



Memorial Avenue Upgrade

Addendum Review of Environmental Factors

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Approval and authorisation

Title:	Memorial Avenue Upgrade Addendum Review of Environmental Factors
Accepted on behalf of transport for NSW by:	Najib Wakili Project Engineer Central & Southern Sydney Project Office Sydney Project Delivery Infrastructure and Place
Signed:	
Dated:	24 November 2021

Executive summary

The proposed modification

Transport for NSW (Transport) proposes to modify the Memorial Avenue Upgrade at Kellyville (the project) by including an additional stockpiling location to support construction. Key features of the proposed modification would include:

- Establishment of a temporary stockpile site on part of Lot 135 DP1250868
- Erection of temporary fencing around the perimeter of the proposed stockpile site
- Installation of a gate at the access to Lot 135 DP1250868
- Construction of a new fence and gate on eastern boundary of the adjacent Lot 134 DP1250868.

Need for the proposed modification

The proposed modification is needed for additional stockpiling capacity at western extent of the upgrade project. There are a limited number of suitable areas for stockpiling immediately adjacent to Memorial Avenue that have not been already used or previously considered.

Proposal objectives

Section 2.3 of the project review of environmental factors identifies the proposal objectives that apply to the proposed modification.

Options considered

Transport investigated the 'do nothing' option and the option of proceeding with the proposed modification. The 'do nothing' option does not provide this needed capacity, and was not adopted.

The proposed modification is preferred because it supports construction by providing additional stockpiling capacity at western extent of the upgrade project, and has only minor potential impacts.

Statutory and planning framework

The proposed modification is categorised as development for the purpose of a road and/or road infrastructure facilities and is being carried out by or on behalf of a public authority.

Under clause 94 of State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) 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.

A referral to Australian Government Department of Agriculture, Water and the Environment under the *Environment Protection and Biodiversity Conservation Act 1999* is not required.

Community and stakeholder consultation

Given the temporary and minor nature of the proposed modification, and the distance to noise sensitive receivers, specific community consultation has not been carried out for the proposed modification.

ISEPP consultation was carried out during the preparation of the project REF. The proposed modification does not trigger the need for any further consultation with Council or with any other government agencies.

Environmental impacts

The proposed modification would involve some additional noise and visual impacts associated with the additional temporary stockpile. Moderately or highly intensive noise is not expected at the nearest receivers.

The existing safeguards and management measures identified in the project REF and subsequent addendum REFs are considered adequate to address potential impacts associated with the proposed modification.

Justification and conclusion

The proposed modification is needed support construction of the Memorial Avenue Upgrade.

While there are environmental impacts associated with the proposed modification associated with longer periods of night work, they are minor, temporary and are addressed through the current safeguards.

The benefits of the proposed modification are considered to outweigh the adverse impacts and risks.

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1 Introduction

1.1 Proposal identification

Transport for NSW (Transport) proposes to modify the Memorial Avenue Upgrade at Kellyville (the project) by including an additional stockpiling location to support construction. Key features of the proposed modification would include:

- Establishment of a temporary stockpile site on part of Lot 135 DP1250868
- Erection of temporary fencing around the perimeter of the proposed stockpile site
- Installation of a gate at the access to Lot 135 DP1250868
- Construction of a new fence and gate on eastern boundary of the adjacent Lot 134 DP1250868.

The location of the proposed modification is shown in Figure 1-1 and the proposed modification is shown in Figure 1-2. Chapter 3 describes the proposed modification in more detail.

A Review of Environmental Factors (REF) was prepared for the Memorial Avenue Upgrade in late 2014 (referred to in this addendum REF as the project REF). The project REF was placed on public display between 17 November 2014 and 12 December 2014 for community and stakeholder comments. A submissions report dated May 2015 was prepared to respond to issues raised.

After consideration of the project REF and submissions report, Transport decided to proceed with the project on 5 May 2015.

In July 2019 an addendum REF was prepared (and subsequently determined) which proposed the following modifications to the approved project:

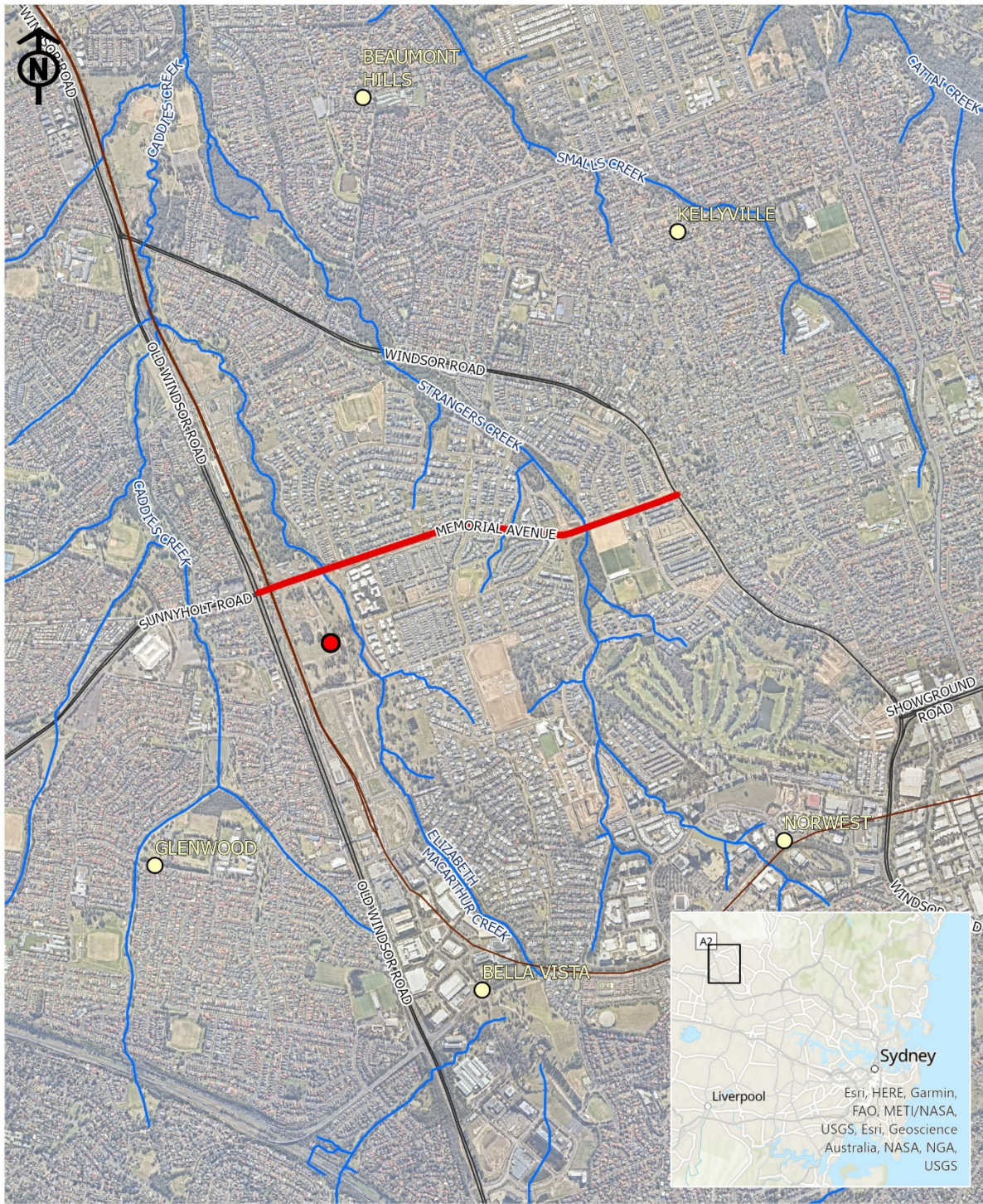
- Increasing the posted speed limit along Memorial Avenue from 70km/h to 80km/h
- Inclusion of a bus bay in either direction on Memorial Avenue north of Rutherford Avenue
- Removal of pedestrian crossings along Memorial Avenue to improve traffic flow
- Three ancillary facilities located off Memorial Avenue
- Minor modifications to the project boundary.

A consistency review was prepared in November 2019 to address minor changes to the approved project.

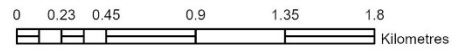
In April 2021 an addendum REF was prepared (and subsequently determined) which proposed the following modifications to the approved project:

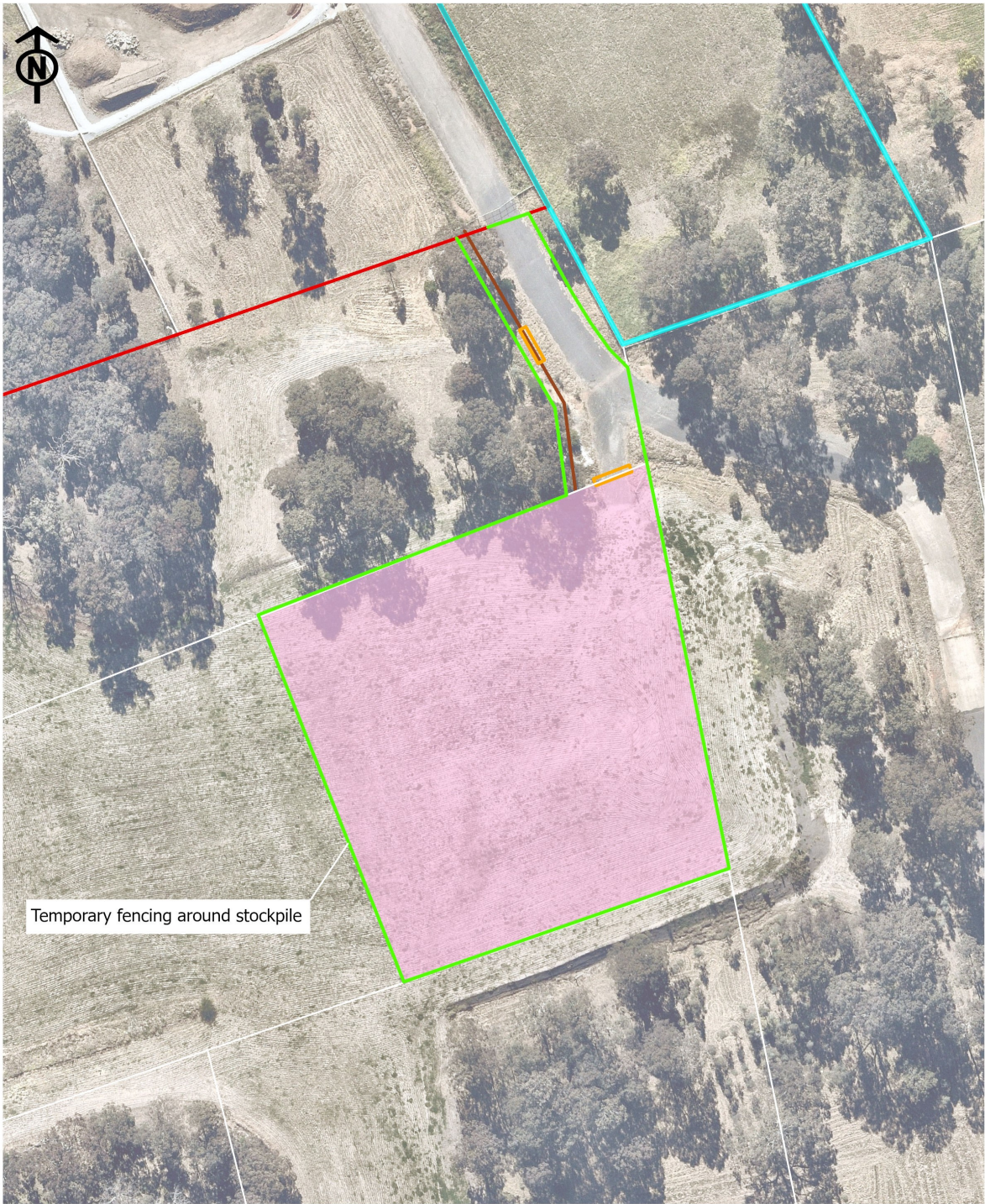
- Utility works
- Line marking works including asphalt re-sheeting along Windsor Road, Old Windsor Road, Arnold Avenue and Severn Vale Drive.
- Additional construction haulage routes and site accesses.
- Road widening along Windsor Road for turn lanes.
- Driveway connections to new housing developments
- Property adjustment works.

