Review of environmental factors

Beach nourishment – Long Beach

eurobodalla shire council

Document tracking

Version No.	Document author	Reviewed by	Approved by	Last saved on
1.0	JA	GA	GA	26/06/2022
1.1	JA	GA	GA	25/08/2022

Review of environmental factors

Contents

1. Introduction

The environmental assessment and determination of the proposal has been undertaken in accordance with Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). For this proposal, Eurobodalla Shire Council is both a public authority proponent (EP&A Act s5.3) and the determining authority (EP&A Act s5.1). The REF has been prepared in accordance with Clause 228 of the EP&A Regulation (2000). Table 1 below outlines the proponent contact details.

Table 1: Proponent details

Project name	Long Beach – Erosion Mitigation Works
Proponent (council) name	Eurobodalla Shire Council
Project manager	Tony Swallow
Position	Divisional Manager Works
Contact details	0417 461 466

1.1. Project description and background

Coastal hazards, predominantly erosion, recession and inundation may arise from present day storms, ongoing processes, or future climate change. Adapting to these coastal hazards are required to mitigate any adverse impacts.

Beach nourishment can be defined as the artificial placement of sand (or coarser material) to improve beach amenity and/or increase protection for backshore assets. Beach nourishment is one possible protection adaptation pathway to coastal hazards. It may be a standalone measure for protection or be used to improve the beach amenity when used in combination with other adaptation measures such as a seawall.

Beach nourishment is considered to be a “soft” management/engineering option and usually mimics natural beach and dune systems. When compatible sand is available for beach nourishment projects, if they are well designed, constructed and maintained, the artificial nature of the project may be undetectable to most of the community.

It has come to attention, that a strip of land located between Bay Road and the foreshore has eroded up to a point where it has it has begun to undermine the existing road edge. These emergency works which are within the Batemans Bay Habitat Protection Zone are in

accordance with Cl 1.16 2 a) of the Marine Estate Management (Management Rules) Regulations 1999; for the purposes of ensuring that the public safety of the roadway is maintained. This consent is granted pursuant to S76 of the Marine Estate Management Act 1994.

The emergency works will involve placing bulker bags along the upper section of the beach adjacent Bay Road. These emergency works will be considered as stage 1. Stage 2 of works will involve undertaking beach nourishment works, which have been outlined above. The nourishment works will be undertaken once, a Marine Park permit has been granted.

1.1.1. Detailed scope of works

This proposal sets out to mitigate the impact of past, and current coastal processes behind the foreshore region along the eastern section of Long Beach. Currently a portion of the bank between the beach and exist. road has been eroded. This erosion has got to a point where it has now undermined Bay Road. Action is required to mitigate any future impacts resulting from natural tidal forces, and/or adverse weather events.

To increase resilience within the site, Council is seeking to undertake two stages of works. Stage 1 is sandbagging emergency works with consent being granted under S76 of the Marine Estate Management Act 1994. Stage 2 involves beach scraping and will require a Marine Park Permit.

Stage 1 – Bulker bagging

These works will involve placing up to 100 bulker bags along the upper section of the beach adjacent to the road along the stretch of bank where there is currently orange mesh tape which is being used to isolate the area. This will take place over a length of approx. 75m. Refer image 1. Where possible, the sandbags will be placed from the roadside to prevent the use of excavators along the beach. When excavators are required on the beach side of the works, they will need to be rubber or a “positrack” type machine to minimise the impact on the beach.

The selected sand which will be used for the bulker bags is preferred to be sourced from an alternative location and be compatible with the existing sand along Long Beach. If the utilised sand is classed as compatible, then the sand material can be returned to Long Beach when the maximum allotted time of 90 days has elapsed for the bulker bags. See appendix B for the sand granule size compatibility results. The sand granules are also to be of similar aesthetics such as colour and shape of the existing sand.

Figure 1: Image of Long Beach and Bay Road in respects to the eroded bank. The blue line illustrates the length and location of sandbags which will be placed along the site.

Work method for bulker bagging:

- Set up signage
- Set up a stockpile site on the grass area south off the work site (see figure 2)
- Import sand to the stockpile and fill the bulker bags
- Excavate the trench (Use hydrocarbon booms on the beach between the excavator and the water as protection) required for the bulker bags into the existing sand (approx. 1m deep) and put the excavated sand in front (to the water side) of the excavation and shape as this sand will stay on the beach (a machine will be required to work on the beach to spread the sand)
- Transport the bulker bags from the stockpile site and place in the excavated trench
- Once all bags are secured back fill behind the wall with clean sand matching as close as possible the natural existing sand on site
- Lay turf over the back filled area between the road and the bulker bags to stabilise the site
- Clean up the stockpile site and work area.

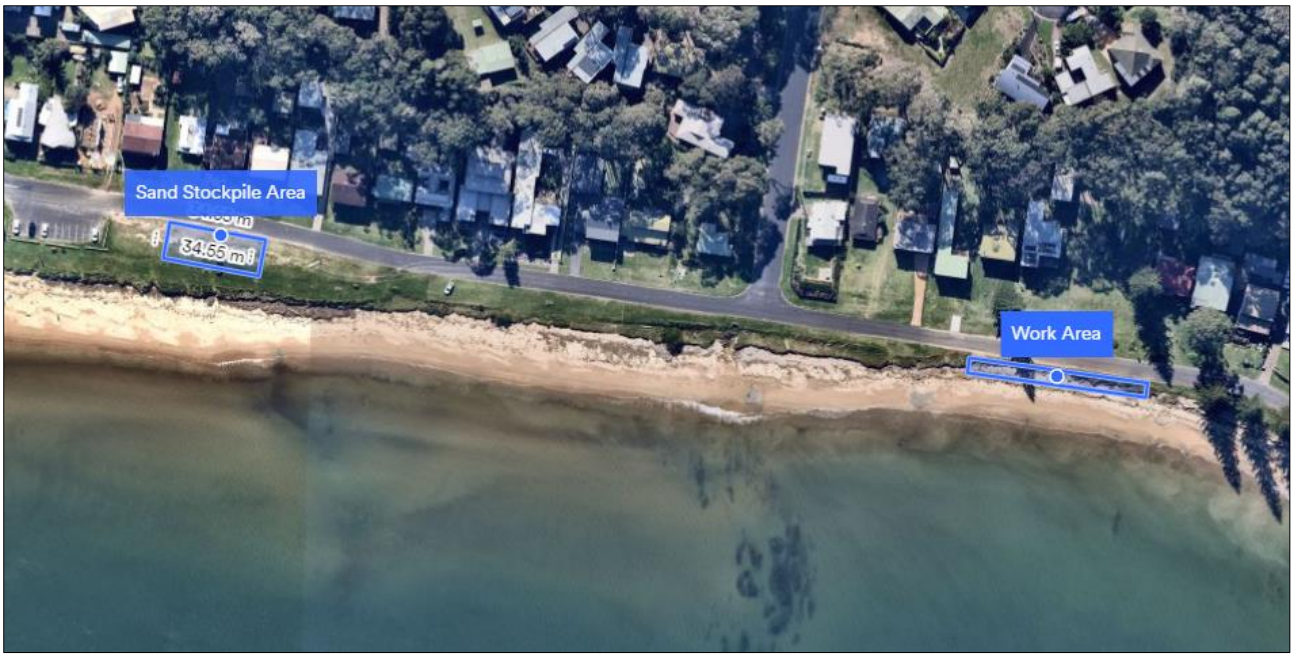


Figure 2: Stockpile site and work location for bulker bagging.

Stage 2- Beach nourishment

Beach nourishment works are proposed to increase the resilience of the area whilst also increasing the natural amenity and recreational values within the region. These works will be undertaken once the Marine Park Permit is issued. This process can be defined as the movement of sand from the intertidal zone to the dune or upper beach by mechanical means. Beach scraping mimics natural beach recovery processes but increases the recovery rate compared with natural processes. In combination with revegetation schemes, beach scraping has commonly been used for dune building.

Works will pursue to build up the beach adjacent to Bay Road where it has receded and is threatening to undermine the existing road. Sand sourced from the east of the degraded dune system will be used as part of the beach scraping process. The sand will act as a buffer against wave and tidal forces on the dune/road regions and is a short to medium term mitigation measure that will enable protection and increase resilience for a period of time while a permanent protection option for the road is finalised in the Eurobodalla CMP. Depending on how long it takes for a permanent protection measure to be implemented, as well as other environmental variables such as frequency and size of storm events, nourishment of the area may need to be repeated through further beach scraping.

