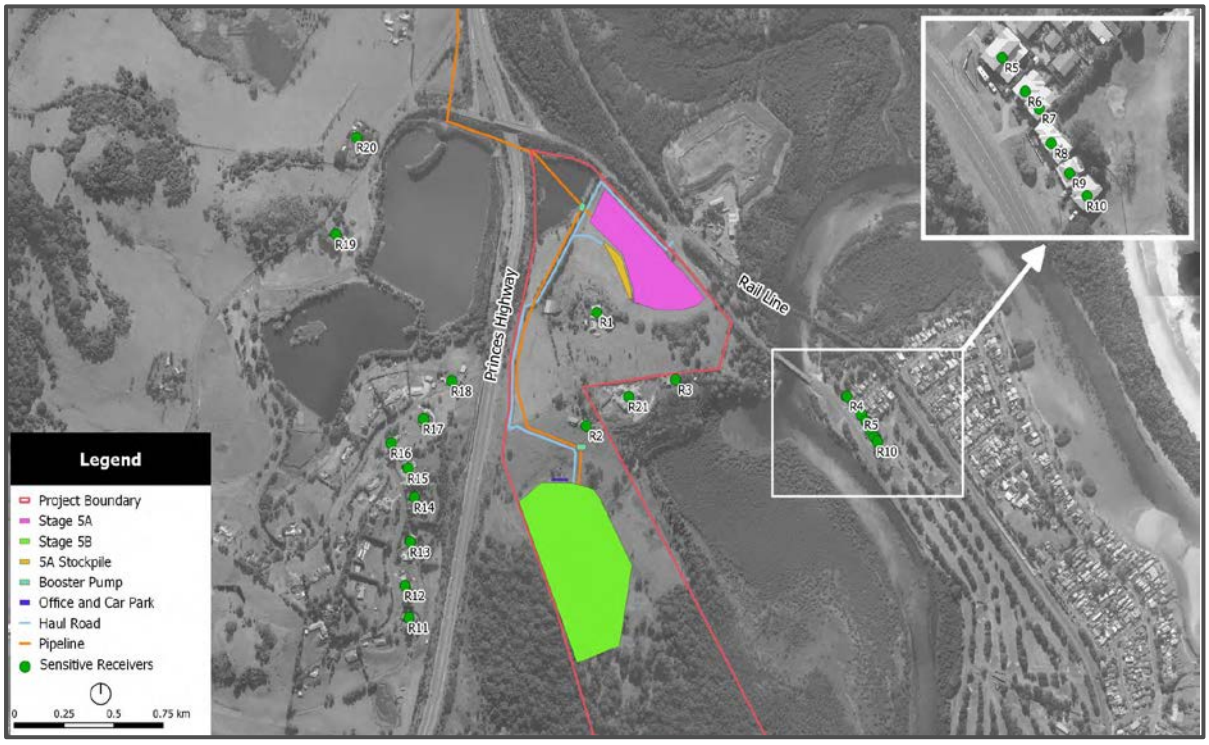

Figure 12 | Location of sensitive receivers near the Stage 5 areas

5.6.7 The updated intrusive noise levels at 79 Fig Hill Lane would comply with relevant operational noise limits during the extraction phase operations, but are expected to exceed the NPfI recommended amenity criteria for rural residential properties and the PSNLs by up to 11 dB(A) over a one month period associated with initial overburden removal and flood bund construction at Stage 5B and by up to 16 dB(A) for a one month period associated with rehabilitation activities for Stage 5B.

5.6.8 Consequently, Boral has identified that if a dwelling were to be constructed on the property before the identified construction and rehabilitation activities were scheduled to occur, it could implement a number of mitigation and management measures to reduce these impacts, including the use of a quieter dredge; installation of mitigation at the new property; adapting the operations to account for noise conditions; limiting the time and duration of works; and erecting temporary barriers around noisy equipment.

5.6.9 Together these measures would be expected to reduce noise levels at 79 Fig Hill Lane by 5-8 dB(A), bringing the predicted impacts to approximately 8 dB(A) above the PSNL during construction and 11 dB(A) above the PSNL during rehabilitation. The Department notes the significant reduction in noise that would be achieved by these measures and considers them to be reasonable and feasible to implement and proportionate to the short term (i.e. a total of two months) nature of impacts.

