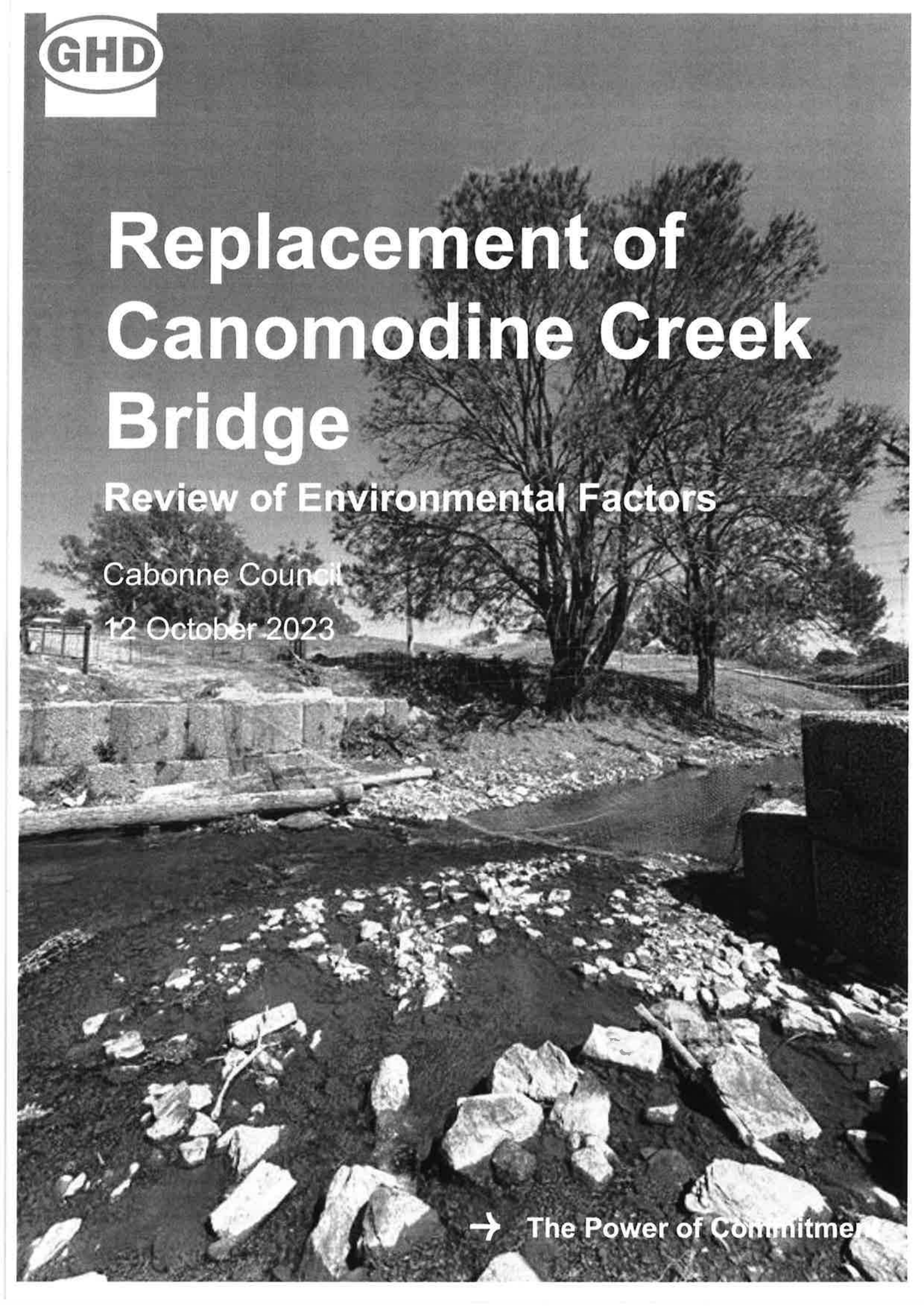
GHD
Replacement of Canomodine Creek Bridge
Review of Environmental Factors
Cabonne Council
12 October 2023
→ The Power of Commitme

Project name		Cabonne REF Nyrang Ck and Canomodine Ck Bridge replacement					
Document title		Replacement of Canomodine Creek Bridge | Review of Environmental Factors					
Project number		12622302					
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Status Code	**Revision**	**Author**	**Reviewer**		**Approved for issue**		
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S4	1	H. Marsh B. Rees	D. Collaguazo		D. Mees		12/10/23

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1. Introduction

Cabonne Council (Council) has engaged GHD Pty Ltd (GHD) to prepare a Review of Environmental Factors (REF) for the proposed replacement of Canomodine Creek Bridge in Canowindra, NSW (the proposal). During major flooding in November 2022 the old bridge was completely washed downstream Canomodine Creek leaving only the remnants of the southern concrete abutment and a few mass concrete blocks on the northern side.

1.1 The proposal

Council proposes the following:

- Demolition and removal of remaining debris and abutments from existing bridge
- Construction of a new single lane concrete girder bridge on the existing road alignment with new deck level and bridge length to suit hydraulic requirements
- Re-installation of guardrail
- Removal of temporary gravel causeway back to the original creek level
- Rehabilitation of disturbed vegetation

The proposal is further described in Section 2 and concept plans are provided in Appendix A.

1.2 Purpose of this REF

This REF has been prepared by GHD on behalf of Council to assess the potential impacts of the proposal. For the purposes of these works, Council is the proponent and the determining authority under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The purpose of this REF is to describe the proposal, to assess the likely impacts of the proposal to having regard to the provisions of Section 5.5 of the EP&A Act, and to identify mitigation measures to reduce the likely impacts of the proposal. In doing so, the REF helps to fulfil the requirements of Section 5.5 of the EP&A Act including that Council examine and take into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity. This REF has been prepared in accordance with:

- Section 171 of the Environmental Planning and Assessment (EP&A) Regulation 2021
- Guidelines for Division 5.1 assessments (Department of Planning and the Environment (DPE), 2022)
- Relevant provisions of other relevant environmental legislation, including the *Biodiversity Conservation Act 2016* (BC Act), *Fisheries Management Act 1994* (FM Act) and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)

The findings of the REF would be considered when assessing:

- Whether the proposal is likely to have a significant impact on the environment and therefore the necessity for an environmental impact statement to be prepared and approval be sought from the Minister for Planning and Public Spaces under Division 5.1 of the EP&A Act.
- The significance of any impact on threatened species as defined by the BC Act and/or FM Act, and whether the proposal requires a Species Impact Statement or Biodiversity Development Assessment Report.
- The significance of any impact on any matters of national environmental significance (MNES) listed under the EPBC Act, with a focus on biodiversity matters, including:
  - Whether there is a real possibility that the activity may threaten long-term survival of these matters.
  - Whether offsets are required and able to be secured.
  - The need or otherwise to make a referral to the Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW) for a decision by the Commonwealth Minister for the Environment and Water on whether assessment and approval is required under the EPBC Act.

Table 1.1 outlines the proponent contact details.

Table 1.1 Proponent details

Proposal Name	Replacement of Canomodine Creek Bridge
Proponent Name	Cabonne Council
Project Manager	Wayne Harris
Contact Details	P 0437-744487 E wharris@uprightmanagement.com.au

1.3 Scope and limitations

This report has been prepared by GHD for Cabonne Council and may only be used and relied on by Cabonne Council for the purpose agreed between GHD and Cabonne Council as set out in Section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other than Cabonne Council arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer Section 1.4 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

1.4 Assumptions

Assumptions made by GHD when preparing this REF include (but are not limited to):

- The proposal has been assessed based on the reports and designs provided by Council and its consultants.
- The proposal is limited to the works described in Section 2 only.
- The proposal has been assessed assuming the implementation of the safeguards and mitigation measures detailed in Section 5 of this report.

2. The proposal

2.1 Proposal location and context

2.1.1 Location of the proposal

The proposal site is located on Canomodine Lane within the suburb of Canowindra and Cabonne Local Government Area (LGA). The regional context of the proposal site and construction impact zone are shown in Figure 2.1. Location details are described in Table 2.1.

Table 2.1 Location of the proposal

Criteria	Details
Coordinates in latitude/longitude (GDA94-Geographic)	33°30'28.93" S, 148°47'31.65" E
Street address	Canomodine Lane
Locality	Canowindra, NSW, Australia
Nearest town distance	12 km northeast of Canowindra, NSW

2.1.2 Proposal site

The size of the proposal site would be approximately 2,500 m². The proposal site consists of:

- Site construction compound
- Bridge replacement works extent
- Traffic diversion through temporary gravel causeway

The exact extent of works for the bridge would be determined at the time of works but they would not exceed an area of 3.07 hectares as defined in the proposal plans and included in Appendix A.

2.1.3 Study area

For the purpose of this REF the following definitions apply

- Proposal site – The area that would be directly affected by construction and operation of the proposal.
- Study area – The area investigated as part of this REF which includes the proposal site and surrounding area within a 100 m radius of the proposal site.
- Locality – the area within a 10 km radius of the proposal site.

2.1.4 Site context

The proposal site context is described in Table 2.2.

Table 2.2 Site context

Criteria	Description
Great Soil Group soil type map of NSW & Australian Soil Classification (ASC) Soil Type Map of NSW	Dermosols (DE).
NSW Acid Sulfate Soil (ASS) Risk map	Area mapped as extremely low probability of ASS.
Elevation (m AHD)	350 m AHD.

Criteria	Description
Topography	The topography in the vicinity of the site is defined by a relatively level surface of land on the northern side of the bridge with gentle slopes down to the creek bed of Canomodine Creek. In contrast, the southern side of the bridge has a stepper gradient that slopes down to the bridge at an angle of approximately 20 degrees. The banks of the creek are absent of any thick terrain and consists predominately of medium sized cobble.
Drainage/hydrology	The proposal site drains in a westerly direction into Canomodine Creek (refer to Figure 2.1).
Water catchment	Lachlan catchment
Flood prone land	The proposal site is located on flood prone land.
Bushfire prone land	The proposal site is located in Vegetation Category 1 and 3.
Location of services	There is no indication that services would be impacted based on the site visit undertaken by GHD. Contractors would be required to carry out their own investigations prior to construction works to confirm if utilities are present and make appropriate investigation to their location if their presence is noted.

2.1.5 Land use and ownership

Land use and ownership of the proposal site are described in Table 2.3.

Table 2.3 Land use and ownership

Criteria	Description
Land use zoning at the proposal site	RU1 Primary Production under Cabonne Local Environmental Plan (LEP) 2012.
Land use at proposal location	– Waterway – Bridge/Road
Land uses surrounding the proposal site	The predominant land use surrounding the existing bridge is typically agricultural with sparse pockets of rural housing and properties to the north and east.
Who owns the site (within the accepted road reserve)?	Council is responsible for the accepted road reserve.
Is land to be acquired as part of the proposal?	All works would remain within the road reserve. No land acquisition is required.
Do any works, including access requirements, impinge on a National Park or land owned by National Parks and Wildlife Service (NPWS)?	No.

2.1.6 Site inspection

A site walkover was conducted by GHD environmental consultants on 14 September 2023. Selected site photos taken during the site visit are presented in Table 2.4.

Table 2.4 Site inspection photos 14 September 2023.

Photo 1 Remainng concrete southern abundements of Canomodine bridge (looking south).

Photo 2 Current flow and quality of water in Canomodine creek (looking west)

Photo 3 Location of constuction compound in the distance on the southern side of the birdge

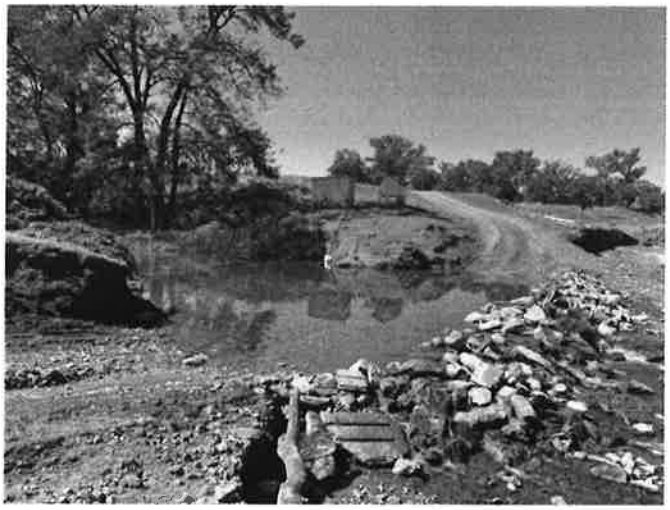


Photo 4 Tempoary gravel causeway utilised by local residents

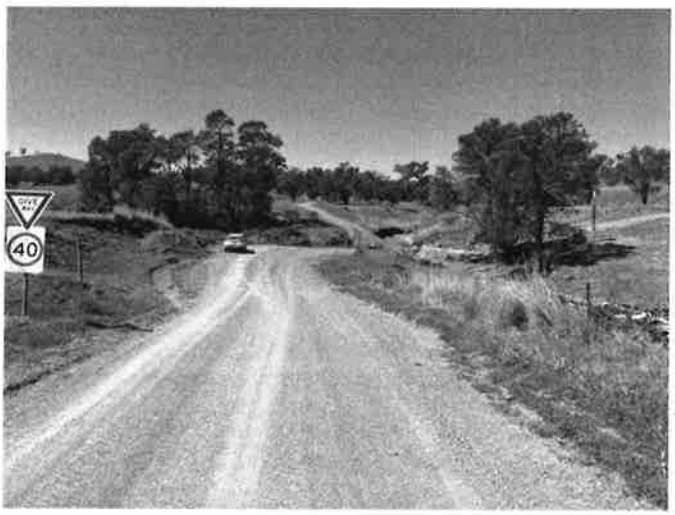
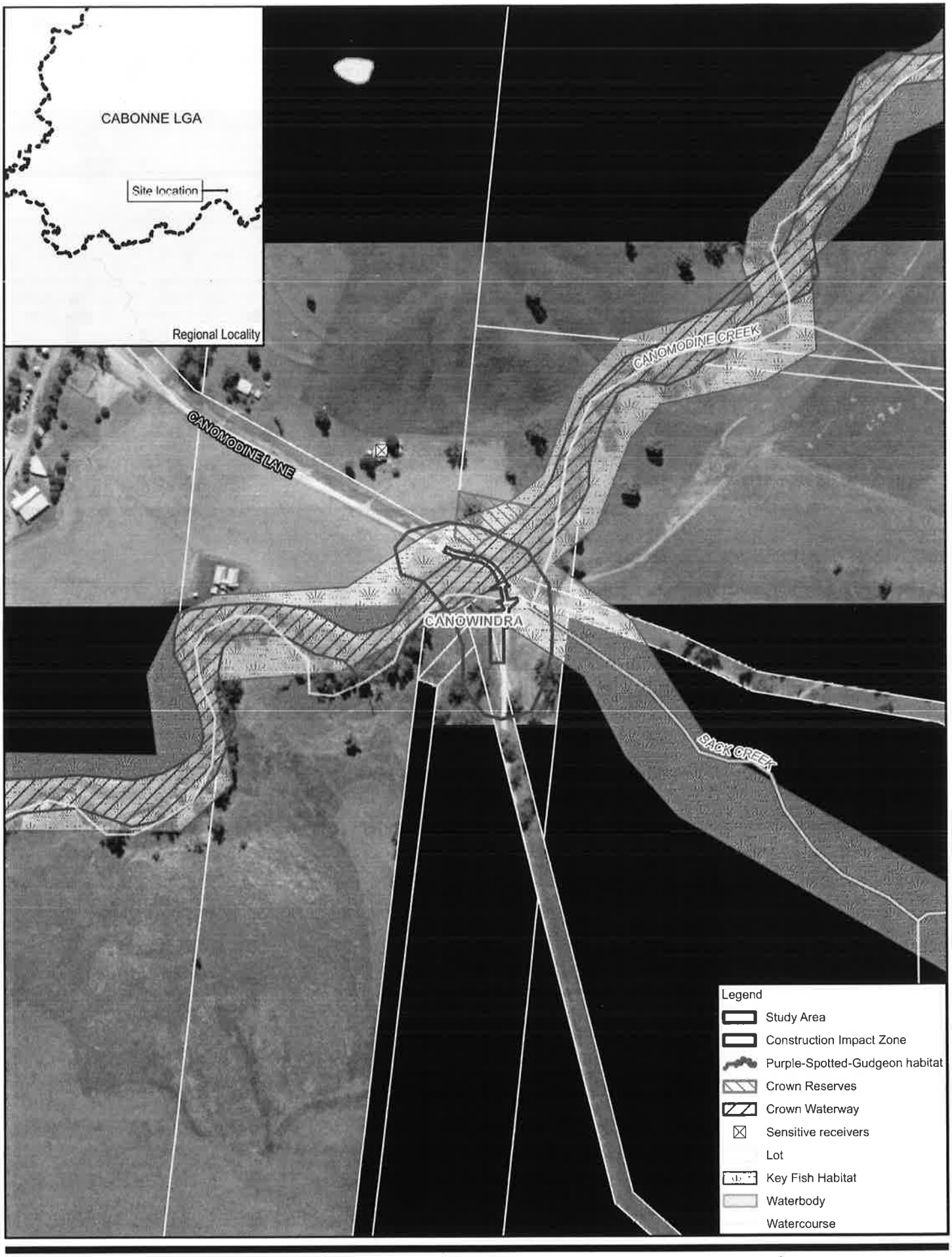


Photo 5 Width of road reseve to be utilised as a turning circle for vehciles during construction

Photo 6 Potenital lay down area considred for machinery and equipment off Canomodine Lane



Paper Size ISO A4

0 30 60 90 120

Metres

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Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

GHD

Cabonne Council
Bridge replacement
Review of Environmental Factors

Canomodine Creek
Site location

Project No. **12622302**
Revision No. **A**
Date **28/02/2023**

FIGURE 2.1

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Print date: 29 Sep 2023 - 09:58

Data source: SSI: PSG, 2023; LPI: DTDB / DCDB, 2023; Light Gray Base: Esri, HERE, Garmin, Foursquare, FAO, METI/NASA, USGS
sixmaps/LPI_Imagery_Best: © Department of Customer Service 2020
Light Gray Reference: Esri, HERE, Garmin, Foursquare, FAO, METI/NASA, USGS. Created by: kpsroba

2.2 Proposal justification and consideration of alternatives

2.2.1 Need for the proposal

In November 2022 major flooding engulfed many parts of south-eastern Australia including Canowindra, in the Central West of NSW. During major flooding, the Canomodine Bridge was completely washed away leaving behind only small remains of the concrete abutments. Due to the severity of the damage, the remaining abutments are deemed non-compliant with current design standards and are therefore unsuitable to be reused as structural elements for the new bridge.

Local residents have been utilising a temporary low-level gravel causeway crossing installed by Council which is located immediately upstream from the existing bridge. The bridge services Canomodine Station, a residence a few paddocks east of the bridge and another rural property further south of the bridge.

Council is eligible for financial assistance under the *NSW Disaster Assistance Guidelines* to fund the construction of a replacement bridge. However, this funding is constrained to a like-for-like replacement bridge that must link in with the existing road alignment.

The proposal is required to:

- Replace the bridge
- Ensure the road and bridge complies with current Australian Standards
- Enable the bridge to return to pre-flood conditions
- Maintain safety for local residences

Council is responsible for managing road related transport infrastructure and providing safe and efficient access for the local road network.

2.2.2 Proposal objectives

The key objectives of the proposal are to:

- Restore the road / bridge to a serviceable condition and improve the resilience of the structure to major flooding events in the future.
- Reinstate safe access to local users in the rural regional community.

2.2.3 Options

The following options were considered for the proposal:

- **Option 1 – Do nothing**

  This option would leave the bridge in its current deteriorated and unserviceable condition and involve not replacing the bridge. This option would not meet road safety standards.
- **Option 2 – Replace the bridge (preferred option)**

  This option would involve removing the remaining remnants of the old bridge and replacing the bridge with a single lane concrete girder bridge to align with current engineering standards. This option would involve minor impacts on the environment through disturbance of a waterway and minor interruption to local road users.

2.2.4 Justification for preferred option

Replacing the bridge option (option 2) is the preferred option as it will enable the road and bridge to return to pre flood conditions. This option meets the proposal objectives as it will ensure the bridge and road comply with current safety standards and also maintains safety for local road users.

2.3 Construction

2.3.1 Construction methodology

Specific details of construction methods, scheduling and equipment requirements would be determined by the contractor once engaged by Council. Information in this section relates to the general site arrangements and the scope of works. On average about 20 personal would be required for the proposal works, staffing would be confirmed by the successful works contractor. The works contractor would need to provide necessary accommodations for light vehicles and amenities for the staff on the proposal.

Before works can commence, any remaining material would be removed and relocated temporarily to the site compound area so that a solid working base can be established. Footings and concrete abutments would be installed. A bridge deck with an overall deck length of 14.5 meters (m) and a deck level at RL 347.80 would be installed. This higher deck level is required to enable construction of a much thicker and more flood-resilient bridge deck compared to the previous structure. Street furniture would be installed on and around the new bridge. The connecting road would remain as a gravel rural road with localised rip-rap scour protection installed around the new bridge abutments to tie the new bridge into the adjacent creek banks.

2.3.2 Construction compound

A temporary construction compound is proposed to be established within the road corridor, on council owned land. The proposed construction compound (approximately 70 metres long) would be located on the western side of Canomodine Lane on the southern side of the original bridge (Figure 2.1). If a larger compound is required for storage of equipment, this would be determined by the construction contractor in discussions with Council and the private landowners (where required). If an additional compound is required to be located in an area outside the road corridor, it would be located in an area that is clear of vegetation, drainage lines and heritage items. The compound area would be secured using temporary fencing and is likely to consist of:

- Site shed
- Parking
- Equipment laydown area
- Waste receptacles
- Storage areas for construction materials
- Site amenities

Site amenities would be provided for site workers, which would be appropriately managed by a licenced contractor.

2.3.3 Plant and equipment

The proposal would require a range of construction plant and equipment. The following is an indicative list of equipment that would be required for the proposal:

- Crane
- Skid loaders
- Boom lift
- Bulldozer
- Cherry picker
- Chainsaw
- Excavator
- Trucks
- Light vehicles
- Pile driving equipment
- Loader
- Concrete mixers and pumps

- Rollers
- Power tools

2.3.4 Site access and vehicle movements

Construction access to the proposal site would be from the west from Canomodine Lane on the northern outskirts of Canowindra via a two-way, predominantly unsealed road. Canomodine Lane is currently open in both directions through use of the temporary gravel causeway constructed by Council to provide residents with access while the bridge is unserviceable and during construction works but is limited to a single lane of traffic. This access could be restricted during high flows as the causeway follows the natural gradient of the creek.

