

New England Highway bypass of Singleton

Addendum review of environmental
factors

May 2023

Acknowledgement of Country

Transport for NSW acknowledges the traditional custodians of the land on which we work and live.

We pay our respects to Elders past and present and celebrate the diversity of Aboriginal people and their ongoing cultures and connections to the lands and waters of NSW.

Many of the transport routes we use today – from rail lines, to roads, to water crossings – follow the traditional Songlines, trade routes and ceremonial paths in Country that our nation's First Peoples followed for tens of thousands of years.

Transport for NSW is committed to honouring Aboriginal peoples' cultural and spiritual connections to the land, waters and seas and their rich contribution to society.



Prepared by Transport for NSW.

Executive summary

The proposed modification

Transport for NSW (Transport) proposes to modify the New England Highway bypass of Singleton by adjusting the proposal area following consultation and to facilitate general constructability (proposed modification). Key features of the proposed modification would include:

- Minor adjustments to existing property acquisitions in response to property owner consultation and to facilitate general project constructability
- Additional and modified public utility works required following further consultation with utility providers.
- Change in alignment of the northern property access off Rix's Creek Lane following further consultation and agreement with the property owners.

The location of the proposed modification is shown in Figure1-1. Section 3 describes the proposed modification in more detail.

Background

The New England Highway is a major freight and commuter route, passing through Singleton and forms the main road access through the town. The route allows for the transport of goods to domestic and international markets via Newcastle and Sydney. Due to mining activities in the region, the route also accommodates the transport of mining equipment and vehicles, which are often oversize and/or over-mass vehicles.

A review of environmental factors (REF) was prepared for the New England Highway bypass project on 11 December 2019 date (referred to in this addendum REF as the project REF). The project REF was placed on public display between 16 December 2019 and 1 March 2020 for community and stakeholder comment. A submissions report dated 7 August 2020 was prepared to respond to issues raised. The project REF was determined on 10 August 2020.

This addendum REF provides a detailed description of the potential environmental impacts associated with the modifications proposed for the New England Highway bypass of Singleton.

Need for the proposed modification

Section 2 of the project REF addresses the strategic need for the project, the project objectives and the options that were considered. The proposed modification described and assessed in this addendum REF is consistent with the strategic need for the project.

The proposed modification is needed following further investigations, consultation with utility providers and to facilitate construction of the project.

Proposal objectives

Following post approval property owner consultation and investigations into the project constructability it was determined that minor existing property acquisition adjustments were required to facilitate construction of the Project. In addition, consultation with applicable utility providers, identified that utility adjustment works were also required outside of the REF approval area to tie into existing utilities.

Options considered

The following options have been considered in the preparation of this addendum REF:

- Option 1 – Do nothing (maintain project as per REF).
- Option 2 – Modify the proposal area and activities.

The preferred option is Option 2, to modify the proposal area as described in Section 2.3 as this would accommodate changes necessary to address property owner consultation and facilitate construction, along with

required utility relocations identified following the project's determination. The preferred option would also achieve and be consistent with the objectives of the REF.

Statutory and planning framework

Section 2.108 of the *State Environmental Planning Policy (Transport and Infrastructure) 2021* (SEPP (Transport and Infrastructure)) permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent.

The proposed modification is for the purpose of a road and is to be carried out by Transport for NSW. Therefore, development consent from Singleton Council is not required. As a public authority, Transport for NSW has a duty to consider the potential environmental impacts of the development in accordance with Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). This addendum REF has been prepared to consider the environmental impacts of the proposed modification.

Community and stakeholder consultation

Transport for NSW has consulted with the community, including those directly affected by the project and proposed modification, and relevant stakeholders throughout the development of the project.

Transport for NSW has assessed the requirement to consult with Singleton Council and public authorities other than council under the SEPP (Transport and Infrastructure) and determined that consultation is not required under this proposed modification.

Appendix B contains a consultation checklist that documents how SEPP (Transport and Infrastructure) consultation requirements have been identified.

While consultation under the SEPP isn't required for the scope of the proposed modification, ongoing consultation has been carried out with Singleton Council and other stakeholders. Feedback from consultation has been incorporated into the proposed modification. Community and stakeholder consultation will continue throughout the construction of the project, including matters relevant to the proposed modification. Information regarding the project and the proposed modification is also available on the Transport website.

Environmental impacts

The main environmental impacts for the proposed modification are:

Biodiversity

The proposed modification would result in an increase of clearing to 42.89 Ha of native vegetation. The cumulative impact from the approved project and proposed modification is not likely to significantly impact threatened species, populations or ecological communities or their habitats, within the meaning of the *Biodiversity Conservation Act 2016* or *Fisheries Management Act 1994* and therefore a Species Impact Statement is not required.

The cumulative impact from the approved project and proposed modification is likely to result in a significant impact to the *Central Hunter Valley Eucalypt Forest and Woodland*. This outcome is consistent with the REF.

Aboriginal heritage

Three Aboriginal sites are recognised within those portions of the updated proposal area not previously subject to assessment for the project. Two of these sites, being Singleton Bypass OAS21 (37-6-3925) and Singleton Bypass OAS23 (37-6-4219) would be impacted by the proposed modification. The third site identified, Singleton Bypass PAD4, would not be directly impacted by the proposed modification. Additionally, surface artefact scatter Singleton Bypass OAS3 (37-6-3896), previously identified as not being impacted by the project, would now be partially impacted.

These additional impacts to Aboriginal heritage require a variation to the Aboriginal Heritage Impact Permit (AHIP) prior to impact.

Justification and conclusion

The proposed modification is also consistent with the objectives stated in Section 2.3 of the REF and Section 2.2 of this addendum REF.

The proposed modification would potentially result in some minor increases to environmental impacts including impacts to biodiversity and Aboriginal heritage. However, the safeguards and management measures provided in Section 7.2 would avoid, minimise, or mitigate these potential impacts arising from the proposed modification.

This addendum REF has examined and considered to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the proposed activity. The potential environmental impacts of the proposed modification are not likely to be significant and therefore an environmental impact statement (EIS) and approval from the Minister for Planning and Public Spaces under Division 5.2 of the EP&A Act are not required. The potential environmental impacts are considered to be manageable with the effective implementation of the measures detailed in the REF, submissions report, and this addendum REF.

Table of contents

Executive summary	4
1. Introduction	10
1.1 Proposed modification overview	10
1.2 Purpose of the report.....	12
2. Need and options considered.....	13
2.1 Strategic need for the proposed modification.....	13
2.2 Proposal objectives and development criteria.....	13
2.3 Alternatives and options considered.....	13
2.4 Preferred option	14
3. Description of the proposed modification	15
3.1 The proposed modification	15
3.2 Design.....	19
3.3 Construction activities.....	19
3.4 Ancillary facilities.....	20
3.5 Public utility adjustment	20
3.6 Property acquisition	20
4. Statutory and planning framework	23
4.1 Environmental Planning and Assessment Act 1979.....	23
4.2 Other relevant NSW legislation.....	24
4.3 Commonwealth legislation.....	26
4.4 Confirmation of statutory position.....	27
5. Consultation	28
5.1 Consultation strategy	28
5.2 Ongoing or future consultation.....	29
6. Environmental assessment.....	30
6.1 Biodiversity	30
6.2 Aboriginal heritage.....	42
6.3 Other impacts	49
7. Environmental management.....	55
7.1 Environmental management plans	55
7.2 Summary of environmental safeguards and management measures	56
7.3 Licensing and approvals.....	82
8. Conclusion.....	83
8.1 Justification.....	83

8.2	Objects of the EP&A Act	84
8.3	Ecologically sustainable development.....	85
8.4	Conclusion.....	86
9.	Certification.....	87
10.	EP&A Regulation publication requirement	88
11.	Terms and acronyms used in this addendum REF.....	89
12.	References.....	91
	Appendix A.....	95
	Appendix B.....	101
	Appendix C.....	106
	Appendix D.....	107

Tables

Table 3-1: Proposed property acquisition as a result of the proposed modification	21
Table 2 Reviewed PCTs within the revised project area.....	33
Table 3 TECs listed under the BC Act within the 2019 and revised project area	34
Table 4 TECs listed under the EPBC Act within the 2019 and revised project area.....	34
Table 5 Threatened species recorded within the revised project area.....	35
Table 7 Impacts on native vegetation as a result of the proposed modification.....	36
Table 9 Offsetting thresholds for REFs (Roads and Maritime 2016).....	41
Table 10 Ecosystem credits summary 2021 according to BAM	42
Table 6-10: Aboriginal sites located within updated proposal area.....	43
Table 6-11: Impact Assessment for Aboriginal sites identified within the updated proposal are	45
Table 6-12: Impact and management recommendations for Aboriginal archaeological sites relevant to the proposed modification.....	47
Table 6-11: Existing environment and potential impacts.....	49
Table 7-1: Summary of safeguards and management measures	56
Table 7-2: Summary of licensing and approval required.....	82

Appendices

- A Consideration of section 171(2) factors and matters of National Environmental Significance and Commonwealth land
- B Statutory consultation checklists
- C Biodiversity Assessment Report
- D Aboriginal Cultural Heritage Assessment Report

1. Introduction

1.1 Proposed modification overview

Transport for NSW (Transport) proposes to modify the New England Highway bypass of Singleton by adjusting the proposal area following consultation and to facilitate general constructability (proposed modification). Key features of the proposed modification would include:

- Minor adjustments to existing property acquisitions in response to property owner consultation and to facilitate general project constructability
- Additional and modified public utility works required following further consultation with utility providers
- Change in alignment of the northern property access off Rix's Creek Lane following further consultation and agreement with the property owners.

The location of the proposed modification shown in Figure 1-1. Section 3 describes the proposed modification in more detail.

A review of environmental factors (REF) was prepared for the New England Highway bypass project on 11 December 2019 date (referred to in this addendum REF as the project REF). The project REF was placed on public display between 16 December 2019 and 1 March 2020 for community and stakeholder comment. A submissions report dated 7 August 2020 was prepared to respond to issues raised. The project REF was determined on 10 August 2020.

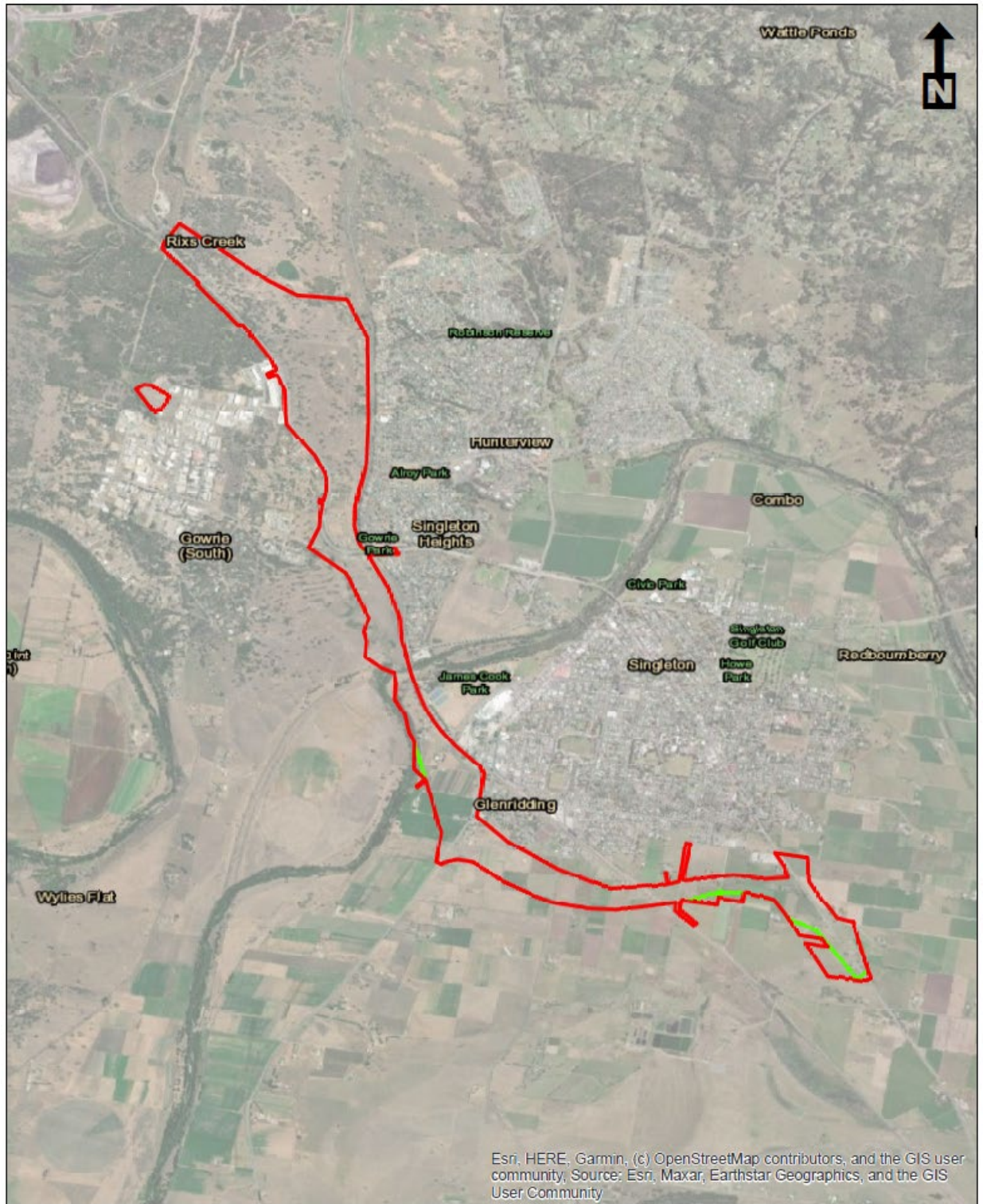


Figure 1.1 Location of the proposed modification

Legend

Proposal Features

- Proposed Project Area
- Project REF Boundary

0 0.5 1 2
Kilometers



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Figure 1-1: Location of the proposed modification

1.2 Purpose of the report

This addendum review of environmental factors (REF) has been prepared by Transport for NSW Hunter Region. For the purposes of these works, Transport for NSW is the proponent and the determining authority under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This addendum REF is to be read in conjunction with the project REF and submissions report for the project. The purpose of this addendum REF is to describe the proposed modification, to document and assess the likely impacts of the proposed modification on the environment, and to detail mitigation and management measures to be implemented.

The description of the proposed work and assessment of associated environmental impacts has been undertaken in context of section 171 of the Environmental Planning and Assessment Regulation 2021, *Is an EIS Required? Best Practice Guidelines for Part 5 of the Environmental Planning and Assessment Act 1979* (Is an EIS Required? guidelines) (DUAP, 1995/1996), *Roads and Road Related Facilities EIS Guideline* (DUAP, 1996), the *Biodiversity Conservation Act 2016* (BC Act), the *Fisheries Management Act 1994* (FM Act), and the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

In doing so, the addendum REF helps to fulfil the requirements of:

- Section 5.5 of the EP&A Act including that Transport for NSW 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 strategic assessment approval granted by the Federal Government under the EPBC Act in September 2015, with respect to the impacts of Transport for NSW's road activities on nationally listed threatened species, ecological communities and migratory species.

The findings of the addendum REF would be considered when assessing:

- Whether the proposed modification is likely to result in a significant impact on the environment and therefore the necessity for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning under Division 5.2 of the EP&A Act
- The significance of any impact on threatened species as defined by the BC Act and/or FM Act, in section 1.7 of the EP&A Act and therefore the requirement for a Species Impact Statement or a Biodiversity Development Assessment Report
- The significance of any impact on nationally listed biodiversity matters under the EPBC Act, including whether there is a real possibility that the activity may threaten long-term survival of these matters, and whether offsets are required and able to be secured
- The potential for the proposed modification to significantly impact any other matters of national environmental significance or Commonwealth land and therefore the need to make a referral to the Australian Department of Climate Change, Energy, the Environment and Water for a decision by the Australian Government Minister for the Environment on whether assessment and approval is required under the EPBC Act.

2. Need and options considered

2.1 Strategic need for the proposed modification

Section 2 of the project REF addresses the strategic need for the project, the project objectives and the options that were considered. The proposed modification described and assessed in this addendum REF is consistent with the strategic need for the project.

The proposed modification is needed following further investigations, consultation with utility providers and to facilitate construction of the project.

2.2 Proposal objectives and development criteria

Section 2.3 of the project REF identifies the proposal objectives and development criteria that apply to the proposed modification. The proposed modification is consistent with the REF proposal objectives and development criteria.

2.3 Alternatives and options considered

The following sections describe the options that have been considered and assessed over the development of the proposed modification.

2.3.1 Methodology for selection of preferred option

Following post approval property owner consultation and investigations into the Project constructability it was determined that minor existing property acquisition adjustments were required to facilitate construction of the Project. In addition, consultation with applicable utility providers, identified that non-contestable utility adjustment works were also required outside of the REF approval area to tie into existing utilities.

For the purpose of the proposed modification, two options have been considered and are discussed in the following sections.

2.3.2 Identified options

The following options have been considered in the preparation of this addendum REF:

- Option 1 – Do nothing (maintain project as per REF).
- Option 2 – Modify the proposal area and activities.

2.3.3 Analysis of options

Option 1 – Do nothing

This option would consist of the construction of the Singleton bypass as presented in the REF. This option would impact the constructability of the Project along with not facilitating the relocation of public utilities required to comply utility providers requirements and continue utility access to the Singleton community during construction and operation of the Project. This option would also not address the outcomes and agreements following property owner consultation.

Option 2 – Modify the proposal area and activities

This option consists of modifying the proposal area at key locations to address consultation outcomes and facilitate construction along with utility additions and relocations identified following the project's determination and addresses non-contestable utility provider requirements.

2.4 Preferred option

The preferred option is Option 2, to modify the proposal area as described in Section 2.3 as this would accommodate changes necessary to address property owner consolation and facilitate construction, along with required utility relocations identified following the project's determination. The preferred option would also achieve and be consistent with the objectives of the REF.

3. Description of the proposed modification

3.1 The proposed modification

Transport for NSW proposes to modify the New England Highway bypass of Singleton by adjusting the proposal area following consultation and to facilitate general constructability. The key features of the proposed modification are shown in Figure 3-1.

Key features of the proposed modification would include:

- Minor adjustments to existing property acquisitions in response to property owner consultation and to facilitate general project constructability.
- Additional and modified public utility works required following further consultation with utility providers.
- Change in alignment of the northern property access off Rix's Creek Lane following further consultation and agreement with the property owners.

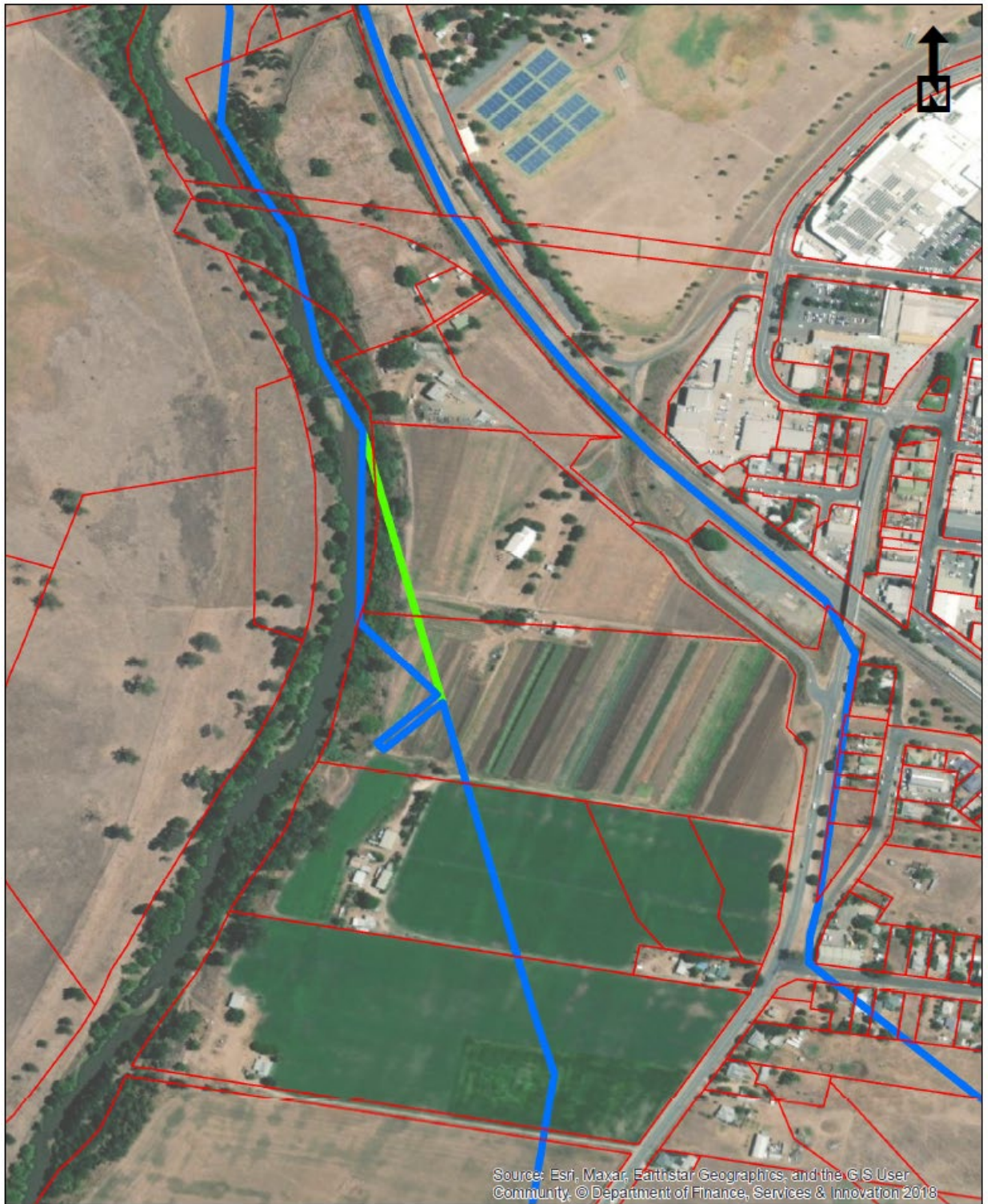


Figure 3.1 Key features of the proposed modification - Proposed project boundary

Legend

- Urban_Property
- Proposed Project Boundary
- Project REF Boundary



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Figure 3-1: Key features of the proposed modification