Figure 3: Indicative area where sand will be sourced. Approx. 2000m3 (Pink area). Additional sand may be required outside of this area to the west (Green area).

Figure 4: Indicative area of where additional sand will be sourced if required (green area). Blue region is the location where the sand will be placed to mitigate erosion impacts.

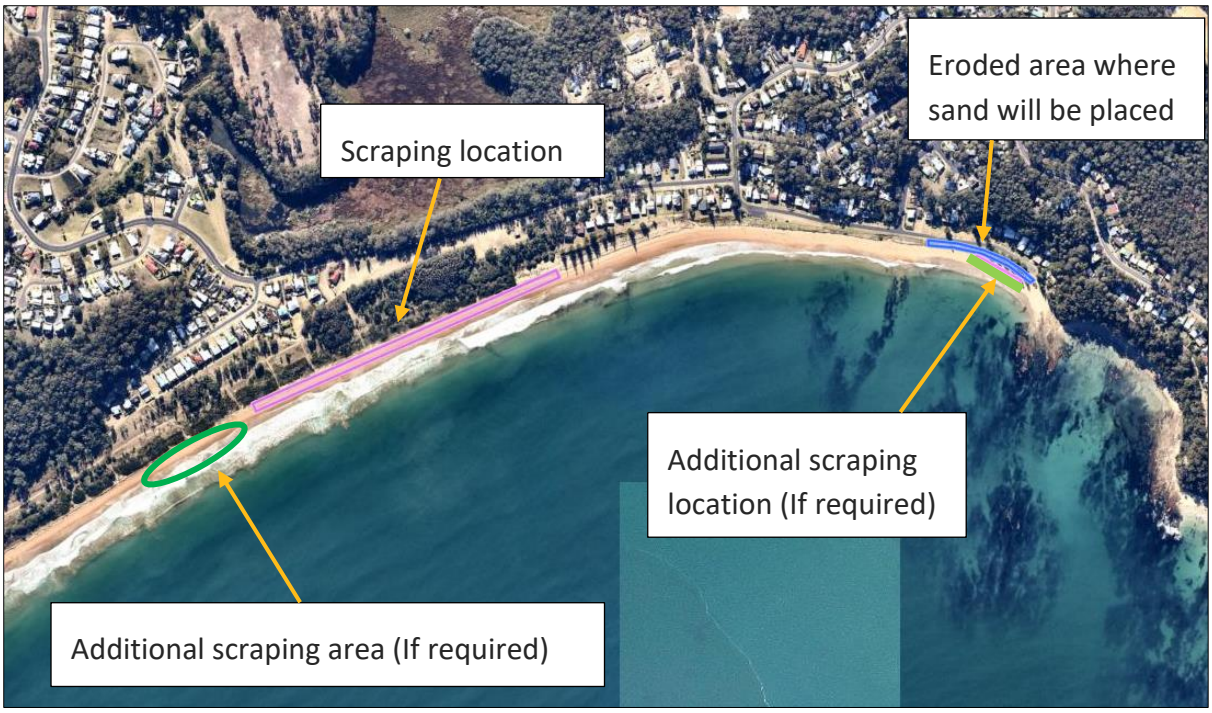


Figure 5: Overview of site.

Work method for sand scraping:

- Sourcing roughly 2000m³ of sand from the mid-west end of the beach where housing does not extend immediately behind the dune (see figure 3 for indicative area) and where there is a wide dune. By spreading the sand source area over a long length of beach, this would reduce any short-term impacts on any specific area of dune in the event of a large storm straight after the scraping, noting this area would quickly replenish through natural sand movement onshore in calm weather. An area drawn of 7000m² would yield around 2000m³ at a scrape depth of 0.3m.
- Sand to be sourced primarily through working around low-mid tide, extending from the swash zone to no further up the beach than around mid-tide level.
- If additional beach area is required to obtain enough sand, the area of operation could be extended further west along the beach. See figure 5. Marine Parks will require notification if an extension is required. It has also been recommended that if additional sand is required, that it can be sourced from in front of the eroded dune. See figure 4.
- Volume of 10,000m³ of or more will require a license from the EPA. Works will not exceed this amount of volume.
- Estimate this would take approximately a week, based on using an excavator to obtain sand over the source area at a roughly 300mm scrape depth and loading onto dump trucks, two dump trucks to move sand down the beach, and a small dozer to

level and reprofile the beach as material is deposited from the dump trucks. Recent estimates from similar scraping exercises in the Shoalhaven LGA have moved around 500-800m³ sand per day.

- Estimate of costs from Shoalhaven recent beach scraping exercises is around $40-50k.
- To enable estimation of sand quantity moved, the number of dump truck movements should be recorded and quantity of sand able to be loaded and moved on the dump truck calculated (eg ~1.6tonne sand roughly equates to 1m³).
- Sand to be profiled to just below top of the foreshore and be graded down to widen the existing beach, a slope of no greater than 1:7 to be achieved. Ideally leaving a small lip to minimise sand blowing over the top of foreshore, and/or other considerations such as the use of jute mesh and plantings on the landward margin of the nourishment would increase stability.
- Sand placement to be tapered in east and west direction as per below diagram to extend over distance of around 160m.
- Focus of nourishment to be in front of road, but consideration should be given to extending west to cover full length of road if enough sand can be sourced. This should be done if the focus area can be sufficiently widened/nourished and further sand is still available for scraping.

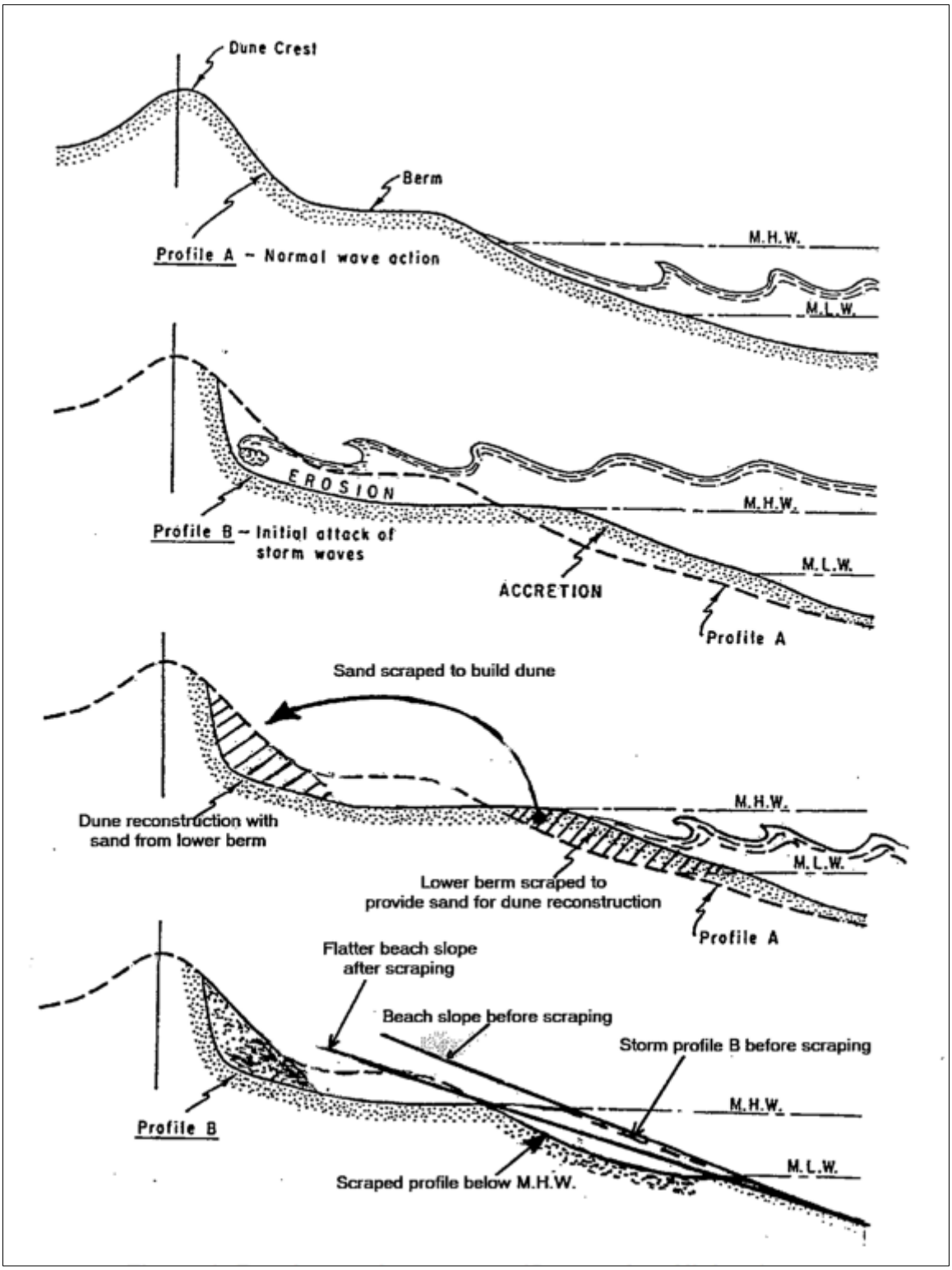


Figure 6: Beach scraping concept (Source: Lex Nielson).

