REVIEW OF ENVIRONMENTAL FACTORS (REF)
MARTINVALE LANE UNNAMED CREEK
ADDITIONAL STABILISATION WORKS

Contents

Document control

Item	Details
Project	Review of Environmental Factors – Martinvale Lane Unnamed Creek Additional Stabilisation Works
Client	City Services, Shoalhaven City Council
Prepared By	City Services, Shoalhaven City Council

Document status

Version	Author / Reviewer*	Name	Signed	Date
V1.0	Author	Jeff Bryant	[redacted]	07/04/2025
	Reviewer	Geoff Young	[redacted]	07/04/2025
	Minor amendments	Jeff Bryant	[redacted]	10/04/2025

*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
Determining authority / authorities	Shoalhaven City Council
Required approvals (consents, licences and permits)	NSW DPI Fisheries Permit for dredging and reclamation under S200 of the *Fisheries Management Act 1994*
Required publication	Yes: 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 and the guidelines published under cl.170, as requiring an approval or permit under section 200 of the *Fisheries Management Act 1994*.

1. PROPOSAL AND LOCATION

1.1 Proposed activity

The proposal involves additional stabilisation works to address a partial failure of previous stabilisation works, and to address ongoing erosion of an unnamed tributary of Jaspers Creek, impacting on Martinvale Rd, Jaspers Brush, in the vicinity of an existing causeway crossing.

Extreme and ongoing rain events beginning in 2020 resulted in realignment of the creek, with pronounced and ongoing erosion of the southern embankments either side of the causeway and failure (wash-out) of the southern causeway approach of Martinvale Lane.

Council engaged a consultant civil and structural engineer to design an upgraded crossing which would stabilise and protect the road and creek embankments and improve flow along this section of the creek. The resulting design involved a series of angled box culverts spanning a 60-metre width of the waterway in place of the causeway, with regrading of the creek bed and significant bank stabilisation. The high cost of implementation of this design could not – and still cannot – be met by available funding.

An interim stabilisation solution which retained the existing causeway and aimed to re-establish a direction of flow over the causeway, with stabilisation and protection of the upstream and downstream embankments using ELCOROCK Geotextile Sand Containers (bags) and Kyowa rock bags, was designed and constructed in 2023. An REF was produced for this activity (Bryant 2022, SCC reference D22/517757).

A subsequent extreme rain event in April 2024 resulted in partial failure of several ELCOROCK Geotextile Sand Containers and further erosion of stabilised embankments immediately adjacent to the southern sides of the causeway. Additionally, large quantities of rock and other alluvial material was deposited within the creek.

The currently proposed works seek to stabilise and protect exposed embankments and re-establish channel alignment where alluvial deposition has occurred.

Note that the current proposal does not aim to upgrade or increase the life of the causeway.

Works would involve (refer also to Figure 3):

- Removal of failed ELCOROCK Geotextile Sand Containers.
- Excavation of accumulated rock and alluvial material to the creek bed level.
- Install Kyowa rock bags on the eastern and western side of the causeway where the embankment was exposed. Additional Kyowa rock bags (2-3) would be installed above existing bags on the north-east side of the causeway to offer further protection to the embankment. Excavated rock of suitable size would be used to fill bags.
- Excess accumulated rock and alluvial material would be used to reinstate embankments.
- Impact on vegetation would be limited to exotic pasture grass and scattered sedges and herbs. No native trees or shrubs would be removed.
- Works would involve the implementation of prescribed safeguards and mitigation measures including the installation of silt curtains within the creek, and other sediment erosion control measures (refer to Section 7).
- If required, a fenced site compound with stabilised access would be established within existing cleared, private land, adjacent to Martinvale Lane (subject to landowner agreement), and would be remediated following completion of works.

- Any removed fencing would be reinstated immediately when access is no longer required for the works. Temporary fencing would be installed as required to secure stock.
- Martinvale would be subject to traffic control and/or temporary closures during works. A temporary crossing will therefore not be required.

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 be undertaken either side of Martinvale Lane, extending into adjacent private land in proximity to an existing culvert crossing of an unnamed tributary of Jaspers Creek, Jaspers Brush.

Details of affected land are provided in Table 1.

Table 1. Property affected by the proposal

Lot / DP	Description	Land owner / manager	Other pertinent information
-	Martinvale Lane	Shoalhaven City Council	
Lot 5 DP 738163	246A Strongs Rd, Jaspers Brush	Privately owned freehold land	Authorisation to access this property must be obtained prior to works in the form of a Permit to Enter.
Lot 104 DP 814663	220 Strongs Rd, Jaspers Brush	Privately owned freehold land	Authorisation to access this property must be obtained prior to works in the form of a Permit to Enter.