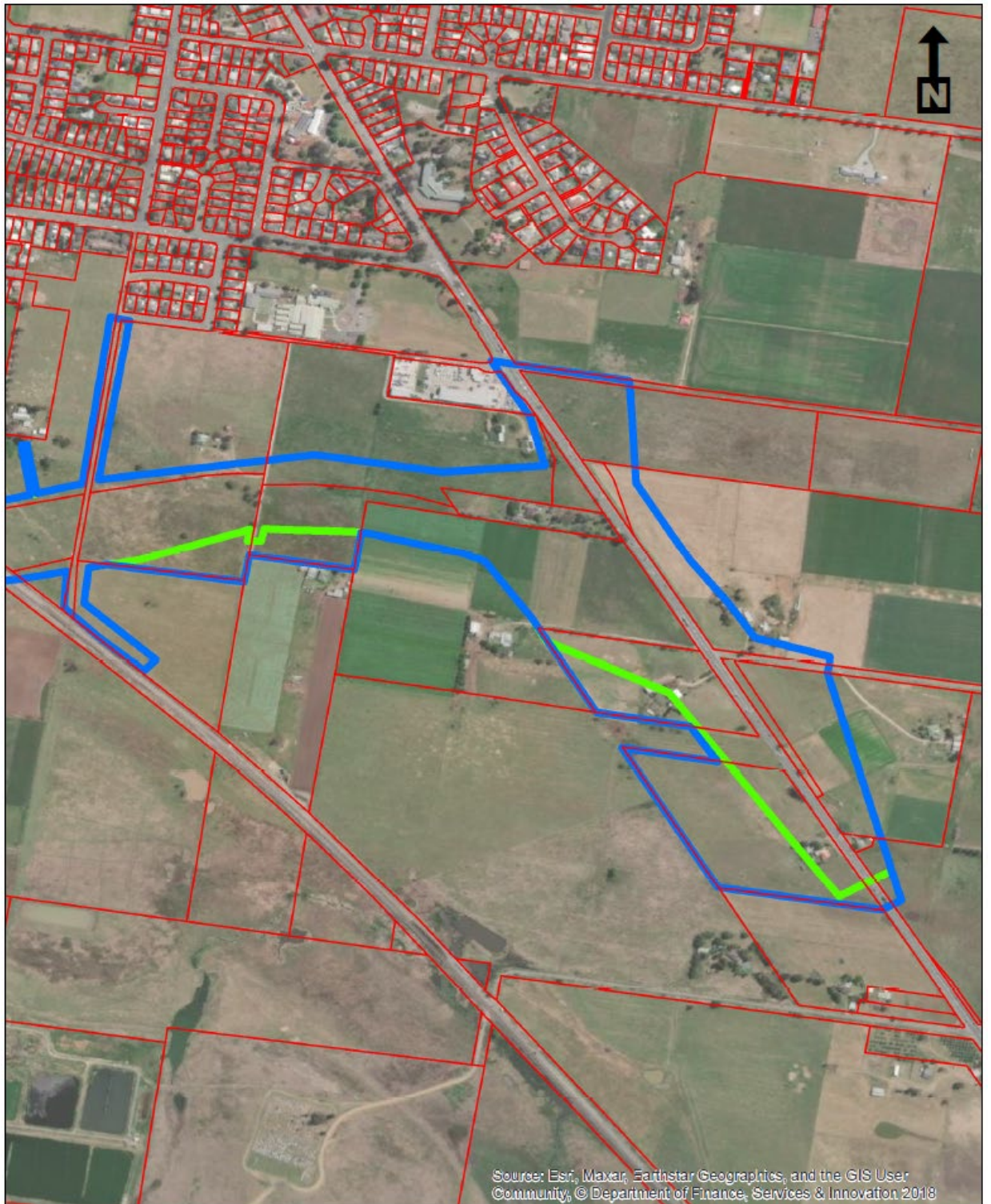


Figure 3.2 Key features of the proposed modification - Proposed project boundary

Legend

- Urban_Property
- Proposed Project Boundary
- Project REF Boundary



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Figure 3-2: Key features of the proposed modification

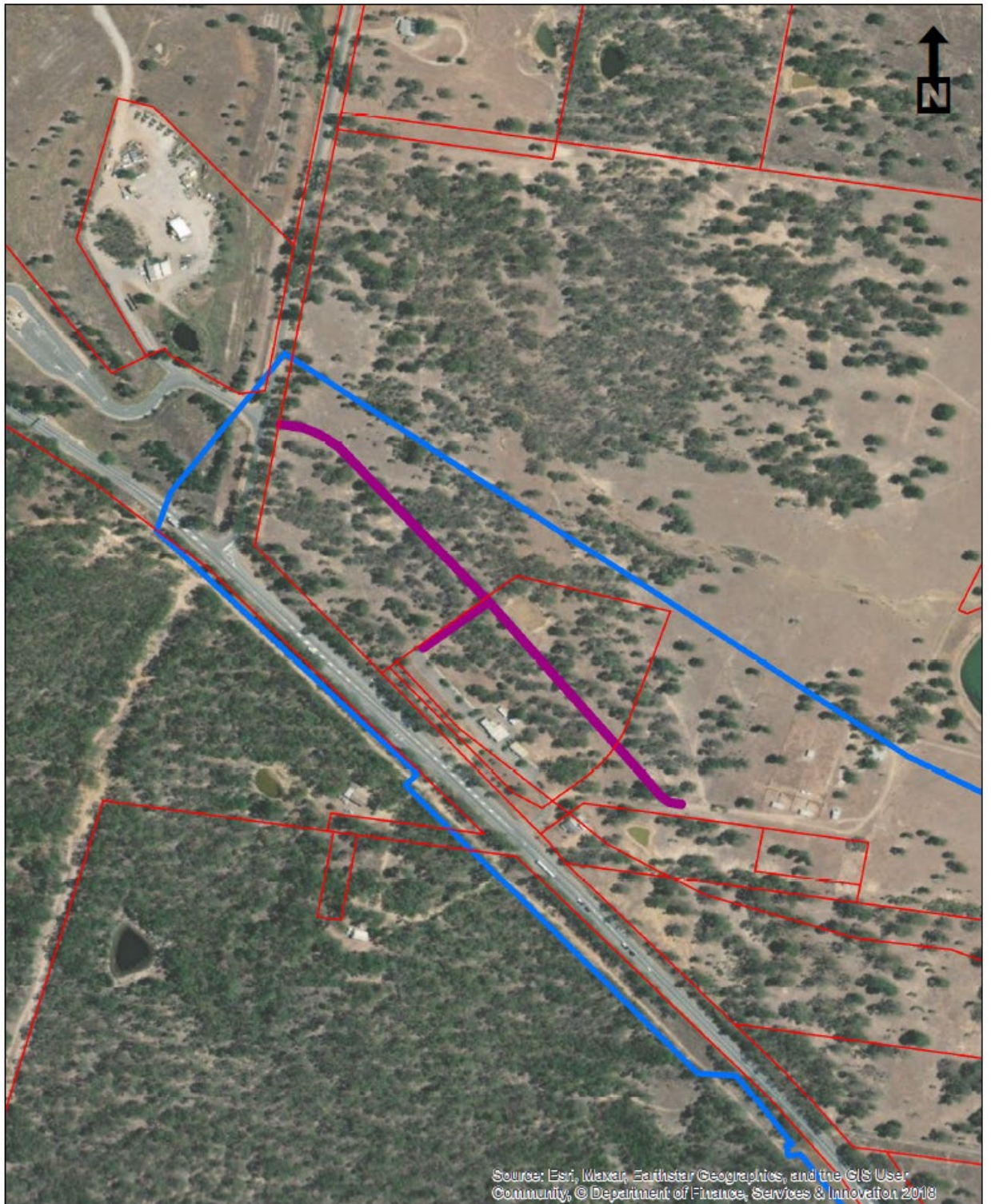


Figure 3.3 Key features of the proposed modification - Proposed change to northern property access driveway off Rix's Creek Lane

Legend

- Urban_Property
- Northern Driveway Alignment
- Proposed Project Area

0 0.05 0.1 0.2
 Kilometers



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Figure 3-3: Key features of the proposed modification

3.2 Design

3.2.1 Design criteria and engineering constraints

The design criteria and engineering constraints outlined in Section 3.2 of the REF remain consistent with the approach that would be undertaken for the proposed modification. There are no changes to the concept design proposed as part of this modification.

3.2.2 Main features of the modification

Utility adjustments

The proposed modification would require minor modifications to utilities (refer to Section 3.5 for detail).

Property adjustments

Consistent with section 3.2.3 of the REF, all properties affected by changed access arrangements as a result of the project would be provided with restored or new permanent access arrangements.

There may be adjustments to access (both temporary and permanent) at other locations in addition to the northern extent of the project corridor at Rix's Creek Lane. Adjustments would be made in consultation with relevant property owners and in accordance with the requirements of the REF and this addendum REF.

Details of the existing property acquisition changes and justifications are provided in Section 3.6 and Table 3-1.

3.3 Construction activities

3.3.1 Work methodology

The work methodology outlined in Section 3.3.1 of the REF remains consistent with the approach that would be used for the proposed modification. Detailed work methodologies would be determined during detailed design and construction planning. Indicative work methodologies for the proposed modifications are described below.

3.3.2 Construction hours and duration

Construction hours for the proposed modification would be consistent with the hours proposed in Section 3.3.2 of the REF. Construction would largely be carried out during standard construction hours in accordance with the Interim Construction Noise Guideline (DECC, 2009):

- Monday to Friday: 7am to 6pm
- Saturday: 8am to 1pm
- Sundays and public holidays: no work.

Construction activities that involve impulsive or tonal noise emissions would be limited to the following hours in accordance with the Construction Noise and Vibration Guideline (Roads and Maritime, 2016):

- Monday to Friday: 8am to 5pm
- Saturday: 9am to 1pm
- Sundays and public holidays: no work.

To minimise disruption to daily traffic and disturbance to surrounding land owners and businesses, it would be necessary to carry out some work outside of these hours. The following activities are likely to take place outside standard construction working hours:

- Construction activities within the rail corridor during rail possessions
- Delivery of construction materials such as precast bridge structures
- Intersection and tie-in activities of the bypass to existing roads

- Installation and adjustment of barriers and signage for construction zones during each construction stage
- Construction of the bridge over the New England Highway at Gowrie Gates
- Operation of construction compounds to support the above work.

3.3.3 Plant and equipment

The range of plant and equipment used during construction is expected to be consistent with the indicative list presented in Section 3.3.3 of the REF. Plant and equipment required for construction would be determined by the construction contractor.

3.3.4 Earthworks

Earthworks activities for the proposed modifications including trenching excavations would be minor and consistent with the quantities outlined in Section 3.3.4 of the REF.

3.3.5 Source and quantity of materials

Construction of the proposed modification would not require any material or quantities in addition to those listed in Section 3.3.5 of the REF. The exact quantities of materials required for the project, including the proposed modifications, would be confirmed during detailed design.

3.3.6 Traffic management and access

Traffic numbers, management and access during construction would be consistent with the arrangements discussed in Section 3.3.6 of the REF.

3.4 Ancillary facilities

No changes to the number and placement of construction ancillary facilities outlined in Section 3.4 of the REF are required for the proposed modification.

3.5 Public utility adjustment

As utility assets are owned by a third-party, Transport are obligated to collaboratively work with utility authorities to reach an adjustment that is mutually beneficial for the Project and the respective utility infrastructure. Following consultation regarding utility adjustments several changes were required to ensure compliance with the nominated provider requirements.

The designs, as developed in consultation with the utility authority, have been incorporated into the updated proposal area and considered in this Addendum REF. Modifications would include the relocation of overhead and underground powerlines along with communication line installations. The nature of the modifications would be consistent with those described in section 3.5 of the REF.

3.6 Property acquisition

No new properties in addition to those identified in section 3.6 of the REF are proposed to be acquired as a result of the proposed modifications.

The further consultation and investigation into the feasibility of construction has result in adjustments to property acquisition boundaries of existing partially acquired properties. The changes are detailed in Table 3 4 and shown on Figure 3 3.

Property acquisition will continue to be carried out in accordance with the *Land Acquisition Information Guide (Roads and Maritime, 2014)* and the *Land Acquisition (Just Terms Compensation) Act 1991*.

Transport would continue to carry out consultation with affected landowners prior to acquisition or to arrange leasing agreements.

Table 3-1: Proposed property acquisition as a result of the proposed modification

Description	Previously proposed acquisition (percent of lot)	Percentage of lot impacted by the project (incl. modification)	Acquisition type	Current owner	Lot and DP	Reason for adjustment
Rural property	<5%	5%	Partial	Private	4/DP36999	Project constructability and pavement retention.
Rural property	<5%	<5%	Partial	Private	111/DP855355	Calculation differences occurred during review of design refinements of the northbound NEH exit ramp into Singleton resulting in minor changes to the percentage of the lot acquired.
Rural property	91%	100%	Full	Private	2/DP1139915	Full property acquisition requested by residents.
Rural property	9%	15%	Partial	Private	20/DP1129695	Adjustment facilitates pavement retention and a corridor for the utility relocations (electrical and comms) away from the mainline civil works.
Rural property	33%	38%	Partial	Private	110/DP1137689	Calculation discrepancy identified following design reviews.
Rural property	19%	25%	Partial	Private	15/DP1117570	Calculation discrepancy identified following design reviews.
Rural property	21%	21% (minor change not shown with rounding)	Partial	Private	1/DP1100628	No change – calculation rounding.
Rural property	6%	9%	Partial	Private	1/DP1050582	Additional acquisition associated with the feasibility of construction.
Rural property	<5	100%	Full	Private	5/DP1159019	The large disparity is the result of a change from the future designation of the land as ‘road corridor’ vs. ‘residue land’.

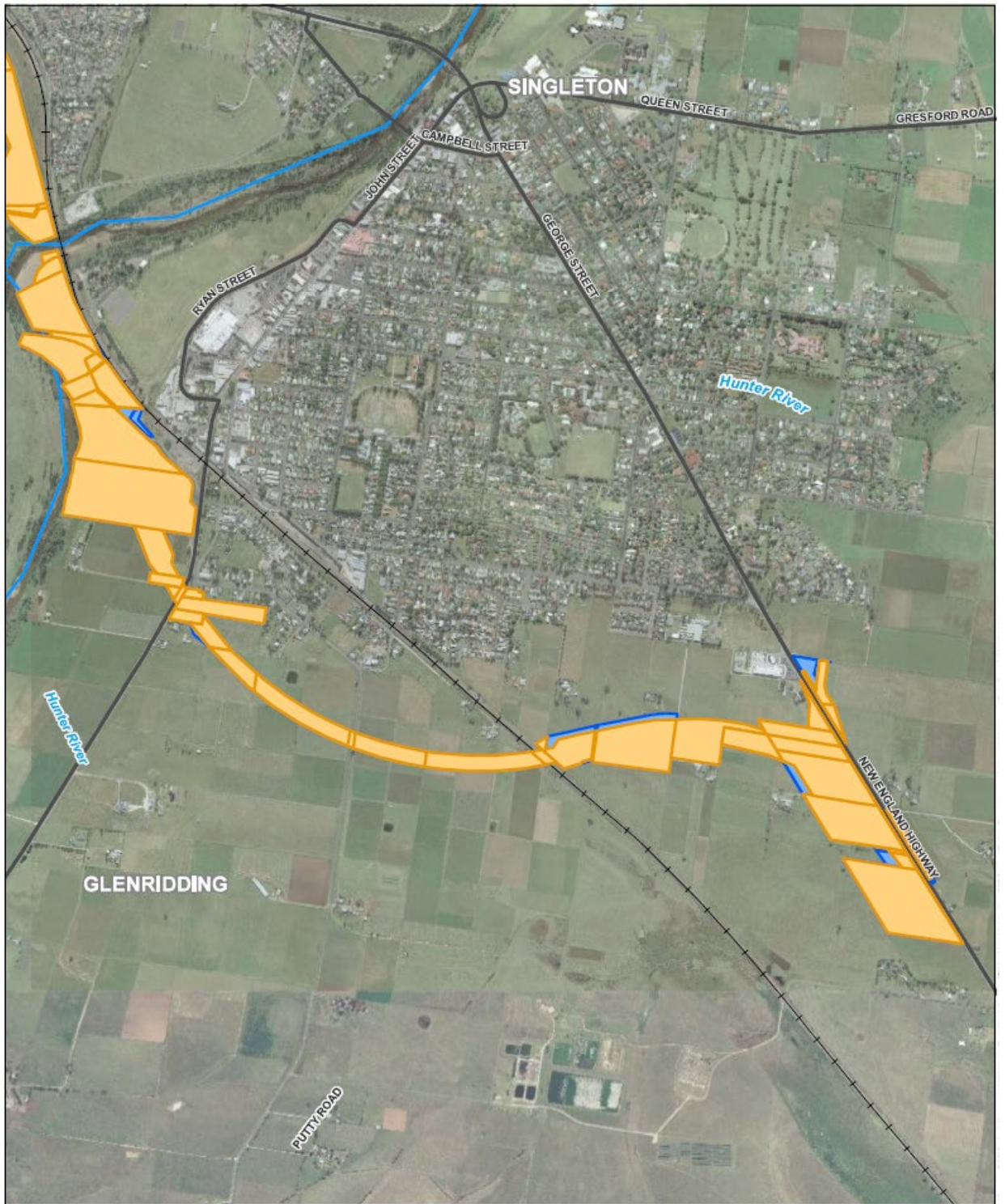


Figure 3.4 Proposed property acquisition

Legend

- Property acquisition (2019)
- Property acquisition (2023)

Other features

- State roads
- Main North railway line



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Figure 3-4: Proposed property acquisition

4. Statutory and planning framework

This chapter provides the statutory and planning framework for the proposed modification and considers the provisions of relevant state environmental planning policies (SEPP), local environmental plans (LEP) and other legislation.

4.1 Environmental Planning and Assessment Act 1979

4.1.1 State Environmental Planning Policies

State Environmental Planning Policy (Transport and Infrastructure) 2021

Chapter 2 (Infrastructure) of SEPP (Transport and Infrastructure) aims to facilitate the effective delivery of infrastructure across the State.

Section 2.108 of SEPP (Transport and Infrastructure) permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent.

As the proposed modification is for a road and road infrastructure facilities and is to be carried out by Transport for NSW, it can be assessed under Division 5.1 of the EP&A Act. Development consent from council is not required.

The proposal is not located on land reserved under the *National Parks and Wildlife Act 1974* and does not require development consent or approval under:

- State Environmental Planning Policy (Resilience and Hazards) 2021
- State Environmental Planning Policy (Planning Systems) 2021
- State Environmental Planning Policy (Precincts – Central River City)
- State Environmental Planning Policy (Precincts – Eastern Harbour City)
- State Environmental Planning Policy (Precincts – Regional) 2021
- State Environmental Planning Policy (Precincts – Western Parkland City) 2021

Section 2.10 to 2.15 of SEPP (Transport and Infrastructure) contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development.

Consultation, including consultation as required by SEPP (Transport and Infrastructure) (where applicable), is discussed in section 5 of this addendum REF.

State Environmental Planning Policy (Biodiversity and Conservation) 2021

The Biodiversity Assessment Report (BAR) for the approved project considered State Environmental Planning Policy 44 – Koala Habitat Protection (SEPP 44) for assessment of koala habitat. Since that time SEPP 44 has been replaced by State Environmental Planning Policy (Biodiversity and Conservation) 2021 (Biodiversity and Conservation SEPP) which includes two chapters providing for assessment, conservation, and management of koala habitat in NSW.

Chapter 3 Koala Habitat Protection 2020 applies to rural zoned land in non-metropolitan local government areas while Chapter 4 Koala Habitat Protection 2021 applies to metropolitan local government areas and non-rural zoned land in non-metropolitan land. The koala habitat protection chapters apply to development applications in the Singleton local government area.

Both chapters apply to different areas of land within and surrounding the proposed modification. The BAR carried out for the proposed modification assessed the potential for Koala habitat in accordance with the Biodiversity and Conservation SEPP. Overall, it was assessed that given the absence of historical and recent records and no evidence of the Koala being recorded during the assessment undertaken for the approved project, there is a low likelihood that a resident population of the Koala occurs within the area (refer to Appendix A for further detail).

4.1.2 Local Environmental Plans

The proposed modification is located within the Singleton LGA. There are two local environmental planning instruments that apply to the Singleton LGA. These are the:

- Singleton Local Environmental Plan 1996 (Singleton LEP 1996)
- Singleton Local Environmental Plan 2013 (Singleton LEP 2013).

The Singleton LEP 1996 remains in force for portions of the Singleton LGA which are identified as deferred matters on the Singleton LEP 2013 land zoning maps. No elements of the proposed modification would be on land that is identified as a deferred matter in the Singleton LEP 2013, therefore no further consideration of the Singleton LEP 1996 is required.

Clause 5.10 of the Singleton LEP 2013 provides for the protection of heritage items within the Singleton LGA. The REF identified four heritage items within the project area that are listed on the Singleton LEP 2013. The proposed modification is located within three of these items being the “Former Pumping Station”, “Bebeah” and the “Woolpack Inn”. An assessment of the potential impacts of the proposed modification on these heritage items is provided in Section 6.3.

As outlined in Section 4.1.1, Section 2.108(1) of SEPP (Transport and Infrastructure) overrides the requirement for development consent from Singleton Council and therefore the consent requirements of the Singleton LEP 2013 do not apply.

Nevertheless, consideration of the objectives of the land use zones prescribed by the Singleton LEP 2013 that are relevant to the proposed modification are discussed below.

RU1 Primary Production

The proposed modification would primarily be located on land zoned RU1 Primary Production. The objectives of this zone under the Singleton LEP 2013 are to encourage diverse and sustainable primary industry production, to minimise the fragmentation of resource lands and to minimise conflict between land uses.

The proposed modification would involve some adjustments to property acquisitions presented in the REF, however this is not expected to increase land fragmentation. Property acquisitions required for the proposed modification are detailed in Section 3.6. As described in the socio-economic impact of the proposed modification in Section 6.8, the impact to agricultural productivity within the Singleton LGA as a result of the proposed modification is considered to be minor.

SP2 Infrastructure

The objectives of this zone under the Singleton LEP 2013 are to provide for infrastructure and related land uses and to prevent development that is not compatible with infrastructure.

The proposed modification would meet the objectives of this zone.

4.2 Other relevant NSW legislation

4.2.1 Roads Act 1993

Under section 143 of the *Roads Act 1993* (Roads Act), a roads authority can use a public road in the exercise of a function conferred by the Roads Act, so long as the function is exercised in a way that will not unduly interfere with the rights of passage and access that exist with respect to the public road.

As outlined in Section 6.6, there would be additional short-term impacts to traffic movements as a result of the proposed modification, however safe access would be maintained throughout the construction period. Therefore, the proposed modification would not change the applicability of the Roads Act.

4.2.2 Biodiversity Conservation Act 2016

The purpose of the *Biodiversity Conservation Act 2016* (BC Act) is to maintain a healthy, productive, and resilient environment for the greatest well-being of the community consistent with the principles of ecologically sustainable development.

