

**REVIEW OF ENVIRONMENTAL FACTORS (REF)
GABION WALL REPAIR
BOOLIJAH CREEK BRIDGE
BRAIDWOOD ROAD / MAIN ROAD (MR) 92, TIANJARA**

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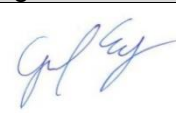
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Document control

Item	Details
Project	Review of Environmental Factors – Gabion Wall Repair – Boolijah Creek Bridge – Braidwood Road –Tianjara
Client	City Services, Shoalhaven City Council
Prepared By	City Services, Shoalhaven City Council

Document status

Version	Author / Reviewer*	Name	Signed	Date
V1.0	Author	Geoff Young		18/01/2023
	Reviewer	Jeff Bryant		19/01/2023

*Review and endorsement statement:

"I certify that I have reviewed and endorsed the contents of this REF document and, to the best of my knowledge, it is in accordance with the EP&A Act, the EP&A Regulation and the Guidelines approved under clause 170 of the EP&A Regulation, and the information it contains is neither false nor misleading".

Assessment and approvals overview

Item	Details
Assessment type	Division 5.1 (EP&A Act) - Review of Environmental Factors (REF)
Proponent	Shoalhaven City Council – City Services
Determining authority / authorities	Shoalhaven City Council – City Services
Required approvals (consents, licences and permits)	Nil
Required publication	Yes – as a matter of public interest (road works, threatened species, and near Morton National Park)

1. PROPOSAL AND LOCATION

1.1 Proposed activity

The proposed activity is the remediation of damaged gabion walls on the abutments and wingwalls either side of the bridge on Braidwood Road crossing Boolijah Creek, Tianjara (Figure 1 p.7). The existing gabion walls were damaged by the 2019/2020 Currowan Bushfire. Remediation would involve the following works:

- stripping of vegetation and additional debris from the face of existing gabions
- some removal of trees from the top of the abutments to allow access for excavator arm and “man basket”
- application of steel fibre reinforced shotcrete onto existing gabion wall face.

Works would be conducted entirely from Braidwood Road with the site compound in a pre-existing cleared road verge to the east of the bridge (Figure 2 p.8). Positioned on the bridge or approaches, a 35 tonne long-reach excavator would be used to suspend shotcrete operators via a “man basket”. A 32-35 metre concrete boom pump would be positioned on the approaches to the bridge. A similar set up is shown below (from PCA 2023). Construction methodology and Construction Environmental Management Plan are provided in Appendix A.

Works would also involve the implementation of prescribed safeguards and mitigation measures (refer to Section 7).

Shoalhaven City Council (SCC) is the proponent and the determining authority under Part 5 of the EP&A Act. The environmental assessment of the proposed activity and associated environmental impacts has been undertaken in the context of Clause 171 of the *Environmental Planning and Assessment Regulation 2021*. In doing so, this Review of Environmental Factors (REF) helps to fulfil the requirements of Section 5.5 of the Act that SCC examine and take into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity.



1.2 Location

The proposed activity would occur under the and adjacent to the existing concrete bridge across Boolijah Creek, Braidwood Road, Tianjara (Figure 1 and Figure 2 below).

The activity would take place entirely within the Braidwood Road road reserve. Braidwood Road is also known as Main Road 92. SCC is the roads authority for this road.

The Braidwood Road reserve is bordered by Morton National Park. All works are to be contained within the road reserve and not encroach into the National Park.

1.3 Background, justification and analysis of alternatives

The existing gabion walls on all corners of the bridge were impacted by the 2019/2020 Currowan Bushfire. The bushfire caused the protective coating to melt, exposing the mesh wire leading to deterioration through rust and other forces. The eastern abutment is particularly affected. The following risks were identified (Stantec 2022):

- The geometric arrangement of this abutment is considered to result in a higher risk to the existing infrastructure because of potential ongoing deterioration of the gabion wall, specifically if destabilising of the material around the soffit, bridge piles and bridge deck occurs.
- Based on the orientation of the bridge and gabion wing walls, this abutment may be more susceptible to scour from the creek during significant storm events which could further impact the integrity of the abutment and bridge.

The velocity of waters are high in the 1 in 100 year ARI event (up to 4.5 m/s) (Sinclair Knight Merz 2002). The bed of the waterway comprises sandstone bedrock with large rocks with little sediment, therefore the beds would be able to withstand high velocities without unacceptable scour occurring. The embankment is also protected by the gabion mesh, which would normally also be able to withstand high velocities without being adversely affected by scour. Continued deterioration of the gabion mesh however may reduce the integrity of the wall and lead to increased scouring potentially affecting the integrity of the bridge.

Initial plans proposed the installation of soil nails, steel mesh and nail plates. After a preliminary environmental assessment (D22/435743) however, this component was withdrawn due to associated environmental risks and sensitivity of the creek. It is understood that the shotcrete to be utilised is highly viscous and its application can be precise and input into the creek, creek bed, and natural banks is not anticipated. Bunding and geofabric adjacent to the base of the walls will also be utilised to further protect the creek *i.e.* like a 'ground-sheet'.

1.4 Operational Environmental Management Plan for MR92 (Braidwood Road)

The Minister of Planning's Conditions of Approval for the 2006 - 2010 upgrade of the road required TfNSW (RMS) to develop an Operational Environmental Management Plan (OEMP) for the ongoing management of various environmental components. Although the bridge was not constructed as part of the upgrade, the OEMP was applied to the entire 54 kilometre upgraded section between Hames Road and Nerriga.

Copies of the OEMP and sub-plans are SCC reference numbers D12/5516 (OEMP), D12/5558 (Vegetation and Habitat), D12/5676 (Soil and Water), and D12/5734 (Heritage).

Of relevance to the proposed activity, the Soil and Water Management Sub-plan describes the soil and water quality measures to be implemented for the operation of Braidwood Road. This includes:

- Time maintenance works near waterways during periods of dry weather.
- Avoid the unnecessary removal of vegetation and minimise surface disturbance especially near waterways and drainage structures.
- Limit plant and equipment to the roadway unless necessary
- Rehabilitate disturbed areas as rapidly as possible
- Always have spill kits on-site for the containment of fuel and oil spill.
- Prior to entering site, plant and equipment shall be inspected and cleaned to remove soil and vegetative material.
- All liquid chemicals, fuels and oils must be stored in a suitable secondary containment bund and protected to minimise the impact of any spillage or containment on or around the site. Bunds shall be:
 - imperviously lined using a material unaffected by chemical attack from the liquid being stored
 - able to contain a minimum of 120% of the volume of liquid being stored
 - bunds and storage areas to be above the emergency spill basins located on all four sides of the bridge.

Within the catchment of Boolijah and Tianjara Creeks, the importing of damp material or use of water collected outside of these catchments required approval from the Office of Environment and Heritage (OEH) during the road upgrade. These catchments were considered free of Chytrid Fungus *Batrachochytrium dendrobatidis* – a frog pathogen that is resulting in the death of many frog species in affected areas. The fungus is transferred by direct contact between frogs and tadpoles or via zoospores in infected water. Boolijah and Tianjara Creeks are known to contain a range of frog species including the endangered Heath Frog *Litoria watsoni*¹ and the Giant Burrowing Frog *Heleioporus australiacus*.

The use of Shoalhaven Water town water gained approval for use in these catchments during the construction phase of the project. It is assumed that this is the case for the operational phase of the road and can be utilised in this project.

A range of management and mitigation methods and measures will minimise the potential for the introduction of Chytrid fungus into these catchments including:

- disinfecting boots before entering or moving between catchments particularly if entering waterways or drainage lines
- disinfecting equipment likely to come into contact with waters of these habitats.

The plan also references the Department of Environment and Climate Change 2008 Hygiene Protocol which has been superseded by DoPIE's (2020) Hygiene Guidelines to which the proposed activity will need to observe (refer to Section 7 of this REF).

¹ This frog was once regarded as being Littlejohns Tree Frog *Litoria littlejohni* but has recently been taxonomically divided into two separate species with *L. watsoni* thought most likely to occur in Boolijah Creek.

Figure 1: Location

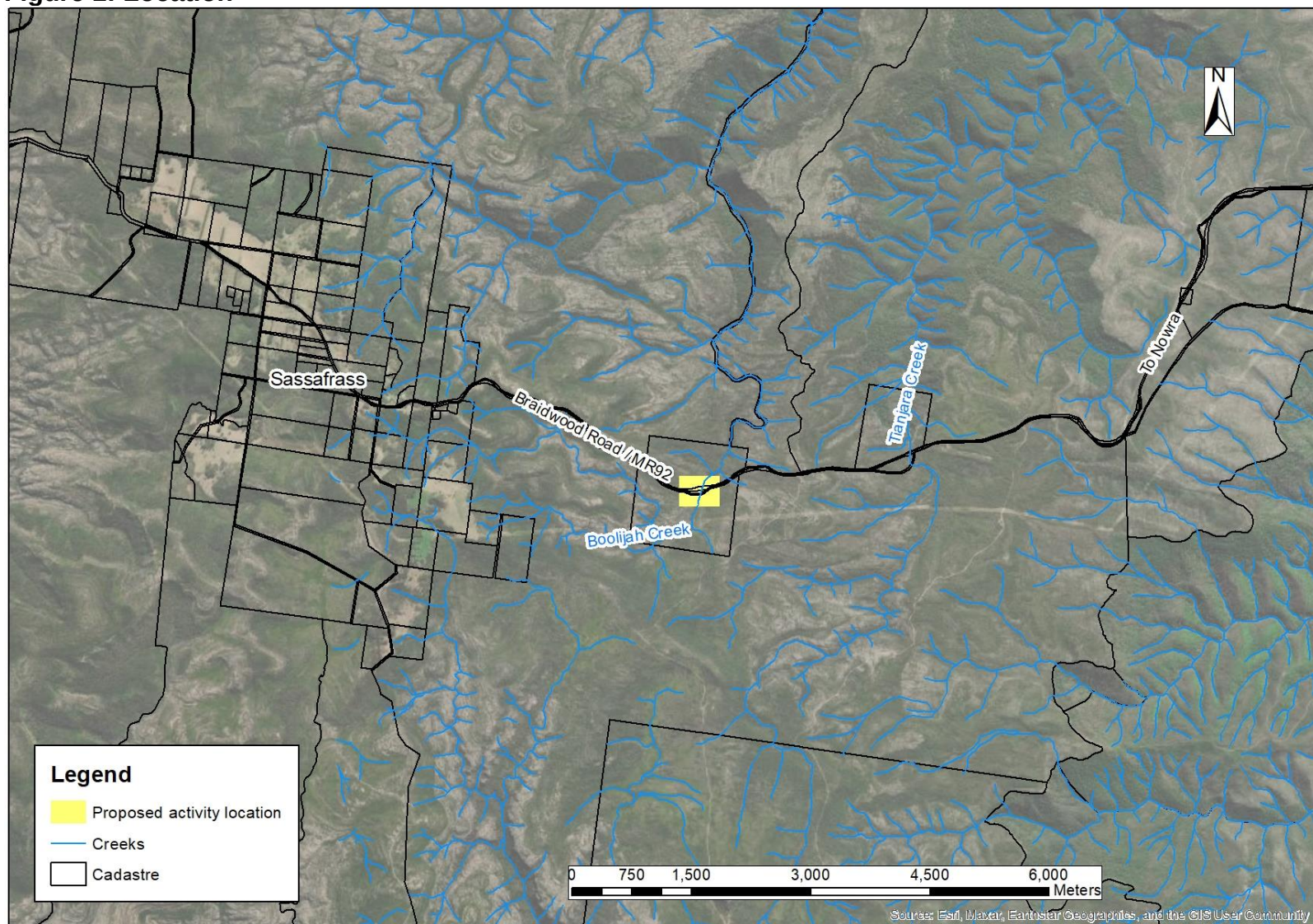
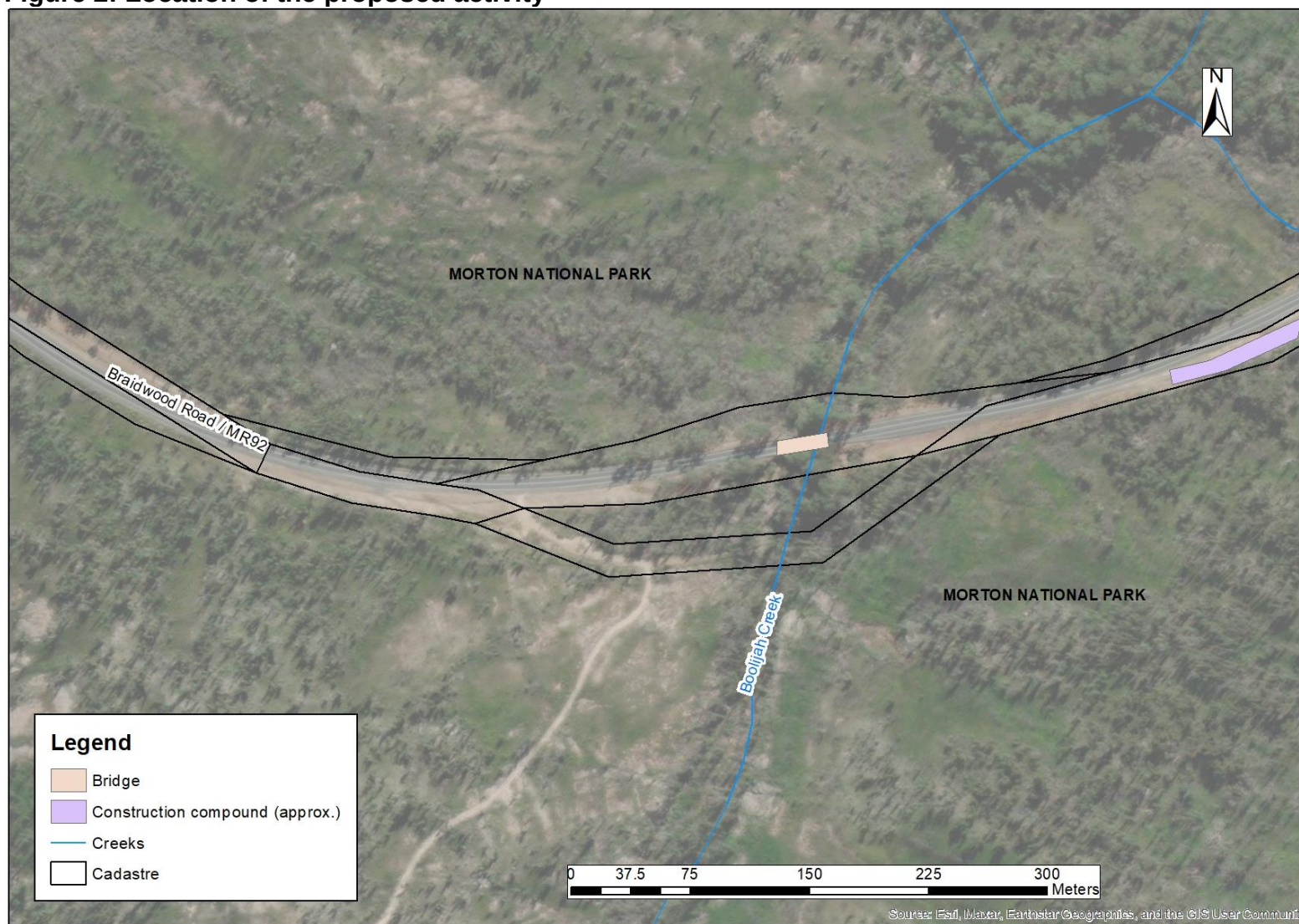


Figure 2: Location of the proposed activity



2. EXISTING ENVIRONMENT

The proposed activity would be undertaken primarily at the bridge structure, Braidwood Road and immediate surrounds.