Image 1: Beach scraping at the Gold Coast circa 1967.

Image 2: Beach scraping in Sydney 2008.

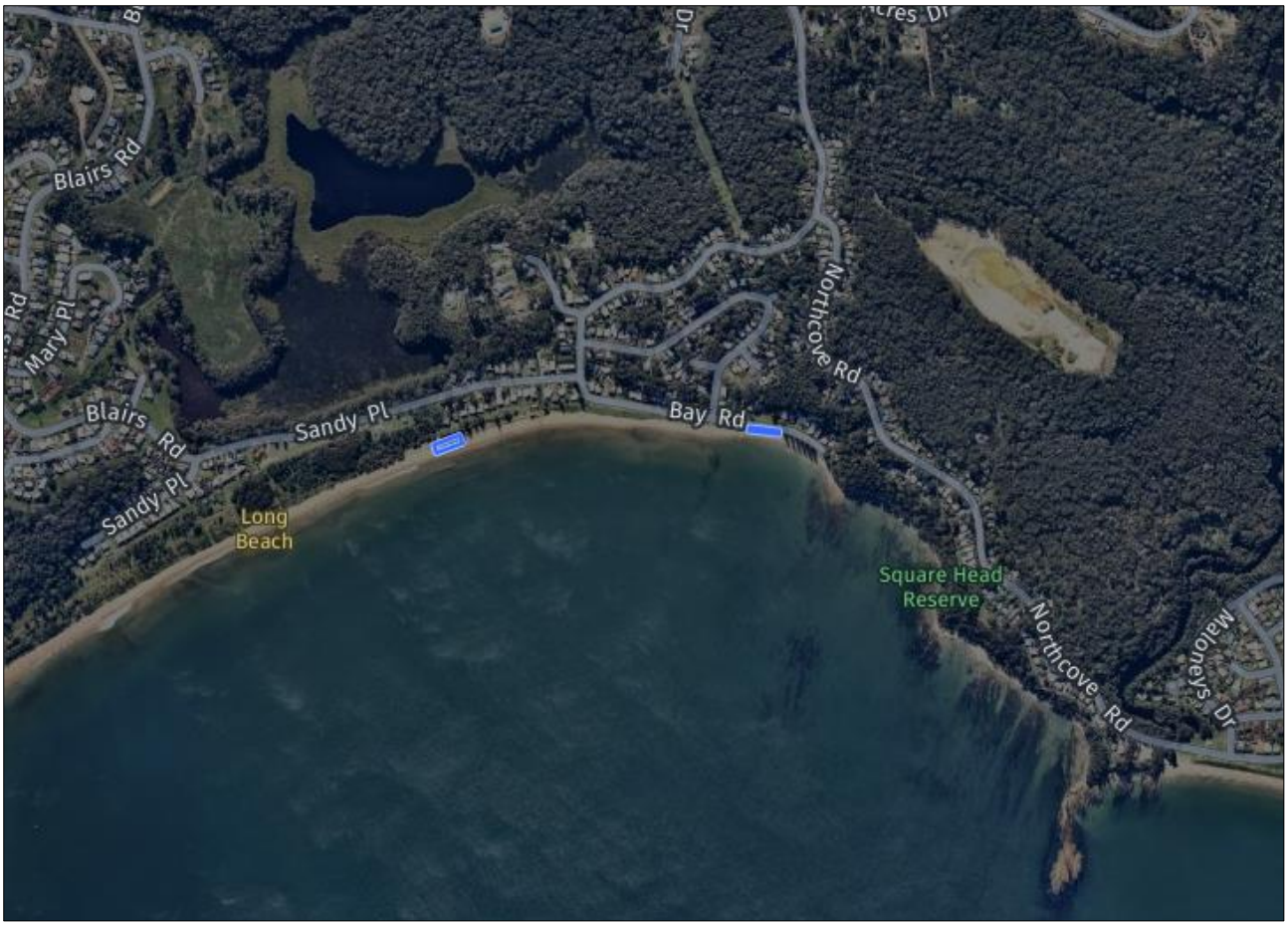


Figure 7: Works location in respects to local surroundings.

1.1.2. Machinery and equipment

Machinery and equipment used for the works will include:

- Bobcat
- Excavator
- Bulldozer
- Dump truck

1.1.3. Access and ancillary works

The site compound will be located to the east of the existing carpark along Bay Road, adjacent Long Beach beach.

Image 3: Site compound & stockpile location.

1.1.4. Duration and working hours

The works are described as short term, as outlined in Table 2.

Table 2: Project timeframes

Start date	Sand bagging – July 2022. Beach Scraping – October 2022*
Work duration	Sand bagging - 1 week*. Beach Scraping - 1 week*
Work hours	Working hours will be Monday-Friday 7am to 6pm Saturday 8am to 1pm Sunday & public holidays – No works other than inspections Any work outside these hours would require appropriate advice to residents, approval of the Divisional Manager Works and notification of the NSW EPA.

1.2. Project location and context

1.2.1. Location of the proposed activity

The works are being undertaken adjacent from Bay Road in Long Beach. Lot 7301 DP1143292, ESC land number 28052, ESC property number 924081. The works are located approx. 10kms north from the CBD of Batemans Bay and approx. 5 kms west of Maloney's Beach. Latitude -35.70027 Longitude 150.21573.

See Figures 1 and 2 in Appendix A.

1.2.2. Site context

The geologic formation is categorised as Ordovician metasediments, particularly shale and phyllite. Soil type is composed generally of gravelly yellow podzolics, lithosols and very gravelly sandy loams over clay loams.

The drainage around the works location is classed as "good" but is however prone to erosion closer to the foreshore regions. This is illustrated at the work site location where erosion processes are prominent.

Eurobodalla Shire LGA mapping has classed the vegetation within the area as typically of a grassland formation composed of various shrubs, ferns and spinifex. An ESC GIS investigation has illustrated that there are no EECs or TECs located within the works location.

The Batemans Marine Park, Habitat Protection Zone is located to the south of the works. Consequently, the works will require a Marine Park Permit prior to any construction.

ECSs GIS mapping system has mapped the probability of encountering Acid Sulphate Soils (ASS) as "no known occurrence". As a result, no ASS plan is required for the works.

Elevation ranges from 3m ASL on the northern (road) side of works to 1 ASL to the southern side of works closer to the water edge. There are no known Aboriginal sites located within the area of works. No AHIP is required for the works.

Image 4: Photo looking east illustrating the undermining of the existing bank from coastal processes.

Image 5: Long Beach looking to the north.

Image 6: Erosional impacts on the dune and adjacent Bay Road.

Image 7: Works area as of January 2020.

Image 8: Works area as of April 2021.