An assessment of the potential impacts to biodiversity and measures to manage potential impacts are discussed in Section 6.1. The assessment found that the proposed modification is unlikely to have a significant impact on any threatened species or communities under the BC Act and therefore a Species Impact Statement (SIS) or a Biodiversity Development Assessment Report (BDAR) is not required for the proposal.

4.2.3 Biosecurity Act 2015

The *Biosecurity Act 2015* (Biosecurity Act) covers all biosecurity risks, including pest animals, plant diseases and noxious weeds and introduces the legally enforceable concept of a General Biosecurity Duty.

As outlined in Section 6.1 of this REF, a number of weed species have been identified in the proposed modification area. Consistent with the REF, management measures have been recommended to manage these weed species in accordance with the requirements of the Biosecurity Act.

4.2.4 Fisheries Management Act 1994

The *Fisheries Management Act 1994* (FM Act) provides for the protection of threatened fish and marine vegetation and for the management of associated threatening processes. Part 7A Division 4 of the FM Act prohibits, without a licence or permit, activities that damage habitats or harm threatened species, populations or ecological communities.

The proposed modification would not result in any changes to the previous requirements, which noted that notification of the proposed work to the Department of Primary Industries–Fisheries (DPI–Fisheries) is required, as well as a permit to obstruct fish habitat, should any in stream structures be required to obstruct the full width of the Hunter River (refer to Section 4.2.4 of the REF).

Consultation regarding the project has already been carried out with the DPI–Fisheries as part of the REF (refer to Section 5.5 of the REF).

4.2.5 Water Management Act 2000

The *Water Management Act 2000* (WM Act) provides for the management of surface water and groundwater in NSW.

The proposed modification would not result in any changes to the previous requirements, which noted no licences are required under the WM Act (refer to Section 4.2.5 of the REF).

4.2.6 National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974* (NPW Act) governs the establishment, preservation and management of national parks, state reserves, historic sites and certain other areas, and the protection of certain fauna, native plants, and Aboriginal heritage.

An addendum Aboriginal Cultural Heritage Assessment Report (ACHAR) was prepared for the proposed modification which is summarised in Section 6.5 and attached in Appendix B. Potential impacts to Aboriginal cultural heritage as a result of the proposal have been assessed in accordance with Roads and Maritime's *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (NSW Roads and Maritime Services, 2011) (PACHCI).

A variation to the Aboriginal Heritage Impact Permit (AHIP) area presented in the REF would be required to cover the additional areas and impacts of the proposed modification.

4.2.7 Heritage Act 1977

The *Heritage Act 1977* (Heritage Act) aims to protect and conserve non-Aboriginal cultural heritage, including scheduled heritage items, sites and relics.

The proposed modification would not increase the impact to the heritage items identified in the REF. An assessment of potential impacts on non-Aboriginal heritage items is provided in Section 6.9 of this report.

The proposed modification would also not result in any changes to the previous requirement that prior to ground disturbance impacts at the Former Pumping Station (I21).

4.2.8 Contaminated Lands Management Act 1997

The *Contaminated Lands Management Act 1997* (CLM Act) establishes a process for investigating and remediating land where required.

A Phase 1 Preliminary Site Investigation was carried out to inform the REF and is summarised in Section 6.5 of the REF. Following review of the PSI, the NSW EPA provided a submission to Transport on the REF dated 28 February 2020. It was concluded that due to the potential presence PFAS in environmental media in or near sections of the project, further assessment of soil and groundwater was warranted with a Detailed Site Inspection (DSI) completed in 2022 assessing all Areas of Environmental Concern (AECs) identified as part of the PSI.

The proposed modification does not alter the likelihood of encountering contaminated soil or groundwater from that described in the REF.

4.2.9 Protection of the Environment and Operations Act 1997

The NSW *Protection of the Environment Operations Act 1997* (POEO Act) aims to protect, restore, and enhance the environments of NSW and reduce potential risks to human health and the environment.

The proposed modification would not result in any changes to the previous requirements, which noted that an Environmental Protection Licence is required under Schedule 1, Clause 35 of the POEO Act.

4.2.10 Land Acquisition (Just Terms Compensation) Act 1991

The *Land Acquisition (Just Terms Compensation) Act 1991* (Land Acquisition Act) applies to the acquisition of land (by agreement or compulsory process) by a public authority authorised to acquire the land by compulsory process. It provides a guarantee that, when a public authority requires the acquisition of land, the amount of compensation will not be less than the market value of the land.

The Land Acquisition Act would apply to the acquisition of any land required for the project. Changes to property acquisition as a result of the proposed modification are further discussed in Section 3.6.

4.2.11 Aboriginal Land Rights Act 1983

The *Aboriginal Land Rights Act 1983* (ALR Act) provides for the land rights for Aboriginal persons and for representative Aboriginal Land Councils in New South Wales.

The proposed modification would not change the applicability of the ALR Act.

4.3 Commonwealth legislation

4.3.1 Environment Protection and Biodiversity Conservation Act 1999

Under the EPBC Act a referral is required to the Australian Government for *proposed 'actions that have the potential to significantly impact on matters of national environmental significance or the environment of Commonwealth land'*. These are considered in Appendix C and section 6 of the addendum REF.

A referral is not required for proposed road actions that may affect nationally listed threatened species, endangered ecological communities and migratory species. This is because requirements for considering impacts to these biodiversity matters are the subject of a strategic assessment approval granted under the EPBC Act by the Australian Government in September 2015.

Potential impacts to these biodiversity matters are also considered as part of Section 6.1 of the addendum REF and Appendix C.

Findings – matters of national environmental significance (other than biodiversity matters)

The assessment of the proposed modification's impact on matters of national environmental significance and the environment of Commonwealth land found that there would be no change to the findings of the determined activity and the proposed modification would be unlikely to cause a significant impact on matters of national

environmental significance or the environment of Commonwealth land. A referral to the Australian Government Department of Agriculture, Water and the Environment Climate Change, Energy, the Environment and Water is not required.

The assessment undertaken for the REF found that there is likely to be a significant impact on the Central Hunter Valley eucalypt forest and woodland community, listed as critically endangered under the EPBC Act. The proposed modification does not change this outcome, nor does it have any other additional impact to nationally listed threatened species, endangered ecological communities (EEC), or migratory species.

4.3.2 Other relevant Commonwealth legislation

Native Title Act 1993

The Native Title Act 1993 (NTA) provides for the recognition and protection of native title for Aboriginal peoples and Torres Strait Islanders.

Searches of the National Native Title Register, Register of Native Title Claims and Register of Indigenous Land Use Agreements were undertaken on 15 June 2022 for the Singleton LGA. These searches returned no registered native title claims, determinations or Indigenous land use agreements. However, a recently filed native title claim NSD58/2022 (Application name: Scott Franks & Anor on behalf of the Plains Clans of the Wonnarua People and Attorney General of NSW (Plains Clans of the Wonnarua People)) applies to land within the proposed modification area. NSD58/2022 has not been formally registered however has been identified for a registration decision.

Aboriginal community consultation carried out for the Addendum ACHAR continues that undertaken for the project at large. Consultation has followed Heritage NSW's Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010) and involved consultation with 37 Registered Aboriginal Parties (RAPs), including Plains Clans of the Wonnarua People. Further detail is provided in the Addendum ACHAR (refer to Appendix B).

Ongoing consultation with the Aboriginal community would continue to occur throughout the PACHCI process for any further investigations necessary.

4.4 Confirmation of statutory position

The proposed modification is categorised as development for the purpose of road and road infrastructure facilities and is being carried out by or on behalf of a public authority. Under section 2.108 of SEPP (Transport and Infrastructure), the proposed modification is permissible without consent. The proposed modification is not State significant infrastructure or State significant development. The proposed modification can be assessed under Division 5.1 of the EP&A Act. Consent from Council is not required.

Transport for NSW is the determining authority for the proposed modification. This addendum REF fulfills Transport for NSW's obligation under clause 5.5 of the EP&A Act including 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.

5. Consultation

5.1 Consultation strategy

Transport has endeavoured to keep the community and stakeholders informed and proactively consulted throughout the development of the project and proposed modification. Consultation has been carried out in accordance with the Community and Stakeholder Engagement Plan prepared for the proposal. The purpose of consultation is:

- To keep community informed and increase understanding of the proposal
- To gain local knowledge and consider comments and issues relating to the project
- To ensure stakeholders potentially impacted by the project are provided clear information
- To provide clear and timely information and advise the community on how they may obtain information and communicate concerns, complaints, and suggestions.

5.1.1 Community consultation

The REF was publicly displayed for comment from Monday 16 December 2019 and Sunday 1 March 2020. During which time, members of the community, government agencies and regulatory authorities provided submissions regarding the project. A Submissions Report was prepared documenting the outcomes of this process and published 7 August 2020.

5.1.2 Aboriginal community consultation

Aboriginal community consultation has been carried out in accordance with the requirements of *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010) and Transport for NSW's *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (PACHCI), which is a staged process for investigating potential impacts to Aboriginal cultural heritage as a result of Transport for NSW road planning, development, construction and maintenance activities.

Consultation has included meetings (online and face to face), phone calls, general project updates, as well as direct communications between Transport and Registered Aboriginal Parties regarding the addendum ACHAR and proposed modification.

Following the completion of the additional test excavation program, a draft addendum ACHAR was provided for comment. A meeting was held on 14 October 2022 to discuss the findings from the test excavation program, proposed salvage methodology and addendum ACHAR. A final version of the addendum ACHAR was provided to after the 28 day consultation period had ended which included feedback received.

5.1.3 Landowners

Affected landowners have been consulted with throughout each phase of the project. Those who are likely to be affected as a result of the proposed modification have been consulted with regards to changes to potential impacts on their property in accordance with the Community and Stakeholder Engagement Plan. Compensation associated with property impacts will be undertaken in accordance with the provisions of the NSW Land Acquisition (Just Terms Compensation) Act 1991 and the Land Acquisition Reform 2016 process (<https://www.propertyacquisition.nsw.gov.au/>).

No new properties to those identified in the REF were identified for acquisition as a result of the proposed modifications. Transport will continue to consult with all directly affected landholders.

5.1.4 SEPP (Transport and Infrastructure) consultation

Transport for NSW has assessed the requirement to consult with Singleton Council and other public authorities under the SEPP (Transport and Infrastructure) and determined that consultation is not required for this proposed modification.

Appendix B contains a consultation checklist that documents how SEPP (Transport and Infrastructure) consultation requirements have been identified.

5.2 Ongoing or future consultation

The community and stakeholders will be informed about the addendum REF and the proposed modifications. This addendum REF will be made available on the Transport project website.

Transport will continue to inform and consult with the community and relevant stakeholders during property acquisition processes and construction of the project.

Transport is continuing to liaise with key stakeholders including but not limited to landowners, Aboriginal groups, Emergency Services and Singleton Council.

6. Environmental assessment

This section of the addendum REF provides a detailed description of the potential environmental impacts associated with the construction and operation of the proposed modification of the New England Highway bypass of Singleton. All aspects of the environment potentially impacted upon by the proposed modification are considered. This includes consideration of the guidelines Roads and Related Facilities EIS Guideline (DUAP, 1996) and Is an EIS required? (DUAP, 1999) the factors specified in section 171 of the Environmental Planning and Assessment Regulation 2021. The factors specified in section 171(2) of the Environmental Planning and Assessment Regulation 2021 are also considered in Appendix C.

Site-specific safeguards and management measures are provided to ameliorate the identified potential impacts.

6.1 Biodiversity

This section addresses the potential biodiversity impacts associated with the proposed modification and details the management measures proposed to mitigate these impacts, additional to the project. It summarises the results of the supplementary BAR prepared to incorporate additional survey findings and the proposed modification provided in Appendix A.

6.1.1 Methodology

A BAR was prepared for the REF which assessed potential biodiversity impacts and proposed mitigation measures to minimise the impact of the project (BAR). The assessment identified areas that were not able to be surveyed due to access constraints in those areas.

Transport engaged Umwelt to conduct ground-truthing survey the areas that were unable to be accessed in 2019. A supplementary BAR was prepared to detail the results and update the initial impacts as provided in the BAR (Umwelt 2019).

The following sections provide the outcomes of the revised assessment as a whole and incorporate areas impacted by the proposed modification.

Key terminology used in the supplementary BAR includes:

- 2019 project area – the broader study area considered by the REF and assessed in the BAR (257.73 hectares)
- revised project area – the broader study area considered by the proposed modification (268.56 hectares)
- 2019 survey area – the northern portion of the 2019 project area which was ground-truthed and assessed by the BAR (86.57 hectares)
- 2021 survey area – the remaining extent of the revised project area identified as native vegetation by regional vegetation mapping and verified by surveys in 2021 (89.25 hectares)
- 2019 impact area – the impact footprint considered by the REF and assessed in the BAR (109.69 hectares)
- revised impact area – the impact footprint of the project¹ (147.49 hectares).
- These boundaries are shown on Figure 6. The methodology for the supplementary BAR is described below.

¹ Given the overlap of the determined project and proposed modification, these areas are referred to collectively as the “project” unless explicitly stated

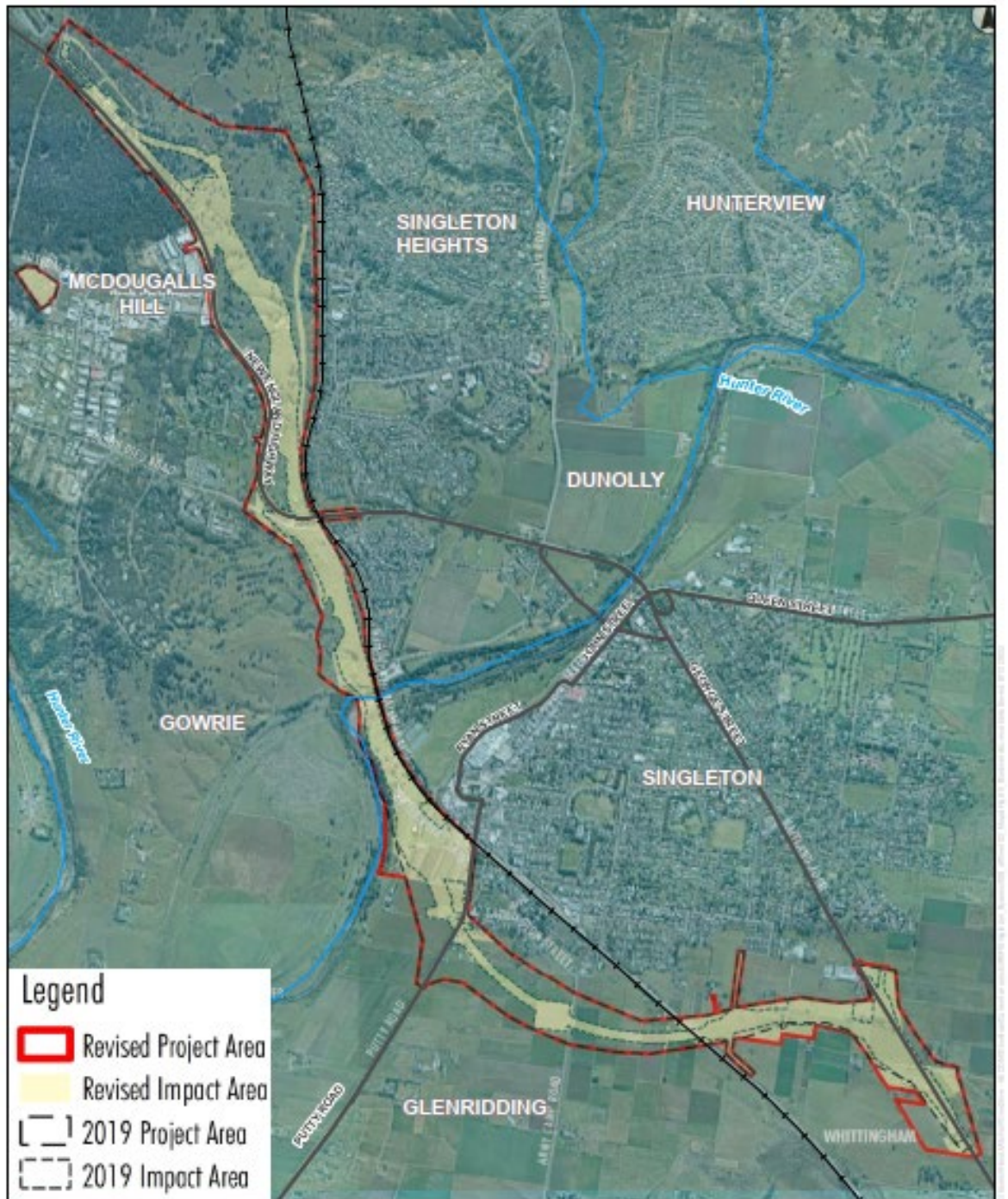


FIG. 6-1 Boundaries used in biodiversity assessment

Source: Umwelt 2022

Legend

- State roads
- +— Main North railway line
- Watercourse

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Figure 6-1 Boundaries used in biodiversity assessment. Source: Umwelt 2022

Background research

A desktop biodiversity assessment was carried out and included a review of relevant and publicly available literature and background information to identify threatened and migratory species, endangered populations and threatened ecological communities (TECs) that had previously been recorded within, or near to, the revised project area. The following searches and databases were used by Umwelt:

- Department of Planning and Environment (DPE) Atlas of NSW Wildlife Database within a 10km radius of the revised project area, last accessed in August 2021
- NSW Department of Primary Industries (DPI) Fisheries Fish Records Viewer, last accessed in February 2018
- Department of Climate Change, Energy, the Environment and Water (DCCEEW) Protected Matters Search Tool (PMST) within a 10km radius of the revised project area, last accessed in September 2021
- Commonwealth critical habitat register, last accessed in February 2018
- The federal Bureau of meteorology Atlas of Groundwater Dependant Ecosystems (GDE), last accessed in January 2022
- DCCEEW directory of important wetlands, last accessed in January 2022
- DPI database for aquatic TECs, last accessed in December 2021
- DPI Key Fish Habitat mapping, last accessed in December 2021
- DPE vegetation information system (VIS) database, last accessed in December 2021
- The Vegetation of the Central Hunter Valley, NSW (Peake 2006)
- Greater Hunter Native Vegetation Mapping (Sivertsen et al. 2011)
- State Vegetation Type Map: Upper Hunter (OEH 2019).

Field survey

Vegetation surveys

Vegetation field surveys were conducted using integrity plots and rapid vegetation assessment points over four days in August and September 2021. The location of each vegetation integrity plot was recorded using a hand-held GPS and rapid vegetation assessment points were recorded using Collector application for ArcGIS.

All data collected from observing the ground cover, shrub, mid-story, canopy, and emergent layer, was recorded according to Table 1 and Table 2 of Section 5 of the Biodiversity Assessment Method (BAM) (DPE 2020).

Targeted flora surveys were completed to confirm the presence of threatened biodiversity in previously inaccessible areas. The surveys targeted:

- River red gum (*Eucalyptus camaldulensis*) endangered population as listed under the BC Act
- Hunter Floodplain Red Gum Woodland in the NSW North Coast and Sydney Basin Bioregions EEC as listed under the BC Act
- River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria CEEC as listed under the EPBC Act.

Habitat surveys

Fauna habitat surveys were completed focusing on habitat suitability of four culvert structures in the rail corridor, habitat for threatened birds to identify seasonal resources and nesting sites, and habitat for arboreal species to identify suitable hollow resources.

In a targeted microbat survey in October 2021, assessment by harp trapping for the potential roost status for Southern Myotis (*Myotis Macropus*) in sandstone culverts situated throughout the northern portion of the revised project area was undertaken. Records of species identification, and breeding status were collected, and animals were released afterwards.

6.1.2 Existing environment

Plant community types

Table 2 compares the extent of plant community types (PCTs) within the 2019 project area and as assessed in the revised project area.

Table 2 Reviewed PCTs within the revised project area

Plant Community Type (PCT)	Condition	Area in 2019 project area (ha)	Area in revised project area (ha)
Verified Vegetation Mapping			
1598 Forest Red Gum Grassy Open Forest on Floodplains of the Lower Hunter	Moderate / Good	0.47	1.08
1598 Forest Red Gum Grassy Open Forest on Floodplains of the Lower Hunter	Derived Native Grassland (DNG)	0.22	0.80
1604 Narrow-leaved Ironbark - Grey Box - Spotted Gum Shrub - Grass Woodland of the Central and Lower Hunter	Moderate / Good	19.45	24.81
1604 Narrow-leaved Ironbark - Grey Box - Spotted Gum Shrub - Grass Woodland of the Central and Lower Hunter	Thinned Canopy	11.46	11.80
1604 Narrow-leaved Ironbark - Grey Box - Spotted Gum Shrub - Grass Woodland of the Central and Lower Hunter	DNG	50.16	62.65
1604 Narrow-leaved Ironbark - Grey Box - Spotted Gum Shrub - Grass Woodland of the Central and Lower Hunter	African Olive Infestation	1.14	4.28
1604 Narrow-leaved Ironbark - Grey Box - Spotted Gum Shrub - Grass Woodland of the Central and Lower Hunter	Regenerating	-	0.13
42 River Red Gum / River Oak riparian woodland wetland in the Hunter Valley	Low Condition	-	4.00
1731 Swamp Oak - Weeping Grass grassy riparian forest of the Hunter Valley	Low Condition	-	0.42
Exotic grassland		0.84	129.68
Cleared Land, infrastructure, water bodies		2.84	26.22
Total Area		86.57	265.87
Regional Vegetation Mapping*			
42 River Red Gum / River Oak riparian woodland wetland in the Hunter Valley	-	3.83	-
1600 Spotted Gum - Red Ironbark - Narrow-leaved Ironbark - Grey Box shrub-grass open forest of the lower Hunter	-	4.36	0.06
1600 Spotted Gum - Red Ironbark - Narrow-leaved Ironbark - Grey Box shrub-grass open forest of the lower Hunter	DNG	2.44	2.44

1601 Spotted Gum - Narrow-leaved Ironbark-Red Ironbark shrub - grass open forest of the central and lower Hunter	-	4.15	0.05
1603 Narrow-leaved Ironbark - Bull Oak - Grey Box shrub - grass open forest of the central and lower Hunter	-	0.15	-
1604 Narrow-leaved Ironbark - Grey Box - Spotted Gum shrub - grass woodland of the central and lower Hunter	-	0.02	-
1731 Swamp Oak - Weeping Grass grassy riparian forest of the Hunter Valley	-	-	0.07
Non-native Vegetation	-	156.11	0.07
Total extent of Regional Vegetation Mapping (ha)		171.06	2.69
Overall Total (ha)		257.73	268.56

*portion of the study area informed by regional vegetation mapping in the project BAR (Umwelt 2019) and for McDougalls Hill ancillary facility in the supplementary BAR

Threatened ecological communities

The area of TECs listed under the BC Act within the 2019 project area and in the revised project area are provided in Table 3. Three endangered ecological communities (EECs) were identified in the revised project area.