2.3.5 Construction staging

Works would be undertaken generally in the following manner, subject to works contractor's preferred methods:

Stage 1 - Preparatory works

- Establishment of traffic procedures and access, as required.
- Installation of erosion and sedimentation controls in accordance with *Managing Urban Stormwater: Soils and construction—Volume 1* (Landcom, 2004), *Volume 2C Unsealed roads* (DECC, 2008b) and *Volume 2D, Main Road Construction* (DECC, 2008c) (collectively referred to as the "Blue Book").
- Establishment of the site compound area
- Tree felling/ branch removal
- Installation of temporary working platforms for cranes or piling rigs

Stage 2 - Bridge construction

- Demolition of existing abutments and any remaining bridge debris
- Excavation of abutment area
- Construction of concrete abutments and piers
- Backfilling behind abutments
- Installation of rip-rap scour protection
- Installation of deck
- Installation of railings and street furniture
- Removal of temporary gravel crossing back to the original creek level with a rock base retained
- Rehabilitation of vegetation

Stage 3 - Decommissioning of site

- At completion of works, all construction equipment, materials and waste would be removed
- Decommissioning of site compound
- Erosion and sediment controls removed

2.3.6 Duration and working hours

Planning of works for expected wet weather conditions is essential. Incorporation of temporary measures to protect exposed work areas and prevent further damage to the site, especially with respect to rainfall events, would be essential at the proposal site. The works would be completed as outlined in Table 2.5.

Table 2.5 Proposal timeframes

Commencement Date	The estimated commencement date is early 2024.
Work Duration	The estimated total timeframe of the proposed works is 6 months, weather permitting.
Work Hours	Works would take place during standard construction hours (7:00 am to 6:00 pm Monday to Friday and 8.00 am to 1.00 pm on Saturdays) unless otherwise approved by Council. The proposed hours are in accordance with the ***Interim Construction Noise Guideline*** (DECC 2016) as follows: – Mondays to Fridays between 7:00 am and 6:00 pm – Saturdays between 8:00 am and 1:00 pm – No work would occur on Sundays or public holidays.

2.4 Operation

Once operational, this section of Canomodine Lane and the Canomodine Creek Bridge would function in its pre-flood capacity as a bridge providing access to local residents.

3. Statutory and planning framework

3.1 Environmental Planning and Assessment Act

The EP&A Act is the principal planning legislation in NSW for all environmental planning and development approvals. All relevant statutory planning instruments under the EP&A Act have been examined in relation to the proposal. Part 5, Division 5.1 provides controls for 'activities' that do not require development consent undertaken by a public authority.

Section 2.109 of the State Environmental Planning Policy (Transport and Infrastructure) 2021 (T&I SEPP) outlines 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 is being undertaken by a public authority (Council) the works are permitted without consent and is subject to assessment and approval under Part 5 of the EP&A Act.

The proposal is not State Significant Infrastructure or State Significant Development and an environmental impact statement is not required for approval by the Minister for Planning and Public Spaces.

Council is the determining authority for the proposal. This REF fulfils Councils obligation under Section 5.5 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.

The proposal has been assessed against other relevant Commonwealth and State environmental legislation and policies in Section 3.2.

3.2 Other environmental legislation

Table 3.1 outlines how the proposal has been considered under other relevant Commonwealth and State environmental legislation.

Table 3.1 Other environmental legislation and policies

Legislation	Relevance to the proposal
Commonwealth legislation	
EPBC Act	The EPBC Act provides protections for the environment, especially aspects considered MNES. MNES include: – World Heritage areas – National heritage places – Wetlands of International Importance (i.e., Ramsar wetlands) – Nationally listed threatened species and ecological communities – Listed migratory species – Commonwealth marine areas – The Great Barrier Reef Marine Park – Nuclear actions – A water resource, in relation to coal seam gas development and large coal mining development Environmental approvals under the EPBC Act are required for any 'action' that is likely to have a significant impact on: – MNES – Environment on Commonwealth land – The environmental overseas when action is undertaken by a Commonwealth agency A search of the EPBC Act Protected Matters Search Tool was undertaken on 19 September 2023 for the proposal site and a 10 km buffer (refer to Appendix E). No MNES or Commonwealth land have been identified to be impacted by the proposal. As the proposal would not impact on any of these matters, and is not being undertaken by a Commonwealth agency, a referral to DCCEEW is not required. MNES are further discussed in Section 5.4 and Appendix E.

Legislation	Relevance to the proposal
State legislation	
EP&A Regulation	Section 171 of the EP&A Regulation defines the factors which must be considered when determining if an activity assessed under Division 5.1 of the EP&A Act has or is likely to have a significant impact on the environment. Section 6 of this REF provides an environmental impact assessment of the proposed activity in accordance with Section 171, and 5 specifically responds to the factors for consideration under Section 171. Additionally, Section 171(4) states that this REF must be published on Council website or the NSW planning portal if: a. The proposal has a capital investment value of more than $5 million b. The proposal requires an approval or permit under the following provisions before it may be carried out: i. Section 144, 200, 205 or 219 of the FM Act ii. Section 57 of the *Heritage Act 1977* (Heritage Act) iii. Section 90 of the *National Parks and Wildlife Act 1974* (NP&W Act) iv. Sections 47-49 or 122 of the *Protection of the Environment and Operations Act 1997* (POEO Act) No permits are required by council under FM legislation.
BC Act	Part 7 of the BC Act provides the environmental assessment requirements for activities being assessed under Part 5 of the EP&A Act. If a significant impact is likely, a Species Impact Statement or Biodiversity Development Assessment Report is required. Section 7.2(1)(a) and 7.3 of the Act describe the assessment requirements and thresholds for what is considered a significant impact. One Critically Endangered Ecological Community, *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions* was identified as occurring within the proposal site. A biodiversity site assessment was undertaken by an ecologist on 20 September 2023 to assess the impacts of the proposal works to any native flora and fauna, and the identified Critically Endangered Ecological Community. The assessment found that the proposal would be unlikely to have any significant impacts to any threatened species or communities. A summary of the biodiversity assessment is provided in Section 5.4, and the assessments of significance is provided in Appendix J. A Species Impact Statement or Biodiversity Development Assessment Report is not required for the proposal.
FM Act	The objectives of the FM Act are to conserve, develop and share the fishery resources of the State for the benefit of present and future generations. It lists threatened species of fish and marine vegetation, including endangered populations, ecological communities and key threatening processes. One of the objectives of the FM Act is to 'conserve key fish habitats' which includes aquatic habitats that are important to the maintenance of fish populations generally and the survival and recovery of threatened aquatic species. The proposal would occur in a waterway mapped as key fish habitat. Accordingly, consultation would be required between Council and DPI and a permit would be required in accordance with Part 7 of the FM Act. This is required prior to commencement of construction. Key fish habitat within the proposal site is shown in Appendix C. Section 220ZZ of the FM Act lists the factors to be considered to determine the impact of an activity on threatened species, populations, ecological communities of fish and marine vegetation. If the project is likely to significantly impact on the threatened species, populations or ecological communities, then an SIS is required. The proposal site is mapped as Southern Purple Spotted Gudgeon (*Morgunda adspersa*) habitat. Refer to Appendix D. There would be no significant impact to this species. Refer to section 5.4 and Appendix F for detailed assessment. No other species/population/ecological community listed under Schedules 4, 4a or 5 of the FM Act are considered likely to occur within the study area, nor are they expected to be indirectly impacted by the proposed works. A permit is required under the FM Act for works that constitute dredging and reclamation. The project would fit the definition of dredging and reclamation under the FM Act. However, Clause 227 of the Fisheries Management (General) Regulation 2019 states that 'any dredging work or any reclamation work carried out by a public authority is exempt from Division 3 of Part 7 of the FM Act if the work is carried out in accordance with the Code of Practice for Minor Works in NSW Waterways (the Code) published on the Department's website.' Works would be undertaken in accordance with the Code, therefore a permit under the FM Act is not required. Under section 219 of the FM Act, works within a waterway that may result in the temporary or permanent blockage of fish passage would also require a permit from DPI Fisheries. The project would not block fish passage.

Legislation	Relevance to the proposal
NP&W Act	The NP&W Act regulates the control and management of all national parks, historic sites, nature reserves, and Aboriginal areas. The main aim of the Act is to conserve the natural and cultural heritage of NSW. Where works will disturb Aboriginal objects, an Aboriginal Heritage Impact Permit (AHIP) is required. An Aboriginal Heritage Information Management System (AHIMS) register search was undertaken on 15 September 2023 and no known Aboriginal sites or places have been recorded or declared in or near the proposal site (Refer to Appendix K). The proposal is unlikely to uncover or harm Aboriginal objects and therefore a permit under the NP&W Act is not required. Aboriginal heritage is further discussed in Section 5.
Heritage Act	The Heritage Act provides for the conservation of buildings, works, archaeological items, relics and places of heritage value. A search of the following online heritage database searches was undertaken on the 15 September 2023: – NSW Heritage database – Commonwealth EPBC heritage list – Australian Heritage Places Inventory – Local Environmental Plan(s) heritage items The proposal does not involve an item or place listed on the NSW State Heritage Register or the subject of an interim heritage order or listing and is therefore not a controlled activity. Approval of the proposal is therefore not required under Part 4 of the Heritage Act. Heritage is further discussed in Section 5.
POEO Act	The POEO Act is the key environmental protection and pollution statute. The POEO Act is administered by the NSW Environment Protection Authority (EPA) and establishes a licensing regime for waste, air, water and pollution. The proposal does not constitute a scheduled activity and does not require an Environmental Protection Licence (EPL). Therefore, no licences have been identified as being required. The proposal would generate natural excavated material waste. Disposal of this waste would be subject to Part 5.6 Division 3 of the POEO Act.
Water Management Act 2000 (WM Act)	The objective of the WM Act is to manage NSW water in a sustainable and integrated manner that will benefit today's generations without compromising future generations' ability to meet their needs. Section 56 of the WM Act establishes access licences for the taking of water within a water management area. No significant dewatering is required and therefore this section is not applicable. The WM Act requires controlled activity approvals to carry out specified controlled activities on or under waterfront land (section 91E). The proposal would be undertaken on waterfront land (within 40 metres of the bed of a river or estuary) and as such comprises a controlled activity under the WM Act. However, public authorities such as Council are exempt from obtaining a controlled activity approval under Clause 41 of the Water Management (General) Regulation 2018. Even though a formal approval under the WM Act is not required, as the proposal is located within 40 m of a waterway, it would be undertaken in a manner consistent with the requirements of controlled activities. These are detailed in *NSW DPI – Office of Water publication Guidelines for watercourse crossings on waterfront land (*NSW DPI 2015). The proposal complies with this guideline in the following ways: – The design would be certified by a suitably qualified engineer – The design minimises disturbance to the watercourse and vegetation – The design maintains the natural geomorphic processes and hydrological regimes of the watercourse – The design protects against scour The proposal would include stabilisation and rehabilitation of all disturbed areas including, revegetation, hydro mulching and maintenance in order to adequately restore the integrity of the riparian corridor of Canomodine Creek. Water quality and hydrology is further discussed in Section 5.
Roads Act 1993 (Roads Act)	The Roads Act provides for the operation, maintenance and use of roadways in NSW including managing authorities, rites of passage and classification of roads. Consent under Section 138 of the Roads Act is required for any works or activities in a public reserve, public road or footpath (nature strip). A Section138 permit is not required as Council are both the proponent and road authority as defined by the Act.

Legislation	Relevance to the proposal
Biosecurity Act 2015	The *Biosecurity Act 2015* and regulations provide requirements for state level priority weeds. The Act regulates all plants, with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Mitigation measures to reduce the spread of weeds and biodiversity are further discussed in Section 5.
State Environmental Planning Policy (Biodiversity and Conservation) 2021 (B&C SEPP)	Chapters 3 and 4 of the B&C SEPP aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for *Phascolarctos cinereus* (Koala) to ensure a permanent free-living population over their present range and reverse the current trend of Koala population decline. Chapters 3 and 4 only apply to development that requires development consent from Council. As the proposal is being assessed under Part 5 of the EP&A Act these provisions of the B&C SEPP do not apply. Biodiversity has been considered in Section 5. See Appendix E to Appendix J for supporting information.

3.2.1 Summary of permits and licences required

Under Division 3 of Part 7 in section 200 of the FM Act, a local government authority requires a permit issued by the Minister to carry out dredging or reclamation works. However, as per section 227 of the Fisheries Management (General) Regulation 2019 any dredging works carried out by a public authority are exempt if the works are carried out in accordance with the *Code of Practice for Minor Works In NSW Waterways* (RMS 2014).

The guidelines note that minor works which require an REF for works within a waterway require consultation to be undertaken with Fisheries NSW. As such, Council is to consult with Fisheries prior to the commencement of works to confirm if the proposal can be undertaken in accordance with the Code of Practice and if a permit is required.

4. Community and agency consultation

4.1 Government agency and stakeholder involvement

Part 2.2 of the TISEPP contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. A summary of the consultation requirements under the TISEPP is provided below in Table 4.1.

Table 4.1 SEPP (Transport and Infrastructure) consultation requirements summary

SEPP (Transport and Infrastructure) consultation requirements	Response
2.10 – Consultation with councils relating to development with impacts on council-related infrastructure or services	
(1) public authority, or a person acting on behalf of a public authority, must not carry out development to which this section applies unless the authority, or the person has—	
(a) will have a substantial impact on stormwater management services provided by a council.	Not triggered – No consultation required.
(b) is likely to generate traffic to an extent that will strain the capacity of the road system in a local government area.	Not triggered – No consultation required.
(c) involves connection to, and a substantial impact on the capacity of, any part of a sewerage system owned by a council.	Not triggered – No consultation required.
(d) involves connection to, and use of a substantial volume of water from, any part of a water supply system owned by a council.	Not triggered – No consultation required.
(e) involves the installation of a temporary structure on, or the enclosing of, a public place that is under a council's management or control that is likely to cause a disruption to pedestrian or vehicular traffic that is not minor or inconsequential.	Not triggered – No consultation required.
(f) involves excavation that is not minor or inconsequential of the surface of, or a footpath adjacent to, a road for which a council is the roads authority under the ***Roads Act 1993*** (if the public authority that is carrying out the development, or on whose behalf it is being carried out, is not responsible for the maintenance of the road or footpath).	Not triggered – No consultation required.
(2) public authority, or a person acting on behalf of a public authority, must not carry out development to which this section applies unless the authority, or the person has—	
(a) given written notice of the intention to carry out the development (together with a scope of works) to the council for the area in which the land is located, and	Not triggered – No consultation required.
(b) taken into consideration any response to the notice that is received from the council within 21 days after the notice is given.	Not triggered – No consultation required.
2.11 – Consultation with councils—development with impacts on local heritage	
(1) This section applies to development carried out by or on behalf of a public authority if the development—	
(a) is likely to affect the heritage significance of a local heritage item, or of a heritage conservation area, that is not also a State heritage item, in a way that is more than minor or inconsequential.	Not triggered – No consultation required.
(b) is development that this Chapter provides may be carried out without consent.	Not triggered – No consultation required.
(2) is development that this Chapter provides may be carried out without consent.	

SEPP (Transport and Infrastructure) consultation requirements	Response
(a) had an assessment of the impact prepared, and	Not triggered – No consultation required.
(b) given written notice of the intention to carry out the development, with a copy of the assessment and a scope of works, to the council for the area in which the heritage item or heritage conservation area (or the relevant part of such an area) is located, and	Not triggered – No consultation required.
(c) taken into consideration any response to the notice that is received from the council within 21 days after the notice is given.	Not triggered – No consultation required.
2.12- Consultation with councils—development with impacts on flood liable land.	
(1) In this section, flood liable land means land that is susceptible to flooding by the probable maximum flood event, identified in accordance with the principles set out in the manual entitled Floodplain Development Manual: the management of flood liable land published by the New South Wales Government and as in force from time to time.	
(2) A public authority, or a person acting on behalf of a public authority, must not carry out, on flood liable land, development that this Chapter provides may be carried out without consent and that will change flood patterns other than to a minor extent unless the authority or person has—	
(a) given written notice of the intention to carry out the development (together with a scope of works) to the council for the area in which the land is located, and	The proposal is located on flood liable land, however as per Section 2.17 of the TISEPP consultation is not required as Council is the proponent.
(b) taken into consideration any response to the notice that is received from the council within 21 days after the notice is given.	Not triggered – No consultation required.
2.13 Consultation with State Emergency Service—development with impacts on flood liable land	
(1) A public authority, or a person acting on behalf of a public authority, must not carry out development on flood liable land that may be carried out without development consent under a relevant provision unless the authority or person has—	
(a) given written notice of the intention to carry out the development (together with a scope of works) to the State Emergency Service, and	Consultation is required. Council to undertake consultation.
(b) taken into consideration any response to the notice that is received from the State Emergency Service within 21 days after the notice is given.	Consultation is required. Council to undertake consultation.
(2) Any of the following provisions in Part 2.3 is a relevant provision—	
(a) Division 1 (Air transport facilities), (b) Division 2 (Correctional centres and correctional complexes), (c) Division 6 (Emergency services facilities and bush fire hazard reduction), (d) Division 10 (Health services facilities), (e) Division 14 (Public administration buildings and buildings of the Crown), (f) Division 15 (Railways), (g) Division 16 (Research and monitoring stations), (h) Division 17 (Roads and traffic), (i) Division 20 (Stormwater management systems).	The proposal is being undertaken under Division 17. Consultation is required.
2.14 Consultation with councils—development with impacts on certain land within the coastal zone	
(1) This section applies to development on land that is within a coastal vulnerability area and is inconsistent with a certified coastal management program that applies to that land. acquired under Part 11 of that Act—the Office of Environment and Heritage.	
(2) A public authority, or a person acting on behalf of a public authority, must not carry out development to which this section applies, which this Chapter provides may be carried out without development consent, unless the authority or person has—	

SEPP (Transport and Infrastructure) consultation requirements	Response
(a) A public authority, or a person acting on behalf of a public authority, must not carry out development to which this section applies, which this Chapter provides may be carried out without development consent, unless the authority or person has—	Not triggered – No consultation required.
(b) taken into consideration any response to the notice that is received from the council within 21 days after the notice is given.	Not triggered – No consultation required.
2.15 Consultation with authorities other than councils	
(1) A public authority, or a person acting on behalf of a public authority, must not carry out specified development that this Chapter provides may be carried out without consent unless the authority or person has— a. given written notice of the intention to carry out the development (together with a scope of works) to the specified authority in relation to the development, and b. taken into consideration any response to the notice that is received from that authority within 21 days after the notice is given.	
2) For the purposes of subsection (1), the following development is specified development and the following authorities are specified authorities in relation to that development—	
(a) development adjacent to land reserved under the *National Parks and Wildlife Act 1974* or to land acquired under Part 11 of that Act—the Office of Environment and Heritage, (b) development on land in Zone C1 National Parks and Nature Reserves or in a land use zone that is equivalent to that zone, other than land reserved under the *National Parks and Wildlife Act 1974*—the Office of Environment and Heritage, (c) development comprising a fixed or floating structure in or over navigable waters—Transport for NSW, (d) development that may increase the amount of artificial light in the night sky and that is on land within the dark sky region as identified on the dark sky region map—the Director of the Observatory, (e) development on defence communications facility buffer land within the meaning of clause 5.15 of the Standard Instrument—the Secretary of the Commonwealth Department of Defence, (f) development on land in a mine subsidence district within the meaning of the Mine Subsidence Compensation Act 1961—the Mine Subsidence Board, (g) development on, or reasonably likely to have an impact on, a part of the Willandra Lakes Region World Heritage Property—the World Heritage Advisory Committee and Heritage NSW, (h) development within a Western City operational area specified in the Western Parkland City Authority Act 2018,	Not triggered – No consultation required.
(3) In this section - dark sky region map means the map marked "Dark Sky Region Map" held in the head office of the Department of Planning and Environment. Willandra Lakes Region World Heritage Property means the land identified as the Willandra Lakes Region World Heritage Property on—	
(a) the Willandra Lakes Region World Heritage Property Map under Balranald Local Environmental Plan 2010, or (b) the Willandra Lakes Region World Heritage Property Map under Wentworth Local Environmental Plan 2011.	Not triggered – No consultation required.

SEPP (Transport and Infrastructure) consultation requirements	Response
2.16 Consideration of Planning for Bush Fire Protection	
1) This section applies to development for the following purposes that this Chapter provides may be carried out without development consent—	
(a) health services facilities, (b) correctional centres, (c) residential accommodation.	Not triggered – No consultation required.

4.2 Future consultation activities

Consultation undertaken by Council would include, but not be limited to, newsletters or letter box drops to the residents in the surrounding vicinity of the works and those impacted by traffic access. These letters would provide an overview on the proposal, working hours, anticipated duration of the proposal, safety measures, traffic access and a contact name and number for more information or to register community feedback or complaints.

5. Environmental assessment

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

5.1 Assessment of applicable environmental factors

A scoping exercise has been completed for the proposal. The scoping exercise has considered the potential environmental impacts of the proposal to identify those environmental factors requiring environmental impact assessment within this REF.

The environmental factors relevant to the proposal are summarised in Table 5.1. Where further assessment is identified to be required, this is provided in sections 5.2 to 5.9 For environmental factors that do not require further environmental assessment, standard control measures are identified in Section 6.1.