5.6.10 While these are still elevated noise levels, the impacts of the modification may not be as significant as they initially seem. In reaching this conclusion, the Department notes that:

- the property would have previously complied with noise limits under RMS ownership and has only been recently sold as a private landholding;
- while the landholding has approval to construct a residence, there is currently no dwelling on the property;
- given the limited duration of extraction under the modification, there is no guarantee that a dwelling would be constructed before Stage 5B is extracted and rehabilitation is completed;
- existing Princes Highway traffic would continue to have a degree of influence over the noise environment at that property; and
- Boral may yet be able to enter into a negotiated agreement with the landowner.

5.6.11 In cases like this, the consent authority may give consideration to the mitigation and acquisition rights that can be afforded under the Voluntary Land Acquisition and Mitigation Policy (VLAMP). In order to reduce the ongoing noise impacts of a proposal, the consent authority can afford acquisition rights to residential receivers where the predicted operational noise impacts are predicted to exceed the PSNLs by more than 5 dB(A) and exceed the recommended amenity noise levels in Table 2.2 of the NPfI. However, the VLAMP also stipulates that the consent authority should not apply voluntary acquisition rights to reduce construction noise impacts as these impacts are shorter term and can be controlled.

5.6.12 Overall, the Department considers that given the relatively short duration of impacts, the current status of this lot as a vacant block and the continuing degree of influence that traffic on the Princes Highway would have on the noise environment at that property, the short term impacts of the proposal may not be as significant as they initially seem. In this regard, the Department considers that Boral's proposal to enter into a negotiated agreement with the landowner to manage noise impacts generated by the development would be a preferred and proportionate mechanism to manage the noise impacts at 79 Fig Hill Lane and has recommended a condition that would afford the owner of 79 Fig Hill Lane with mitigation rights should a residence be built during the life of the project.

5.6.13 Boral has also committed to notifying neighbouring residents of its intention to start work on Stage 5B well ahead of commencing the works, to ensure the community is well informed when noisier activities are scheduled to occur and outline the proposed management and mitigation of these noise impacts.

5.6.14 Overall, the Department considers that the proposed modification would be unlikely to result in any significant increases in noise impacts on the community, beyond the levels already approved for the existing operations. This is in part because of the contributing influence of background noise from a range of other noise sources, including the Princes Highway, the South Coast Rail Line and local industries, including the nearby waste management facilities.

5.6.15 The Department and EPA consider that the noise impacts generated by the proposal could be mitigated and appropriately managed through a suite of proposed management and mitigation measures. The Department has therefore recommended that Boral:

- provides mitigation rights to the owner of 79 Fig Hill Lane if a dwelling is constructed on the property and Boral is unable to reach a negotiated agreement with the landowner;
- complies with the NPfI limits for all other residences assessed for the proposed modification; and
- prepares a Noise Management Plan for Stage 5 which describes the range of noise management and mitigation measures that it would use to ensure noise impacts are minimised during construction, operation and rehabilitation activities.

5.7 Rehabilitation

5.7.1 The Department has carefully considered how the Stage 5 areas are proposed to be rehabilitated. While the EA did not include a detailed rehabilitation strategy for the site, the Department accepts that the general principles proposed to be applied in the Stage 5 area have been successful implemented as part of the rehabilitation of the previous extraction stages, which are detailed in the approved Rehabilitation Management Plan for the project.

5.7.2 These principles include:

- stockpiling topsoil from extraction areas in processing and stockpiling areas until it is required for blending and/or rehabilitation works. Stockpiles would be managed to be free of weed seeds and stabilised with a sterile cover crop if they are to be in place for greater than 10 days;
- progressive backfilling and re-profiling with VENM in areas where dredging has been completed, in accordance with the approved Final Landform Plans;
- revegetation of areas adjacent to extraction activities in accordance with the approved Final Landform Plans;
- all weed control is undertaken in accordance with the Pest and Weed Management Plan contained within the Flora and Fauna Management Plan; and
- erosion and sediment control is undertaken in accordance with the Sediment and Erosion Control Plan in the Water Management Plan.