The area of TECs listed under the EPBC within the revised project area are shown in Table 4. One critically endangered ecological community (CEEC) was identified within the revised project area.

Table 3 TECs listed under the BC Act within the 2019 and revised project area

Threatened Ecological Communities (TEC)	Area in 2019 project area (ha)	Area in revised project area (ha)
Hunter Lowland Redgum Forest in the Sydney Basin and NSW North Coast Bioregions EEC	0.47	1.08
Hunter Floodplain Red Gum Woodland in the NSW North Coast and Sydney Basin Bioregions EEC	3.83	4.00
Central Hunter Ironbark – Spotted Gum – Grey Box Forest in the NSW North Coast and Sydney Basin Bioregions EEC	39.44	36.72
Central Hunter Grey Box – Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions EEC*	0.15	-
Total	43.88	41.80

* TEC predicted to occur based on regional vegetation mapping (Umwelt 2019). Field surveys have not identified this EEC in the revised project area

Table 4 TECs listed under the EPBC Act within the 2019 and revised project area

Threatened Ecological Communities (TEC)	Area in 2019 project area (ha)	Area in revised project area (ha)
Central Hunter Valley Eucalypt Forest and Woodland CEEC	47.77	47.16

The extent of *Central Hunter Valley Eucalypt Forest and Woodland* CEEC within the revised project area comprises of 36.72 hectares of forest/woodland habitat and 10.44 hectares derived native grassland.

Threatened species and populations

Nine threatened fauna species and one endangered population were recorded as present, and four threatened species as potentially present, within the revised project area (refer to Table 5). No additional threatened species were recorded during the 2021 surveys.

Table 5 Threatened species recorded within the revised project area

Scientific Name	Common Name	Status		2019	2021
		BC Act	EPBC Act		
Threatened flora species					
<i>Eucalyptus camaldulensis</i>	river red gum	Endangered population	-	✓	✓
Threatened fauna species					
<i>Hieraaetus morphnoides</i>	little eagle	V	-	✓	
<i>Pomatostomus temporalis</i>	grey-crowned babbler	V	-	✓	✓
<i>Tyto novaehollandiae</i>	masked owl	V	-	✓	
<i>Falsistrellus tasmaniensis</i>	eastern false pipistrelle	V	-	✓	
<i>Micronomus norfolkensis</i>	eastern coastal free-tailed bat	V	-	✓	
<i>Miniopterus australis</i>	little bent-winged bat	V	-	✓	
<i>Miniopterus orianae oceanensis</i>	large bent-winged bat	V	-	✓	
<i>Myotis Macropus</i>	southern myotis	V	-	✓	✓
<i>Petaurus norfolcensis</i>	squirrel glider	V	-	✓	
<i>Phascogale tapoatafa</i>	brush-tailed phascogale	V	-	✓	
<i>Pteropus poliocephalus</i>	grey-headed flying-fox	V	V	✓	✓
<i>Scoteanax rueppellii</i>	greater broad-nosed bat	V	-	✓	
<i>Vespadelus troughtoni</i>	eastern cave bat	V	-	✓	

Habitat for threatened species which occurs in the revised project area include:

- A total of 112.59 hectares of native vegetation, comprised of 65.89 hectares of grassland habitat and 46.70 hectares of woodland and forest vegetation that contains 242 hollow-bearing trees
- Microbat roost sites were recorded in the existing large sandstone arch culverts, where a maternity roost was confirmed in the southern most culvert while signs of use were identified by Umwelt (2022) in the other two arch culverts
- Key fish habitat in the Hunter River
- A total of 39 River Red Gums (*Eucalyptus camaldulensis*) forming part of the endangered population in the Hunter Catchment.

Matters of National Significance

A total of seven Matters of National Environmental Significance (MNES) were predicted to occur in the EPBC Act Protected Matters Report (DAWE 2021) in addition to those outlined by the project BAR including:

- River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria EEC under BC Act and CEEC under the EPBC Act.
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland EEC under BC Act and CEEC under the EPBC Act.
- Austral toadflax (*Thesium australe*) listed as vulnerable under the BC Act and EPBC Act
- Grey falcon (*Falco hypoleucos*) listed as endangered under the BC Act and vulnerable under the EPBC Act
- Large-eared Pied Bat (*Chalinolobus dwyeri*) listed as vulnerable under the BC Act and EPBC Act
- Pink-tailed legless lizard (*Aprasia parapulchella*) listed as vulnerable under the BC Act and EPBC Act
- Striped legless lizard (*Delma impar*) listed as vulnerable under the BC Act and EPBC Act.

None of these additional MNES were considered likely to occur or were identified during the survey of the 2021 survey area.

6.1.3 Potential Impacts

Construction

Changes within the revised impact area primarily occur in the area south of the Hunter River due to the Putty Road connection. The revised impact area also includes a number of additional areas occurring north of the Hunter River to facilitate the modification of ancillary facilities, utilities, access and other minor modifications. Restrictions would be placed on the extent of clearing for ancillary facilities and enabling work to reduce the area of impact. A review of clearing as a consequence of the detailed design of the project would occur to confirm clearing limits and ensure reductions are achieved.

Removal of native vegetation

The revised impact area covers an area of 147.49 hectares which 42.89 hectares of native vegetation. The extent of PCTs to be impacted by the proposed modification is outlined in Table 6 indicating an overall increase in impact area.

Table 6 Impacts on native vegetation as a result of the proposed modification

PCT	Area to be directly impacted (ha)	
	2019	2021
Verified Vegetation Mapping		
VZ1 - 1598 Forest Red Gum Grassy Open Forest on Floodplains of the Lower Hunter – Moderate/Good	-	0.37
VZ2 - 1598 Forest Red Gum Grassy Open Forest on Floodplains of the Lower Hunter - DNG	-	0.30
VZ3 - 1604 Narrow-leaved Ironbark - Grey Box - Spotted Gum Shrub - Grass Woodland of the Central and Lower Hunter – Moderate/Good	5.34	8.61
VZ4 - 1604 Narrow-leaved Ironbark - Grey Box - Spotted Gum Shrub - Grass Woodland of the Central and Lower Hunter – Thinned Canopy	6.35	6.69
VZ5 - 1604 Narrow-leaved Ironbark - Grey Box - Spotted Gum Shrub - Grass Woodland of the Central and Lower Hunter – DNG	14.21	22.39
VZ6 - 1604 Narrow-leaved Ironbark - Grey Box - Spotted Gum shrub - grass woodland of the central and lower Hunter – African Olive Infestation	-	0.46

VZ8 - 42 River Red Gum / River Oak riparian woodland wetland in the Hunter Valley – Low condition	-	1.21
VZ9 - 1731 Swamp Oak - Weeping Grass grassy riparian forest of the Hunter Valley – low condition	-	0.24
Native vegetation predicted by Regional Vegetation Mapping*		
42 River Red Gum/River Oak riparian woodland wetland in the Hunter Valley	1.22	-
1600 Spotted Gum - Red Ironbark - Narrow-leaved Ironbark - Grey Box shrub-grass open forest of the lower Hunter	2.21	0.06
1600 Spotted Gum - Red Ironbark - Narrow-leaved Ironbark - Grey Box shrub-grass open forest of the Lower Hunter DNG	2.44	2.44
1601 Spotted Gum - Narrow-leaved Ironbark-Red Ironbark shrub - grass open forest of the central and lower Hunter	0.08	0.05
1731 Swamp Oak - Weeping Grass grassy riparian forest of the Hunter Valley	0.08	0.07
Total area of native vegetation removed	31.93	42.89

* Total area in the 2019 Impact Area predicted for PCT 42, PCT 1600, PCT 1600 DNG, PCT 1601, and PCT 1731 (Umwelt 2019); Total area of predicted native vegetation attributed to only the McDougalls Hill ancillary facility.

Threatened ecological communities

Of the 42.89 hectares of native vegetation with potential to be impacted, 21.13 hectares conforms to a TEC including 16.99 hectares that conforms to TEC's listed under the BC Act and 19.55 hectares that conforms to a TEC listed under the EPBC Act.

The following TECs were identified in the revised impact area and would be cleared as a result of the project:

- Around 0.37 hectares of Hunter Lowland Redgum Forest in the Sydney Basin and NSW North Coast Bioregions EEC (BC Act), new impact
- Around 1.21 hectares of Hunter Floodplain Red Gum Woodland in the NSW North Coast and Sydney Basin Bioregions EEC (BC Act), decreasing from 2019
- Around 15.41 hectares of Central Hunter Ironbark – Spotted Gum – Grey Box Forest in the NSW North Coast and Sydney Basin Bioregions EEC (BC Act), increasing from 2019
- Around 19.55 hectares of Central Hunter Valley Eucalypt Forest and Woodland CEEC (EPBC Act) (comprising 15.41 hectares of forest/woodland habitat and 4.14 hectares derived native grassland), increasing from 2019.

Previously Hunter Lowland Redgum Forest in the Sydney Basin and NSW North Coast Bioregions EEC was not identified within the impact area, therefore an assessment of significance was undertaken for this TEC. It was concluded that the project is unlikely to result in a significant impact on the Hunter Lowland Redgum Forest EEC listed under the BC Act.

The BAR identified that the clearing of 16.89 hectares of Central Hunter Valley Eucalypt Forest and Woodland is a significant impact.

Threatened flora

A total of 39 River Red Gum (*Eucalyptus camaldulensis*) which are part of the endangered flora populations in the Hunter catchment (BC Act) were recorded within the revised project area. The population was recorded adjacent to the revised impact area and it is not expected that any River Red Gums would be removed. However, given the steep slope and short distance separating the threatened population to the revised impact area, works may exacerbate natural erosion process and result in the damage or loss to individuals.

Fauna habitat

The 42.89 hectares of native vegetation within the revised impact area provides potential foraging and breeding habitat for fauna species. The proposed modification would result in the removal of three additional hollow bearing trees, resulting in 101 hollow bearing trees being impacted by the project.

There are four culverts located within the revised project area, three of which provide suitable habitat for microbats. None of the culverts are likely to be directly impacted. Two of the culverts could be indirectly impacted from noise, light and vibration during construction and one is not expected to experience any impacts.

Indirect impacts to the two culverts may occur as a result of relocation of telecommunication services (including contamination test pits and installation by trenching) along the old rail alignment extending about 1.3 kilometres north from the Gowrie Gates. Impacts are most likely to result from sudden loud noise and vibration that the microbats are not habituated to, particularly if this occurs during the breeding season or when microbats are torpid over winter.

Abandonment of roosts during daylight hours increases the risk of predation (particularly by birds during clearance activities). Microbats seeking refuge in other culverts nearby may result in overcrowding, as well as disruption and trigger impacts to other roosts throughout the area.

Earthworks in the upper catchment may increase the spread of weeds and increased encroachment of weeds such that they block the culvert entrances limiting flight pathways for microbats. Changes to flow regime through the culverts may increase runoff which could obstruct access/egress, while increased sedimentation within the sandstone block culverts may result in roosting habitat becoming less favourable. Conversely a decrease in flow may increase terrestrial fauna movements through the culverts, including predators. Increased presence of predators such as foxes can also disrupt the microbat roost and cause abandonment.

Assessments of Significance determined that no threatened microbat species are expected to be impacted by the proposed modification.

No new key threatening processes (KTPs) under the BC Act relevant to the removal of threatened fauna habitat have been identified for the proposed modification. No significant changes in the operation of the KTPs outlined in the project BAR are expected as a result of the proposed modification

Operation

The operational impacts within the revised impact area are considered consistent with impacts outlined in the project BAR.

Assessment of Significance

Assessments of significance were completed for the threatened species which are known or have the potential to occur within the revised impact area.

Previous assessments of significance were revised for:

- *Eucalyptus camaldulensis* endangered population in the Hunter Catchment under the BC Act
- Southern myotis (*Myotis macropus*) listed as vulnerable under the BC Act
- Central Hunter Valley Eucalypt Forest and Woodland CEEC under the EPBC Act.

All other assessments of significance undertaken for the preparation of the project BAR were considered to be consistent with the results of field surveys.

An additional assessment of significance was conducted for *Hunter Lowland Redgum Forest in the Sydney Basin and NSW North Coast Bioregions EEC* listed under the BC Act.

The assessments of significance under the BC Act and EPBC Act found the project is likely to result in a significant impact to the *Central Hunter Valley Eucalypt Forest and Woodland CEEC*. No other significant impacts are likely for the other abovementioned threatened species, endangered population or TECs.

Conclusion on significance of impacts

The project including the proposed modification is not likely to significantly impact threatened species, populations or ecological communities or their habitats, within the meaning of the BC Act or FM Act and therefore a Species Impact Statement is not required.

The project including the proposed modification is likely to significantly impact threatened species, populations, ecological communities, or migratory species, within the meaning of the EPBC Act.

Where a significant impact is likely to threatened species, populations, ecological communities, or migratory species within the meaning of the EPBC Act:

Is there a real chance that the activity threatens the long-term survival of nationally listed biodiversity matters?	No
Has the consistency of the activity with relevant recovery plans, threat abatement plans, conservation advices and guidelines provided by the Australian Government been considered?	Yes
Can suitable offsets be secured?	Yes

6.1.4 Safeguards and management measures

Measures in addition to those identified in the REF have been identified and are described below. Recommendations provided below pertain specifically to impacts to biodiversity values identified in the supplementary BAR.

The management recommendations for the project are provided in Section 7.

Impact	Environmental safeguards	Responsibility	Timing
Biodiversity	<p>Notwithstanding the Revised Impact Area, clearing of trees² in areas mapped as a Threatened Ecological Community (TEC) or habitat features would be avoided for the following activities unless within the design footprint of the bypass:</p> <ul style="list-style-type: none"> • Geotechnical investigations • Construction compound sites including stockpiling and material laydown areas • Temporary infrastructure including security and exclusion fencing, erosion and sediment controls • Utility relocations. <p>If the removal of trees for the above activities cannot be avoided, a Tree Removal Application would be prepared for approval. The application would include a review of options considered, justification for why removal is required, and total areas of TEC and habitat features to be removed. Transport approval of the application would be</p>	Construction contractor	Prior and during construction

² Tree as defined Tree Hollow Replacement Guidelines (Transport 2022a): long lived woody perennial plant greater (or usually greater than) 3m in height with one or relatively few main stems or trunks (or as defined by the determining authority).

Impact	Environmental safeguards	Responsibility	Timing
	required prior to commencing the activity.		
Biodiversity	A Tree and Hollow Replacement Plan will be prepared in accordance with the Transport Tree and Hollow Replacement Guidelines (2022) for tree removal not subject to the Biodiversity Offset Strategy. The plan will exclude hollow replacement otherwise addressed by the Habitat Replacement Strategy.	Construction contractor	Prior, during and post construction
Biodiversity	<p>The Flora and Fauna Management Plan will also include the following measures to reduce potential for fauna entrapment within the pipeline trenches:</p> <ul style="list-style-type: none"> • Minimizing to the period of time the trench is open • Provide opportunities for fauna to exit the trench such as trench plugs or other appropriate measures, at a minimum of every 500 metres • Installation of fauna shelter devices, such as sawdust filled bags, at 250 metres intervals along the trench • Daily pre-start inspections of the open trench, and removal of trapped fauna by suitably qualified personnel as required • Welded pipe strings will be end capped to prevent fauna entry. 	Construction contractor	Construction

6.1.5 Biodiversity offsets

Guideline for Biodiversity Offset (Roads and Maritime, 2016) requires consideration of biodiversity offsets when threatened ecological communities or threatened species habitat is impacted above specified thresholds as outlined in Table 7 below.

Table 7 Offsetting thresholds for REFs (Roads and Maritime 2016)

Description of Activity or Impact	Consider Offsets or Supplementary Measures
Works involving clearing of national or NSW listed critically endangered ecological communities (CEECs)	Where there is any clearing of an CEEC in moderate to good condition
Works involving clearing of nationally listed TEC or nationally listed threatened species habitat	Where clearing >1 hectare of a TEC or habitat in moderate to good condition
Works involving clearing of NSW endangered or vulnerable ecological community	Where clearing > 5 hectares or where the ecological community is subject to an SIS
Works involving clearing of NSW listed threatened species habitat where the species is a species credit species as defined in the OEH Threatened Species Profile Database (TSPD)	Where clearing > 1ha or where the species is the subject of an SIS
Works involving clearing of NSW listed threatened species habitat and the species is an ecosystem credit species as defined in OEH's Threatened Species Profile Database (TSPD)	Where clearing > 5ha or where the species is the subject of an SIS
Type 1 or Type 2 key fish habitats (as defined by NSW Fisheries)	Where there is any net loss of habitat

The revised project area triggers offsetting thresholds for the following matters, all decreasing from 2019:

- Clearing of 19.55 hectares of EPBC Act listed Central Hunter Valley Eucalypt Forest and Woodland CEEC
- Clearing of 15.41 hectares of BC Act listed Central Hunter Ironbark – Spotted Gum – Grey Box Forest in the NSW North Coast and Sydney Basin Bioregions EEC
- Clearing of greater than one ha of BC Act listed threatened species credit species habitat.
 - Southern myotis 12.34 hectares (includes all woodland and forest habitat within 200 metres of dams, sandstone culverts and Hunter River)
 - Squirrel glider 16.55 hectares (includes all woodland and forest habitat, excluding the riparian vegetation along the Hunter River)
 - Brush-tailed phascogale 16.55 hectares (includes all woodland and forest habitat, excluding the riparian vegetation along the Hunter River).

Preliminary biodiversity credit requirement

A preliminary biodiversity credit assessment (BAM) methodology credit calculator assessment determined the following credit requirements for 2021 in Table 8.

Table 8 Ecosystem credits summary 2021 according to BAM

Threatened Ecological Community / Threatened Speices	Updated Biodiversity Credit Requirements 2021
Central Hunter Ironbark – Spotted Gum – Grey Box Forest in the NSW North Coast and Sydney Basin Bioregions EEC under the BC Act	550 credits
Central Hunter Valley Eucalypt Forest and Woodland CEEC under the EPBC Act	550 credits
Southern myotis (<i>Myotis macropus</i>) listed as vulnerable under the BC Act	364 credits
Squirrel glider (<i>Petaurus norfolcensis</i>) listed as vulnerable under the BC Act	517 credits
Brush-tailed phascogale (<i>Phascogale tapoatafa</i>) listed as vulnerable under the BC Act	517 credits

Under an agreement with Department of Climate Change, Energy, the Environment and Water (DCCEEW), Transport must carry out a Strategic Assessment of the impacts on ‘Specified Protected Matters’.

The project (approved project and proposed modification) would likely have a significant impact on the Central Hunter Valley Eucalypt Forest and Woodland CEEC which is identified as a ‘Specified Protected Matter’.

In keeping with the Strategic assessment agreement, Transport would, as part of the detailed design, reduce impacts where possible to this Specific Protect Matter and consult with the DCCEEW regarding activity.

Fulfilling offset requirements under the BC Act 2016 would be achieved by Transport using one or a combination of the following offset strategies:

- In-perpetuity conservation through the establishment of a Stewardship site and the retirement of credits
- Securing required credits through the open credit market
- Payments to the Biodiversity Conservation Fund.

6.2 Aboriginal heritage

6.2.1 Methodology

In accordance with Stage 3 of the Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI) (Roads and Maritime, 2011), an Aboriginal cultural heritage assessment report (ACHAR) was carried out for the REF which documented potential impacts and proposed mitigation measures to minimise the impact of the project. The assessment also identified areas in which there was uncertainty due to access constraints in those areas.

Archaeological and consultative activities undertaken were documented in the project’s ACHAR, which was finalised in December 2019, and included in the REF. In July 2022, an updated version of the ACHAR was submitted to Heritage NSW in support of an AHIP application for the project.

An addendum ACHAR has been prepared for the proposed modification to assess those areas which were previously not able to be accessed as well as changes to the REF proposal area that introduces additional areas not previously assessed. Information for the assessment was obtained through a combination of desktop research, archaeological fieldwork and Aboriginal community consultation.

The addendum ACHAR was carried out in accordance with the PACHCI (Roads and Maritime, 2011) as well as relevant statutory guidelines including the Guide to Investigation, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH, 2011), consistent with the methodology applied for the REF.

The addendum ACHAR is attached in Appendix B.

6.2.2 Existing environment

An overview of the Aboriginal and cultural history of the region and existing environment is described in Section 6.7 of the REF and is considered relevant to the proposed modification.

AHIMS sites

An updated search of the Aboriginal Heritage Information Management System (AHIMS) database was completed on 20 June 2022, covering a 500 metre buffer centred on the updated proposal area. The search returned 64 registered sites. A desktop review of the results identified that 31 registered sites³ are located either wholly or partially within the updated proposal area, with all but three comprising sites assessed as part of project ACHAR.

Archaeological significance

The survey confirmed the presence of parts of two previously recorded sites (Singleton Bypass OAS21 (37-6-3925) and Singleton Bypass PAD4 (37-6-4215)) extending into within the updated proposal area as retaining subsurface archaeological potential. Therefore, test excavations were carried out within both these areas.

No Aboriginal objects were found during the investigations of the additional area of Singleton Bypass OAS21 (37-6-3925). Aboriginal objects were found within Singleton Bypass PAD4 (37-6-4215) and that portion of the site was reidentified as Singleton Bypass OAS23 (37-6-4219). This area encompasses the tested section of Singleton Bypass PAD4 (37-6-4215) west of the New England Highway while Singleton Bypass PAD4 (37-6-4215) now comprises that portion of the PAD located to the east of the highway.

Taking into account the results of the survey and test excavation works completed, a total of three Aboriginal sites are recognised within those portions of the updated proposal area not previously subject to assessment by AECOM. The sites, all of which are located at the southern end of the updated proposal area, are detailed in Table 6-9. Of these sites, only Singleton Bypass OAS21 (37-6-3925) was assessed for partial impact in the project ACHAR. Singleton Bypass PAD4 (37-6-4215) was identified subsequent to the initial finalisation of the project ACHAR in December 2019.

Table 6-9: Aboriginal sites located within updated proposal area

Site name	New or existing site?	AHIMS ID	Site type	AHIMS site features	Location relative to updated proposal area
Singleton Bypass OAS21	Existing	37-6-3925	Artefact scatter (subsurface)	AFT	Partially within
Singleton Bypass OAS23	New	37-6-4219	Artefact scatter (subsurface)	AFT	Partially within
Singleton Bypass PAD4	Existing	37-6-4215	PAD	PAD	Partially within

Cultural significance

No specific cultural values pertaining to the updated proposal area were identified by RAPs during the archaeological survey, test excavation work or consultation. Regardless, it is acknowledged that all material remains of past Aboriginal activity within the updated proposal area hold significant cultural value to RAPs. This value was expressed broadly by multiple knowledge holders and RAPs during the preparation of the project's ACHAR and Aboriginal Cultural Values Assessment Report.