Table 5.1 Applicable environmental factors

Environmental Factors	Comments	Detailed discussion in REF?		Where?
Landforms, geology and soils	The proposal would be undertaken on an unsealed road and directly over a waterway which contains steep slopes on the southern side of the bridge and is prone to erosion. In contrast, the landscape on the northern side of the bridge is generally flat. As the proposal site is located directly over a waterway, and there would be excavation on both sides of the creek potential impacts to landforms, geology and soils are discussed further in section 5.2.	Yes	☒	Refer to section 5.2
		No	☐	
Contaminated land and acid sulfate soils (ASS)	A search of the NSW EPA Contaminated Land Record undertaken on 15 September 2023 indicated that there are no existing notices for the suburb of Canowindra. A search of the Australian Soil Resource Information System indicates the proposal site is located within an area that is mapped as extremely low probability of ASS being present. Given that the proposal would involve minor excavation within the disturbed road corridor and a Council owned reserve, there is minimal potential to encounter contaminated soils. The impacts due to potentially encountering contaminated soils or ASS would be mitigated through the implementation of standard control measures provided in section 6.1.	Yes	☐	
		No	☒	Standard control measures to be implemented in section 6.1.
Water quality and hydrology	Canomodine Creek traverses Canomodine Lane and the proposal site. Given the immediate proximity of the proposal to this watercourse, impacts to water quality and hydrology are discussed further in section 5.3.	Yes	☒	Refer to section 5.3
		No	☐	
Biodiversity	A site survey for the proposal site was undertaken by two ecologists on 20 September 2023. The survey identified that most of the bridge works would be occurring on exotic grassland with minimal impacts on native biodiversity. Important habitat features were identified within the study area including hollow-bearing trees with large hollows able to support threatened species such as the superb parrot, which was identified within the study area during the site survey. Impacts on biodiversity are discussed further in Section5.4.	Yes	☒	Refer to section 5.4
		No	☐	

Environmental Factors	Comments	Detailed discussion in REF?		Where?
Aboriginal heritage	An extensive search of AHIMS was undertaken on 15 September 2023 which found no record of Aboriginal sites or places in or near the proposal site (Appendix K). This search was undertaken with a buffer radius of one-kilometre around the site. As such, the proposal is extremely unlikely to uncover or harm Aboriginal objects and therefore a permit under the NP&W Act is not required.	Yes No	☒ ☐	Refer Section 5.5.
Non-Aboriginal heritage	A search of the following online heritage database searches was undertaken on the 15 September 2023: – NSW Heritage database – Commonwealth EPBC heritage list – Australian Heritage Places Inventory – Local Environmental Plan(s) heritage items There were no items in the vicinity of the proposal site. As such the proposal poses no rise to non-Aboriginal heritage items.	Yes No	☐ ☒	Standard control measures to be implemented in section 6.1.
Noise and vibration	The existing noise environment is that of a rural area, consisting of farming activities and biophilic sounds. The proposal is located amongst dispersed rural properties. There is one sensitive receiver within 500 meters of the proposal (refer to Figure 2.1). As such, the works associated with the proposal, including the delivery of plant and material, could potentially cause noise impacts to these receivers. The potential for noise impacts are discussed further in Section 5.5.	Yes No	☒ ☐	Refer to section 5.5
Air quality	Construction activities have the potential to impact on air quality due to dust generation resulting from works. Only minor potential impacts from construction dust are considered likely, given the limited extent of excavation works. However, as there are sensitive receivers within close vicinity of the proposal site, potential impacts are discussed further in Section 5.7.	Yes No	☒ ☐	Refer to section 5.7
Waste management	Waste streams that would potentially be generated during the proposal are detailed in Section 5.8. While waste impact during construction can be managed through implementation of standard controls, preliminary classification of wastes, the volume of waste and storage of waste is discussed in Section 5.8.	Yes No	☒ ☐	Refer to section 5.8
Traffic and access	Construction would generate increased road movements for the movement of equipment, plant and construction personnel, including contractors and workers. The local road network consists of a few rural property owners. As such, this minor increase in vehicle traffic is considered low and no major impacts are expected. However, given the proximity to surrounding properties and the need to restrict traffic flow on Canomodine Lane during construction, potential impacts to traffic and access are discussed further in Section 5.9.	Yes No	☒ ☐	Refer to section 5.9.
Visual amenity/landscape	The presence of construction equipment and the establishment of compounds and stockpile sites on the site would be a minor and temporarily impact on the visual amenity of the area. At the completion of the proposal works the overall visual amenity would be improved and returned to pre-flood condition as far as practical. Visual impacts during construction would be short term and associated with construction equipment.	Yes No	☐ ☒	Standard control measures to be implemented in section 6.1.

Environmental Factors	Comments	Detailed discussion in REF?		Where?
	Any impacts on visual amenity would be mitigated through the implementation of standard control measures provided in section 6.1.			
Socio-economic effects	During construction, local residents would continue to utilise the gravel causeway constructed by council. As such, there is no altered access outside what has been previously utilised since the bridge became unserviceable in late 2022. During operation, the proposal would provide ongoing benefit to the local residents by improving the access and safety of the bridge. The proposal has the potential to indirectly affect the amenity of the surrounding community and/or users of adjoining areas during construction. These potential impacts include noise, air quality, traffic and access and visual impacts. Any socio-economic impacts would be mitigated through the implementation of standard control measures provided in section 6.1.	Yes No	☐ ☒	Standard control measures to be implemented in section 6.1.
Hazards and risk	Vegetation surrounding the site is mapped as Vegetation Category 1 and 3 bushfire prone land, which has the highest risk of bushfire. Bushfire risk would be managed through the implementation of standard control measures in section 6.1.	Yes No	☐ ☒	Standard control measures to be implemented in section 6.1.
Cumulative environmental effects	The proposal would not cause any cumulative environmental effects. A search of the DPE Major Projects Planning Portal indicates that there are no active major projects in the Cabonne LGA. It is not anticipated that the proposal would make a significant contribution to any cumulative environmental impacts on either a local or regional scale, provided that the safeguards identified in section 6.1 are implemented.	Yes No	☐ ☒	Standard control measures to be implemented in section 6.1.

5.2 Landform, geology and soils

Issue	Description
Existing environment	The geology beneath the site contains wackestone, clastic sediment and shale. Soils on site are mapped as being part of the Dermosols (DE) greater soil group. The site is at an elevation of 350 m AHD. The slope below Canomodine Lane is steep nearing the creek banks and prone to erosion, directing runoff into Canomodine Creek.
Proposal details	Does the proposal involve the disturbance of large areas (e.g. >2ha) for earthworks? Yes ☐ No ☒
	Does the site have constraints for erosion and sedimentation controls such as steep gradients, narrow corridors or is located on private property? Yes ☒ No ☐ The proposal would be undertaken on an unsealed road and directly over a waterway which contains steep slopes on the southern side of the bridge and is prone to erosion. As traffic flow would still be maintained on the temporary gravel causeway, the work area would be a narrow corridor where space is somewhat restricted.
	Are there any sensitive receiving environments that are located in or nearby the likely proposal footprint or that would likely receive stormwater discharge from the proposal such as wetlands, state forests, national parks, nature reserves, rainforests, drinking water catchments? Yes ☒ No ☐ The proposal site is located on Canomodine Creek. Works would occur on both the northern and southern side of the bridge. Runoff from the proposal site would be directed into this creek.

Issue	Description
Potential impacts	Earthworks required as part of construction of the proposal would include: – Demolition of existing abutments and any remaining bridge debris – Excavation of abutment area – Construction of concrete abutments and piers – Backfilling behind abutments – Installation of rip-rap scour protection – Installation of deck – installation of railings and street furniture – Removal of temporary gravel crossing back to the original creek level with a rock base retained – Rehabilitation of vegetation Earthworks have the potential to result in localised erosion and soil loss, leading to sedimentation of the waterway. The extent of the working base and installation of concrete abutments and scour protection would require some vegetation disturbance. The operational phase of the proposal is expected to have a positive impact to soil stability in the area, as the proposal would stabilise the area surrounding the bridge affected by the flood through constructing embankments. These would channel the flow of water during floods and protect the adjacent soil from erosion.
Proposed safeguards	– Implement the Erosion and Sediment Control Plan as part of the Construction Environmental Management Plan that includes soil and erosion protection measures in accordance with *Managing Urban Stormwater: Soils and construction—Volume 1 (Landcom, 2004), Volume 2C Unsealed roads (DECC, 2008b) and Volume 2D, Main Road Construction (DECC, 2008c) (collectively referred to as the Blue Book).* – Erosion and sedimentation controls will be checked daily and maintained as required until ground stability is achieved. – High risk soil erosion activities such as earthworks will not be undertaken immediately before or during high rainfall (i.e. >20 mm in any 24 hour period) or wind events. – Locate stockpiles and construction materials away from vegetation, waterways and drainage lines, implement bunding practices where appropriate. – Minimise exposure of soils and retain vegetation where practicable. – Vehicle and machinery movement will be minimised across the site. Wherever possible, vehicles and machinery will be parked at the compound site and movement on site will be on foot. – Construct temporary drainage structures in accordance with the '*Technical Guideline - Temporary Stormwater Drainage for Road Construction*' (RMS 2011). – Stockpiles will be designed, established, operated and decommissioned in accordance with the *RMS Stockpile Site Management Guidelines (*RMS 2018). – The rehabilitation of disturbed areas would be carried out progressively as construction stages are completed, and in accordance with: • Landcom's "Blue Book" (4th Edition) on sediment and erosion control (Landcom 2004) • RMS Landscape Guidelines (LGNSW 2019) • RMS Guidelines for Batter Stabilisation Using Vegetation (RMS 2015a)

5.3 Water quality and hydrology

Issue	Description
Existing environment	The proposal is located directly over a waterway - Canomodine Creek which is a natural watercourse that drains into the Belubula River approximately three kilometres southwest of the proposal site. The Belubula River continues west and meets the Lachlan River approximately 20 km (in a straight line) south of the proposal site. All waterways in the vicinity of the proposal form part of the Lachlan Catchment.
Proposal details	Are the works located within or adjacent to a waterbody or wetland, or within 40 m of a waterway? Yes ☒ No ☐ Proposal works would occur directly over Canomodine Creek.

Issue	Description
	If yes, the NSW DPI Water or DPI Fisheries should be notified. Have they been notified? Yes ☐ No ☒ Council to notify NSW DPI Water and DPI Fisheries before construction works commence.
	Is the location known to flood or be prone to water logging? Yes ☒ No ☐ According to Council and recent site history, the site location is prone to flooding. Canowindra is situated on the Belubula River which has a history of flooding.
Potential impacts	Does the proposal pose any potential risk to the surrounding water quality? Yes ☒ No ☐ Potential impacts to water quality, hydrology and flooding that could arise from the proposal include: – Sediment and nutrient laden water resulting from ground disturbance during removal of loose soil and vegetation entering the waterway. – Pollution of local water quality from machinery and construction materials and spills. – Runoff from cleared and mulched vegetation stockpiled on-site. – Erosion and sedimentation that may affect Canomodine Creek and local aquatic habitats. – A variety of dispersible liquid materials would be used which pose a potential pollutant threat to local water quality. These liquids include, but are not limited to, diesel, unleaded petrol, machinery oils and lubricants. The nature of these liquids and their ability to disperse away from the study area means that they could have a negative impact on ground or surface water on or adjacent to the study area, especially during rainfall events. Overall, with the safeguards and management measures described in the next section, the potential for impacts on water quality, hydrology and flooding impacts from the proposal are considered to be minimal.
Proposed safeguards	– A spill kit will be kept on site for potential chemical or fuel spills. – Contractors will be trained in the correct use of a spill kit. – All materials that have the potential to contaminate surface water or groundwater will be stored at least 40 m away from any watercourses and on flat grades. – Erosion and sediment controls in accordance with Landcom's "Blue Book" (4th Edition) (refer Section 5.2. – Visual monitoring of Canomodine Creeks water quality (i.e. turbidity, hydrocarbon spills/slicks, algal blooms, colour and odour) will be undertaken on a regular basis to identify any potential spills or deficient erosion and sediment controls. A comprehensive record will be kept of these inspections. If water quality deteriorates over consecutive monitoring inspections quantitative water quality testing should be undertaken to obtain a comprehensive understanding of creek health. – When deconstructing/constructing the bridge a capture system would be installed across the creek to prevent any materials from entering the creek. – If feasible, schedule construction works to minimise disruption to the creek during sensitive times such as spawning seasons for fish or other aquatic life. – Works will be conducted during dry seasons or low-flow periods where possible. – No works will be undertaken during heavy rain periods or where flooding warnings for the wider area are issued. During works weather forecasts would be monitored daily. – All work sites will be kept in a clean and tidy condition to prevent waste/litter from entering watercourses.

5.4 Biodiversity

Issue	Description
Existing environment	The following terrestrial species database searches were undertaken: – EPBC Act Protected Matters Search (performed on 19 September 2023). – NSW BioNet Search (performed on 19 September 2023). Did the terrestrial species database searches identify any threatened ecological communities, populations, threatened flora and/or threatened or protected fauna, or migratory species within the vicinity of the proposed works? Both Federal and State listed matters must be considered. Yes ☒ No ☐ An ecological survey was undertaken by two GHD Ecologists on 20 September 2023. The aim of the ecological survey was to identify vegetation present on site, habitat on site and the potential for threatened species occurring. The species identified by the database searches were evaluated for their potential to occur within the study area based on habitat assessments undertaken in the field and local BioNet records. No threatened flora, fauna, or migratory species were identified as having moderate or greater likelihood of occurrence within the study area. Two Plant Community Types (PCTs) were identified within the study area, PCT 79 and PCT 276. PCT 276 (Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion) is associated with the Critically Endangered Ecological Community (CEEC) *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions* listed under the BC Act, and *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* listed under the EPBC Act. PCT 276 within the study area meets the BC Act listed TEC due to the site occurring within the NSW South Western Slopes bioregion, and the dominant overstory species containing Yellow box (*Eucalyptus melliodora*). PCT 267 within the study area does not conform to the EPBC listed CEEC as the patch within the study area has a groundcover layer of less than 50% native perennial vegetation cover. An Assessment of Significance (AoS) as per Section 7.3 of the BC Act has been completed for potential impacts to this community and determined that the proposal would not result in a significant impact on the CEEC (Appendix J). The likelihood of occurrence for threatened biota predicted to occur within the locality is provided in Appendix F. Vegetation within the proposal site and study area is predominantly comprised of exotic grasses, forbs and shrubs (Photo 5.1). The vegetation is degraded and has been subject to frequent disturbance and clearing as a result of previous road work activities and surrounding agricultural use. Two PCTs where identified within the study area: – PCT 79- River Red Gum shrub/grass riparian tall woodland or open forest wetland mainly in the upper slopes sub-region of the NSW South Western Slopes Bioregion and western South Eastern Highlands Bioregion (Photo 5-2). Within the study area this PCT occurs as a tall grassy woodland along the riverbank, dominated by River Red Gum (*E. camaldulensis)* and River oak (*Casuarina cunninghamiana subsp. cunninghamiana)*. The shrub layer was sparse only containing the exotic species Blackberry (*Rubus fruticosus sp, agg.**). The groundcover is dominated by exotic grasses and forbs including included Spear Thistle (*Cirsium vulgare**), Lamb's Tongues *(Plantago lanceolata**), Perennial Ryegrass (*Lolium perenne**), Barley Grass (*Hordeum vulgare* *) Small Nettle *(Urtica urens**) *and* Wild Oats (*Avena fatua**), Some natives grasses and forbs where scattered throughout including Common Couch *(Cynodon dactylon*), Wallaby Grass (*Rytidosperma spp.),* and Speargrass (*Austrostipa scabra*). – PCT 276 - Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion. Within the study this PCT occurs as a tall grassy woodland on the higher hills above the riverbank, dominated by Yellow Box (*E. melliodora*). The shrub layer was sparse only containing the exotic species Blackberry (*Rubus fruticosus sp, agg.**). The groundcover is dominated by exotic grasses and forbs including Spear Thistle (Cirsium vulgare Lamb's Tongues *(Plantago lanceolata**), Perennial Ryegrass (*Lolium perenne**), Barley Grass (*Hordeum vulgare* *), Soft Brome (Bromus hordeaceus**) *and* Wild Oats (*Avena fatua**), Some natives grasses and forbs where scattered throughout including Common Couch (Cynodon dactylon), (Rytidosperma spp.), Speargrass (Austrostipa scabra) and Slender Bamboo Grass (Austrostipa verticillate). A full list of the flora species identified on site during the field survey is provided in Appendix G. Habitat features within the study area include: – Mature River Oak and River Red Gum canopy trees which provide shelter and foraging resources for birds and microbats.

Issue	Description
	– Two hollow bearing trees (HBTs) which may be utilised for shelter and breeding by arboreal mammals, birds or microbats. There are no HBTs within the proposal site. – A dense ground cover of grasses and forbs which provides foraging resources for local fauna, as well as shelter and refuge habitat for ground-dwelling birds, reptiles and invertebrates. A detailed list of habitat features identified within the study area is provided in Appendix I.

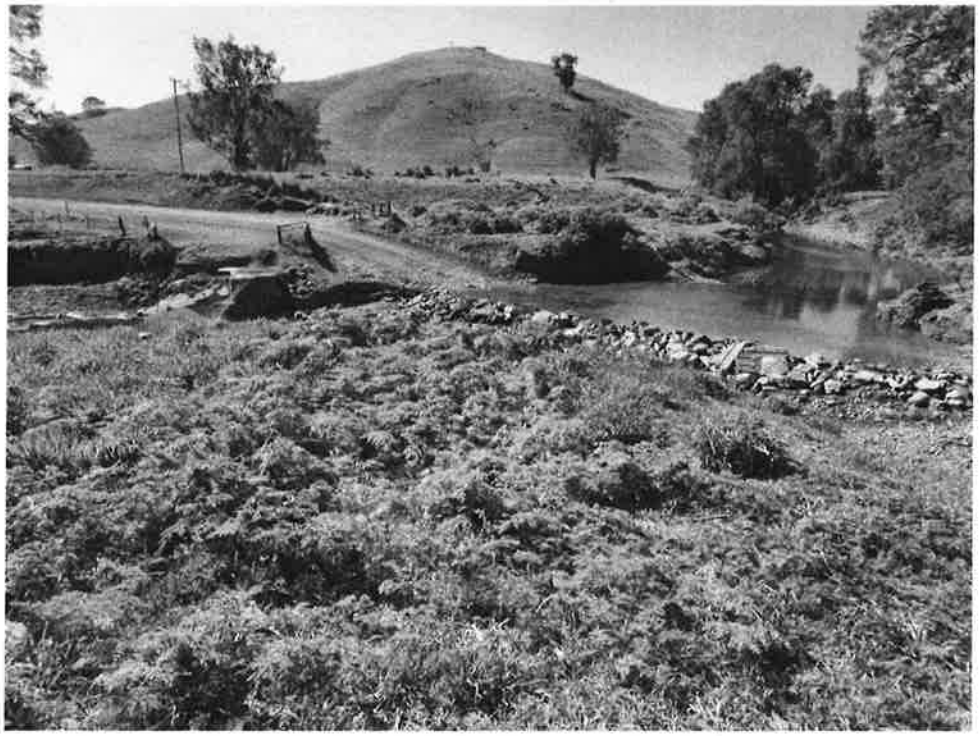


Photo 5.1 Example of exotic groundcover within proposal site

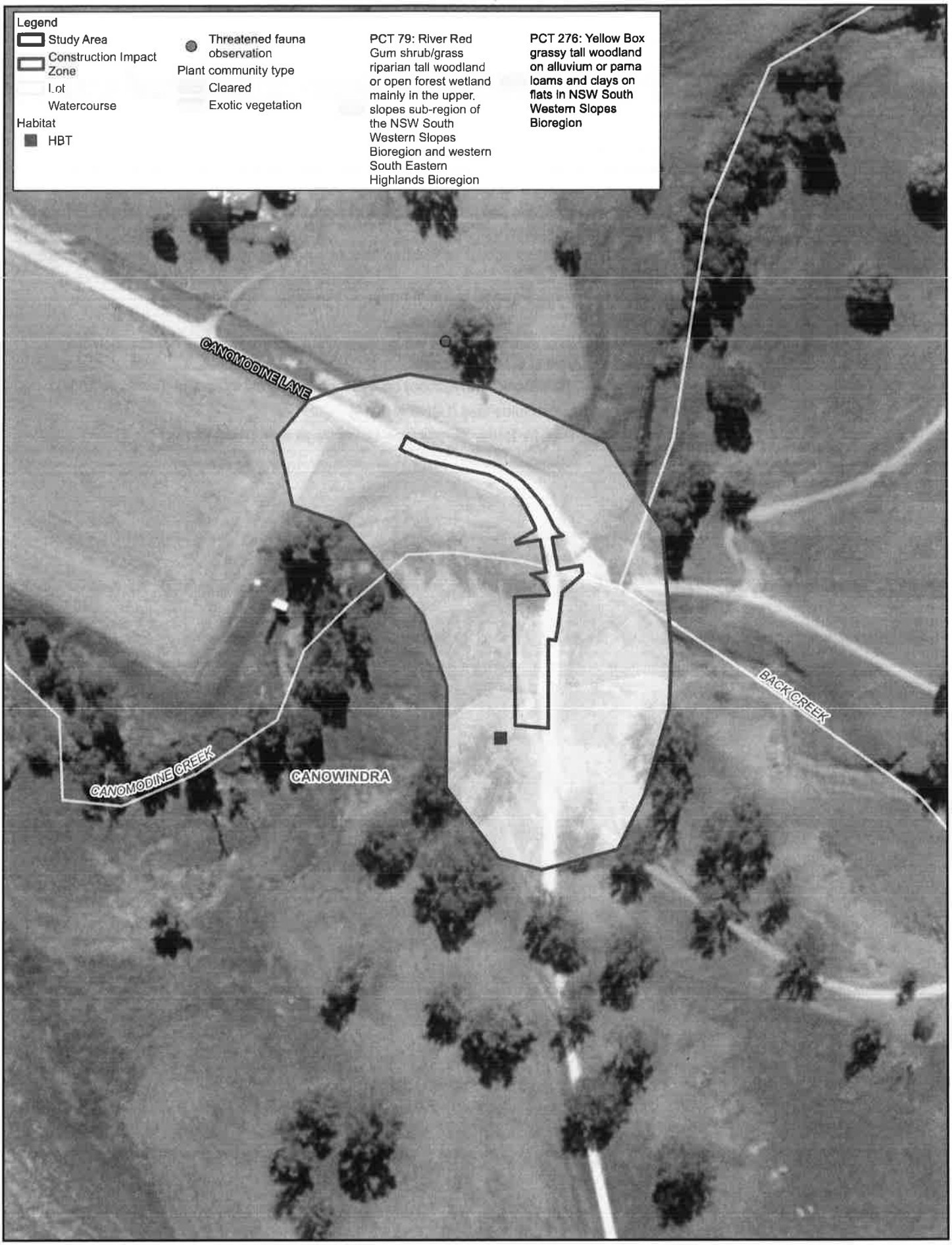
Photo 5.2 Example of PCT 79 within proposal site

Issue	Description
	 *Photo 5.3 Example of PCT 276 within the study area* Are the proposed works likely to impact on any vegetation including, shrubs, trees? Yes ☒ No ☐ The proposal would require clearing of about 0.9 ha of vegetation, comprising 0.0706 ha of exotic groundcover, 0.0067 ha of PCT 79 and 0.0129 ha of PCT 276. The 0.0067 ha of PCT79 to be cleared includes exotic ground cover and trimming or removal of one River Oak adjacent to the existing bridge.  *Photo 5.4 Tree to be potentially removed or trimmed*

Issue	Description
	Will the proposed works affect any tree hollows or crevices? Yes ☐ No ☒ HBT's of varying sizes are present within the study area, however no HBT's occur within the proposal site.
	Will the proposed works disturb any natural waterways or aquatic habitat? Yes ☒ No ☐ Canomodine creek and Back Creek flow through the proposal site. Both creeks are identified as KFH on the Fisheries NSW Spatial Data Portal Department of Primary Industries).) (Appendix C). Canomodine would be subject to minor excavation work as a result of the proposed work. The creek has been previously subject to past disturbance from road traffic and construction of the existing bridge and culvert-causeway which has resulted in minimal native aquatic vegetation remaining within the creek. Fish passage would not be impeded during the construction of the proposal through the use of a coffer dam. The design of the new bridge would be an open concrete bridge with piles to ensure fish passage is not impeded during operation. As noted in Section 3.2, a permit is required under the FM Act for works that constitute dredging and reclamation. The proposal would fit the definition of dredging and reclamation under the FM Act. However, Clause 227 of the Fisheries Management (General) Regulation 2019 states that 'any dredging work or any reclamation work carried out by a public authority is exempt from Division 3 of Part 7 of the FM Act if the work is carried out in accordance with the Code of Practice for Minor Works in NSW Waterways (the Code) published on the Department's website.' Works would be undertaken in accordance with the Code, therefore a permit under the FM Act is not required. Under section 219 of the FM Act, works within a waterway that may result in the temporary or permanent blockage of fish passage would also require a permit from DPI Fisheries. The project would not block fish passage therefore a permit from DPI Fisheries is not required.
	Are there any weeds present that require the implementation of safeguards? Yes ☒ No ☐ Groundcover within the study area is dominated by exotic vegetation. Of the 40 flora species identified within the study area, 30 were exotic (Appendix G). Of these species, six are priority weeds listed on NSW WeedWise (NSW Department of Primary Industries) for the Central Tablelands. These are: – Blackberry (Rubus fruticosus sp. agg.) (also listed as a Weed of National Significance) – Patterson's Curse (Echium plantagineum) – Spear Thistle (Cirsium vulgare) – Noogoora Burr (Xanthium occidentale) – Mexican Poppy (Argemone ochroleuca subsp. ochroleuca) These species are subject to the Biosecurity Act and a general biosecurity duty applies. All pest plants are to be regulated to "prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable".
Potential impacts	Does the proposal pose any potential risk to the biodiversity within the vicinity of the site? Yes ☒ No ☐ **Removal of fauna habitat** The proposal would remove approximately 0.09 ha of vegetation, comprising 0.0706 ha of exotic groundcover and shrubs, 0.0067 ha of PCT 79 and 0.0129 ha of PCT 276. Removal of this vegetation would result in: – Minor loss in the amount of available foraging and shelter habitat for native species in the local area. – Negligible increase to the listed key threatening process 'Clearing of native vegetation'. The vegetation to be removed mostly poor condition groundcover of exotic vegetation which provides limited habitat to local fauna species. The River Oak to be trimmed or potentially removed is well established but does not have any fissures or hollows and is unlikely to provide habitat critically to the survival of any local fauna. The proposal works are unlikely to have an adverse impact on any retained vegetation, ecological communities or fauna habitat resources outside of the proposal site. – Potential mortality or injury to any non-mobile species that may occur within the proposal site during the construction phase of the proposal. – Temporary disturbance resulting from increased noise, vibration and light during the construction phase of the proposal.