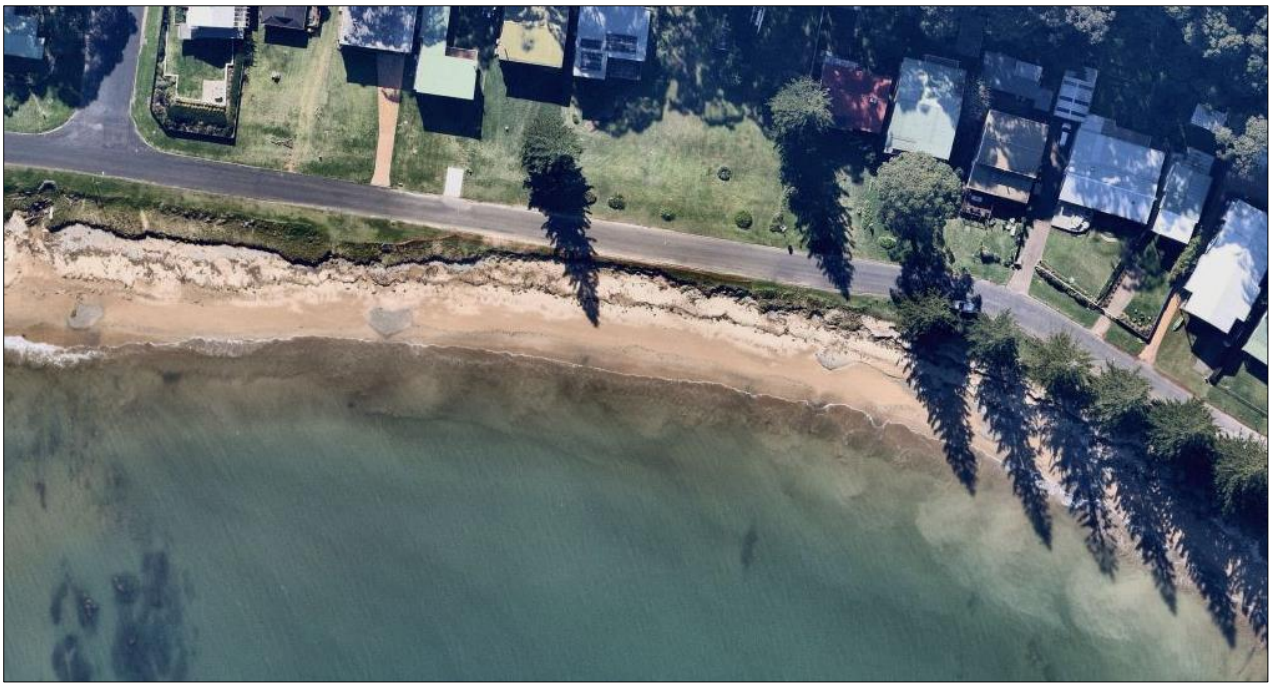


Image 9: Works area as of May 2022.

1.2.3. Land use and ownership

The land is classed as Operational Land which is owned and managed by Eurobodalla Shire Council zoned as C2 Environmental Conservation.

Towards the north is Bay Road with the area behind Bay Road made up of residential properties zoned as RE2. The road works do not impinge on any National Parks, or any land owned by NPWS. The nourishment works will however impinge on the Batemans Marine Park. The surrounding area to the north, is zoned as C2 Environmental Conservation as observed in ESCs LEP 2012. There are no vegetation patches within the area which is classed as EEC.

1.2.4. Project justification and consideration of alternatives

As a result of numerous coastal processes, the foreshore area along Long Beach has deteriorated which has caused erosion to the banks foreshore. To mitigate this situation, and increase resilience within the foreshore area, Council is proposing to undertake nourishment works along this coastal stretch as well as implement bulker bagging installations.

Alternatives that were explored included:

- Option 1 – Place bulker bags along the impacted foreshore area to minimise future coastal processes such as erosion and sediment migration.
- Option 2 – Do nothing. This would result with no works being undertaken within the area. This would leave the location prone to further erosion which could potentially undermine Bay Road and restrict beach access to the public due to the elevated foreshore face. Do nothing would also pose a safety risk to road users and beach goers.
- Option 3 – Undertake beach nourishment works to rehabilitate the affected coastal area and boost the resilience. This would involve retrieving sand from the northern section of Long Beach and relocating it to areas where the erosion has taken place. Essentially this would create a short-term barrier between the tidal zone and the eroded dune area.
- Option 4- Construct a rock wall along the eroded face of the bank to prevent further erosional processes and increased resilience. This option was considered however did not come under the Part 5 Assessment. This option can be explored once ESCs Coastal Management Plan has been completed and there are resources available.

The chosen alternatives are a combination of options 1 & 3. These was preferred as it would reduce the risk of further erosion immediately, boost resilience and is the most cost-effective solution.

2. Statutory and planning framework

2.1. Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) and the Environmental Planning and Assessment Regulation 2000 (EP&A Regulation) provide the framework for development and environmental assessment in NSW.

As Council is the proponent, the works have been assessed as 'development permissible without consent' under Part 5 of the EP&A Act. Therefore, the activity has been assessed in accordance with Sections 5.5, 5.6 and 5.7 of that Act by examining and taking into account to the fullest extent possible all matters which are likely to affect the environment. Environmental Planning Instruments made under the EP&A Act 1979 may also be relevant and are addressed below.

2.2. State Environmental Planning Policy (Infrastructure) 2007

The *State Environmental Planning Policy (Infrastructure) 2017* (Infrastructure SEPP) aims to facilitate the delivery of infrastructure across NSW by identifying whether certain types of infrastructure require consent, can be carried out without consent or are exempt development.

Pursuant to clause 94 of the SEPP, development for the purpose of a road or road infrastructure facilities may be carried out by or on behalf of a public authority without consent on any land. The proposed works are therefore assessed under Part 5 of the EP&A Act.

Not all roadside vegetation management requires assessment under Part 5 of the EP&A Act. Section 97(1) of the infrastructure SEPP states:

> *(1) Development for any of the following purposes is exempt development if it is carried out by or on behalf of a public authority in connection with a road or road infrastructure facilities and complies with clause 20:*
>
> (f) *upgrading or maintenance of landscaping, or vegetation management (such as weed spraying, slashing and pruning), and:*
>
> *(i) does not involve construction works, and*

(ii) involves the replacement (if any) of existing materials with similar materials only.

Clause 20 in the SEPP (Infrastructure) limits when 'exempt development' applies, including a statement that it must not involve clearing of vegetation that would otherwise require a permit – unless the clearing is undertaken in accordance with the permit.

2.3. Other environmental legislation

Table 3 outlines how the project has been considered under other relevant Commonwealth and State environmental legislation.

Table 3: Other environmental legislation

Legislation	Relevance to the Proposed Activity
COMMONWEALTH LEGISLATION	
***Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act)**	The EPBC Act protects matters of National Environmental Significance (NES), such as threatened species and ecological communities, migratory species (protected under international agreements), and National Heritage places (among others). **No matters of NES have been identified at or near the site. A referral to the Commonwealth Department of Environment is not required.**
STATE LEGISLATION	
***Biodiversity Conservation Act 2016* (BC Act)**	Part 7 of the BC Act provides the environmental assessment requirements for activities being assessed under Part 5 of the EP&A Act 1979. If a significant impact is likely, a Species Impact Statement is required. A biodiversity development assessment report may also be required if the proponent elects for this. Section 7.2(1)(a) and 7.3 describe the assessment requirements and thresholds for what is considered a significant impact. **Threatened species and communities listed under this Act will not be impacted by the works and therefore a Species Impact Statement or Biodiversity Development Assessment Report is not required.**
***Local Land Services Act 2013* (LLS Act)**	The objects of the LLS Act include 'to ensure the proper management of natural resources in the social, economic and environmental interests of the State, consistently with the principles of ecologically sustainable development. The Act regulates the clearing of native vegetation, however section 60(O)(b)(ii) excludes the need for consent under the LLS Act where the clearing is an activity carried out by a determining authority within the meaning of Part 5 of the EP&A Act 1979.
***Fisheries Management Act 1995* (FM Act)**	FM Act provides for the protection, conservation, and recovery of threatened species, populations and ecological communities of fish and marine vegetation and fish habitats, as well as promoting the development and sharing of fishery resources in NSW.