Figure 1. Site location

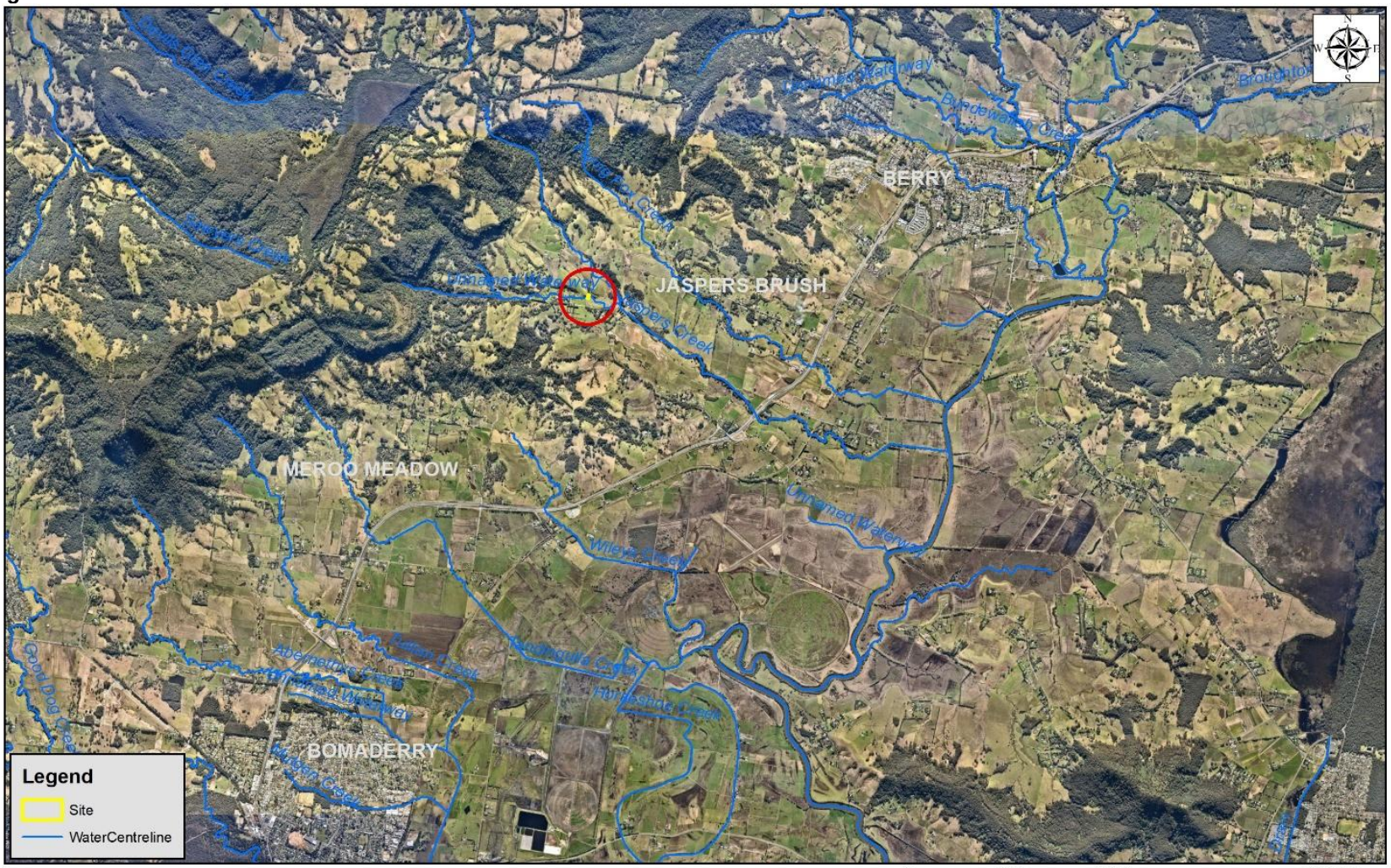


Figure 2. Site

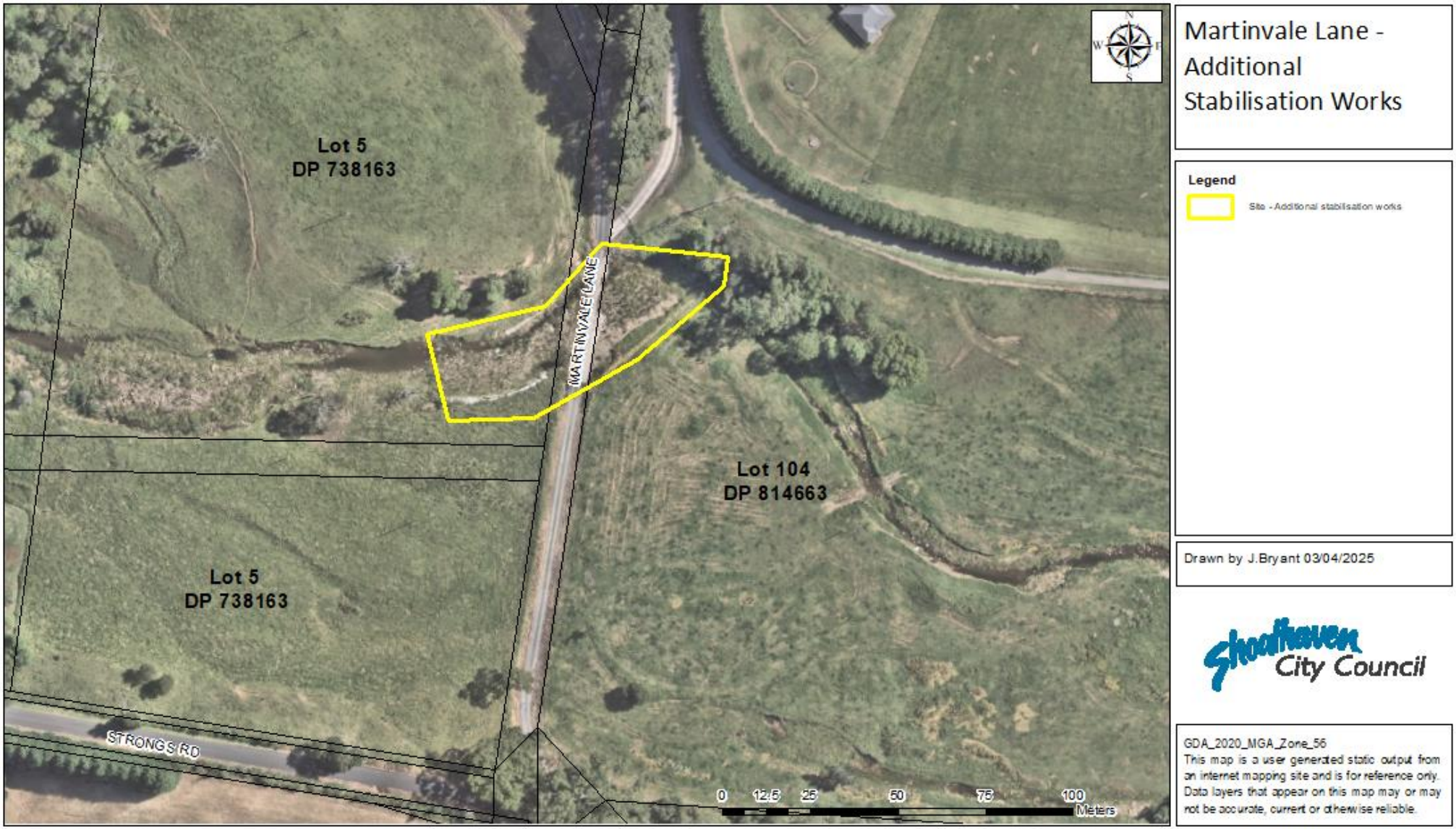


Figure 3. Proposed additional stabilisation works

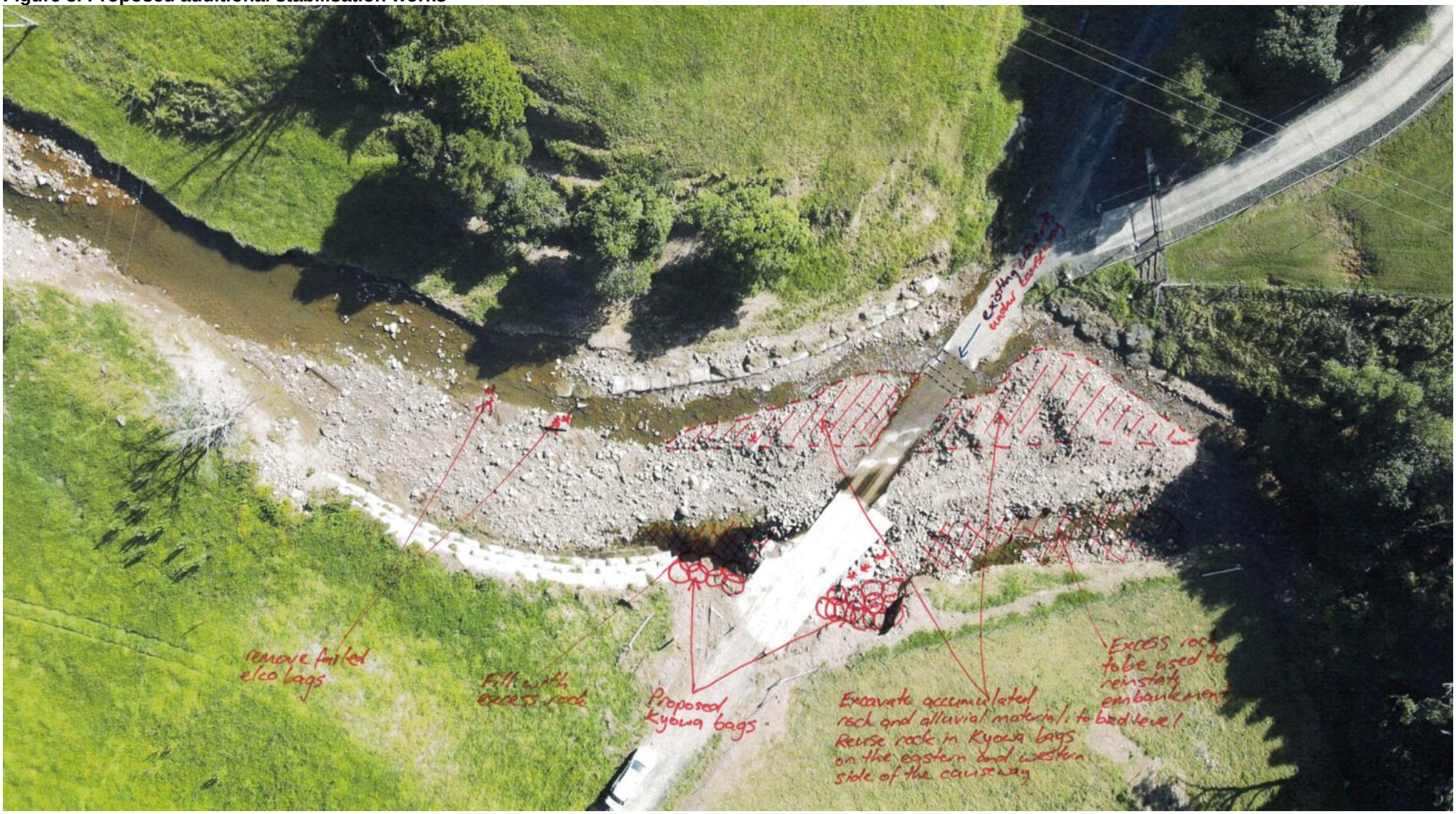
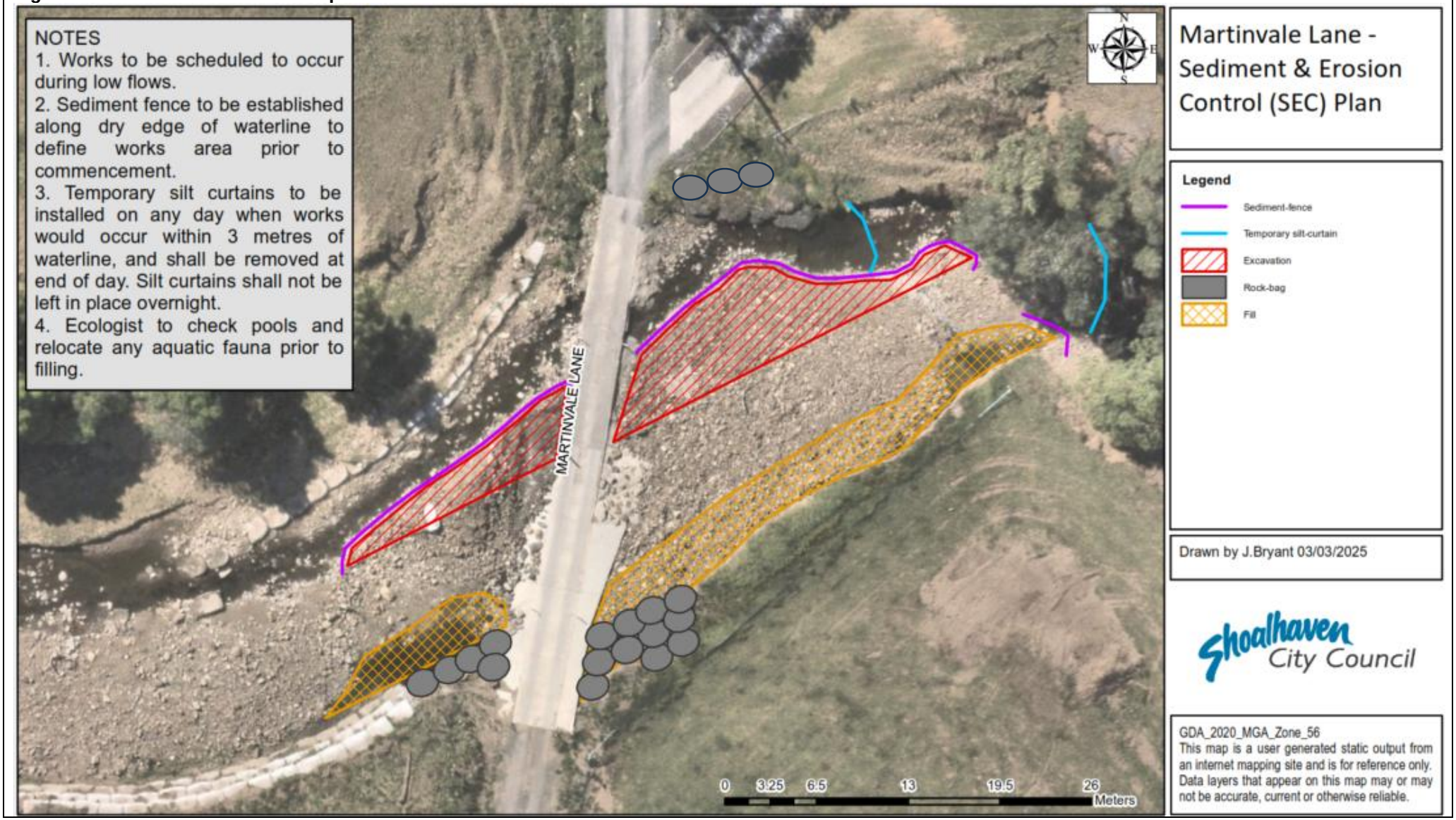


Figure 4. Sediment erosion control plan



1.3 Site photos

Photo 1 (above left): site on 18/11/2020 following re-establishment of access; Photo 2 (above right): site on 07/03/2022 during flooding; Photo 3 (below left): site on 14/03/2022 during construction of piped temporary access; Photo 4 (below right): site on 30/03/2022 following partial wash-out of temporary crossing.