5.7.3 Topsoil from Stage 5A would be stockpiled on the northern side of the extraction area for use in the final stages of backfilling for the Stage 5A pond to provide a landform that is commensurate with the current landform at the site and has appropriate topsoil characteristics. Erosion and sediment would also be controlled to ensure the site is returned to its former agricultural capability, in consultation with the landowner.

5.7.4 Stage 5B would be left as a pond in the final landform, with the ultimate intention of removing the flood bunds and grading these areas to create a ribbon of riparian vegetation around the edges of the pond. This is similar to the practices that have been successfully achieved by Boral in the former Stage 1 ponds and that are currently being implemented for the Stage 2 and 3 ponds (see **Figures 13** and **14**).

5.7.5 For the existing Stage 2 and 3 ponds, the key consideration in the rehabilitated landform was the stability of the batters adjacent to the Princes Highway embankments. To address this, the batters in this area have been shaped to extend out further into the former dredge pond with a gentler slope to provide for long term stability and are in the process of being re-vegetated.

Figure 13 | Previously completed rehabilitation of the Stage 1 Extraction Area (source Nearmaps)

Figure 14 | Progressive rehabilitation of pond edges in the Stage 2 Extraction Area (source Nearmaps)

5.7.6 The same approach would apply to Stage 5B, where rehabilitation would be achieved by reshaping the bunds in a staged process and modifying the pond batters with dense vegetation planting to create a natural landform. The rehabilitation would be timed to allow the establishment of vegetation on the edges of the pond to maximise stability of the pond edge and to create a wetland fauna habitat, particularly on the western and southern boundaries.

5.7.7 As identified in Section 5.2, the timing of the removal of the bunds would also be reliant on regular water quality monitoring in the pond and whether the water in the pond meets relevant ANZECC water quality guideline levels to enable the integration of the pond back into the floodplains of the Minnamurra River. Water quality monitoring would be undertaken in accordance with the project's Water Management Plan, which would be updated to include the proposed modification.

5.7.8 Given the above, there are two key design aspects relating to the development of the flood bunds. The first is to ensure the bunds are designed in a manner that is stable during the active operation of the dredge pond and the second is to ensure this stability is maintained in the long term and can withstand floodwaters up to and including the probable maximum flood (as discussed in Section 5.2).

5.7.9 Provided the detailed design of the flood bunds is implemented to address these stability measures, there would be negligible risks associated with the retention of these bunds around the Stage 5B pond over an extended period. Once water in the ponds reaches an appropriate and sustained water quality level to enable the integration of the pond back into the floodplain, these bunds would be able to be progressively lowered and reshaped to form gentler, stable banks that would be revegetated to integrate with the surrounding landscape.

5.7.10 All of the material that would be used to rehabilitate the Stage 5 extraction areas of the proposed modification would be verified as non-potential acid sulfate soil VENM and handled in accordance with the established protocols already in place for the approved Stages 2 to 4 operations (see **Section 5.2**). Receival protocols would be implemented in accordance with those specified in the approved Waste Management Plan for the project and would be updated to include the Stage 5 extraction areas.

5.7.11 Rehabilitation at the existing project site is undertaken in accordance with a detailed Rehabilitation Management Plan, which describes the short, medium and long term measures that would be implemented to rehabilitate the site. This plan includes detailed landscaping plans and completion criteria for the rehabilitation activities associated with Stages 2 to 4 and the processing facilities.

5.7.12 The Department considers that this plan should be updated to incorporate the detailed design of the proposed flood bunds and rehabilitation strategies for Stage 5B, with an emphasis on providing clear guidance on landscaping at the site so that a wetland area can be created as soon as possible.

5.7.13 The Department has recommended that these updates to the Rehabilitation Management Plan are developed in consultation with Shellharbour City Council, Kiama Municipal Council and BCD (as currently required under the existing conditions), prior to extraction commencing in the Stage 5 area.