Issue	Description
	Introduction of disease Vehicles and plant have the potential to introduce new weed species to site or perpetrate their spread from within the proposal site. This risk will be minimised by mitigation measures outlined below. Diseases and pathogens can be introduced or spread to the proposal site via dirt or organic material attached to machinery, vehicles, equipment and employees. This risk will be minimised by the implementation of wash down procedures detailed in DPIE's (2020) hygiene protocol for vehicles and heavy machinery, as outlined below.
	Assessment of significance of impacts PCT 276 identified within the proposal site is associated with the BC Act-listed CEEC *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions*. An AoS has been completed for this CEEC and is provided in Appendix J. The AoS confirmed the proposal would not result in a significant impact due to the following: – The proposal would not result in any impacts to known occurrences of species associated with this community and is unlikely to result in an adverse effect on the life cycle of associated species such that a viable local population is placed at risk of extinction. – The proposal will not result in fragmentation or isolation of this community. – The proposal would not result in any impacts to areas of intact native vegetation elsewhere in the area that represents better quality potential habitat for this community. A Species Impact Statement or Biodiversity Development Assessment Report is not required. No MNES listed under the EPBC Act are likely to be impacted by the proposal. A referral to DCCEEW is not required.
Proposed safeguards	**General safeguards** – As part of the site induction process, provide all site personnel with information on the biodiversity values of the proposal site and surrounding area, including potential threatened species habitat, threatened ecological communities, no-go areas and responsibilities under relevant environmental legislation, including but not limited to the EP&A Act, BC Act and EPBC Act. Refer to the threatened species habitat descriptions detailed in Appendix F. – Should unexpected, threatened fauna or flora be identified at any time during construction, cease work immediately in the area to prevent further harm to the individual. Contact Council's Environmental Officer and a suitably qualified ecologist to determine if further assessment or management plans are required. **Clearing of vegetation/demolition** – No removal or disturbance of vegetation outside the proposal site is to occur without further assessment. – Establish exclusion zones in accordance with *Guide 2 Exclusion Zones of Roads and Traffic Authority Biodiversity Guidelines* (Transport Roads and Traffic Authority, 2011) to ensure clearing does not extend beyond the approved area. – Trees are to be removed in accordance with *Guide 4: Clearing of Vegetation and Removal of Bushrock of Roads* and *Traffic Authority Biodiversity Guidelines* (Transport Roads and Traffic Authority, 2011). – Trees that are to be trimmed (or removed if necessary) will be clearly marked. Any vegetation to be protected adjacent to the proposal site will be protected with exclusion fencing. – No HBTs (including dead/stag trees and hollow bearing stumps) are to be removed without further assessment for fauna species or hollows by a suitably qualified person. – Coarse woody debris (CWD) produced from vegetation clearing is to be placed in areas of existing vegetation within the assessed study area. CWD is not to be pushed into adjoining vegetation. – If any damage occurs to vegetation outside of the boundaries of the work site as a result of the proposal, the Council Project Manager will be notified and will establish strategies for mitigation of impacts and site restoration. **Pathogen control** – Implement wash-down procedures detailed in DPIE's (2020) hygiene protocol for vehicles and heavy machinery.

Issue	Description
	Invasion of exotic species – Manage vegetation within the road reserve and adjacent areas of vegetation clearing in accordance with *Guide 6: Weed Management of Roads and Traffic Authority Biodiversity Guidelines* (Transport Roads and Traffic Authority, 2011) to reduce invasion of priority weed species. – Use weed-free topsoil in any landscaping works post-construction and revegetate disturbed sites with locally Indigenous species. – Construction machinery should be washed prior to entering and leaving site to ensure weed propagules are not transported. – Transport of any soil or gravel material from one site to another is prohibited. **Site rehabilitation** – The rehabilitation of disturbed areas will be carried out progressively as construction stages are completed, and in accordance with: • Landcom's "Blue Book" (4th Edition) on sediment and erosion control (Landcom 2004) • RMS Landscape Guidelines (LGNSW 2019) • RMS Guidelines for Batter Stabilisation Using Vegetation (RMS 2015a)



Paper Size ISO A4

0 10 20 30 40

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

GHD

Cabonne Council
Bridge replacement
Review of Environmental Factors

Canomodine Creek Ecology

Project No. **12622302**
Revision No. **A**
Date **28/02/2023**

FIGURE 5.1

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Print date: 29 Sep 2023 - 09:53

Data source: SSI: PSG, 2023; LPI: DTDB / DCDB, 2023; sixmaps/LPI_Imagery_Best: © Department of Customer Service 2020. Created by: kpsroba

5.5 Aboriginal heritage

Issue	Description
Existing environment	Are the works likely to disturb previously undisturbed areas of the landscape? Yes ☐ No ☒
	Has an AHIMS register search been conducted? Yes ☒ No ☐
	Are there any known Aboriginal artefacts/sites within the vicinity of the work site? Yes ☐ No ☒ There were no sites/places of Aboriginal heritage recorded within a one-kilometre buffer of the proposal site (refer Appendix K).
	Would the project involve the removal of mature native trees? Yes ☒ No ☐
Potential impacts	Does the project pose any potential risk to Aboriginal heritage? Yes ☒ No ☐ A search of the Aboriginal Heritage Information Management System was undertaken on 15 September 2023 with no listed or known Aboriginal sites previously recorded within one kilometre of the proposed works. The bridge replacement works span Canomodine Creek, which is a landscape feature likely to have been subject to regular use in Aboriginal people's lives and the lack of previously recorded AHIMS sites does not preclude the potential for Aboriginal objects to identified in the vicinity of the Proposal site. However, the activity is restricted to rehabilitation works to maintain an existing road bridge that has been impacted by recent flood events. Any Aboriginal objects previously occurring within the proposal site are likely to have been disturbed during the initial bridge construction, maintenance work or scouring during flood events and the potential for Aboriginal cultural material, if any, to be impacted by the proposal is considered to be very low. The proposal is required to maintain an existing road within a landform that has been previously disturbed and is considered a low impact activity. The potential to impact any unexpected finds would be managed by implementing proposed safeguards provided below. The proposal is unlikely to harm Aboriginal objects and therefore a permit under the NP&W Act is not required.
Proposed safeguards	– All personnel working on site will receive training to ensure awareness of relevant statutory responsibilities. – If Aboriginal heritage items are uncovered during the works, all works in the vicinity of the find must cease and the Council will be contacted immediately, and the *Standard Management Procedure - Unexpected Heritage Items* (RMS, 2015b) will be followed.

5.6 Noise and vibration

Issue	Description
Existing environment	The existing noise environment is that of a rural area, consisting of farming activities and biophilic sounds.
Proposal details	Are there any noise sensitive areas near the location of the proposed works that may be affected by the works (i.e. church, school, hospital, residences)? Yes ☒ No ☐ The proposal is located amongst dispersed rural properties. The nearest sensitive receiver is a rural resident located approximately 200 meters northwest of the proposal site (Figure 2.1).

Issue	Description
	Are the proposed works going to be undertaken during standard working hours detailed below? Yes ☒ No ☐ *Standard working hours* *Monday – Friday* — *7:00 am to 6:00 pm* *Saturday* — *8:00 am to 1:00 pm* *Sunday and Public Holidays* — *No work*
Potential impacts	Does the proposal pose any potential risk to the surrounding noise quality? Yes ☒ No ☐ The construction of the proposal would require construction activities which would generate noise uncharacteristic of the surrounding rural environment. Noise impacts are expected to be minor and restricted to the construction phase of the proposal. Any noise impacts would be short term and limited to standard construction hours. No vibration impacts to sensitive receivers are expected due to the distance between the site and the closest residence. Operation of the proposal would not alter the noise environment for sensitive receivers.
Proposed safeguards	– The works will be carried out during standard work hours (i.e. 7:00 am to 6:00 pm Monday to Friday; 8:00 am to 1:00 pm Saturdays) which comply with the ***Interim Construction Noise Guideline*** (DECC 2016). Any work that is performed outside normal work hours or on Sundays or public holidays requires approval from Council. – Council or nominated contractors will notify affected sensitive receivers if any work is to occur outside of normal work hours. – All employees, contractors and subcontractors are to receive an environmental induction. The induction must at least include: • All proposal specific and relevant standard noise and vibration mitigation measures • Relevant licence and approval conditions • Permissible hours of work • Any limitations on high noise generating activities • Location of nearest sensitive receivers • Construction employee parking areas • Designated loading/unloading areas and procedures • Site opening/closing times (including deliveries) – Regularly inspect and maintain equipment to ensure it is in good working order. – Use quieter and less vibration emitting construction methods where feasible and reasonable. – Neighbouring property access to be maintained. Residents affected by the proposal would be notified of the works in advance. Contact details would be provided for queries or complaints. – Plant and equipment will be switched off when not in use. – Landowners will be notified prior to commencement of activities that may result in noise disturbance. During the project, the contact details of a representative of the company will be provided to receive and address noise complaints.

5.7 Air quality

Issue	Description
Existing environment	The existing environment is rural in nature. Westlime Canowindra quarry located on Canomodine Lane is the closest nearby industry located approximately 4 kilometres to the north west of the proposal site.
Proposal details	Are the proposed works likely to result in large areas (>2ha) of exposed soils? Yes ☐ No ☒
	Are there any dust sensitive receivers located within the vicinity of the proposed works during the construction period (i.e. church, school, hospital, residences)? Yes ☒ No ☐

Issue	Description
	The nearest sensitive receiver is a rural resident located approximately 200 meters northwest of the proposal site (Figure 2.1).
	Is there likely to be an emission to air of dust, smoke, steam or vehicle emissions? Yes ☒ No ☐ The proposal may generate dust during earthworks. Construction vehicles would generate emissions in keeping with permitted emissions from mobile plant.
Potential impacts	Does the proposal pose any potential risk to the surrounding air quality? Yes ☒ No ☐ Fumes, odours and other air emissions may occur from vehicles, plant and equipment on site. Dust generation is possible during excavation works and material emplacement. However, these impacts would be short-term and temporary. It is considered that construction of the proposal would not significantly impact local air quality if the safeguards listed below are implemented.
Proposed safeguards	– Dust generated during construction will be visually monitored by construction staff. If dust generation is evident, measures such as water sprays, minimising vehicle movements and reducing vehicle speeds would be implemented immediately. – Stabilisation of disturbed areas will be undertaken as soon as practicable. – Plant and machinery will be turned off when not in use and maintained in accordance with Australian standards or manufactures recommendations. – Construction plant and equipment are to be maintained in good working order. – Any dust complaint will be investigated as soon as possible, and measures taken to manage any impacts identified. – No burning of materials will occur. – During transportation, loads will be adequately covered.

5.8 Waste and chemical management

Issue	Description
Existing environment	Are the proposed works likely to generate >200 tonnes of waste material (contaminated and/or non-contaminated material)? Yes ☐ No ☒
	Are the proposed works likely to require a **licence from EPA**? Yes ☐ No ☒
	Is waste being transported off site to another location? Yes ☒ No ☐ Waste generated by the proposal is expected to include vegetation, damaged concrete abutments and any remaining bridge debris. Other waste generated would include small amounts of domestic waste, sewage waste and packaging may also be generated by the proposal. No hazardous waste is expected to be produced by the proposal. Wastes would be classified prior to disposal and recycled where possible. Waste to be disposed would be transported a licenced waste management facility for disposal.
	Does the proposal pose any potential risk to the surrounding environment as a result of waste generated? Yes ☒ No ☐ The proposal may result in potential risks to the surrounding environment due to the generation of waste on site outlined above.

Issue	Description
Potential impacts	Waste materials generated by construction of the proposal could include: – Concrete abutments from existing bridge structure. – Vegetation waste, which would be stockpiled at the temporary compound site, prior to removal. – Rock and soil waste generated from earthworks would be managed as per the contractor's preferred method and will be compliant with waste regulations. – Domestic waste including food scraps, aluminium cans, glass bottles, plastic and paper containers and putrescible waste generated by site construction personnel. – Liquid wastes such as oils, lubricants etc. used by machinery or excess material (erosion controls and mulch) generated during works. Excess material not used onsite would be classified in accordance with the Waste Classification Guidelines (EPA 2014) for disposal at a licensed waste management facility. Waste materials have the potential to cause pollution to the environment. However, given the proposed safeguards detailed below, pollution to the environment is unlikely to occur.
Proposed safeguards	– All site waste will be managed in accordance with the waste reduction hierarchy of avoid, reduce, re-use and recycle as per the *Waste Avoidance and Resource Recovery Act 2001*. – Wastes will be classified prior to disposal and recycled where possible. – Liquid waste is to be contained in appropriate sealed containers. – Waste will only be transported to a site that may lawfully receive the material. A Section 143 Certificate (POEO Act) will be required from the receiving premises to confirm the necessary environmental and planning approvals are in place. – Cease work in the immediate vicinity of any areas of suspected contamination that are identified prior to or during work. Ensure that these areas are not disturbed and are cordoned off as a safety risk. – All surplus material, off cuts, and other debris resulting from the work shall be removed from site and disposed of at an appropriate site with the appropriate environmental and planning approvals in place. – Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day. – Contingency plan will be implemented in the event that contaminated soils are encountered during the works.

5.9 Traffic and transport

Issue	Description
Existing environment	The proposal site is located on Canomodine Lane, approximately 14 km north east of Canowindra. Vehicles accessing the site from Canowindra or Orange would travel via Cargo Road, which is a two-way, sealed road and the only route to access the proposal site. Canomodine Lane is currently open in both directions through use of the temporary gravel causeway but is limited to a single lane of traffic. This access could be restricted during high flows as the causeway follows the natural gradient of the creek. The bridge services two residential that would require access to be maintained throughout the construction process.
Potential impacts	Are the proposed works likely to result in detours, disruptions or delays to traffic flow (vehicular, cycle and pedestrian) or access to properties or businesses? During construction Yes ☒ No ☐ Canomodine Lane would remain open with access proved through the gravel causeway. Construction would generate increased road movements for the movement of equipment, plant and construction personnel, including contractors and workers. Heavy vehicle movements would be limited to site establishment and decommissioning to install and remove site facilities and heavy equipment. In addition to these, the transportation of materials to the proposal site and removal of spoil/excavated material would require heavy vehicle movements. Light vehicle movements would primarily occur in morning and afternoon/evening periods of each working day. The local road network consists of a few rural property owners. As such, this minor increase in vehicle traffic is considered low and no major impacts are expected. Attributable to the above, traffic control at the proposal site would not be deemed necessary throughout the construction works. However, due to the constrained worksite a Traffic Control Plan

Issue	Description
	(TCP) which contains measures and strategies to manage traffic safely and efficiently in and around the construction works would be implemented.
	During Operation Yes ☐ No ☒
	Are the proposed works likely to affect any other transport nodes or transport infrastructure (e.g. bus stops, bus routes) in the surrounding area? Result in detours or disruptions to traffic flow (vehicular, cycle and pedestrian) or access during operation? Yes ☐ No ☒
Proposed safeguards	– If road closures are required during construction, traffic control is to be implemented in accordance with Council requirements, AS *1742.3-2009 – Manual of uniform traffic control devices*, *Roads and Maritime Traffic Control at Work Sites Manual* (RTA, 2010) and *Roads and Maritime QA Specification G10 Control of Traffic* (Roads and Maritime, 2008). – Develop and implement a TCP that would be in place for the entire duration of construction works. This plan should consider but not be limited to the following components: • Traffic flow management • Access and egress points • Parking and loading zones • Work zones • Speed limits • Emergency procedures • Schedule and phasing for construction activities • Public outreach

6. Summary of safeguards and environmental management measures

6.1 Safeguards and management measures

Table 6.1 details the safeguards and management measures that will be implemented to minimise the environmental impacts identified in Section 5.

Table 6.1 Summary of management measures for the proposed works

Factor	Safeguards
Landform, geology and soils	Implement the Erosion and Sediment Control Plan as part of the Construction Environmental Management Plan that includes soil and erosion protection measures in accordance with *Managing Urban Stormwater: Soils and construction—Volume 1 (Landcom, 2004), Volume 2C Unsealed roads (DECC, 2008b) and Volume 2D, Main Road Construction (DECC, 2008c) (collectively referred to as the Blue Book).*
	Erosion and sedimentation controls will be checked daily and maintained as required until ground stability is achieved.
	High risk soil erosion activities such as earthworks will not be undertaken immediately before or during high rainfall (i.e. >20 mm in any 24-hour period) or wind events.
	Locate stockpiles and construction materials away from vegetation, waterways and drainage lines, implement bunding practices where appropriate.
	Minimise exposure of soils and retain vegetation where practicable.
	Vehicle and machinery movement will be minimised across the site. Wherever possible, vehicles and machinery will be parked at the compound site and movement on site will be on foot.
	Construct temporary drainage structures in accordance with the '*Technical Guideline - Temporary Stormwater Drainage for Road Construction*' (RMS 2011).
	Stockpiles will be designed, established, operated and decommissioned in accordance with the *RMS Stockpile Site Management Guidelines* (RMS 2018).
	The rehabilitation of disturbed areas would be carried out progressively as construction stages are completed, and in accordance with: – Landcom's "Blue Book" (4th Edition) on sediment and erosion control (Landcom 2004) – RMS Landscape Guidelines (LGNSW 2019) – RMS Guidelines for Batter Stabilisation Using Vegetation (RMS 2015a)
Contaminated land and acid sulfate soils	In the event of an unexpected find of contaminated land or acid sulfate soils, work would cease in the affected area and the Council project manager would be contacted for advice on how to proceed accordingly.
Water quality and hydrology	A spill kit will be always kept on site for potential chemical or fuel spills.
	Contractors will be trained in the correct use of a spill kit.
	All materials that have the potential to contaminate surface water or groundwater will be stored at least 40 m away from any watercourses and on flat grades.
	Erosion and sediment controls in accordance with Landcom's "Blue Book" (4th Edition) (refer Section 5.2.
	Visual monitoring of Canomodine Creeks water quality (i.e. turbidity, hydrocarbon spills/slicks, algal blooms, colour and odour) will be undertaken on a regular basis to identify any potential spills or deficient erosion and sediment controls. A comprehensive record will be kept of these inspections. If water quality deteriorates over consecutive monitoring inspections quantitative water quality testing should be undertaken to obtain a comprehensive understanding of creek health.
	When deconstructing/constructing the bridge a capture system will be installed across the creek to prevent any materials from entering the creek.

Factor	Safeguards
	If feasible, schedule construction works to minimise disruption to the creek during sensitive times such as spawning seasons for fish or other aquatic life.
	Works will be conducted during dry seasons or low-flow periods where possible.
	No works will be undertaken during heavy rain periods or where flooding warnings for the wider area are issued. During works weather forecasts would be monitored daily.
	All work sites will be kept in a clean and tidy condition to prevent waste/litter from entering watercourses.
Biodiversity	As part of the site induction process, provide all site personnel with information on the biodiversity values of the study area, including potential threatened species habitat, threatened ecological communities, no-go areas and responsibilities under relevant environmental legislation, including but not limited to the EP&A Act, BC Act and EPBC Act. Refer to the threatened species habitat descriptions detailed in Appendix F.
	Should unexpected, threatened fauna or flora be identified at any time during construction, cease work immediately in the area to prevent further harm to the individual. Contact Council's Environmental Officer and a suitably qualified ecologist to determine if further assessment or management plans are required.
	No removal or disturbance of vegetation outside the proposal area is to occur without further assessment.
	Establish exclusion zones in accordance with *Guide 2 Exclusion Zones of Roads and Traffic Authority Biodiversity Guidelines* (Transport Roads and Traffic Authority, 2011) to ensure clearing does not extend beyond the approved area.
	Trees are to be removed in accordance with *Guide 4: Clearing of Vegetation and Removal of Bushrock of Roads* and *Traffic Authority Biodiversity Guidelines* (Transport Roads and Traffic Authority, 2011).
	Trees that are to be trimmed (or removed if necessary) will be clearly marked. Any vegetation to be protected adjacent to the work area will be protected with exclusion fencing.
	No HBTs (including dead/stag trees and hollow bearing stumps) are to be removed without further assessment for fauna species or hollows by a suitably qualified person.
	Coarse woody debris (CWD) produced from vegetation clearing is to be placed in areas of existing vegetation within the assessed study area. CWD is not to be pushed into adjoining vegetation.
	If any damage occurs to vegetation outside of the boundaries of the work site as a result of the proposal, the Council Project Manager will be notified and will establish strategies for mitigation of impacts and site restoration.
	Implement wash-down procedures detailed in DPIE's (2020) hygiene protocol for vehicles and heavy machinery.
	Manage vegetation within the road reserve and adjacent areas of vegetation clearing in accordance with *Guide 6: Weed Management of Roads and Traffic Authority Biodiversity Guidelines* (Transport Roads and Traffic Authority, 2011) to reduce invasion of priority weed species.
	Use weed-free topsoil in any landscaping works post-construction and revegetate disturbed sites with locally indigenous species.
	Construction machinery should be washed prior to entering and leaving site to ensure weed propagules are not transported.
	Transport of any soil or gravel material from one site to another is prohibited.
	The rehabilitation of disturbed areas will be carried out progressively as construction stages are completed, and in accordance with: – Landcom's "Blue Book" (4th Edition) on sediment and erosion control – *RMS Landscape Guidelines* – *RMS Guidelines for Batter Stabilisation Using Vegetation*
	Council is to consult with Fisheries prior to the commencement of works to confirm if the proposal can be undertaken in accordance with the Code of Practice and if a permit is required.