	The works will be within the vicinity of Batemans Marine Park and will require a Marine Park permit prior to beach scraping works. **The emergency works (sandbagging) within the Batemans Bay habitat protection zone are in accordance with Cl 1.16 2 a) of the Marine Estate Management (Management Rules) Regulations 1999; for the purposes of ensuring that the public safety of the roadway is maintained.** **This consent is granted pursuant to S76 of the Marine Estate Management Act 1994.**
National Parks and Wildlife Act 1974 **(NPW Act)**	The NPW Act regulates the control and management of all national parks, historic sites, nature reserves, and Aboriginal areas. The main aim of the Act is to conserve the natural and cultural heritage of NSW. Where works will disturb Aboriginal objects, an Aboriginal Heritage Impact Permit (AHIP) is required. **No disruption or harm to any Aboriginal objects is expected.**
Heritage Act 1977	**The proposed activity does not involve an item or place listed on the NSW State Heritage Register or the subject of an interim heritage order or listing and is therefore not a controlled activity. Approval of works on the site is therefore not required under Part 4 of the Heritage Act.**
Protection of the Environment Operations Act 1997 **(POEO Act)**	The POEO Act is the key environmental protection and pollution statute. The POEO Act is administered by the EPA and establishes a licensing regime for waste, air, water and pollution. Relevant sections of the Act are listed below: • Part 5.3 Water Pollution • Part 5.4 Air Pollution • Part 5.5 Noise Pollution • Part 5.6 Land Pollution and Waste Any work potentially resulting in pollution must comply with the POEO Act. Relevant licences must be obtained if required. Check the POEO Public Register for any relevant Environment Protection Licences (EPLs). **No licences have been identified as being required including an Environmental Protection Licence (EPL).**
Water Management Act 2000 **(WM Act)**	The WM Act's main objective is to manage NSW water in a sustainable and integrated manner that will benefit today's generations without compromising future generations' ability to meet their needs. Section 91E of the Act establishes an approval regime for controlled activities within waterfront land. However, clause 41 of the Water Management (General) Regulation 2018 provides an exemption for public authorities in relation to all controlled activities on waterfront land. Therefore, approval under the WM Act is not required. **Note: Although formal approval under the WM Act is not required, if the proposed activity is within 40m of a waterway, an attempt should be made to**

	comply with the requirements of controlled activities in order to reduce risks to waterways.
Roads Act 1993	Section 88 of the *Roads Act* states that a roads authority may, despite any other Act or law to the contrary, remove or lop any tree or other vegetation that is on or overhanging a public road if, in its opinion it is necessary to do so for the purposes of carrying out road work or removing a traffic hazard. **Part of these works will be undertaken inside a Council managed Road Reserve, thus the Roads Act will be applied in this circumstance.**
State Environmental Planning Policy – Coastal Management 2018	The *State Environmental Planning Policy (Coastal Management) 2018* provides controls for undertaking development and activities in coastal management areas. The four coastal management areas are: • Coastal wetlands and littoral rainforests area – areas which display the characteristics of coastal wetlands or littoral rainforests that were previously protected by SEPP 14 and SEPP 26 • Coastal vulnerability area – areas subject to coastal hazards such as coastal erosion and tidal inundation • Coastal environment area – areas that are characterised by natural coastal features such as beaches, rock platforms, coastal lakes and lagoons and undeveloped headlands. Marine and estuarine waters are also included • Coastal use area – land adjacent to coastal waters, estuaries and coastal lakes and lagoons. Under clause 10 of the SEPP, clearing native vegetation in the mapped '*Coastal wetland and littoral rainforest area*' is permissible without consent when undertaken by or on behalf of a public authority and in accordance with a certified coastal management program, a plan of management under Division 2 of Part 2 of Chapter 6 of the *Local Government Act*, or a plan of management under Division 6 of the *Crown Land Management Act 2016*. In other cases, the clearing requires consent. **The proposed activity is located on land subject to the Coastal Management SEPP. The nature of the Works do not however require consent.**
State Environmental Planning Policy Vegetation in Non-Rural Areas 2017	Clause 8 of the SEPP states that an authority to clear vegetation under this policy is not required if it is a clearing authorised under s60(O) of the Local Land Services Act 2013. Section 60(O) provides an exemption for clearing under Part 5 of the EP&A Act and therefore consent is not required under the SEPP (Vegetation in Non-Rural Areas).
State Environmental Planning Policy (Koala Habitat Protection) 2019	Koala Habitat Protection SEPP aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for *Phascolarctos cinereus* (Koala) to ensure a permanent free-living population over their present range and reverse the current trend of Koala population decline. Koala Habitat Protection SEPP applies to development under part 4 of the EP&A Act 1979. As the proposed activity is not 'development', Koala Habitat Protection

	SEPP doesn't apply. Regardless, consideration of impacts to koala and koala habitat may still be relevant under the BC Act 2016.
The Rural Fires Act 1997	Section 100C of the *Rural Fires Act 1997* takes in regard – a. the principles of ecologically sustainable development (as described by section 6 (2) of the *Protection of the Environment Administration Act 1991*), and b. any matter likely to affect the environment by reason of the carrying out of bush fire hazard reduction works on the land that a determining authority would be required to consider under section 5.5 (1) of *the Environmental Planning & Assessment Act 1979* if Part 5 of that Act were applicable to the work and the carrying out of the works were and activity within the meaning of that part. **The proposed activity will not be subject to this code.**

3. Community and agency consultation

Table 4: Community and agency consultation

Community / agency consultation	Have any community stakeholders been identified for the proposed works? **Yes ☒ No ☐** Community stakeholders impacted by works will receive a mailed notification of works. Is consultation with other authorities required under the requirements of Clauses 13-16 of the Infrastructure SEPP? **Yes ☐ No ☒** Are the works adjacent to a national park, nature reserve or other area reserved under the *National Parks and Wildlife Act 1974*? **Yes ☐ No ☒** Are the works adjacent to a declared aquatic reserve under the *Fisheries Management Act 1994*? **Yes ☒ No ☐** **Other agency and community consultation:** Batemans Marine Park Authority. – Marine Park permit required (processing) Crown Lands – Consent Given for works Department of Planning and the Environment NTS Corp

4. Environmental assessment

This section describes in detail the potential key environmental impacts associated with the proposal during both construction and operation and includes identifying site-specific safeguards to ameliorate the identified potential impacts.

Table 5: Impacts, environmental safeguards and mitigation measures

General	Stakeholder notification Site specific training and induction Noise mitigation
Safeguards	• All key stakeholders including businesses and residents affected by the activity to be notified at least five business days prior to the start of the activity. • • All personnel working on site will receive training to ensure awareness of environment protection requirements to be implemented during the project. This is to include site induction and regular 'toolbox' briefings. • Site specific training to include areas of high sensitivity including Aboriginal objects, threatened species habitat and if any EECs. Records of site induction training to be kept by project manager. Standard construction hours: • * Monday to Friday 7:00am to 6:00pm • * Saturdays 8:00am to 1:00pm • * No work on Sundays or Public Holidays • • Works outside these hours will be carried out in accordance with the management and mitigation measures detailed within the Noise and Vibration Management Plan.
Biodiversity	Have relevant database searches been carried out? • NSW Bionet • Threatened species profile search (www.environment.nsw.gov.au/threatenedspeciesapp/) • Commonwealth EPBC **Yes ☒ No ☐** **Date searches undertaken:** Are the proposed works likely to impact on any vegetation including, shrubs, trees? **Yes ☒ No ☐**

	Did the database searches identify any endangered ecological communities, populations, threatened flora and/or threatened or protected fauna, or migratory species within the vicinity of the proposed works? Both Federal and State listed matters must be considered. **Yes ☐ No ☒** Are the works taking place in a roadside area designated as high conservation value vegetation? **Yes ☐ No ☒** Will the proposed works require the removal of any other vegetation? **Yes ☐ No ☒** Do the proposed works involve pruning, trimming or removal of any tree/s? **Yes ☐ No ☒** Will the proposed works affect any tree hollows or hollow logs? **Yes ☐ No ☒** Will the proposed works disturb any crevices or other locations (such as on bridges and culverts) for potential bat habitat? **Yes ☐ No ☒** Are there any known areas of Areas of Outstanding Biodiversity Value (formerly known as critical habitat), Directory of Important Wetlands in Australia within the vicinity of the proposed works? **Yes ☐ No ☒** Will the proposed works disturb any natural waterways or aquatic habitat? **Yes ☒ No ☐** Batemans Marine Park Have the trees been planted by a community group, Landcare group or by Council or is the tree a memorial or part of a memorial group eg. has a plaque? **Yes ☐ No ☒** Do the trees form part of a heritage listing or have other heritage value? **Yes ☐ No ☒**
Potential Impacts	Does the project pose any potential risk to the biodiversity within the vicinity of the site? **Yes ☐ No ☒**
Safeguards	• Identify measures to manage vegetation within the works area • Detail restoration, regeneration and rehabilitation of areas of native vegetation that will be removed to accommodate the proposed works. • Detail appropriate management for the potential habitat of threatened flora and fauna species that will be indirectly impacted by the proposal. • Identify weed management strategies. • As part of the site induction process, provide all site personnel with information on the biodiversity values of the study area, including threatened species, no-go areas and responsibilities under relevant environmental legislation, including but not