5.7.14 The Department notes that the Secretary has the ability under the conditions to request that Boral re-calculates its existing rehabilitation bond and considers that this should be undertaken immediately following any approval, to reflect the disturbance created by the proposed Stage 5 areas. Boral would then be required to submit a revised rehabilitation bond to the Department to account for the full cost of rehabilitating the project, prior to undertaking extraction in Stage 5A. This bond would be held as a bank guarantee and could be drawn upon by the Secretary should Boral be unable to satisfactorily complete the rehabilitation of any aspect of the modified project.

5.8 Visual Amenity

5.8.1 The Department does not consider the visual impacts of the proposal to be a substantial issue, due in part to the local topography, dense vegetation and the surrounding rural landscape. These landscape features would act to shield outside views over the majority of the proposed extraction operations, particularly in Stage 5B.

5.8.2 The existing Stage 5 areas can currently be characterised as undulating and open rural landscapes. However, the broader area surrounding the site also includes key transport routes and a range of residential, commercial and industrial land uses. Given the presence of these nearby industrial land uses, the proposed ancillary built infrastructure including the pump station, office and 10 space carpark would represent a minor change to the existing regional environment. However, the proposed locations of this ancillary infrastructure would assist to largely shield it behind topographic and vegetation cover.

5.8.3 The development of the dredge ponds would naturally alter localised views of open paddocks to that of a water filled pond. The Department notes that while this may seem like a material change in visual aesthetic, these ponds would look very similar to the nearby ponds associated with previous stages of the project and it is not uncommon to see large dams and ponds in a rural landscape setting.

5.8.4 The Department recognises that some members of the community and Kiama Council have raised concerns over the visual aesthetics of the ponds, particularly in relation to the Stage 5A pond which is situated adjacent to Riverside Drive. In addition, Kiama Council asked for screen planting at Stage 5A to reduce the visual impact from Riverside Drive. As no residences on Riverside Drive would have views into Stage 5A, this requested screening would be primarily for the benefit of road users.

5.8.5 The Department has considered the matters raised in submissions and the likely visual impact of the ponds from Riverside Drive. Overall, these ponds would look very similar to farm dams found in rural communities throughout NSW (see **Figure 15**) and for most road traffic users, would not appear to be out of place in a rural agricultural setting. Further, once extraction has been completed, Stage 5A would be rehabilitated back to agricultural land and ancillary infrastructure would be removed from the site.

5.8.6 The Department considers that for the scale and duration of visual impacts associated with Stage 5A, these impacts would be appropriately mitigated by the height of the proposed flood bunds and by the establishing ground cover on the bunds to ensure a green vegetated embankment. Planting of a more substantial tree screen would also be impractical given the short duration of extraction in the Stage 5A area, as this does not provide sufficient time for a thick tree screen to be established.

Figure 15 | Visualisations of the Stage 5A pond from Riverside Drive (northbound) and the Stage 5B pond from 79 Fig Hill Lane during operations

5.8.7 It is also important to note that Boral is not the owner of the land and the landowner would need to agree to the proposed final plantings. The current arrangement in place for the proposal requires the land to be returned to agricultural land at the end of Stage 5A and may require the removal of any tree screening within the property boundary in order to return the site to its current agricultural use.

5.8.8 With respect to Stage 5B, views of the flood bunds from the Prince Highway would be limited to a 150 m stretch of road with limited vegetation cover. Views for traffic travelling north would be effectively shielded by dense remnant vegetation to the south and views for traffic travelling south would be effectively shielded by a 19 m deep benched highway cutting to the north.

5.8.9 The Department considers that peripheral views of the grassed flood bunds between sparse vegetation in the remaining 150 m wide stretch of road would be minimal and could be mitigated by ensuring the bunds are kept appropriately vegetated and in time landscaped to integrate into the surrounding visual characteristic of the area, as has been the case for Stage 1 and Stage 2 extraction areas.

5.8.10 Accordingly, the Department considers that the minor and temporary visual impacts in the Stage 5A area and the longer term visual impacts in the Stage 5B area can be appropriately managed through the implementation of the proposed visual mitigation measures, rehabilitation of the site in accordance with an updated Rehabilitation Management Plan and compliance with the existing consent conditions that require Boral to minimise the visual impacts of the development.