Photos of the site are provided in Section 2.6 below.

2.1 Stream environment

Boolijah Creek is located on the Sassafras Plateau. The creek flows generally northwards into Danjera Creek which flows into the Danjera Dam impoundment. Boolijah Creek has a catchment of approximately 8km² upstream of the proposed activity.

At the site of the proposed activity, Boolijah Creek flows over Nowra Sandstone bedrock, large sandstone boulders with a thin infill of sand (refer Photos in Section 2.6 below).

Boolijah Creek at the site of the proposed gabion works is a second order stream and would likely be considered a Class 1 – Major Key Fish Habitat waterway with Type 1 – highly sensitive key fish habitat present (DoPI 2013).

Water quality is anticipated to be high based on previous sampling (Sinclair Knight Merz 2002) and surrounding land-use comprising natural catchments (conservation areas and National Parks) with extensive plateau-top swamps floored by mudstone bands of leaf compost. The spill basins on all sides of the bridge would also assist to maintain water quality by the retention of sediment and litter from the road.

Width of the creek at the time of inspection (10 June 2022) was one metre and a maximum depth of approximately 100 millimetres.

2.2 Current structure

The bridge has gabion abutment and wing walls up to five metres, which have been founded on Nowra Sandstone. The gabion also acts to train the creek in the direction appropriate for the bridge.

The existing gabion baskets vary between four and eight stacks of 0.5 metres in height on the eastern abutment. The geometry of the baskets into the slope has not been established, however a single stack arrangement has been assumed.

2.3 Habitat and vegetation assessment

Vegetation communities mapped as occurring within or immediately around the site are shown in Figure 3 below and include:

- Biometric SR593 *Red Bloodwood – Grey Gum shrubby open forest on shale-sandstone interface on the lower Shoalhaven valleys, southern Basin*. This vegetation type is not associated with any endangered ecological community (ECC).
- Biometric SR594 *Red Bloodwood – Hard-leaved Scribbly Gum – Silvertop Ash heathy open forest on sandstone plateaux of the lower Shoalhaven Valley, Sydney Basin*. This vegetation type is not associated with any EEC.
- Biometric SR513 *Banksia – Red Bloodwood – Hard-leaved Scribbly Gum heathy open woodland on sandstone plateaux, southern Sydney Basin*. This vegetation type is not associated with any EEC.

The site was assessed by a Council Environmental Officer on 17 January 2023. Vegetation appears to be a mix and/or interface of SR593 and SR594. Surveys undertaken involved

vegetation and habitat assessment, recording flora species that would be impacted by the works, determination of vegetation communities, and investigation of habitat availability on site including suitability of habitat for threatened flora and fauna species.

The site of the set-up and construction compound area generally comprises road verge with imported road base surrounded by regularly slashed grassy area (refer to Photo 1 in Section 2.6 below). The gabion wall works would require the removal of approximately 13 small to medium (<250mm dbh) trees being Sydney Peppermint *Eucalyptus piperita*, and Silvertop Ash *E.sieberi* growing in, on, or immediately adjacent to the gabions (refer to Photos 2 to 5 in Section 2.6 below). Other vegetation that is growing immediately adjacent to the gabion wing walls which may require removal include Sydney Golden Wattle *Acacia longifolia*, Hop Goodenia *Goodenia ovata*, *Gahnia clarkei*, and *Pittosporum multiflorum*.

No threatened flora species were detected on-site during field surveys and no suitable habitat was considered to occur in any areas that would be impacted by the proposed activity.

No evidence of potential use of this site by threatened fauna species including Glossy Black Cockatoo (*Calyptorhynchus lathami*) (e.g. chewed *Allocasuarina littoralis* cones), Glider species (e.g. feeding scars on *Corymbia gummifera* or *Eucalyptus punctata*) or bandicoot diggings were recorded within the site.

No hollow-bearing trees were recorded as occurring within areas that would be impacted on by the proposal.

The creek was confirmed to be potential habitat for the endangered species Heath Frog *Litoria watsoni* and the Giant Burrowing Frog *Heleioporus australiacus*. There were no individuals present at time of inspection and no eggs or tadpoles were visible.

2.4 Utility Services

Optic Fibre Cables and the Eastern Gas Pipeline parallel the road and bridge in this location. As no excavation is proposed, these utilities should not be impacted. However due to the presence of the excavator in the vicinity of the Eastern Gas Pipeline, Jemena should at least be notified of the works prior to commencing.

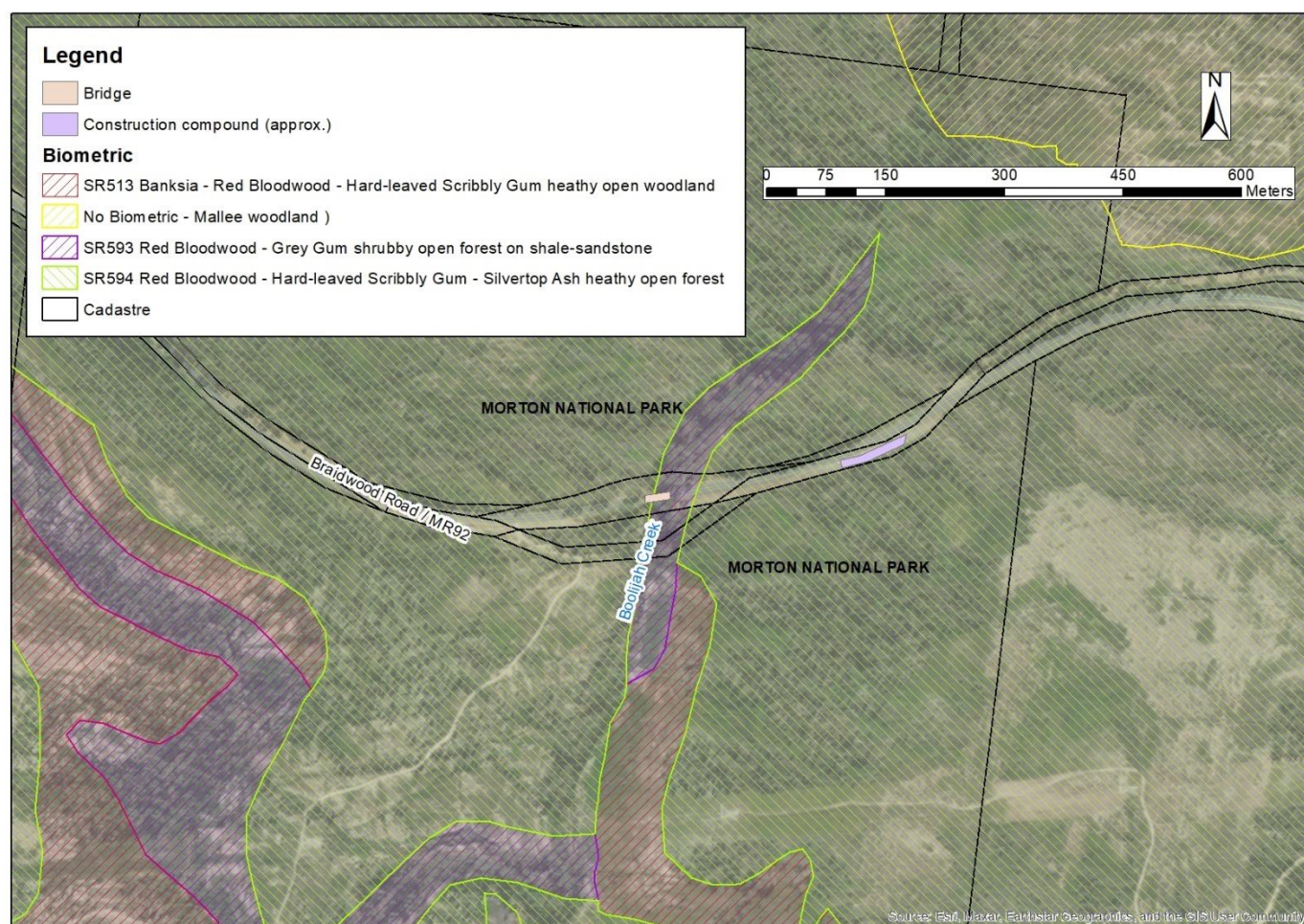
2.5 Other considerations

In the context of this environmental assessment, the area to be affected by the proposed activity:

- is not an Aboriginal Place in the context of the NSW *National Parks and Wildlife Act 1974*
- is not mapped as “potentially contaminated land”
- would not involve acid sulfate soils or potential acid sulfate soils

These factors are not considered in this REF

Figure 3: Vegetation communities - Biometric



2.6 Photos

Photo 1: Site set-up and construction compound area



Photo 2: Example of fire damage to wire netting on gabion with plastic coating melted exposing wire underneath



Photo 3: Gabion wall on the southeastern wing of the bridge. Showing three Eucalypts plus other vegetation adjacent to the gabion which will be removed.



Photo 4: Gabion wall on the south-western wing of the bridge. Showing approx four to five Eucalypts plus other vegetation adjacent to the gabion which will be removed.



Photo 4: Gabion wall on the south-western wing of the bridge. Showing approx two dead Eucalypts plus other vegetation adjacent to the gabion which will be removed.



Photo 5: Gabion wall on the south-western wing of the bridge. Showing approx five Eucalypts plus other vegetation adjacent to the gabion which will be removed.



Photo 6: Gabion wall under the bridge (eastern abutment) showing Boolijah Creek



3. ASSESSMENT OF LIKELY IMPACTS ON THE ENVIRONMENT

3.1 Impacts associated with the proposal

The proposal would involve the following disturbance and direct impacts:

- Removal of approximately thirteen trees (Sydney Peppermint and Silvertop Ash).
- Removal of other native vegetation growing on or immediate adjacent to the gabion wing walls (approximately 40m² to provide at least one metre clearance from the base of the gabion).

Other potential impacts on the environment, including indirect impacts have been considered, including:

- Impacts on threatened species and endangered ecological communities.
- Impacts on indigenous and non-indigenous heritage.
- Impacts on water quality, the riparian zone and key fish habitat.

Each of these is discussed below.

3.2 Vegetation removal

The proposed activity would result in the removal of approximately 40m² of native vegetation including thirteen trees on, in and immediately adjacent to the gabion.

The impact caused by the vegetation removal is not significant for the following reasons:

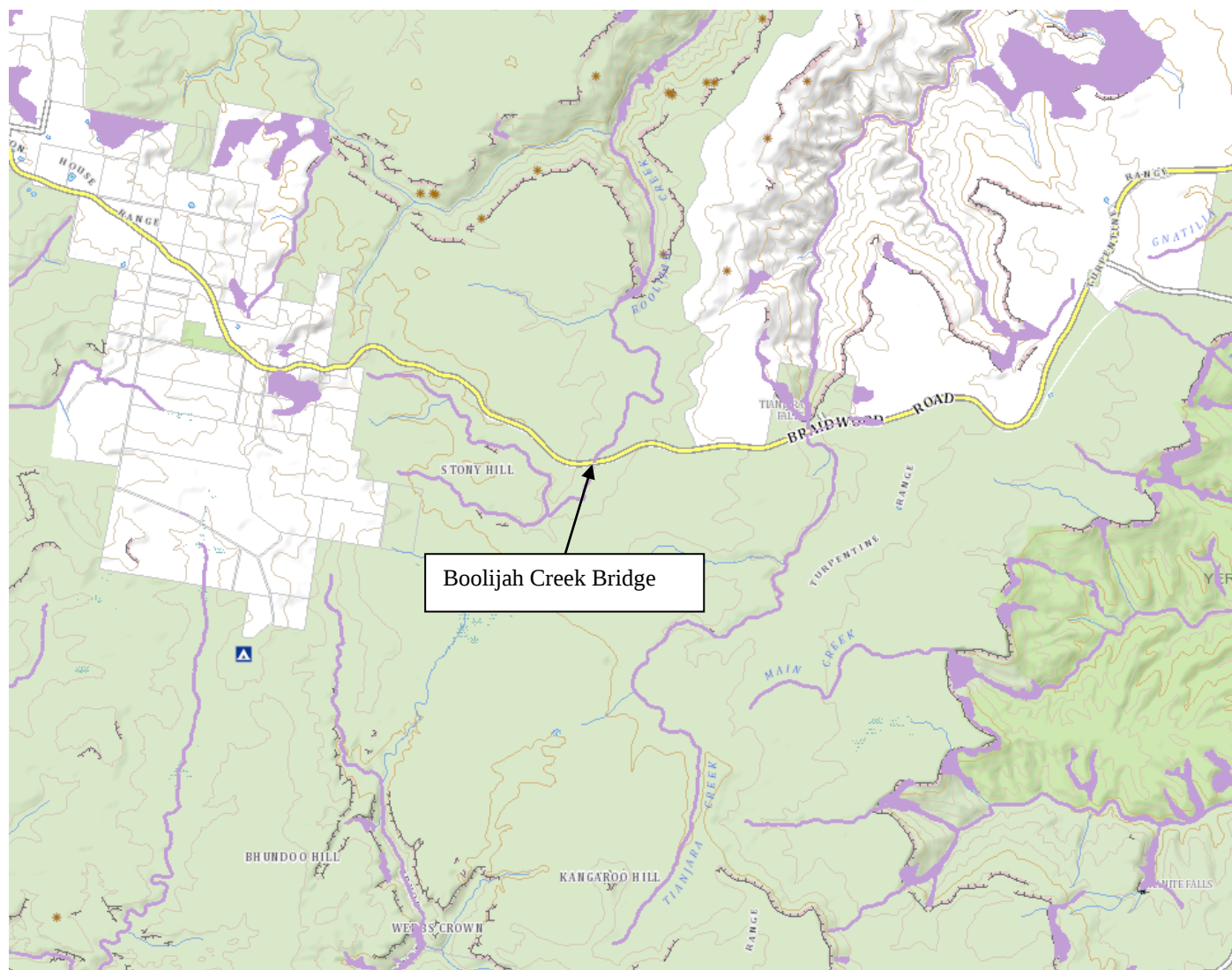
- There are no plants in this area listed in the threatened species schedules of the NSW *Biodiversity Conservation Act 2016* (NSW BC Act) or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The species are considered common and widespread.
- Removal of tree species growing on top of, and in the gabion wing walls would normally be undertaken as routine maintenance.
- Fauna species listed in the threatened species schedules of the NSW BC Act and the EPBC Act are not likely to rely on this vegetation for food, refuge or breeding (refer to Section 3.3 of this REF).
- The vegetation does not comprise an endangered ecological community listed under the NSW BC Act and EPBC Act.
- The vegetation does not appear to provide important food sources for locally occurring threatened species and do not appear to contain nests or hollows.
- With regard to environmental planning instruments, the subject vegetation:
 - is not mapped on Terrestrial Biodiversity Map layer in the Shoalhaven Local Environment Plan 2014 (SLEP 2014)
 - is not mapped as “Scenic Protection Area” layer in the SLEP 2014

The site is mapped as “High Environmental Value” in the Illawarra Shoalhaven Regional Plan 2041 (<https://www.planning.nsw.gov.au/-/media/Files/DPE/Plans-and-policies/Plans-for-your-area/Regional-plans/Illawarra-Shoalhaven-Regional-Plan-05-21.pdf>) and mapped on the Biodiversity Values Map administered for the purposes of the NSW *Biodiversity Conservation Act 2016*. These maps are interconnected and include all ‘natural’ riparian areas to which it is very extensive including all riparian corridors of Boolijah Creek, Danjera Creek in which it flows and

neighbouring catchment of Tianjara and Yarramunmun Creek catchment. The removal of 40m² of vegetation would be insignificant in comparison to the riparian areas of these creeks which are protected in Morton National Park.