Photo 5. Stabilisation works as completed (drone aerial view, September 2023)

Photo 6. Post stabilisation works (11 April 2024) showing erosion of south-east embankment and accumulated rock

Photo 7. Post stabilisation works (11 April 2024) showing erosion of south-west embankment, failed ELCO bags and accumulated rock

Photo 8. Site on 3 April 2025 showing erosion of south-east embankment and accumulated rock (*cf* photo 6*)*

Photo 9. Site on 3 April 2025 showing erosion of south-west embankment, failed ELCO bags and accumulated rock (*cf* photo 7)

2. EXISTING ENVIRONMENT

2.1 Habitat and vegetation assessment

The site was assessed by a Council Environmental Officer on 11th April 2024 and 3rd April 2025 in consideration of the current proposal and had previously been investigated on 21st April and 12th December 2022.

Investigations involved vegetation and habitat assessment, recording all flora species within and immediately adjacent to the subject site, determination of vegetation communities, targeted survey for potentially occurring threatened flora species (including *Rhodamnia rubescens* and *Syzygium paniculatum*) and investigation of habitat availability on site for threatened fauna species and cryptic threatened flora species.

The site comprised a 4th order (Strahler), unnamed creek tributary of Jaspers Creek with a concrete causeway crossing on Martinvale Lane.

Land within and adjacent to the site was mostly cleared and is utilised for agricultural purposes (cattle farming).

Vegetation mapped as occurring in proximity to the site (refer to Figure 5) includes:

- PCT3078 *Illawarra Lowland Wet Vine Forest.* This vegetation community is associated with Illawarra Sub-tropical Rainforest endangered ecological community (EEC).
- PCT3269 *Shoalhaven Lowland Spotted Gum – Paperbark Forest*. This vegetation community is associated with Illawarra Lowlands Grassy Woodland EEC.
- PCT3153 *Illawarra Escarpment Bangalay x Blue Gum Wet Forest*. This vegetation community is not associated with any EEC.

Vegetation in proximity to the site, was considered most consistent with PCT3153, but contained some apparent influence from PCT3078 and PCT3269.

Pasture paddocks within and in proximity to the site were dominated by *Cenchrus clandestinus* (Kikuyu), with scattered *Lolium* spp. (Ryegrass), *Holcus lanatus* (Yorkshire Fog), *Rumex* spp. (Dock), and *Avena* spp. (Wild Oats).

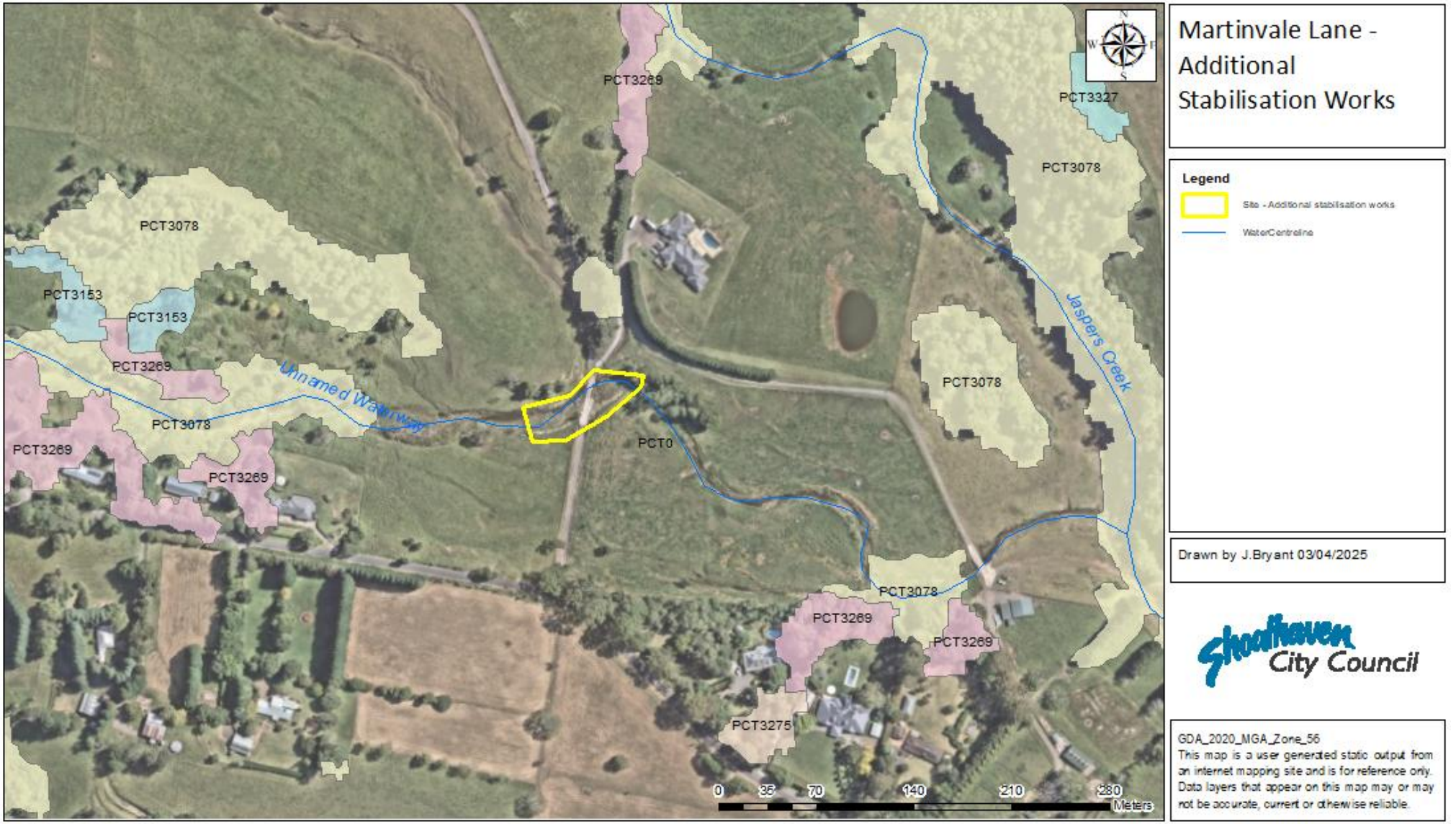
Vegetation within the footprint of the proposed additional stabilisation works primarily consists of exotic invasive plants including *Tagetes minuta* (Stinking Roger), *Solanum mauritianum* (Wild Tobacco), *Cenchrus clandestinus* (Kikuyu), *Cyperus eragrostis* (Umbrella Sedge), *Bidens pilosa* (Cobblers Pegs), *Sonchus spp* (Sow Thistle), *Senecio madagascariensis* (Fireweed), *Conyza spp* (Fleabane), and *Paspalum dilatatum* (Caterpillar Grass). Scattered native sedges, rushes and herbs also occur, including *Persicaria spp* (Knotweed), *Sigesbeckia orientalis* (Indian Weed), *Juncus spp* (Rush), *Isolepis ssp*, *Eleocharis spp* (Spike Rush), and *Typha orientalis* (Cumbungi).

The creek bed consisted of variably sized cobbles and boulders to 0.7 m diameter, with pockets of coarse, sandy silt sediment. Decaying and some live algae occurred over cobbles within the creek.

The creek was flowing at the time of each site visit, with pools up to 20 m long and 1.0m depth, broken by cobbled riffles for lengths of 50 m or more. Pools up to 1m deep occurred at the base of eroded scarps to the north-east of the causeway. The pool immediately south-west of the causeway, which is proposed to be filled, was approx. 20cm deep and contained scattered rushes.

No aquatic fauna were observed during recent site investigations. Investigations during 2022 observed one eel in a deep pool to the north-east of the causeway and *Crinia signifera* (Common Eastern Froglet) tadpoles downstream of the causeway.

Figure 5. Vegetation mapped as occurring in the locality of the site



Threatened species, habitat resources and targeted survey findings

No threatened flora including *Rhodamnia rubescens* or *Syzygium paniculatum,* nor suitable habitat for locally occurring threatened orchid species were identified on site during vegetation surveys.

No Glossy Black Cockatoo (*Calyptorhynchus lathami*) feed trees (i.e. *Allocasuarina littoralis* with characteristic chewed cones), nor Yellow-bellied Glider (*Petaurus australis*) feed trees (i.e. e.g. *Corymbia gummifera* or *Eucalyptus punctata* with v-shaped feeding scars) occured within or in close proximity to the site. No signs of potential threatened fauna use of the site (e.g. bandicoot diggings, owl white-wash or other threatened fauna scats) were noted.

No hollow-bearing trees (HBTs) were found to occur within or in close proximity to the site.

No targeted nocturnal survey was undertaken as this was not considered necessary to inform the REF.

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:

- Excavation (dredging) of accumulated cobbles above the waterline, over a triangular area roughly 50m long and 10m wide and avg. 2m deep (approx. 500m^3).
- Reclamation over approx. 50m x 5 – 10m battered embankment up to 2m high, using a combination Kyowa rock bags (immediately either side of the causeway) and loose rock and cobble.
- One shallow pool (approx. 20cm), which is disconnected from the primary creekline, would be filled in with Kyowa rock bags and cobbles.
- Removal of native vegetation would be limited to scattered sedges and herbs which have reestablished over accumulated cobble mounds and in the shallow pool, amongst invasive exotic plants.
- Works may require the temporary removal of fencing, to enable access. Any removed fencing would be reinstated immediately when access is no longer required for the works.