	limited to the EP&A Act, BC Act and EPBC Act and associated management plans for individual species. Should unexpected threatened fauna be located at any time during construction, cease work immediately in the area to prevent further harm to the individual. Contact Council's Environmental Officer and a suitably qualified ecologist to determine if further assessment or management plans are required. <u>Clearing of vegetation – general safeguards</u> • Remove minimum required vegetation and minimise disturbance to remaining vegetation • If any damage occurs to vegetation outside of the boundaries of the work site as a result of the implementation of the proposal, the Project Manager will be notified and will establish strategies for mitigation of impacts and site restoration. <u>Loss of threatened species and their habitats:</u> • Minimise removal of native vegetation and fauna habitat. • Implement exclusion zones to protect threatened ecological communities and threatened species habitat. • Works are not to harm threatened fauna. • Works are not to create a barrier to fauna movement. <u>Shorebird Populations</u> • If any shorebird populations are located within the vicinity of the site, specific buffer zones and appropriate barriers are to be used to restrict access to any habitat areas prior to works <u>Invasion of Exotic Species:</u> • Construction machinery should be washed prior to entering and leaving site to ensure weed propagules are not transported. <u>Stockpiling:</u> • Only place stockpiles in low value vegetation, where cleared sites are unavailable. • Stockpiles should be no taller than 2m height. • Use existing stockpiles before creating new ones. • Stockpiles should be 30m away from the Batemans Marine Park <u>Site Restoration:</u> • The rehabilitation of disturbed areas will be carried out progressively as construction stages are completed, and in accordance with: • Landcom's "Blue Book (4th Edition) on sediment and erosion control
Aboriginal Heritage	Are the works likely to disturb previously undisturbed areas of the landscape? **Yes ☐ No ☒** Has an AHIMS register search been conducted? **Yes ☒ No ☐** Are there any known Aboriginal artefacts/sites within the vicinity of the work site?

	Yes ☐ No ☒ Would the proposal involve the removal of mature native trees? **Yes ☐ No ☒**
Potential Impacts	Does the project pose any potential risk to Aboriginal heritage? **Yes ☐ No ☒**
Safeguards	<u>Due Diligence</u> • Undertake due diligence assessment prior to any work <u>Unexpected Finds:</u> • If Aboriginal heritage items are uncovered during the works, all works in the vicinity of the find must cease and the Project Manager and/or the Environmental Officer contacted immediately as the material is protected under the NPWS Act.
Noise	Are there any noise sensitive areas near the location of the proposed works that may be affected by the works (ie. church, school, hospital, residences)? During construction? **Yes ☒ No ☐** During Operation? **Yes ☒ No ☐**  **Figure 7:** Approx. works location in respects to local residences Are the proposed works going to be undertaken during standard working hours detailed below? **Yes ☒ No ☐** *<u>Standard working hours</u>* *Monday – Friday* *7:00am to 6:00pm*

	Saturday	*8:00am to 1:00pm*
	Sunday and Public Holidays	*No work*
Potential Impacts	Does the project pose any potential risk to the surrounding noise quality? **Yes ☒ No ☐** Machinery used for relocating and the scraping of sand	
Safeguards	<u>Notification:</u> • All sensitive receivers (eg local residents) likely to be affected will be notified at least five working days prior to the start of any works associated with the activity that may have an adverse noise or vibration impact. <u>Standard Hours of Operation:</u> • Works to be carried out during normal work hours (ie.7am to 6pm Monday to Friday; 8am to 1pm Saturdays). Any work that is performed outside normal work hours or on Sundays or public holidays may not be permitted and, if permitted, works are to minimise noise impacts. <u>Out of hours:</u> • Where out-of-hours activities are required, a Noise and Vibration Management Plan will be prepared and implemented in consultation with sensitive receivers.	
Air quality	Are the proposed works likely to result in large areas (>2ha) of exposed soils? **Yes ☐ No ☒** Are there any dust sensitive receivers located within the vicinity of the proposed works during the construction period (ie. church, school, hospital, residences)? **Yes ☒ No ☐** Is there likely to be an emission to air of dust, smoke, steam or vehicle emissions? **Yes ☒ No ☐**	
Potential Impacts	Does the project pose any potential risk to the surrounding air quality? **Yes ☒ No ☐**	
Safeguards	• Measures to minimise or prevent air pollution or dust are to be used including watering or covering exposed areas. • Vegetation or other materials are not to be burnt on site. • Vehicles and vessels transporting waste or other materials that may produce odours or dust are to be covered during transportation • Vehicles and equipment are to be maintained in good working order. • Monitor work areas and stockpiles for dust generation and seed/cover/spray to suppress. • Measures (including watering or covering exposed areas) are to be used to minimise or prevent air pollution and dust • Do not leave vehicles idling	
Visual Amenity/ Landscape	Will the project have any potential impact on visual amenity of the site and surrounding landscape?	

	Yes ☒ No ☐ The relocation of sand from one location to another. Machinery operating on beaches
Potential Impacts	Change in scenic amenity within the area.
Safeguards	• Contain all work within the boundaries designated on the site plan • Restore work sites to as close to their original condition as possible • Minimise spread of stockpiles, waste, and parking
Erosion and Sediment Control	Is there potential for erosion and sediment to migrate during the works **Yes ☐ No ☒** Will there be exposed soils as part of the works **Yes ☐ No ☒** Will there be works close to any waterways which will require ESC? **Yes ☐ No ☒**
Acid Sulphate Soils	Are there any Acid Sulphate Soils within the works location? **Yes ☐ No ☒** ESC GIS has indicated that there are no *known* occurrences of Acid Sulphate Soils within the works area
Beach Nourishment	Will any sediment be sourced and relocated along any areas of Long Beach? **Yes ☒ No ☐**
Potential Impacts	• Sourcing sand which is incompatible with the current sandy arrangement • Disturbance to microorganisms • Sand compression by heavy machinery • Changes in beach slope • Changes in granulometry • Drastic faunistic changes • Changes in food resource for littoral birds may be temporarily diminished via temporary loss of intertidal benthic macrofauna • Shorebird habitats in the vicinity of works

Safeguards	• Ensure granulometry matches • Heavy machinery to be “soft track” • Sand to be profiled to just below top of the foreshore and be graded down to widen the existing beach, a slope of no greater than 1:7 to be achieved • A max scraping depth of 30cm to be adopted • Fence off any areas where shorebird habitats are present

4.1 Environmental Planning and Assessment Regulation 2000 checklist

In accordance with the Environmental Planning and Assessment Act, the following factors have been considered in assessing the likely impact of this activity on the environment.

Does the proposed work:

a) Have any environmental impact on a community?

During construction, the main impact on the people within the community will be from dust, noise and machinery. Works will be undertaken between 7am to 6pm Mondays to Fridays or 8am to 1pm Saturdays.

b) Cause any transformation of a locality?

There will be a slight transformation to the locality as sand will be relocated from the western end of Long Beach to the eastern eroded section of the beach. This sand transfer will be beneficial to the area as it will renourish a dune area which has eroded over time due to various coastal processes. It will also increase resilience and to residential properties and various infrastructure assets in the area. Prior to any nourishment works, there will be bulker bags placed along the eroded bank to mitigate further erosion.

c) Have any environmental impact on the ecosystems of the locality?

Minimal. For most of the bulker bagging works, machinery will be either on, or beside Bay Road. When this is too restrictive to effectively undertake the works, machinery will be operated on the sand. When on the beach machinery with rubber tracks should be utilised. Rubber tracked machinery will also be used when relocating sand from the western to the eastern end of Long Beach. An access route will be chosen closer to the construction date prioritising minimal impact on the foreshore region and vegetation within the area.

d) Have a reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?

There will be no reduction in these values. The works will increase the environmental quality of the area by nourishing the dune region. Beach scraping mimics the natural beach recovery processes at increased rates promoting a healthier more resilient natural area.

e) Have any effect upon a locality, place or building having aesthetic or anthropological, cultural, historical, scientific or social significance or other social significance or other special value for present or future generations?

There are no known Aboriginal sites within the works extents. As the works are being undertaken on the coast, extreme caution must be exercised throughout the works. If any items of shell, stone or bone material is found during works, please stop works and protect the site and contact Council's Engineering Environmental Support Officer, Joshua Aschmann (0437686914) or Divisional Manager of Works, Tony Swallow (0455 551 214) for further direction in this circumstance. Council is also required to notify the Office of Environment and Heritage, Queanbeyan (1300 361 967). In the event of human remains discovery, the Police should be contacted in the first instance.

f) Have any impact on the habitat of protected or endangered fauna (as per Biodiversity Conservation Act 2016)?