An environmental impact statement (EIS) is therefore not considered warranted.

Figure 4: Biodiversity Values Map (mapped areas in purple)



3.3 Threatened species impact assessment (NSW)

Section 1.7 of the EP&A Act 1979 applies the provisions of Part 7 of the NSW *Biodiversity Conservation Act 2016* and Part 7A of the NSW *Fisheries Management Act 1994* that relate to the operation of the Act in connection with the terrestrial and aquatic environment. Each are addressed below.

3.3.1 Part 7A Fisheries Management Act 1994

Part 7A relates to threatened species conservation. There are no species listed in the schedules of the Act anticipated to occur at the site of the proposed works. The Australian Grayling *Protoctes maraena* may occur in the lower reaches of the stream system below Danjera Dam. However, the Dam as well as natural features such as Boolijah Falls, located downstream of the bridge would be

significant barriers to this species effectively ruling-out the species existence at the proposed activity site.

The proposed activity does not significantly comprise a key threatening process under the Act as removal of riparian vegetation would be minimal limited to that on the surface and crest of the gabion walls and immediately adjacent to the wing-walls. Large woody debris in the creek would not be removed and fish passage would not be affected. No further consideration is required.

3.3.2 Part 7 Biodiversity Conservation Act 2016

An assessment of the potential for NSW threatened flora and fauna species occurring on-site or otherwise being impacted by the proposal was undertaken (refer to Appendix B). The following threatened species or endangered ecological communities are known to occur on-site or are considered to have some potential to occur on-site or be otherwise impacted by the proposal:

- Heath Frog *Litoria watsoni*
- Giant Burrowing Frog *Heleioporus australiacus*

Section 7.3 of the Act provides a 'five-part' test to determine whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats. Each Part is addressed below:

Part A - In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the lifecycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

Heath Frog

This species breeds in the upper reaches of permanent streams and in perched swamps. Non-breeding habitat is heath-based forests and woodlands where it shelters under leaf litter and low vegetation, and hunts for invertebrate prey either in shrubs or on the ground. Breeding is triggered by heavy rain and can potentially occur all year but is usually from late summer to early spring when conditions are favourable. Males call from low vegetation close to slow flowing pools. Eggs are laid in loose gelatinous masses attached to small, submerged twigs. Eggs and tadpoles are mostly found in still or slow flowing pools that receive extended exposure to sunlight but will also use temporary isolated pools (OEH 2017).

The species may be adversely impacted by:

- loss of streamside vegetation through clearing or frequent burning
- changes to natural water flows and water quality
- predation of eggs and tadpoles by introduced fish
- disturbance to habitat and hydrology due to longwall mining
- infection by amphibia chytrid fungus
- disturbance to forest and woodland breeding and non-breeding habitat by trail bike activity and other recreation
- forest disturbance associated with forestry operations
- excessive sediment or turbid water entering the creek

The species is known to occur in Boolijah Creek and the creek at the site of the proposed works provides suitable habitat. The proposed activity however is unlikely to have an adverse effect on the lifecycle of the species such that a viable local population is likely to be placed and risk of extinction for the following reasons:

- works would be undertaken in consideration with NSW Department of Planning, Industry and Environment (DoPIE 2020) Hygiene guidelines to mitigate the risk of chytrid fungus spread
- streamside vegetation would be retained with vegetation removal minor and limited to the removal of regrowth on the surface of the gabion walls and the crest on the gabion walls and immediately (within one metre) of the wingwalls
- the work would be conducted from Braidwood Road, not in the creek.
- shotcrete works would be undertaken in a way that does not deposit material into the creek or natural banks i.e. use of highly viscous shotcrete, bunding and geofabric at the base of gabions.

The purpose of the works is to protect and extend the life of the bridge. The replacement of which would have a greater risk of impact to this species.

A species impact statement (SIS) or entry into the Biodiversity Offset Scheme (BOS) is therefore not required for this species for this Part.

Giant Burrowing Frog

The Giant Burrowing Frog is distributed in south eastern NSW and Victoria. The Frog is found in heath, woodland and open dry sclerophyll forest on a variety of soil type except those that are clay based.

Breeding habitat of this species is generally soaks or pools within first or second order streams. They are also commonly recorded from 'hanging swamp' seepage lines and where small pools form from the collected water. When breeding, the frog will call from open spaces, under vegetation or rocks or from within burrows in the creek bank. Egg masses are foamy and are laid in burrows or under vegetation in small pools. Spends more than 95% of its time in non-breeding habitat in areas up to 300 metres from breeding sites. Whilst in non-breeding habitat it burrows below the soil surface or in the leaf litter (OEH 2017b).

The species is known to occur in Boolijah Creek and the creek at the site of the proposed works provides suitable habitat. The proposed activity however is unlikely to have an adverse effect on the lifecycle of the species such that a viable local population is likely to be placed and risk of extinction for the following reasons:

- works would be undertaken in consideration with NSW Department of Planning, Industry and Environment (DoPIE 2020) Hygiene guidelines to mitigate the risk of chytrid fungus spread
- streamside vegetation would be retained with vegetation removal minor and limited to the removal of regrowth on the surface of the gabion walls and the crest on the gabion walls and immediately (within one metre) of the wingwalls
- the gabion does not comprise breeding or non-breeding habitat
- the work would be conducted from Braidwood Road not in the creek.
- shotcrete works would be undertaken in a way that does not deposit material into the creek or natural banks i.e. use of highly viscous shotcrete, bunding and geofabric at the base of gabions.
- Ground disturbance would be minimal limited to the hand-removal of the vegetation.

The purpose of the works is to protect and extend the life of the bridge. The replacement of which would have a greater risk of impact to this species.

A species impact statement (SIS) or entry into the Biodiversity Offset Scheme (BOS) is therefore not required for this species for this Part.

Part B - In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

- (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
- (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction*

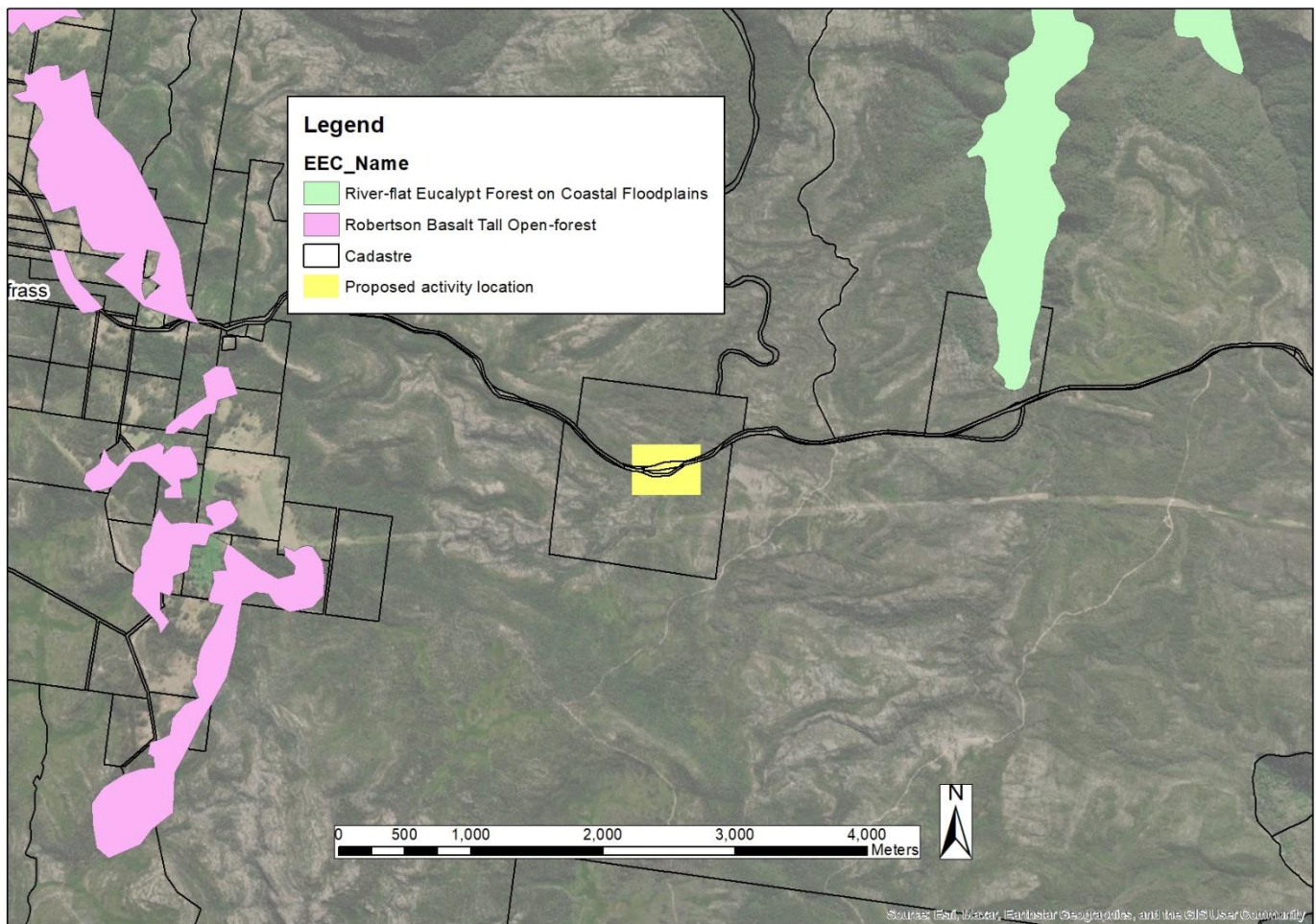
Two endangered ecological communities are mapped as occurring in the landscape surrounding the site (refer to Figure 5 below). These are:

- Robertson Basalt Tall Open Forest in the Sydney Basin and South Eastern Highlands Bioregions which has been mapped as occurring approximately 2.5 kilometres to the west of the Boolijah Creek bridge; in and around Sassafras.
- River-flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions which has been mapped in the Tianjara Creek below Tianjara Falls.

The area surrounding the Boolijah Creek bridge is neither of these EECs as it is not on Robertson Basalt and not on the coastal floodplain.

The proposal would therefore not result in the fragmentation or isolation of areas of any EEC and is unlikely to adversely affect the extent or composition of any EEC such that a local occurrence of the EEC would be placed at risk of extinction.

Figure 5: Endangered Ecological Communities (EECs) mapped as occurring in the surrounding locality



Part C - In relation to the habitat of a threatened species or ecological community:

(iii) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity

(iv) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

(v) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality.

No important habitat for threatened species would be removed or otherwise significantly impacted (see Part A).

No EEC would not be fragmented or isolated, nor removed or modified to an extent that would affect the long-term survival of the EEC occurring in the locality (refer to Part B).

The proposal will therefore not affect the long-term survival of any threatened species or endangered ecological community in the locality.

Part D – Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).

No “areas of outstanding biodiversity values” have been declared in the City of Shoalhaven.

Part E – Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

No key threatening processes listed in the NSW *Biodiversity Conservation Act 2016* are considered relevant to the proposed activity.

3.4 Threatened species impact assessment (Commonwealth EPBC Act 1999)

A Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Report was generated on 23rd August 2022. An EPBC Protected Matters Report provides general guidance on matters of national significance and other matters protected by the EPBC Act in the area selected. Of those threatened species and endangered ecological communities reported as likely occurring or having habitat within the area of the report, the following were considered to have potential habitat on the site and requiring of further assessment:

- Heath Frog - Endangered
- Giant Burrowing Frog – Vulnerable

Additional highly mobile species including migratory birds may occur occasionally and transiently within the vicinity of the proposed activity but would not be affected by the proposal.

Table 1: EPBC Significant impact assessment

Critically endangered and endangered species - Significant impact criteria	
Species to consider: Heath Frog	
Criteria	Assessment
lead to a long-term decrease in the size of a population	No. The proposed activity would not directly impact on the species, would not affect, or disrupt breeding and would not impact on breeding or foraging habitat.
reduce the area of occupancy of the species	No
fragment an existing population into two or more populations	No
adversely affect habitat critical to the survival of a species	No important habitat will be impacted.
disrupt the breeding cycle of a population	All works would be conducted on the road, road verge, and gabion walls. Works would not be conducted in breeding habitat (streams and perched swamps)
modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	No important habitat will be impacted. All works would be conducted on the road, road verge, and gabion walls. Works wont impact breeding habitat or non-breeding habitat.
result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	No invasive species will be introduced
introduce disease that may cause the species to decline	No disease will be introduced. Hygiene protocols would be followed (refer to Section 7 of this REF)
interfere with the recovery of the species	No
Vulnerable species - Significant impact criteria	
Species to consider: Giant Burrowing Frog	
Criteria	Assessment

lead to a long-term decrease in the size of an important population of a species	The proposed activity will not directly impact on the species will not affect or disrupt breeding and will not impact on breeding or foraging habitat
reduce the area of occupancy of an important population	No
fragment an existing important population into two or more populations	No
adversely affect habitat critical to the survival of a species	No important habitat will be impacted by the proposed activity
disrupt the breeding cycle of an important population	All works would be conducted on the road, road verge, and gabion walls. Works would not be conducted in breeding habitat (open spaces, under vegetation or rocks or from within burrows in the creek bank). Works will be conducted to limit the application of concrete to the gabion walls only.
modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	No important habitat will be impacted by the proposed activity.
result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	No invasive species will be introduced
introduce disease that may cause the species to decline	No disease will be introduced
interfere substantially with the recovery of the species	No

Conclusion of EPBC Significant Impact Assessment

The proposal is therefore unlikely to have an adverse effect on a vulnerable, endangered, critically endangered or migratory species or its habitat, nor on the extent or integrity of an endangered ecological community such that its local occurrence is likely to be placed at risk of extinction. Further assessment and referral to the Commonwealth is therefore not required.

3.5 Indigenous heritage

Under Section 86 of the NSW *National Parks and Wildlife Act 1974* (NPW Act) it is an offence to disturb, damage, or destroy any Aboriginal object without an Aboriginal Heritage Impact Permit (AHIP). The Act, however, provides that if a person who exercises 'due diligence' in determining that their actions will not harm Aboriginal objects has a defence against prosecution if they later unknowingly harm an object without an AHIP (Section 87(2) of the Act). To effect this, the NSW Department of Environment, Climate Change and Water have prepared the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (hereafter referred to as the 'Due Diligence Guidelines') to assist individuals and organisations to exercise due diligence when carrying out activities that may harm Aboriginal objects and to determine whether they should apply for an AHIP.

Landscape features that are regarded as indicating a higher potential for Aboriginal objects, as outlined in the NSW Department of Environment, Climate Change and Water's Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (2010) include:

- within 200m of waters, or
- located within a sand dune system, or

- located on a ridge top, ridge line or headland, or
- located within 200m below or above a cliff face, or
- within 20m of or in a cave, rock shelter, or a cave mouth.

As the site occurs within 200m of waters (Boolijah Creek) and as Aboriginal heritage sites are known under the bridge in the adjacent creek catchment (Tianjara), an onsite survey was conducted on 17 January 2023 by SCC Environmental Officer – specifically looking for grinding grooves and stone artefacts. No Aboriginal heritage objects were located during this survey.

A search on the Aboriginal Heritage Information Management System (AHIMS) on 13 October 2022 indicated that there are no recorded Aboriginal sites or places in the vicinity of the proposal (refer to AHIMS report in Figure 6 below).