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

- Impacts on threatened species;
- Impacts on indigenous and non-indigenous heritage;
- Impacts on water quality, the riparian zone and key fish habitat;
- Impacts associated with flood liable land.

Each of these is discussed below.

3.2 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.

3.2.1 Part 7A *Fisheries Management Act 1994*

Part 7A relates to threatened species conservation.

There are no threatened species listed under the Act which are mapped as occurring in proximity to the site[1], or likely to occur in proximity to the site.

No marine vegetation or threatened marine fauna would be directly impacted by the proposal.

The proposal would not create a new barrier to movement within the creek and is unlikely to result in indirect impacts which would affect threatened aquatic species or their habitats.

[1] Fisheries NSW Spatial Data Portal https://webmap.industry.nsw.gov.au/Html5Viewer/index.html?viewer=Fisheries_Data_Portal

Further consideration of Parts 1 through 6 of the NSW DPI Threatened species assessment criteria, which considers impacts to threatened species, habitat of threatened species, and endangered ecological communities listed under the Act, is not warranted.

As demonstrated in Table 2 below (Part 7 of NSW DPI Threatened species assessment criteria), the proposal would not contribute significantly to key threatening processes, as listed under Part 7A of the Act.

It is concluded that the proposal is unlikely to result in any impact on threatened entities or their habitat; or contribute significantly to key threatening processes, as listed under Part 7A of the Act.

The proposed activity therefore does not require an Environmental Impact Statement (EIS) or Species Impact Statement (SIS) under the Act.

Table 2. Fisheries Management Act – Key Threatening Process Assessment

Key Threatening Process	Assessment
Degradation of native riparian vegetation along NSW water courses	Negligible – The proposal would not involve the removal of any trees or large shrubs, but would involve removal/disturbance of weeds as well as scattered native sedges and herbs which have grown over the accumulated cobbles. The resulting embankments would be more stable than existing.
Hook and line fishing in areas important for the survival on threatened fish species	Not applicable – proposal does not comprise or facilitate hook and line fishing.
Human-caused climate change	Not applicable – the proposal does not contribute to human-cause climate change.
Installation and operation of instream structures and other mechanisms that alter natural flow regimes of rivers and streams	The proposal would reduce the risk and impact of the creek embankments over-topping during high flow events and would direct potential overland flow through existing channels. No new obstruction of the main creek channel would be introduced.
Introduction of fish to waters within a river catchment outside their range	Not applicable – the proposal does not involve releasing fish.
Introduction of non-indigenous fish and marine vegetation to the coastal waters of NSW	Not applicable – the proposal does not involve the introduction of non-indigenous fish.
Removal of large woody debris from NSW rivers and streams	Not applicable – the proposal does not involve the removal of woody debris.
The current shark meshing program in NSW waters	Not applicable – the proposal does not involve shark meshing.

3.2.2 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. No 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.

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 place at risk of extinction.

No breeding, refuge or foraging habitat which is important for any threatened fauna species, was found to occur within or in close proximity to the site.

No suitable habitat for any locally occurring threatened flora species occurs within the site.

Highly mobile threatened species such as birds and microbats may occur transiently within or in proximity to the site, but are unlikely to utilise any available habitat.

The proposal is therefore unlikely to impact on any threatened species or their habitats, such that a viable local population of any threatened species is placed at risk of extinction.

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***

Three endangered ecological communities are mapped as occurring in the landscape surrounding the site.

Of these, *Illawarra Subtropical Rainforest in the Sydney Basin Bioregion* EEC is mapped as occurring extensively in the locality including approx. 580m to the south of the site. Site surveys confirmed that the EEC does not occur within or in close proximity to the site, such that there is risk of impact as a result of the proposal.

Other EECs present in the surrounding area are each mapped as occurring over 1km from the site.

Vegetation occurring in proximity to the site was found to be most consistent with PCT3153 *Illawarra Escarpment Bangalay x Blue Gum Wet Forest*, (while containing some influence from PCT3078 and PCT3269). PCT3153 is not associated with any EEC. Refer to Section 2.1 for more information.

Vegetation occurring within the site itself is limited to exotic invasive species and scattered native herbs and sedges, and is not representative of any EEC.

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.

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.

Key threatening processes listed in the NSW *Biodiversity Conservation Act 2016* considered relevant to the proposed activity include:

- Clearing native vegetation
- Alteration to the natural flow regimes of rivers, streams, floodplains and wetlands

Clearing of native vegetation is listed as a key threatening process, defined by the Scientific Committee's determination (OEH 2021) as:

> *"the destruction of a sufficient proportion of one or more strata (layers) within a stand or stands of native vegetation so as to result in the loss, or long-term modification, of the structure, composition and ecological function of a stand or stands."*

Clearing of native vegetation has been shown to:

- cause widespread fragmentation of ecological communities;
- reduce the viability of ecological communities by disrupting ecological functions;
- result in the destruction of habitat and loss of biological diversity;
- lead to soil and bank erosion, increased salinity and loss of productive land.

Removal / disturbance of vegetation associated with the proposal would be limited to exotic invasive species and scattered native herbs and sedges.

The impact of the proposal with regard to clearing of native vegetation, is not considered to be significant as it is unlikely to lead to:

- destruction of habitat causing a loss of biological diversity and extinction of species or loss or local genotypes

- fragmentation of populations resulting in limited gene flow between small, isolated populations, reduced potential to adapt to environmental change and loss or severe modification of the interactions between species
- riparian zone degradation such as bank erosion leading to sedimentation that affects aquatic communities – the riparian corridor would be stabilised as a result of the works.
- disturbance of habitat which may permit the establishment and spread of exotic species which may displace native species
- loss of leaf litter, removing habitat for a wide variety of vertebrates and invertebrates.
- significant reduction of habitat for threatened species or ecological communities.

Alteration to the natural flow regimes of rivers, streams, floodplains and wetlands is noted in the Scientific Committee's determination (OEH 2021) as occurring through:

> *"reducing or increasing flows, altering seasonality of flows, changing the frequency, duration, magnitude, timing, predictability and variability of flow events, altering surface and subsurface water levels and changing the rate of rise or fall of water levels".*

The proposal would modify the creek embankments to achieve stabilisation, but would not result in any alteration to natural flow regimes.

3.3 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 12th December 2022. Of those threatened species and endangered ecological communities reported as likely occurring or having habitat within the area of the report, none were considered to have potential habitat within the site requiring further assessment. 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.

3.4 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 Wale*s (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.

The site contains an unnamed tributary of Jaspers Creek and an associated category 2 riparian corridor.

Figure 6. Results of AHIMS Aboriginal heritage search

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : Martinvale Lane
Client Service ID : 739854

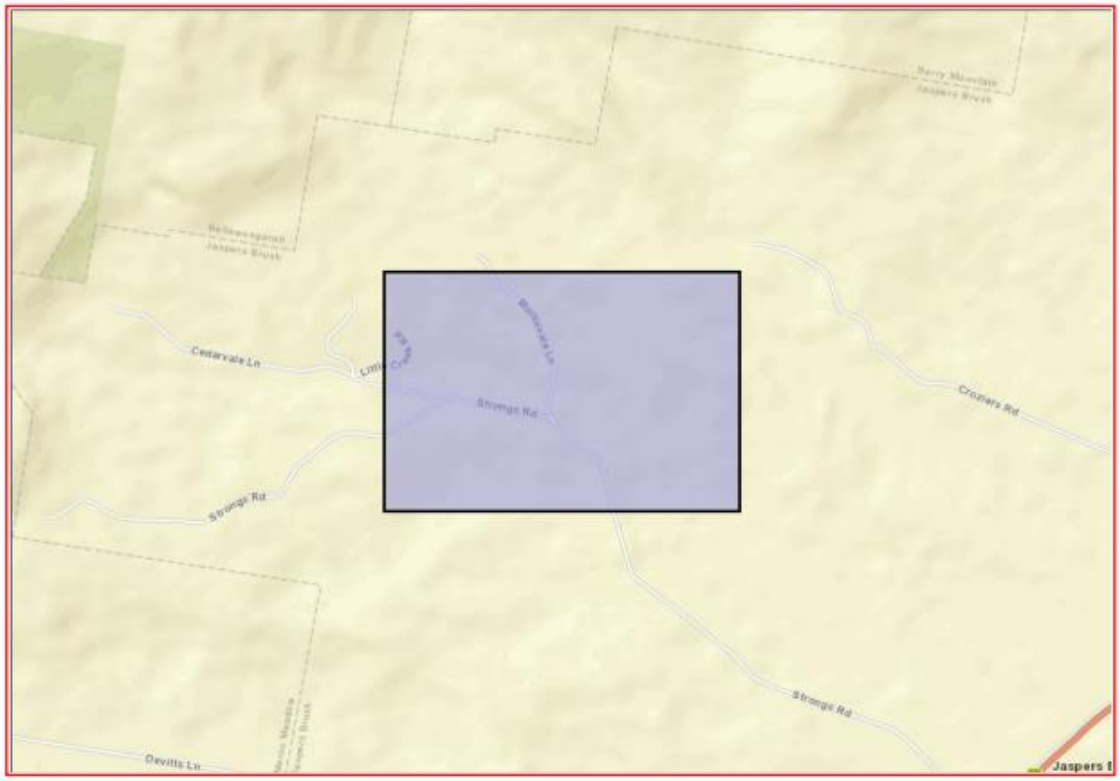
Shoalhaven City Council - Nowra
PO Box 42 Bridge Rd
Nowra New South Wales 2541
Attention: Jeff Bryant
Email: jeff.bryant@shoalhaven.nsw.gov.au

Date: 12 December 2022

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -34.7919, 150.6328 - Lat, Long To : -34.7831, 150.6483, conducted by Jeff Bryant on 12 December 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. *

A search on the Aboriginal Heritage Information Management System (AHIMS) on 12th December 2022 indicated that there are no recorded Aboriginal sites or places in the vicinity of the proposal (refer to AHIMS report in Figure 6).