In October 2021 a consistency review was prepared for an additional stockpiling location on the south-west corner of the Memorial Avenue / Hector Court intersection.



- Project location
- Railway
- Proposed modification location
- Watercourses





1.2 Purpose of the report

This addendum review of environmental factors (REF) has been prepared by Hills Environmental on behalf of Transport. For the purposes of these works, Transport 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, submissions report and previous addendum REFs 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 carried out in the context of clause 228 of the Environmental Planning and Assessment Regulation 2000, the factors in 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 Related Facilities EIS Guideline (DUAP 1996), the *Biodiversity Conservation Act 2016* (BC Act), the *Fisheries Management Act 1994* (FM Act), and the Commonwealth *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 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 findings of the REF would be considered when assessing:

- Whether the proposal is likely to have a significant impact on the environment and therefore the necessity for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning and Public Spaces 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 proposal to significantly impact any other matters of national environmental significance or the environment of Commonwealth land and the need, subject to the EPBC Act strategic assessment approval, to make a referral to the Australian Government Department of the Agriculture, Water and the Environment for a decision by the Commonwealth 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

Chapter 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 for additional stockpiling capacity at western extent of the upgrade project. There are a limited number of suitable areas for stockpiling immediately adjacent to Memorial Avenue that have not been already used or previously considered.

Table 2-1: Evaluation of stockpile against criteria

Criteria	Discussion
Within proposal area and outside threatened ecological communities, Aboriginal sites and heritage items.	<p>The proposed stockpile site is adjacent to but outside the project boundary established by the 2019 addendum REF. This addendum REF considers the impacts of extending the project boundary.</p> <p>The site is cleared. The edges of the site and adjacent areas are mapped Cumberland Plain Woodland threatened ecological community (Refer to Section 6.2), however no impacts on this community are expected.</p> <p>The site is heavily disturbed (being previously within the constriction boundary of Sydney Metro Northwest and fully cleared for s storage area).</p> <p>The site does not include a listed heritage item.</p>
Not prone to flash flooding and more than 50 metres from a watercourse.	<p>The site is not known to be prone to flash flooding. The nearest watercourse is Elizabeth Macarthur Creek, about 100 metres to the east.</p>
Previously disturbed and does not require the removal of native vegetation.	<p>The proposal is cleared, with vegetation limited to grasses. A review of historical aerial photography indicates extensive previous disturbance associated initially with cropping and then construction activities for the adjacent residential development.</p>
In plain view of the public to deter theft and illegal dumping	<p>The proposal site may be visible from Sydney Metro Northwest. The site can be appropriately secured through gates and fencing to prevent illegal dumping.</p>
Outside the drip line of trees and on level ground wherever possible.	<p>The site is relatively level. Stockpiles would not encroach the dripline of any trees.</p>

2.2 Proposal objectives and development criteria

2.2.1 Proposal objectives

Section 2.3 of the project REF identifies the proposal objectives that apply to the proposed modification.

2.3 Alternatives and options considered

2.3.1 Methodology for selecting the preferred option

The proposed modification involves one additional stockpile site. There are a limited number of suitable areas for stockpiling immediately adjacent to Memorial Avenue that have not been already used or previously considered. In this context, the proposed modification was evaluated against the 'do nothing' option (i.e. no change from the approved project). It was not necessary to consider other options.

2.3.2 Identified options

Transport investigated two options, the 'do nothing' option and the option of proceeding with the proposed modification.

2.3.3 Analysis of options

The proposed modification is preferred because it supports construction by providing additional stockpiling capacity at western extent of the upgrade project. The 'do nothing' option does not provide this needed capacity.

The proposed modification also adequately addresses the established criteria for new stockpiles set out in Table 2-1.

2.4 Preferred option

The preferred option is to proceed with the proposed modification as evaluated in Section 2.3.3.

The preferred option addresses the identified need.

3 Description of the proposed modification

3.1 The proposed modification

Transport proposes to modify the Memorial Avenue Upgrade (the project) by establishing an additional temporary stockpiling location which has an area of approximately 6,000m². The proposed modification is shown in Figure 1-2.

Key features of the proposed modification would include:

- Establishment of a temporary stockpile site on part of Lot 135 DP1250868
- Erection of temporary fencing around the perimeter of the proposed stockpile site
- Installation of a gate at the access to Lot 135 DP1250868
- Construction of a new fence and gate on eastern boundary of the adjacent Lot 134 DP1250868.

3.2 Design

3.2.1 Design criteria

Design criteria for the project are identified in Section 3.2.1 of the project REF. There are no additional design criteria for the proposed modification except those considered in Table 2-1.

3.2.2 Engineering constraints

Engineering constraints relevant to the project are identified in Section 3.2.2 of the project REF. There are no additional engineering constraints for the proposed modification.

3.3 Construction activities

3.3.1 Work methodology

The work methodology for the proposed modification would be consistent with Section 3.4.1 of the project REF.

3.3.2 Construction hours and duration

No changes to construction hours or duration are proposed.

3.3.3 Plant and equipment

No changes to plant and equipment are proposed.

3.3.4 Earthworks

No changes to earthworks are proposed (except for the proposed stockpiling at the new location).

3.3.5 Source and quantity of materials

No changes to sources and/or quantity of materials are proposed.

3.3.6 Traffic management and access

Some changes to traffic management and access are proposed. The site would be accessed via the unnamed private road which intersects Memorial Avenue about 200 metres to the east of the Old Windsor Road intersection, which is currently being used to access the existing stockpile area.

3.4 Ancillary facilities

The proposal involves one additional stockpiling location as described in Section 3.1 and as shown on Figure 1-2.

3.5 Public utility adjustment

Public utility adjustment and/or protection works are not required for the proposed modification.

3.6 Property acquisition

The proposed modification does not require property acquisition. A construction lease has been negotiated with the property owner. The land would be used in accordance with the lease agreement, and returned in the condition it was received.

4 Statutory planning framework

4.1 Environmental Planning and Assessment Act 1979

4.1.1 State Environmental Planning Policies

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) aims to facilitate the effective delivery of infrastructure across the State.

Clause 94 of ISEPP 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 *Environmental Planning and Assessment Act 1979*. Development consent from council is not required.

The proposed modification 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 (Coastal Management) 2018, State Environmental Planning Policy (State and Regional Development) 2011 or State Environmental Planning Policy (State Significant Precincts) 2005.

Part 2 of ISEPP 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 ISEPP (where applicable), is discussed in Chapter 5 of this REF.

Sydney Regional Environmental Plan No 20 – Hawkesbury-Nepean River

Sydney Regional Environmental Plan No 20 – Hawkesbury-Nepean River (SREP 20) aims to protect the environment of the Hawkesbury-Nepean River system by ensuring that the impacts of future land uses are considered in a regional context. Clause 4(1)(b) states that a public authority proposing to carry out development which does not require development consent must consider:

- The general planning considerations set out in Clause 5
- Specific planning policies and recommended strategies set out in Clause 6.

The matters outlined in Clause 5 and Clause 6 of the SREP 20 have been considered in the project REF. The outcomes for the proposed modification is consistent with that assessment.

4.1.2 Local Environmental Plans

Since the project REF and subsequent addendum REFs The Hills Local Environmental Plan 2019 (The Hills 2019 LEP) has come into force. The site is zoned R1 General Residential under The Hills 2019 LEP and the objectives of that zone are as follows:

- To provide for the housing needs of the community.
- To provide for a variety of housing types and densities.
- To enable other land uses that provide facilities or services to meet the day to day needs of residents.
- To enable other land uses that support the adjoining or nearby commercial centres and protect the amenity of the adjoining or nearby residential areas.

While the proposed modification does not directly align with these objectives, it represents a temporary use that would not affect the realisation of the objectives in the long-term. The Memorial Avenue Upgrade supports future housing growth in the area.

Development for the purposes of roads is permitted with consent in the R1 zone. The ISEPP operates to remove that consent requirement.

4.2 Other relevant NSW legislation

The discussion of other relevant legislation in section 4.2 of the project REF is generally applicable to the project inclusive of the proposed modification.

Biodiversity Conservation Act 2016

Subsequent to the project REF, the Biodiversity Conservation Act 2016 (BC Act) has come into force. The BC Act seeks to conserve biological diversity and promote ecologically sustainable development; to prevent extinction and promote recovery of threatened species, populations and ecological communities; and to protect areas of outstanding biodiversity value.

The BC Act provides a listing of threatened species, populations and ecological communities, areas of outstanding biodiversity value, and key threatening processes.

Part 7 of the BC Act requires that the significance of the impact on threatened species, populations and endangered ecological communities listed under the BC Act or Fisheries Management Act 1994, are assessed using a five-part test. Where a significant impact is likely to occur, a Species Impact Statement or Biodiversity Development Assessment Report (BDAR) must be prepared.

An assessment of the potential impact on biodiversity is provided in Section 6.2.

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 A and chapter 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 Chapter 6 of the addendum REF and Appendix A.

Findings – matters of national environmental significance

The assessment of the proposed modification's impact on matters of national environmental significance and the environment of Commonwealth land found that there is unlikely to be a significant impact on relevant matters of national environmental significance or on Commonwealth land. Accordingly, the proposal has not been referred to the Australian Government Department of Agriculture, Water and the Environment under the EPBC Act.

4.4 Confirmation of statutory position

The proposed modification is categorised as development for the purpose of a road and/or road infrastructure facilities and is being carried out by or on behalf of a public authority.

Under clause 94 of ISEPP 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.

A referral to Australian Government Department of Agriculture, Water and the Environment under the EPBC Act is not required.

5 Consultation

5.1 Consultation strategy

The consultation strategy relevant to the proposed modification remains consistent with Section 5.1 of the project REF.

5.2 Consultation outcomes

Given the temporary and minor nature of the proposed modification, and the distance to noise sensitive receivers, specific community consultation has not been carried out for the proposed modification.

ISEPP consultation was carried out during the preparation of the project REF. The proposed modification does not trigger the need for any further consultation with Council or with any other government agencies.

5.3 Ongoing or future consultation

Ongoing consultation would be consistent with section 5.6 of the project REF.

6 Environmental assessment

This section of the addendum REF provides a detailed description of the potential environmental impacts associated the proposed modification. All aspects of the environment potentially impacted by the proposed modification are considered. This includes consideration of:

- Potential impacts on matters of national environmental significance under the EPBC Act
- The factors specified in the guidelines Is an EIS required? (Department of Planning, 1995) as required under clause 228(1) of the Environmental Planning and Assessment Regulation 2000 and the Roads and Related Facilities EIS Guideline (Department of Urban Affairs and Planning, 1996). The factors specified in clause 228(2) of the Environmental Planning and Assessment Regulation 2000 are also considered in Appendix A.

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

6.1 Noise and vibration

6.1.1 Methodology

Given its location outside the approved project boundary, the proposed modification has the potential to generate new impacts on different noise sensitive receivers.