The Due Diligence Guidelines define disturbed land as follows:

“Land is disturbed if it has been the subject of a human activity that has changed the land’s surface, being changes that remain clear and observable. Examples include ploughing, construction of rural infrastructure (such as dams and fences), construction of roads, trails and tracks (including fire trails and tracks and walking tracks), clearing vegetation, construction of buildings and the erection of other structures, construction or installation of utilities and other similar services (such as above or below ground electrical infrastructure, water or sewerage pipelines, stormwater drainage and other similar infrastructure) and construction of earthworks.”

The site of the proposed works is within a dynamic area of the Boolijah Creek which has been subject to ongoing, regular disturbance through natural processes of accretion and scouring in addition to the construction of the bridge and associated gabion walls. As such, it is reasonable to conclude that there is a low probability of objects occurring in area.

As the proposal would occur on disturbed land and would not impact any recorded Aboriginal sites or places, the Due Diligence Guidelines requires no further assessment, an AHIP is not required, and the activity can proceed.

Figure 6 Results of AHIMS Aboriginal heritage search



**AHIMS Web Services (AWS)
Search Result**

Your Ref/PO Number : Boolijah Creek

Client Service ID : 721725

Shoalhaven City Council - Nowra

Date: 13 October 2022

PO Box 42 Bridge Rd
Nowra New South Wales 2541

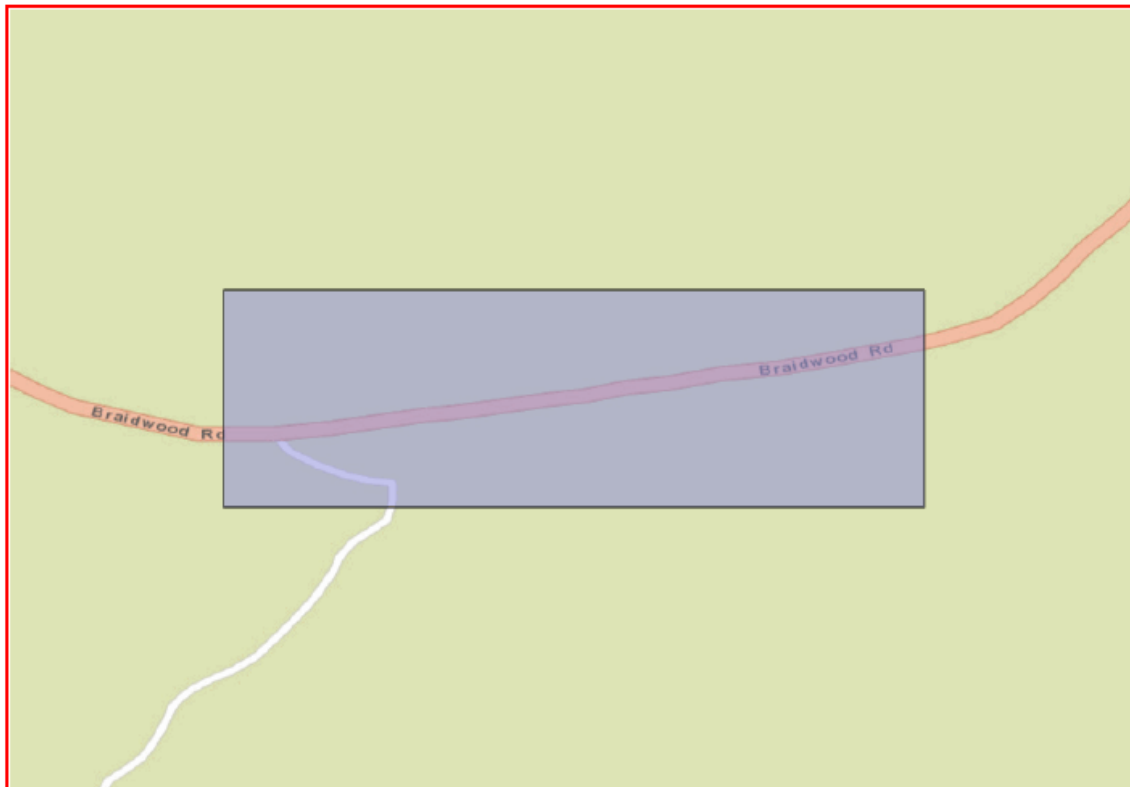
Attention: Geoffrey Young

Email: geoff.young@shoalhaven.nsw.gov.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Datum :GDA, Zone : 56, Eastings : 253931.0 - 254414.0, Northings : 6110877.0 - 6111040.0 with a Buffer of 0 meters, conducted by Geoffrey Young on 13 October 2022.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

3.6 Non-indigenous heritage

No heritage items listed on the NSW State Heritage Inventory or the *Shoalhaven Local Environment Plan 2014* occur within or in proximity to the site, such that there is any risk of impact as a result of the proposal.

3.7 Riparian corridors, Key Fish Habitat & Water quality

Impacts on riparian corridors, Key Fish Habitat (KFH) and water quality were considered regarding the following:

- Likely and potential impacts on vegetation as a result of construction activities;
- Sediment movement into waterways as a result of construction activities;
- Dredging and reclamation in proximity to key fish habitat.

Boolijah Creek is Key Fish Habitat for the purposes of the NSW *Fisheries Management Act 1994*, however, the work is permissible without a Permit under the Act (refer to Section 4.3 of this REF).

The Boolijah Creek catchment was considered free of Chytrid Fungus *Batrachochytrium dendrobatidis* - a frog pathogen that is resulting in the death of many frog species in affected areas. The fungus is transferred by direct contact between frogs and tadpoles or via zoospores in infected water. With the presence of threatened frogs, it is vital that works are conducted in such a way that to minimise the risk of chytrid introduction. Instream works will need to be consistent with NSW Department of Planning, Industry and Environment 2020 Hygiene Guidelines.

<https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Wildlife-management/saving-our-species-hygiene-guidelines-200164.pdf>. The use of Shoalhaven Water town water gained approval for use in these catchments during the construction phase of the project. It is assumed that this is the case for the operational phase of the road and can be utilised in this project. If other, non-Shoalhaven Water water from outside the catchment is used, advice from the relevant authority may need to be sought. These requirements are reflected in the prescribed environmental impact mitigation measures listed in Section 7 of this REF.

Due to the sensitivity of the creek (high water quality, habitat for threatened frogs) all works, except for the placement of bunding and geofabric at the base of the gabion and hand removal of the vegetation, will be conducted away from the creek and on the bridge, road and road verge utilising excavators and 'man baskets'. With the implementation of pollution prevention and control and other safeguards prescribed in Section 7 of this REF, impact to the creek's water quality and habitat values is not anticipated.

3.8 EP&A Regulation – Clause 171 matters of consideration

Clause 171(2) of the *Environmental Planning and Assessment Regulation 2021* lists the factors to be taken into account when consideration is being given to the likely impact of an activity on the environment under Part 5 of the EP&A Act. These matters are addressed in Table 3.

Table 2: Clause 171 Factors

Does the proposal:	Assessment	Reason
a) Have any environmental impact on a community?	Positive	The purpose of the proposes activity would be to protect and extend the life of the bridge along this important transport route.

Does the proposal:	Assessment	Reason
		There would only be short-term and minor inconvenience to road users <i>i.e.</i> partial road closures, stop/slow arrangements. The proposed activity would not have any impact on community services and infrastructure such as power, water supply, wastewater, waste management, educational, medical or social services.
b) Cause any transformation of a locality?	Negligible	The locality's current use would remain unchanged.
c) Have any environmental impact on the ecosystem of the locality?	Low-adverse	The five-part test of significance (Section 3.3) concludes that the proposed activity would not have a significant impact upon threatened species or endangered ecological communities. No food resources critical to the survival of a particular species would be removed. Aquatic ecosystems are not likely to be affected by the proposed activity and there is not likely to be any long-term or long-lasting impact through the input of sediment, concrete, and nutrient into the ecosystem. Refer to prescribed environmental safeguards and mitigation measures (Section 7).
d) Cause a diminution of the aesthetic, recreational, scientific or other environmental quality or value of a locality?	Negligible	The site does not have recreational values. In the context of the locality, the visual impact of the proposal is considered to be minimal. Scientific and environmental qualities of the site would not be affected. The proposed activity would have no impact on these values.
e) Have any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific, or social significance or other special value for present or future generations?	negligible	The site has no historical, social or scientific significance and does not contain, nor is associated with any heritage item listed on the NSW State Heritage Inventory. In accordance with the NSW Department of Environment, Climate Change and Water's Due Diligence Code of Practice, the proposed activity does not require an Aboriginal Heritage Impact Permit as the activity is unlikely to harm an Aboriginal artefact (refer to Section 3.5).
f) Have any impact on the habitat of protected fauna	Negligible	Minor (~40m ²) removal of planted vegetation may be required to facilitate access for works. This was assessed to be insignificant (refer to Section 3.2 of this REF)

Does the proposal:	Assessment	Reason
(within the meaning of the Biodiversity Conservation Act 2016)?		The five-part test of significance, provided in Section 3.3 above, concludes that the proposed activity would not have a significant impact upon threatened fauna. The prescribed environmental safeguards and mitigation measures (Section 7) would mitigate indirect impacts to fauna and habitat including through control of sediment and concrete.
g) Cause any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?	Negligible	The five-part test of significance, provided in Section 3.3 above, concludes that the proposed activity would not have a significant impact upon threatened fauna. There are no species likely to rely on the site of the proposed works to the extent that modification would put them further in danger. The prescribed environmental safeguards and mitigation measures (Section 7) would minimise the risk of impact to resident fauna including potentially occurring endangered frog species.
h) Have any long-term effects on the environment?	Negligible / potentially low-adverse	The proposed activity would not use hazardous substances or use or generate chemicals which may build up residues in the environment. The concrete would only be applied to the gabion. The possible impacts have been discussed in detail under Section 3. Refer also to the prescribed environmental safeguards and mitigation measures in Section 7.
i) Cause any degradation of the quality of the environment?	Negligible	The majority of the work would be conducted on previously degraded areas such as the bridge, bridge approaches, road verge and gabion. Only a small area of vegetation would be impacted to allow access to the gabion. Aquatic ecosystems are not likely to be affected by the proposed activity and there is not likely to be any long-term or long-lasting impact through the input of sediment, concrete and nutrient into the ecosystem (refer to Sections 3.2.1 and 3.6). The proposal would not intentionally introduce noxious weeds, vermin, or feral animals into the area or contaminate the soil. Environmental safeguards and mitigation measures (Section 7) would be employed to minimise risk of impacts.
j) Cause any risk to the safety of the environment?	Negligible	The proposed activity would not involve hazardous wastes and would not lead to increased bushfire or landslip risks. The activity would not adversely affect flood or tidal

Does the proposal:	Assessment	Reason
		regimes or exacerbate flooding risks. The prescribed environmental safeguards and mitigation measures in Section 7.
k) Cause any reduction in the range of beneficial uses of the environment?	Negligible / positive	The proposed activity would benefit the site's use as a bridge crossing over a creek.
l) Cause any pollution of the environment?	Low-adverse	Measures would be in place to prevent contamination of the creek, creek bed and natural banks by concrete (refer to Section 7) It is unlikely that the activity (including the environmental impact mitigation measures) would result in water or air pollution, spillages, dust, odours, vibration or radiation. The proposal does not involve the use, storage or transportation of hazardous substances or the generation of chemicals which may build up residues in the environment. The risk of contamination and spills from machinery including fuel and hydraulic fluids would be minimised through prescribed environmental safeguards and mitigation measures (Section 7).
m) Have any environmental problems associated with the disposal of waste?	Negligible	There would be no trackable waste, hazardous waste, liquid waste, or restricted solid waste as described in the <i>NSW Protection of the Environment Operations Act 1997</i> .
n) Cause any increased demands on resources (natural or otherwise) which are, or are likely to become, in short supply?	Low-adverse	The amount of resources that would be used are not considered significant and would not increase demands on current resources such that they would become in short supply.
o) Have any cumulative environmental effect with other existing or likely future activities?	negligible	The effects of the proposed activity are isolated to the gabion and immediate surrounds (~1 metre). There is no other plans to remove vegetation or apply concrete elsewhere in the locality.
p) Any impact on coastal processes and coastal hazards, including	negligible	The site of the proposed activity is not on the coast and not affected by coastal processes.

Does the proposal:	Assessment	Reason
those under projected climate change conditions		
q) Any applicable local strategic planning statement, regional strategic plan or district strategic plan made under Division 3.1 of the Act	Low-adverse	The proposed activity is consistent with the Shoalhaven 2040 planning statement particularly Planning Priority 2 – Delivering Infrastructure (https://doc.shoalhaven.nsw.gov.au/displaydoc.aspx?record=D20/437277). The proposed activity is not inconsistent with the Illawarra Shoalhaven Regional Plan 2041 (https://www.planning.nsw.gov.au/-/media/Files/DPE/Plans-and-policies/Plans-for-your-area/Regional-plans/Illawarra-Shoalhaven-Regional-Plan-05-21.pdf). The site is mapped as “High Environmental Value” in the Illawarra Shoalhaven Regional Plan 2041 and mapped on the Biodiversity Values Map administered for the purposes of the NSW <i>Biodiversity Conservation Act 2016</i>. These maps are interconnected and include all ‘natural’ riparian areas to which it is very extensive including all riparian corridors of Boolijah Creek, Danjera Creek in which it flows and neighbouring catchment of Tianjara and Yarramunmun Creek catchment. The removal of 40m² of vegetation would be insignificant in comparison to the riparian areas of these creeks which are protected in Morton National Park (refer to Figure 4 p.17).
r) Any other relevant environmental factors	N/A	Addressed in this REF

4. PERMISSIBILITY

4.1 Environmental Planning & Assessment Act 1979

Section 4.1 (Development that does not need consent) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) states that:

“If an environmental planning instrument provides that specified development may be carried out without the need for development consent, a person may carry the development out, in accordance with the instrument, on land to which the provision applies.”

In this regard, clause 2.109(1) of the NSW State *Environmental Planning Policy (Transport and Infrastructure) 2021* (Transport & Infrastructure SEPP) provides that:

“Development for the purpose of a road or a road infrastructure facilities may be carried out by or on behalf of a public authority without consent on any land”

“Road infrastructure facilities” includes “vehicle or pedestrian bridges” (Section 2.108 of the Transport & Infrastructure SEPP).

As the proposal does not require development consent, and as it constitutes an ‘activity’ for the purposes of Part 5 of the EP&A Act, being carried out by (or on behalf of) a public authority, environmental assessment under Part 5 of the EP&A Act is required. This REF provides this assessment and ensures that Council as determining authority in consideration of the activity, meets its obligation under s5.5 of the EP&A Act, to examine and take into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity.

4.2 Biodiversity Conservation Act 2016

The proposed development complies with the *Biodiversity Conservation Act 2016* for the following reasons:

- The proposed activity is unlikely to have a significant impact on threatened species and/or threatened ecological communities listed in the schedules of the Act (refer to Section 3.3.2). There is, therefore, no requirement to ‘opt in’ to the Biodiversity Offset Scheme.
- The design and mitigation measures (Section 7) would ensure that no *serious and irreversible impacts on biodiversity values* (as defined by the BC Act) occur at the site of the proposed activity.
- The proposed activity is not within an area declared to be of “outstanding biodiversity value” as defined in the Act and Regulations.
- As shown in Figure 4 (p.17), Boolijah Creek is mapped in the Biodiversity Values Map administered under the Act. Section 7.2(2) of the Act, however, excludes activities that have been subject of an REF from being considered to “*likely to significantly affect threatened species*” and require entry into the Biodiversity Offset Scheme and the preparation of a Biodiversity Development Assessment Report.