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 cleared agricultural land and a disturbed and modified road reserve which has been subject to clearing, excavation and filling, construction and maintenance of the road and causeway, as well as natural erosion and accretion processes associated with the unnamed creek. 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 with caution.

3.5 Non-indigenous heritage

No items of local heritage significance or any items on the State Heritage Register or listed in the Shoalhaven Local Environmental Plan occur in close proximity to the site such that the proposed works might impact them.

3.6 Riparian corridors, Key Fish Habitat & Water quality

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

- Likely and potential impacts on vegetation as a result of construction activities;
- Sediment movement into waterways as a result of construction activities;

Riparian corridors

A Category 2 riparian corridor buffer associated with the unnamed tributary of Jaspers Creek occurs within the site (refer to Figure 7).

The riparian corridor in proximity to the site is largely unvegetated except for pasture grasses, however, patches of riparian vegetation occur to the north of the creek channel, both east and west of the causeway, in addition to scattered, isolated trees.

The proposal would not involve the removal of any trees or large shrubs, but would involve removal/disturbance of weeds as well as scattered native sedges and herbs which have grown over the accumulated cobbles.

The proposed works are intended to stabilise and protect the road and adjacent creek embankments.

The proposal would not impact on the function or integrity of the riparian corridor.

The proposal would therefore not result in significant impacts on riparian corridors.

Water Quality

Excavation would occur above the waterline over areas of accumulated cobble. Sediment and erosion controls would be implemented during works, including sediment fencing along the waterline edge to delineate works and minimise the risk of sediment movement into the waterway, as well as the use of temporary silt curtains across the creek, downstream of works, on days where works would occur in proximity to the waterline.

Dewatering is unlikely to occur, but if required, shall involve discharging of pumped water into bunding of geofabric-wrapped straw bales (or similar) on a grassed area with a 10 m (approx.) buffer to the creek to allow to slow infiltration into the groundwater for filtration of sediment.

Works would attempt to avoid rain events predicted to involve 50mm or more rain in a 7-day period.

No machinery would operate from within the water.

Following construction, the proposed stabilised embankments would minimise ongoing sediment and erosion impacts affecting and resulting from the site.

It is therefore concluded that sediment movement and the risk of impact on water quality, resulting from the proposal, would be negligible.

Key Fish Habitat

Key Fish Habitat (KFH) is mapped as occurring within and in proximity to the site in association with the unnamed tributary of Jaspers Creek (refer to Figure 7).

Proposed excavation, fill and construction of the stabilised embankments constitute dredging and reclamation activities in KFH requiring a permit under the *Fisheries Management Act 1994.* Refer to Section 4.2 below.

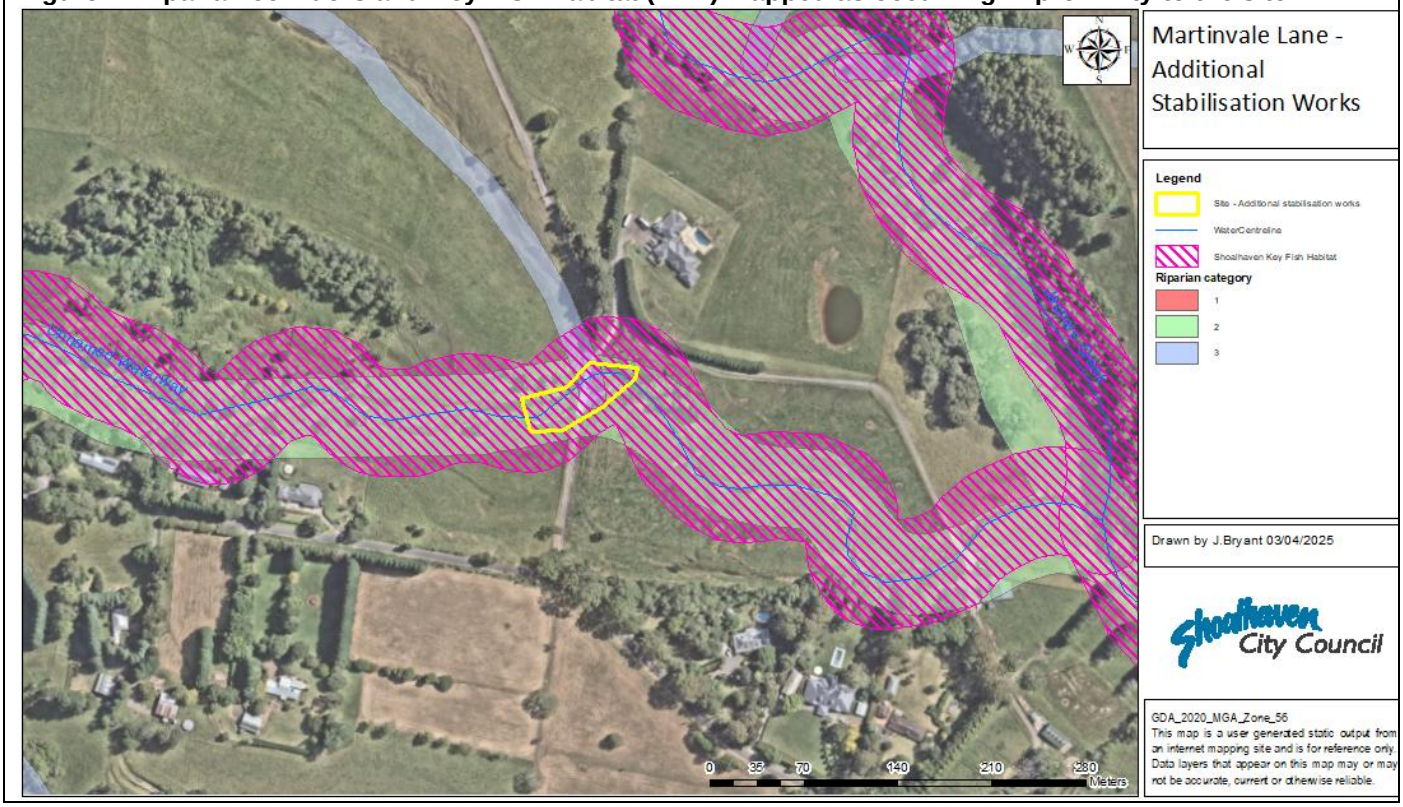
One shallow pool, to the south-west of the causeway and disconnected from the primary channel, would be filled in with large rock. No fish, eels or other aquatic fauna were observed in the pool during site investigations.

The proposal would not introduce new obstructions and would not significantly alter existing habitat features.

The inlet pipe for dewatering (if required) shall be covered with a 6 mm mesh screen to prevent fish being drawn into the pump. Monitoring of pools and relocation of any aquatic fauna shall be undertaken.

Aquatic habitat would therefore not be significantly altered or impacted by the proposal.

Figure 7. Riparian corridors and Key Fish Habitat (KFH) mapped as occurring in proximity to the site



3.7 Flood liable land

The site is subject to localised flooding during heavy and prolonged rain events, however the proposal does not occur on land which is mapped as being flood liable, and the proposal is not anticipated to adversely affect flood behaviour or exacerbate flooding risks.

Further consideration is not required or warranted.

3.8 Acid Sulfate Soil

The site and surrounds are mapped as Class 5 Acid Sulfate Soils. As the proposal would not result in any lowering of the watertable or excavation below 2.0m, it is considered there is no risk of exposure of Acid Sulfate Soils as a result of the proposed works

3.9 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, nor is it known to contain Aboriginal artefacts
- is not mapped as “potentially contaminated land”

3.10 EP&A Regulation – Section 171 matters of consideration

Section 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 3. Section 171 Matters of consideration

Does the proposal:	Assessment	Reason
a) Have any environmental impact on a community?	Positive	The purpose of the proposed activity is to stabilise and protect Martinvale Lane and adjacent creek embankments and provide greater immunity against failures of the road during flooding, thereby reducing risk and inconvenience to affected landowners and negating ongoing reinstatement of access. The proposal would retain but not upgrade or prolong the life of the existing causeway, noting that this interim design was developed as an initial stage of a final upgrade involving a series of angled box culverts spanning a 60 metre width of the waterway in place of the causeway – which would result in improved flow and fish passage along this section of the creek. Proposed works would occur within Martinvale Lane and adjacent private land (subject to agreement). 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?	Positive	The proposal would involve stabilising and protection of the creek embankment and Martinvale Lane. 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 3.2) 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 and nutrient into the ecosystem. Refer to prescribed environmental safeguards and mitigation measures (Section 7).
d) Cause a diminution of the	Low adverse	Removal of riparian vegetation would be limited to invasive exotic weeds and scattered sedges.