Construction noise impacts for the compounds have been considered in accordance with the Construction Noise and Vibration Guideline (Roads and Maritime Services, 2016) and associated Construction and Maintenance Noise Estimator tool. The 'distance-based 'noisiest plant' worksheet was used with the '13.5 tonne excavator' selected as representative of the noisiest plant. The selected ground type used in the assessment was for 'developed settlements – urban and suburban'. Line of sight between noise sources and receivers was assumed.

The stockpile area is located within noise catchment area (NCA) 2 and the noise management levels (NMLs) adopted to assess the stockpile area used the Rating Background Level (RBL) for the R2 representative environment defined in the noise estimator. This best reflects the levels defined in the REF. Existing environment

The proposed location of stockpile introduces additional sensitive receivers in the form of apartment buildings to the east on Free Settlers Drive and Gerbera Place. For these receivers the following representative background noise levels and noise management levels from the Transport for NSW Construction and Maintenance Noise Estimator have been adopted as provided in Table 6-1.

Table 6-1: Noise management levels – residential receivers

Period	RBL (dDA)	NML
Standard hours	45	55
Day out of hours	45	50
Evening out of hours	40	45
Night out of hours	35	40

Standard hours: 7am-6pm, Monday to Friday, 8am-1pm Saturday
 Out of hours day: 7am-8am and 1pm-6pm Saturday
 Out of hours evening: 6pm-10pm Monday to Sunday
 Out of hours night: 10pm-7am Sunday to Friday, 10pm-8am Saturday

6.1.2 Potential impacts

Potential noise impacts associated with the operation of the stockpile are provided in Table 6-2. Key noise affected distances are shown in Figure 6-1

Table 6-2: Construction noise assessment results

Impact types	Period	Distance	No. receivers
Affected distance (>NML)	Day	85	0
	Day (OOHW)	135	0
	Evening	200	7
	Night	305	38
Clearly audible (10-20 dBA > Background)	Day	-	-
	Day (OOHW)	85	0
	Evening	135	0
	Night	200	7
Moderately intrusive (20-30 dBA > Background)	Day	30	0
	Day (OOHW)	30	0
	Evening	50	
	Night	85	0
Highly intrusive (>30 dBA > Background)	Day	15	0
	Day (OOHW)	15	0
	Evening	20	0
	Night	30	0
Highly noise affected (> 75 dBA)	-	15	0
Sleep disturbance (LAm _{ax} 65 dBA)	Night	85	0

Note: Apartment buildings are counted as one receiver in the table.

The results show that the nearest receivers could be affected by clearly audible noise at night. Moderately intrusive noise, highly intrusive noise or noise causing sleep disturbance is not expected. The actual noise impact would depend on several factors such as the specific location of the compound / stockpile, equipment, duration, shielding (which has not been assumed in calculations), distance equipment-receiver, etc. Noise levels above 75 dBA are not expected at the nearest receivers, but noise levels are likely to exceed the noise management level for most of the time when equipment is in use. The use of quieter equipment, shielding using compound sheds and an increase in the distance between the source and receiver would result in a reduced noise impact.



- Stockpile
- Watercourses
- Affected distance (day) / Moderately intrusive (night) - 85m
- Affected distance (evening) / Clearly audible (night) - 200m
- Affected distance (night) - 305m

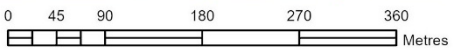


Figure 6-1: Key noise affected distances

6.1.3 Safeguards and management measures

The existing safeguards and management measures identified in the project REF and subsequent addendum REFs are considered adequate to address noise impacts associated with the proposed modification. No additional measures are proposed.

6.2 Biodiversity

6.2.1 Methodology

The assessment of potential biodiversity impacts was carried out with reference to the following sources:

- Vegetation mapping – Remnant Vegetation of the western Cumberland subregion, 2013 Update. VIS_ID 4207
- Bionet vegetation classification system
- Bionet Atlas search (North: -33.67 West: 150.89 East: 150.99 South: -33.77) conducted on 14 October 2021
- Department of Agriculture, Water and the Environment Protected Matters Search conducted on 14 October 2021
- Aerial photographs showing site history

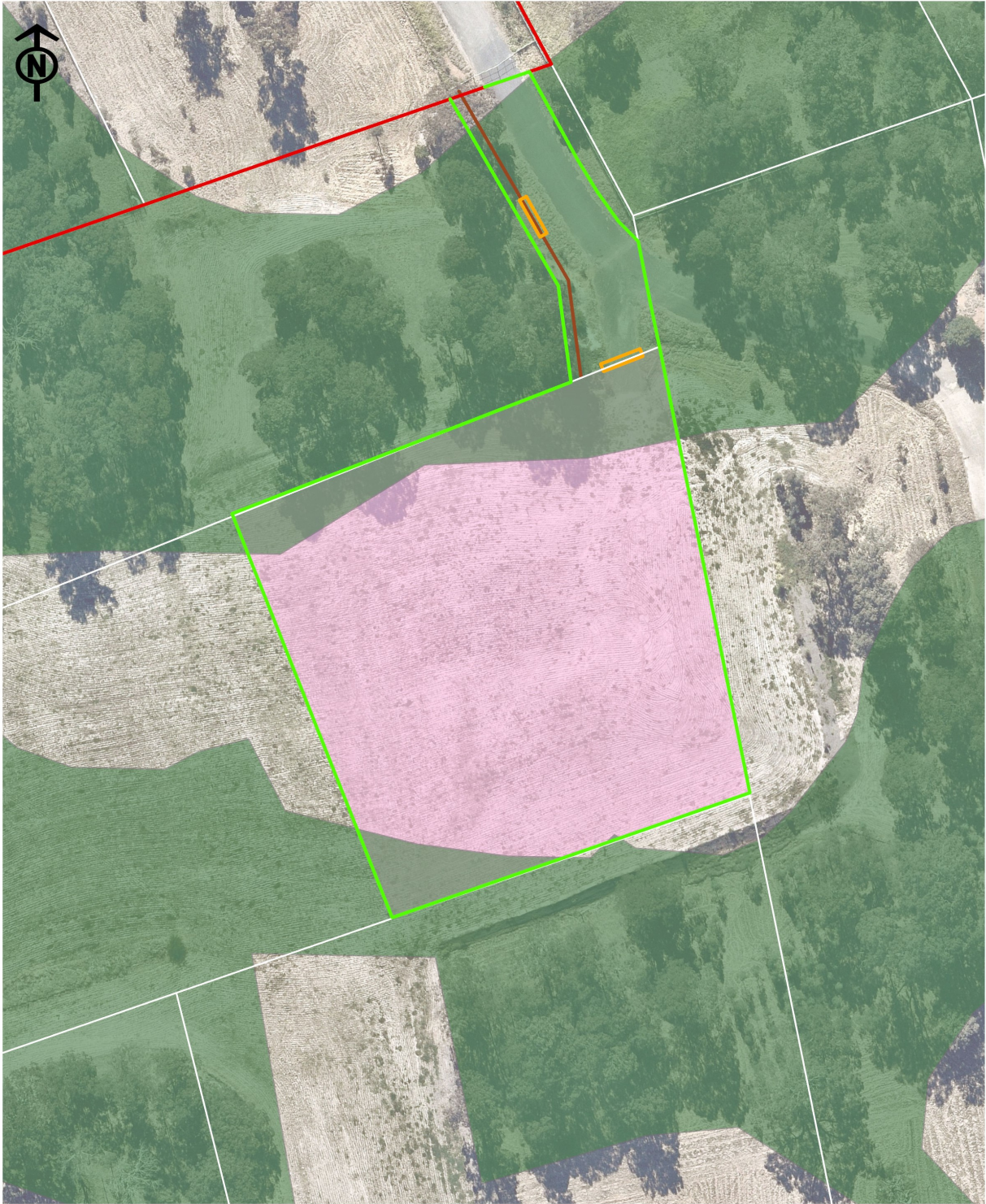
6.2.2 Existing environment

The site of the proposed modification is cleared land. There are adjacent areas of vegetation which are mapped as plant community type (PCT) 849 (Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion), which is equivalent to the BC Act and EPBC Act critically endangered Cumberland Plan Woodland. Refer to Figure 6-2 for the location of mapped PCT 849.

The site has been extensively disturbed during previous construction activities for Sydney Metro Northwest (refer to Figure 6-3) and the proposed modification would be confined to those previously disturbed areas.

The Bionet Atlas search identified no records for threatened flora or fauna at or adjacent to the site of the proposed modification.

The site does not provide habitat on which native fauna (including threatened fauna) would be reliant.



- Revised project boundary
- Current project boundary
- Gates
- Fencing
- Stockpile
- 849, Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion

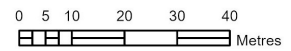


Figure 6-2: Threatened ecological communities



- Revised project boundary
- Current project boundary
- Watercourses

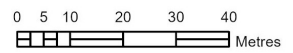


Figure 6-3: Proposed modification site (12 March 2017)

6.2.3 Potential impacts

Given the disturbed nature of the site and the absence of threatened species records, impacts on threatened flora and fauna are not anticipated.

New impacts on Cumberland Plan Woodland are not anticipated. The intact stand of Cumberland Plan Woodland to the north of the site would not be encroached by the proposed modification.

6.2.4 Safeguards and management measures

The existing safeguards and management measures identified in the project REF and subsequent addendum REFs are considered adequate to address biodiversity impacts associated with the proposed modification. The Biodiversity Management Plan (Flora and Fauna Management Sub-Plan) for the project (as required by Safeguard FF1) will be updated to include the site of the proposed modification.

No additional measures are proposed.

6.3 Aboriginal heritage

6.3.1 Methodology

The assessment of potential Aboriginal cultural heritage impacts was carried out with reference to the following sources past levels of site disturbance and an Aboriginal Heritage Information Management System (AHIMS) search conducted on 13 October 2021.

6.3.2 Existing environment

The site of the proposed modification has been extensively disturbed during previous construction activities for Sydney Metro Northwest (refer to Figure 6-3) and the proposed modification would be confined to those previously disturbed areas.

The AHIMS search returned 42 records in the broader locality. The nearest sites are shown on Figure 6-4 and are classified as either destroyed or partially destroyed.



- Revised project boundary
- Current project boundary
- Watercourses
- Destroyed
- Not a Site
- Partially Destroyed
- Valid

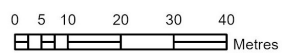


Figure 6-4: AHIMS sites near the proposed modification

6.3.3 Potential impacts

Given the disturbed nature of the site and noting the status of nearby AHIMS sites, Aboriginal cultural heritage impacts are not expected.

Aboriginal cultural heritage advice from the Aboriginal Cultural Heritage Officer is included in Appendix C. There is no requirement to proceed to Stage 2 of the Procedure for Aboriginal Cultural Heritage Consultation and Investigation (Roads and Maritime Services, 2011).

6.3.4 Safeguards and management measures

The existing safeguards and management measures identified in the project REF and subsequent addendum REFs are considered adequate to address potential Aboriginal heritage impacts associated with the proposed modification. The Aboriginal heritage management procedures for the project (as required by Safeguard AH1) will be updated to include the site of the proposed modification.

No additional measures are proposed.