³ Of the 31 sites, two previously recorded open artefact sites have been subsumed within a larger artefact scatter with PAD site (refer to Appendix B for detail)

6.2.3 Potential impacts

Construction

Ground disturbance activities expected from the proposed modification include:

- Topsoil stripping, cut and fill earthworks including haul roads
- Native vegetation removal, clearing and grubbing
- Utility works including protection and/or adjustment of existing utilities, removal of redundant utilities and installation of new utilities
- Construction of drainage outlets
- Building demolition including sheds, fencing and septic tank removal
- Temporary and permanent boundary fences
- Establishment of site offices, amenities and temporary infrastructure including fencing
- Laydown and storage of materials
- Access tracks for delivery of materials, plant and equipment
- Establishment of spoil stockpile locations and temporary concrete washout pits
- Construction of temporary access roads
- Construction of access roads to properties
- Haulage of construction materials to site
- Installation of sediment and erosion controls.

Proposed ground disturbance activities are expected to result in physical impacts to 19 of the 30 Aboriginal sites identified within the updated proposal area. Of the 19 sites that would be impacted, two are located within areas not previously assessed by AECOM, being Singleton Bypass OAS21 (37-6-3925) and Singleton Bypass OAS23 (37-6-4219). Singleton Bypass PAD4 would not be directly impacted by the proposed modification.

Additionally, surface artefact scatter Singleton Bypass OAS3 (37-6-3896), previously identified as not being impacted by the project, would now be partially impacted. Impacts to this site are required to allow for the realignment of a property access road.

Impacts to Aboriginal sites as a result of proposed ground disturbance activities are detailed in Table 6-10.

Regarding impacts to previously recorded subsurface artefact scatter site Singleton Bypass OAS21 (37-6-3925), it is noted that the proposed modification would result in an 18.1 per cent increase in the total area of impact for this site.

Table 6-10: Impact Assessment for Aboriginal sites identified within the updated proposal are

Site name	AHIMS ID(s)	Site type	Type of harm	Degree of harm	Consequence of harm	Site area (m2)	Area of impact (m2)	Total % harmed
Singleton Bypass OAS1	37-6-3894	Isolated artefact	Will not be harmed	None	No loss of value	1	-	-
Singleton Bypass OAS2	37-6-3895	Isolated artefact	Direct	Total	Total loss of value	1	1	100
Singleton Bypass OAS3	37-6-3896	Artefact scatter	Direct	Partial	Partial loss of value	877	382	43.6
Singleton Bypass OAS4	37-6-3897	Artefact scatter	Will not be harmed	None	No loss of value	14,156	-	-
Singleton Bypass OAS5	37-6-3890	Artefact scatter	Will not be harmed	None	No loss of value	1,003	-	-
Singleton Bypass OAS6	37-6-3893	Artefact scatter	Will not be harmed	None	No loss of value	206	-	-
Singleton Bypass OAS7	37-6-3889	Isolated artefact	Direct	Total	Total loss of value	1	1	1
Singleton Bypass OAS8	37-6-3888	Artefact scatter	Will not be harmed	None	No loss of value	4,251	-	-
Singleton Bypass OAS9	37-6-3887	Artefact scatter	Direct	Total	Total loss of value	2	-	-
Singleton Bypass OAS10	37-6-3886	Isolated artefact	Direct	Total	Total loss of value	1	1	100
Singleton Bypass OAS11	37-6-3892	Artefact scatter	Direct	Total	Total loss of value	438	438	100
Singleton Bypass OAS12	37-6-3891	Isolated artefact	Direct	Total	Total loss of value	1	1	100
Singleton Bypass OAS13	37-6-3900	Artefact scatter	Direct	Total	Total loss of value	4	4	100
Singleton Bypass OAS14	37-6-3899	Isolated artefact	Will not be harmed	None	No loss of value	1	-	-
Singleton Bypass OAS15	37-6-3898	Isolated artefact	Direct	Total	Total loss of value	1	1	100
Singleton Bypass OAS16	37-6-3901	Isolated artefact	Will not be harmed	None	No loss of value	1	-	-
Singleton Bypass OAS17	37-6-3905	Isolated artefact	Direct	Total	Total loss of value	1	1	100
Singleton Bypass OAS18	37-6-3904	Artefact scatter	Direct	Partial	Partial loss of value	11,171	4205	37.6

Site name	AHIMS ID(s)	Site type	Type of harm	Degree of harm	Consequence of harm	Site area (m2)	Area of impact (m2)	Total % harmed
Singleton Bypass OAS19	37-6-3903 37-6-1466 37-6-1468	Artefact scatter	Direct	Partial	Partial loss of value	182,481		88.9
Singleton Bypass OAS21	37-6-3925	Artefact scatter	Direct	Partial	Partial loss of value	59,497	25,093 (10,784 m ² of which is located within Addendum ACHAR area 1)	42.2
Singleton Bypass OAS22	37-6-3927	Artefact scatter	Direct	Total	Total loss of value	1	1	100
Singleton Bypass OAS23	37-6-4219	Artefact scatter	Direct	Partial	Partial loss of value	16,970	8,400	49.5
McDougall Hill 2	37-6-0789	Artefact scatter	Direct	Total	Total loss of value	741	741	100
McDougall Hill 3	37-6-0788	Artefact scatter	Direct	Total	Total loss of value	1	1	100
Scarred tree	37-6-0681	Artefact scatter	Direct	Total	Total loss of value	N/A	N/A	100
Singleton Bypass PAD3	37-6-3928	PAD	Will not be harmed	None	No loss of value	27,287	-	-
Singleton Bypass PAD4	37-6-4215	PAD	Will not be harmed	None	No loss of value	3,778	-	-
Singleton Bypass PAD5	37-6-4216	PAD	Will not be harmed	None	No loss of value	7,710	-	-
ADV/ARTC/DD Gowrie 1	37-6-3954	Artefact scatter	Will not be harmed	None	No loss of value	40	-	-
Cultural Site A: Gathering Place (Railway Bridge Camps)	37-6-4214	Cultural site	Direct	Partial	Partial loss of value	134,216	58,015	43.2

A summary of the impacts to sites and proposed management approach as a result of the proposed modification is provided in Table 6-11. All management measures are detailed in Section 7.

Table 6-11: Impact and management recommendations for Aboriginal archaeological sites relevant to the proposed modification

Site name	AHIMS ID	Site type	Impact	Degree of harm	Management recommendation(s)
Singleton Bypass OAS3	37-6-3896	Artefact scatter (surface)	Impacted	Partial	<i>Impacted portion</i> - salvage (surface collection) <i>Non-impacted portion</i> - conservation, with associated protective measures to be outlined in project AHMP
Singleton Bypass OAS21	37-6-3925	Artefact scatter (subsurface)	Impacted	Partial	<i>Impacted portion</i> - no further management or mitigation actions <i>Non-impacted portion</i> - conservation, with associated protective measures to be outlined in project AHMP
Singleton Bypass OAS23	37-6-4219	Artefact scatter (subsurface)	Impacted	Partial	<i>Impacted portion</i> - salvage (excavation) <i>Non-impacted portion</i> - conservation, with associated protective measures to be outlined in project AHMP
Singleton Bypass PAD4	37-6-4215	PAD	Will not be impacted	None	No further management or mitigation actions

An AHIP variation application will be submitted to Department of Planning and Environment - Heritage NSW to amend the AHIP area and allow for additional impacts identified in Table 6-10. This revision is necessary to allow impacts to Singleton Bypass OAS3 (37-6-3896), Singleton Bypass OAS21 (37-6-3925) and Singleton Bypass OAS23 (37-6-4219). The Addendum ACHAR will be submitted in support of the application

Operation

Operation of the proposed modification is not expected to impact on any items or places of Aboriginal heritage or cultural values.

6.2.4 Safeguards and management measures

Measures in addition to those identified in the REF have been identified and are described below. Recommendations provided below pertain specifically to impacts to Aboriginal heritage values identified in the addendum ACHAR.

The management recommendations for the project are provided in Section 7.

Impact	Environmental safeguards	Responsibility	Timing
Aboriginal heritage	Impacted surface artefact scatter site Singleton Bypass OAS3 (37-6-3896) has been assessed as being of low scientific significance and will be partially impacted by the proposed modification. To mitigate this impact, it is recommended that the impacted portion of this site be subject to archaeological salvage. Salvage should take the form of surface collection and be undertaken in accordance with the surface collection methodology provided in Appendix F of AECOM's (2022b) updated Aboriginal Archaeological Report (AAR) for the project.	Transport	Detailed design
Aboriginal heritage	Impacted subsurface artefact scatter site Singleton Bypass OAS23 (37-6-4219) has been assessed as being of high scientific significance and will be partially impacted by both the project and proposed modification. To mitigate this impact, an archaeological salvage program is recommended for the impacted portion of this site. Salvage activities within OAS23 can only occur after the AHIP variation application has been approved by Department of Planning and Environment - Heritage NSW and should be completed in accordance with the research design and methodology provided in Appendix F of the Addendum ACHAR.	Transport	Detailed design
Aboriginal heritage	The portion of Singleton Bypass OAS23 (37-6-4219) located outside of the revised disturbance area should be conserved in situ, with associated protective measures outlined in the AHMP.	Transport / contractor	Detailed design
Aboriginal heritage	PAD site Singleton Bypass PAD4 (37-6-4215) will not be impacted by the project or proposed modification. The PAD should be conserved in situ, with associated protective measures outlined in the AHMP.	Transport / contractor	Detailed design

6.3 Other impacts

For the remaining environmental aspects where the potential impact of the proposed modification was considered to be negligible to minor, a brief discussion and assessment was undertaken for each, and the results summarised in Table 6-11. These remaining environmental aspects include:

- Surface water, hydrology, and flooding
- Groundwater
- Soils and contamination
- Traffic and transport
- Noise and vibration
- Non-Aboriginal heritage
- Air quality
- Landscape character and visual impacts
- Property and land use
- Socio-economic
- Resource use and waste management
- Climate change
- Hazard and risk
- Cumulative impacts

Safeguards and management measures identified in the REF and Submissions Report as well as any additional measures identified to mitigate the potential impacts of the proposed modification are detailed in Chapter 7.

6.3.1 Existing environment and potential impacts

Table 6-12: Existing environment and potential impacts

Environmental aspect	Existing environment	Potential impacts
Surface water, hydrology, and flooding	Existing surface water, hydrology, and flooding in the vicinity of the proposed modification are consistent with those described in Section 6.2 of the REF..	<p>Construction</p> <p>The surface water, hydrology, and flooding impacts for the construction of the proposed modification would be consistent with those identified in the REF.</p> <p>Operation</p> <p>Operational surface water, hydrology, and flooding impacts of the proposed modification would generally be consistent with those identified in the REF.</p> <p>Safeguards and management measures</p> <p>The impacts of the proposed modification would be managed through the implementation of the safeguards and management measures identified in Table 7-1 of this addendum REF.</p>
Groundwater	The proposed modification is located on the superficial alluvial aquifer to the south of the Hunter River and on the bedrock aquifer to the north of the Hunter River.	<p>Construction</p> <p>No further impacts to groundwater users are likely to occur as a result of the proposed modification.</p> <p>The proposed modification would not increase the likelihood or risk of groundwater contamination during construction.</p>

Environmental aspect	Existing environment	Potential impacts
	<p>The existing environment is consistent with that described in Section 6.3 of the REF.</p>	<p>Operation</p> <p>There are no expected impacts to groundwater during operation.</p> <p>Safeguards and management measures</p> <p>The impacts of the proposed modification would be managed through the implementation of the safeguards and management measures identified in Table 7-1 of this addendum REF.</p>
<p>Soils and contamination</p>	<p>The existing environment including geology, soils and potential sources of contamination described in Section 6.4 of the REF applies to the proposed modification.</p>	<p>Construction</p> <p>Erosion and sedimentation</p> <p>Potential erosion and sedimentation impacts of the proposed modification are consistent with those identified in the REF.</p> <p>Contamination</p> <p>The proposed modification does not alter the likelihood of encountering contaminated soil or groundwater from that described in the REF.</p> <p>Operation</p> <p>Erosion and sedimentation</p> <p>During operation of the proposed modification, the risk of soil erosion would be minor as all areas disturbed would be sealed or rehabilitated and landscaped to prevent soil erosion from occurring.</p> <p>Contamination</p> <p>Contamination risks associated with the operation of the proposed modification would be consistent with those identified in the REF, being spill incidents arising from motor vehicle accidents.</p> <p>Safeguards and management measures</p> <p>The impacts of the proposed modification would be managed through the implementation of the safeguards and management measures identified in Table 7-1 of this addendum REF.</p>
<p>Traffic and transport</p>	<p>Existing traffic and transport in the vicinity of the proposed modification are consistent with those described in Section 6.5 of the REF..</p>	<p>Construction</p> <p>The traffic and transport impacts for the construction of the proposed modification would be consistent with those identified in the REF.</p> <p>Operation</p> <p>Operational traffic and transport impacts of the proposed modification would generally be consistent with those identified in the REF.</p> <p>Safeguards and management measures</p> <p>The impacts of the proposed modification would be managed through the implementation of the safeguards and management measures identified in Table 7-1 of this addendum REF.</p>

Environmental aspect	Existing environment	Potential impacts
Noise and vibration	Existing noise and vibration in the vicinity of the proposed modification are consistent with those described in Section 6.6 of the REF..	<p>Construction</p> <p>The noise and vibration impacts for the construction of the proposed modification would be consistent with those identified in the REF.</p> <p>Operation</p> <p>Operational noise and vibration impacts of the proposed modification would generally be consistent with those identified in the REF.</p> <p>Safeguards and management measures</p> <p>The impacts of the proposed modification would be managed through the implementation of the safeguards and management measures identified in Table 7-1 of this addendum REF.</p>
Non-Aboriginal heritage	<p>The non-Aboriginal heritage located within and in the area surrounding the project is described in section 6.8 of the REF.</p> <p>Specifically, the proposed modification are located within the “Former Pumping Station”, “Bebeah” and the “Woolpack Inn” heritage curtilages.</p>	<p>Construction</p> <p>Construction of the proposed modification would not increase the impact to the heritage items identified in the REF.</p> <p>Bebeah and Woolpack Inn</p> <p>The proposed modification would not involve direct impacts to the features cited as contributing to the heritage significance of the “Bebeah” or “Woolpack Inn” items, consistent with the REF. Works are proposed within the curtilages of these items, with the changes being minor and for constructability.</p> <p>Former pumping station</p> <p>The “Former pumping station” heritage item would be removed by the project and the proposed modification does not change this impact.</p> <p>Coke Ovens</p> <p>The “Coke Ovens” item would not be impacted by the proposed modification.</p> <p>Great Northern Railway section</p> <p>A utility realignment is proposed near the “Great Northern Railway section”. The realignment would not directly impact on the structures of the heritage item as it would be located away from the disused railway. Given that the proposed mitigation measures provided in the REF regarding minimum working distances for heritage items would be adhered to, no impacts to this item are expected.</p> <p>Operation</p> <p>The operation of the proposed modification is not expected to introduce or increase impacts to non-Aboriginal heritage identified in the REF.</p> <p>Safeguards and management measures</p> <p>The impacts of the proposed modification would be managed through the implementation of the safeguards and management measures identified in Table 7-1 of this addendum REF.</p>

Environmental aspect	Existing environment	Potential impacts
Air quality	Existing air quality in the vicinity of the proposed modification are consistent with those described in Section 6.9 of the REF..	<p>Construction</p> <p>The air quality impacts for the construction of the proposed modification would be consistent with those identified in the REF.</p> <p>Operation</p> <p>Operational air quality impacts of the proposed modification would be consistent with those identified in the REF.</p> <p>Safeguards and management measures</p> <p>The impacts of the proposed modification would be managed through the implementation of the safeguards and management measures identified in Table 7-1 of this addendum REF.</p>
Landscape character and visual impacts	The existing environment in the context of landscape character and visual impacts is included in Section 6.10 of the REF.	<p>Construction</p> <p>The landscape character and visual impacts for the construction of the proposed modification would be consistent with those identified in the REF.</p> <p>Operation</p> <p>Operational landscape character and visual impacts of the proposed modification would be consistent with those identified in the REF.</p> <p>Safeguards and management measures</p> <p>The impacts of the proposed modification would be managed through the implementation of the safeguards and management measures identified in Table 7-1 of this addendum REF.</p>
Property and land use	<p>The existing property and land use environment was described in Section 6.11 of the REF. The existing environment of the proposed modification is consistent of that described in the REF.</p> <p>Land use zones that occur within the proposed modification area include:</p> <ul style="list-style-type: none"> • RU1 (Primary production) • SP2 (Infrastructure). <p>The majority of the land within the proposed modification is zoned RU1 (Primary production).</p>	<p>Construction</p> <p>Construction of the proposed modification would result in long term impacts on land use and property from land acquisition and modified property access arrangements. Property acquisition for the project, including revisions to previously identified acquisitions for the proposed modification are summarised in Table 3-4.</p> <p>Land used to facilitate constructability would either be on land acquired by Transport for NSW for the project or leased in negotiation with the owner.</p> <p>Operation</p> <p>Properties that would be acquired for the proposed modification are listed in Table 3-4. In summary, no additional properties to what was presented in the REF would be acquired for the proposed modification. However, adjustments to the area acquired of some properties is necessary for the proposed modification.</p> <p>All properties with access arrangements affected, as a result, of the proposed modification would be provided with restored or new permanent access arrangements during operation.</p> <p>The proposed modification would result in a permanent change in land use from existing land uses to a road corridor, consistent with the REF.</p>

Environmental aspect	Existing environment	Potential impacts
		<p>Safeguards and management measures</p> <p>The impacts of the proposed modification would be managed through the implementation of the safeguards and management measures identified in Table 7-1 of this addendum REF.</p>
Socio-economic	The existing socio-economic environment is consistent with that described in Section 6.12 of the REF.	<p>Construction</p> <p>The socio-economic impacts for the construction of the proposed modification would be generally consistent with those identified in the REF.</p> <p>Operation</p> <p>Operational socio-economic impacts of the proposed modification would be consistent with those identified in the REF.</p> <p>Safeguards and management measures</p> <p>The impacts of the proposed modification would be managed through the implementation of the safeguards and management measures identified in Table 7-1 of this addendum REF.</p>
Resource use and waste management	The existing environment is consistent with that described in Section 6.13 of the REF.	<p>Construction</p> <p>Resource use and waste streams generated by the construction of the proposed modification are expected to be generally consistent with that identified in the REF.</p> <p>It is likely that the exact quantities of materials required for construction and the volume of waste generated across the entire project would be altered as a result of the proposed modification. However, it is not anticipated that this difference would be substantial.</p> <p>Operation</p> <p>No further impacts to resource use and waste management would occur from the operation of the proposed modification.</p> <p>Safeguards and management measures</p> <p>The impacts of the proposed modification would be managed through the implementation of the safeguards and management measures identified in Table 7-1 of this addendum REF.</p>
Climate change	The existing environment in the context of climate change is included in Section 6.14 of the REF.	<p>Construction</p> <p>The emission of greenhouse gases during construction of the proposed modification would be negligible in addition to that described in the REF.</p> <p>Operation</p> <p>No further impacts are anticipated during operation of the proposed modification.</p> <p>Safeguards and management measures</p> <p>The impacts of the proposed modification would be managed through the implementation of the safeguards and management measures identified in Table 7-1 of this addendum REF.</p>

Environmental aspect	Existing environment	Potential impacts
Hazard and risk	Existing hazards and risks in the vicinity of the proposed modification are consistent with those described in Section 6.15.	<p>Construction</p> <p>The hazards and risks for the construction of the proposed modification would be consistent with those identified in the REF.</p> <p>Operation</p> <p>Operational hazards and risks of the proposed modification would generally be consistent with those identified in the REF.</p> <p>Safeguards and management measures</p> <p>The impacts of the proposed modification would be managed through the implementation of the safeguards and management measures identified in Table 7-1 of this addendum REF.</p>
Cumulative impacts	N/A	<p>Construction</p> <p>Cumulative impacts were assessed in Section 6.16 of the REF. The key cumulative impacts identified for construction included:</p> <ul style="list-style-type: none"> • Increased construction vehicle traffic on local roads • Cumulative air and noise impacts associated with multiple construction activities • Temporary changes to visual amenity. <p>The proposed modification would not materially alter cumulative impacts for traffic, air, noise and visual amenity.</p> <p>Operation</p> <p>The cumulative impacts associated with the operation of the proposed modification would be consistent with those identified in the REF.</p> <p>Safeguards and management measures</p> <p>The impacts of the proposed modification would be managed through the implementation of the safeguards and management measures identified in Table 7-1 of this addendum REF.</p>

7. Environmental management

7.1 Environmental management plans

A number of safeguards and management measures have been identified to minimise adverse environmental impacts, including social impacts, which could potentially arise as a result of the proposed modification. Should the proposed modification proceed, these management measures would be addressed if required during detailed design and incorporated into the Contractors Environmental Management Plan (CEMP) and applied during the construction and operation of the proposed modification.

7.2 Summary of environmental safeguards and management measures

Environmental safeguards and management measures for the New England Highway bypass of Singleton are summarised in Table 7-1. Additional safeguards and management measures identified in this addendum REF are included in bold and italicised font. The safeguards and management measures will be incorporated into the detailed design phase of the proposed modification, the CEMP and implemented during construction and operation of the proposed modification, should it proceed. These safeguards and management measures will minimise any potential adverse impacts arising from the proposed works on the surrounding environment.