aesthetic, recreational, scientific or other environmental quality or value of a locality?		Stabilisation of creek embankments with Kyowa rock bags may reduce the aesthetic value of the site, but is considered required to prevent ongoing erosion of the creek banks in this location. 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 (refer particularly to Sections 3.1 and 3.6 above). 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 of the proposed activity has no significant aesthetic, architectural, cultural, historical, scientific or social values. No items in the vicinity of the work site which are listed on the State Heritage Register and the Shoalhaven Local environmental Plan would be impacted by the proposal (refer to Section 3.5). The site is not within an Aboriginal Place declared under the National Parks and Wildlife Act 1974. 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 3.4).
f) Have any impact on the habitat of protected fauna (within the meaning of the Biodiversity Conservation Act 2016)?	Low adverse	No important terrestrial habitat would be removed or otherwise impacted (refer to Sections 3.1 and 3.2.1 of this REF). The five-part test of significance, provided in Section 3.2 above, concludes that the proposed activity would not have a significant impact upon threatened fauna. Aquatic habitat would not be significantly altered or impacted by the proposal. The proposal would not significantly alter existing habitat features (refer to Section 3.2.1 and 3.6 of this REF). The prescribed environmental safeguards and mitigation measures (Section 7) would mitigate indirect impacts to fauna and habitat including through control of sediment.
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 3.2 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 threatened microbat species.
h) Have any long-term effects on the environment?	Positive	The proposal would address ongoing erosion of a section of an unnamed tributary of Jaspers Creek. Works would be relatively short term and the noise generated will occur during normal working hours. The proposed activity would not use hazardous substances or use or generate chemicals which may build up residues in the environment. 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?	Low-adverse	The proposal does not involve removal of riparian vegetation and would result in the stabilisation creek embankments. Kyowa rock bags proposed to be installed along the creek embankments would provide additional scour protection to reduce the risk of exacerbation of erosion impacts on downstream locations as a result of the proposal. 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 and nutrient into the ecosystem. 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?	Low-adverse	The proposed activity would not involve hazardous wastes and would not lead to increased bushfire or landslip risks. The activity is unlikely to adversely affect flood or tidal regimes or exacerbate flooding risks (refer to (i) above). The prescribed environmental safeguards and mitigation measures in Section 7
k) Cause any reduction in the range of beneficial uses of the environment?	Negligible	The site and local environment will remain relatively unchanged.
l) Cause any pollution of the environment?	Low adverse	The proposal would involve a temporary and local increase in noise during the construction phase due to the use of machinery. However, this will not affect any sensitive receivers such as residential areas, schools, childcare centres and hospitals.

		Sediment and erosion control in accordance with the Blue Book will be implemented to minimise movement of sediment into waterways. 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 NSW *Protection of the Environment Operations Act 1997*.
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?	Low adverse	The assessed low adverse or negligible impacts of the proposal are not likely to interact. Prescribed environmental safeguards and mitigation measures (Section 7) shall be implemented to minimise the risk of cumulative environmental effects. The current proposal would not significantly affect habitat connectivity or reduce any significant vegetation.
p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions	Negligible	The proposed activity would have no effect on coastal processes including those projected under climate change conditions. The site is not located in a coastal hazard area.
q) Any applicable local strategic planning statement, regional strategic	Positive	The proposed activity is consistent with Planning Priority 2 (Delivering Infrastructure) of the *Shoalhaven 2040* Strategic Land-use Planning Statement https://doc.shoalhaven.nsw.gov.au/displaydoc.aspx?record=D20/437277

plan or district strategic plan made under Division 3.1 of the Act		The proposed activity is not inconsistent with the Illawarra Shoalhaven Regional Plan 2041 (ISRP): 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
r) Any other relevant environmental factors	N/A	

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 2.108(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 road infrastructure facilities may be carried out by or on behalf of a public authority without consent on any land…"*

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. There is, therefore, no requirement to 'opt in' to the Biodiversity Offset Scheme.
- The design and mitigation measures (Section 7 of this REF) 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.

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.

Refer to Section 3.2 for more information.

4.3 Fisheries Management Act 1994

The proposed works would involve dredging and reclamation in water land which is regulated under Part 7 of the *Fisheries Management Act 1994*.

Section 200 of the Act prescribes circumstances where a local government can carry out dredging or reclamation, *i.e.*:

- Under the authority of a permit ("Fisheries Permit"), or
- Work authorised under the Crown Land Management Act 2016, or
- Work authorised by a relevant public authority (other than a local government authority).

Under the *Policy and guidelines for fish habitat conservation and management* (NSW DPI 2013), DPI Fisheries focuses the application of the FM Act and FM Regulations and associated policies and guidelines on "key fish habitats". Issue of a Fisheries Permit is typically required for activities constituting dredging or reclamation within or with potential to impact areas identified as Key Fish Habitat.

The site occurs within a waterway mapped as Key Fish Habitat (refer to Figure 9 above).

A Permit covering the proposed additional dredging and reclamation works has been obtained from NSW DPIRD Fisheries (permit PN24/228, SCC reference D24/208359).

Any works within the creek or riparian corridor shall be carried out in accordance with the Fisheries Permit and its conditions.

All works shall be undertaken in accordance with the Fisheries Permit.

Regarding other considerations of the FM Act, the proposal:

- would not affect declared aquatic reserves (Part 7, Division 2 of the Act);
- would not impact mangroves and marine vegetation (Part 7, Division 4);
- would not involve disturbance to gravel beds where salmon or trout spawn (s.208 of the Act);
- does not involve the release of live fish (Part 7, Division 7);
- does not involve the construction of dams and weirs (s.218);
- would not impact declared threatened species of endangered ecological communities (Part 7A);
- does not constitute a declared key threatening process (Part 7A); and
- would not use explosives in a watercourse (Clauses 70 and 71 of the *Fisheries Management (General) Regulation 2019).*

4.4 Other

A summary of other relevant legislation and permissibility is provided in Table 4 below.

Table 4. Summary of other relevant legislation and permissibility

NSW STATE LEGISLATION
Environmental Planning and Assessment Act 1979 **(EP&A Act)**
Permissible √ Not permissible ☐

The Transport and 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.

Shoalhaven Local Environmental Plan 2014 (SLEP)

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 proposed activity would be undertaken within an area which is not mapped for the purpose of the SEPP.

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 knowlingly 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 3.4 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*.

Refer to s3.5 of this REF for more information.

Water Management Act 2000
Permissible √ Not permissible ☐
• Local councils are exempt from s.91E(1) of the Act in relation to all controlled activites 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 3.3). The proposed activity is therefore not a controlled action and does not require commonwealth referral.
Commonwealth *Native Title Act 1993*
Permissible √ Not permissible ☐
The proposal would occur within a Public Road reserve (Martinvale Lane) and on Private Freehold land (Lot 5 DP 738163 and Lot 104 DP 814663). It is therefore assumed that Native Title has been extinguished as a Previous Exclusive Possession 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.

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

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

The proposal would temporarily impact the form and function of a public road for which Council who is undertaking the works, is also the road authority.

Consultation under clause 2.11 is therefore not required.

Clause 2.11 – Development with impacts on local heritage

No listed heritage items occur in proximity to the proposal. Refer to Section 3.5 for more information.

Consultation under clause 2.11 is therefore not required.

Clause 2.12 – Development with impacts on flood liable land

The proposal would not occur on land which is mapped as being flood liable (refer to Section 3.7) and the proposal is unlikely to change flood patterns other than to a minor extent.

Consultation under clause 2.12 is therefore not required.

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

The proposal constitutes a relevant provision for the clause, but would not occur on land which is mapped as being flood liable (refer to Section 3.7).

Consultation under clause 2.13 is therefore not required.

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

The proposal would not occur within a coastal vulnerability area. Consultation is therefore not required.

Clause 2.15 – Consultation with public authorities other than councils

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

- would not be undertaken on adjacent to land reserved under the *National Parks and Wildlife Act 1974* or 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*

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

Clause 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.

Summary

No consultation with government agencies under Part 2.2, Division 1 of the Transport & Infrastructure SEPP is required.

6. COMMUNITY ENGAGEMENT

In accordance with Council's Community Engagement Policy, the proposal constitutes a *Local Area – Low Impact* activity. Formal community engagement is not required.

Consultation with affected landowners shall continue through the proposal including:

- Permit to enter agreements shall be made with property owners of land which is affected by the works.
- Landowners and residents with property access on Martinvale Lane shall be notified of the proposal and advised of works timeframes and any proposed and likely disruptions to property access.

7. ENVIRONMENTAL SAFEGUARDS AND MEASURES TO MINIMISE IMPACTS

Safeguards and mitigation measures are prescribed unless otherwise stated.

Safeguard / Measure	Responsibility
Works planning, approvals, consultation & notification	
1. a) A Permit to Enter agreement shall be obtained with the landowner of Lot 5 DP 738163 (246A Strongs Rd, Jaspers Brush) prior to commencement of works. b) A Permit to Enter agreement shall be obtained with the landowner of Lot 104 DP 814663 220 Strongs Rd, Jaspers Brush prior to commencement of works.	SCC Project Manager; Construction contractor;
2. Landowners and residents of properties with access from Martinvale Lane shall be notified of the proposal and advised of works timeframes and any proposed and likely disruptions to property access.	SCC Project Manager; Construction contractor;
3. All works shall be undertaken in accordance with a NSW DPI Fisheries Permit for dredging and reclamation.	Construction Contractor
4. 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 and the guidelines published under cl.170.	SCC Environmental Officer
Site Establishment	
5. An appropriate traffic management plan shall be developed and implemented to minimise disruption and reduce risk of incident along Martinvale Lane during works.	Construction Contractor
6. Any construction compound, machinery, vehicles and stockpiles shall be located within existing cleared areas of the road reserve or neighbouring land (under agreement), and shall not encroach into native vegetation. A buffer of minimum 3 m to tree trunks and 10 m to watercourses shall be maintained.	Construction Contractor
7. Temporary fencing shall be installed as required to secure stock where removal of existing fencing is required for access.	Construction Contractor
8. All machinery to be used shall be cleaned, degreased and in good working order prior to entering the site.	Construction contractor
9. The contractor shall keep an emergency spill kit on-site at all times with procedures to contain and collect any leakage or spillage of fuels, oils and greases from plant and equipment.	Construction contractor