6.4 Other impacts

6.4.1 Existing environment and potential impacts

Table 6-3: Existing environment and potential impacts – other issues

Environmental factor	Existing environment	Potential impacts
Hydrology and water quality	Refer to Section 6.1.1 of the project REF.	Consistent with the Project REF (refer to section 6.1.2) – no additional hydrology and water quality impacts. Existing safeguards WQ1-WQ6 and ES1-ES12 are adequate.
Topography, geology and soils	Refer to Section 6.2.1 of the project REF	Consistent with the Project REF (refer to section 6.2.2) – no additional topography, geology and soils impacts. Existing safeguards WQ1-WQ6, ES1-ES12 and CM1-CM2 are adequate.
Traffic and transport	Refer to Section 6.3.1 of the project REF.	Consistent with the Project REF (refer to section 6.3.3) – no additional traffic and transport impacts. There would be no change to construction haulage routes and no increase in the construction traffic movements identified in the project REF. Existing safeguards TT1-TT6 are adequate.
Non- Aboriginal heritage	Refer to section 6.7.1 of the project REF.	Consistent with the Project REF (refer to section 6.7.6) – no additional non-Aboriginal heritage impacts. A search of the State Heritage Inventory conducted on 14 October 2021 did not identify any heritage items near the site of the proposed modification. Existing safeguards NAH1-NAH4 are adequate.
Air quality	Refer to Section 6.8.1 of the project REF.	Consistent with the Project REF (refer to section 6.8.3) – no additional air quality impacts. Stockpiles would be covered when not being worked on. Existing safeguards AQ1-AQ4 are adequate.

Environmental factor	Existing environment	Potential impacts
Land use and socio-economic	Refer to section 6.9.1 of the project REF.	Consistent with the Project REF (refer to section 6.9.2) – no additional land use and socio-economic impacts. Existing safeguards SE1-SE9 are adequate.
Landscape character and visual	Refer to Section 6.10.1 of the project REF.	Consistent with the Project REF (refer to section 6.10.3) – minor additional landscape character and visual impacts. While the proposed stockpile would be visible (to occupants of upper-level apartments to the east), they would be an expected feature in the context of the broader Memorial Avenue construction site. Impacts would be temporary. Existing safeguards LC1-LC5 are adequate.
Climate change and greenhouse	Refer to Section 6.11.1 of the project REF.	Consistent with the Project REF (refer to section 6.11.2) – no additional climate change and visual impacts. Existing safeguards CG1-CG4 are adequate.
Resource use and waste management	Refer to Section 6.12 of the project REF.	Consistent with the Project REF (refer to section 6.12.1) – no additional resource use and waste management impacts. Existing safeguards WM1-WM13 are adequate.

6.4.2 Safeguards and management measures

Existing safeguards are considered adequate to address the impacts identified in Table 6-1. No additional measures are proposed.

6.5 Cumulative impacts

6.5.1 Potential impacts

Cumulative impacts associated with the proposed modification are not expected due to its small scale, location near the existing construction site and only minor identified impacts.

6.5.2 Safeguards and management measures

Minimising impacts attributable to the proposal is the best way to address any potential cumulative effects. Various measures have already been proposed as part of the approved project to address impacts.

7 Environmental management

7.1 Environmental management plans (or system)

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 project. These measures are documented in the project REF and subsequent addendum REFs.

Should the proposed modification proceed, these management measures would be addressed if required during detailed design and incorporated into the Project Environmental Management Plan (PEMP) and Contractors Environmental Management Plan (CEMP) and applied during the construction and operation of the proposed modification.

7.2 Summary of safeguards and management measures

Environmental safeguards and management measures for the Memorial Avenue Upgrade are summarised in Table 7-1. No additional or modified safeguards and management measures are proposed. The safeguards and management measures will be incorporated the CEMP and the PEMP 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.	Impacts	Environmental safeguards	Responsibility	Timing
G1	General	All environmental safeguards must be incorporated within the following: <ul style="list-style-type: none"> • Project Environmental Management Plan • Detailed design stage • Contract specifications for the proposal • Contractor's Environmental Management Plan 	Project Manager	Pre-construction
G2	General	The Roads and Maritime Services Project notify the Roads and Maritime Services Officer [Sydney region] at least 5 days commencing	Project Manager	Pre-construction
G3	General	All businesses and residences likely to be affected by the proposed work must be notified at least 5 working days prior to the commencement of the proposed activities.	Project Manager	Pre-construction
G4	General	Environmental awareness training must be provided, by the contractor, to all field personnel and subcontractors.	Contractor	Pre-construction and during construction as required
WQ1	Water quality	A Soil and Water Management Plan (SWMP) would be prepared as part of the CEMP in accordance with the requirements of Roads and Maritime contract specification G38 before construction begins. The SWMP would address: <ul style="list-style-type: none"> • The Roads and Maritime Code of Practice for Water Management 	Construction contractor	Pre-construction

No.	Impacts	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> • The Roads and Maritime Erosion and Sedimentation Procedure (RTA 2008) • The Blue Book • Roads and Maritime Technical Guidelines – Temporary Stormwater Drainage for Road Construction (Roads and Maritime 2011). <p>The SWMP would also include and address:</p> <ul style="list-style-type: none"> • The identification of catchment areas and the direction of on-site and off-site water flow • The likely runoff from each road subcatchment • Dust suppression mechanisms • Separation of on-site and off-site water • The direction of runoff and drainage points during each stage of construction • The locations and sizing of sediment traps such as sumps or basins • The locations of other erosion and sediment control measures (eg rock check dams, swales, scour protection and sediment fences) • The staging plans, location, sizing and details of creek alignment and realignment controls for scour protection and bank and bed stabilisation including those used during construction and long term • Progressive site-specific Erosion and Sedimentation Control Plans (ESCPs). The ESCPs would be updated at least fortnightly • A process for monitoring and preparing for wet weather • Provision of an inspection and maintenance schedule for ongoing maintenance of temporary and permanent erosion and sedimentation controls. 		
WQ2	Water quality	The SWMP would be reviewed by a soil conservationist and updated to address their comments and recommendations.		

No.	Impacts	Environmental safeguards	Responsibility	Timing
WQ3	Water quality	Detailed design to further investigate the provision of additional water quality treatment near Strangers Creek and Elizabeth Macarthur Creek.	Construction contractor	Construction
WQ4	Drainage lines and flow paths causing scouring	Channel bank and bed stabilisation measures would be maintained until riparian vegetation is completely re-established.	Construction contractor	Construction
WQ5	Spills	Emergency wet and dry spill kits would be kept on site at all times. All staff would be made aware of the location of the spill kits and trained in their use.	Construction contractor	Construction
WQ6	Spills	All fuels, chemicals and liquids would be stored in an impervious bunded area within the construction compound, a minimum of 50 metres away from: <ul style="list-style-type: none"> • Rivers, creeks or any areas of concentrated water flow • Flooded areas • Slopes above 10%. Refuelling would be done in a similarly contained area	Construction contractor	Construction
HF1	Flooding due to increases in peak flow velocities	Further flood modelling, including a detailed afflux assessment, would be carried out during detailed design to confirm impacts on surrounding land uses	Construction contractor	Construction
GW1	Groundwater	Further investigations would be carried out during detailed design to confirm levels of soil salinity and potential impacts on groundwater.	Roads and Maritime	Detailed design
ES1	Erosion and sediment control	During detailed design an Erosion and Sedimentation Management Report is to be prepared. The report is to include (as a minimum): <ul style="list-style-type: none"> • Identify site catchment and sub-catchments, high risk areas and sensitive areas • Sizing of each of the above areas and catchments • Proposed staging plans for the project to ensure appropriate erosion and sediment controls measures are possible 	Roads and Maritime	Detailed design

No.	Impacts	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> The likely volume of run-off from each catchment and sub-catchment in accordance with the Managing Urban Stormwater: Soils and Construction, Volume 1 and 2 (Landcom, 2004) Direction of water flow, both off and on site Diversion of off-site water around or through the site or details of separation of on-site and off-site water The direction of runoff and drainage points during each stage of construction The locations and sizing of sediment basins / sumps as well as associated drainage to direct site water to the basin or sumps A mapped plan identifying the above at all major construction stages A review process by a soil conservationist and a process for updating the report to address any recommendations 		
ES2	Erosion and sediment control	A soil conservationist from the Roads and Maritime Erosion, Sedimentation and Soil Conservation Consultancy Services Register would be engaged to review the Erosion and Sedimentation Management Report.	Roads and Maritime	Detailed design
ES3	Erosion and sediment control	<p>An Erosion and Sedimentation Control Plan (ESCP) would be prepared prior to construction and is to include as a minimum:</p> <ul style="list-style-type: none"> Identify site catchment and sub-catchments, high risk areas and sensitive areas Sizing of each of the above areas and catchments The likely run-off from each sub-catchment Separation of on-site and off-site water The direction of run-off and drainage points during each stage of construction Direction of flow of on-site and off-site water The locations and sizing of sediment basins or sumps and associated catch drains and/or bunds The locations of other erosion and sediment control measures (eg rock check dams, swales and sediment fences) 	Contractor	Prior to construction

No.	Impacts	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> • Controls/measures to be implemented on wet weather events • A mapped plan identifying the above • A dewatering procedure for onsite water and basins • A process for reviewing and updating the plan on a fortnightly basis and/or when works alter. 		
ES4	Erosion and sediment control	Wet weather plans for a rain event would be included and shown on the ESCPs outlining the controls to be implemented in preparation for a rain event.	Construction contractor	Pre-construction
ES5	Erosion and sediment control	<p>Environmental Work Method Statements (EWMS) would be prepared for high-risk activities such as:</p> <ul style="list-style-type: none"> • Clearing and grubbing • Earthwork • Temporary creek diversions • Work around the bridge and culverts • Drainage work • Utilities relocations • Bridge and culvert construction. <p>Environmental Work Method Statements (EWMS) would include:</p> <ul style="list-style-type: none"> • Description of the work/activities and machinery • Outline of the sequence of the work/activities, including interfaces with other construction activities • Identification of potential environmental risks/impacts due to the work/activities and associated with wet weather events • Evaluation of methods to eliminate/reduce the environmental risk • Mitigation measures to reduce environmental risk. • Any safeguards resulting from consultation with public authorities and other stakeholders, where appropriate • A map indicating sensitive locations, likely potential environmental impacts, and work areas • Identification of work areas and exclusion areas 	Construction contractor	Pre-construction

No.	Impacts	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> Operational and monitoring measures to reduce environmental impact A process for assessing and reporting the performance of the implemented environmental control measures A process for resolving environmental issues or conflicts and reporting outcomes. 		
ES6	Erosion and sediment control	<p>A Stabilisation Plan is to be prepared and included in the SWMP. The stabilisation plan is to include but not be limited to the following:</p> <ul style="list-style-type: none"> Identification and methodology of techniques for stabilisation of site Identification of area on site for progressive stabilisation. Stabilisation is to be undertaken of areas, including stockpiles and batters, exposed for a duration of 2 weeks or greater. For example covering with geotextile fabric, stabilised mulch, soil binder or spray grass. Identification of areas on site for progressive permanent stabilisation such as implementation of landscaping 	Contractor	Prior to construction
ES7	Erosion and sediment control	<p>Localised erosion and sediment control measures would also be implemented to minimise erosion and the volume of sediment transported from disturbed areas. Measures would include use of the following elements:</p> <ul style="list-style-type: none"> Temporary revegetation /rehabilitation work to reduce the extent of disturbed surfaces Application of temporary surface treatments or blanketing on exposed earth surfaces Sediment barriers and sumps, in series where necessary Vegetated buffer strips. 	Construction contractor	Pre-construction and construction
ES8	Erosion and sediment control	Control measures would be implemented at egress points to minimise dirt and mud tracking.	Construction contractor	Construction
ES9	Erosion and sediment control	All stockpiles would be designed, established, operated and decommissioned in accordance with Roads and	Construction contractor	Construction