Because of the above considerations, neither a species impact statement nor a biodiversity development assessment report is required for the proposed activity.

It is also a defence to a prosecution for an offence under Part 2 of the Act (harming animals, picking plants, damaging the habitat of threatened species or ecological communities etc) if the

work was essential for the carrying out of an activity by a determining authority within the meaning of Part 5 of the *Environmental Planning and Assessment Act 1979* after compliance with that Part.

The activity will not remove vegetation that is listed under Schedule 1 Threatened Species, Schedule 2 Threatened ecological communities and Schedule 6 Protected Plants. Therefore the activity is considered permissible as this REF has been prepared and determined in accordance with the EP&A Act.

4.3 NSW Fisheries Management Act 1994

The objects of Fisheries Management Act are to conserve, develop and share the fishery resources of NSW and to conserve fish stocks and key fish habitat, threatened species, populations and ecological communities of fish and marine vegetation.

Boolijah Creek would be regarded as key fish habitat and is mapped as such by the NSW Department of Primary Industries (DoPI)

(https://webmap.industry.nsw.gov.au/Html5Viewer/index.html?viewer=Fisheries_Data_Portal) .

Under the Act, a Permit issued by the DoPI – NSW Fisheries is required for the following works and/or impacts within key fish habitat:

- Dredging and reclamation (s.200 of the Act)
- Blockage of fish passage (s.219)
- Impact to mangroves and marine vegetation (Part 7, Division 4 of the Act)
- Use of explosives (cl.70 and 71 of the *Fisheries Management (General) Regulation 2019*)

It is anticipated that these works / impacts would not be undertaken as all operations being conducted from the road, bridge and road verge without the need for blocking or removing material (dredging) from the creek. There are no mangroves or marine vegetation removed, and explosives would not be used.

The nil requirement for a permit was confirmed by Mick Bettanin (Fisheries Manager – Coastal Systems, NSW Department of Primary Industries) on the 16 January 2023 (refer to D23/17255).

4.4 Other

A summary of other relevant legislation and permissibility is provided in Table 3 below.

Table 3: Summary of other relevant legislation and permissibility

NSW STATE LEGISLATION	
<i>Environmental Planning and Assessment Act 1979 (EP&A Act)</i>	
Permissible	√ Not permissible ☐
The Transport & Infrastructure SEPP provides for the proposed works to be undertaken without development consent (refer above). In circumstances where development consent is not required, the environmental assessment provisions outlined in Part 5 of the Act are required to be complied with. This REF fulfils this requirement.	
<i>Shoalhaven Local Environmental Plan 2014 (SLEP)</i>	
Permissible	√ Not permissible ☐
Under the SLEP the proposed activity may have required development consent. The provisions	

of Transport and Infrastructure SEPP however, prevail over the SLEP where there is an inconsistency by virtue of Section 3.28 of the EP&A Act. Consequently, development consent is not required.

State Environmental Planning Policy (Resilience and Hazards) 2021

Permissible ☒ Not permissible ☐

- The site is not mapped as Coastal Use Area and Coastal Environment Area for the purpose of the SEPP.
- There are no areas mapped by this SEPP as coastal wetlands, littoral rainforest and coastal vulnerability areas in the proposed activity area.
- The proposed activity is not “hazardous and offensive development” nor is it cominated land requiring remediation.

Wilderness Act 1987

Permissible ☒ Not permissible ☐

The proposed activity is not located within a wilderness area declared under this Act.

Roads Act 1993

Permissible ☒ Not permissible ☐

Justification:

- Section 71 provides that a roads authority can carry out road work on any public road for which it is the roads authority. SCC is the roads authority for Braidwood Road.
- Braidwood Road is classified regional road, however the proposed works do not require notification under Section 75 of the Act.
- Section 88 provides that a roads authority can 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 purpose of carrying out road work or removing a traffic hazard.
- Section 94 allows a roads authoirty to carry out drainage work in or on any land in the vicinity of a road in order to drain or protect that road.

Protection of the Environment Operations Act 1997

Permissible ☒ Not permissible ☐

The proposed activity does not constitute scheduled development work or scheduled activities as listed in Schedule 1 of the Act. The proposed activity therefore does not require an environmental protection licence.

National Parks and Wildlife Act 1974 (NP&W Act)

Permissible ☒ Not permissible ☐

- The proposed activity would not encroach into National Park estate.
- The Act provides the basis for the legal protection and management of Aboriginal sites in NSW. Under Sections 86 and 90 of the Act it is an offence to disturb an Aboriginal object or knowingly destroy or damage, or cause the destruction or damage to, an Aboriginal

object or place, except in accordance with a permit of consent under section 87 and 90 of the Act.

- As there are no recorded sites or visible objects and as the site is on 'disturbed land', the Due Diligence Guidelines requires no further assessment as it is reasonable to conclude that there is a low probability of objects occurring in the area of the proposed activity and an AHIP is not required. Refer to Section 3.5 for more information.

Heritage Act 1977

Permissible ☒ Not permissible ☐

The proposed activity would not disturb an item of state heritage significance. The proposal would occur in a previously disturbed area and constitutes 'minor works' under 'Relics of local heritage significance: a guide for minor works with limited impact'. The proposal would not result in any direct impacts on heritage items or values. Works can be undertaken with caution under an applicable exception from an excavation permit under s139(1) and (2) of the Heritage Act 1977.

Water Management Act 2000

Permissible ☒ Not permissible ☐

- Local councils are exempt from s.91E(1) of the Act in relation to all controlled activities that they carry out in, on or under waterfront land by virtue of clause 41 of the *Water Management (General) Regulation 2018*.
- The proposal would not interfere with the aquifer and therefore an interference licence is not required (s.91F).

COMMONWEALTH LEGISLATION

Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EP&BC Act)

Permissible ☒ Not permissible ☐

The proposed activity would not be undertaken on Commonwealth land and no matters of National Environmental Significance are likely to be significantly impacted by the proposed activity (Section 3.4). The proposed activity is therefore not a controlled action and does not require commonwealth referral.

Commonwealth *Native Title Act 1993*

Permissible ☒ Not permissible ☐

Works would occur entirely within a gazetted road reserve, for which Council is the roads authority. It is anticipated that Native Title has been extinguished as a Past Act (Section 228 and 229 of the Act). No procedural rights are applicable.

5. CONSULTATION WITH GOVERNMENT AGENCIES

5.1 Transport & Infrastructure SEPP

Note that consultation under Chapter 2, Part 2.2 of the Transport & Infrastructure SEPP applies only to relevant development undertaken as development without consent under the provisions of Chapter 2.

Section 2.10 – Development with impacts on council-related infrastructure or services

No impacts to public roads, sewerage systems, water infrastructure, nor excavation of footpaths, such as described under clause 2.10(1) would occur.

Consultation under s.2.10 is therefore not required.

Section 2.11 – Development with impacts on local heritage

No local heritage items are recorded as occurring in proximity to the proposal. Refer to Section 3.5 for more information.

Consultation under Section 2.11 is therefore not required.

Section 2.12 – Development with impacts on flood liable land and

Section 2.13 – Consultation with State Emergency Service—development with impacts on flood liable land

The bridge is not mapped as being within flood-labile land

The proposed activity is aimed to protect the bridge structure during high-flow levels in the Creek.

Consultation is therefore not warranted.

Section 2.14 – Development with impacts on certain land within the coastal zone

The land on which the proposal would occur is not within a coastal vulnerability area. Consultation is therefore not required.

Section 2.15 – Consultation with public authorities other than councils

As the works would be undertaken adjacent to Morton National Park, a notice of intention in accordance with Section 2.15 was emailed to rangers for Morton NP north and south, and NPWS Shoalhaven Office on the 7 July 2022 (SCC ref D22/427894). As of 16 January 2023 no response was received. As this is beyond the prescribed 21-day notification period, the proposed activity can proceed without further consultation.

In consideration of the other consultation requirements specified under Clause 2.15 of the Infrastructure SEPP, the proposed activity:

- would not be undertaken in Zone E1 or in equivalent zones.

- does not comprise a fixed or floating structure in or over navigable waters
- would not increase the amount of artificial light in the night sky and located on land within the dark sky region as identified on the dark sky region map
- would not be undertaken within Defence communications facility buffer (only relevant to the defence communications facility near Morundah)
- would not be undertaken on land in a mine subsidence district within the meaning of the *Mine Subsidence Compensation Act 1961*

Therefor the remaining consultation requirements specified under Clause 2.15 of the Transport and Infrastructure SEPP therefore do not apply.

Section 2.16 – Consideration of Planning for Bush Fire Protection (PBP)

The proposed activity is not a type applicable to this clause *i.e.* health services facilities, correctional centres and residential accommodation. Consideration of PBP is therefore not required.

6. COMMUNITY ENGAGEMENT

There proposed activity would have no impact on the community. Consultation and / or engagement is not warranted prior to the commencement of works.

During works, a traffic management plan will be in operation to notify drivers of the road works, partial road closure, speed reduction, and stop/slow signage either side of Boolijah Creek.

As the works may be of public interest (being roadworks, near Morton National Park and within Boolijah Creek), the REF should be published on the NSW Planning Portal in accordance with clause 171(4) – as soon as practicable and no later than one month after the activity commences.

7. ENVIRONMENTAL SAFEGUARDS AND MEASURES TO MINIMISE IMPACTS

Note that all environmental safeguards and measures are prescribed unless otherwise stated.

Safeguard / Measure	Responsibility
Works planning, approvals, consultation & notification	
1. This REF must be published on the determining authority's (Council's) website or the NSW planning portal, in accordance with clause 171(4) EP&A Regulation 2021 (as a matter of "public interest") – as soon as practicable and no later than one month after the activity commences.	Project Manager / Environmental Officer
2. Jemena (Eastern Gas Pipeline) should be notified prior to works commencing due to the presence of excavators.	SCC Project Manager or Construction Contractor
Site Establishment	
3. The construction compound (if required), vehicles and stockpiles shall be located within existing cleared areas of the road reserve and not encroach into adjacent Morton National Park or forested area.	Construction Contractor
4. The contractor shall always keep an emergency spill kit on-site with procedures to contain and collect any leakage or spillage of concrete and fuels, oils and greases from plant and equipment.	Construction contractor
5. Any equipment maintenance works or refuelling shall be undertaken above the existing emergency spill retention basins either side of the bridge. No maintenance works shall be taken on the bridge or approaches.	Construction contractor
6. To avoid the risk of pollution from machinery, refuelling shall generally be done off site, however if refuelling on site is required, due care shall be taken to avoid spilling fuel and a tray shall be used to catch any accidentally spilt fuel.	Construction contractor
Construction works	
7. A Council approved Traffic Control Plan shall be implemented.	Construction Contractor
8. Vegetation removal at the base of the gabion shall be conducted with handtools (chainsaws, brushcutters). Cut material can be left at the site.	Construction Contractor
9. Shotcrete works shall be undertaken in a way that it does not deposit any concrete into the creek, creek bed and its banks. This shall include utilising highly viscous shotcrete and the placement of clean, unused bunding and geofabric (as a "dropsheet") at the bottom of the gabion.	Construction Contractor

Safeguard / Measure	Responsibility
10. Relevant requirements of the Road Operational Environmental Management Plan shall be implemented: - If possible works are to be scheduled during low flows and periods of dry weather. - Avoid unnecessary removal of vegetation and minimise surface disturbance especially near and in the creek. - Limit plant and equipment to the roadway unless necessary. - Always have spill kits on-site for the containment of fuel, oils or concrete spill. - All liquid chemicals, fuels and oils must be stored in a suitable secondary containment bund and protected to minimise the impact of any spillage or containment on or around the site. Bunds shall be: - imperviously lined using a material unaffected by chemical attack from the liquid being stored - able to contain a minimum of 120% of the volume of liquid being stored - bunds and storage areas to in the catchment above the emergency spill basins located on all four sides of the bridge.	Construction Contractor
11. Relevant hygiene protocols shall be followed for any instream works such as installation of the protective bunding and geofabric. These are: - The protective bunding and geofabric shall be new and not been used elsewhere. - No machinery shall enter the waterway or its banks. - Frogs are not to be handled. - All footwear, gloves and clothing shall be thoroughly cleaned and free of soil, dampness (from off-site) and other debris. - Disinfecting hands, gloves, footwear and any equipment with Chloramine and chlorhexidine-based products is recommended.	Construction Contractor
12. Vegetation removal shall be limited to that required to access the gabion walls to apply shotcrete.	Construction Contractor
13. Cleaning of concrete pump and hoses shall not occur on-site.	Construction Contractor
14. Any waste generated on site shall be reused in accordance with relevant Resource Recovery Orders and Exemptions, or otherwise disposed of at a licenced waste facility. No waste concrete shall be applied to the site.	Construction Contractor

8. SIGNIFICANCE EVALUATION & DECISION STATEMENT

This Review of Environmental Factors has assessed the likely environmental impacts, in the context of Part 5 of the Environmental Planning and Assessment Act 1979, of a proposal by Shoalhaven City Council for the repair, using shotcrete, of the gabion abutments and wing walls under Boolijah Creek, Tianjara.

In consideration of the proposal as described in Section 1, in accordance with any design plans referred to in this report, and assuming the implementation of all proposed safeguards and mitigation measures (Section 7), it is determined that:

1. It is unlikely that there will be any significant environmental impact as a result of the proposed activity and an Environmental Impact Statement is not required.
2. The proposed activity will not be carried out in a declared area of outstanding biodiversity value and is not likely to significantly affect threatened species, populations or ecological communities, or their habitats, and a Species Impact Statement / BDAR is not required.
3. No statutory approvals, licences, permits or further external government consultations are required.
4. The proposed activity may proceed.

In accepting and adopting this REF, Shoalhaven City Council commits to ensuring the implementation of the proposed safeguards and mitigation measures identified in this report (Section 7) to minimise and/or prevent detrimental environmental impacts.

Determined by:



Theophilus Prakash
District Engineer
Shoalhaven City Council

Date: 23/0/2023

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APPENDIX A – Construction Methodology and CEMP

SITE SETUP & COMPOUND ARRANGEMENT

- "A site compound can be established within the road verge area"
- "Markup below shows area that can be used for material storage/ site facilities"



NOTE: Park PCA longreach excavator here and get all equipment off the road overnight.

PCA Proposed Site Compound ✓✓✓



TRAFFIC CONTROL

Question 1. Traffic Management

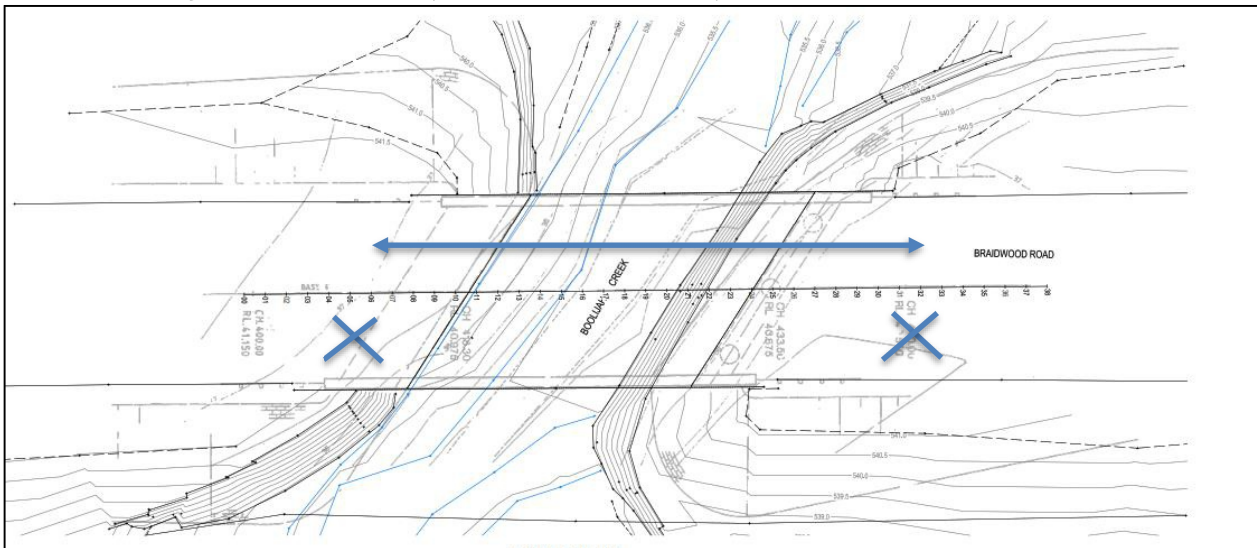
What is Councils preference for traffic management? Portable traffic lights 24/7 or manned stop/slow?