5.9 Other Issues

5.9.1 The Department has assessed a range of other issues associated with the proposed modification and considers that they would result in minor or negligible impacts. **Table 2** summarises the Department's consideration of these issues.

Table 2 | Assessment of other issues

Issue	Consideration	Recommendation
Air Quality	• The modification would contribute a negligible difference in air quality impacts relative to the existing operations. The combined impacts would be mitigated by: - developing the new extraction areas in stages while the existing extraction stages are winding down; - extracting sand under water and piping it to the processing area (thereby reducing dust sources); - maintaining the existing production, processing and transportation rates; - seeding/vegetating flood bunds as soon as possible; - progressively rehabilitating and re-seeding Stage 5A; - emplacing VENM in Stage 5A at significant distances from the nearest residences; and - retaining the Stage 5B area as a lake environment. • EPA was consulted on the the air quality assessment for the proposal and did not raise any concerns about the potential air quality impacts.	• The current strict air quality conditions and criteria would continue to apply to the new extraction areas, and the Department has recommended that contemporary PM_{10} and $PM_{2.5}$ standards are included in the conditions. • Boral would also be required to update its Air Quality Management Plan for the site to reflect the modified project.
Historic Heritage	• There modification would result in minor and temporary impacts within a small section of the curtilage of a local heritage item known as the 'Dunmore House Complex, Dry Stone Walls and Trees'.	• The Department has recommended that Boral be required to provide a detailed plan outlining how

	• While Dunmore House is a local heritage significance, it is not listed as an item on the State Heritage Register and Heritage NSW has advised that the modification is not of concern in relation to matters of State heritage. • The Department notes that Boral is leasing the Stage 5 area from the owners of Dunmore House and that the modification would not cause any direct impacts to the residence, which is located near the top of a large hill adjacent to the Stage 5A dredge pond. The Stage 5B dredge pond would not be visible from the Dunmore House residence due to intervening topography. • The impacts to the Dunmore House would be limited to vegetation clearance within the curtilage of the Dunmore House Complex for the Stage 5A dredge pond and new intersection with Riverside Drive. This area includes cleared grazing land and limited landscaping features and vegetation, however these items are not considered to represent original or significant fabric of the Complex. • The proposed rehabilitation approach would ensure that this temporary impact is appropriately managed and grazing land restored following completion of extraction. • The proposal would not directly impact the 'Anglesboro and Trees' or the 'Rocklow Road Drystone Wall' sites, which have local heritage listing status. These sites are located near the Stage 3 extraction pond and are well outside of the Stage 5 proposed disturbance areas. • Vegetation clearing for Stage 5B would affect around 3% of the overall Minnamurra Vegetation Area, however its local heritage status as a landscape feature would not be compromised by this impact.	it intends to restore the Dunmore House curtilage in an updated rehabilitation management plan for the modified project. • This plan would need to be approved by the Secretary, prior to any impacts occurring in the curtilage.
Socio-Economic	• Several community submissions raised concerns that the proposal could adversely impact local tourism. • The Department has considered these matters and does not consider that tourism would be affected as: - the proposed extraction area would be located well away from local tourist locations including the Minnamurra River and its wetland area and would not affect access to these areas; - the extraction areas would result in minimal visual impacts, many of which would be temporary or would be shielded by local topography and vegetation; and - the proposal would not impact the integrity of Dunmore House and associated sites. • The modification would however generate a range of benefits for the region and for NSW, including: - continued operation and optimisation of an established sand extraction operation; - continued employment for around 10 people; and - provision of high quality sand products for use in major construction projects in the Illawarra and Greater Sydney regions.	• The Department considers that the socio-economic impacts of the proposed modification can be appropriately managed in accordance with the existing conditions.

6 Recommended Conditions

6.1.1 In making its recommendations to the Commission, the Department has drafted recommended amendments to the existing conditions of consent for DA-195-8-2004, that reflect the Department's consideration of submissions, advice from Government agencies and contemporary standards for regulating extractive industries.