Factor	Safeguards
Aboriginal heritage	All personnel working on site will receive training to ensure awareness of relevant statutory responsibilities.
	If Aboriginal heritage items are uncovered during the works, all works in the vicinity of the find must cease and the Council's Environmental Officer will be contacted immediately, and the *Standard Management Procedure - Unexpected Heritage Items* (RMS, 2015b) will be followed.
Non-Aboriginal heritage	In the event of an unexpected find of an archaeological deposit (or suspected item), works on site would cease in the affected area and the Council project manager would be contacted immediately for advice on how to proceed.
Noise	The works will be carried out during normal work hours (i.e. 7:00 am to 6:00 pm Monday to Friday; 8:00 am to 1:00 pm Saturdays) which comply with the ***Interim Construction Noise Guideline*** (DECC 2016). Any work that is performed outside normal work hours or on Sundays or public holidays requires approval from Council.
	Council or nominated contractors will notify affected sensitive receivers if any work is to occur outside of normal work hours.
	All employees, contractors and subcontractors are to receive an environmental induction. The induction must at least include: – All proposal specific and relevant standard noise and vibration mitigation measures – Relevant licence and approval conditions – Permissible hours of work – Any limitations on high noise generating activities – Location of nearest sensitive receivers – Construction employee parking areas – Designated loading/unloading areas and procedures – Site opening/closing times (including deliveries) – Environmental incident procedures
	Regularly inspect and maintain equipment to ensure it is in good working order.
	Use quieter and less vibration emitting construction methods where feasible and reasonable.
	Neighbouring property access to be maintained. Residents affected by the proposal would be notified of the works in advance. Contact details would be provided for queries or complaints.
	Plant and equipment will be switched off when not in use.
	Landowners will be notified prior to commencement of activities that may result in noise disturbance. During the project, the contact details of a representative of the company will be provided to receive and address noise complaints.
Air quality	Dust generated during construction will be visually monitored by construction staff. If dust generation is evident, measures such as water sprays, minimising vehicle movements and reducing vehicle speeds would be implemented immediately.
	Stabilisation of disturbed areas will be undertaken as soon as practicable.
	Plant and machinery will be turned off when not in use and maintained in accordance with Australian standards or manufactures recommendations.
	Construction plant and equipment are to be maintained in good working order.
	Any dust complaint will be investigated as soon as possible, and measures taken to manage any impacts identified.
	No burning of any materials will occur.
	During transportation, loads will be adequately covered.
Waste and chemical management	All site waste would be managed in accordance with the waste reduction hierarchy of avoid reduce, re-use and recycle as per the *Waste Avoidance and Resource Recovery Act 2001*.
	Wastes will be classified prior to disposal and recycled where possible.
	Liquid waste is to be contained in appropriate sealed containers.
	Waste will only be transported to a site that may lawfully receive the material. A Section 143 Certificate (POEO Act) will be required from the receiving premises to confirm the necessary environmental and planning approvals are in place.

Factor	Safeguards
	Cease work in the immediate vicinity of any areas of suspected contamination that are identified prior to or during work. Ensure that these areas are not disturbed and are cordoned off as a safety risk.
	All surplus material, off cuts, and other debris resulting from the work shall be removed from site and disposed of at an appropriate site with the appropriate environmental and planning approvals in place.
	Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day.
	Contingency plan will be implemented in the event that contaminated soils are encountered during the works.
Traffic and transport	If road closures are required during construction, traffic control is to be implemented in accordance with Council requirements, AS *1742.3-2009 – Manual of uniform traffic control devices*, *Roads and Maritime Traffic Control at Work Sites Manual* (RTA, 2010) and *Roads and Maritime QA Specification G10 Control of Traffic (*Roads and Maritime, 2008).
	Develop and implement a TCP that would be in place for the entire duration of construction works. This plan should consider but not be limited to the following components: – Traffic flow management – Access and egress points – Parking and loading zones – Work zones – Speed limits – Emergency procedures – Schedule and phasing for construction activities – Public outreach
Visual amenity/landscape	Construction areas are to be maintained in an orderly manner and inspected daily.
	Any high-rise equipment such as cranes, would be lowered (if possible) when not in use on-site.
	Disturbed areas would be rehabilitated immediately following completion of construction.
	All temporary structures, equipment and waste is to be removed at the completion of works.
Socio-economic	Property owners and residents adjacent to the proposal site will be contacted via letter box drops four weeks before the commencement of works. One day before construction, residents will be notified again by door knock, or letter box drop if they are not present. Information will be provided on the proposed works and working hours, and a contact name and number will be provided for any questions or concerns.
Hazards and risk	Bushfire hazard mapping and consultation with local fire authorities would occur to determine the specific fire danger rating for the local area.
	Firefighting equipment, such as hoses, pumps, and fire extinguishers would be easily accessible on site and in good working condition.
	Any long grass in the work area will be cut prior to commencing works.
Cumulative impacts	If deemed necessary works will be scheduled in conjunction with other utility and road projects occurring in the local area, such that heavy vehicle movements and high noise generating activities are undertaken at differing times and spread out throughout the proposal.

7. Conclusion

This REF has been prepared in accordance with the provisions of Section 5.5 of the EP&A Act, taking into account to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the proposal.

The proposal would provide the following benefits:

- **Improved safety** – The new bridge would be engineered to current Australian safety standards which reduces the risk of future collapses.
- **Long-term accessibility** – Although the temporary side-track provides access through to Canomodine Lane, high flows of Canomodine Creek could easily restrict this. As such, a new bridge would provide long term accessibility to local residents and minimises the occurrence of disrupted access in the future.
- **Emergency response** – Bridges are essential for emergency services to reach affected areas after a flood event. A new bridge ensures that emergency responders can reach those in need promptly and safety.
- **Environmental considerations** – Although there would be short team minor impacts on the environment during construction works, a new bridge with rip rap scour protection would stabilise the creek banks and protect against further soil erosion along the creek banks.

Where possible, impacts would be avoided or minimised through the implementation of safeguards and management measures outlined in this review of environmental factors.

This REF has considered and assessed these impacts in accordance with Section 171 of the EP&A Regulation and the requirements of the EPBC Act. Based on the assessment contained in this REF, it is considered that the proposal is not likely to have a significant impact upon the environment or any threatened species, populations or communities. Accordingly, an EIS is not required, nor is the approval of the Minister for Planning and Public Spaces.

8. Certification, review and decision

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

REF author:

Signature:

Name: Hannah Marsh

Title: Graduate Environmental Scientist

Date: 12/10/2023

Reviewed and endorsed by:

Signature: dcl

Name: Dharini Collaguazo

Title: Senior Environmental Planner

Date: 12/10/2023

Authorising manager's approval:

Signature:

Name: Daniel Mees

Title: Manager, Orange

Date: 12/10/2023

Council review by:

Signature: W.J. Dorfman

Name: Warwick Dorfman

Title: Environmental Officer

Date: 9. 10. 23

Council approval by:

Signature:

Name: MATTHEW CHRISTENSEN.

Title: DEPUTY GENERAL MANAGER

Date: 17/10/2023

9. Bibliography

Commonwealth of Australia 2013 Matters of National Environmental Significance. Significant Impact Guidelines 1.1. Dept of Environment Canberra.

DAWE 2021. EPBC Protected Matters Search Tool. https://www.environment.gov.au/webgis-framework/apps/pmst/pmst.jsf.

DPIE 2021. BioNet Atlas Search https://www.environment.nsw.gov.au/atlaspublicapp/UI_Modules/ATLAS_/AtlasSearch.aspx.

DPE 2022. Guidelines for Division 5.1 assessments.

EPA 2014. Waste Classification Guidelines.

Landcom 2004. Managing Urban Stormwater: Soils and construction – Volume 1. 4th Edition.

NSW DPI (2012). Guidelines for watercourse crossings on waterfront land. https://propertydevelopment.ssc.nsw.gov.au/PublicEPropertyPDF/DA151134%20Appendix%204%20-%20[A3295169].pdf

NSW DPI (2023) NSW WeedWise

https://weeds.dpi.nsw.gov.au/

NSW Government (2022). Roads Act 1993.

NSW Government (2021). NSW Disaster Assistance Guidelines. https://www.nsw.gov.au/sites/default/files/2022-02/nsw-disaster-assistance-guidelines-dag-2021.pdf

NSW RTA 2010. Traffic Control at Work Sites Manual.

NSW RTA Environmental Branch 2011. Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects. Revision 0/September 2011. https://www.rms.nsw.gov.au/business-industry/partners-suppliers/documents/guides-manuals/biodiversity_guidelines.pdf.

Roads and Maritime Services (RMS) 2008. QA Specification G10 Control of Traffic.

Roads and Maritime Services (RMS) 2011. Technical Guideline: Temporary Stormwater Drainage for Road Construction.

Roads and Maritime Services (RMS) 2015a. Guidelines for Batter Surface Stabilization using vegetation https://roads-waterways.transport.nsw.gov.au/documents/about/environment/guideline-for-batter-surface-stabilisation-using-vegetation.pdf

Roads and Maritime Services (RMS) 2015b. Unexpected Heritage Items – Heritage Procedure 02.

Roads and Maritime Services (RMS) 2018. Technical Direction Geotechnology: GTD 2018/001.

Roads and Maritime Services (RMS) 2016. Construction Noise and Vibration Guideline.

Roads and Maritime Services (RMS) 2014. Code of Practice - Minor work in NSW waterways.

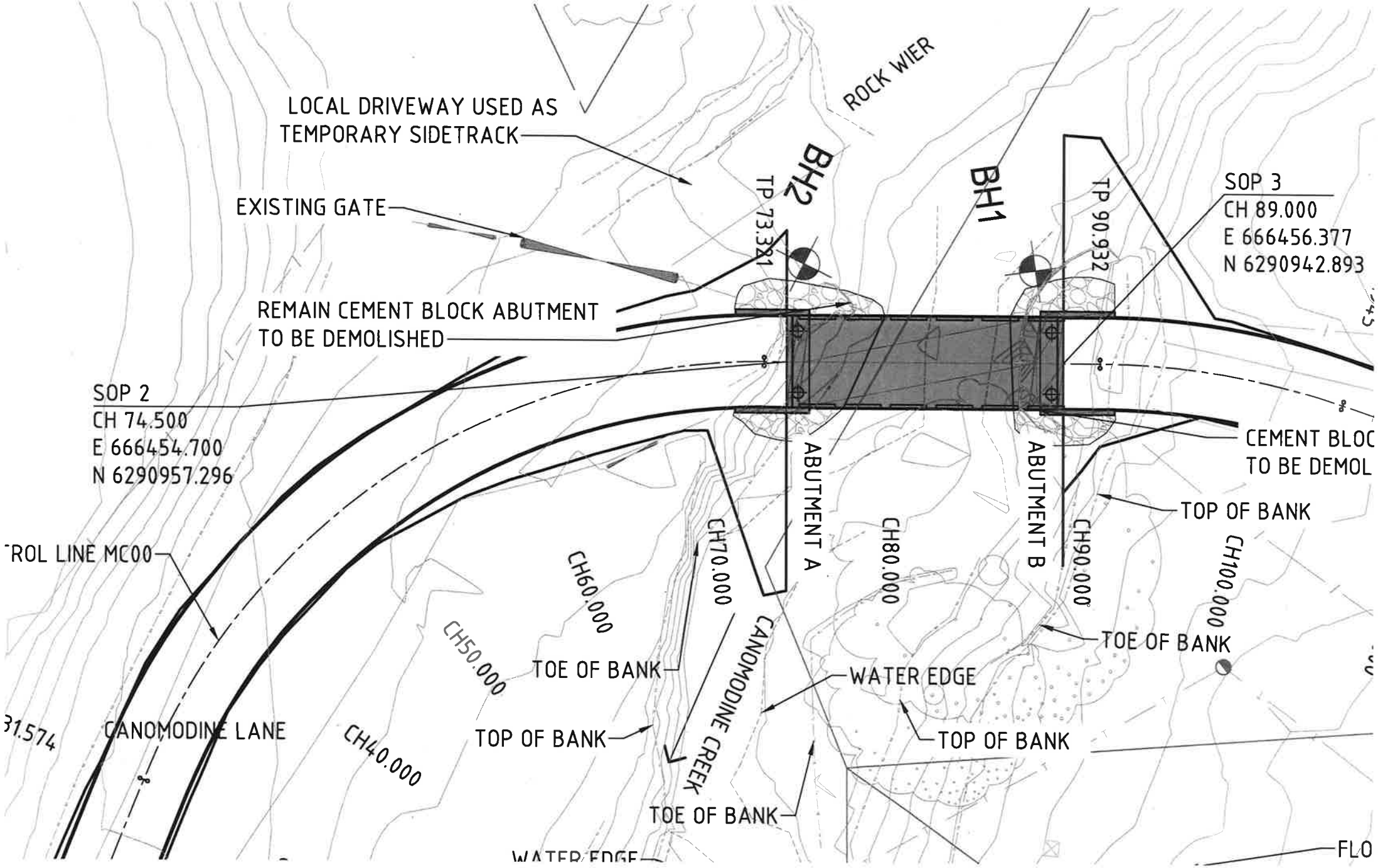
REF Environmental Safeguards and Mitigation Measures Workbook. Prepared as part of the REF Templates for councils as part of the Local Government NSW (LGNSW) Council Roadside Reserves Project. https://www.lgnsw.org.au/common/Uploaded%20files/REM_files/REF_Environmental_Safeguards_and_Mitigation_Measures_Workbook.xlsx.

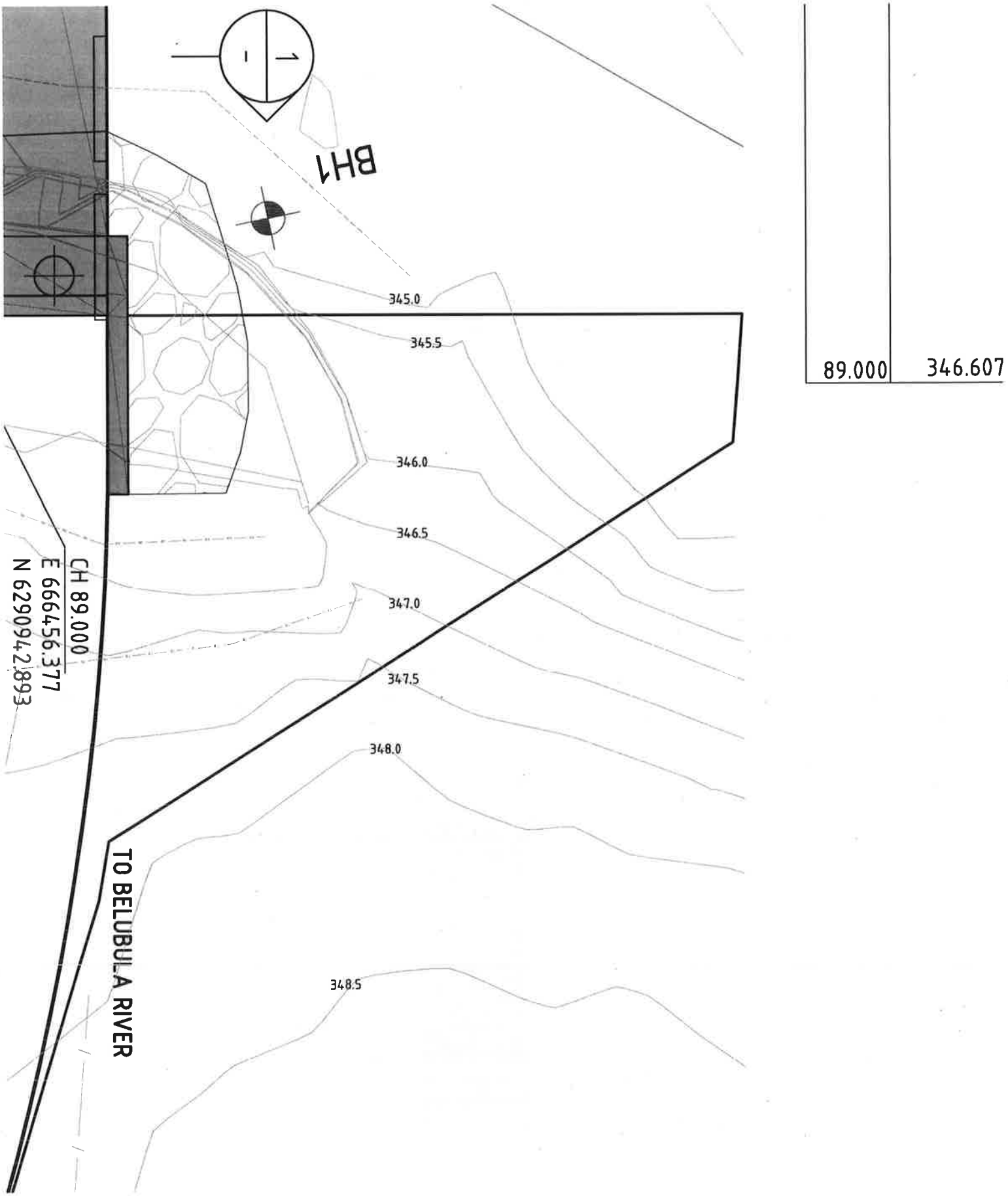
Appendices

Appendix A

Concept plans

LONG SECTION ALONG MC00

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Appendix B

Section 171 checklist

Section 171 checklist

The following factors, listed in Section 171 of the *Environmental Planning and Assessment Regulation 2021*, have also been considered to assess the likely impacts of the proposal on the natural and built environment.

Factor	Impact
a) Any environmental impact on a community? The community would not be affected through declines in the local environment as a result of the proposal. Mitigation measures have been designed to reduce environmental impacts on the community to short-term minor negative levels (refer to Section 5).	Short-term minor negative
b) Any transformation of a locality? Temporary transformations of the locality are restricted to the site and comprise the works detailed in Section 5. After completion of the work, permanent transformations would be restricted to the site. No significant transformation of the locality would occur as a result of the proposal.	Short-term minor negative
c) Any environmental impact on the ecosystems of the locality? The ecosystems of the locality would not be affected through declines in local environmental values (e.g. biodiversity, physical environment) as a result of the proposal. Mitigation measures have been designed to reduce environmental impacts (refer to Section 5).	Short-term minor negative
d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality? The aesthetic, recreational, scientific or other environmental qualities or value of the locality are not expected to be impacted by the proposal. The character of the general area would largely remain the same post-construction and no significant visual impact or recreational impediment is expected. No reduction in the quality of environmental values associated with noise, water, soil and air quality or significant decreases in biodiversity are likely to occur due to the mitigation measures provided in Section 5 of this REF. No significant changes to the locality are expected to occur. No long-term changes in the character or nature of the site or its immediate environs are expected as a result of the proposal.	Short-term minor negative
e) Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significanceor other special value for present or future generations? No long-term changes to the character or nature of the site or its immediate environs are expected as a result of the proposal.	Negligible
f) Any impact on the habitat of protected fauna (within the meaning of the *National Parks and Wildlife Act 1974)?* A small area of habitat would be disturbed in order to complete the proposal. With effective implementation of the safeguards provided in Section 5 of this REF, the proposal is not considered likely to have a significant negative impact on the habitat of any other protected fauna.	Short-term minor negative
g) Any endangering of any species of animal, plant or other form of life, whetherliving on land, in water or in the air? With effective implementation of the safeguards provided in Section 5 of this REF, the proposal is not considered likely to significantly endanger any species of animal, plant or other form of life.	Short-term minor negative
h) Any long-term effects on the environment? No significant negative long-term impacts are considered likely with effective implementation of the proposed mitigation measures in Section 5 of this REF.	Negligible
The proposal would have beneficial long-term impacts by providing safe access across Canomodine Creek.	Long-term positive
i) Any degradation of the quality of the environment? No significant degradation of the quality of the environment is expected with effective implementation of the safeguards in Section 5 of this REF.	Short-term minor negative

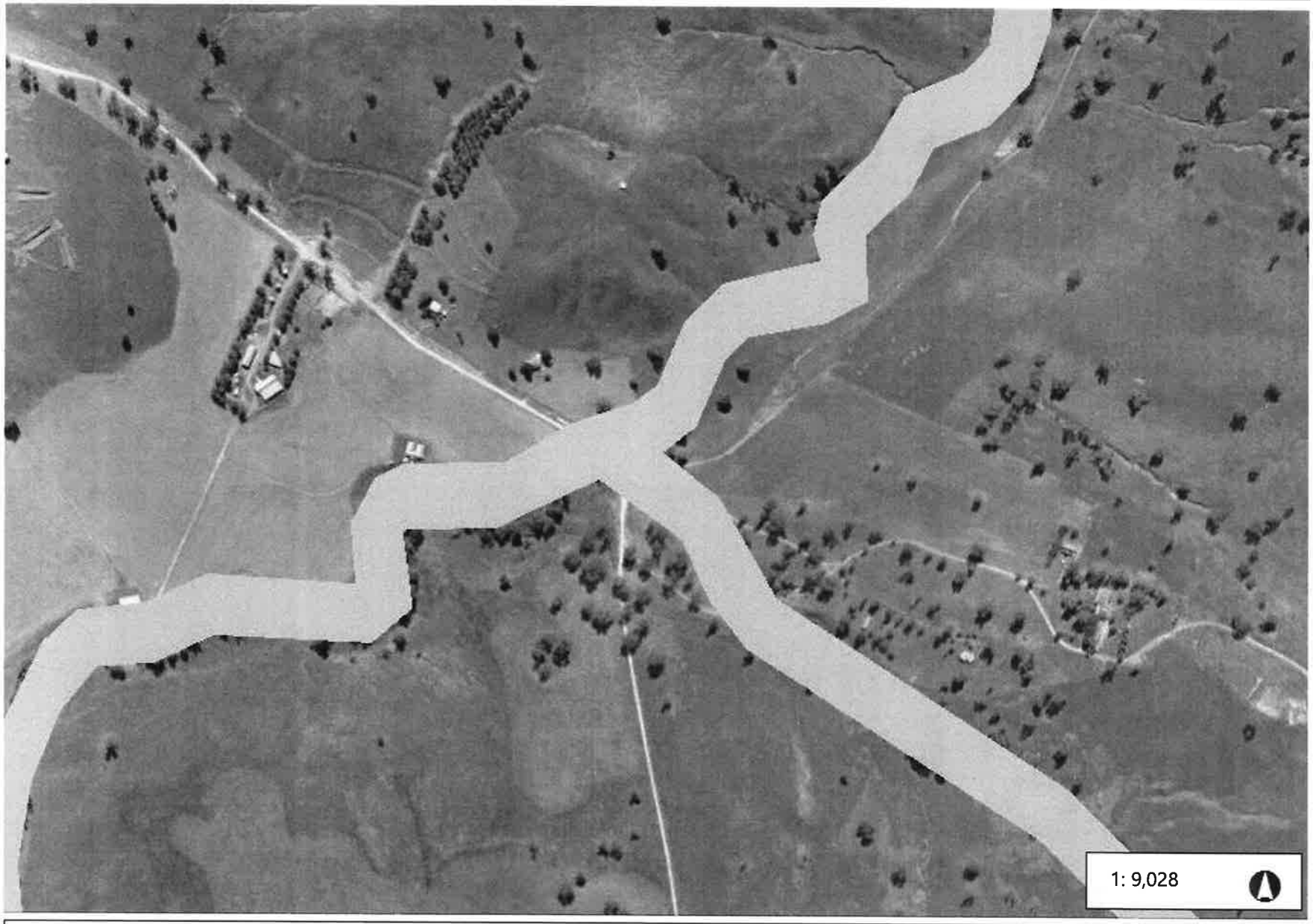
Factor	Impact
j) Any risk to the safety of the environment? The primary objective of the proposal is to improve safety for road users. The proposal is unlikely to pose any significant risk to the safety of the environmental attributes outlined in Section 5. Any possible impacts would be minimised with the implementation of the safeguards in Section 5 of this REF.	Short-term minor negative
k) Any reduction in the range of beneficial uses of the environment? The proposal is not likely to result in any reduction in the range of beneficial uses of the environment.	Nil
l) Any pollution of the environment? Waste materials, fuel spills and sediment have the potential to cause pollution to the environment. However, given the proposed safeguards detailed in Section 5 of this REF, pollution to the environment is unlikely to occur.	Short-term minor negative
m) Any environmental problems associated with the disposal of waste? All waste generated by the proposal would be disposed of in a manner which would not damage or disturb any native flora or fauna or the physical environment. The disposal of waste would be in accordance with EPA approved methods of waste disposal. Safeguards detailed in Section 5 of this REF would protect the environment from problems associated with all waste disposal.	Nil
n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply? The proposal does not create any demand for resources that are in short supply nor is it likely to result in an increased demand on any natural resources that are likely to become in short supply. Council would attempt to draw supplies and resources from established suppliers having appropriate environmental approvals and standards.	Nil
o) Any cumulative environmental effect with other existing or likely future activities? The proposal would have minor cumulative impacts (e.g. resource consumption) but is unlikely to significantly contribute to any cumulative impacts.	Nil
p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions? No impact on coastal process and coastal hazards would be applicable to this proposal.	Nil
q) Applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1? No strategic planning statements, regional or district plans would be applicable to this proposal.	Nil
r) Other relevant environmental factors? Environmental factors impacted by the proposal are discussed in Section 5 of this REF. With the implementation of the safeguards given in Section 5 in this REF, no additional impacts would be generated by the proposal etc.	Nil

Appendix C

Key Fish Habitat

Department of Primary Industries

Canomodine Creek KFH



Legend

- Key Fish Habitat - Central Rive
- Key Fish Habitat - Murray Darli
- Key Fish Habitat - Murray Darli
- Key Fish Habitat - Southern Ri

Notes

0.5 0 0.23 0.5 Kilometers

WGS_1984_Web_Mercator_Auxiliary_Sphere

05-Oct-2023

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Appendix D

Threatened Fish Distributions Map

SEED Sharing and Enabling Environmental Data

Canomodine Creek Threatened Fish Distributions

Map may contain errors and omissions. Neither the NSW Government nor any other data custodian will accept liability for any loss, damage, cost or expenses incurred as a result of the use of, or reliance upon, the information in the map. Map copyright the State of NSW through the Office of Environment and Heritage.