Table 7-1: Summary of safeguards and management measures

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
GEN1	General - minimise environmental impacts during construction	<p>A Construction Environment and Management Plan (CEMP) will be prepared and submitted for review and endorsement of the Roads and Maritime Environment Manager prior to commencement of the activity. As a minimum, the CEMP will include the following:</p> <ul style="list-style-type: none"> (a) A Surface Water Management Plan (SWMP) (b) Any requirements associated with statutory approvals (c) Details of how the proposal will implement the safeguards outlined in the REF (d) Issue-specific environmental management plans (e) Roles and responsibilities (f) Communication requirements (g) Induction and training requirements (h) Procedures for monitoring and evaluating environmental performance, and for corrective action (i) Reporting requirements and record-keeping (j) Procedures for emergency and incident management (k) Procedures for audit and review. 	Construction contractor	Pre-construction / construction
B1	Biodiversity	A Flora and Fauna Management Plan will be prepared and implemented as part of the CEMP. It will address terrestrial and aquatic matters and will include, but not necessarily be limited to:	Construction contractor	Pre-construction / construction

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
		<p>(a) plans for the construction site and adjoining area showing native vegetation, flora and fauna habitat, threatened species and threatened ecological communities;</p> <p>(b) plans showing areas to be cleared and areas to be protected, including exclusion zones and protected habitat features (e.g. hollow-bearing trees), and areas for rehabilitation or re-establishment of native vegetation. The limits of clearing within the construction site and protected habitat features will be clearly delineated using appropriate signage, barriers, fencing or markings;</p> <p>(c) requirements set out in the Landscape Design Guideline (RMS 2018);</p> <p>(d) procedures addressing relevant matters specified in the Biodiversity Guidelines - Protecting and managing biodiversity on RTA projects (RTA 2011) including but not limited to:</p> <ul style="list-style-type: none"> • pre-clearing, including the outcomes of final flora and fauna species checks, establishment of exclusion zones and on-ground identification of specific habitat features to be retained (such as hollow-bearing trees) • vegetation clearing and bushrock removal, including staged habitat removal and any specified seasonal limits on clearing activities • fauna handling and unexpected threatened species finds • rehabilitation, revegetation, re-use of soils, woody debris and bushrock, and other habitat management actions • weed, pathogen and pest management <p>(e) procedures addressing relevant matters specified in the NSW DPI (Fisheries) Policy and guidelines for fish habitat conservation and management</p> <p>(f) monitoring during construction and post-construction</p> <p>(g) adaptive management measures to be applied if monitoring indicates unexpected adverse impacts.</p>		

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
		<p><i>The Flora and Fauna Management Plan will also include the following measures to reduce potential for fauna entrapment within the pipeline trenches:</i></p> <ul style="list-style-type: none"> • <i>Minimising to the period of time the trench is open</i> • <i>Provide opportunities for fauna to exit the trench such as trench plugs or other appropriate measures, at a minimum of every 500 m</i> • <i>Installation of fauna shelter devices, such as sawdust filled bags, at 250 m intervals along the trench</i> • <i>Daily pre-start inspections of the open trench, and removal of trapped fauna by suitably qualified personnel as required</i> • <i>Welded pipe strings will be end capped to prevent fauna entry.</i> 		
B2	Biodiversity	<p>Measures to further avoid and minimise the construction footprint and native vegetation or habitat removal will be considered during the detailed design stage and implemented where practicable and feasible. Measures to avoid and minimise impacts should be prioritised in the following order:</p> <ul style="list-style-type: none"> • critical habitat • threatened species, endangered ecological communities, groundwater dependent ecosystems or their habitat • native vegetation and habitat supporting flora and fauna connectivity and/or that supports other environmental objectives such as protecting water quality, hydrology or erosion and sediment controls • native vegetation of higher quality condition • other native vegetation. 	Construction contractor	Pre-construction / construction
B3	Biodiversity	<p>Consistent with the Biodiversity Guidelines - Protecting and managing biodiversity on RTA projects (RTA 2011), and any specific requirements of the approved Flora and Fauna Management Plan, management arrangements will be implemented to ensure unavoidable vegetation and bushrock removal minimises biodiversity impacts as far as practicable. As a minimum that will include:</p>	Construction contractor	Pre-construction / construction

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
		<ul style="list-style-type: none"> • no vegetation clearing or bushrock removal beyond limits identified in this proposal • avoiding identified exclusion zones and protected habitat features. • avoiding mixing of topsoil with woody debris materials • separation of woody vegetation suitable for re-use during construction and rehabilitation or revegetation works • implementation of staged clearing • trimming and pruning to be undertaken in accordance with relevant Australian Standards • in riparian zones: avoiding clearing during likely flood periods; ensuring cleared vegetation does not enter the waterway; installation of suitable sedimentation and erosion control; retaining roots and stumps to maintain bank stability; applying the hierarchy for snag management set out in the Guidelines. 		
B4	Biodiversity	<p>Prior to the commencement of construction, carry out:</p> <ul style="list-style-type: none"> • Targeted surveys to confirm the presence of the following along the Hunter River and unnamed tributary to the north of the Hunter River within the area to be impacted by the proposal <ul style="list-style-type: none"> - River red gum (<i>Eucalyptus camaldulensis</i>) (endangered population - BC Act) - Hunter Floodplain Red Gum Woodland in the NSW North Coast and Sydney Basin Bioregions (EEC - BC Act) • Threatened flora survey, fauna habitat assessments and ground-truthing of vegetation mapping, between the Hunter River and the southern extent of the area surveyed by Umwelt (2019), north of the New England Highway near Gowrie Gates, within the area to be impacted by the proposal • Ground truthing surveys of the regional vegetation mapping within the McDougalls Hill ancillary facility to confirm presence of: 	Construction contractor	Pre-construction

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
		<ul style="list-style-type: none"> - Central Hunter Ironbark – Spotted Gum – Grey Box Forest in the NSW North Coast and Sydney Basin Bioregions EEC (BC Act) - Central Hunter Valley Eucalypt Forest and Woodland CEEC (EPBC Act) <p>No clearing of threatened native vegetation is to be carried out within the McDougalls Hill ancillary facility. Subject to the outcomes of the above, a consistency review or environmental assessment may be required.</p>		
B5	Biodiversity	The unexpected species find procedure is to be followed under <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA 2011) if threatened ecological communities, not assessed in the biodiversity assessment, are identified in the proposal site.	Construction contractor	Construction
B6	Biodiversity	A nest box strategy Habitat Replacement Strategy would be developed and implemented during the detailed design stage in accordance with <i>Guide 5: Re-use of woody debris and bushrock</i> and <i>Guide 8: Nest boxes of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA 2011). The strategy is to include consider where suitable the use of: <ul style="list-style-type: none"> (a) a trial of artificial hollow creations. (b) reinstallation of suitable hollows removed by the proposal. (c) installation of nest boxes in the event that there are not sufficient trees for artificial hollow creation and hollows for reinstallation. 	Construction contractor	Detailed design
B7	Biodiversity	Prior to the commencement of construction, carry out monitoring to determine the presence of threatened microbats in the culverts that are part of the former Great Northern Railway. If threatened microbats are identified, collect the following information: <ul style="list-style-type: none"> (a) Species present. (b) Total number of individuals and groups per occupied roost site. (c) Description of occupied roost sites. (d) Breeding status of the colony, including approximate adult to juvenile ratios. 	Construction contractor	Pre-construction

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
B8	Biodiversity	<p>If roosting threatened microbats are found during pre-construction monitoring, a Microbat Management Plan is to be developed and implemented. The Microbat Management Plan is to be prepared by a microbat specialist and include the following:</p> <ul style="list-style-type: none"> (a) A monitoring program for both during and outside of breeding periods. (b) Details of construction activities to be monitored that may affect microbat habitat, particularly light, noise, vibration, alteration of drainage into culverts. (c) Mitigation measures to be implemented during construction, including regular inspections of impacts from sedimentation and weed encroachment to culvert entrances, consider timing and nature of immediately adjacent works in relation to known breeding period of relevant threatened microbats. (d) Adaptive management measures to be implemented if monitoring indicates a decline in bat numbers or if bats are observed leaving the roost during construction activities. (e) A process for evaluating the effectiveness of management measures. 	Construction contractor	Pre-construction / construction / post-construction
B9	Biodiversity	In accordance with Section 199 of the FM Act, Transport would notify DPI Fisheries in writing of any proposed dredging or reclamation in the Hunter River and its tributary. Transport would consider any matters raised by the Minister.	Transport	Pre-construction
B10	Biodiversity	In accordance with Section 219 of the FM Act, Transport would seek a permit from DPI Fisheries for any temporary blockage of fish passage. Transport would consider any matters raised by the Minister.	Transport	Pre-construction
B11	Biodiversity	Instream silt curtains would be implemented and maintained for construction in the Hunter River. Silt curtains would be installed such that they do not block fish passage.	Construction contractor	Construction
B12	Biodiversity	Changes to existing surface water flows would be minimised through detailed design. Any rock platform required to be constructed within the Hunter River bridge would be designed and constructed to prevent blocking the main river channel. The platform would be designed to ensure that flow of	Construction contractor	Detailed design

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
		the main river channel and fish passage is maintained even during low flow periods. The Department of Primary Industries (DPI) would be consulted on the final design.		
B13	Biodiversity	A wildlife connectivity strategy would be finalised and implemented during the detailed design stage in accordance with the draft Transport Wildlife Connectivity Guidelines (RMS 2011). The strategy is to focus on maintaining connectivity in the northern extent of the proposal and is to include, but not be limited to: <ul style="list-style-type: none"> (a) provision for a rope crossing with an indicative location between chainages 8450 and 8725 (b) identification of trees suitable for retention in the northern connection and tie in to facilitate glider crossings (c) consideration of additional gliding crossing structures where the width of disturbance is greater than 50 metres (d) type and extent of any associated landscaping or structures such as fencing or fauna infrastructure. 	Construction contractor	Detailed design
B14	<i>Biodiversity</i>	<i>Notwithstanding the Revised Impact Area clearing of trees in areas mapped as a Threatened Ecological Community \TEC. or habitat features would be avoided for the following activities unless within the design footprint of the bypass</i> <ul style="list-style-type: none"> • <i>Geotechnical investigations</i> • <i>Construction compound sites including stockpiling and material laydown areas</i> • <i>Temporary infrastructure including security and exclusion fencing, erosion and sediment controls</i> • <i>Utility relocations.</i> <p><i>If the removal of trees for the above activities cannot be avoided a Tree Removal Application would be prepared for approval The application would include a review of options considered justification for why removal is required and total areas of TEC and habitat features to be removed Transport approval of the application would be required prior to commencing the activity</i></p>	<i>Transport • Construction contractor</i>	<i>Pre-construction • construction</i>

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
B15	<i>Biodiversity</i>	<i>A Tree and Hollow Replacement Plan will be prepared in accordance with the Transport Tree and Hollow Replacement Guidelines V2022. for tree removal not subject to the Biodiversity Offset Strategy The plan will exclude hollow replacement otherwise addressed by the Habitat Replacement Strategy</i>	<i>Construction contractor</i>	<i>Construction</i>
W1	Surface water and flooding	A Soil and Water Management Plan will be prepared in accordance with QA Specification G38 and implemented as part of the CEMP. The Plan will identify all reasonably foreseeable risks relating to soil erosion and water pollution associated with undertaking the activity and describe how these risks will be managed and minimised during construction. That will include arrangements for managing pollution risks associated with spillage or contamination on the site and adjoining areas and monitoring during and post-construction.	Construction contractor	Pre-construction / construction
W2	Surface water and flooding	A flood response management plan will be prepared as part of the CEMP. The Flood Risk Response Management Plan will address, but not necessarily be limited to: <ul style="list-style-type: none"> Processes for monitoring and mitigation flood risk Steps to be taken in the event of a flood warning including removal or securing of loose material, equipment, fuels and chemicals.	Construction contractor	Construction
W3	Surface water and flooding	A site specific Erosion and Sediment Control Plan(s) will be prepared and implemented and included in the Soil and Water Management Plan. The Plan(s) will identify detailed measures and controls to be applied to minimise erosion and sediment control risks including, but not necessarily limited to: runoff, diversion and drainage points; sediment basins and sumps; scour protection; stabilising disturbed areas as soon as possible, check dams, fencing and swales; and staged implementation arrangements. The Plan will also include arrangements for managing wet weather events, including monitoring of potential high risk events (such as storms) and specific controls and follow-up measures to be applied in the event of wet weather.	Construction contractor	Construction
W4	Surface water and flooding	Stockpiles will be designed, established, operated and decommissioned in accordance with the RTA Stockpile Site Management Guideline 2011.	Construction contractor	Construction
W5	Surface water and flooding	The rehabilitation of disturbed areas will be undertaken progressively as construction stages are completed, and in accordance with:	Construction contractor	Construction

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
		<ul style="list-style-type: none"> Landcom's Managing Urban Stormwater: Soils and Construction series RTA Landscape Guideline RMS Guideline for Batter Stabilisation using Vegetation (2015). 		
W6	Surface water and flooding	<p>Consistent with any specific requirements of the approved Soil and Water Management, control measures will be implemented to minimise risks associated with erosion and sedimentation and entry of materials to drainage lines and waterways. That will include, but not necessarily be limited to:</p> <ul style="list-style-type: none"> Sediment management devices, such as fencing, hay bales or sandbags Measures to divert or capture and filter water prior to discharge, such as drainage channels and first flush and sediment basins Scour protection and energy dissipaters at locations of high erosion risk Installation of measures at work entry and exit points to minimise movement of material onto adjoining roads, such as rumble grids or wheel wash bays Appropriate location and storage of construction materials, fuels and chemicals, including bunding where appropriate. 	Construction contractor	Construction
W7	Surface water and flooding	Batters will be designed and constructed to minimise risk of exposure, instability and erosion, and to support long-term, on-going best practice management, in accordance with Transport 'Guideline for Batter Surface Stabilisation using vegetation' (2015).	Transport / construction contractor	Detailed design / construction
W8	Surface water and flooding	Two spill containment basins with a minimum volume of 25,000 Litres are to be provided on the north and south side of the Hunter River.	Transport / construction contractor	Detailed design / pre-construction / construction
W9	Surface water and flooding	A Spill Management Plan will be prepared and implemented as part of the CEMP to minimise the risk of pollution arising from spillage or contamination on the site and adjoining areas. The Spill Management Plan will address, but not necessarily be limited to:	Construction contractor	Pre-construction / construction

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
		<ul style="list-style-type: none"> • Management of chemicals and potentially polluting materials • Any bunding requirements • Maintenance of plant and equipment • Emergency management, including notification, response and clean-up procedures. 		
W10	Surface water and flooding	<p>A water quality monitoring program would be developed and implemented as part of the Soil and Water Management Plan in accordance with Transport Guideline for Construction Water Quality Monitoring (Roads and Maritime, 2003). The monitoring program is to include:</p> <ul style="list-style-type: none"> • Visual monitoring of local water quality • Up and down stream water quality monitoring of the Hunter River prior to the start of construction • Monthly up and down stream water quality monitoring for the duration of working within and over the Hunter River. 	Construction contractor	Construction
W11	Surface water and flooding	Any dewatering activities will be undertaken in accordance with the RTA Technical Guideline: Environmental management of construction site dewatering in a manner that prevents pollution of waters.	Construction contractor	Detailed design / construction
E1	Contamination	The CEMP will include an unexpected finds protocol for potentially contaminated material encountered during construction work.	Construction contractor	Construction
E2	Contamination	<p>If contaminated areas are encountered during construction, appropriate control measures will be implemented to manage the immediate risks of contamination. This may include but not be limited to:</p> <ul style="list-style-type: none"> • Diversion of surface runoff • Capture of any contaminated runoff • Temporary capping. <p>All other works that may impact on the contaminated area will cease until the nature and extent of the contamination has been confirmed and any necessary site-specific controls or further actions identified in consultation with the Transport Environment Manager and/or the EPA.</p>	Construction contractor	Construction

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
E3	Contamination	<p>An Asbestos Management Plan will be developed and implemented to manage asbestos and asbestos containing material if encountered during the construction. The plan will include:</p> <ul style="list-style-type: none"> • Identification of potential asbestos on site • Procedures to manage and handle any asbestos • Mitigation measures if asbestos is encountered during construction • Procedures for disposal of asbestos in accordance with NSW EPA guidelines, Australian Standards and relevant industry codes of practice. 	Construction contractor	Construction
E4	Soils	An Acid Sulfate Materials Management Plan will be prepared and implemented as part of the CEMP. The Plan will be prepared in accordance with the RTA Guidelines for the Management of Acid Sulfate Materials.	Construction contractor	Construction
T1	Traffic and transport	Disruptions to property access and traffic will be notified to landowners at least five days prior in accordance with the relevant community consultation processes outlined in the Traffic Management Plan.	Transport	Detailed design
T2	Traffic and transport	Where any legal access to property is permanently affected, arrangements for appropriate alternative access will be determined in consultation with the affected landowner and local road authority.	Construction contractor / Transport	Detailed design
T3	Traffic and transport	Access to properties will be maintained during construction. Where that is not feasible or necessary, temporary alternative access arrangements will be provided following consultation with affected landowners and the relevant local road authority.	Construction contractor / Transport	Construction
T4	Traffic and transport	<p>A detailed construction traffic management plan will be prepared in accordance with <i>Traffic Control at Work Sites Manual Version 61</i> (<i>Transport 2022, 4</i> (RTA, 2010)) and <i>Specification G10 - Control of Traffic</i>. The plan will be approved by Transport before implementation to provide a comprehensive and objective approach to minimise any potential impacts on road network operations during construction. The plan will include:</p> <ul style="list-style-type: none"> • Access and haulage routes 	Construction contractor	Pre-construction

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
		<ul style="list-style-type: none"> Measures to maintain access to local roads and properties Site specific traffic control measures (including signage) to manage and regulate traffic movement Measures to maintain pedestrian and cyclist access Requirements and methods to consult and inform the local community of impacts on the local road network <i>including identifying and consulting with receivers that may be affected by construction road traffic noise</i> Access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads. A response plan for any construction traffic incident Consideration of other developments that may be under construction to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic <p>Monitoring, review and amendment mechanisms.</p>		
T5	Traffic and transport	<i>Consultation with Singleton Council will occur regarding the use of local roads as construction haulage routes</i> Where practical, heavy vehicle movements would be outside the traffic peak hours to minimise impacts on the existing road network operation during construction.	<i>Transport</i> Construction contractor	<i>Pre-construction</i> • Construction
T6	Traffic and transport	Preparation of pre-construction and post construction road condition reports for local roads likely to be used during construction. Any damage resulting from construction (not normal wear and tear) will be repaired unless alternative arrangements are made with the relevant road authority. Copies of road condition reports will be provided to the local roads authority.	Construction contractor	Pre-construction / post-construction
T7	Traffic and transport	Pedestrian and cyclist access will be maintained throughout construction. Where that is not feasible or necessary, temporary alternative access arrangements will be provided following consultation with affected landowners and the local road authority.	Construction contractor	Construction
N1	Noise and vibration	A Construction Noise and Vibration Management Plan (CNVMP) would be prepared as part of the Construction Environmental Management Plan. The CNVMP would identify:	Contractor	Pre-construction / post-construction

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
		<ul style="list-style-type: none"> • all potential significant noise and vibration generating activities associated with the activity • noise and vibration sensitive receptors • measures to be implemented during construction to minimise noise and vibration impacts, such as restrictions on working hours, staging, placement and operation of work compounds, parking and storage areas, temporary noise barriers, haul road maintenance, and controlling the location and use of vibration generating equipment • feasible and reasonable mitigation measures to be implemented, taking into account the Transport's Beyond the Pavement urban design policy, process and principles. • a monitoring program to assess performance against relevant noise and vibration criteria • arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures • an out of hours works procedure, including approval process and proposed mitigation measures. 		
N2	Noise and vibration	<p>All sensitive receivers likely to be affected will be notified at least five days prior to commencement of any works associated with the activity that may have an adverse noise or vibration impact. The notification will include details of:</p> <ul style="list-style-type: none"> • the project • construction period and construction hours • contact information for project management staff • complaint and incident reporting and how to obtain further information. 	Contractor	Construction
N3	Noise and vibration	<p>All employees, contractors and subcontractors are to receive an environmental induction. The induction must at least include:</p>	Contractor	Construction

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
		<ul style="list-style-type: none"> All relevant project specific and 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. 		
N4	Noise and vibration	<p>Where feasible and reasonable, construction should be carried out during the standard daytime working hours. Work generating high noise and/or vibration levels should be scheduled during less sensitive time periods.</p> <p>Any variations to the standard construction hours will follow the approach RTA Environmental Facts Sheet -Noise Management and Night Works, including consultation with the affected local community.</p>	Contractor	Construction
N5	Noise and vibration	<p>Where reasonable and feasible, high noise generating activities (75dB(A)L_{eq} at receiver) be used during standard construction hours and in continuance blocks of no more than three hours with at least one hour respite between each block of work generating high noise impact, where the location of the work is likely to impact the same receiver.</p>	Contractor	Construction
N6	Noise and vibration	<p>Where high noise generating activities (75 dB(A) L_{eq} at receiver) are required out of hours the following will be implemented:</p> <ul style="list-style-type: none"> The equipment will be used prior to 10pm where reasonable and feasible Where the above cannot be achieved the equipment will be used prior to midnight where reasonable and feasible <p>It is not proposed to apply a three hour on and a one hour off respite approach in an effort to ensure that the use of such equipment is completed as early in the night as possible.</p>	Contractor	Construction

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
N7	Noise and vibration	Where properties have been identified for architectural treatment and these properties would be impacted by noise from construction works, Transport would consult with those property owners on the early installation of treatments to provide noise mitigation during the construction of the proposal.	Transport	Pre-construction
N8	Noise and vibration	The following will be implemented for deliveries the and from the proposal: <ul style="list-style-type: none"> • Loading and unloading of materials/deliveries is to occur as far as possible from sensitive receivers. • Dedicated loading/unloading areas to be shielded if close to sensitive receivers. • Delivery vehicles to be fitted with straps rather than chains for unloading, wherever possible. Construction sites would be arranged to limit the need for reversing associated with regular/repeatable movements	Contractor	Construction
N9	Noise and vibration	Non-tonal reversing beepers (or an equivalent mechanism) must be fitted and used on all construction vehicles and mobile plant regularly used on site and for any out of hours work.	Contractor	Construction
N10	Noise and vibration	The noise associated with the operation of construction ancillary facilities would primarily result from the operation of fixed and mobile plant and truck movements. Consideration would be given to the layout of the site in order to maximise distance and shielding to nearby receivers.	Contractor	Pre-construction / construction
N11	Noise and vibration	Where practicable, work should be scheduled to avoid major student examination periods such as before or during Higher School Certificate and at the end of higher education semesters.	Contractor	Construction
N12	Noise and vibration	At compound sites, consider positioning site sheds, earth bunds and hoarding to maximise shielding to residential receivers.	Contractor	Construction
N13	Noise and vibration	In circumstances where the noise levels are predicted to exceed construction noise management levels after implementation of the general work practices, additional mitigation measures are required. These measures include the following: <ul style="list-style-type: none"> • Monitoring 	Contractor	Construction

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
		<ul style="list-style-type: none"> • Notification (letterbox drop or equivalent) • Specific notifications • Phone calls • Individual briefings • Respite Offers • Respite Periods • Duration Respite. • Alternative Accommodation 		
N14	Noise and vibration	Vibration intensive equipment size would be selected to avoid working within the structural damage minimum working distances. The use of less vibration intensive methods of construction or equipment would be considered where feasible and reasonable.	Contractor	Construction
N15	Noise and vibration	Where the use of vibration intensive equipment within the relevant minimum working distances cannot be avoided, prior to the commencement of vibration intensive work, a detailed inspection will be carried out and a written and photographic report prepared to document the condition of buildings and structures within the minimum working distances. A copy of the report will be provided to the relevant landowner or land manager.	Contractor	Pre-construction
N16	Noise and vibration	To confirm that the noise level targets are achieved, a post-construction noise monitoring program be carried out in accordance with the Noise Mitigation Guideline (Roads and Maritime 2014d).	Transport	Operation
B1AH1	Aboriginal heritage	A total of 16 Aboriginal archaeological sites, detailed in Table 6-37 of the REF will be impacted by the proposal. Transport should apply for an 'all of area' AHIP for land to be impacted by the proposal (the 'AHIP area' shown on Figure 38 of Appendix E). This AHIP will allow impacts to these sites.	Transport	Detailed design / pre-construction
B2AH2	Aboriginal heritage	Impacted open artefact site Singleton Bypass OAS19 (37-6-3903, 37-6-1466 and 37-6-1468) has been assessed as being of moderate scientific significance and will be partially impacted by the proposal. To mitigate the impact of the proposal on this site, an archaeological salvage	Transport	Detailed design