6.1.2 The key recommended conditions include:

- updating the Water Management Plan for the project to include an Acid Sulfate Soils Management Plan (including a Trigger Action Response Plan) and an updated Erosion and Sediment Control Plan;
- requiring the Stage 5B flood bunds to be engineered to withstand the probable maximum flood event, with regular bund stability monitoring;
- updating the existing Flora and Fauna Management Plan and requiring the retirement of additional offset obligations for the modification, in consultation with BCD;
- preparation of a comprehensive artefact salvage program and Aboriginal Cultural Heritage Management Plan;
- development of a Construction Traffic Management Plan for the proposed modification and development of the new Riverside Drive intersection to the satisfaction of the relevant road authority;
- incorporation of contemporary PM_{10} and $PM_{2.5}$ air quality standards for the project;
- incorporation of strict noise criteria for all surrounding residences in accordance with the Noise Policy for Industry and the provision of mitigation rights for the owner of 79 Fig Hill Lane;
- updating the Rehabilitation Management Plan for the project and re-calculation of the current rehabilitation bond; and
- preparing a range of updated site management plans to incorporate the modifications to the project.

6.1.3 Overall, the Department considers that the recommended conditions reflect contemporary practice and provide a clear framework for the environmental management of the project.

6.1.4 The Department believes that these recommended conditions are reasonable, achievable and appropriately scaled to the nature and extent of impacts associated with the proposed modifications. With these amended conditions in place, the Department considers that the project as modified could be undertaken in an environmentally sustainable manner.

6.1.5 The Department has consulted with relevant State Government agencies and regulators on the recommended conditions and has received feedback from BCD, DPIE Water, NRAR, the EPA, Fisheries NSW, Heritage Branch, MEG and the RMS. None of these agencies objected to the recommended conditions, however some provided advice or requested amendments to the conditions. The Department has considered and adopted this advice in developing its final recommended conditions at **Appendix D**.

6.1.6 Boral has also reviewed the recommended conditions and has not objected to their imposition.

7 Evaluation

7.1.1 Boral has applied to modify the development consent for the Dunmore Lakes Sand Project to enable the extraction of sand from two new dredge ponds located to the southeast of the existing project site.

7.1.2 The application has been made under the now repealed Section 75W of the EP&A Act. The application can be considered under savings provisions which apply to Section 75W modification applications, as the application was made on 28 February 2018 which is prior to the cut-off date for this type of modification.

7.1.3 The Department has undertaken a comprehensive whole-of-government assessment of the merits of the proposed modification. The Department notes that none of the State Government agencies objected to the proposal. While some agencies expressed concerns with aspects of the proposal, all agencies considered that the impacts could be appropriately managed through strict conditions of consent and made recommendations for additional conditions to be included where appropriate.

7.1.4 Nevertheless, the Department recognises that Shellharbour City Council and Kiama Municipal Council objected to the proposal, along with 148 individual submitters and 7 special interest groups.

7.1.5 The Department has considered all issues raised in submissions and assessed the impacts of the proposed modification in detail in accordance with all the relevant NSW legislation, policies and guidelines. Based on this assessment, the Department has found that the proposed modification offers several benefits, including that it would:

- ensure the continuation of development of a significant sand resource;
- provide continuity of operation for a long-standing quarrying operation;
- offer continued employment to around 10 quarry staff; and
- provide a high quality construction sand product to the Illawarra and Greater Sydney regions with the potential to supply up to 7.5% of the sand required for Sydney's construction industry.

7.1.6 The development of the modification would also result in environmental impacts, including the clearing of native vegetation and threatened species habitat. This clearing would be strictly limited and controlled, and the resulting impacts would be offset in accordance with legislation and policy to compensate for the biodiversity impacts of the modification.

7.1.7 In terms of water impacts, extraction would occur within the water table with some water take required to extract and process the sand resource. Groundwater losses would be minimised by pumping reclaimed process water back into the dredge ponds. Any water that leaves the site as moisture within the sand would be appropriately regulated under water access licences. Surface water impacts would be minimised by diverting run-off around the extraction areas using a series of drains and ensuring there is no interaction between the ponds and the surrounding environment.