No.	Impacts	Environmental safeguards	Responsibility	Timing
		<p>Maritime Stockpile Management Procedures (RTA 2011a). Stockpile sites would be located:</p> <ul style="list-style-type: none"> - At least 50 metres from the nearest waterway - In an area of low ecological and heritage conservation significance - On relatively level ground - Outside the 1 in 10-year ARI floodplain. 		
ES10	Erosion and sediment control	Topsoil would be stockpiled separately for possible reuse in landscaping and rehabilitation	Construction contractor	Construction
ES11	Erosion and sediment control	An accredited soil conservationist would be engaged regularly inspect work throughout the construction phase	Construction contractor	Construction
ES12	Erosion and sediment control	Any material transported onto road surfaces would be swept and removed at the end of each working day and before rainfall	Construction contractor	Construction
CM1	Contamination	A Stage 2 – Detailed site investigation in accordance with NSW EPA guidelines would be prepared and would include preparation of a sampling, analysis and quality plan in accordance with the Roads and Maritime Contaminated Land Management Guidelines. This plan would include site specific sampling and analysis of soil at the site on the corner of Old Windsor Road and Memorial Avenue.	Roads and Maritime	Detailed design
CM2	Contamination	<p>Following the Stage 2 – Detailed site investigation, a Contaminated Land Management Plan would be prepared in accordance with the Contaminated Land Act 1997 and relevant EPA Guidelines as part of the CEMP and would include:</p> <ul style="list-style-type: none"> • Outline of occupational health and safety measures • Contamination management measures. • Incident reporting in according with the RMS Environmental Incident Management Procedure. • Identification of rehabilitation requirements, classification, transport and disposal requirements of any contaminated land within the construction footprint. 	Roads and Maritime	Detailed design

No.	Impacts	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> In the event that indications of contamination are encountered (known and unexpected, such as odorous or visually contaminated materials), work in the area would cease until a contamination assessment can be prepared to advise on the need for remediation or other action, as deemed appropriate 		
TT1	Construction traffic impacts	<p>A Traffic Management Plan (TMP) would be prepared as part of the CEMP. The TMP would be prepared in accordance with Traffic Control at Worksites (Roads and Maritime 2010), Australian Standard AS1742 and the worksite manual Roads and Maritime Specification G10.</p> <p>The TMP would outline:</p> <ul style="list-style-type: none"> Traffic controls to manage and regulate traffic movements, including minimising traffic switching Maintenance of continuous, safe and efficient movement of traffic for both the public and construction workers Haulage routes/access arrangements to minimise impacts on local routes Temporary speed restrictions to ensure a safe driving environment around work zones Access provisions for local roads and properties, including the use of temporary turn-around bays Maintenance of pedestrian and cyclist access Provision of appropriate warning and advisory signposting Requirements and methods to consult and inform the local community of impacts on the local road network and traffic Measures to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic caused by other developments 	Construction contractor	Pre-construction
TT2	Access	<p>Vehicular property access would be maintained where possible including pre-schools, places of worship and commercial premises. If driveway access cannot be maintained the resident would be consulted.</p>	Construction contractor	Construction

No.	Impacts	Environmental safeguards	Responsibility	Timing
TT3	Access	Road users, pedestrians and cyclists would be informed of changed conditions, including likely disruptions to access during construction	Construction contractor	Construction
TT4	Temporary impacts on bus services	Access to bus stops and safe stopping locations would be maintained during construction in consultation with bus operators. Ongoing updates on locations and access to bus stops would be provided to the community during the construction period to minimise disruption.	Roads and Maritime and construction contractor	Construction
NV1	Construction noise and vibration	<p>A Construction Noise and Vibration Management Plan (CNVMP) in accordance with OEHL/EPA's Interim Construction Noise Guideline (DECCW 2009) would be prepared as part of the CEMP. This plan would detail the mitigation, monitoring and community liaison measures and would include but not be limited to:</p> <ul style="list-style-type: none"> • Identification of potentially affected properties and residences (including a detailed map) • A map indicating the locations of likely potential impacts • A risk assessment to determine potential risk for activities likely to affect residents • Mitigation measures to reduce excessive noise during construction activities including those associated with truck movements • A process for assessing the performance of the implemented mitigation measures • A process for identifying management measures for highly noise affected receivers including consultation with affected residences • A process for resolving issues and complaints 	Construction contractor	Pre-construction
NV2	Construction noise and vibration	<p>A vibration assessment is to be prepared and included in the NVMP. The vibration assessment is to include (as a minimum):</p> <p>Identification of potentially affected properties/receivers</p> <ul style="list-style-type: none"> • A risk assessment to determine the potential for discrete work activities to affect receivers 	Construction contractor	Pre-construction

No.	Impacts	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> • A map indicating the locations considered likely to be impacted and those requiring building condition surveys • Outline a monitoring program • A process for assessing the performance of the implemented mitigation measures • A process for resolving issues and conflicts. 		
NV3	Construction noise and vibration	Works would be carried out during standard working hours (ie 7am – 6pm Monday to Friday, 8am –1pm Saturdays). Any work that is performed outside normal work hours or on a Sunday or public holiday is to minimise noise impacts in accordance with Roads and Maritime’s Environmental Noise Management Manual Practice Note 7 – Roadworks Outside of Normal Working Hours (RTA 2001) and the Interim Construction Noise Guidelines (DECC 2009).	Construction contractor	Construction
NV4	Construction noise and vibration	Where feasible, and particularly in areas in close proximity to sensitive receivers, noise and vibration generating activities with impulsive, tonal or low frequency characteristics (such as jack hammering, rock breaking, rock hammering, vibratory rolling) would only be carried out: <ul style="list-style-type: none"> • in continuous blocks, up to but not exceeding 3 hours each; and • with a minimum respite period of one hour between each block 	Construction contractor	Construction
NV5	Construction noise and vibration	Where vibration is found to exceed project criteria, management measures would be implemented to control vibration. In terms of human comfort criteria, measures would include modifications of construction methods and respite periods. For potential structural damage impacts, modification of construction methods or equipment would be necessary.	Construction contractor	Construction
NV6	Construction vibration	The CNVMP would include an assessment of the structures such as buildings that need building condition surveys.	Construction contractor	Construction
NV7	Construction noise	Simultaneous operation of noisy plant within the discernible range of a sensitive receiver would be limited/ avoided where possible	Construction contractor	Construction

No.	Impacts	Environmental safeguards	Responsibility	Timing
NV8	Construction noise	Noise-emitting plant would be directed away from sensitive receivers where possible	Construction contractor	Construction
NV9	Construction noise	Non-tonal reversing beepers (or an equivalent mechanism) would be fitted and used on all construction vehicles and mobile plant regularly used on site for periods of over two months.	Construction contractor	Construction
NV10	Construction vibration	Vibration testing of actual equipment on site would be carried out prior to their commencement of operation to determine acceptable buffer distances to the nearest affected receiver locations	Construction contractor	Pre-construction and construction
NV11	Construction vibration	Building condition surveys would be undertaken for buildings identified in the NVMP. A copy of the report would be sent to the landholder	Roads and Maritime	Pre-construction
NV12	Construction noise and vibration	All employees, contractors and subcontractors would receive a project induction which would include: <ul style="list-style-type: none"> • all relevant project specific and standard noise vibration mitigation measures; • relevant license 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); and • environmental incident procedures. 	Construction contractor	Construction
NV13	Operational noise	During the detailed design stage of the proposal, further investigations of all feasible and reasonable mitigation options would be undertaken for affected receivers in accordance with the Road Noise Policy (DECCW 2011) and RTA's Environmental Noise Management Manual Practice Note 4 (RTA 2001).	Roads and Maritime	Detailed design
NV14	Operational noise	A post-construction noise monitoring program (including simultaneous traffic counts) would be undertaken in	Roads and Maritime	Post-construction

No.	Impacts	Environmental safeguards	Responsibility	Timing
		accordance with the RMS Environmental Noise Management Manual within 6 to 12 months of opening once traffic flows have stabilised in order to verify the noise assessment.		
NV15	Early works noise and vibration	<ul style="list-style-type: none"> The NSW Roads and Maritime Services Construction Noise and Vibration Guideline (April 2016) 'standard mitigation measures' will be adopted for all proposed construction works. Work activities and heavy vehicle movement will be scheduled for standard hours as much as possible to minimise sleep disturbance. Out of hours works will not be scheduled for more than two consecutive nights to allow respite to nearby residences. Additional noise mitigation measures will be applied where there are still exceedances of the NMLs after the 'standard mitigation measures' have been applied. These will be implemented in accordance with the flowchart outlined in Figure 2 and Appendix E of the Early Works Acoustic Assessment. 	Contractor	Pre-construction and construction
NV16	Construction noise and vibration	<ul style="list-style-type: none"> The NSW Roads and Maritime Services Construction Noise and Vibration Guideline (April 2016) 'standard mitigation measures' will be adopted for all proposed construction works. Additional noise mitigation measures will be implemented in accordance with Figure 4 and Appendix I of the Acoustic Addendum Report if there are still exceedances of the NMLs after application of the standard mitigation measures. Prior to the commencement of site establishment all potentially impacted receivers identified in Appendix I of the Acoustic Addendum Report will be notified to advise that noise from the works may at times be audible. Attended vibration monitoring will be undertaken to determine site specific minimum working distances for structural damage and human response. Further attended vibration monitoring will be conducted whenever significant vibration generating plant items are operating close to or within the determined minimum working 	Contractor	Pre-construction and construction

No.	Impacts	Environmental safeguards	Responsibility	Timing
		<p>distances. Locations for vibration monitoring during particular works will be determined by the construction contractor.</p> <ul style="list-style-type: none"> • The additional vibration mitigation measures outlined in Table 27 of the Acoustic Addendum Report will be applied when predicted vibration levels at receivers exceed the criteria for human comfort after the appropriate standard mitigation measures have been applied. • All receivers within 100m of works will be notified of potential vibration impacts. Prior to the commencement of work, receivers around the site will also be notified to advise that vibration from the works may be perceptible. • All potentially impacted noise and vibration receivers will be kept informed of the nature of the works to be carried out, the expected noise and vibration levels and duration and well as being given appropriate enquiries and complaints contact details. • A management procedure will be put in place to deal with noise and vibration complaints that may arise from construction works. Each complaint will be investigated and appropriate noise and/or vibration amelioration measures be put in place to mitigate further occurrences, where the noise and/or vibration in question exceeds allowable limits. • A Construction Noise and Vibration Management Plan (CNVMP) in accordance with OEH/EPA's Interim Construction Noise Guideline (DECCW 2009) would be prepared as part of the Construction Environmental Management Plan (CEMP) • Potentially affected receivers would be notified of any start of work via a letterbox drop. The notification would include details of the proposed work, location, type of work, days and dates of work and hours involved. A contact phone number would be provided to manage complaints. • Work hours will be generally carried out during standard construction hours (i.e. 7.00am to 6.00pm Monday – Friday; 8.00am to 1.00pm on Saturdays; no work to be carried out during Sundays or public holidays) where it is possible to carry 		