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
		program incorporating surface collection and excavation is recommended for the impacted portion of this site. Salvage activities within OAS19 can only occur after an AHIP has been obtained and should be completed in accordance with the research design and methodology provided in Appendix F of AECOM's AAR.		
B3 AH3	Aboriginal heritage	Impacted open artefact sites Singleton Bypass OAS2 (37-6-3895), OAS7 (37-6-3889), OAS9 (37-6-3887), OAS10 (37-6-3886), OAS11 (37-6-3892), OAS12 (37-6-3891), OAS13 (37-6-3900), OAS15 (37-6-3898), OAS17 (37-6-3905), OAS18 (37-6-3904), McDougall Hill 2 (37-6-0789) and McDougall Hill 3 (37-6-0788) have been assessed as being of low scientific significance. Regardless, in recognition of their cultural significance, community collection is recommended for these sites, with collection to be limited to the impacted portion of each site. Community collection can only occur after an AHIP has been obtained from OEH and should be completed in accordance with research design and methodology provided in Appendix F of AECOM's AAR.	Transport	Detailed design
B4 AH4	Aboriginal heritage	Impacted subsurface artefact scatter sites Singleton Bypass OAS21 and OAS22 have been assessed as being of low scientific significance. No further management or mitigation actions are recommended for these sites.	Transport	Detailed design
B5 AH5	Aboriginal heritage	Should the requirement for impacts to AHIMS registered potential Aboriginal scarred tree 37-6-0681 be confirmed during the detailed design or construction phases of the proposal, a qualified arborist should be engaged to undertake a removal/relocation feasibility assessment of the tree. Subsequent mitigation will depend on the results on this assessment, as follows: <ul style="list-style-type: none"> Should the engaged arborist determine that 37-6-0681 is not suitable for relocation (i.e., due to the health of the tree and/or other factors), a detailed archival recording of the tree and its associated scars should be undertaken by a qualified archaeologist. A minimum of one RAP field representative will be invited to participate in the archival recording. Should the engaged arborist determine that 37-6-0681 is suitable for removal/relocation, the relocation procedure outlined in section 10.1 of Appendix E should be employed. 	Contractor	Detailed design / pre-construction

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
		All RAPs should be given the opportunity to review and comment on the arborist's relocation assessment report and if required, the removal methodology (including equipment), keeping place and ongoing access arrangements.		
B6 AH6	Aboriginal heritage	Ten Aboriginal archaeological sites, listed in Table 6-37 of the REF will not be impacted by the proposal and should be conserved in situ. The protection of these sites to be retained and those sites identified for partial impact will occur in accordance with the measures outlined in the adopted Aboriginal Heritage Management Plan.	Contractor	Detailed design / pre-construction
B7 AH7	Aboriginal heritage	Cultural Site A: Gathering Place (Railway Bridge Camps) will be partially impacted by the proposal. Protective fencing should be erected between the zone of construction activity and the unimpacted area(s) of this site prior to any construction activities, with the unimpacted area(s) of the site to be clearly marked on all operational maps as 'no go zones' of environmental and heritage sensitivities. The location of the fencing at Cultural Site A: Gathering Place (Railway Bridge Camps) should be confirmed by a cultural heritage values consultant to ensure that it accurately reflects the mapped site. Fencing should be maintained throughout the duration of works.	Contractor	Pre-construction
B8 AH8	Aboriginal heritage	An Aboriginal Heritage Management Plan (AHMP) will be prepared and implemented as part of the CEMP. The AHMP will provide specific guidance on measures and controls to be carried out to avoid and mitigate impacts on Aboriginal cultural heritage during construction. This will include protection measures to be applied during construction, as well as contractor training in general Aboriginal cultural heritage awareness and management of Aboriginal heritage values. Site locations will be identified in the proposal's CEMP and marked as environmentally sensitive areas or no-go zones. The management recommendations detailed in the Addendum ACHAR will be included in the project's AHMP.	Contractor	Detailed design / pre-construction
B9 AH9	Aboriginal heritage	All relevant staff and contractors working on site are to receive training to ensure awareness of the requirements of the AHMP and relevant statutory responsibilities. Site-specific training is to be given to personnel when working in the vicinity of identified Aboriginal heritage sites.	Contractor	Pre-construction

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
ᑲᑲᑲ AH10	Aboriginal heritage	In the event that construction works within the study area uncover any unexpected Aboriginal objects, the relevant provisions of Transport's Standard Management Procedure for Unexpected Heritage Items (Roads and Maritime, 2015) should be followed.	Contractor	Pre-construction
ᑲᑲᑲ AH11	Aboriginal heritage	<p>A project specific Aboriginal cultural heritage interpretation plan will be developed to promote understanding and awareness of the cultural heritage values of the study area. The strategy should be prepared in accordance with Transport's draft Heritage Interpretation Guideline (2016) in consultation with the RAPs and identified Aboriginal knowledge holders. The Aboriginal heritage interpretation project plan will include:</p> <ol style="list-style-type: none"> a. Interpretative signage (or similar) relevant to Cultural Site A: Gathering Place (Railway Bridge Camps) and how it sits within the wider cultural landscape. The content of the signage is to be developed by a cultural heritage specialist in consultation with the identified Aboriginal knowledge holders. b. Opportunities for input into (aesthetic) design elements of the proposal such as noise walls, bridge piers or abutments to include the interpretation of the Aboriginal cultural values of the area. <p>Provisions for rehabilitation and revegetation of the impacted portion of Cultural Site A: Gathering Place (Railway Bridge Camps) with local Indigenous plant species. The identification of the plant species should be undertaken in consultation with the identified Aboriginal knowledge holders. Opportunities should be provided to local Aboriginal organisations for involvement and potential engagement in the revegetation and landscaping process.</p>	Transport	Detailed design / pre-construction
ᑲᑲᑲ AH12	Aboriginal heritage	An educational booklet (or similar) would be developed by a cultural heritage specialist on the cultural values and historical records relating to the broader cultural landscape of which Cultural Site A: Gathering Place (Railway Bridge Camps) is one element. As part of this process the photographic recording of the cultural landscape should occur prior to any construction impacts. The final content of the booklet (or similar) to be developed in consultation with the RAPs and identified Aboriginal knowledge holders. To assist in the production of the recommended educational booklet, photographic recording of the cultural landscape by a cultural values specialist at Cultural Site A: Gathering Place (Railway Bridge Camps) should occur prior to any construction impacts.	Transport	Detailed design / pre-construction

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
ᑭᑭᑭ AH13	Aboriginal heritage	In accordance with Requirement 16B of the Code of Practice, all stone artefacts recovered from the proposal area as part of the test excavation program detailed in the AAR is to be stored temporarily at AECOM's head office (Level 8, 420 George Street, Sydney) while options for their long term management are being investigated, as determined through consultation with RAPs. Requirement 26 of the Code of Practice provides standard procedures for the deposition of stone artefacts dealt with under AHIPs and the Code of Practice. These procedures will be strictly adhered to.	AECOM / Transport	Detailed design / pre-construction
ᑭᑭᑭ AH14	Aboriginal heritage	Any Aboriginal objects removed from the study area as a result of test excavation and salvage activities authorised by the Code of Practice or an AHIP should be reburied upon completion of all post-excavation analyses, with the location of the reburial to be determined in consultation with RAPs.	Transport	Construction
AH15	<i>Aboriginal heritage</i>	<i>Impacted surface artefact scatter site Singleton Bypass OAS3 \37-ᑭ—3896. has been assessed as being of low scientific significance and will be partially impacted by the proposed modification To mitigate this impact it is recommended that the impacted portion of this site be subject to archaeological salvage Salvage should take the form of surface collection and be undertaken in accordance with the surface collection methodology provided in Appendix F of AECOM's \2022b. updated Aboriginal Archaeological Report \AAR. for the project</i>	<i>Transport</i>	<i>Detailed design</i>
AH16	<i>Aboriginal heritage</i>	<i>Impacted subsurface artefact scatter site Singleton Bypass OAS23 \37-ᑭ—4219. has been assessed as being of high scientific significance and will be partially impacted by both the project and proposed modification To mitigate this impact an archaeological salvage program is recommended for the impacted portion of this site Salvage activities within OAS23 can only occur after Transport's AHIP variation application has been approved by Heritage NSW and should be completed in accordance with the research design and methodology provided in Appendix F of the Addendum ACHAR</i>	<i>Transport</i>	<i>Detailed design</i>
AH17	<i>Aboriginal heritage</i>	<i>The portion of Singleton Bypass OAS23 \37-ᑭ-4219. located outside of the revised disturbance area should be conserved in situ with associated protective measures outlined in the AHMP</i>	<i>Transport • contractor</i>	<i>Detailed design</i>

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
AH18	<i>Aboriginal heritage</i>	<i>PAD site Singleton Bypass PAD4 137-6-4215. will not be impacted by the project or proposed modification The PAD should be conserved in situ with associated protective measures outlined in the AHMP</i>	<i>Transport • contractor</i>	<i>Detailed design</i>
H1	Non-Aboriginal heritage	<p>A heritage management plan should be produced and included with in the Construction and Environment Management Plan measures to manage the identified heritage items in relation to the proposed works, including:</p> <ul style="list-style-type: none"> Heritage protection measures. An induction program for construction personnel on the management of non-Aboriginal heritage values. Procedures to be implemented if previously unidentified non-Aboriginal relics or heritage items are discovered during construction, in accordance with the Transport's Standard Management Procedure - Unexpected Archaeological Finds. 	Contractor	Construction
H2	Non-Aboriginal heritage	<p>If the use of vibration intensive plant cannot be avoided within the minimum working distance for cosmetic damage the following procedure would occur as a minimum:</p> <ul style="list-style-type: none"> Notification of the works to the affected residents and community Works would not proceed until attended vibration measurements are undertaken. Vibration monitors are to provide real-time notification of exceedances of levels approaching cosmetic damage criteria. <p>If ongoing works are required a temporary relocatable vibration monitoring system would be installed, to warn operators (via flashing light, audible alarm, short message service (SMS) etc) when vibration levels are approaching the cosmetic damage objective.</p>	Contractor	Detailed design / construction
H3	Non-Aboriginal heritage	Singleton Council should be informed of the proposed impacts to heritage items and their records relating to the corresponding LEP listings should be updated accordingly.	Transport	Construction
H4	Non-Aboriginal heritage	Should any heritage items, archaeological remains or potential relics of Non-Aboriginal origin be encountered, then construction work that might affect or damage the material will cease and notification provided to Transport's as per Transport Standard Management Procedure -	Contractor	Construction

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
		Unexpected Archaeological Finds. Work will only re-commence once the requirements of that Procedure have been satisfied.		
H5	Non-Aboriginal heritage	Transport will investigate the need to salvage heritage fabric from listed items removed by the proposal for possible reuse in heritage reinterpretation in consultation with Singleton Council.	Transport	Detailed design
H6	Non-Aboriginal heritage	An archival recording of the Former Pumping Station (I21) will be prepared prior to the removal of the item. The recording will be prepared in accordance with guidelines published by the Heritage Division, Department of Premier & Cabinet.	Contractor	Construction
H7 8	Non-Aboriginal heritage	Prior to ground disturbance impacts at the Former Pumping Station (I21), a permit under Section 140 of the <i>Heritage Act 1977</i> would be obtained given the potential for archaeological relics at this location.	Transport / contractor	Detailed design / construction
A1	Air quality	<p>An Air Quality Management Plan will be prepared and implemented as part of the CEMP. The Plan will identify:</p> <ul style="list-style-type: none"> • Potential sources of air pollution (such as dust, vehicles transporting waste, plant and equipment) during construction • Air quality management objectives consistent with any relevant published EPA and/or DPIE guidelines • Mitigation and suppression measures to be implemented, such as spraying or covering exposed surfaces, provision of vehicle clean down areas, covering of loads, street cleaning, use of dust screens, maintenance of plant in accordance with manufacturer's instructions • Methods to manage works during strong winds or other adverse weather conditions • A progressive rehabilitation strategy for exposed surfaces • When the air quality, suppression and management measures need to be applied, who is responsible, and how effectiveness will be assessed • Community notification and complaint handling procedures. 	Construction contractor	Construction
A2	Air quality	As part of the Air Quality Management Plan, a monitoring program would be developed for monitoring construction dust from the proposal.	Construction contractor	Construction

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
		The monitoring plan would be implemented prior to construction and during the construction period to assess effective implementation of air quality safeguards, identify any unexpected or inadvertent impacts, and identify recommended revisions or improvements.		
LV1	Landscape and visual	All plant material to be locally sourced (seed collection preferred), with any seed collection to commence within three months of construction contract award, where possible.	Transport	Detailed design
LV2	Landscape and visual	An Urban Design Plan will be prepared as part of the CEMP. The Plan will include: <ul style="list-style-type: none"> • Location and identification of vegetation in the proposal area to be retained and proposed landscaped areas • Details of the staging of built elements including retaining walls, bridges and noise walls • Details of the staging of landscape works • Maintenance measures for landscaped or rehabilitated areas, including timings A landscape monitoring program including an inspection program with frequency.	Construction contractor	Pre-construction
P1	Property acquisition	Property acquisition will be carried out in accordance with the <i>Land Acquisition Information Guide</i> (Roads and Maritime, 2014) and the <i>Land Acquisition (Just Terms Compensation) Act 1991</i> .	Roads and Maritime Transport	Detailed design
P2	Property acquisition	Transport will complete property adjustments including fencing, driveways/access and other property infrastructure impacted by the proposal in consultation with affected property owners.	Roads and Maritime Transport	Detailed design
P3	Property acquisition	Transport will investigate the possibility of licencing land beneath the bridge to impacted landholders to enable continued access for fragmented properties.	Transport	Detailed design
SE1	Social and economic	Landowner surveys will be carried out to: <ul style="list-style-type: none"> • Gather information about the current use and activities carried out on their property 	Transport	Detailed design

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
		<ul style="list-style-type: none"> Identify how the proposal would affect ongoing land use and activities on their property Inform the development of appropriate mitigation measures. 		
SE2	Social and economic	<p>A Communication Plan (CP) will be prepared and implemented as part of the CEMP to ensure provision of timely and accurate information to the community during construction. The CP will include (as a minimum):</p> <ul style="list-style-type: none"> Mechanisms to provide details and timing of proposed activities to affected residents, including changed traffic and access conditions Contact name and number for complaints How the project webpage will be maintained for the duration of the proposal. Minimum consultation activities to be carried out A complaints handling procedure. 	Transport / construction contractor	Detailed design / construction
SE3	Social and economic	<p>Transport will develop a signage strategy for the entrances to Singleton, in consultation with Singleton Council to encourage motorists to visit Singleton. This will include signage showing:</p> <ul style="list-style-type: none"> The travel distances and estimated times for travelling routes via the bypass compared to travelling via the Singleton town centre Services and facilities available within the Singleton township Any visitor attractions within the Singleton township. 	Transport	Detailed design
SE4	Social and economic	Transport will engage with Singleton Council and local businesses regarding the progress of the proposal to allow businesses time to prepare for changed traffic conditions through the town.	Transport	Detailed design / construction
M1	Resource use	Use of recycled-content materials would be considered during the detailed design	Transport	Detailed design
M2	Construction waste	A Waste Management Plan (WMP) will be prepared and implemented as part of the CEMP. The WMP will provide specific guidance on measures and controls to be implemented to support minimising the amount of	Construction contractor	Pre-construction / construction

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
		<p>waste produced and appropriately handle and dispose of unavoidable waste.</p> <p>The WMP will include, but not necessarily be limited to:</p> <ul style="list-style-type: none"> • Measures to avoid and minimise waste associated with the project. • Classification of wastes generated by the project and management options (re-use, recycle, stockpile, disposal). • Classification of wastes received from off-site for use in the project and management options. • Identifying any statutory approvals required for managing both on and off-site waste, or application of any relevant resource recovery exemptions. • Procedures for storage, transport and disposal. • Monitoring, record keeping and reporting, including any documentation management obligations arising from resource recovery exemptions. <p>The WMP would be prepared taking into account the <i>Roads and Maritime Environmental Procedure – Management of Wastes on Roads and Maritime Services Land</i> and relevant Transport Waste Fact Sheets.</p>		
M3	Construction waste	<p>The following resource management hierarchy principles will be followed:</p> <ul style="list-style-type: none"> • Avoid unnecessary resource consumption as a priority. • Avoidance will be followed by resource recovery (including reuse of materials, reprocessing, and recycling and energy recovery). • Disposal will be a last resort (in accordance with the Waste Avoidance and Resource Recovery Act 2001). 	Construction contractor	Pre-construction / construction
CC1	Climate change	<p>Construction equipment, plant and vehicles will be appropriately sized for the task, serviced frequently and will not be left idling when not in use.</p>	Construction contractor	Construction
R1	Hazard and risk	<ul style="list-style-type: none"> • Emergency response plans will be incorporated into the construction environmental management plan. 	Construction contractor	Pre-construction / construction

No.	Impact	Environmental safeguards and management measures	Responsibility	Timing
R2	Hazard and risk	<p>A Hazard and Risk Management Plan will be prepared and implemented as part of the CEMP. The Plan will identify:</p> <ul style="list-style-type: none"> • Details of hazards and risks associated with the activity • Measures to be implemented during construction to minimise these risks • Record keeping arrangements, including information on the materials present on the site, material safety data sheets, and personnel trained and authorised to use such materials • A monitoring program to assess performance in managing the identified risks, including "equipment checking and maintenance requirements contingency measures to be implemented in the event of unexpected hazards or risks arising, including emergency situations". 	Construction contractor	Pre-construction / construction

7.3 Licensing and approvals

All relevant licenses, permits, notifications and approvals needed for the New England Highway bypass of Singleton and when they need to be obtained are listed in Table 7-2. Additional or changed licenses and approval requirements identified in this addendum REF are indicated by underlined and/or struck out font. No additional licensing or approval is required as a result of the proposed modification.

Table 7-2: Summary of licensing and approval required

Instrument	Requirement	Timing
<i>Protection of the Environment Operations Act 1997</i> (s43)	Environment protection licence (EPL) for scheduled activities from the EPA.	Prior to start of the activity.
<i>Fisheries Management Act 1994</i> s199.	Notification to the Minister for Primary Industries prior to any dredging or reclamation works.	A minimum of 28 days prior to the start of work.
<i>Fisheries Management Act 1994</i> s219.	Permit to obstruct the free passage of fish (temporary or permanent) from the Minister for Primary Industries.	Prior to start of the activity.
<i>National Parks and Wildlife Act 1974</i> s90.	Aboriginal heritage impact permit from the Chief Executive of Heritage Division, Department of Premier & Cabinet. An AHIP variation application will be submitted to Heritage NSW to have the AHIP area presented in AECOM's updated ACHAR for the project (2022a: 153, Fig. 38) revised to that shown on Figure 46 of the Addendum ACHAR (the 'revised AHIP area').	Prior to start of the activity.
<i>Crown Lands Act 1989</i> s6.	Licence to occupy areas of Crown land.	Prior to start of the activity

8. Conclusion

8.1 Justification

The New England Highway is of key importance to national and regional economic growth, development and connectivity. The strategic need for the project stems from the importance of the New England Highway in providing safe and efficient access as a major freight and commuter route for the Upper and Lower Hunter. The proposed modification would enhance connectivity of the bypass to Singleton town centre whilst also maintaining the New England Highway as a safe and efficient freight and commuter route. The proposed modification is considered consistent with the strategic planning and policy frameworks, as listed in Section 2.1 of the REF.

The proposed modification is also consistent with the objectives stated in Section 2.3 of the REF and Section 2.2 of this addendum REF.

The proposed modification would potentially result in some minor increases to environmental impacts including impacts to biodiversity, Aboriginal heritage, and property. However, the safeguards and management measures provided in Section 7.2 would avoid, minimise, or mitigate these potential impacts arising from the proposed modification.

The proposed modification would have long-term benefits including better access to Singleton town centre and improved flood performance of the bypass.

8.1.1 Social factors

Potential social impacts as a result of the proposed modification include the adjustment of existing acquisitions, temporary disruptions and permanent adjustments to private property access. However, no new properties would be needed to be acquired to those presented in the REF.

Long-term benefits of the proposed modification include improving access to Singleton town centre and business district while also maintaining the New England Highway as an important freight and commuter route and improving travel through Singleton.

8.1.2 Biophysical factors

Impacts to biodiversity by the proposed modification have been assessed in Section 6.1 and mitigation measures proposed to manage identified residual impacts.

The proposed modification has sought to minimise impacts to biodiversity where reasonable and feasible. The proposed modification would result in the direct removal of up to 42.89 hectares of native vegetation. This would result in a minor additional impact to biodiversity in the context of the approved project.

Assessments of significance have been conducted for the threatened species, populations or ecological communities that have been identified within or surrounding the proposed modification or that are considered to have a moderate to high likelihood of using habitat which would be affected by the proposed modification.

An assessment of significance has been carried out for threatened species and ecological communities as part of the supplementary BAR. The assessment found that the project including the proposed modification is unlikely to have a significant impact on all matters listed under the BC Act, however is likely to have a significant impact on Central Hunter Valley eucalypt forest and woodland listed as critically endangered under the EPBC Act. This is consistent with the outcome of the project BAR.

Transport for NSW would consider biodiversity offsets, or where offsets are not feasible or reasonable, supplementary measures for impacts that exceed the thresholds in the 'Guideline for Biodiversity Offsets' (Roads and Maritime Services, 2016).

8.1.3 Economic factors

The project (including the proposed modification) has been designed to be low maintenance and economically viable. The project would improve transport connections, reduce commuting times and lower vehicle operating costs between employment and tourist destinations. This section of the New England Highway is a major transport artery for freight travelling between the Port of Newcastle and the Hunter Valley and has supported the substantial growth in transportation for coal and agricultural industries and employment in NSW.

8.1.4 Public interest

The proposed modification is considered to be in the public interest as it would improve access to Singleton town centre and improve the flood performance of the bypass. The community are not anticipated to experience any increases in impacts as a result of the proposed modification. Where impacts are experienced, they are likely to be minor, temporary in nature, and would be minimised with the implementation of safeguards provided in Section 7.

8.2 Objects of the EP&A Act

A summary of the objects of the EP&A Act and how they are considered in this addendum REF are provided in the table below.