Unlikely. However, if any shorebirds are in the vicinity of the work site, specific buffer zones and appropriate barriers will be used to restrict access to any important habitat areas prior to works. Assessments for these shorebirds should be undertaken prior to any works.

g) Cause any endangering of any species of animal, plant or other form of life whether living on land, water or air?

Not expected.

h) Cause any long-term effects on the environment?

Not expected

i) Cause any degradation of the quality of the environment?

The works will increase the quality of the environment by stabilising the bank, reducing erosion and preventing further undermining of the foreshore upper bank region along the eastern end of Long Beach. It is expected that the area where the sand which will be taken from for the scraping will naturally reconfigure to its previous state.

j) Cause any risk to the safety of the environment?

No risk to the safety of the environment is expected.

k) Cause any reduction in the range of beneficial uses of the environment?

The works will increase the recreational value of the area by mitigating erosion impacts and allowing greater accessibility to the beach.

l) Cause any pollution of the environment?

ESCs GIS has mapped the area as having “no known occurrence” of Acid Sulphate Soils.

Acid sulphate soils are not likely to pose any significant problem during construction as they are only likely to occur in the bottom sediment, which will be kept wet by the tide during construction.

However, if any ASS is discovered, an ASSMP will need to be undertaken and associated guidelines followed. There will however be vehicle emissions from the works.

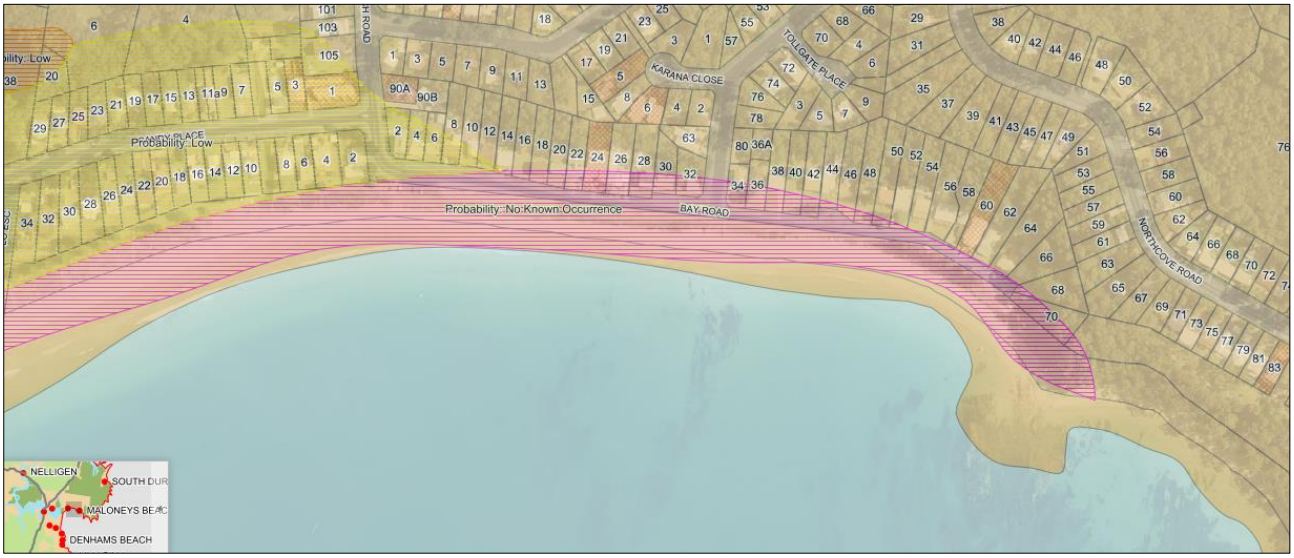


Figure 8: ESC GIS mapping of ASS likelihoods within the area. Note that this mapping shows no known occurrences within the work areas.

j) Have any environment problems associated with the disposal of waste?

No. Any excess materials and/or waste will be disposed of at a local landfill site.

k) Increase demands on resources (natural or otherwise) which are, or are likely to become, in short supply?

No materials are expected to become in short supply.

l) Have any cumulative environmental effect with other existing or likely future activities?

Yes there will be a minor cumulative loss of sand from the scraping works. No long-term impacts are expected from this process.

m) Have any impact on coastal processes and coastal hazards, including those under projected climate change conditions.

Yes, the bulker bag wall will prevent the natural meandering process of the tidal and wave actions within the area. The works will create a barrier to build resilience for severe weather events which will also continue to erode the bank if left unattended.

The impact of sea level rise and future flood events has been considered in the selection of the rock erosion protection and stormwater drainage improvements. This is further expanded upon with ESCs draft CMP which acknowledges that the area is susceptible to sea level rise and for any future design to take this important factor into consideration.

4.2 Matters of national environmental significance

In accordance with the Environment Protection and Biodiversity Act 1999, the following factors have been considered in assessing the environmental impact of this activity.

Table 6: Matters of natural significance factors and possible impacts.

Factor	**Impact**
(a) Any impact on a World Heritage property?	Nil
(b)	
(c) Any impact on a National Heritage place?	Nil
(d) Any impact on a wetland of international significance?	Nil
(e) Any impact on nationally threatened species, ecological communities or migratory species?	Nil
(f) Any impact on a Commonwealth marine area?	Nil
(g) Does the proposal involve a nuclear action?	Nil
Additionally, any impact (direct or indirect) on the environment of Commonwealth land?	Nil

5. Summary

The dune area located between Bay Road and Long Beach has deteriorated significantly since the April 2022 East Coast Low weather event. As a result, works are required ASAP to ensure the road, residential properties and infrastructure assets do not sustain any further significant damage. Any further adverse weather events will undoubtedly impact the road significantly while also creating a significant public safety and asset risk.

The anticipated works adjacent to Bay Road are not expected to cause any significant environmental issues. It is proposed that bulker bags will be placed along the eroded sections of the bank adjacent from the beach side of Bay Road to mitigate any further erosion and undermining of Bay Road. These works are to be undertaken as soon as resources become available considering the emergency nature of the situation which is now threatening the road itself.

Post bulker bagging the eroded area, Council is proposing beach nourishment works in the form of beach scraping. This will involve taking sand from the western side of Long Beach and placing it along the eroded dune area towards the eastern end of the beach. This process will further mitigate erosional impacts within the site and protect Council assets. A Marine Park Permit is required for the beach scraping as the works are in the Habitat Protection Zone of the Batemans Marine Park. The Marine Park requires notification of works starting 5 days prior to start and 5 days prior to finish. Currently there is no permit for the scarping. This REF will accompany the permit application.

As the scraping works will be undertaken on Crown Lands, consent is required prior to any works being undertaken. It was confirmed on 22/08/2022 that this consent was granted, and works could proceed.

The described undertakings will enhance the resilience of the area, negate any further erosion concerns and mitigate any sediment/material migrating into the adjacent Batemans Marine Park. It will also increase safety within the area and increase beach accessibility from Bay Road down to the Long Beach foreshore for the surrounding community stakeholders.

6. Certification, review and decision

This Review of Environmental Factors provides a true and fair review of the proposal in relation to its potential effects on the environment. It addresses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the proposal. It identifies the likely impacts of the proposal on the environment and details the environmental safeguards and mitigation measures to be implemented to minimise the potential impact to the environment. In light of the above assessment of the proposed activity, it is considered that the overall impact on the environment is likely to be minimal and therefore acceptable. The long-term benefits of the activity will have a cumulative positive impact on the safety of road users and the activity should proceed accordingly.