Safeguard / Measure	Responsibility
10. No major equipment maintenance works shall be undertaken on-site.	Construction contractor
11. 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	
12. Works shall be scheduled (to every practical extent) to avoid rain events predicted to involve 50 mm or more rain in a 7-day period.	Construction contractor
13. Erosion and sediment controls shall be installed and maintained in accordance with the Sediment & Erosion Control (SEC) plan (Figure 4 of this REF) and the 'Blue Book' (Landcom 2004) to prevent the entry of sediment into waterways including but not limited to: • Sediment fence shall be established along the dry edge of the waterline to define the works area prior to commencement and to capture potential movement of sediment into the creek. Alternative sediment capture devices (e.g. coir logs) may be used when installation of effective sediment fencing is not possible (e.g. across areas of large cobbles and rock). • Temporary in-stream combination hydrocarbon boom and silt curtains shall be installed across the creek below works on any day when works would occur within 3m of the waterline and shall be removed at the end of the day. Silt curtains shall not be left in place overnight, to minimise obstruction on fish passage. Erosion and sediment controls shall be maintained in good working order for the duration of the works and subsequently until the site has been stabilised and the risk of erosion is minimal.	Construction Contractor
14. No machinery shall operate within the water.	Construction Contractor
15. Temporary rock bridges/ramps (if required) shall be constructed with clean rock to enable machinery access from the causeway to accumulated rock mounds.	Construction Contractor
16. Dewatering (if required) shall involve discharging of pumped water into bunding of geofabric-wrapped straw bales (or similar) on a grassed area with a 10 m (approx.) buffer to the creek to allow to slow infiltration into the groundwater for filtration of sediment. The inlet pipe shall be covered with a 6 mm mesh screen to prevent fish being drawn into the	Construction Contractor

Safeguard / Measure	Responsibility
pump. Monitoring of pools and relocation of any aquatic fauna shall be undertaken.	
17. Excavation of accumulated material and filling of Kyowa rock bags shall not be undertaken over water.	Construction Contractor
18. No trees or large shrubs shall be removed.	Construction Contractor
19. Inspection of any pools shall be undertaken by Council's Environmental Officer immediately prior to filling, to relocate any potential resident aquatic fauna.	Construction Contractor; SCC Environmental Officer
20. Tree protection measures in accordance with AS4970 – *Protection of trees on development sites* shall be implemented to minimise the risk of impact to the structural root zones of trees to be retained.	Construction contractor
21. In the event that any wildlife be significantly disturbed or injured during works, Council's Environmental Officers are to be contacted on 4429 3405, or if unavailable, Wildlife Rescue – South Coast should be contacted on 0418 427 214, to rescue and relocate the animal(s).	Construction Contractor
22. Any waste material shall be contained within the land-based site during construction and then be removed to an authorised waste disposal facility or an appropriate storage area for reuse elsewhere. No material shall be placed in any location or in any manner that would allow it to enter the waterway. Stockpiles of debris and construction materials shall be stored at least 10 metres outside the top of the creek banks. General refuse shall be disposed of to a covered container stored at the site. No waste shall be burnt or buried on-site or disposed of in the waterway.	Construction contractor
23. 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.	Construction Contractor
24. Staff working at the site will be instructed to stop work immediately on identification of any suspected Aboriginal heritage artefact. If any objects are found, NSW Environment Line (ph:131 555) shall be contacted.	Construction Contractor
25. Disturbed table drains and road batters and upper creek embankments shall be stabilised following construction with jute mesh and seeding and /or hydromulch containing suitable grass and endemic sedge species.	Construction Contractor

Safeguard / Measure	Responsibility
26. Remediation of the construction compound area shall involve removal of all stockpiled material, dressing and turfing or seeding of grassed areas, as required to return the area to its existing state prior to establishment of the compound.	Construction Contractor
27. Any fencing removed for access shall be reinstated or replaced to at least the same standard as existing prior to works.	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 additional stabilisation works to address ongoing erosion of an unnamed tributary of Jaspers Creek, impacting on Martinvale Rd, Jaspers Brush.

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. The following statutory approvals, licences, permits and external government consultations are required (refer to Section 7 safeguards and mitigation measures for more information):
    - NSW DPI Fisheries Permit for dredging and reclamation
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:

Michael Berzins

Manager – Works & Services

Shoalhaven City Council Date: 28 April 2025

9. REFERENCES

Bryant, J. 2022. *Review of Environmental Factors (REF) Martinvale Lane Unnamed Creek Interim Stabilisation Works.* Shoalhaven City Council.

DAWE (Department of Agriculture, Water and the Environment, Australian Government). 2021. *Species Profiles and Threats Database* (online database). Available at https://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl

DECCW (Department of Environment, Climate Change and Water, NSW) 2010 Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales.

DoE (Department of Environment, Commonwealth of Australia). 2013. *Matters of National Environmental Significance Significant Impact Guidelines 1.1*. Available at: http://155.187.2.69/epbc/guidelines-policies.html

EES (Environment, Energy and Science – NSW Department of Planning, Industry and the Environment). 2020. *Surveying threatened plants and their habitats*.

Fisheries Scientific Committee 2007 *Determination: Degradation of Native Riparian Vegetation along New South Wales Water Courses.* *https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0009/636534/FR19-riparian-vegetation.pdf*

Jones, D.L. 1988. *Native orchids of Australia*. Reed Books Pty Ltd: Frenches Forest, NSW.

Klaphake, V. 2010. Eucalypts of the Sydney region (2nd edn.). Van Klaphake: Byabarra, NSW.

NSW Government. 2022. *Threatened Biodiversity Data Collection* (online database). Available at: https://www.environment.nsw.gov.au/AtlasApp/UI_Modules/TSM_/Default.aspx

OEH (NSW Office of Environment and Heritage). 2020. *Southern Myotis – profile*. Available at: https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10549

OEH (NSW Office of Environment and Heritage). 2022a. *Eastern Coastal Free-tailed Bat – profile*. Available at: https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10544

OEH (NSW Office of Environment and Heritage). 2022b. *Greater Broad-nosed Bat – profile*. Available at: https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10748

OEH (NSW Office of Environment and Heritage). 2022c. *Yellow-bellied Sheathtail-bat – profile*. Available at: https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10741

Richards, G.C. & Hall, L.S. 2012. *A natural history of Australian bats: Working the night shift*. CSIRO Publishing: Collingwood, Victoria.

APPENDIX A – Threatened Species Likelihood of Occurrence

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/).

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).

Endangered Ecological Community name	***Status***	***Likelihood of presence within areas impacted by the activity***
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 (nearest records are approx. 2.4km to the north-east of the site).
Illawarra Subtropical Rainforest in the Sydney Basin Bioregion	Endangered - *NSW* BC *Act*	Is mapped as occurring extensively in the locality including approx. 580m to the south of the site. Vegetation mapped as occurring around and in proximity to the site is associated with the EEC, but site surveys confirmed that the EEC does not occur within or in close proximity to the site, such that there is risk of impact as a result of the proposal.
Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions	Endangered - *NSW* BC *Act* Endangered - Commonwealth *EPBC Act*	Does not occur on-site and is not mapped as occurring in close proximity to the site (nearest records are approx. 2.29km to the south-south-west of the site).

Species name	***Status***	***Habitat requirements (www.environment.nsw.gov.au)***	***Likelihood of presence within areas impacted by the activity***
FLORA			
Lastreopsis hispida Bristly Shield Fern	Endangered NSW BC Act	Grows in rich humus-rich soils in wet forest and rainforest gullies.	Does not occur on site. No suitable habitat. A conspicuous species not detected during surveys.
Rhodamnia rubescens Scrub Turpentine	Critically Endangered NSW BC Act	Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.	Does not occur on site. A conspicuous species not detected during surveys.

Syzygium paniculatum Magenta Lilly Pilly	Vulnerable EPBC Act Endangered NSW BC Act	On the south coast the Magenta Lilly Pilly occurs on grey soils over sandstone, restricted mainly to remnant stands of littoral (coastal) rainforest.	Does not occur on site. A conspicuous species not detected during surveys.
MICRO-CHIROPTERAN BATS			
Eastern Coastal Freetail-Bat *Micronomus norfolkensis*	*Vulnerable NSW* BC *Act* Vulnerable *EPBC Act*	Small tree hollows/fissures in bark for roosting in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range.	Possibly occurring transiently within or in proximity to the site, but no habitat exists for the species.
Greater Broad-nosed Bat *Scoteanaux ruepelli*	Vulnerable *NSW* BC *Act*	Found mainly in gullies and river systems that drain the Great Dividing Range, it utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, below 500m, though it is most commonly found in tall wet forest. Although this species usually roosts in tree hollows, it has also been found in buildings. Forages after sunset, flying slowly and directly along creek and river corridors at an altitude of 3 - 6 m	Possibly occurring transiently within or in proximity to the site, but no habitat exists for the species.
Large (Eastern) Bentwing-bat *Miniopterus orianae oceanensis*	NSW BC Act Vulnerable	Specific caves are known maternity sites with other caves being primary roosting habitat outside breeding period. Also uses derelict mines, storm-water tunnels, buildings and other man-made structures. Hunts in forested areas, catching moths and other flying insects above the tree tops.	Possibly occurring transiently within or in proximity to the site, but no habitat exists for the species.
Large –eared Pied Bat *Chalinobolus dwyeri*	Vulnerable *NSW* BC *Act* Vulnerable *EPBC Act*	Found mainly in areas with extensive cliffs and caves, from Rockhampton in Queensland south to Bungonia in the NSW Southern Highlands. It is generally rare with a very patchy distribution in NSW. There are scattered records from the New England Tablelands and North West Slopes. Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy	Possibly occurring transiently within or in proximity to the site, but no habitat exists for the species.