No.	Impacts	Environmental safeguards	Responsibility	Timing
		<p>out work without major impacts on the local road network. Any work that is performed outside normal working hours or on Sundays and public holiday, will be carried out in accordance with Practice Note 7 in the Roads and Maritime's Environmental Noise Management Manual (RTA, 2001) and Roads and Maritime's Environmental Fact Sheet No. 2 – Noise Management and Night Work (RTA, undated)</p> <ul style="list-style-type: none"> • Where predicted and/or measured construction noise levels exceed the Noise Management Level (NML), all feasible and reasonable work practices will be applied to meet the management levels. · Carrying out the noisiest activities during standard construction hours. • Allowing adequate respite periods during noise intensive work. · Using alternatives to reversing alarms, such as ambient noise sensitive or 'quacker' type reversing alarms. • Turning off equipment when not in use. · Ensuring equipment is regularly maintained and repair/replace equipment that becomes noisy. • Throughout each construction activity, locating stationary plant items as far from receivers as possible. • Choosing mobile equipment that includes exhaust silencers or residential class mufflers. • Communicating with construction workers via toolbox talks about minimising noise, including the use of equipment, avoidance of shouting, loud talking and door slamming. 		
NV17	Operational noise and vibration	Acoustic property treatments, as outlined in Section 6.2.5 (2019 Addendum REF)	Roads and Maritime	Pre-construction and construction
FF1	Impacts on threatened species	<p>A Biodiversity Management Plan would be prepared and included within the CEMP. The BMP would include but not be limited to the following:</p> <ul style="list-style-type: none"> • A map clearly showing vegetation clearing boundaries and no-go zones 	Roads and Maritime and construction contractor	Pre-construction

No.	Impacts	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> • A site walk-over with the site personnel including RMS representatives to confirm clearing boundaries before the start of work • Identification (marking) of the clearing boundary and identification (marking) of habitat features to be protected. Eg. – use of flagging tape • A procedure for a suitably qualified ecologist to undertake pre-clearing surveys immediately before vegetation removal. Target species would include threatened microbats • Management measures identified as a result of the preclearing survey report, with actions to respond to the recommendations made • Incorporation of management measures identified as a result of the pre-clearing survey report, completed by an ecologist, (G40, section 2.4) and nomination of actions to respond to the recommendations made. This should include details of measures to be implemented to protect clearing limits and no go areas • A detailed clearing process in accordance with RMS Biodiversity Guidelines (2011) including requirements of Guide 1,2, 4 & 9. • Identify in toolbox talks where biodiversity would be included such as vegetation clearing or works in or adjacent to sensitive locations • Identify control/mitigations measures to prevent impacts on sensitive locations or no go zones • A stop works procedure in the event of identification of unidentified species, habitats or populations • A requirement that culverts be checked for roosting microbats by a suitably qualified ecologist with experience in microbat survey prior to construction. In the event microbats are found, a microbat management plan would be developed • A requirement that culvert work and vegetation removal be carried out outside of summer, if possible (the breeding season of most threatened microbats that could be roosting on site) 		

No.	Impacts	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> • A procedure for clearing potential habitat, including hollow-bearing trees in accordance with Roads and Maritime' Specification G40. An experienced, licensed wildlife carer or ecologist would be present to supervise vegetation clearing and capture then relocate fauna if required. Fauna handling and vegetation removal would be in accordance with Roads and Maritime' Biodiversity Guidelines 2011. An experienced, licensed wildlife carer or ecologist would be notified or be on call to supervise vegetation clearing and capture then relocate fauna if required. Fauna handling would be in accordance with Roads and Maritime' Biodiversity Guidelines 2011 – Guide 9. • Protocols to prevent the introduction or spread of pathogens (e.g. chytrid fungus and Phytophthora) in accordance with Roads and Maritime' Biodiversity Guidelines 2011 – Guide 7. • Provision of education to all personnel taking part in construction activities with regards to the importance of clearing limits, land uses and threatened species and communities and their legislative responsibilities. 		
FF2	Impacts on threatened species	If unexpected threatened flora or fauna are discovered, work would stop immediately and RMS' Unexpected Threatened Species Find Procedure in its Biodiversity Guidelines 2011 would be implemented.	Roads and Maritime and construction contractor	Construction
FF3	Impacts on threatened species	The design would be reviewed during the detailed design stage to determine whether it is possible to retain the hollow bearing tree near the unnamed drainage line.	Roads and Maritime and designer	Detailed design
FF4	Impacts on riparian areas	Riparian areas disturbed by the proposal would be rehabilitated as soon as practicable	Roads and Maritime and construction contractor	Pre-construction
FF5	Impacts on the aquatic environment	Creek bank stabilisation would be installed before and during the creek realignment work to minimise bank erosion, topsoil loss and sedimentation of the waterway	Roads and Maritime and construction contractor	Construction

No.	Impacts	Environmental safeguards	Responsibility	Timing
FF6	Impacts on the aquatic environment	Appropriate erosion and sediment controls would be established throughout the proposal site, including at creek crossings, and water quality monitoring would occur throughout construction.	Roads and Maritime and construction contractor	Construction
FF7	Impacts on the aquatic environment	Fish passage would be maintained at all times. If required, water would be pumped to maintain flow at all times in the event of low flow ponding during creek works.	Construction contractor	Construction
FF8	Impacts on the aquatic environment	Temporary waterway diversions would be scheduled during periods of predicted low flow to minimise impacts.	Roads and Maritime and construction contractor	Construction
FF9	Impacts on the aquatic environment	DPI (Fisheries) would be notified of reclamation/dredging work prior to construction. Consideration would be given to any response within 28 days of notification.	Roads and Maritime and construction contractor	Pre-construction
FF10	Weeds and pathogens	<p>Actions for weed management would be developed as part of the Vegetation Management Plan in accordance with the requirements of Roads and Maritime' Specification G36 and Specification G40. The plan would include, but not be limited to the following measures:</p> <ul style="list-style-type: none"> • The identification of the type and location of weeds of concern (including noxious weeds) within the proposal area • The identification of sensitive receivers (such as native vegetation and waterways) within or near the proposal area • Measures to prevent the spread of weeds and fungi, including hygiene procedures for equipment, footwear and clothing • A requirement that weeds (including Declared noxious weeds) be managed and disposed of in accordance with requirements of the Noxious Weeds Act 1993 and Roads and Maritime' Biodiversity Guidelines 2011 – Guide 6 • Communication strategies to improve contractor awareness of weeds and weed management. 	Roads and Maritime and construction contractor	Pre-construction
FF11	Weeds and pathogens	Any application of herbicide for weed management would be carried out in accordance with the requirements of the Pesticides Act 1999 and herbicide that is appropriate to the sensitivity of the area would	Construction contractor	Pre-construction and construction

No.	Impacts	Environmental safeguards	Responsibility	Timing
		be used. Approval by RMS' Regional Environmental Officer would be obtained prior to use.		
FF12	Terrestrial and Aquatic Biodiversity	<ul style="list-style-type: none"> Disturbance to native vegetation within and/or adjacent to the study area will be minimised to the greatest extent practicable. Exclusion fencing will be established outside the tree protection zones and appropriate signage will identify the area as an 'Environmental No Go Area'. Areas adjacent to the CEEC and EECs will be revegetated to provide a vegetated buffer between the development and the TECs. Topsoil transportation within, into or out of the study area will be minimised to reduce the spread of weeds. Appropriate measures will be implemented to minimise the spread of four weeds of national significance and five priority weeds identified in the study area. The Sydney Water Policy Stormwater connections to natural waterways will be implemented and adhered to when connecting to Sydney water assets to minimise impacts to aquatic ecological values and water infrastructure. Stockpiling or storage of construction materials will occur in areas already cleared (such as the footpath) where possible. Appropriate erosion and sediment control measures will be installed at all sites to avoid sedimentation of receiving water bodies or other indirect impacts to surrounding biodiversity values. The removal of any substantial fallen hollow logs, if encountered, would not be permitted without pre-clearance checks by a qualified ecologist. Alternatives to avoid their removal would be promoted in the first instance, which may include relocating the excavations where possible. 	Construction contractor	Pre-construction and construction
FF13		<ul style="list-style-type: none"> Minimise to the fullest extent practicable disturbance to native vegetation within and/or adjacent to the study area. 	Construction contractor	Pre-construction and construction

No.	Impacts	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> • Establish exclusion fencing in areas containing critically endangered and endangered ecological communities, particularly the area adjacent to Strangers Creek south of Memorial Avenue and display appropriate signage for 'Environmental Protection Zones' where identified on Figure 3-1 to 3-4 of the Biodiversity Assessment (Appendix F). • Revegetation of areas adjacent to Critically Endangered Ecological Communities (CEECs) and Endangered Ecological Communities (EECs), namely the area adjacent to Strangers Creek south of Memorial Avenue, to provide a vegetated buffer between development and Threatened Ecological Communities (TECs). • Minimise top soil transportation within, into or out of the study area to reduce the spread of weeds. • Adherence to the Sydney Water Policy Stormwater connections to natural waterways, which provides guidance and management measures to be implemented when connecting to Sydney Water assets to minimise impacts to aquatic ecological values and water infrastructure. • Where possible, stockpiling or storage of construction materials should occur in areas already cleared, such as the footpath, to avoid unnecessary ground disturbance. • Appropriate erosion and sediment control measures should be installed at all sites to minimise sedimentation of receiving water bodies or other indirect impacts to surrounding biodiversity values. • The removal of any substantial fallen hollow logs, if encountered, would not be permitted without pre-clearance checks by a qualified ecologist. Alternatives to avoid their removal would be promoted in the first instance, which may include relocating the excavations where possible. 		
AH1	Impacts to known Aboriginal heritage sites	Aboriginal Heritage Management procedures would be included in the CEMP. These would include but not be limited to the following measures:	Roads and Maritime and construction contractor	Pre-construction and construction

No.	Impacts	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> The location of all Aboriginal sites within and adjacent to proposal area. These would be marked on relevant site plans An environmental risk assessment to determine potential risks for discrete work elements or activities that could affect Aboriginal heritage items Specific mitigation measures to avoid risk of harm or protect Aboriginal heritage Provisions for seeking further advice from an archaeologist should the proposed road design be altered in a manner that could impact the intact portion of site 455-2652 If intact AHIMS sites are within 25 m of the proposal area, these would be identified on construction plans and exclusion fencing and signage would be placed at the boundary of the proposal area at this location to prevent indirect or inadvertent impacts to the site A stop work procedure in the event of actual or suspected potential harm to a heritage feature/place Aboriginal heritage induction for workers so they are made aware of the location of sites and their responsibilities under the National Parks and Wildlife Act and any relevant permits. Induction would occur before work begins. 		
AH2	Possible disturbance to unknown Aboriginal heritage due to construction activities	<ul style="list-style-type: none"> In the event of an unexpected find of an Aboriginal heritage item (or suspected item), work would cease in the affected area and RMS' Regional Environmental Officer and Senior Environmental Specialist (Aboriginal heritage) would be contacted for advice on how to proceed. The RMS Unexpected Archaeological Finds Procedure (2011) would be implemented. No work would be permitted within environmental no-go zones. This would include vehicle access. All staff would be made aware of the no-go zones and their requirements and their legislative obligations. A site induction register would be maintained with the areas demarked in the field. 	Construction contractor	Pre-construction and construction