Answer: The road is to remain open with a minimum of 1 single lane during the works.
Council will consider both options.

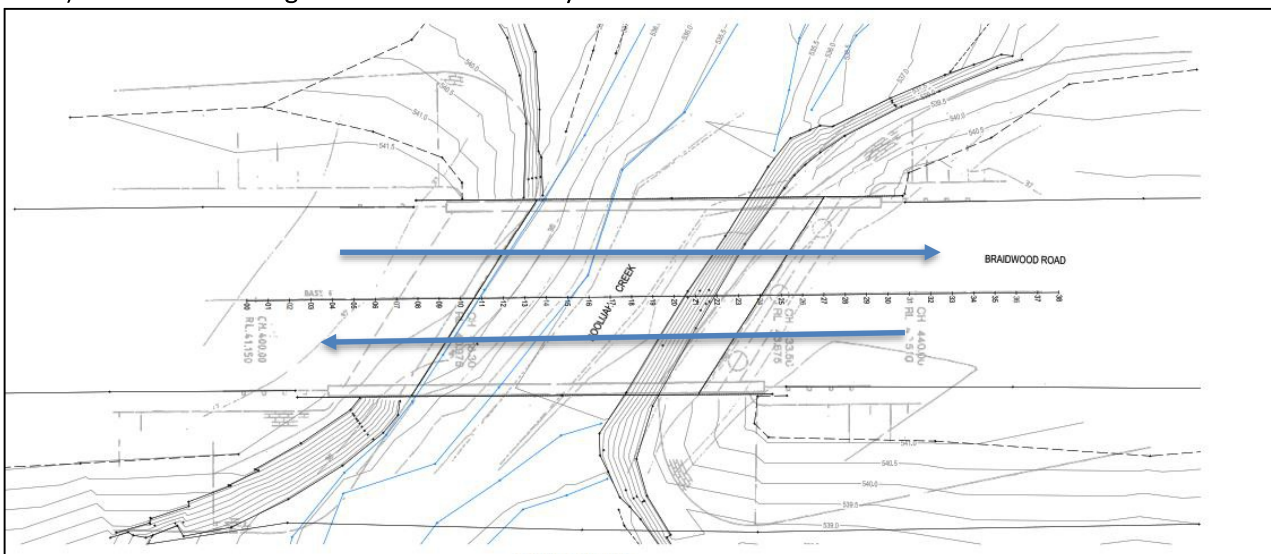
SUMMARY:

- PCA believe the safest approach is manned stop/slow during working hours and have priced accordingly.
- This allows all plant and equipment to be removed from the road out of working hours

A) Working Hours (3 x Man stop/slow TC Crew) - 1-Way Flow



B) Outside Working Hours – Normal 2-Way Flow



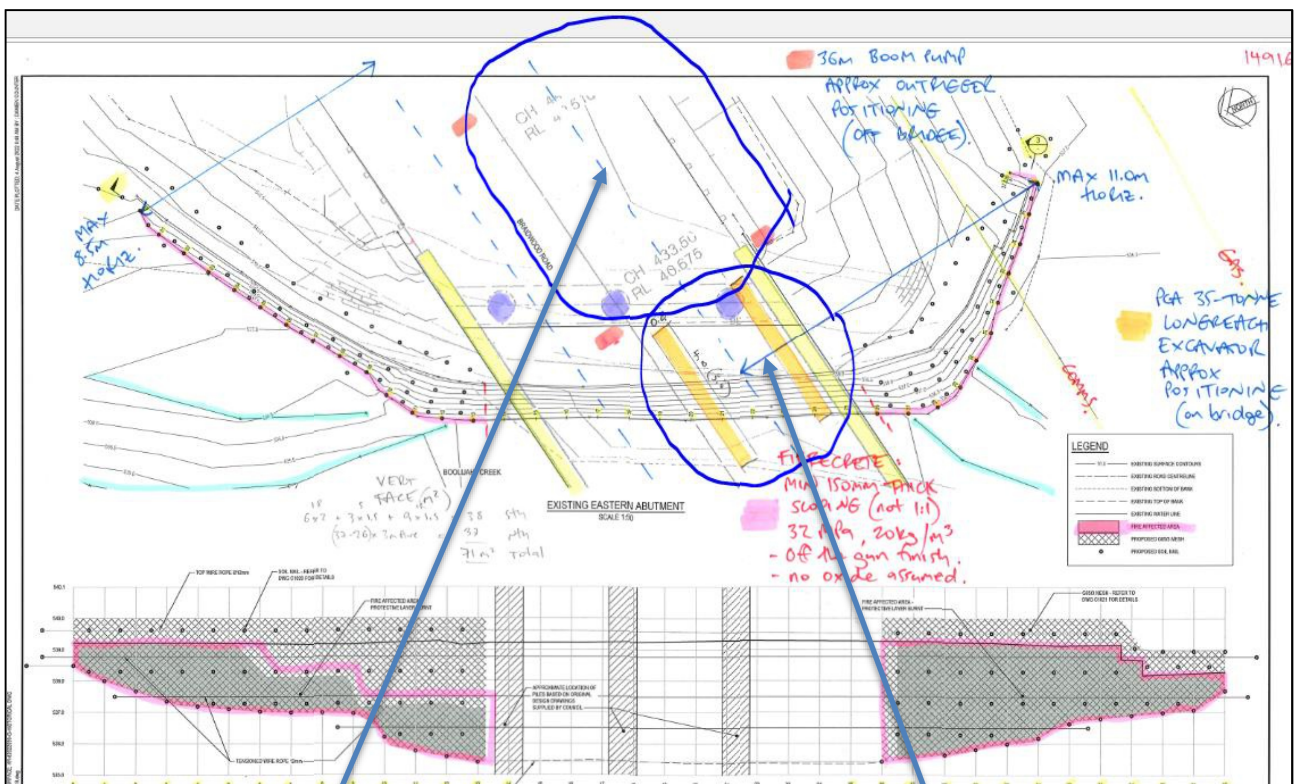
FIBRECRETE

- 1) 35-Tonne Longreach Excavator to be used to suspend men in the air via a Man Basket for Shotcrete spraying (see following pics) generally positioned on the bridge as shown below.

NOTE: Cardno/SCC to confirm that the bridge can withstand the PCA plant proposed. PCA to provide a BER working platform calcs for the plant proposed on the bridge

- 2) Approx 32-35m Boom Pump located back at the approaches

NOTE: PCA to do some minor stabilisation work on the verge to allow outriggers as far off the road as possible, to keep min 3.0m wide live lane open on Shotcrete spraying days



32-35m Boom Pump

35-Tonne Longreach Excavator

METHODOLOGY:



FIBRECRETE:



Example pic from a similar PCA project (Araluen Rd NSW, 2022)

PCA Ground Engineering

ABN 79 137 273 682

Email: info@pcagroundengineering.com
www.pcagroundengineering.com.au

NSW: PO Box 1522 Baulkham Hills NSW 1755

Phone: 02 9620 4812 **Fax:** 02 8088 6028

QLD: PO Box 1605 Runaway Bay QLD 4216

Phone: 07 5500 5898 **Fax:** 07 3041 6068



METHODOLOGY:



FIBRECRETE:



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METHODOLOGY:



FIBRECRETE:



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Phone: 07 5500 5898 Fax: 07 3041 6068



METHODOLOGY:



TREE REMOVAL:

- Remove all trees that impede the use of PCA longreach excavator and man basket and/or boom pump

Eastern Abutment



Western Abutment



PCA Ground Engineering

ABN 79 137 273 682

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NSW: PO Box 1522 Baulkham Hills NSW 1755
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Project 14916
Shoalhaven City Council,
Boolijah Creek Bridge Abutment Remediation
TENDER No. 72006E

**CONSTRUCTION & ENVIRONMENTAL
MANAGEMENT PLAN**

Issue A, Dated 11/01/2023

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1. Introduction

This Environmental Management Plan (EMP) has been developed in line with our clients' specific contractual requirements and as a result of the site visits undertaken. It documents the proposed control methods to mitigate any environmental impacts that could result from the activities being performed through the delivery of this project.

This project involves the remediation of gabion wall bridge abutments to the North and South slopes adjacent Boolijah Creek Bridge on Braidwood Rd.



Figure 1 Southwest bridge abutment

1.1 Policy Statement

PCA Ground Engineering is committed to protecting the environment and preventing pollution through establishing and maintaining industry leading standards, objectives and targets for managing the environment.

To deliver on our commitment PCA will:

- Achieve and maintain ISO 14001 Certification, integrating Environmental Management requirements into our business activities;

- Develop and maintain an Auditing Program to ensure compliance with relevant Legislation, Regulations, Industry Standards, and internal standards;
- Set measurable Key Performance Indicators (KPI) and seek to continually improve the conduct of PCA's business with respect to regulatory compliance and preventing environmental harm;

Undertake annual reviews, to assess, revise, and continually improve the effectiveness of our;

- Environmental Objectives, Policy, KPIs, and Procedures thereby maintaining relevance and suitability;
- Support the principles of pollution prevention, sustainability, waste reduction and recycling by promoting safe and responsible work practices; and
- Encourage environmental awareness and responsibility through closely monitoring field activities that may have an environmental impact.

1.2 Project Environment

The works are located adjacent Boolijah Road Bridge, which crosses over Boolijah Creek along Braidwood Road approximately 35km Southwest of Nowra.

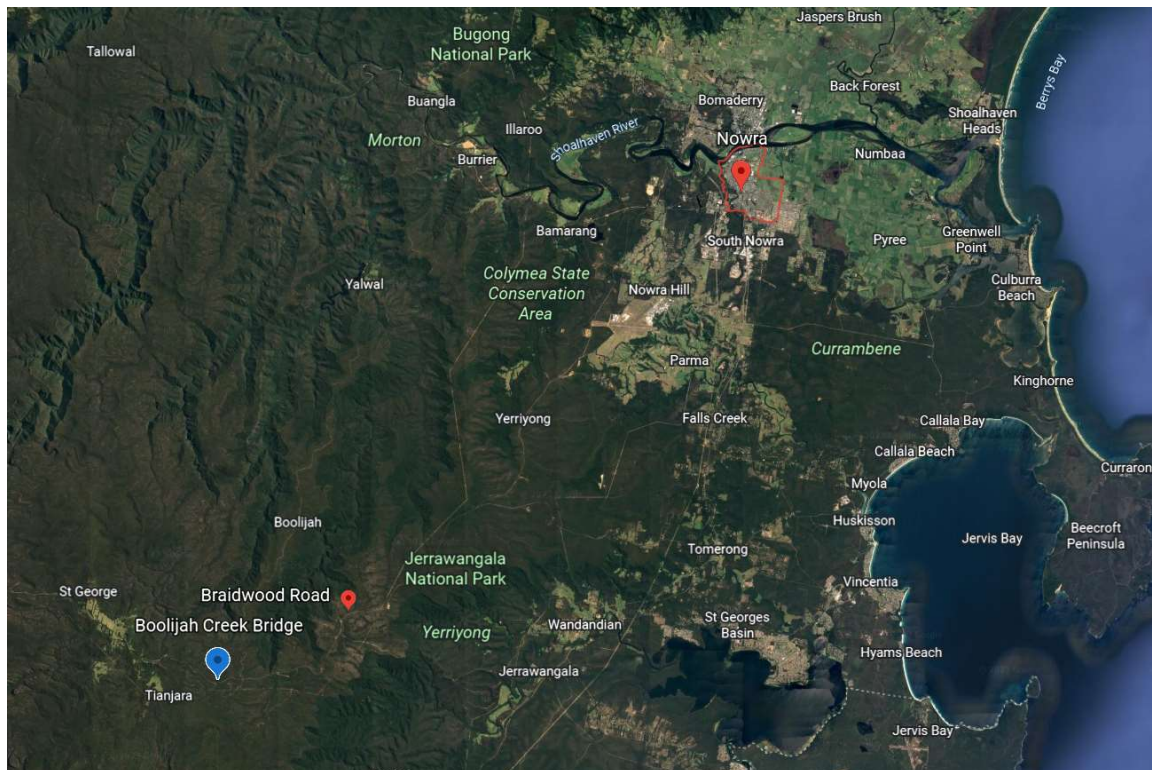


Figure 2 Project Location

The site has been inspected for vegetative, access and fauna issues with a number of sensitive and problematic areas identified that require extra care and attention to contain remedial materials. Special care to be taken to prevent contamination from vehicles and heavy machinery traversing around the site.

There are identified vulnerable frog species known to the area and the creek is considered a key fish habitat by DoPI. Caution is required to ensure shotcrete works be undertaken in a way that does not deposit any material into the creek or its banks.

1.3 Licences, Permits and Approvals

Nil are expected to be necessary using the proposed construction method. It is noted that:

- Any encroachment into National Park estate will require a licence. This is not guaranteed particularly if it results in vegetation removal or ground disturbance.
- If the contractor proposes to go in the vicinity of road boundary, the boundary must be surveyed and demarcated with high-vis bunting (or similar) and signage.

1.4 Environmental Control Activities

The scope of the control activities covered by this plan to facilitate compliance with PCA Ground Engineering objectives and statutory requirements is outlined below:

- Assessment of all activities, identifying high risk work practices which require specific Work Method Statements (WMS) to be developed;
- Providing work practices, training and conducting the business operations in a manner that safeguards the environment against reasonably foreseeable events;
- Response quickly, effectively and with due care to environmental incidents and emergencies, cooperating with industry organisations and authorised Government agencies to achieve minimal environmental harm;
- Compliance with all applicable laws and regulations, and applying responsible work place standards where laws and regulations do not exist;
- Ensuring that all employees hold awareness toward their responsibilities and accountability for environmental performance; and
- Performing appropriate reviews and evaluations of business operations to monitor and manage works delivery and ensure compliance with this Environmental Management Plan.

1.5 Legislation Requirements / Statutory Regulations & Applicable Standards

The project will operate under the Legislation, statutory regulations and applicable standards as listed below, as deemed a requirement to undertake the project at hand.

2. Responsibilities

All parties involved in the delivery of works under the project must be aware of their environmental responsibilities of their actions or inactions performed on the work site.

2.1 Company Personnel

The Project Manager holds accountability for the management of resources, productivity and quality of works being delivered on site. The Work Area Supervisor is the Project Manager's on site representative and assists through ensuring the availability and adherence to work instructions.

The obligation for managing a project's environmental effect rests with both the Project Manager and the Work Area Supervisor. PCA's HSE Manager supports PCA personnel in the field through the provisioning of health, safety and environmental management procedures and the performance of formal audits.