7.1.8 Flooding impacts would be managed by containing water in the dredge ponds through the construction of flood bunds of sufficient height to address the probable maximum flood levels. The Department has recommended that the proposed bund heights are increased to ensure this is the case.

7.1.9 The development of the dredge ponds would require the salvage and storage of Aboriginal artefact scatters located within the disturbance footprint. These activities would be undertaken in line with an Aboriginal Cultural Heritage Management Plan to be prepared in consultation with BCD and Registered Aboriginal Parties, and must include a chance finds protocol and stop work procedures should any significant and unforeseen cultural heritage items be discovered during operations.

7.1.10 One private landowner is predicted to experience short term intrusive noise impacts above the limits imposed under the contemporary Noise Policy for Industry. Boral has proposed to manage these impacts through consultation and a negotiated agreement with the owner and the implementation of mitigation measures should a dwelling be built on the property prior to the predicted impacts occurring. The Department agrees that this would be an appropriate and proportionate hierarchy for managing the short term impacts of the project on this receiver and has recommended that the owner is provided with mitigation rights under the condition of consent to address the residual impacts of the project.

7.1.11 On balance, when considered against the limited environmental impacts of the proposal and the avoidance and management measures proposed to address residual risks, the Department is satisfied that the benefits of the modification could be realised subject to the imposition of suitable conditions.

7.1.12 Accordingly and based on its assessment, the Department considers that the proposed modification is in the public interest and is approvable, subject to the recommended conditions outlined in **Appendices D** and **E**.

7.1.13 This assessment report is hereby presented to the Independent Planning Commission to determine the application.

18/09/2020
Matthew Sprott
Director
Resource Assessments

18/09/2020
Mike Young
Executive Director
Energy, Resources and Compliance

Appendices

Appendix A – Environmental Assessment

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=9166

Appendix B – Submissions

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=9166

Appendix C – Response to Submissions and Additional Information

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=9166

Appendix D – Recommended Notice of Modification

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=9166

Appendix E – Recommended Consolidated Consent

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=9166

Appendix F – Environmental Planning Instruments

SEPP (State and Regional Development) 2011

The project is classified as State significant development under Schedule 1 of the SEPP (State and Regional Development) 2011 as it extracts from a resource of more than 5 million tonnes (clause 7(1)(b) of Schedule 1 of the SEPP).

SEPP (Mining, Petroleum Production and Extractive Industries) 2007

The key aims of the Mining SEPP include:

(a) to provide for the proper management and development of mineral, petroleum and extractive material resources for the purpose of promoting the social and economic welfare of the State, and

(b) to facilitate the orderly and economic use and development of land containing mineral, petroleum and extractive material resources

The quarry is permissible with consent under the SEPP as it allows extractive industries to be carried out on land on which agriculture may be carried out. Agricultural activities are permissible in the RU1, RU2 and E3 zones within which the proposed modification would be located. Aquaculture, a form of agriculture, is also permissible within the SP2 land that would be traversed by the ancillary infrastructure.

The proposed modification would enable the continued extraction of an established and mapped sand resource, and would allow the continued production of a high quality construction sand for the Illawarra and Greater Sydney regions. It would also allow the continued employment of 10 quarry staff and provide temporary construction employment opportunities.

Clause 12 of the Mining SEPP requires the consent authority to consider the compatibility of the proposal with existing and approved land uses in the vicinity.

The existing land uses in the vicinity of the proposed modification are the current Dunmore Lakes Sand Extraction Project, previous extraction ponds which have been rehabilitated, the Princes Highway, the South Coast Railway Line, cleared agricultural land, industrial premises such as the Minnamurra Recycling Centre and environmental management and conservation areas.

The proposed modification would be unlikely to affect any of these land uses, particularly as Stage 5A would be rehabilitated and returned to agricultural use and Stage 5B would be left as a pond with rehabilitated wetland vegetation and habitat around the edges, similar to the nearby rehabilitated ponds.

SEPP (Coastal Management) 2018

The key aim of the Coastal Management SEPP is to promote an integrated and co-ordinated approach to land use planning in the coastal zone in a manner consistent with the objects of the *Coastal Management Act 2016.* The objectives of the *Coastal Management Act 2016* in relation to coastal wetlands are to protect their biological diversity and ecosystem integrity.