0.2 0 0.11 0.2 Kilometers

Scale 1: 4,290.60 WGS_1984_Web_Mercator_Auxiliary_Sphere

Generated from SEED web map. Created 9:59 PM 5/10/2023

Legend

- Eastern Freshwater Cod
- Eel Tailed Catfish
- Fitzroy Falls Spiny Crayfish
- Flathead Galaxias
- Macquarie Perch
- Murray Crayfish
- Olive Perchlet
- Southern Purple Spotted Gudgeon
- River Blackfish
- Silver Perch
- Southern Pygmy Perch
- Trout Cod
- Australian Grayling
- Darling River Hardyhead

Appendix E

EPBC Act search results

ıe EPBC Act in the area you have selected. Please see the caveat for interpretati
ɔvided here.

ıted: 18-Sep-2023

ry

rs of NES
Matters Protected by the EPBC Act
Information

ledgements

e Properties:	None
age Places:	None
ternational Importance (Ramsar	4
Reef Marine Park:	None
h Marine Area:	None
ned Ecological Communities:	4
ned Species:	43
ry Species:	11

ers Protected by the EPBC Act

report summarises other matters protected under the Act that may relate to the area y
be required for a proposed activity that significantly affects the environment on Commo
n is outside the Commonwealth land, or the environment anywhere when the action is t
n land. Approval may also be required for the Commonwealth or Commonwealth agenc
hat is likely to have a significant impact on the environment anywhere.

protects the environment on Commonwealth land, the environment from the actions tal
n land, and the environment from actions taken by Commonwealth agencies. As heritag
of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritag
n Heritage place. Information on the new heritage laws can be found at
ceew.gov.au/parks-heritage/heritage

e required for activities in or on a Commonwealth area that may affect a member of a l
ogical community, a member of a listed migratory species, whales and other cetaceans
species.

h Lands:	None
h Heritage Places:	None
Species:	18
ther Cetaceans:	None
ts:	None
h Reserves Terrestrial:	None
ine Parks:	None
l to the Survival of Marine Turtles:	None

nation

e report provides information that may also be relevant to the area you have

itory Reserves:	None
st Agreements:	None
ortant Wetlands:	None

	upstream from Ramsar site	
e lakes	500 - 600km upstream from Ramsar site	In fe
	700 - 800km upstream from Ramsar site	In fe
and lakes alexandrina and albert wetland	800 - 900km upstream from Ramsar site	In fe

tened Ecological Communities [Resourc

l ecological communities where the distribution is well known, maps are derived f
egetation maps, remote sensing imagery and other sources. Where threatened ec
tributions are less well known, existing vegetation maps and point location data a
ıtive distribution maps.
erable, Disallowed and Ineligible are not MNES under the EPBC Act.

ame	Threatened Category	Presence Text	Buffe
calyptus microcarpa) ands and Derived Native South-eastern Australia	Endangered	Community likely to occur within area	In fe
erate Grassland of the Highlands	Critically Endangered	Community may occur within area	In fe
assy Woodland on Alluvial	Endangered	Community may occur within area	In fe
low Box-Blakely's Red Woodland and Derived and	Critically Endangered	Community likely to occur within area	In fe

tened Species [Resourc

servation Dependent and Extinct are not MNES under the EPBC Act.
current name ID.

		habitat known to occur within area	
loptilus ittern [1001]	Endangered	Species or species habitat may occur within area	In fe
inea iper [856]	Critically Endangered	Species or species habitat may occur within area	In fe
fimbriatum ockatoo [768]	Endangered	Species or species habitat may occur within area	In fe
us lathami lathami Glossy Black-Cockatoo	Vulnerable	Species or species habitat likely to occur within area	In fe
umnus victoriae eeper (south-eastern)	Vulnerable	Species or species habitat known to occur within area	In fe
cos 929]	Vulnerable	Species or species habitat likely to occur within area	In fe
a veater [470]	Vulnerable	Species or species habitat likely to occur within area	In fe
udacutus l Needletail [682]	Vulnerable	Species or species habitat likely to occur within area	In fe

		within area	
ucullata cucullata Hooded Robin, Hooded astern) [67093]	Endangered	Species or species habitat known to occur within area	In fe
rysostoma arrot [726]	Vulnerable	Species or species habitat may occur within area	In fe
dagascariensis , Far Eastern Curlew	Critically Endangered	Species or species habitat may occur within area	In fe
sonii [738]	Vulnerable	Species or species habitat known to occur within area	In fe
ccosus	Vulnerable	Species or species habitat may occur within area	In bu
tralis nted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In fe
guttata ail [59398]	Vulnerable	Species or species habitat known to occur within area	In fe
macquariensis 171]	Endangered	Species or species habitat may occur within area	In bu

		habitat may occur within area	
ongensis og [1844]	Endangered	Species or species habitat may occur within area	In bu
nis s Frog, Southern Bell nd Golden Frog, Warty Golden Bell Frog [1828]	Vulnerable	Species or species habitat may occur within area	In bu
a oth [25234]	Vulnerable	Species or species habitat may occur within area	In bu
dwyeri ied Bat, Large Pied Bat	Vulnerable	Species or species habitat may occur within area	In fe
ulatus maculatus (SE mainland population) oll, Spotted-tail Quoll, outheastern mainland 5184]	Endangered	Species or species habitat may occur within area	In fe
rbeni -eared Bat, South-eastern at [83395]	Vulnerable	Species or species habitat likely to occur within area	In fe
plans (southern and central)	Endangered	Species or species habitat may occur within area	In bu
cinereus (combined populations of Qld, NSW and the ACT) ed populations of	Endangered	Species or species	In fe

)758]	Vulnerable	Species or species habitat may occur within area	In bu
akoolica			
	Endangered	Species or species habitat may occur within area	In fe
ersonii			
ress [10976]	Vulnerable	Species or species habitat may occur within area	In fe
petilum			
Orchid [55144]	Endangered	Species or species habitat may occur within area	In fe
sp. Wybong (C.Phelps ORG 5269)			
81964]	Critically Endangered	Species or species habitat may occur within area	In bu
irrayana			
g-pea, Slender Swainson, son-pea [6765]	Vulnerable	Species or species habitat may occur within area	In bu
cta			
ea, Mountain Swainson-rple Pea [7580]	Endangered	Species or species habitat may occur within area	In bu
ale			
ax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area	In fe
forsteri listed as Tylophora linearis			
	Endangered	Species or species habitat may occur	In fe

estrial Species			
udacutus			
l Needletail [682]	Vulnerable	Species or species habitat likely to occur within area	In fe
l [644]		Species or species habitat may occur within area	In fe
leuca			
er [612]		Species or species habitat likely to occur within area	In fe
rons			
l [592]		Species or species habitat likely to occur within area	In bu
lands Species			
cos			
dpiper [59309]		Species or species habitat may occur within area	In fe
nata			
andpiper [874]		Species or species habitat may occur within area	In fe
inea			
iper [856]	Critically Endangered	Species or species habitat may occur within area	In fe
otos			
piper [858]		Species or species habitat may occur within area	In fe

ers Protected by the EPBC Act

e Species			[Resourc
e	Threatened Category	Presence Text	Buffe
icos dpiper [59309]		Species or species habitat may occur within area	In fe
ift [678]		Species or species habitat likely to occur within area overfly marine area	In fe
as Ardea ibis 6521]		Species or species habitat may occur within area overfly marine area	In fe
nata andpiper [874]		Species or species habitat may occur within area	In fe
inea iper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In fe
otos piper [858]		Species or species habitat may occur within area overfly marine area	In fe

		habitat may occur within area overfly marine area	
cogaster Sea-Eagle [943]		Species or species habitat likely to occur within area	In fe
udacutus l Needletail [682]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In fe
olor 44]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In fe
s eater [670]		Species or species habitat may occur within area overfly marine area	In fe
l [644]		Species or species habitat may occur within area overfly marine area	In fe
leuca er [612]		Species or species habitat likely to occur within area overfly marine area	In fe
rysostoma arrot [726]	Vulnerable	Species or species habitat may occur	In fe

habitat likely to occur within area overfly marine area

nation

eferrals				[Resourc
	Reference	Referral Outcome	Assessment Status	E
action				
oit biocontrol: releasing of RHDV, sthrn two alia	2015/7522	Not Controlled Action	Completed	I

alth and State/Territory reserves;

of listed threatened, migratory and marine species;

ened ecological communities; and

ation that may be useful as an indicator of potential habitat value.

MER

tended to be exhaustive and should only be relied upon as a general guide as mapped data is not available
ities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report
n under the EPBC Act should consider the limitations noted below and whether additional information is req
ion of MNES and other protected matters.

ailable to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that c
icated in general terms. It is the responsibility of any person using or relying on the information in this repor
umstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of a
To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or d
or indirectly through the use of, or reliance

OURCES

ical communities

logical communities where the distribution is well known, maps are generated based on information containe
aps and remote sensing imagery and other sources. Where threatened ecological community distributions a
maps and point location data are used to produce indicative distribution maps.

ory and marine species

ory and marine species distributions have been discerned through a variety of methods. Where distributions
ributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terra
described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

ition is available for a species or large number of maps are required in a short time-frame, maps are derived
e cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hu
or by using topographic features (national park boundaries, islands, etc.).

of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or
bution maps. More detailed distribution mapping methods are used to update these distributions

IONS

es and ecological communities have not been mapped and do not appear in this report:

species listed as extinct or considered vagrants;

tly listed species and ecological communities;

migratory and listed marine species, which are not listed as threatened species; and

ecies that are very widespread, vagrant, or only occur in Australia in small numbers.

s have been mapped, but may not cover the complete distribution of the species:

ory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
have only been mapped for breeding sites near the Australian continent

may be important for the protection of the Commonwealth Marine environment.

ata for the feature group (using the Resource Information link) for the currency of the information.

ent of Land and Resource Management, Northern Territory
ent of Environmental and Heritage Protection, Queensland
ent of Parks and Wildlife, Western Australia
ent and Planning Directorate, ACT
ustralia
n Bird and Bat Banding Scheme
n National Wildlife Collection
istory museums of Australia
Victoria
n Museum
stralian Museum
nd Museum
ological Collections of Australian Museums
nd Herbarium
Herbarium of NSW
tanic Gardens and National Herbarium of Victoria
an Herbarium
barium of South Australia
Territory Herbarium
Australian Herbarium
n National Herbarium, Canberra
of New England
ogeographic Information System
n Government, Department of Defence
Corporation, NSW
ce Australia

n Tropical Herbarium, Cairns
stralia
n Government – Australian Antarctic Data Centre
and Art Gallery of the Northern Territory
n Government National Environmental Science Program
n Institute of Marine Science
Survey Australia
Museum of Natural History
ctoria Museum and Art Gallery, Inveresk, Tasmania
an Museum and Art Gallery, Hobart, Tasmania
ups and individuals

Appendix F

Likelihood of Occurrence Table

Threatened species, populations and ecological communities, and migratory species (listed under the BC Act and/or EPBC Act) that are known, or have potential, to occur within a 10 km radius of the Study Area have been considered in this section. The likelihood of occurrence within the Study Area of each species or TEC was assessed using the criteria described in Table F.1 and Table F.2. The findings presented in Table F.3. This assessment was undertaken based on previous records, the results of the field survey and known species habitat requirements. Table F.3 also provides an assessment of the potential impact of the proposal on each species and TEC.

Table F.1 Likelihood of occurrence criteria

Likelihood Rating	Criteria
Recorded	The species was recorded within the Study Area during the field surveys.
High	It is likely that a species would inhabit or utilise habitat within the Study Area. Criteria for this category may include: – Species recently and/or regularly recorded in contiguous or nearby habitat. – High quality habitat or resources present within the Study Area. – Species is known or likely to maintain a resident population surrounding the Study Area. – Species is known or likely to visit during migration or in response to seasonal availability of resources present on site.
Moderate	Potential habitat for a species occurs within the Study Area. Criteria for this category may include: – Species infrequently recorded in the Study Area and surrounds (i.e. vagrant individuals). – Habitat present, but poor quality, depauperate or modified types and/or resources. – Species has potential to utilise habitat during migration or seasonal availability of resources. – Species unlikely to maintain sedentary populations, however, may seasonally utilise resources within the study area opportunistically during variable seasons or migration. – Cryptic flora species with potential habitat within the Study Area that have not been targeted by surveys (for example, surveys were not undertaken with the flowering season.
Low	It is unlikely that the species inhabits the area, if it did, it would likely be a transient visitor. Criteria for this category may include: – Species not recently recorded (within last 20 years) in the study area or is beyond the known geographic range. – Species dependent on specific habitat types or resources that are not present in the study area. – Highly mobile species that may on occasion utilise habitat within Study Area, though habitat present is of low quality.
Nil	No records in locality, no suitable habitat in study area, outside known range.

Table F.2 Potential for negative impact

Likelihood	Definition
None	Species absent.
	Species would not be directly or indirectly impacted by the proposal.
Low	Species may be indirectly impacted by the proposal.
	May include the removal of small amounts of broadly suitable/ low quality habitat.
Moderate	Species is likely to be directly impacted through the removal/disturbance of habitat resources potentially used by the species, such as HBTs, trees capable of supporting large stick nests or bush rock.
	Species is highly mobile and/or has a comparably larger home range.
	Species largely able to avoid construction impacts.
High	Species would be directly impacted through the removal/disturbance of occupied habitat.
	Species is generally immobile and/or has a small home range.
	May be more vulnerable to construction impacts than other species (if present) e.g., if breeding habitat occurs.
	Would require further targeted surveys to verify the species existence within the Study Area, e.g., habitat tree survey required.

Table F.3 Likelihood of occurrence assessment and potential level for impact assessment

Scientific Name	BS Status	EPBC Status	Source	Habitat Association	Likelihood of Occurrence	Potential for Impact
Amphibians						
Crinia sloanei **Sloane's Froglet**	E	E	Species or species habitat may occur within area (DCCEW 2023a)	Most records are from the Darling Riverine Plains, NSW South Western Slopes and Riverina bioregions. It has not been recorded recently in the northern part of its range and has only been recorded infrequently in the southern part of its range in NSW. Typically associated with periodically inundated areas in grassland, woodland and disturbed habitats.	**Low** Suitable habitat present within the study area, however no records within the locality.	**Low** Low likelihood of occurrence.
Litoria booroolongensis **Booroolong Frog**	E	E	Species or species habitat may occur within area (DCCEW 2023a)	Restricted to NSW and north-eastern Victoria, predominantly along the western-flowing streams of the Great Dividing Range. It has disappeared from much of the Northern Tablelands, however several populations have recently been recorded in the Namoi catchment. Rare throughout most of the remainder of its range. Lives along permanent streams with some fringing vegetation cover such as ferns, sedges or grasses, and shelter under rocks or amongst vegetation near the ground on the stream edge. Recorded on or near cobble banks and other rock structures within stream margins.	**Low** Suitable habitat present within the study area, however no records within the locality.	**Low** Low likelihood of occurrence.
Litoria raniformis **Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog**	E	V	Species or species habitat may occur within area (DCCEW 2023a)	Currently known to exist only in isolated populations in the Coleambally Irrigation Area, the Lowbidgee floodplain and around Lake Victoria. A few yet unconfirmed records have also been made in the Murray Irrigation Area in recent years. Usually found in or around permanent or ephemeral Black Box/Lignum/Nitre Goosefoot swamps, Lignum/Typha swamps and River Red Gum swamps or billabongs along floodplains and river valleys. Also found in irrigated rice crops, particularly where there is no available natural habitat. Breeding occurs during the warmer months and is triggered by flooding or a significant rise in water levels. The species has been known to breed anytime from early spring through to late summer/early autumn.	**Nil** No records within the locality, no suitable habitat present.	**None** Species absent.

Scientific Name	BS Status	EPBC Status	Source	Habitat Association	Likelihood of Occurrence	Potential for Impact
Birds						
Anthochaera phrygia **Regent Honeyeater**	CE	CE	Species or species habitat may occur within area (DCCEW 2023a)	Mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. Only three known key breeding regions remaining: north-east Victoria (Chiltern-Albury), and in NSW at Capertee Valley and the Bundarra-Barraba region. Very patchy distribution in NSW, mainly confined to the two main breeding areas and surrounding fragmented woodlands. In some years flocks converge on flowering coastal woodlands and forests. Inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. Inhabit woodlands that support a significantly high abundance and species richness of bird species. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. Key eucalypt species include Mugga Ironbark, Yellow Box, White Box and Swamp Mahogany. Flowering of associated species such as Thin-leaved Stringybark Eucalyptus eugenioides and other Stringybark species, and Broad-leaved Ironbark E. fibrosa can also contribute important nectar flows at times. Nectar and fruit from the mistletoes Amyema miquelii, A. pendula and A. cambagei are also utilised.	**Low** Suitable habitat present however no records within the locality.	**Low** Low likelihood of occurrence.
Numenius madagascariensis **Eastern Curlew, Far Eastern Curlew**		CE	Species or species habitat may occur within area (DCCEW 2023a)	Occurs across the entire coast but is mainly found in estuaries such as the Hunter River, Port Stephens, Clarence River, Richmond River and ICOLLs of the south coast. Generally occupies coastal lakes, inlets, bays and estuarine habitats, and is mainly found in intertidal mudflats and sometimes saltmarsh of sheltered coasts in NSW. Rarely seen inland.	**Nil** No records within the locality, no suitable habitat present.	**None** Species absent.
Lathamus discolor **Swift Parrot**	E	CE	Species or species habitat likely to occur within area (DCCEW 2023a)	Migrates from Tasmania to south-eastern Australia in the autumn and winter months. Mostly occurs on the coast and south west slopes in NSW. Occurs on the mainland in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany, Spotted Gum, Red Bloodwood, Forest Red Gum, Mugga Ironbark, and White Box.	**Low** No records within the locality, suitable habitat present.	**Low** Species unlikely to occur in study area

Scientific Name	BS Status	EPBC Status	Source	Habitat Association	Likelihood of Occurrence	Potential for Impact
Calidris ferruginea **Curlew Sandpiper**	E	CE	Species or species habitat may occur within area (DCCEW 2023a)	Distributed around most of the Australian coastline. Occurs along the entire coast of NSW, particularly in the Hunter Estuary, and sometimes in freshwater wetlands in the Murray-Darling Basin. Inland records are probably mainly of birds pausing for a few days during migration. Migrates to Australia for the non-breeding period, arriving between August and November, and departing between March and mid-April. Generally occupies littoral and estuarine habitats, and is mainly found in intertidal mudflats of sheltered coasts in NSW. Also occurs in non-tidal swamps, lakes and lagoons on the coast and sometimes inland. Forages in or at the edge of shallow water, occasionally on exposed algal mats or waterweed, or on banks of beach-cast seagrass or seaweed.	**Nil** No records within the locality, no suitable habitat present.	**None** Species absent.
Callocephalon fimbriatum **Gang-gang Cockatoo**	V	E	Species or species habitat may occur within area (DCCEW 2023a)	Distributed from the south-east coast to the Hunter region, and inland to the Central Tablelands and south-west slopes in NSW. Occurs regularly in the ACT. It Rare at the extremities of its range, with isolated records known from as far north as Coffs Harbour and as far west as Mudgee. In spring and summer the species is generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In autumn and winter, the species often moves to lower altitudes in drier more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas.	**Low** No records within the locality, suitable habitat present.	**Low** Species unlikely to occur in study area.
Melanodryas cucullata cucullata **South-eastern Hooded Robin, Hooded Robin (south-eastern)**	V		Species or species habitat may occur within area (DCCEW 2023a)	Found throughout much of inland NSW, with the exception of the extreme north-west, where it is replaced by subspecies picata. Prefers lightly wooded country, usually open eucalypt woodland, Acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses.	**Nil** No records within the locality, suitable habitat present.	**None** Species unlikely to occur in study area

Scientific Name	BS Status	EPBC Status	Source	Habitat Association	Likelihood of Occurrence	Potential for Impact
Rostratula australis **Australian Painted Snipe**	E	E	Species or species habitat known to occur within area (DCCEW 2023a)	In NSW many records are from the Murray-Darling Basin including the Paroo wetlands, Lake Cowal, Macquarie Marshes, Fivebough Swamp and more recently, swamps near Balldale and Wanganella. Other important locations with recent records include wetlands on the Hawkesbury River, the Clarence and lower Hunter Valleys. Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Forages nocturnally on mudflats and in shallow water.	**Nil** No records within the locality, no suitable habitat present.	**None** Species absent.
Lophochroa leadbeateri leadbeateri **Eastern Major Mitchell's Cockatoo**	V		Species or species habitat may occur within area (DCCEW 2023a)	Found across the arid and semi-arid inland, from south-western Queensland south to north-west Victoria, through most of South Australia, north into the south-west Northern Territory and across to the west coast between Shark Bay and about Jurien. In NSW it is found regularly as far east as about Bourke and Griffith, and sporadically further east than that. Inhabits a wide range of treed and treeless inland habitats, always within easy reach of water. Feeds mostly on the ground, especially on the seeds of native and exotic melons and on the seeds of species of saltbush, wattles and cypress pines. Normally found in pairs or small groups, though flocks of hundreds may be found where food is abundant. Nesting, in tree hollows, occurs throughout the second half of the year; nests are at least 1 km apart, with no more than one pair every 30 square kilometres.	**Low** No records within the locality, suitable habitat present.	**Low** Species unlikely to occur in study area
Botaurus poiciloptilus **Australasian Bittern**	E	E	Species or species habitat may occur within area (DCCEW 2023a)	Widespread but uncommon over south-eastern Australia. Found over most of NSW except for the far north-west. Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (Typha spp.) and spikerushes (Eleocharis spp.). Hides during the day amongst dense reeds or rushes and feed mainly at night on frogs, fish, yabbies, spiders, insects and snails. May construct feeding platforms over deeper water from reeds trampled by the bird; platforms are often littered with prey remains.	**Nil** No records within the locality, no suitable habitat present.	**None** Species absent.