2.2 Sub Contractors & Material Suppliers

All sub-contractors and material suppliers must agree to adhere to the requirements of the PCA Environmental Management Plan prior to being permitted to attend site.

Sub-contractors will be required to undertake the following:

- Complete a formal risk assessment, identifying all potential environmental risks associated with the delivery of their contracted works;
- Submit an Environmental Management Plan &/or WMS for approval by PCA prior to the commencement of work on site;
- All the sub-contractors personnel must attend an PCA work site induction before commencing works and may be required to attend the Principal's site induction as directed;
- Ensure all personnel understand and accept their responsibilities as detailed in this EMP and enforce compliance with the safety and environmental procedures as required; and
- Co-operate in monitoring compliance to on-site requirements.

3. Planning

3.1 Hazard Identification & Risk Management

Hazard identification and risk management will be carried out in accordance with the agreed procedures outlined within the PCA Integrated Management System (IMS). All Work Instructions (WI) and Job Safety and Environment Analysis will be developed for the specific tasks as required.

The main environmental risks identified as needing to be managed for the project are:

- Preventing any spillage of fuels, paints or other chemicals on site;
- Noise Control;
- Hazards to Flora & Fauna;
- Air Pollution;
- Waste Management;
- Biosecurity; and
- Site Contamination (Chytrid Fungus *Batrachochytrium dendrobatidis*).

3.2 Hazard Register

A safety and environmental hazard register has been developed for the project and identifies the primary hazards associated with the work being performed and the proposed control measures required to manage each hazard.

3.3 Work Method Statements

There are a number of project specific activities or issues identified as requiring attention and management through the development of specific Work Method Statements (WMS), in order to protect employee health and safety and ensure the prevention of any environmental damage.

WMS applicable to this project are prepared prior to commencing works under contract.

WMS and requested sub contractor Work Method Statements are to be approved by the PCA Project Manager before the associated work is permitted to commence on site. All site personnel are to be adequately trained in all relevant procedures before the commencement of site works.

3.4 Environmental Incidents & Emergencies

In the event of a project environmental incident adherence to PCA's Emergency Management Plan is required. A PCA representative will then conduct an incident investigation performed in alignment with the PCA procedure for Incident Reporting and Investigation. The affiliated forms are to be completed and returned to the PCA Works Delivery Manager, including statements taken from all parties present on site at the time of the incident.

4. Control Measures

4.1 Inductions and Training

Inductions for access to the work site are mandatory; all site personnel are required to attend an induction course prior to commencing work on site. All site visitors will be inducted or escorted at all times by inducted personnel. All personnel / visitors going onto a work site must have a Construction Industry Blue / White Card.

The PCA Work Area Supervisor, or an appropriately qualified nominee as their representative, shall carry out induction training as required, covering the major expectations with respect to quality, health, safety, the environment and employee responsibilities. The induction shall include the following as a minimum:

- Review of hazards and risks on the project;
- Expectations with respect to quality, health, safety, the environment and employees;
- Site environmental requirements, for example:
 - Identification of environmentally sensitive areas;
 - Management of protected areas;
 - Threatened Flora and Fauna;
 - Noise management; and
 - Pollution control.
- Waste and contaminated material management
- Hazardous substances and materials handling
- Emergency and incident investigation procedures;
- Accident / Near Miss / Incident and injury procedures;
- Understanding of relevant documented work activities; and
- Other Safety and Environmental training required by *Shoalhaven City Council*.

A questionnaire will be completed at the completion of the induction to ensure that employees have understood the information presented.

Tool Box talks will be regularly conducted to ensure site personnel are competent to perform all required activities and reinforce standard work practices or site environmental requirements.

4.2 Consultation

Regular site meetings will be conducted on site with personnel engaged in the delivery of works. In addition routine inspections will be undertaken presenting the opportunity for on-site field representatives to discuss any known or previously unidentified environmental issues that need to be taken into consideration in the delivery of works.

PCA management staff are to be present on site at regular intervals to gain immediate exposure to the safety, health and environmental issues that are present on the work site. This also provides the opportunity for management to stay in touch with the field work force and provides a communications medium for the on-site PCA field presentations directly to the organisations management team.

4.3 Flora and Fauna

Access and works delivery under the project will be confined to the nominated access tracks and cleared easements as directed by *Shoalhaven City Council*. No additional clearing or trimming of any vegetation adjacent to the tracks, easements and towers is permit without the endorsement and approval of the Principal.

Where there is a need at the bridge site to clear debris or obstacles in order to facilitate safe access, the prior approval of the Principal is to be obtained prior to any work commencing on site.

Barrier fencing and signage to designate the work area will be erected with the work area under the control of the Work Area Supervisor or an appropriately qualified nominee. Silt fencing, ground sheets and designated access to prevent vehicles and staff causing undue impacts on the surrounding environment will be utilised where deemed necessary to protect local flora.

4.4 Biosecurity

Prior to entry and commencement of work in the nominated areas, all vehicles, plant and equipment shall be thoroughly washed down and inspected. Hygiene guidelines for all vehicles, materials, plant and equipment brought to the work site are required and are available at [Hygiene guidelines \(nsw.gov.au\)](http://www.health.nsw.gov.au/hygieneguidelines/).

All vehicles will be cleaned and suitably presented prior to any vehicles accessing the sites. Staff will be briefed at the project start-up induction regarding weed transfer with portable wash down facilities made available.

The designated work area will be confined to the cleared region immediately beside the top of the bridge structure.

4.5 Erosion and Sediment Control

All approved erosion and sediment controls are to be in place before any construction activities commence, adhering with the Principals requirements. Local and State Regulations and Legislative requirements will also be adhered to ensuring the control of sediment and site erosion is being appropriately managed.

Controls shall include a sediment fence on the low side of any excavated material with controls checked at least weekly or before imminent adverse weather conditions. The Work Area Supervisor will ensure that appropriate precautions are taken to prevent an uncontrolled release of waste water from the tower site.

4.6 Waste Management

Where feasible PCA will in adherence with our environment policy endeavour to reduce project waste and recycle materials involved in the delivery of the project works.

All excess excavated &/or waste materials suitable for re-use or recycling will be stockpiled in an acceptable manner or dispatched to an authorised recycling depot. All paint and rust particles (and contaminated water) are to be removed to an appropriate waste management facility.

Only approved waste contractors are to dispose of any non-reusable construction wastes in secure and approved landfill sites. All contaminated materials and non-reusable tools, including contaminated paint and blasting medium is to regularly collected and disposed of off-site. Waste waiting for collection is to be maintained in a tidy and controlled manner such that it does impact on the local fauna or livestock or have the potential to be wind blown.

All construction waste is to be secured at the end of each day awaiting the timely removal from site with all domestic waste controlled and removed at the end of each day.

All waste will be transported by a licenced provider and disposed of at a licensed facility. Regulated waste quantities over 250kg will be tracked in accordance with the Environmental Protection (Waste Management) Regulation 2000 with records being maintained. Paint and blasting medium and other potentially contaminated material will be disposed of at a facility licensed to take this material.

4.7 Contamination

The water blast cleaning process adopted must be such as to prevent contaminants causing environmental nuisance or harm. Shoalhaven Water town water gained approval for use in these catchments during the construction phase of the project. It is assumed that this is the case for the operational phase of the road and can be utilised in this project. If other, non-Shoalhaven Water water from outside the catchment is used, advice from the relevant authority may need to be sought.

Collection or other protective devices to the approval of *Shoalhaven City Council* shall be installed where required. This will include, but not be limited to the laying of a drop sheet membrane material or a 'terra firma' type material around the base of the structures to contain bulk blast residue, which shall then be disposed of in accordance with the requirements of the Project Management Plan and relevant legislation.

During the surface preparation geotextile, formply or similar shall be used to capture residual material from the preparation process. Site conditions are assessed each day.

Dangerous, flammable or toxic materials shall not be stored on the construction site. The volumes of dangerous materials taken to the site shall be limited to what would be consumed on a daily basis. The mixing, stirring, straining, thinning or de-canting of any dangerous, flammable or toxic material shall be done so in a controlled manor and in compliance with manufacturers instructions.

All liquid chemicals, fuels and oils must be stored in a suitable secondary containment bund and protected to minimise the impact of any spillage or containment on or around the site. Bunds shall be:

- imperviously lined using a material unaffected by chemical attack from the liquid being stored
- able to contain a minimum of 120% of the volume of liquid being stored
- bunds and storage areas to be above the emergency spill basins located all our four sides of the bridge

4.8 Cultural Heritage

All field personnel will maintain cultural heritage awareness whilst on site. In the event that any potential Aboriginal Cultural Heritage is discovered, the Principal will be notified and any work that could harm the Aboriginal cultural heritage suspended with an assessment performed by the *Shoalhaven City Council* representatives.

4.9 Noise Management

Where the works are being delivered in a residential area, the works are to be executed in a manner that minimises the disturbance to, and ensures the safety of, the public.

All work is to be performed within the agreed contract hours and days, for example Monday to Friday 7:00am to 6:00pm and Saturday, 8:00am to 1:00pm. No work will be undertaken outside these hours without the prior consultation and approval from *Shoalhaven City Council*. Suitable plant, equipment &/or activities must be utilised to ensure noise levels surrounding the site boundaries do not exceed local noise control limits.

4.10 Air Pollution

It is essential to be aware and effectively plan for the control of dusts or any air borne pollutant. There is an increasing public awareness of human health issues and expectations in the management of dust in the working environment in addition to the high levels of environmental performance, and the duty of care required by asset owners, builders, government and the community.

Advantages of Erosion & Sediment Control

With careful pre-planning, erosion and sediment control can result in many on-site advantages in addition to protecting the environment.

On-site benefits typically include:

- less dust problems,

- improved working conditions,
- reduced downtime after rain,
- less stockpile losses,
- reduced clean-up costs,
- earlier works completion,
- less chance of complaints by neighbours.

Controls shall include site and track assessment prior to any site activities, track assessment will record existing condition of tracks and make recommendations for track preservation as well as strategies to manage air pollution and specifically control dust. Generally this will be via track or access “wetting” as required, but may include alternative track establishment reduced access or other control measures as deemed appropriate by the PCA environmental officer.

4.11 Material Storage

Ie. Fuel & Hazardous Substances

Fuel and hazardous substances should be kept in a cool, well-ventilated place, preferably protected from weather and unauthorized access. All sources of ignition are to be eliminated from fuel storage areas and clearly marked with “no smoking signage”. Fuel and hazardous substances should be stored off site where possible and only a sites daily requirement are to be transported to site. If bulk storage of fuel and or a hazardous substances is required on site then a site specific risk assessment is to be completed and the appropriate safety mechanisms are to be built to store the fuel and hazardous substance such that they comply with Australian standards and the intent of this environmental policy and PCA's safety policies, specifically those around fuel management and handling. Fuel storage on site will be contained in an Australian standard compliant fuel storage container. Decanting and mixing of fuel should be carried out in a well-ventilated area. When on site storage of fuel containers removed from a vehicle will be stored in either a purpose built “bund” or on containment trays or pallets that can capture at least 25% of the total volume being stored on top of the tray or pallet.

Fuel can only be stored on a site that have spill kits available, spill kits are to be readily available easily identifiable such that any spill or leak can be immediately contained. All spills and leaks are to be reported on the PCA “NCR hazard and risk” form and the supervisor for the site to be immediately advised to appropriately coordinate the response to any reported issue.

4.12 Plant and Equipment

All plant and equipment will be checked for suitability of task and for general fluid leaks upon delivery to site &/or before initial use. Thereafter operators will conduct daily checks of equipment to ensure the continued suitability of the plant to the task.

The Work Area Supervisor will ensure that a competent person conducts periodic inspections of each item of the company's plant and equipment to ensure compliance to manufacturer's specification and maintenance requirements.

Subcontractors are to comply with the above inspection requirements and either provide copies of the checklists or a compliance statement &/or certificate for the plant and equipment located on site to the Work Area Supervisor.

4.13 Incident Investigation and Analysis

It is a requirement that all personnel located on site must report all incidents and accidents associated with the project so that improvements can be made and corrective actions put in place to prevent reoccurrence. Near misses are considered to be an incident and must also be reported for investigation and analysis.

Incident, accident and 'near miss' incident investigations shall be carried out in accordance with PCA's *Incident Reporting and Investigation* procedure. The incident reporting Form is to be completed along with the collection of Person Statements from all personnel on site at the time of the incident.

The investigation team will meet as soon as practicable following an accident / incident to commence investigations. All Environmental Authority notices issued to the site are to be treated as an incident and thus recorded on the Incident Register with the identified improvement actions documented in the register.

Environmental incidents are to be reported to *Shoalhaven City Council* as soon as practical.

4.14 General Site Arrangements

4.14.1 Dust Control Measures

Suitable dust control measures are to be utilised at all times during the project to limit nuisance dust drifts outside the work site boundaries so not to produce any air contamination.

4.14.2 Site Signage

Environmental signage will be visibly displayed as appropriate to guide &/or direct site personnel. Signage will designate the work area and will be displayed on the worksite fencing and at the entrance to the worksite. It is compulsory to obey all signage requirements displayed at the work site.

4.14.3 Construction Access and Work Areas

All transport, works, storage of materials, parking of vehicles and plant, construction of bunds, erosion control and safety fencing must be contained to already cleared access tracks and cleared easements at each structure. Identified designated access areas and tracks will be detailed during the site induction and the importance of sticking to the access routes. Work site fencing will designate the limits of the construction area.

4.14.4 Spill Control

Minimal fuel, oil or any other hazardous substance shall be stored on site. Any fluids on site will be kept in site vehicles or in suitably bunded area(s). On open ground or vented storage shed (no unvented storage to occur), chemicals shall not be decanted, mixed, applied or

stored within 20 meters of a watercourse and shall be handled within a bunded/protected area at all times.

Refuelling of vehicles and plant is permitted in work areas under strict conditions – all refuelling of plant and generators' may take place on site in an approved refuelling area. Small plant can be refuelled within the confines of a site provided that the refuelling occurs in a level area away from drains or watercourses and appropriate spill kits are maintained at all times on site in the immediate vicinity (within 10m) of the refuelling process.

All spills must be suitably contained, cleaned up and disposed of in accordance with spill control process as explained at during the work site induction, for example:

- Spread absorbent material from spill kit to soak up spilt fluid;
- Gather used absorbent material and other affected material and place in a suitable container for disposal;
- Arrange suitable disposal of collected material.

If a Pollution Event occurs, for example a major spill, the procedures set out in the PCA Site Emergency Plan shall be followed.

Relevant vehicles, those carrying liquids with the potential for spills (vehicles carrying plant and loose containers) will carry and maintain spill kits. Training in the use of spill kits will be covered in the PCA personnel's safety and environmental inductions.

4.14.5 Fire

The Work Area Supervisor is to monitor the Fire and Emergency Services warnings and Local Government vehicle movement restrictions during hot weather and comply with such restrictions. Each vehicle is to be equipped with a fire extinguisher which has been inspected and is compliant.

4.14.6 Hazardous Substances

A register of Safety Data Sheets (SDS) for all hazardous substances on the work site will be maintained. All hazardous substances will be confined to the tower work areas with appropriate management practices in place to contain the substances.

5. Monitoring and Review

All site activities will be closely monitored to ensure adherence with business procedures and work practices ensuring that the project requirements and responsibilities are being met.

5.1 Site Inspections

Monitoring of work site activities shall include:

- Formal daily inspections by the Work Area Supervisor;
- Informal inspections by the Project Manager;
- Informal inspections performed by Director or nominee;
- Formal completion of the Safety & Environmental Controls Checklist

Any deficiencies identified during these inspections will be recorded and action as appropriate, with all internal audits being programmed and conducted as detailed within the Project Plan.