No.	Impacts	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> The site induction is to include the requirements of Roads and Maritime's unexpected finds procedure. 		
NH1	Impacts to known non-Aboriginal heritage items	Detailed design should seek to minimise changes to the form and alignment of Windsor Road and Old Windsor Road.	Roads and Maritime	Pre-construction
NH2	Impacts to known non-Aboriginal heritage items	Subsurface impacts to the fabric of Old Windsor Road would be avoided by the proposal. If sub-surface impacts are unavoidable, a section 139(4) exception notification would be required.	Roads and Maritime and construction contractor	Pre-construction and construction
NH3	Possible disturbance to unknown non-Aboriginal heritage due to construction activities	If potential archaeological relics or works associated with Old Windsor Road and Windsor Road are identified, the Roads and Maritime Services 'Unexpected Archaeological Finds Procedure 2012' would be implemented	Construction contractor	Construction
NH4	Impacts to known non-Aboriginal heritage items	The curtilage of the House at 9-11 Windsor Road would be avoided and the vibration management plan would be followed in relation to any potential vibration impacts to this property.	Roads and Maritime and construction contractor	Pre-construction and construction
AQ1	Dust	<p>An Air Quality Management plan (AQMP) would be prepared as part of the CEMP. The plan would include but not be limited to:</p> <ul style="list-style-type: none"> A map identifying locations of sensitive receivers Identification of potential risks/impacts due to the work/activities as dust generation activities Management measures to minimise risk including a progressive stabilisation plan A process for monitoring dust on site and weather conditions A process for altering management measures as required. 	Construction contractor	Pre-construction
AQ2	Dust and odour	To minimise or prevent air pollution and dust, loads that may produce dust or odour would be covered, and water would be sprayed on unsealed access roads and open areas during conditions conducive to dust generation.	Construction contractor	Construction
AQ3	Exhaust emissions	Construction equipment (including all internal combustion	Construction contractor	Construction

No.	Impacts	Environmental safeguards	Responsibility	Timing
		engines) would be properly maintained and running efficiently to ensure exhaust emissions are minimised, where practicable, and comply with the <i>Protection of Environment Operations Act 1997</i> .		
AQ4	Exhaust emissions	Machinery would be turned off when not in use.	Construction contractor	Construction
SE1	Impact on businesses and the community	A complaints handling register would be included in the CEMP.	Construction contractor	Pre-construction and construction
SE2	Impact on businesses and the community	Access would be maintained wherever possible. Prior to any temporary unavoidable disruption to access, consultation would be undertaken with the affected property owner/s.	Construction contractor	Pre-construction and construction
SE3	Impact on businesses and the community	Safe access to bus stops would be maintained at all times and bus companies would be advised before changes to traffic conditions.	Construction contractor	Pre-construction and construction
SE4	Impact on businesses and the community	Existing cyclist and pedestrian access along Windsor and Old Windsor Road would be maintained but may need to be altered during construction to ensure safety. Road users, pedestrians and cyclists would be informed of changed conditions, including likely disruptions to access during construction.	Construction contractor	Construction
SE5	Impact on businesses and the community	Residents would be utility services that utilities.	Construction contractor	Pre-construction and construction
SE6	Impact on businesses and the community	Community consultation would be carried out in accordance with Roads and Maritime's Community Involvement Practice Notes and Resource Manual (2012).	Roads and Maritime	Detailed design, pre-construction and construction
SE7	Impact on businesses	Temporary signage would be provided during construction to inform traffic of alternative access to the businesses along Windsor Road and Memorial Avenue.	Roads and Maritime and construction contractor	Pre-construction and construction
SE8	Impact on property owners due to land acquisition	Property acquisition would be managed in accordance with the provisions of Roads and Maritime's Land Acquisition Policy and the <i>Land Acquisition (Just Terms Compensation) Act 1991</i> .	Roads and Maritime	Pre-construction

No.	Impacts	Environmental safeguards	Responsibility	Timing
LC1	Landscape character and visual impacts	<p>The following would be considered during detailed design:</p> <ul style="list-style-type: none"> • The design of and materials to be used for retaining walls. For walls in fill situations, walls should be appropriate to future adjoining land uses. For example, in residential areas, walls would be a combination of split-faced and smooth-faced blockwork in a recessive colour. Gabion walls should be considered for rural or open space areas. • It is proposed to plant low shrub and groundcover planting to the base of the walls to reduce the walls visibility when viewed from the surrounding landscape • Roadside elements such as safety barriers, fencing, bus stops, street lighting, etc, are to be consistent with those used in other road upgrade projects within the North West Growth Centre • The design and location of the new bridge over Strangers Creek and associated earthworks should be designed to minimise impacts on the creek bed, banks and vegetation • The number and location of existing trees to be retained within verge areas and median would be confirmed following a detailed survey of the study area • Investigate alternative types and colours of paved surfaces to minimise visual impact 	Roads and Maritime	Detailed design
LC2	Landscape character and visual impacts	The landscape and urban design strategy for the proposal would be finalised during detailed design in consideration of design principles and objectives as described in Section 3.2 of the REF and Appendix J	Roads and Maritime	Detailed design
LC3	Landscape character and visual impacts	<p>During detailed design, the design including landscape plans are to incorporate the design principles outlined in the Landscape Character, Visual Impact Assessment and Urban Design Report. These include:</p> <ul style="list-style-type: none"> • To ensure that the design reinforces the identity and functionality of a transit boulevard road type • To ensure that existing land uses is considered and integrated in to the design of the road alignment 	Roads and Maritime	Detailed design

No.	Impacts	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> To contribute to the future urban planning of the adjoining development precincts including its transport and access needs To respond to natural patterns including creek lines and drainage corridors and vegetation communities. This includes the use of local plants consistent with the existing communities either side of the alignment in order to unify the crossing with the existing corridor, and, use of advance stock to escalate the re-vegetation where appropriate To provide a unified and consistent approach to the design of bridges along the corridor. The consideration of landscaping treatment to reduce the incidence of graffiti. To achieve an integrated, safe and minimal maintenance design. 		
LC4	Landscape character and visual impacts	During detailed design, the landscape design principles and streetscape (planting) would be reviewed to ensure that they are consistent with the outcomes of the biodiversity assessment. This would be done in consultation with RMS environment staff.	Roads and Maritime	Detailed design
LC5	Landscape character and visual impacts	If cut-off drains or swales are required as a permanent fixture, their location, size and treatment would be finalised during detailed design so that they blend into the landform and landscape character.	Roads and Maritime	Detailed design
CG1	Climate change	Design would consider the potential effects of climate change on the proposal, including drainage requirements.	Roads and Maritime	Detailed design
CG2	Energy efficiency	The selection process for vehicle and plant would consider energy efficiency and related carbon emissions	Construction contractor	Pre-construction and construction
CG3	Energy efficiency	Equipment would be operating efficiently.	Construction contractor	Construction
CG4	Energy efficiency	Machinery would be operated efficiently to ensure optimal performance, minimise down time and improve fuel efficiency.	Construction contractor	Construction

No.	Impacts	Environmental safeguards	Responsibility	Timing
WM1	Increases in production of waste materials	<p>A Resource and Waste Management Plan (RWPM) would be developed as a component of the CEMP, which would include:</p> <ul style="list-style-type: none"> • The type and volume of all materials • Destinations for each resource/waste type either for on-site reuse or recycling, off-site reuse or recycling, or disposal at a licensed waste facility • Quantity and classification of excavated material generated as a result of the proposal • Disposal strategies for each type of material • Details of how waste would be stored and treated on site • Identification of all non-recyclable waste • Identification of strategies to 'avoid', 'reduce', 're-use', and 'recycle' • Identification of available recycling facilities on and off site • Identification of suitable methods and routes to transport waste • Procedures and disposal arrangements for unsuitable excavated material or contaminated material • Site clean-up for each stage. 	Construction contractor	Pre-construction and construction
WM2	Increases in production of waste materials	Waste management measures developed in accordance with the waste hierarchy established under the WARR Act for the proposal would be included in the CEMP.	Construction contractor	Pre-construction and construction
WM3	Increases in production of waste materials	Training in waste management principles would be included in site inductions for the workforce.	Construction contractor	Pre-construction and construction
WM4	Increases in production of waste materials	Types of waste collected, amounts, date/time and details of disposal shall be recorded in a waste register.	Construction contractor	Pre-construction and construction
WM5	Sourcing of recycled materials	Roads and Maritime contractors would be required to propose recycled-content materials where they are cost and performance competitive.	Construction contractor	Construction

No.	Impacts	Environmental safeguards	Responsibility	Timing
WM6	Reuse and recycling of materials	Workspaces would be maintained, kept free of rubbish and cleaned up at the end of each working day.	Construction contractor	Construction
WM7	Waste disposal	Solid and liquid wastes, as well as fuels, lubricants and chemical containers would be disposed of in accordance with OEH requirements.	Construction contractor	Construction
WM8	Waste disposal	Suitable waste disposal locations would be identified and used to dispose of litter and other wastes on-site. Suitable containers would be provided for waste collection.	Construction contractor	Construction
WM9	Waste disposal	Material identified for recycling would be stockpiled in an adequately bunded area (in accordance with the Roads and Maritime Stockpile Site Management Guidelines, 2011)	Construction contractor	Construction
WM10	Waste disposal	Fuel and chemical storage areas sized and imperviously bunded.	Construction contractor	Construction
WM11	Procurement	Procurement would endeavour to use materials and products with a recycled content and low carbon footprint where it is cost and performance effective to do so	Construction contractor	Pre-construction and construction
WM12	Waste management	All wastes would be managed in accordance with the Protection of the Environment Operations Act 1997.	Construction contractor	Construction
WM13	Waste management	A dedicated concrete washout facility would be provided during construction so that runoff from the washing of concrete machinery and equipment could be collected and disposed of at an appropriate waste facility.	Construction contractor	Construction
CU1	Cumulative impact during construction	Cumulative impact would be considered in the CEMP, addressing any cumulative traffic, noise and vibration and	Contractor	Pre-construction and construction
CU2	Cumulative impact during construction	Work would be staged to minimise impact along the entire length of the proposal area, where possible.	Contractor	Construction
CU3	Cumulative impact during construction	Cumulative impact management measures within the CEMP would be reviewed in response to any complaints received	Contractor	Construction

7.3 Licensing and approvals

All relevant licenses, permits, notifications and approvals needed for the project and when they need to be obtained are identified in the project REF and subsequent Addendum REFs.

The 2019 Consistency Review established that the length of the project is 2,970 metres for the purposes of clause 35 of Schedule 1 to the *Protection of the Environment Operations Act 1997* and noted that an Environment Protection Licence would not be required. The proposed modification does not change this position.

No additional or changed licenses and approval requirements have been identified for the proposed modification.

8 Conclusion

8.1 Justification

The proposed modification is needed for additional stockpiling capacity at western extent of the upgrade project. There are a limited number of suitable areas for stockpiling immediately adjacent to Memorial Avenue that have not been already used or previously considered.

While there are environmental impacts associated with the proposed modification, they are minor, temporary and are addressed through the existing safeguards and management measures. The most affected receivers have also raised no objection to the proposed modification.

The benefits of the proposed modification are considered to outweigh the adverse impacts and risks.

8.2 Objectives of the EP&A Act

Table 8-1 reviews the consistency of the proposal with the objects of the EP&A Act.

Table 8-1: Objects of the EP&A Act

Environmental factor	Construction
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.	Not directly relevant to the proposed modification.
1.3(b) To facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment.	The principles of ecological sustainable development are considered in Section 8.2.1.
1.3(c) To promote the orderly and economic use and development of land.	Not directly relevant to the proposed modification.
1.3(d) To promote the delivery and maintenance of affordable housing.	Not directly relevant to the proposed modification.
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.	The potential environmental impacts of the proposed modification have been assessed. Existing safeguards and management measures are considered adequate.
1.3(f) To promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage).	The proposed modification would have no heritage impacts. Drafting note: To confirm with TfNSW ACHO re Aboriginal heritage
1.3(g) To promote good design and amenity of the built environment.	Not relevant to the proposed modification.
1.3(h) To promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants.	Not directly relevant to the proposed modification.

Environmental factor	Construction
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 directly relevant to the proposed modification.
1.3(j) To provide increased opportunity for community participation in environmental planning and assessment.	Broad community consultation was not considered necessary for the proposed modification.