Scientific Name	BS Status	EPBC Status	Source	Habitat Association	Likelihood of Occurrence	Potential for Impact
Stagonopleura guttata **Diamond Firetail**	V		1 records within 20 km (DPE 2023a)	Widely distributed in NSW, with a concentration of records from the Northern, Central and Southern Tablelands, the Northern, Central and South Western Slopes and the North West Plains and Riverina. Not commonly found in coastal districts, though there are records from near Sydney, the Hunter Valley and the Bega Valley. Scattered distribution over the rest of NSW, though is very rare west of the Darling River. Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities, and often found in riparian areas (rivers and creeks), and sometimes in lightly wooded farmland.	**Moderate** 1 Record within the locality, suitable habitat present within the study area, however no suitable habitat present within the project area.	**Low** Potential habitat for this species would not be removed.
Calyptorhynchus lathami lathami **South-eastern Glossy Black-Cockatoo**	V	V	Species or species habitat may occur within area (DCCEW 2023a)	Uncommon although widespread throughout suitable forest and woodland habitats. Occurs from the central Queensland coast to East Gippsland in Victoria, and inland to the southern tablelands and central western plains of NSW, with a small population in the Riverina. Feeds almost exclusively on the seeds of several species of she-oak (Casuarina and Allocasuarina species).	**Low** No records within the locality, suitable habitat present.	**Low** Potential habitat for this species would not be removed and species is unlikely to occur in study area
Polytelis swainsonii **Superb Parrot**	V	V	31 records within 10km (DPE 2023a)	Found throughout eastern inland NSW. On the South-western Slopes their core breeding area is roughly bounded by Cowra and Yass in the east, and Grenfell, Cootamundra and Coolac in the west. Birds breeding in this region are mainly absent during winter, when they migrate north to the region of the upper Namoi and Gwydir Rivers. The other main breeding sites are in the Riverina along the corridors of the Murray, Edward and Murrumbidgee Rivers where birds are present all year round. Inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest.	**Recorded** Pair identified within the study area, suitable breeding habitat present within the study area, however only low quality foraging habitat occurs within the project area.	**Low** Minimal low quality foraging habitat would be removed, breeding habitat would not be impacted by the proposal.

Scientific Name	BS Status	EPBC Status	Source	Habitat Association	Likelihood of Occurrence	Potential for Impact
Apholocephala leucopsis **Southern Whiteface**	V		Species or species habitat may occur within area (DCCEW 2023a)	Occur across most of mainland Australia south of the tropics, from the north- eastern edge of the Western Australian wheatbelt, east to the Great Dividing Range. Lives in a wide range of open woodlands and shrublands where there is an understorey of grasses or shrubs, or both. These areas are usually in habitats dominated by acacias or eucalypts on ranges, foothills and lowlands, and plains. Forages almost exclusively on the ground, favouring habitat with low tree densities and an herbaceous understorey litter cover.	**Low** No records within the locality, suitable habitat present.	**Low** Potential habitat for this species would not be removed, species unlikely to occur in study area.
Leipoa ocellata **Malleefowl**	E	V	Species or species habitat known to occur within area (DCCEW 2023a)	Stronghold n the mallee in the south west centred on Mallee Cliffs NP and extending east to near Balranald and scattered records as far north as Mungo NP. Eastern boundary distribution follows a line from Wagga-Grenfell-Orange. Typically occurs in mallee eucalypt woodlands with a dense but discontinuous canopy and varied shrubby understorey, especially where the mallee trees are multi-stemmed. Prefers areas of light sandy to sandy loam soils. Occasionally occur in other types of dry eucalypt forests. Found in unburnt habitat, with habitat unburnt for 40–60 years preferred. Also occurs in Red Ironbark E. sideroxylon woodland at the eastern limit of their distribution.	**Nil** No records within the locality, no suitable habitat present.	**None** Species absent.
Neophema chrysostoma **Blue-winged Parrot**	V	V	Species or species habitat may occur within area (DCCEW 2023a)	During the non-breeding period, from autumn to early spring, birds are recorded in western NSW, with some reaching south-eastern NSW, particularly on the southern migration. Inhabits a range of habitats from coastal, sub-coastal and inland areas, through to semi-arid zones. Tends to favour grasslands and grassy woodlands, often found near wetlands both near the coast and in semi-arid zones. Sometimes seen in altered environments such as airfields, golf-courses and paddocks. Pairs or small parties forage mainly near or on the ground for seeds of a wide range of native and introduced grasses, herbs and shrubs.	**Low** No records within the locality, suitable habitat present.	**Low** Potential habitat for this species would not be removed, species unlikely to occur in study area..

Scientific Name	BS Status	EPBC Status	Source	Habitat Association	Likelihood of Occurrence	Potential for Impact
Pycnoptilus floccosus **Eastern Bristlebird**	E	E	Species or species habitat may occur within area (DCCEW 2023a)	Endemic to south-east Australia. Upland Pilotbirds occur above 600 m in the Brindabella Ranges in the ACT, and in the Snowy Mountains in NSW 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. 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.	**Nil** No records within the locality, no suitable habitat present.	**None** Species absent.
Climacteris picumnus victoriae **Brown Treecreeper (south-eastern)**	V		Species or species habitat may occur within area (DCCEW 2023a)	The western boundary of the species range runs approximately through Corowa, Wagga Wagga, Temora, Forbes, Dubbo and Inverell. Often found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species. Also found in mallee and River Red Gum Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses. Usually not found in woodlands with a dense shrub layer. Fallen timber is an important habitat component for foraging. Also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains.	**Low** No records within the locality, suitable habitat present.	**Low** Potential habitat for this species would not be removed, species unlikely to occur in study area..
Grantiella picta **Painted Honeyeater**	V	V	Species or species habitat may occur within area (DCCEW 2023a)	Nomadic species occurring at low densities throughout its range. Most commonly found on the inland slopes of the Great Dividing Range in NSW, where almost all breeding occurs. More likely to be found in the north of its distribution in winter. Inhabits Boree/ Weeping Myall (Acacia pendula), Brigalow (A. harpophylla) and Box-Gum Woodlands and Box-Ironbark Forests. Specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus Amyema.	**Low** No records within the locality, suitable habitat present.	**Low** Potential habitat for this species would not be removed, species unlikely to occur in study area...

Scientific Name	BS Status	EPBC Status	Source	Habitat Association	Likelihood of Occurrence	Potential for Impact
Hirundapus caudacutus **White-throated Needletail**		V	Species or species habitat likely to occur within area (DCCEW 2023a)	Migrates tc eastern Australia from October to April. Almost exclusively aerial and most often seen before storms, low pressure troughs and approaching cold fronts and occasionally bushfire. Occurs over most types of habitat, but mostly recorded above wooded areas, including open forest and rainforest. May also fly between trees or in clearings, below the canopy. Recorded roosting in trees in forests and woodlands, both among dense foliage in the canopy or in hollows.	**Low** No records within the locality, suitable habitat present.	**Low** Potential habitat for this species would not be removed, species unlikely to occur in study area..
Falco hypoleucos **Grey Falcon**	V	V	Species or species habitat likely to occur within area (DCCEW 2023a)	Sparsely d stributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey.	**Low** No records within the locality, suitable habitat present.	**Low** Potential habitat for this species would not be removed, species unlikely to occur in study area...
Numenius madagascariensis **Eastern Curlew**		CE	Species or species habitat likely to occur within area (DCCEW 2023a)	Occurs across the entire coast but is mainly found in estuaries such as the Hunter River, Port Stephens, Clarence River, Richmond River and ICOLLs of the south coast. Generally occupies coastal lakes, inlets, bays and estuarine habitats, and is mainly found in intertidal mudflats and sometimes saltmarsh of sheltered coasts in NSW. Rarely seen inland.	**Nil** No records within the locality, no suitable habitat present.	**None** Species absent.
Gallinago hardwickii **Latha's Snipe, Japanese Snipe**		CE	Species or species habitat may occur within area (DCCEW 2023a)	Non-breeding migrant to the south east of Australia. Breeds in Japan and on the east Asian mainland. Seen in small groups or singly in freshwater wetlands on or near the coast, generally among dense cover. Found in any vegetation around wetlands, in sedges, grasses, lignum, reeds and rushes and also in saltmarsh and creek edges on migration. Also uses crops and pasture.	**Nil** No records within the locality, no suitable habitat present.	**None** Species absent.

Scientific Name	BS Status	EPBC Status	Source	Habitat Association	Likelihood of Occurrence	Potential for Impact
Apus pacificus **Fork-tailed Swift**		CE	Species or species habitat may occur within area (DCCEW 2023a)	Almost exclusively aerial, flying from less than 1 m to at least 300 m above ground and probably much higher. Many records occur east of the Great Divide, however, a few populations have been found west of the Great Divide. Mostly occur over inland plains but sometimes above foothills or in coastal areas. Mostly found over dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh. Also found at treeless grassland and sandplains covered with spinifex, open farmland and inland and coastal sand-dunes. Sometimes occur above rainforests, wet sclerophyll forest or open forest or plantations of pines. Also found over settled areas, including towns, urban areas and cities.	**Low** No records within the locality, suitable habitat present.	**Low** Potential habitat for this species would not be removed, species unlikely to occur in study area..
Myiagra cyanoleuca **Satin Flycatcher**		CE	Species or species habitat may occur within area (DCCEW 2023a)	Found along the east coast of Australia from far northern Queensland to Tasmania. Uncommonly seen species, especially in the far south of its range, where it is a summer breeding migrant. Inhabits heavily vegetated gullies in eucalypt-dominated forests and taller woodlands, and on migration, occur in coastal forests, woodlands, mangroves and drier woodlands and open forests.	**Low** No records within the locality, suitable habitat present.	**Low** Species unlikely to occur in study area..
Rhipidura rufifrons **Rufous Fantail**		CE	Species or species habitat may occur within area (DCCEW 2023a)	Found along NSW coast and ranges. Inhabits rainforest, dense wet forests, swamp woodlands and mangroves. During migration, it may be found in more open habitats or urban areas.	**Low** No records within the locality, suitable habitat present.	**Low** species unlikely to occur in study area..
Calidris melanotos **Pectoral Sandpiper**	V		Species or species habitat may occur within area (DCCEW 2023a)	Widespread but scattered records across NSW, east of the divide and in the Riverina and Lower Western regions. Prefers shallow fresh to saline wetlands and is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands. Usually in coastal or near-coastal habitats, and prefers wetlands with open mudflats and low emergent or fringing vegetation such as grass or samphire.	**Low** No records within the locality, suitable habitat present.	**Low** Low likelihood of occurrence.

Scientific Name	BS Status	EPBC Status	Source	Habitat Association	Likelihood of Occurrence	Potential for Impact
Actitis hypoleucos **Common Sandpiper**		CE	Species or species habitat may occur within area (DCCEW 2023a)	Found in Australia during non-breeding season, on all coastlines and in inland areas, but is concentrated in the north and west with important areas in WA, the NT and QLD. Utilises a wide range of coastal and inland wetlands with varying salinity levels.	**Nil** No records within the locality, no suitable habitat present.	**None** Species absent.
Motacilla flava **Yellow Wagtail**	CE	CE	Species or species habitat may occur within area (DCCEW 2023a)	Occurs within Australia in open country habitat with disturbed ground and some water. Recorded in short grass and bare ground, swamp margins, sewage ponds, saltmarshes, playing fields, airfields, ploughed land and town lawns. Breeds in temperate Europe and Asia.	**Low** No records within the locality, suitable habitat present.	**Low** Removal of marginally suitable foraging habitat, species unlikely to occur in study area..
Calidris ferruginea **Curlew Sandpiper**	C	CE	Species or species habitat may occur within area (DCCEW 2023a)	Distributed around most of the Australian coastline. Occurs along the entire coast of NSW, particularly in the Hunter Estuary, and sometimes in freshwater wetlands in the Murray-Darling Basin. Inland records are probably mainly of birds pausing for a few days during migration. Migrates to Australia for the non-breeding period, arriving between August and November, and departing between March and mid-April. Generally occupies littoral and estuarine habitats, and is mainly found in intertidal mudflats of sheltered coasts in NSW. Also occurs in non-tidal swamps, lakes and lagoons on the coast and sometimes inland. Forages in or at the edge of shallow water, occasionally on exposed algal mats or waterweed, or on banks of beach-cast seagrass or seaweed.	**Low** No records within the locality, suitable habitat present.	**Low** Removal of marginally suitable foraging habitat, however species unlikely to occur in study area.
Calidris acuminata **Sharp-tailed Sandpiper**		CE	Species or species habitat may occur within area (DCCEW 2023a)	Most of the population migrates to Australia during non-breeding season, mostly to the south-east and are widespread in both inland and coastal locations and in both freshwater and saline habitats. Many inland records are of birds on passage. Prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation.	**Low** No records within the locality, suitable habitat present.	**Low** Removal of marginally suitable foraging habitat, however species unlikely to occur in study area..

Scientific Name	BS Status	EPBC Status	Source	Habitat Association	Likelihood of Occurrence	Potential for Impact
Hirundapus caudacutus **White-throated Needletail**	V	CE	Species or species habitat may occur within area (DCCEW 2023a)	Migrates to eastern Australia from October to April. Almost exclusively aerial and most often seen before storms, low pressure troughs and approaching cold fronts and occasionally bushfire. Occurs over most types of habitat, but mostly recorded above wooded areas, including open forest and rainforest. May also fly between trees or in clearings, below the canopy. Recorded roosting in trees in forests and woodlands, both among dense foliage in the canopy or in hollows.	**Low** No records within the locality, suitable habitat present.	**Low** Potential habitat for this species would not be removed, species unlikely to occur in study area...
Fish						
Maccullochella peelii **Murray Cod**		V	Species or species habitat may occur within area (DCCEW 2023a)	Endemic to river systems of the Murray–Darling Basin in south-eastern Australia. Once widespread throughout the Murray-Darling system, it is now uncommon in much of its range and restricted to the lower Murray-Darling. Found in a variety of habitats ranging from clear, rocky streams to slow flowing turbid rivers, lakes and billabongs and are more common in waterways with large rocks, snags and undercut banks with overhanging vegetation.	**Low** No records within the locality, marginal habitat present.	**Low** Removal of marginally suitable habitat, species unlikely to occur in study area and fish passage would not be impeded during construction and operation.
Maccullochella macquariensis ***Trout Cod***	E	E	Species or species habitat may occur within area (DCCEW 2023a)	Endemic to the Murray-Darling Basin. Once widespread in the southern tributaries, the species has declined dramatically in both abundance and distribution and are now known only from scattered localities. The last remaining natural populations in the wild are in the Murray River between Yarrawonga, Barmah and Seven Creeks. Occurs in a range of habitats, but is strongly associated with the presence of woody debris and snags.	**Low** No records within the locality, marginal habitat present.	**Low** Removal of marginally suitable habitat, species unlikely to occur in study area and fish passage would not be impeded during construction and operation.
Macquaria australasica ***Macquarie Perch***	E	E	Species or species habitat may occur within area (DCCEW 2023a)	Known only from scattered localities in the cool upper reaches of the Murray-Darling system of NSW, including the Hawkesbury-Nepean and Shoalhaven catchments, Victoria and ACT. Also found in man-made lakes on the NSW coast and in lakes and reservoirs, where adults aggregate in small shoals during the spawning season. Inhabits cool, clear freshwaters of rivers with deep holes and shallow riffles.	**Low** No records within the locality, marginal habitat present.	**Low** Removal of marginally suitable habitat, species unlikely to occur in study area and fish passage would not be impeded during construction and operation.

Scientific Name	BS Status	EPBC Status	Source	Habitat Association	Likelihood of Occurrence	Potential for Impact
Insects						
Synemon plana **Golden Sun Moth**		V	Species or species habitat may occur within area (DCCEW 2023a)	Found in the area between Queanbeyan, Gunning, Young and Tumut. Occurs in Natural Temperate Grasslands and grassy Box-Gum Woodlands in which groundlayer is dominated by wallaby grasses *Austrodanthonia* spp. Grasslands dominated by wallaby grasses are typically low and open - the bare ground between the tussocks is thought to be an important microhabitat feature. Habitat may contain several wallaby grass species, which are typically associated with other grasses particularly spear-grasses *Austrostipa* spp. or Kangaroo Grass *Themeda australis*.	**Nil** No records within the locality, no suitable habitat present.	**None** Species absent
Mammals						
Petaurus norfolcensis **Squirrel Glider**	V		Species or species habitat likely to occur within area (DCCEW 2023a)	Widely though sparsely distributed in eastern Australia, from northern Queensland to western Victoria. Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia midstorey. Require abundant tree hollows for refuge and nest sites.	**Low** No records within the locality, suitable habitat present within the study area, however no suitable habitat present within the project area.	**Low** Potential habitat for this species would not be removed and species unlikely to occur in study area.
Phascolarctos **Koala**	V	V	Species or species habitat known to occur within area (DCCEW 2023a)	Found on the central and north coasts, southern highlands, southern and northern tablelands, Blue Mountains, southern coastal forests of NSW, with some smaller populations on the plains west of the Great Dividing Range. Inhabits eucalypt woodlands and forests, and feeds on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but will select preferred browse species in any one area.	**Low** No records within the locality, suitable habitat present within the study area, however no suitable habitat present within the project area.	**Low** Potential habitat for this species would not be removed and species unlikely to occur in study area.
Dasyurus maculatus maculatus **Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll**	V	E	Species or species habitat may occur within area (DCCEW 2023a))	Found in eastern NSW, the species has been 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. Uses hollow-bearing trees, fallen logs, small caves, rock outcrops and rocky-cliff faces as den sites. Females occupy home ranges of 200-500 hectares, while males occupy very large home ranges from 500 to over 4000 hectares. Known to traverse their home ranges along densely vegetated creek lines.	**Low** No records within the locality, suitable habitat present within the study area, however no suitable habitat present within the project area.	**Low** Removal of a small amount of broadly suitable/ low quality habitat, however species unlikely to occur in study area.

Scientific Name	BS Status	EPBC Status	Source	Habitat Association	Likelihood of Occurrence	Potential for Impact
Petauroides volans **Greater Glider (southern and central)**	E	E	Species or species habitat may occur within area (DCCEW 2023a))	Occurs in eastern Australia, in eucalypt forests and woodlands, where it has a broad distribution from around Proserpine in Queensland, south through NSW and the Australian Capital Territory into Victoria. Feeds exclusively on eucalypt leaves, buds, flowers and mistletoe. Shelter during the day in tree hollows and will use up to 18 hollows in their home range. Occupy a relatively small home range with an average size of 1 to 3 ha.	**Low** No records within the locality, suitable habitat present.	**Low** Potential habitat for this species would not be removed and species unlikely to occur in study area.
Chalinolobus dwyeri **Large-eared Pied Bat, Large Pied Bat**	V	V	Species or species habitat may occur within area (DCCEW 2023a))	Found mainly in areas with extensive cliffs and caves, from Rockhampton to Bungonia in the NSW Southern Highlands. Generally rare with a very patchy distribution in NSW and scattered records from the New England Tablelands and North West Slopes. Roosts in caves, crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (Petrochelidon ariel), frequenting low to mid-elevation dry open forest and woodland close to these features. Found in well-timbered areas containing gullies.	**Low** No records within the locality, suitable habitat present.	**Low** Potential habitat for this species would not be removed and species unlikely to occur in study area.
Pteropus poliocephalus **Grey-headed Flying-fox**	V	V	Species or species habitat may occur within area (DCCEW 2023a))	Generally found within 200 km of the eastern coast of Australia, from Rockhampton to Adelaide. May be found in unusual locations in times of natural resource shortage. Occurs 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 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy.	**Low** No records within the locality, suitable habitat present.	**Low** Potential habitat for this species would not be removed and species unlikely to occur in study area.
Nyctophilus corbeni **Corben's Long-eared Bat, South-eastern Long-eared Bat**	V	V	Species or species habitat may occur within area (DCCEW 2023a))	Found throughout the Murray-Darling Basin and the Pilliga Scrub region. Inhabits a variety of vegetation types, including mallee, bulloke Allocasuarina leuhmanni and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland. Roosts in tree hollows, crevices, and under loose bark.	**Low** No records within the locality, suitable habitat present.	**Low** Potential habitat for this species would not be removed and species unlikely to occur in study area.