The following forms will be used for such activity:

- Pre Start Risk Assessment;
- Daily Prestart
- Weekly Toolbox
- Non Conformance Report
- Non Conformance Report Hazard and Risk

5.2 Auditing

Internal audits will be programmed and conducted as detailed within the Project Plan.

5.3 Reporting

The Project Supervisor shall report at least weekly to the Construction Manager or more frequently if requested. At least once during the course of the project, a Safety & Environmental Controls Checklist (PCA-EF-005) is to be completed.

An Environmental Report (PCA-EF-002) is made available to record a snap shot of items such as, trends, improvements, waste management usage and other data. There is no specific requirement for this document to be completed unless this information is required on request by the client.

5.4 Project Review

The Project Supervisor will conduct regular reviews of each project with the Construction Manager to ensure compliance in the delivery of environmental controls to prevent environmental harm.

6. Procedures and Forms

The Environmental Management Plan, in conjunction with the other parts of the Project Plan will ensure that the safety of all site personnel is a managed process and that all environmental aspects pertaining to the project are addressed via established procedures.

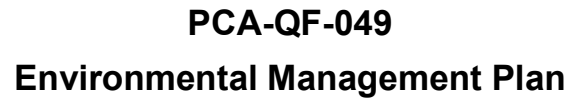
6.1 Non-conformance and Corrective Actions

The identification of non-conformances may be a result of checks/audits and monitoring of operations. Disposition of non-conformances will be identified, assessed and carried out on site by any project staff and/or Principal staff.

Such activity will be carried out in accordance with PCA's Corrective and Preventative Action Procedure.

6.2 Incidents, Hazards and Emergency Response

All environmental hazards, incidents and complaints must be reported and emergencies handled in accordance with *Shoalhaven City Council* Environmental Incident and Emergency Response Procedures and minimum requirements.



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7. Relevant System Documentation

[illegible]

APPENDIX B – Threatened Species Likelihood of Occurrence

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NSW Threatened Species Likelihood of Occurrence Table

The table of likelihood of occurrence evaluates the likelihood of threatened species to occur on the subject site. This list is derived from previously recorded species within a 5 km radius (taken from NSW BioNet Atlas) around the subject site. Ecology information unless otherwise stated, has been obtained from the *Threatened Biodiversity Profile Search* on the NSW OEH (Office of Environment & Heritage) online database (<https://www.environment.nsw.gov.au/threatenedspeciesapp/>) access pm the 18 January 2023.

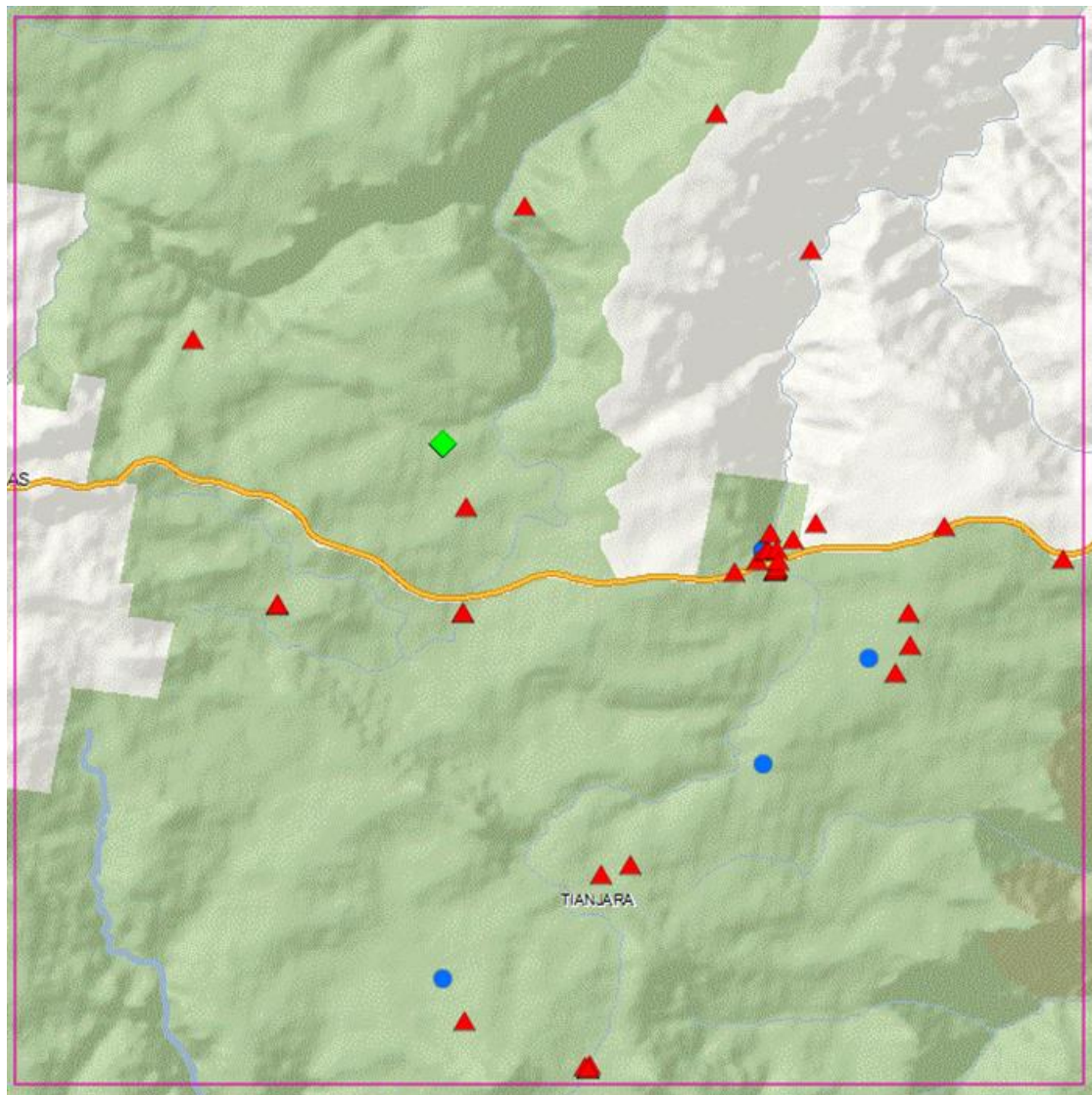
Likelihood of occurrence in study area

1. Unlikely – Species, population or ecological community is not likely to occur. Lack of previous recent (<25 years) records and suitable potential habitat limited or not available in the study area.
2. Likely – Species, population or ecological community could occur and study area is likely to provide suitable habitat. Previous records in the locality and/or suitable potential habitat in the study area.
3. Present – Species, population or ecological community was recorded during the field investigations.

Possibility of impact

1. Unlikely – The proposal would be unlikely to impact this species or its habitats. No NSW *Biodiversity Conservation Act 2016* “Test of Significance” or EPBC Act significance assessment is necessary for this species.
2. Likely – The proposal could impact this species, population or ecological community or its habitats. A NSW *Biodiversity Conservation Act 2016* “Test of Significance” and/or EPBC Act significance assessment is required for this species, population or ecological community.

Note that where further assessment is deemed required, this is undertaken within the REF as a Test of Significance (in the case of NSW listed species) or an EPBC Significant Impact Assessment (in the case of Commonwealth listed species).



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<i>Endangered Ecological Community name</i>	<i>Status</i>	<i>Likelihood of presence within areas impacted by the activity</i>
River-flat eucalypt forest on coastal floodplains of the North Coast, Sydney Basin and South East Corner	Endangered - NSW BC Act	Does not occur on-site. The site is not on the coastal floodplain. The ECC is mapped 2.5 kilometres to the east (in the Tianjara Creek area below the falls)
Robertson Basalt Tall Open-forest in the Sydney Basin Bioregion	Critically Endangered – NSW BC Act	Does not occur on-site. The site is not on Robertson Basalt. The EEC is mapped 2.5 kilometres to the west in and around Sassafras.
Bangalay Sand Forest of the Sydney Basin and South East Corner Bioregions	Endangered - NSW BC Act	Does not occur on-site and is not mapped as occurring in close proximity to the site.
Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner Bioregions	Endangered - NSW BC Act Vulnerable - Commonwealth EPBC Act	Does not occur on-site and is not mapped as occurring in close proximity to the site.
Freshwater wetlands on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions	Endangered - NSW BC Act	Does not occur on-site and is not mapped as occurring in close proximity to the site.
Illawarra Lowlands Grassy Woodland in the Sydney Basin Bioregion	Endangered - NSW BC Act Critically Endangered - Commonwealth EPBC Act	Does not occur on-site and is not mapped as occurring in close proximity to the site.
Illawarra Subtropical Rainforest in the Sydney Basin Bioregion	Endangered - NSW BC Act Critically Endangered - Commonwealth EPBC Act	Does not occur on-site and is not mapped as occurring in close proximity to the site.

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Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		Endangered - NSW BC Act Critically Endangered - Commonwealth EPBC Act	Does not occur on-site and is not mapped as occurring in close proximity to the site.
Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions		Endangered - <i>NSW BC Act</i> Endangered - Commonwealth <i>EPBC Act</i>	Does not occur on-site and is not mapped as occurring in close proximity to the site.
Swamp sclerophyll forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions		Endangered - NSW BC Act	Does not occur on-site and is not mapped as occurring in close proximity to the site.
<i>Species name</i>	<i>Status</i>	<i>Habitat requirements (www.environment.nsw.gov.au)</i>	<i>Likelihood of presence within areas impacted by the activity</i>
FLORA			
Budawangs Cliff-heath <i>Epacris gnidioides</i>	Vulnerable NSW BC Act and EPBC Act	The species as only been recorded in the Northern Budawang Range west of Ulladulla (e.g. Hidden Valley, The Castle, Nibelung Crag, Ettrema Canyon, and Mount Sturgess). Grows in Skeletal soil in sandstone crevices or on sandy ledges beneath	Unlikely to occur. Site survey did not detect species within or in proximity to the site. Previous surveys also did not detect the species (Sinclair Knight Merz 2002) Site does not comprise suitable habitat.
Budawangs Bush-pea <i>Pultenea abeuerlenii</i>	Vulnerable NSW BC Act and EPBC Act	The species is known from a few sites in Morton and Budawang National Parks including Mt Currockbilly, Bhundoo Hill, Little Forest, Burrumbeet Brook and Corang Trig. It appears to prefer swampy heathland on sandstone.	Unlikely to occur. Site survey did not detect species within or in proximity to the site. Previous surveys also did not detect the species (Sinclair Knight Merz 2002) Site does not comprise suitable habitat.
AMPHIBIANS			

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Green and Golden Bell Frog <i>Litoria aurea</i>	Vulnerable EPBC Act Endangered NSW BC Act	Marshes, dams and stream-sides, particularly those containing bullrushes (<i>Typha</i> spp.) or spikerushes (<i>Eleocharis</i> spp.). Optimum habitat for the species includes water-bodies that are unshaded, free of predatory fish such as Plague Minnow (<i>Gambusia holbrooki</i>), with a grassy area nearby and diurnal sheltering sites available. Some sites, particularly in the Greater Sydney region occur in highly disturbed areas (OEH 2017).	Unlikely to occur. No suitable habitat present within the site.
Heath Frog <i>Litoria watsoni</i>	Vulnerable NSW BC Act and EPBC Act	The species breeds in the upper reaches of permanent streams and in perched swamps. Non-breeding habitat is heath forests and woodlands where it shelters under leaf litter and low vegetation. Breeding is triggered by heavy rain and can potentially occur all year, but is usually from late summer to early spring. Eggs are laid in loose gelatinous masses attached to small submerged twigs. Eggs and tadpoles are mostly found in still or slow flowing pools that receive extended exposure to sunlight.	Likely to occur and known to be present in the creek. Refer to Section 3.3.2 of this REF for impact assessment.
Giant Burrowing Frog <i>Heleiporus australiacus</i>	Vulnerable NSW BC Act and EPBC Act	The species is found in heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based	Potential to occur. Refer to Section 3.3.2 of this REF for impact assessment.
REPTILES			
Broad-headed Snake <i>Hoplocephalus bungaroides</i>	Vulnerable NSW BC Act and EPBC Act	The Broad-headed Snake is largely confined to Triassic and Permian sandstones. It shelters in rock crevices and under flat rocks on exposed cliff edges during autumn, winter and spring. Moves from the sandstone rocks to shelters in crevices or hollows in large trees within 500 metres of escarpments.	Unlikely to occur. No suitable habitat present within the site.
BIRDS			

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White-throated Needletail <i>Hirundapus caudacutus</i>	Vulnerable and migratory <i>EPBC Act</i>	Almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. Because they are aerial, it has been stated that conventional habitat descriptions are inapplicable, but there are, nevertheless, certain preferences exhibited by the species. Although they occur over most types of habitat, they are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland. They also commonly occur over heathland, but less often over treeless areas, such as grassland or swamps. When flying above farmland, they are more often recorded above partly cleared pasture, plantations or remnant vegetation at the edge of paddocks. In coastal areas, they are sometimes seen flying over sandy beaches or mudflats, and often around coastal cliffs and other areas with prominent updraughts, such as ridges and sand-dunes. They are sometimes recorded above islands well out to sea.	Possibly occurring over or in proximity to the site, but unlikely to utilise available habitat within the site.
Gang-gang Cockatoo <i>Callocephalon fimbriatum</i>	Vulnerable NSW BC Act	Tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In winter, may occur at lower altitudes in drier more open eucalypt forests and woodlands, and often found in urban areas. preferring more open eucalypt forests and woodlands, particularly in box-ironbark assemblages, or in dry forest in coastal areas. Favours old growth attributes for nesting and roosting	Possibly occurring over or in proximity to the site, but unlikely to utilise available habitat within the site.
Eastern Bristlebird <i>Dasyornis brachypterus</i>	Endangered NSW BC Act and EPBC Act	Habitat is characterised by dense, low vegetation including heath and open woodland with a healthy understorey. Age of habitat since fires is of paramount importance to this species.	Possibly occurring over or in proximity to the site, but unlikely to utilise available habitat within the site.
MAMMALS			
Spotted-tailed Quoll <i>Dasyurus maculatus</i>	Endangered <i>EPBC Act</i> Vulnerable <i>NSW BC Act</i>	Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow-bearing trees, fallen logs, small	Possibly occurring over or in proximity to the site, but unlikely to utilise available habitat within the site.

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		caves, rock outcrops and rocky-cliff faces as den sites. Mostly nocturnal, although will hunt during the day; spends most of the time on the ground, although also an excellent climber and will hunt possums and gliders in tree hollows and prey on roosting birds. Use communal 'latrine sites', often on flat rocks among boulder fields, rocky cliff-faces or along rocky stream beds or banks. Such sites may be visited by multiple individuals and can be recognised by the accumulation of the sometimes characteristic 'twisty-shaped' faeces deposited by animals. Females occupy home ranges up to about 750 hectares and males up to 3500 hectares. Are known to traverse their home ranges along densely vegetated creeklines.	
Koala <i>Phascolarctos cinereus</i>	Vulnerable NSW BC Act	Eucalypt woodland and forest. Feeds on the foliage of more than 70 eucalypt species and 30 non-eucalypt species. Spends most of the day, feeding and moving mostly at night.	Possibly occurring over or in proximity to the site, but unlikely to utilise available habitat within the site.
Brush-tailed Rock-wallaby <i>Petrogale penicillate</i>	Endangered NSW BC Act and Vulnerable EPBC Act	The species occupies rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north.	Unlikely to occur. No suitable habitat present within the site.