		Martin (*Petrochelidon ariel*), frequenting low to mid-elevation dry open forest and woodland close to these features	
Southern Myotis (Large-footed Myotis) *Myotis macropus*	Vulnerable *NSW* BC *Act*	This species is predominantly roosts in caves, however, is known to roost in trees and man-made structures close to water. Roosts are generally located close to water, where the bats forage in small groups of three or four. They have a strong association with streams and permanent waterways in areas that are vegetated rather than cleared (Churchill, S 2008, Australian Bats, Jacana Books, Crows Nest, NSW They feed on small fish, prawns and aquatic macroinvertebrates. They have a preference towards large still pools, rather than flowing streams. They will also forage an aerial insects flying over water. They use their large feet to capture prey items (Churchill 2008).	Possibly occurring transiently within or in proximity to the site, but no habitat exists for the species.
Yellow-bellied Sheathtail-bat *Saccolaimus flaviventris*	Vulnerable *NSW* BC *Act*	Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. When foraging for insects, flies high and fast over the forest canopy, but lower in more open country. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory. Breeding has been recorded from December to mid-March, when a single young is born. Seasonal movements are unknown; there is speculation about a migration to southern Australia in late summer and autumn	Possibly occurring transiently within or in proximity to the site, but no habitat exists for the species.
BIRDS			
Black-necked Stork *Ephippiorhynchus asiaticus*	Endangered *NSW* BC *Act*	Floodplain wetlands (swamps, billabongs, watercourses and dams) of the major coastal rivers are the key habitat in NSW for the Black-necked Stork. Secondary habitat includes minor	Unlikely to occur. No suitable habitat present within the site.

		floodplains, coastal sandplain wetlands and estuaries. Storks usually forage in water 5-30cm deep for vertebrate and invertebrate prey. Eels regularly contribute the greatest biomass to their diet, but they feed on a wide variety of animals, including other fish, frogs and invertebrates (such as beetles, grasshoppers, crickets and crayfish). Black-necked Storks build large nests high in tall trees close to water. Trees usually provide clear observation of the surroundings and are at low elevation (reflecting the floodplain habitat). In NSW, breeding activity occurs May - January; incubation May - October; nestlings July - January; fledging from September. Parents share nest duties and in one study about 1.3-1.7 birds were fledged per nest. The NSW breeding population has been estimated at about 75 pairs. Territories are large and variable in size. They have been estimated to average about 9,000ha, ranging from 3,000-6,000ha in high quality habitat and 10,000-15,000ha in areas where habitat is poor or dispersed.	
Eastern Bristlebird- *Dasyornis brachypterus*	Endangered EPBC Act Endangered NSW BC Act	Sedgeland/heathland/dry sclerophyll and woodlands- / requires thick shrub/heath layer for shelter, nesting and foraging	Unlikely to occur. No suitable habitat present within the site.
Gang-gang Cockatoo *Callocephalon fimbriatum*	*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 transiently over or in proximity to the site. No suitable nesting habitat is present. No important foraging habitat occurs.

Glossy Black-cockatoo *Calyptorhynchus lathami*	Vulnerable *NSW* BC *Act*	The GBC inhabits open forest and woodlands of the coast where stands of she-oak occur. In the Jervis Bay region they feed almost exclusively on the seeds of the black she-oak *Allocasuarina littoralis*, shredding the cones with their bill	Possibly occurring transiently over or in proximity to the site. No suitable nesting habitat is present. No suitable foraging habitat occurs.
Pilotbird *Pycnoptilus floccosus*	Vulnerable EPBC Act	Pilotbirds are small, plump, ground-dwelling birds, about 18 cm long and endemic to south-east Australia. Upland Pilotbirds occur above 600 m in the Brindabella Ranges in the Australian Capital Territory, and in the Snowy Mountains in New South Wales and north-east Victoria. Lowland Pilotbirds occur in forests from the Blue Mountains west of Newcastle, around the wetter forests of eastern Australia, to Dandenong near Melbourne. Pilotbirds are strictly terrestrial, living on the ground in dense forests with heavy undergrowth. Largely sedentary, they are typically seen hopping briskly over the forest floor and foraging on damp ground or among leaf-litter. Flight is described as fairly weak, though, if disturbed, birds can sometimes ascend into shrubs (but no more than 1–2 m from the ground). They are typically seen in pairs or occasionally in family parties, occupying small territories all year round. Birds forage mostly in pairs for insects, and occasionally eat seeds and fruits. Pilotbirds have been associated with Superb Lyrebirds (Menura novaehollandiae), foraging in their wake as they scratch the forest floor. Adults build a domed nest on or near the ground in which they usually lay two eggs. Habitat critical to the survival of the Pilotbird includes: wet sclerophyll forests in temperate zones in moist gullies with dense undergrowth; and dry sclerophyll forests and woodlands occupying dry slopes and ridges (EPBC 2022: http://www.environment.gov.au/biodiversity/threat	Unlikely to occur. No suitable habitat present within the site.

		ened/species/pubs/525-conservation-advice-02032022.pdf)	
Powerful Owl *Ninox strenua*	Vulnerable NSW BC Act	Coastal Woodland, Dry Sclerophyll Forest, wet sclerophyll forest and rainforest- Can occur in fragmented landscapes Roosts in dense vegetation comprising species such as Turpentine *Syncarpia glomulifera*, Black She-oak *Allocasuarina littoralis*, Blackwood *Acacia melanoxylon*, Rough-barked Apple *Angophora floribunda,* Cherry Ballart Exocarpus cupressiformis and a number of eucalypt species. requires old growth elements-hollow bearing tree resources for nesting and prey resource. Nests in large tree hollows in large eucalypts that are at least 150yrs old. Often in riparian areas. Large home range	Possibly occurring transiently within the site. Potential foraging habitat exists, but no suitable nesting hollows are present. No important habitat would be affected.
Scarlet Robin *Petroica boodang*	Vulnerable *NSW* BC *Act*	The Scarlet Robin is primarily a resident in dry forests and woodlands, but some adults and young birds disperse to more open habitats after breeding.	Unlikely to occur. No suitable habitat present within the site.
Sooty Owl *Tyto tenebricosa*	Vulnerable *NSW* BC *Act*	Occurs in rainforest, including dry rainforest, subtropical and warm temperate rainforest, as well as moist eucalypt forests	Possibly occurring transiently within the site. Potential foraging habitat exists, but no suitable nesting hollows are present. No important habitat would be affected.
Square-Tailed Kite *Lophoictinia isura*	*Vulnerable NSW* BC *Act*	Summer breeding migrant to the south-east, including the NSW south coast, arriving in September and leaving by March. Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses large hunting ranges of more than 100km2. Breeding is from July to February, with nest sites generally located along or within 200m of riparian areas, near watercourses, in a fork or on large horizontal limbs.	Possibly occurring transiently through the site. No large stick nests observed during surveys. Unlikely to be affected in any way by the proposal. No important habitat occurs.

White-bellied Sea-Eagle *Haliaeetus leucogaster*	*NSW* BC *Act* Vulnerable Migratory *EPBC Act*	Found in coastal habitats (especially those close to the sea-shore) and around terrestrial wetlands in tropical and temperate regions of mainland Australia and its offshore islands. The habitats occupied by the sea-eagle are characterized by the presence of large areas of open water (larger rivers, swamps, lakes, the sea). Birds have been recorded in (or flying over) a variety of terrestrial habitats. The species is mostly recorded in coastal lowlands, but can occupy habitats up to 1400 m above sea level on the Northern Tablelands of NSW and up to 800 m above sea level in Tasmania and South Australia. Birds have been recorded at or in the vicinity of freshwater swamps, lakes, reservoirs, billabongs, saltmarsh and sewage ponds. They also occur at sites near the sea or sea-shore, such as around bays and inlets, beaches, reefs, lagoons, estuaries and mangroves. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, forest (including rainforest) and even urban areas. Breeding has been recorded on the coast, at inland sites, and on offshore islands. Breeding territories are located close to water, and mainly in tall open forest or woodland, although nests are sometimes located in other habitats such as dense forest (including rainforest), closed scrub or in remnant trees on cleared land.	Unlikely to occur. No suitable habitat present within the site.
White-throated Needletail *Hirundapus caudacutus*	Migratory *EPBC Act*	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	Possibly occurring transiently through the site. Unlikely to be affected in any way by the proposal. No important habitat occurs.

		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.	
MAMMALS			
Eastern Pygmy-possum *Cercatetus nanus*	Vulnerable NSW BC Act	Rainforest, sclerophyll forest & woodland to heath – but heath & woodland preferred. Forages on banksias, eucalypts & bottlebrushes.	Unlikely to occur. No suitable habitat present.
Grey-headed Flying-fox *Pteropus poliocephalus*	Vulnerable *EPBC Act* Vulnerable *NSW* BC *Act*	Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy.	Possibly occurring transiently within or in proximity to the site. Unlikely to be affected in any way by the proposal. No important habitat occurs. No foraging habitat would be removed. Works would occur outside nocturnal foraging times.
Koala *Phascolarctos cinereus*	Vulnerable NSW BC Act	Eucalypt woodland and forest Home range sizes vary with quality of habitat ranging from less than two ha to several hundred ha. Preferred tree species on the south coast are *Eucalyptus amplifolia, E.viminalis, & E.tereticornis* but numerous other species also known food trees.	Unlikely to occur. No suitable habitat present.
Spotted-tailed Quoll *Dasyurus maculatus*	Endangered *EPBC Act* Vulnerable *NSW* BC *Act*	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 caves, rock outcrops and rocky-cliff faces	Unlikely to occur. No suitable habitat present. Possibly occurring transiently through site, but unlikely considering how degraded and disconnected the riparian corridor is.

		as den sites. 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.	
Yellow-bellied Glider - *Petaurus Australis*	Vulnerable *NSW* BC *Act*	Forest with old growth elements. Large Eucalypt Hollows for denning- Inhabits mature or old growth Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia mid storey. Feed primarily on plant and insect exudates, including nectar, sap, honeydew and manna with pollen and insects providing protein. Extract sap by incising (or biting into) the trunks and branches of favoured food trees, often leaving a distinctive 'V'-shaped scar. Very mobile and occupy large home ranges between 20 to 85 ha to encompass dispersed and seasonally variable food resources.	Unlikely to occur. No suitable habitat present.