8.2.1 Ecologically sustainable development

Ecologically sustainable development (ESD) is development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends. The principles of ESD have been an integral consideration throughout the development of the proposal.

ESD requires the effective integration of economic and environmental considerations in decision-making processes. The four main principles supporting the achievement of ESD are discussed below.

The precautionary principle

The precautionary principle deals with certainty in decision-making. It provides that where there is a threat of serious or irreversible environmental damage, the absence of full scientific certainty should not be used as a reason to postpone measures to prevent environmental degradation.

The precautionary principle has guided the assessment of environmental impacts for this assessment and the development of mitigation measures.

8.2.2 Intergeneration equity

Social equity is concerned with the distribution of economic, social and environmental costs and benefits. Inter-generational equity introduces a temporal element with a focus on minimising the distribution of costs to future generations.

The impacts of the proposed modification are short term and manageable.

8.2.3 Conservation of biological diversity and ecological integrity

The twin principles of biodiversity conservation and ecological integrity have been a consideration during the design and assessment process with a view to identifying, avoiding, minimising and mitigating impacts.

The proposed modification would not have biodiversity impacts.

8.2.4 Improved valuation, pricing and incentive mechanisms

The principle of internalising environmental costs into decision making requires consideration of all environmental resources which may be affected by a project, including air, water, land and living things.

While it is often difficult to place a reliable monetary value on the residual, environmental and social effects of the proposed modification, the value placed on environmental resources within and around the corridor is evident in the extent of environmental investigations, planning and design of impact mitigation measures to prevent adverse environmental impacts.

8.3 Conclusion

The proposed modification is subject to assessment under Division 5.1 of the EP&A Act. The 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 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.

The proposed modification is aligned with the project objectives but would still result in some minor impacts. Safeguards and management measures as detailed in the project REF and previous addendums would ameliorate or minimise these expected impacts. The proposed modification would shorten the overall period of works and the associated period of impacts, including noise impacts. On balance the proposed modification is considered justified, and the following conclusions are made.

8.3.1 Significance of impact under NSW legislation

The proposed modification 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 and Public Spaces 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 Council is not required.

8.3.2 Significance of impact under Australian legislation

The proposed modification is not likely to have a significant impact on matters of national environmental significance or the environment of Commonwealth land within the meaning of the *Environment Protection and Biodiversity Conservation Act 1999*. A referral to the Australian Department of the Agriculture, Water and the Environment is not required.

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.



Stuart Hill

Environmental Planner

Hills Environmental

Date: 23.11.2021

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



Najib Wakili

Project Engineer

Transport for NSW

Date: 24/11/2021

10 References

Department of Planning. (1995). *Is an EIS required?* Sydney: Department of Planning.

Department of Urban Affairs and Planning. (1996). *Roads and Related Facilities EIS Guideline*. Sydney: Department of Urban Affairs and Planning.

Roads and Maritime Services. (2016). *Construction Noise and Vibration Guidelines*. Sydney: Roads and Maritime Services.

Terms and acronyms used in this REF

Term / Acronym	Description
BC Act	Biodiversity Conservation Act 2016 (NSW).
CEMP	Construction environmental management plan
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i> (NSW). Provides the legislative framework for land use planning and development assessment in NSW
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Commonwealth). Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process.
Heritage Act	Heritage Act 1977 (NSW)
ISEPP	State Environmental Planning Policy (Infrastructure) 2007
LEP	Local Environmental Plan. A type of planning instrument made under Part 3 of the EP&A Act.
NPW Act	National Parks and Wildlife Act 1974 (NSW)
SEPP	State Environmental Planning Policy. A type of planning instrument made under Part 3 of the EP&A Act.
QA Specifications	Specifications developed by Roads and Maritime Services for use with road work and bridge work contracts let by Roads and Maritime Services.

Appendix A

Consideration of clause 228(2) factors and matters of national environmental significance and Commonwealth land

Clause 228(2) Checklist

In addition to the requirements of the Is an EIS required? guideline (DUAP 1995/1996) and the Roads and Related Facilities EIS Guideline (DUAP 1996) as detailed in the REF, the following factors, listed in clause 228(2) of the Environmental Planning and Assessment Regulation 2000, have also been considered to assess the likely impacts of the proposal on the natural and built environment.

Factor	Impact
a) Any environmental impact on a community? The incremental impact of the proposed modification on the community would be minor.	Short-term minor negative
b) Any transformation of a locality? The proposed modification would not transform a locality.	Nil
c) Any environmental impact on the ecosystems of the locality? The proposal would have no impact on ecosystems.	Nil
d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality? The proposed modification would have minor visual impacts. There would be some short-term noise impacts associated. The operation of plant at the stockpile site.	Short-term minor negative
e) 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 not affect Aboriginal or non-Aboriginal heritage.	Nil
f) Any impact on the habitat of protected fauna (within the meaning of the <i>National Parks and Wildlife Act 1974</i>)? There would be no impact on habitat for native species.	Nil
g) 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 animals, plants or other forms of life.	Nil
h) Any long-term effects on the environment? Impacts of the proposed modification would be short-term.	Nil
j) Any risk to the safety of the environment? The proposed modification does not represent a risk to the safety of the environment.	Nil
k) Any reduction in the range of beneficial uses of the environment? The proposed modification would not reduce the range of beneficial uses of the environment.	Nil
l) Any pollution of the environment? No pollution of the environment would result from the proposed modification.	Nil
m) Any environmental problems associated with the disposal of waste? No environmental problems are anticipated for the disposal of waste. The proposed modification would not change waste volumes or types.	Nil

Factor	Impact
<p>n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply?</p> <p>The proposed modification would not increase demand for resources, which are, or are likely to become, in short supply.</p>	Nil
<p>o) Any cumulative environmental effect with other existing or likely future activities?</p> <p>The proposed modification is not expected to have cumulative impacts due to its small scale and location near the existing construction site.</p>	Nil
<p>p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions?</p> <p>The proposed modification would not influence coastal processes and/or coastal hazards.</p>	Nil

Matters of National Environmental Significance and Commonwealth land

Under the environmental assessment provisions of the EPBC Act 1999, the following matters of national environmental significance and impacts on Commonwealth land are required to be considered to assist in determining whether the proposal should be referred to the Australian Government Department of Agriculture, Water and the Environment.

A referral is not required for proposed actions that may affect nationally listed threatened species, endangered ecological communities and migratory species. Impacts on these matters are still assessed as part of the REF in accordance with Australian Government significant impact criteria and taking into account relevant guidelines and policies.

Factor	Impact
a) Any impact on a World Heritage property? The proposed modification would not have any impact on a World Heritage property.	Nil
b) Any impact on a National Heritage place? The proposed modification would not have any impact on a National Heritage Place.	Nil
c) Any impact on a wetland of international importance? The proposed modification would not affect a wetland of international importance.	Nil
d) Any impact on a listed threatened species or communities? Some Commonwealth listed threatened species have the potential to occur in the local area. The proposed modification would have no impact on these species.	Nil
e) Any impacts on listed migratory species? Some Commonwealth listed migratory species have the potential to occur in the local area. The proposed modification would have no impact on these species.	Nil
f) Any impact on a Commonwealth marine area? The proposed modification would not have any impact on a Commonwealth marine area.	Nil
g) Does the proposal involve a nuclear action (including uranium mining)? The proposed modification does not involve a nuclear action.	Nil
h) Additionally, any impact (direct or indirect) on the environment of Commonwealth land? The proposed modification would not impact Commonwealth land.	Nil

Appendix B

Statutory consultation checklists

Certain development types

Development type	Description	Yes / No	If 'yes' consult with	ISEPP clause
Car Park	Does the project include a car park intended for the use by commuters using regular bus services?	No		ISEPP cl. 95A
Bus Depots	Does the project propose a bus depot?	No		ISEPP cl. 95A
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		ISEPP cl. 95A

Development within the coastal zone

Development type	Description	Yes / No	If 'yes' consult with	ISEPP clause
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?	No		ISEPP cl. 15A

Council related infrastructure or services

Development type	Description	Yes / No	If 'yes' consult with	ISEPP clause
Stormwater	Are the works likely to have a substantial impact on the stormwater management services which are provided by council?	No		ISEPP cl.13(1)(a)
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		ISEPP cl.13(1)(b)
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		ISEPP cl.13(1)(c)

Development type	Description	Yes / No	If 'yes' consult with	ISEPP clause
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		ISEPP cl.13(1)(d)
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		ISEPP cl.13(1)(e)
Road & 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		ISEPP cl.13(1)(f)

Local heritage items

Development type	Description	Yes / No	If 'yes' consult with	ISEPP clause
Local heritage	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? 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?	No		ISEPP cl.14

Flood liable land

Development type	Description	Yes / No	If 'yes' consult with	ISEPP clause
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 (the site not identified as within a flood planning area under The Hills 2019 LEP)		ISEPP cl.15

Development type	Description	Yes / No	If 'yes' consult with	ISEPP clause
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 (the site not identified as within a flood planning area under The Hills 2019 LEP)	State Emergency Service	ISEPP cl.15AA

Public authorities other than councils

Development type	Description	Yes / No	If 'yes' consult with	ISEPP clause
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	Office of Environment and Heritage	ISEPP cl.16(2)(a)
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	Office of Environment and Heritage	ISEPP cl.16(2)(b)
Aquatic reserves	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	ISEPP cl.16(2)(c)
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	ISEPP cl.16(2)(d)
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	ISEPP cl.16(2)(f)
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	ISEPP cl.16(2)(g)

Development type	Description	Yes / No	If 'yes' consult with	ISEPP clause
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 clause 5.15 of Lockhardt LEP 2012, Narrandera LEP 2013 and Urana LEP 2011.	No	Secretary of the Commonwealth Department of Defence	ISEPP cl.16(2)(h)
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	ISEPP cl.16(2)(i)

Appendix C

Aboriginal cultural heritage advice

Project Number : P.0062004.05.002.006

Project Manager
Mark Jajou
Transport for NSW

Dear Mark Jajou

Preliminary assessment results for Investigation works at Memorial Avenue Upgrade on Stage 1 of the *Procedure for Aboriginal cultural heritage consultation and investigation (the procedure)*.

The project, as described in the Stage 1 assessment checklist (see attached), was assessed as being unlikely to have an impact on Aboriginal cultural heritage.

The assessment is based on the following due diligence considerations:

- The project is unlikely to harm known Aboriginal objects or places.
- The AHIMS search did not indicate moderate to high concentrations of Aboriginal objects or places in the study area.
- The study area does not contain landscape features that indicate the presence of Aboriginal objects, based on the Office of Environment and Heritage's *Due diligence Code of Practice for the Protection of Aboriginal objects in NSW* and the Transport for NSW procedure.
- The cultural heritage potential of the study area appears to be reduced due to past disturbance.
- There is an absence of sandstone rock outcrops likely to contain Aboriginal art.

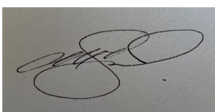
Your project may proceed in accordance with the environmental impact assessment process, as relevant, and all other relevant approvals.

If the scope of your project changes, you must contact me and your regional environmental staff Chris McBride 0447978380 to reassess any potential impacts on Aboriginal cultural heritage.

If any potential Aboriginal objects (including skeletal remains) are discovered during the course of the project, all works in the vicinity of the find must cease. Follow the steps outlined in the Transport for NSW *Unexpected Archaeological Finds Procedure*.

For further assistance in this matter do not hesitate to contact me.

Yours sincerely / faithfully



Chris McBride
Aboriginal Cultural Heritage Advisor – Greater Sydney



rms.nsw.gov.au/



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Customer feedback
Transport for NSW
Locked Bag 928,
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November 2021