Object	Comment
1.3(a) To promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources.	The proposed modification would promote social welfare in the Singleton community by providing better access to the town centre from the bypass.
1.3(b) To facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment.	Where feasible, the project would limit its use of natural and artificial resources and would source locally where possible.
1.3(c) To promote the orderly and economic use and development of land.	Ecologically sustainable development is considered in Section 8.3. The proposed modification would comply with the principles of ecologically sustainable development.
1.3(d) To promote the delivery and maintenance of affordable housing.	Not relevant to the project.
1.3(e) To protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats.	Construction of the proposed modification would require the clearing of up to 42.89 hectares of native vegetation classified as PCTs. PCTs within the proposed modification are detailed in Section 6.1.
1.3(f) To promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage).	The proposed modification is consistent with the outcomes of the project BAR and would not have a significant impact on any new biodiversity, including threatened species and ecological communities.
1.3(g) To promote good design and amenity of the built environment.	The proposed modification is not expected to increase impacts to non-Aboriginal heritage.
1.3(h) To promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants.	Impacts to Aboriginal heritage would be managed in accordance with an Aboriginal Heritage Impact Permit (AHIP) issued by Heritage NSW.

Object	Comment
1.3(i) To promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State.	Not relevant to the project.
1.3(j) To provide increased opportunity for community participation in environmental planning and assessment.	Consultation with the community and relevant government agencies has occurred throughout the development of the project, including this proposed modification.

8.3 Ecologically sustainable development

8.3.1 The precautionary principle

The precautionary principle states ‘if there are threats of serious or irreversible damage, lack of scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation’.

The assessment of potential environmental impacts arising from the proposed modification has not identified any threats of serious or irreversible environmental damage as a result of its construction or operation. The safeguards and management measures detailed in Section 7.2 would be implemented to minimise and manage potential environmental impacts during construction and operation of the proposed modification.

8.3.2 Intergenerational equity

This principle states, ‘the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations’.

The project and proposed modification would result in amenity impacts for some residents of Singleton and road users however would not result in any impacts that are likely to impact on the health, diversity or productivity of the environment for future generations. The proposed modification would benefit future generations by improving access to Singleton town centre from the bypass as well as improving flood performance of the bypass.

Should the project and proposed modification not proceed, the principle of intergenerational equity may be compromised, as public safety may be affected by continued freight and through-traffic within Singleton town centre.

8.3.3 Conservation of biological diversity and ecological integrity

This principle states the ‘diversity of genes, species, populations and communities, as well as the ecosystems and habitats to which they belong, must be maintained and improved to ensure their survival’.

The environment in which the proposed modification would be located primarily comprises cleared agricultural land and exotic or planted vegetation. An assessment of the existing local environment was carried out to identify and manage any potential impacts of the proposed modification on biodiversity. The design of the proposed modification has sought to minimise impacts on vegetation where feasible.

It is noted that the REF concluded that a significant impact was likely on a Commonwealth listed threatened ecological community, however, would not threaten its long-term survival. This impact would be suitably offset in accordance with the Biodiversity Offset Strategy for the project. The proposed modification would not increase this impact nor would it have a significant impact on biological diversity and ecological integrity.

8.3.4 Improved valuation, pricing and incentive mechanisms

This principle requires ‘costs to the environment should be factored into the economic costs of a project’.

This addendum REF as well as the approved REF and submissions report has examined the environmental impacts and benefits of the project and identified mitigation measures to manage the potential for adverse impacts. The requirement to implement these mitigation measures would result in an economic cost to Transport

for NSW. Incorporating environmental mitigation measures into the physical design and contractual requirements ensures that the costs of environmental impacts and mitigation are recognised by the project.

The project design has been developed with an objective of minimising potential impacts on the surrounding environment. This indicates that the project is being developed with an environmental objective in mind.

8.4 Conclusion

This addendum REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

This has included consideration where relevant, of conservation agreements and plans of management under the NPW Act, biodiversity stewardship sites under the BC Act, wilderness areas, areas of outstanding value, impacts on threatened species, populations and ecological communities and their habitats and other protected fauna and native plants. It has also considered potential impacts to matters of national environmental significance listed under the Federal EPBC Act.

A number of potential environmental impacts from the proposed modification have been avoided or reduced during the design development and options assessment. The proposed modification as described in the addendum REF best meets the project objectives but would still result in some impacts on Aboriginal heritage, biodiversity, and land acquisitions. Safeguards and management measures as detailed in this addendum REF would ameliorate or minimise these expected impacts. The proposed modification would also provide better access to Singleton town centre and improve the flood performance of the bypass. On balance the proposed modification is considered justified, and the following conclusions are made.

8.4.1 Significance of impact under NSW legislation

The proposed modification would not result in a change to the findings of the project REF [also refer to the submissions report and any other previous addendum REFs if relevant] and would be unlikely to cause a significant impact on the environment. Therefore, it is not necessary for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning under Division 5.2 of the EP&A Act. A Biodiversity Development Assessment Report or Species Impact Statement is not required. The proposed modification is subject to assessment under Division 5.1 of the EP&A Act. Consent from Singleton Council is not required.

8.4.2 Significance of impact under Australian legislation

The proposed modification would not likely cause a significant impact on matters of national environmental significance or the environment of Commonwealth land within the meaning of the EPBC Act. A referral to the Australian Government Department of Climate Change, Energy, the Environment and Water is not required.

It is noted that the REF concluded that a significant impact was likely on a Commonwealth listed threatened ecological community, however, would not threaten its long-term survival. This impact would be suitably offset in accordance with the Biodiversity Offset Strategy for the project.

9. Certification

This addendum review of environmental factors provides a true and fair review of the proposed modification 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 proposed modification.



Sam Mitchell
Senior Environment and Sustainability Officer
Transport for NSW

Date: 18 April 2023

I have examined this addendum review of environmental factors and accept it on behalf of Transport for NSW.



Peter Wood
Senior Project Manager
Transport for NSW

Date: 28 April 2023

10. EP&A Regulation publication requirement

Respondent	Yes/No
Does this REF need to be published under section 171(4) of the EP&A Regulation?	Yes

11. Terms and acronyms used in this addendum REF

Term /acronym	Description
AusLink	Mechanism to facilitate cooperative transport planning and funding by Commonwealth and state and territory jurisdictions
BC Act	<i>Biodiversity Conservation Act 2016 (NSW)</i>
CEMP	Construction environmental management plan
EIA	Environmental impact assessment
EP&A Act	<i>Environmental Planning and Assessment Act 1979 (NSW)</i> . Provides the legislative framework for land use planning and development assessment in NSW
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)</i> . Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process.
ESD	Ecologically sustainable development. Development which uses, conserves and enhances the resources of the community so that ecological processes on which life depends, are maintained and the total quality of life, now and in the future, can be increased
FM Act	<i>Fisheries Management Act 1994 (NSW)</i>
Heritage Act	<i>Heritage Act 1977 (NSW)</i>
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan. A type of planning instrument made under Part 3 of the EP&A Act.
LoS	Level of Service. A qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers.
NES	Matters of national environmental significance under the Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> .
NPW Act	National Parks and Wildlife Act 1974 (NSW)
REF	Review of Environmental Factors
Roads and Maritime	NSW Roads and Maritime was dissolved by the Transport Administration Amendment Bill in August 2019, all function are now managed by Transport for NSW
SEPP	State Environmental Planning Policy. A type of planning instrument made under Part 3 of the EP&A Act.
SEPP (Biodiversity and Conservation)	State Environmental Planning Policy (Biodiversity and Conservation) 2021
SEPP (Planning Systems)	State Environmental Planning Policy (Planning Systems) 2021
SEPP (Precincts – Central River City)	State Environmental Planning Policy (Precincts – Central River City) 2021
SEPP (Precincts – Eastern Harbour City)	State Environmental Planning Policy (Precincts – Eastern Harbour City) 2021

Term /acronym	Description
SEPP (Precincts – Regional)	State Environmental Planning Policy (Precincts –Regional) 2021
SEPP (Precincts – Western Parkland City)	State Environmental Planning Policy (Precincts –Western Parkland City) 2021
SEPP (Resilience and Hazards)	State Environmental Planning Policy (Resilience and Hazards) 2021
SEPP (Transport and Infrastructure)	State Environmental Planning Policy (Transport and Infrastructure) 2021
Transport	Transport for NSW
TSC Act	<i>Threatened Species Conservation Act 1995</i> (NSW)
QA Specifications	Specifications developed by Roads and Maritime Services for use with road work and bridge work contracts let by Transport for NSW.

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Appendix A

Consideration of section 171(2) factors and matters of National Environmental Significance and Commonwealth land

Section 171(2) checklist

In addition to the requirements of the Is an EIS required? (1995/1996) guideline and the *Roads and Related Facilities EIS Guideline* (DUAP, 1996) as detailed in the addendum REF, the following factors, listed in section 171(2) of the Environmental Planning and Assessment Regulation 2021, have also been considered to assess the likely impacts of the proposed modification on the natural and built environment.

Factor	Impact
Any environmental impact on a community?	
The proposed modification would be consistent with the REF and require total and partial acquisition of land. Property acquisition would be carried out in accordance with the Land Acquisition Information guide (Roads and maritime, 2013) and the Land Acquisition (Just Terms Compensation) Act 1991.	Short-term negative
Construction of the proposed modification would be consistent with the environmental impacts outlined in the REF, including altered visual amenity and access for some residents, noise and air quality impacts. These impacts would be temporary and managed with the implementation of the mitigation measures outlined in Section 7.2 of the addendum REF.	Short-term negative
Aboriginal heritage sites would be impacted by the proposed modification. The proposed modification has been designed to reduce impacts to these aspects as far as practical. Measures including salvage of heritage items would mitigate these impacts.	Long-term negative
Operation of the proposed modification would be consistent with the REF and improve traffic flow, travel times and safety through Singleton by reduced traffic volumes and improve the movement of heavy freight vehicles.	Long-term positive
Any transformation of a locality?	
During construction of the proposed modification would be consistent with the REF with amenity impacts expected including noise and air quality impacts which would temporarily transform the locality. These impacts would be managed through the implementation of the mitigation measures identified in Section 7.2 of the addendum REF.	Short-term negative
The proposed modification would be consistent with the REF and result in a permanent change in land use from the existing land uses to a road corridor. This would remove the ability of the land to be developed for residential or agricultural purposes in the future.	Long-term negative
Any environmental impact on the ecosystems of the locality?	
The proposed modification would not involve any further impacts to ecosystems than those assessed in the REF.	Nil
Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?	
The proposed modification would be consistent with the REF and have some temporary impacts during construction associated with visual amenity, access arrangements for some residents and noise and vibration. These impacts would be short-term and minimised through the implementation of the safeguards provided in the addendum REF.	Short-term negative
Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical,	

scientific or social significance or other special value for present or future generations?	
The proposed modification would impact Aboriginal heritage sites, including the loss of value and removal of some sites. The proposed modification has been designed to reduce impacts to these aspects as far as practical. Mitigation measures including salvage activities would help to conserve the heritage value of some sites.	Long-term negative
Any impact on the habitat of protected fauna (within the meaning of the National Parks and Wildlife Act 1974)?	
The proposed modification would result 42.89 hectares of native vegetation requiring removal which is a minor increase to what was assessed in the REF. One additional TEC was identified within the revised impact area, being Hunter Lowland Redgum Forest in the Sydney Basin and NSW North Coast Bioregions EEC. It was concluded that the project is unlikely to result in a significant impact on the Hunter Lowland Redgum Forest EEC listed under the BC Act. The proposed modification would result in the removal of three additional hollow bearing trees.	Long-term negative
Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?	
The proposed modification would not endanger any species of animal, plant or other form of life.	Nil
Any long-term effects on the environment?	
The proposed modification would be consistent with the REF and continue to facilitate and improve traffic flow, travel times and safety through Singleton by reduced traffic volumes and improve the movement of heavy freight vehicles.	Long-term positive
Any degradation of the quality of the environment?	
The proposed modification would have some temporary impacts during construction. These impacts would be short-term and minimised through the implementation of the safeguards provided in the addendum REF.	Short-term negative
Operation of the proposed modification is unlikely to result in the ongoing degradation of the environment.	Long-term neutral
Any risk to the safety of the environment?	
Operation of the proposed modification would align with the REF in improve safety for road users, especially through Singleton by reducing traffic volumes and improving traffic flow and travel times. The proposed modification would also see an increase in safety for pedestrians and access throughout Singleton. Furthermore, the flood performance of the bypass would be improved by the proposed modification.	Long-term positive
Any reduction in the range of beneficial uses of the environment?	
The proposed modification would result in the acquisition and a permanent change in land use from the existing land uses to a road corridor. This would remove the ability of the land to be developed for residential or agricultural purposes in the future.	Long-term negative
Any pollution of the environment?	

The proposed modification would have some temporary impacts that would be consistent with the REF during construction associated with dust and noise and vibration. The proposed modification could also result in minor impacts to water quality from erosion and sedimentation impacts and from potential oil or fuel spills from construction machinery. These impacts would be short-term and minimised through the implementation of the safeguards provided in the addendum REF.	Short-term negative
Operational pollution is likely to be consistent with the existing New England Highway.	Long-term neutral
Any environmental problems associated with the disposal of waste?	
Construction of the proposed modification would result in a number of waste streams to be generated, consistent with that of the REF. Mitigation measures for the disposal of waste streams likely to be produced during construction are detailed in the REF.	Short-term negative
Waste generation during operation of the proposed modification is likely to be minor, consistent with the operation of the existing New England Highway	Long-term neutral
Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply?	
Resources required are readily available and are not in short supply. The proposed modification is therefore unlikely to affect any resources that are or are likely to become in short supply.	Nil
Any cumulative environmental effect with other existing or likely future activities?	
There is potential for cumulative impacts to occur as a result of the construction of the proposed modification occurring simultaneously with other projects, including traffic, noise, air quality and visual impacts. The impacts would be temporary during the construction period and would be minimised with the mitigation measures provided in the addendum REF.	Short-term negative
The operation of the proposed modification would have a positive cumulative impact on travel times, road safety and efficiency. The proposed modification would result in improved safety for Singleton by reducing congestion and heavy vehicle voles through the town.	Long-term positive
Any impact on coastal processes and coastal hazards, including those under projected climate change conditions?	
The proposed modification is located about 70 kilometres from the coast. The proposed modification would not impact coastal processes or hazards including those predicted under climate change conditions.	Nil
Applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1.	
Rebuilding NSW plan through which the NSW Government committed \$92 million towards the New England Highway bypass of Singleton and a further \$2.7 million in 2019-2020.	Long-term positive
The project in its entirety is also generally consistent with the objectives of other State strategic documents, including the Hunter Regional Plan 2036. In particular, Direction 4 of the Hunter Regional Plan seeks to enhance inter-regional linkages to support economic growth. The project would contribute to this Direction by reducing travel times on the New	

<p>England Highway, a major road in NSW that links important regional centres between Newcastle and the Queensland border.</p> <p>The project supports local strategic planning in the Singleton Local Government Area. The Singleton Socio-economic Development Strategy includes a strategic focus area of infrastructure, in which it cites the Singleton bypass as a priority infrastructure project for the region.</p>	
<p>Other relevant environmental factors</p>	
<p>In considering the potential impacts of the proposed modification, all relevant environmental factors have been considered. Refer to Chapter 6 of this addendum REF.</p>	<p>Nil</p>

Matters of National Environmental Significance and Commonwealth land

Under the environmental assessment provisions of the EPBC Act, the following matters of national environmental significance and impacts on Commonwealth land are required to be considered to assist in determining whether the proposed modification should be referred to the Australian Government Department of Climate Change, Energy, the Environment and Water.

Under the EPBC Act strategic assessment approval a referral is not required for proposed road actions that may affect nationally listed threatened species, populations, endangered ecological communities and migratory species. Impacts on these matters are assessed in detail as part of this addendum REF in accordance with Australian Government significant impact criteria and taking into account relevant guidelines and policies.

Factor	Impact
Any impact on a World Heritage property?	Nil
Any impact on a National Heritage place?	Nil
Any impact on a wetland of international importance? One wetland of international importance was identified being the Hunter estuary wetlands. This occurs 45 to 50 kilometres downstream of the proposed modification.	Nil
Any impact on a listed threatened species or communities? The REF identified a significant impact on one threatened ecological community, being the Central Hunter Valley Eucalypt Forest and Woodland critically endangered ecological community. The proposed modification would result in a minor increase in the clearance of this CEEC, however the previous assessment of significance is considered consistent with the outcomes of the proposed modification. The proposed modification would not increase or introduce an impact to any EPBC Act listed threatened species or community.	Nil
Any impacts on listed migratory species? An assessment of significance under the EPBC Act was undertaken as part of the REF for one migratory species, being the White-throated Needletail (<i>Hirundapus caudacutus</i>). The assessment concluded that the project is unlikely to substantially impact this species. The proposed modification is unlikely to impact any migratory species, including the White-throated Needletail, given that only minor adjustments to the proposal area are required. No important habitat would be substantially modified or destroyed, the lifecycle of an ecologically significant proportion of the population of White-throated Needletail would not be disrupted and no invasive species would be introduced that would be harmful to the White-throated Needletail becoming established within the project area.	Nil
Any impact on a Commonwealth marine area?	Nil
Does the proposed modification involve a nuclear action (including uranium mining)?	Nil
Additionally, any impact (direct or indirect) on Commonwealth land?	Nil

Appendix B

Statutory consultation checklists

Transport and Infrastructure SEPP

Certain development types

Development type	Description	Yes / No	If 'yes' consult with	SEPP (Transport and Infrastructure) section
Car park	Does the project include a car park intended for the use by commuters using regular bus services?	No	Singleton Council	Section 2.110
Bus depots	Does the project propose a bus depot?	No	Singleton Council	Section 2.110
Permanent road maintenance depot and associated infrastructure	Does the project propose a permanent road maintenance depot or associated infrastructure such as garages, sheds, tool houses, storage yards, training facilities and workers' amenities?	No	Singleton Council	Section 2.110

Development within the Coastal Zone

Issue	Description	Yes / No / N/A	If 'yes' consult with	SEPP (Transport and Infrastructure) section
Development with impacts on certain land within the coastal zone	Is the proposal within a coastal vulnerability area and is inconsistent with a certified coastal management program applying to that land?	N/A	Singleton Council	Section 2.14

Note: See interactive map [Coastal management - \(nsw.gov.au\)](https://www.nsw.gov.au). Note the coastal vulnerability area has not yet been mapped.

Note: a certified coastal zone management plan is taken to be a certified coastal management program.

Council related infrastructure or services

Development type	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s).	SEPP (Transport and Infrastructure) section
Stormwater	Are the works likely to have a substantial impact on the stormwater management services which are provided by council?	No	Singleton Council	Section 2.10
Traffic	Are the works likely to generate traffic to an extent that will strain the capacity of the existing road system in a local government area?	No	Singleton Council	Section 2.10
Sewerage system	Will the works involve connection to a council owned sewerage system? If so, will this connection have a substantial impact on the capacity of any part of the system?	No	Singleton Council	Section 2.10
Water usage	Will the works involve connection to a council owned water supply system? If so, will this require the use of a substantial volume of water?	No	Singleton Council	Section 2.10
Temporary structures	Will the works involve the installation of a temporary structure on, or the enclosing of, a public place which is under local council management or control? If so, will this cause more than a minor or inconsequential disruption to pedestrian or vehicular flow?	No	Singleton Council	Section 2.10
Road and footpath excavation	Will the works involve more than minor or inconsequential excavation of a road or adjacent footpath for which council is the roads authority and responsible for maintenance?	No	Singleton Council	Section 2.10

Local heritage items

Development type	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s).	SEPP (Transport and Infrastructure) section
Local heritage	<p>Is there is a local heritage item (that is not also a State heritage item) or a heritage conservation area in the study area for the works?</p> <p>If yes, does a heritage assessment indicate that the potential impacts to the heritage significance of the item/area are more than minor or inconsequential?</p>	No	Singleton Council	Section 2.11

Flood liable land

Development type	Potential impact	Yes / No	If 'yes' consult with	SEPP (Transport and Infrastructure) section
Flood liable land	Are the works located on flood liable land? If so, will the works change flood patterns to more than a minor extent?	No	Singleton Council	Section 2.12
Flood liable land	Are the works located on flood liable land? (to any extent). If so, do the works comprise more than minor alterations or additions to, or the demolition of, a building, emergency works or routine maintenance	No	State Emergency Services	Section 2.13

Note: 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.

Public authorities other than councils

Development type	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s).	SEPP (Transport and Infrastructure) section
National parks and reserves	Are the works adjacent to a national park or nature reserve, or other area reserved under the <i>National Parks and Wildlife Act 1974</i> , or on land acquired under that Act?	No	DPE	Section 2.15
National parks and reserves	Are the works on land in Zone E1 National Parks and Nature Reserves or in a land use zone equivalent to that zone?	No	DPE	Section 2.15
Aquatic reserves and marine parks	Are the works adjacent to an aquatic reserve or a marine park declared under the <i>Marine Estate Management Act 2014</i> ?	No	Department of Industry	Section 2.15
Sydney Harbour foreshore	Are the works in the Sydney Harbour Foreshore Area as defined by the <i>Sydney Harbour Foreshore Authority Act 1998</i> ?	No	Sydney Harbour Foreshore Authority	Section 2.15
Bush fire prone land	Are the works for the purpose of residential development, an educational establishment, a health services facility, a correctional centre or group home in bush fire prone land?	No	Rural Fire Service	Section 2.15
Artificial light	Would the works 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? (Note: the dark sky region is within 200 kilometres of the Siding Spring Observatory)	No	Director of the Siding Spring Observatory	Section 2.15
Defence communications buffer land	Are the works on buffer land around the defence communications facility near Morundah? (Note: refer to Defence Communications Facility Buffer Map referred to in section 5.15 of Lockhart LEP 2012, Narrandera LEP 2013 and Urana LEP 2011).	No	Secretary of the Commonwealth Department of Defence	Section 2.15

Development type	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s).	SEPP (Transport and Infrastructure) section
Mine subsidence land	Are the works on land in a mine subsidence district within the meaning of the <i>Mine Subsidence Compensation Act 1961</i> ?	No	Mine Subsidence Board	Section 2.15

SEPP (Precincts – Central River City) 2021 and SEPP (Precincts – Western Parkland City) 2021

Development type	Potential impact	Yes / No	If 'yes' consult with the relevant local council(s).	SEPP (Transport and Infrastructure) section
Clearing native vegetation	Do the works involve clearing native vegetation (as defined in the Local Land Services Act 2013) on land that is not subject land (as defined in cl 17 of schedule 7 of the <i>Threatened Species Conservation Act 1995</i>)?	No	DPE	Section 3.24

Appendix C

Biodiversity assessment report

Appendix D

Aboriginal Cultural Heritage Assessment Report

REMOVED DUE TO CULTURAL SENSITIVITY



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