Overall the biodiversity and groundwater assessments contained in the EA (see Appendix A) demonstrate that the proposed modification would not significantly or detrimentally affect the biological diversity and ecosystem integrity of the wetland. This is because:

- all direct impacts occur outside of the mapped wetland areas and no wetland vegetation would be removed during the proposal;
- while the Stage 5A area overlaps with the proximity area for Coastal Wetlands, no extraction would occur within the wetland and the Stage 5A dredge pond would be backfilled, rehabilitated and returned to its previous landform post extraction;
- the Stage 5B extraction area is located completely outside of any mapped Coastal Wetlands area and associated proximity areas;
- the modification would not result in any material drawdown from the groundwater system that feeds the wetland or the reversal of groundwater flow regimes; and
- potential sedimentation and acid sulfate soil risks could be appropriately managed through engineered structures, flood bunds and management plans.

SEPP No. 33 – Hazardous and Offensive Development

The proposal does not meet the definition of hazardous or offensive development in accordance with SEPP 33 as it would not pose a risk to human health, life or property and to the biophysical environment. The current processing facilities would continue to be used to process the sand extracted from Stage 5 and are isolated from residential areas. The proposed Stage 5 ponds would be subject to strict operating conditions to ensure the biophysical impacts are minimised to acceptable and established standards.

SEPP 55 – Remediation of Land

The object of this Policy is to provide for a Statewide planning approach to the remediation of contaminated land. The Stage 5 areas are not contaminated land, and therefore SEPP 55 does not govern the modification application.

Shellharbour Local Environment Plan 2013 (SLEP)

The Department has considered the aims of the SLEP, as well as the objectives of the RU1 Primary Production, RU2 Rural Landscape, E3 Environmental Management and SP2 Infrastructure zones and other relevant provisions of the Plan in its assessment of the Project.

The relevant aims of the SLEP seek to encourage a range of development that balances ecological, social and economic considerations, facilitates the economic and social vitality of the area, conserves, protects and enhances the heritage values of Shellharbour and protects, enhances and maintains significant landscapes with visual, scenic, historic, ecological or conservation value. The SLEP also seeks to protect and conserve scenic and environmental resources, including remnant native vegetation, soil stability, waterways, wetlands and habitats for threatened species, populations and communities.

Relevant objectives of the RU1 Primary Production zone include the maintenance of sustainable and diverse primary production enterprises, minimising the fragmentation and alienation of resource lands and minimising conflict between land uses within this zone and adjoining zones.

The objectives of the RU2 Rural Landscape zone include encouraging sustainable primary industry production, maintaining the rural landscape character of the land and providing for a range of compatible land uses including extensive agriculture.

Relevant objectives of the E3 Environmental Management zone seek to protect, manage and restore areas with special ecological, scientific, cultural or aesthetic values and provide for a limited range of development that does not have an adverse effect on those values. Importantly, the Department notes that its recommended conditions require Boral to avoid any disturbance of land within this zone.

Finally, the objectives of SP2 Infrastructure include the provision of infrastructure and key transport corridors and the prevention of development *'that is not compatible with or that may detract from the provision of infrastructure'*. The Department notes that the only infrastructure proposed to be installed within this zone is the sand delivery and water return pipelines, which would be installed in existing culverts beneath the Princes Highway and Swamp Road. This ancillary infrastructure would not impact upon or detract from the provision of the overlying road infrastructure and may only be installed following the issue of a Section 138 consent under the *Roads Act 1993* from TfNSW.

The Department considers that the Project as proposed to be modified can be carried out in a manner that it consistent with the above aims and objectives of the SLEP and has sought to integrate these considerations into its recommended conditions (see **Appendix D**).

In accordance with clause 5.10(8) of the SLEP, local Aboriginal communities and Heritage NSW have been appropriately considered with as part of the proposed modification. The Department has carefully considered the potential impacts on Aboriginal heritage items and places, including issues raised during consultation on the ACHAR and in submissions on the modification, in its assessment (see **Section 5**).