Scientific Name	BS Status	EPBC Status	Source	Habitat Association	Likelihood of Occurrence	Potential for Impact
Reptiles						
Aprasia parapulchella **Pink-tailed Legless Lizard**	V	V	28 records within 20 km (DPE 2023a)	Only known from the Central and Southern Tablelands, and the South Western Slopes. There is a concentration of populations in the Canberra/Queanbeyan Region. Other populations have been recorded near Cooma, Yass, Bathurst, Albury and West Wyalong. This species is also found in the Australian Capital Territory. Inhabit sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (*Themeda australis*). Sites are typically well-drained, with rocky outcrops or scattered, partially buried rocks. Commonly found beneath small, partially embedded rocks and appear to spend considerable time in burrows below these rocks; the burrows have been constructed by and are often still inhabited by small black ants and termites.	**Low** Records within the locality, however habitat within the project area lacks a native understory and suitable rocky habitat due to previous road work activities.	**Low** Low likelihood of occurrence.
Flora						
Prasophyllum sp. Wybong ***a leek-orchid***	E	E	Species or species habitat may occur within area (DCCEW 2023a))	Endemic to NSW and known from near Ilford, Premer, Muswellbrook, Wybong, Yeoval, Inverell, Tenterfield, Currabubula and the Pilliga area. Known to occur in open eucalypt woodland and grassland.	**Nil** No records within the locality, no suitable habitat present.	**None** Species absent.
Swainsona recta **Small Purple-pea, Mountain Swainson-pea, Small Purple Pea**	E	E	Species or species habitat may occur within area (DCCEW 2023a)	Current populations exist in the Queanbeyan and Wellington-Mudgee areas, previous populations thought extinct include Carcoar, Culcairn and Wagga Wagga. Inhabits grassy woodlands and open-forests dominated by Blakely's Red Gum, Yellow Bloodwood, Candlebark and Long-leaved Box and in association with understorey dominants that include Themeda australis, Poa spp. and Austrostipa spp. Flowers throughout spring, with a peak in October.	**Nil** No records within the locality, no suitable habitat present in proposal site	**None** Species absent.

Scientific Name	BS Status	EPBC Status	Source	Habitat Association	Likelihood of Occurrence	Potential for Impact
Austrostipa wakoolica -	E	E	Species or species habitat may occur within area (DCCEW 2023a)	Confined to floodplains of the Murray River tributaries of central and south western NSW, in open woodland on grey, silty clay or sandy loam soils. Habitats include the edges of a lignum swamp with box and mallee; creek banks in grey, silty clay; mallee and lignum sandy-loam flat; open Cypress Pine forest on low sandy range; and a low, rocky rise. Associated species include White Cypress Pine, Grey Box, Bimble Box, Austrostipa eremophila, A. drummondii, Austrodanthonia eriantha and Climbing Saltbush. Flowers from October to December.	**Low** No records within the locality, suitable habitat present.	**Low** Low likelihood of occurrence.
Prasophyllum petilum Tarengo Leek Orchid	E	E	Species or species habitat may occur within area (DCCEW 2023a)	Known from five sites near Boorowa, Queanbeyan area, Ilford, Delegate and west of Muswellbrook. Grows in open sites within Natural Temperate Grassland at the Boorowa and Delegate sites. Grows in grassy woodland in association with River Tussock, Black Gum and tea-trees near Queanbeyan and within grassy groundlayer dominated by Kangaroo Grass under Box-Gum Woodland at Ilford. Flowers in October at Boorowa and Ilford, and December at sites near Queanbeyan and Delegate.	**Nil** No records within the locality, no suitable habitat present.	**None** Species absent.
Vincetoxicum forsteri -	E	E	Species or species habitat may occur within area (DCCEW 2023a)	Occurs from southern QLD into central NSW, as far south near Temora with the majority of records occurring in the central western region. Records from Goonoo, Pillaga West, Pillaga East, Bibblewindi, Cumbil and Eura State Forests, Coolbaggie NR, Goobang NP and Beni SCA. Also has been recorded Hiawatha State Forest near West Wyalong in the south and there are old records as far north as Crow Mountain near Barraba and near Glenmorgan in the western Darling Downs. Grows in dry scrub and open forest. Recorded from low-altitude sedimentary flats in dry woodlands of Eucalyptus fibrosa, Eucalyptus sideroxylon, Eucalyptus albens, Callitris endlicheri, Callitris glaucophylla and Allocasuarina luehmannii. Also grows in association with Acacia hakeoides, Acacia lineata, Melaleuca uncinata, Myoporum species and Casuarina species. Flowers in spring, with flowers recorded in November or May and is suspected to be related to rainfall, with fruiting probably 2 to 3 months later. Altitudes are generally in the range of 300 - 400 m a.s.l.	**Low** No records within the locality, suitable habitat present.	**Low** Low likelihood of occurrence.

Scientific Name	BS Status	EPBC Status	Source	Habitat Association	Likelihood of Occurrence	Potential for Impact
Ammobium craspedioides Yass Daisy	V	V	Species or species habitat may occur within area (DCCEW 2023a)	Occurs between Crookwell and Wagga Wagga, with most populations near Yass. Occurs in moist or dry forest communities, Box-Gum Woodland and secondary grasslands derived from clearing of these communities. Grows in association with a range of eucalypts (Blakely's Red Gum, Apple Box, Broad-leaved Peppermint, Long-leaved Box, Red Stringybark, Brittle Gum, Yellow Box, Red Box, Candlebark).	**Low** No records within the locality, suitable habitat present.	**Low** Low likelihood of occurrence.
Lepidium aschersonii *Spiny Peppercress*	V	V	Species or species habitat may occur within area (DCCEW 2023a)	Occurring in the marginal central-western slopes and north-western plains regions of NSW. Found on ridges of gilgai clays dominated by Acacia harpophyll, Casuarina cristata, Allocasuarina luehmanii and Eucalyptus microcarpa, with the understorey often dominated by introduced plants. Grows as a component of the ground flora, in grey loamy clays. Vegetation structure varies from open to dense, with sparse grassy understorey with introduced plants and occasional heavy litter.	**Nil** No records within the locality, no suitable habitat present within the project area.	**None** Species absent.
Swainsona murrayana Slender Darling-pea, Slender Swainson, Murray Swainson-pea	V	V	Species or species habitat may occur within area (DCCEW 2023a)	Found throughout NSW, recorded in the Jerilderie and Deniliquin areas of the southern riverine plain, the Hay plain as far north as Willandra National Park, near Broken Hill and in various localities between Dubbo and Moree. Grows in a variety of soil and vegetation types including bladder saltbush, black box and grassland communities on level plains, floodplains and depressions and is often found with Maireana species. Also found in remnant native grasslands or grassy woodlands that have been intermittently grazed or cultivated.	**Low** No records within the locality, suitable habitat present.	**Low** Low likelihood of occurrence.
Thesium australe Toadflax	V	V	Species or species habitat may occur within area (DCCEW 2023a)	Found in very small populations scattered across eastern NSW, along the coast, and from the Northern to Southern Tablelands. Occurs in grassland or grassy woodland, and is often found in association with Kangaroo Grass.	**Low** No records within the locality, suitable habitat present.	**Low** Low likelihood of occurrence.

Appendix G

Flora species list

Table G.1 Flora species list

Family	Exotic	Scientific Name	Common Name
Trees			
Myrtaceae		*Eucalyptus melliodora*	Yellow Box
Myrtaceae		*Eucalyptus camaldulensis*	River Red Gum
Casuarinaceae		*Casuarina cunninghamiana subsp. cunninghamiana*	River Oak
Shrubs			
Rosaceae	*W, P	*Rubus fruticosus* sp. agg.	Blackberry
Forbs			
Oxalidaceae		*Oxalis perennans*	
Fabaceae (Faboideae)	*	*Medicago spp.*	A Medic
Asteraceae	*	*Arctotheca calendula*	Capeweed
Verbenaceae	*	*Verbena bonariensis*	Purpletop
Malvaceae	*	*Malva parviflora*	Small-flowered Mallow
Fumariaceae	*	*Fumaria officinalis*	
Myrsinaceae	*	*Lysimachia arvensis*	Scarlet Pimpernel
Lamiaceae	*	*Salvia verbenaca*	Vervain
Brassicaceae	*	*Capsella bursa-pastoris*	Shepherd's Purse
Iridaceae	*	*Romulea rosea*	Onion Grass
Urticaceae	*	*Urtica urens*	Small Nettle
Boraginaceae	*P	*Echium plantagineum*	Patterson's Curse
Polygonaceae	*	*Rumex crispus*	Curled Dock
Plantaginaceae	*	*Plantago lanceolata*	Lamb's Tongues
Asteraceae	*P	*Cirsium vulgare*	Spear Thistle
Brassicaceae	*	*Brassica napus*	Canola
Fabaceae (Faboideae)	*	*Trifolium spp.*	A Clover
Asteraceae	*	*Silybum marianum*	Variegated Thistle
Asteraceae	*P	*Xanthium occidentale*	Noogoora Burr
Lamiaceae	*P	*Marrubium vulgare*	White Horehound
Iridaceae	*	*Moraea setifolia*	Thread Iris
Papaveraceae	*P	*Argemone ochroleuca subsp. ochroleuca*	Mexican Poppy
Asteraceae	*	*Ambrosia artemisiifolia*	Annual Ragweed
Grasses			
Poaceae	*	*Lolium perenne*	Perennial Ryegrass
Poaceae	*	*Phalaris aquatica*	Phalaris
Poaceae	*	*Paspalum dilatatum*	Paspalum
Poaceae		*Cynodon dactylon*	Common Couch
Rubiaceae	*	*Galium aparine*	Goosegrass
Poaceae	*	*Avena fatua*	Wild Oats
Poaceae		*Rytidosperma spp.*	

Family	Exotic	Scientific Name	Common Name
Poaceae		*Austrostipa scabra*	Speargrass
Poaceae		*Austrostipa verticillata*	Slender Bamboo Grass
Poaceae	*	*Eleusine indica*	Crowsfoot Grass
Poaceae	*	*Hordeum vulgare*	Barley
Poaceae	*	*Bromus hordeaceus*	Soft Brome
Poaceae	*	*Bromus catharticus*	Praire Grass

Key:

* - Exotic species

w - Weed of national significance

P – Priority weed identified on NSW WeedWise (2023)

Appendix H

Fauna Species List

Table H.1 Fauna observed or heard in Canomodine Creek bridge study site

Common Name	Scientific Name	Observation
Superb Fairy Wren	*Malurus cyaneus*	O
Whip Bird	*Psophodes olivaceus*	O
Australian Magpie	*Gymnorhina tibicen*	O
Galah	*Eolophus roseicapilla*	O
Superb Parrot	*Polytelis swainsonii*	O
Eastern Banjo Frog	*Limnodynastes dumerilii*	H
Sulphur-crested cockatoo	*Cacatua galerita*	O
Kookaburra	*Alcedo gigantea*	O
Australian Raven	*Corvus coronoides*	O
Magpie-lark	*Grallina cyanoleuca*	O

Key:

O - Observed

H - Heard

Appendix I

Fauna habitat elements

Table I.1 Fauna habitat elements

Habitat element	Present in Proposal site	Present in Study area	Comment
Winter nectar source	No	No	
Mature fleshy fruit –bearing tree species	Yes	Yes	Blackberry (*Rubus fruticosus* sp. agg.) present within the study area and proposal site.
Small (<2 cm) tree hollows and fissures	No	Yes	Two HBT's with a combined 7 small hollows in study area, none occur within the proposal site.
Medium (2-10 cm) tree hollows	No	Yes	One HBT with 3 medium follows in the study area, none occur within the proposal site.
Large (>10 cm) tree hollows	No	Yes	One HBT with 2 large hollows in study area, none occur within the proposal site.
Perennial water sources	Yes	Yes	Canomodine Creek flows through the study area and proposal area.
Creek bed	Yes	Yes	Shallow creek bed on floodplain within both study area and proposal area.
Creek banks	Yes	Yes	Steep creek banks populated with well established River Red Gums and River Oak.
Flow	Yes	Yes	Slow flowing creek which fluctuates depending on the amount of recent rainfall.
Wildlife corridor potential	Yes	Yes	Adjoining vegetation is part of a large contiguous landscape along Canomodine Creek comprised of River Red Gums and River Oak along the creek bank.
Preferred Koala browse species	No	Yes	Yellow Box (*E. Melliodora*) are ranked 3 - significant use (feed or shelter tree) for Koalas (NSW Department of Planning and Environment, 2022). River Red Gum (*E. camaldulensis*) is ranked 1 - high preferred use (feed tree) for the central and southern tablelands koala modelling region (NSW Department of Planning and Environment, 2022). None of the above species will be impacted by the proposal.
Fruiting *Allocasuarina* trees	No	No	
Large trees, old trees, large woody debris	Yes	Yes	Mature River Oak *(C. cunninghamiana)* within project site, and mature River Red Gum (*E. camaldulensis*) within the study area. Large pieces of woody debris within the creek area also located within proposal site. Mature Yellow Box (*E. melliodora*), and River Red Gum (*E. camaldulensis*) are present within the study area boundaries, however none occur within the proposal site.
Nests and roosts	No	No	

Habitat element	Present in Proposal site	Present in Study area	Comment
Latrine or den sites for spotted-tailed quolls;	No	No	
Other potential bat roosts culverts, bridges, fairy martin nests, staghorns	No	No	
Deep litter cover	No	No	
Additional site notes	The proposal site comprises of an existing bridge across associated roads. The area is highly disturbed with a majority of the proposal site groundcover dominated by exotic vegetation. Any fauna species present would be capable of persisting and habitat features such as HBTs associated with the project boundaries will not be disrupted during the construction phase of the project.		
Constraints identified	-		

Appendix J

Assessments of Significance

The likely significance of impacts on threatened species, populations and ecological communities, or their habitat known or considered likely to occur and be affected by the proposal has been assessed pursuant to Section 7.3 of the BC Act.

An assessment of the likely significance of impacts has been prepared for the following biota listed under the BC Act:

> *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions – Critically Endangered Ecological Community*

The section below analyses and discusses the above ecological community in accordance with the test of significance.

White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions– Critically Endangered Ecological Community (Box Gum Woodland)

Box Gum Woodland is listed as a CEEC under the BC act. This CEEC is associated with PCT 276, which was identified within the proposal study area.

The proposal would result in the removal of up to 0.0129 Ha of low-quality habitat associated with the CEEC.

The following is to be taken into account for the purposes of determining whether a proposed activity is likely to significantly affect threatened species or ecological communities, or their habitats:

a. **Is the proposed development or activity likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.**

   Life cycle of species will not be impacted.

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**

A conservative approach should be taken as the CEEC has been identified within the study area with suitable habitat close to the proposal site.

This CEEC is known to be threatened by the following relevant activities. (NSW Biodiversity conservation trust, 2023)

- Habitat loss, degradation and fragmentation from agricultural, forestry, mining, infrastructure and residential development.
- Degradation of remnants by non-native plant species, including noxious weeds, exotic pasture species and environmental weeds, including garden escapes, olives and pines.
- Removal of native ground layer in box-gum woodland remnants where trees have been partially or fully removed.
- Human disturbance by off road vehicles, camping, other recreational activities and dumping.

Loss and decline of mature hollow-bearing trees that provide habitat for hollow-utilising fauna (e.g. possums, microbats, hollow-nesting birds).

Infrastructure development is a known threat to the community. However, the bridge replacement would reduce the likelihood of locals, trail-making bikers etc detouring through the CEEC as is currently required by the side track in place to circumvent the current collapsed bridge remnants. Increased levels of sedimentation or contamination from runoff related to earthworks activities may threaten potential habitat for this CEEC downhill of the proposal site.

Control of weed species will be important during construction to prevent the spread of Blackberries from the proposal site into the CEEC within the study area, as this is known to be a degradation factor for the community.

There is a small area south of the bridge that may be used for material laydown / site office location which would encroach onto the edge of the CEEC boundary however the groundcover in this area is comprised of mostly exotic species and would be a minor impact to the community and associated fauna species which use the area for foraging and habitat.

Given that only a small area of up to 0.0129 ha of low quality habitat associated with the CEEC may be removed it is unlikely to result in an adverse effect on the community and place at risk of extinction.

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,

The composition of the ecological community on site was comprised of Yellow Box (*E. melliodora*), Slender Bamboo Grass (*Austrostipa verticillate),* Spear Grass *(Austrostipa scabra)* and a range of exotic grasses and forbs such as Soft Brome *(Bromus hordeaceus),* Perennial Ryegrass (*Lolium perenne) and* Wild Oats *(Avena Fatua).* HBTs were identified within the dominant yellow box (*E. melliodora)* canopy layer which would provide habitat for local fauna. The proposal would not impact or remove the groundcover or canopy cover associated with the CEEC. It is therefore unlikely that the proposal would adversely modify the composition of the community.

c. in relation to the habitat of a threatened species or ecological community:

i. the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

The proposal would result in the minor disturbance of fringing areas of the CEEC, however this would be a temporary modification during the construction period and none of the area associated with the CEEC will be permanently removed.

Potential impacts from noxious weeds identified on site during construction will need to be managed as they have potential to modify surrounding habitat outside the proposal site. Earthwork activities and associated run off during bridge construction may potentially impact suitable habitat nearby the riverbank.

Taking these points into consideration, the proposal is unlikely to result in a substantial modification to any potential habitat for this community within the proposal site. Ensuring standard construction protocols for earthworks and biosecurity are implemented it is likely to reduce the risk of the proposal resulting in substantial modification in adjacent potentially suitable habitat.

ii. 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

The proposal site occurs within a fragmented landscape that has been subject to heavy clearance and disturbance as a result of agricultural activities.

Connectively for the CEEC would remain at the same level with potential minor impacts on fringing areas of this CEEC that may be used. Any such potential habitat would be of low quality, given the ongoing impacts associated with partial vegetation clearing, historical disturbance, influence of agricultural activities and weed encroachment.

The proposal would not result in fragmentation or isolation of any known or potential habitat for this CEEC and would be unlikely to result in the reduction in the total available amount of broadly suitable habitat for this CEEC from within the locality. The proposal would also not result in the establishment of any permanent or long-term barriers to spread or expansion for this community.

iii. 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,

As outlined above up to0.0129 ha of CEEC would be removed by the proposal which would have no impact on fragmenting or isolating long-term survival of species or CEEC.

Minor modifications to fringing habitat will be temporary during construction and impact areas of poor-quality exotic dominated groundcover is unlikely to be important for the persistence of the community within the locality. The proposal is unlikely to result in any modification to known habitat for this community and is unlikely to impact on any aspect of the life cycle of known populations of its associated species.

Taking these points into consideration, the proposal is unlikely to result in impacts to potential habitat that is important to the long-term survival of this community in the locality.

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),

The proposal will not have an impact on any area of outstanding biodiversity value.

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.

The proposal would result in the operation of the following KTPs:

Invasion of plant communities by exotic vines and scramblers

- The proposal has the potential to introduce new species of weeds that may not already be present, some of which are particularly prone to invading disturbed roadside edges, and which are not already present within the study area. Mitigation measures to minimise indirect impacts, including the introduction or further spread of weeds and pathogens, would be included in the CEMP (see Section 5).

Conclusion of Assessment of Significance

Based on consideration of the above criteria, the proposal is unlikely to have a significant effect on the local occurrence of White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions pursuant to Section 7.3 of the BC Act, given:

- The proposal would not result in any impacts to known occurrences of species associated with this community and is unlikely to result in an adverse effect on the life cycle of associated species such that a viable local population is placed at risk of extinction.
- The proposal would not result in the removal of any area associated with the CEEC and would only have minor modifications to fringing areas of habitat.
- The proposal will not result in fragmentation or isolation of any known or potential habitat for this community.
- The proposal would not result in any impacts to areas of intact native vegetation elsewhere in the locality that represents better quality potential habitat for this community.

Consequently, a species impact statement would not be required for White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions

Appendix K

AIHMS Search

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : Canomodine Lane (1)

Client Service ID : 820283

Hannah Marsh

270 Summer Street
Orange New South Wales 2800

Attention: Hannah Marsh

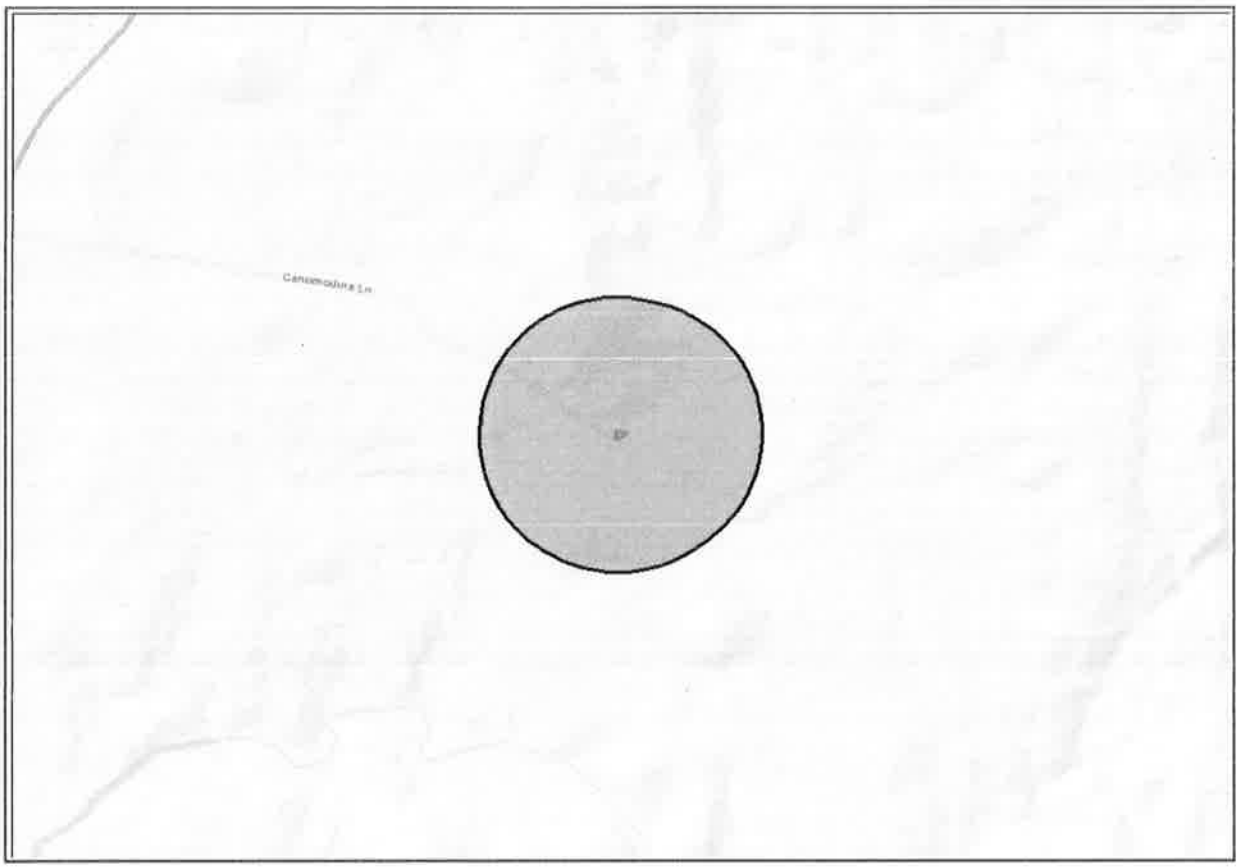
Email: hannah.marsh@ghd.com

Date: 15 September 2023

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 7300, DP:DP1143832, Section : - with a Buffer of 1000 meters, conducted by Hannah Marsh on 15 September 2023.

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. *

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (https://www.legislation.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Heritage NSW upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Heritage NSW and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

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