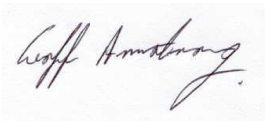
REF Author

Joshua Aschmann

Environmental Engineering Support Officer

19/10/2022

Reviewed and endorsed by:



Geoff Armstrong

Design Coordinator

20/10/2022

Appendix A

Figures

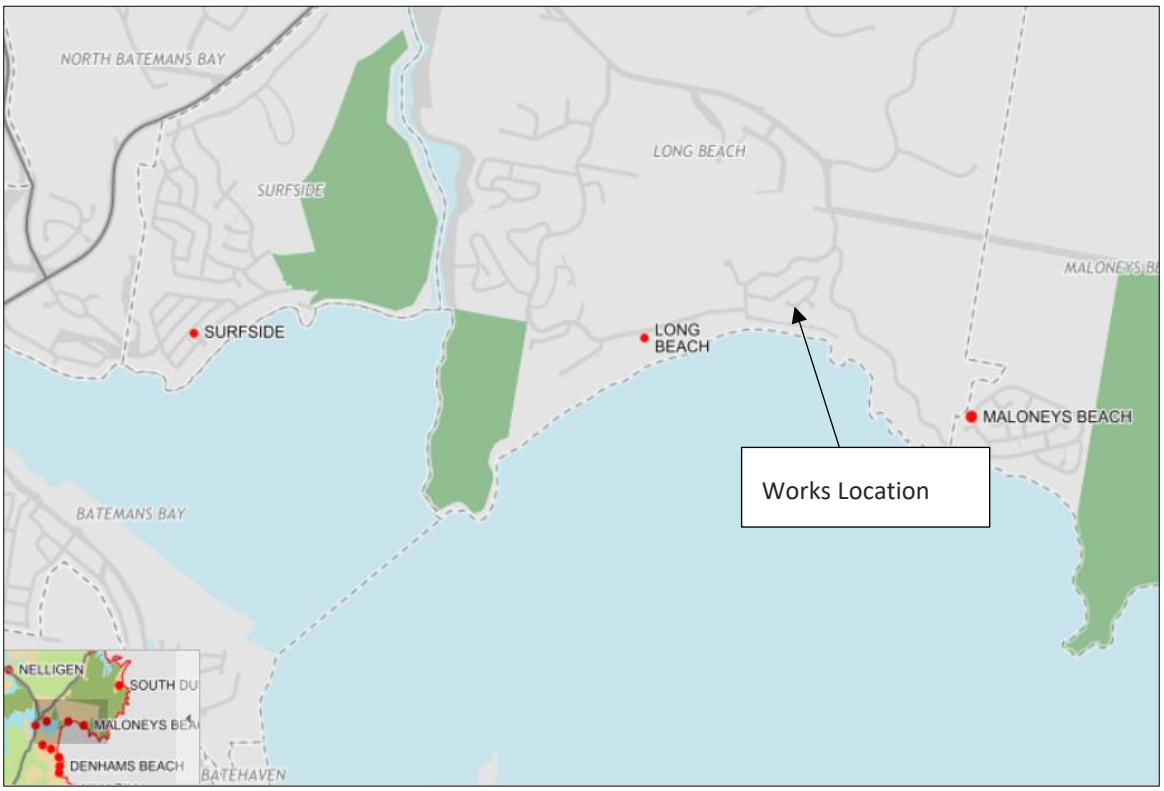


Figure 1: Works location - Regional Context.

Figure 2: Near Maps image showing works location and surrounding area.

2.2 Sand Samples for Particle Size Analysis

Sediment samples were collected from each of the ten beaches requiring erosion/recession maps. Additional samples were also collected at Durras Beach, Cookies Beach, Cullendulla Beach, Tomakin Beach and Bengello Beach. For beaches outside of Batemans Bay, the location of each sediment sample (collected in 2012) is illustrated on the site details figure for each coastline sub-section referred to in Appendix B (exact sand sample locations were not recorded for the Batemans Bay beaches in 2011). The dried sediment samples were treated according to Australian Standard 1289.3.6.1 (2009) to determine the particle size distributions by mechanical sieving. A photograph of each dried sample and its associated particle size distribution is also shown in Appendix B. The median particle size (d_{50}) for the sand fraction of sediment (60 µm to 2 mm) varies between 180 and 1,240 µm as shown in Table 2-2. Particle size standard deviations (i.e. "sorting") of these samples are shown in Table 3-3.

Table 2-2: Median Sand Fraction Particle Sizes (60 µm to 2 mm)

Name	Sample	d_{50} (µm)	d_{50} (mm)
Durras & Cookies Beaches	1	430	0.43
	2	320	0.32
	3	350	0.35
Maloneys Beach	1	210	0.21
Long Beach	1	240	0.24
Cullendulla Beach	1	180	0.18
Surfside Beach (east)	1	250	0.25
Surfside Beach (west)	1	210	0.21
Sunshine Bay	1	1,010	1.01
	2	210	0.21
Malua Bay	1	400	0.40
	2	290	0.29
Guerrilla Bay	1	280	0.28
	2	300	0.30
Barlings Beach	1	320	0.32
	2	280	0.28
Tomakin Cove & Beach	1	350	0.35
	2	190	0.19
Broulee Beach	1	210	0.21
	2	220	0.22
Bengello Beach	1	220	0.22
	2	320	0.32
	3	340	0.34
	4	330	0.33
	5	350	0.35
	6	1,240	1.24

Table 3-3: Beach and Sediment Characteristics of the Study Sites

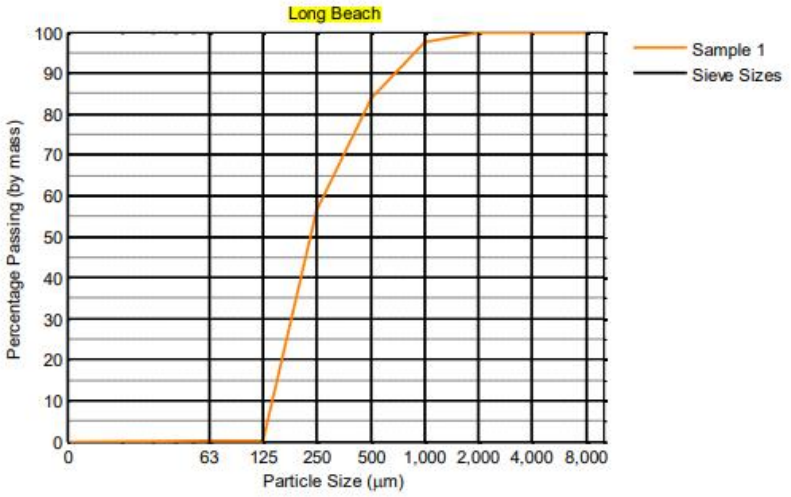
Beach	Embay. Ratio (-)[1]	Orient. (°TN)[2]	Critical (Design) Offshore Wave Direction (°TN)[3]	H_s (m)[3]		100 year ARI Storm Demand (m^3/m above 0 m AHD)	Beach State[4]	Beach Swash Slope (1V:?H)	Median Sand Size, D_{50} (mm)	Sand Sorting (Standard Deviation)		Carbonate Content of Sand (%)
				Median	100 year ARI					Quant. (Phi Units, Ø)	Qual.	
Maloneys Beach	0.58	200	180	0.4-0.5	1.5-1.9	50-80	R-LTT	10	0.21	0.90	Moderate	69-76
Long Beach	0.68	165	157.5	0.4-0.7	2.0-3.0	70-120	LTT-TBR	9-18	0.24	0.30	Very well	64-78
Cullendulla Beach	0.55	190	157.5	0.2	0.9	N/A	B+SF	24	0.18	1.60	Poor	62
Surfside Beach (east)	0.82	145	135-157.5	0.3-0.4	1.5-1.6	50-60	LTT	13-18	0.25	0.65	Moderate	20
Surfside Beach (west)	0.91	220	157.5	0.2	0.7	20	B+SF	20	0.21	0.64	Moderate	20
Sunshine Bay	0.52	70	112.5	0.4	4.0	25	R	11	0.21-1.01	0.90	Moderate	62 (sand), 1 (gravel)
Malua Bay	0.69	100	112.5	1.1	6.4	120	TBR	12	0.29-0.40	0.32	Very well	78
Guerilla Bay (south)	0.38	80	90	0.5	4.3	80	LTT	12	0.28-0.30	0.28	Very well	45
Barlings Beach	0.61	180	180	0.6-1.0	2.8-3.5	60-110	TBR	10-21	0.28-0.32	0.42	Well	74
Tomakin Cove	0.19	140	112.5	0.6	3.7	90	LTT	26	0.19	0.42	Well	71
Broulee Beach	0.60	70	90-112.5	0.4-0.9	1.8-3.5	70-110	TBR-LTT	23-30	0.21-0.22	0.42	Well	48-84
Bengello Beach	0.87	120	112.5	1.2-1.3	5.6-5.7	170	TBR-RBB	18	0.22-0.35	0.41	Well	4-5

(1) Embayment Ratio = straight line distance (chord) between controlling headlands / curved shoreline length (i.e. deeper bays have a lower embayment ratio)

(2) Beach Orientation

(3) The critical (design) offshore wave direction, median *Hs*, and 100 year *Hs* for each beach are specified with additional information (including bed elevation) in Appendix D, Table D-5.

(4) Beach States RBR = rhythmic bar and beach
TBR = transverse bar and rip
LTT = low tide terrace
R = reflective
B+SF = beach and sand flats



Sample 1