M1 Princes Motorway Improvements, Picton Road to Bulli Tops
Stage 1 – Picton Road to Bellambi Creek
Submissions report

June 2017
**Approval and authorisation**

<table>
<thead>
<tr>
<th>Title</th>
<th>M1 Princes Motorway Improvements, Picton Road to Bulli Tops (Stage 1) submissions report</th>
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| Accepted on behalf of Roads and Maritime NSW by | Julian Watson  
Project Development Manager |
| Signed | [Signature] |
| Dated | 29 May 2017 |
Executive summary

Background

Roads and Maritime Services proposes to upgrade the M1 Princes Motorway (previously Mount Ousley Road) for 8.3 kilometres, between Picton Road at Mount Ousley and Bulli Pass at Bulli Tops. The upgrade involves road widening and realignment of the M1 Princes Motorway from a four lane divided road (two lanes in each direction), to a six lane divided road (three lanes in each direction). This project is jointly funded by the Australian ($42 million) and the New South Wales ($43 million) governments.

Purpose of this report

This report relates to submissions received by Roads and Maritime in response to the Review of Environmental Factors (REF) prepared for the M1 Princes Motorway Improvements, Picton Road to Bulli Tops (Stage 1 – Picton Road to Bellambi Creek).

The REF document is available on www.rms.nsw.gov.au/m1improvements and was placed on public display between December 2016 and February 2017. This report summarises the issues and questions raised by submissions and provides responses to each issue (see Chapter 2). It also identifies new or revised environmental management measures (see Chapter 3) as a result of these submissions.

Key issues raised

A total of 11 submissions were received in response to the REF display. This included submissions from five government agencies, Endeavour Energy, one bus company and four from members of the community. Of the submissions received, one was supportive of the proposal, one objected and all other submissions did not offer a position.

The main issues raised, and Roads and Maritime’s responses are summarised below (see Chapter 2 for all issues raised).

Options development, assessment and justification

Concerns were raised that the options selection process was insufficiently presented and that the options assessment process, the methodology used and the justification for the project in general were insufficiently described.

An Options Analysis Report (Appendix A) has been prepared to better outline the options development and assessment process, and the assessment methodology used to develop the preferred option.

Biodiversity impacts and safeguards

Coastal Upland Swamps

Concerns were raised that the level of impact the proposal has on Coastal Upland Swamps was not correctly assessed.

A specialist biodiversity assessment has been carried out in accordance with relevant legislation, polices and guidelines. The proposal would impact 2.27 hectares of Coastal Uplands Swamp endangered ecological community (EEC); however there are 53.59 hectares of adjoining Coastal Upland Swamp EEC not impacted by the proposal. In addition, none of the impacted Coastal Upland Swamps were determined to be swamps of special significance. This has been assessed in accordance with Draft Upland Swamp Environmental Assessment Guidelines (OEH, 2013) which determined the proposal would not result in a significant impact on Upland Coastal Swamps.
Fish Passage

The design of stream crossings is of particular interest to the DPI (Fisheries) due to the issues associated with maintaining fish passage. As a result, the Department has requested further consultation when the detailed designs of these crossing extensions is being carried out.

Roads and Maritime would consult with DPI (Fisheries) regarding the design of crossing extensions.

Biodiversity Offsetting

The Office of Environment and Heritage (OEH) requested that a biodiversity offset strategy (BOS) be prepared in accordance with the NSW BioBanking Assessment Methodology (BBAM). WaterNSW also requested that all biodiversity offsets be located within Cataract catchment.

Roads and Maritime would prepare a Biodiversity Offset Strategy in accordance with the Roads and Maritime Guideline for Biodiversity Offsets (Nov 2016), noting the challenge of obtaining suitable land within the Cataract catchment. Roads and Maritime would continue to consult with WaterNSW on the matter.

Groundwater

Questions were raised by a respondent that statements within the groundwater assessment on Coastal Upland Swamps regarding the reliance on aquifers and lateral flow were incorrect. The requirement to carry out a groundwater monitoring program and commit to remedial actions was also advised.

A hydrological assessment was carried out in accordance with relevant legislation, polices and guidelines. The assessment determined that the proposal would not result in any impacts on the regional groundwater systems and would not result in draining of Coastal Upland Swamps. The proposal is not anticipated to have any effects on adjoining swamps to the east or downgradient of the proposal or to the west of the existing roads. This indicates groundwater flow to lower altitudes has been considered and as such there is unlikely to be indirect impacts on the swamps at lower altitudes.

Roads and Maritime would work with OEH on the post-construction groundwater monitoring requirement near the Coastal Upland Swamps. Appropriate remedial measures would be developed and implemented where impacts on groundwater is identified. Roads and Maritime would also consider, adopting swamp monitoring regimes suggested in the Addendum to NSW Biodiversity Offsets Policy for Major Projects (Upland swamps impacted by longwall mining subsidence)(Dec 2016).

Eastern Pygmy Possums

Concerns were raised that the assessment carried out on impacts to Eastern Pygmy Possums was incorrect and that the conclusions made regarding significant impact were not appropriate.

Targeted surveys for Eastern Pygmy-possums were carried out in accordance with the Draft Threatened Biodiversity Survey and Assessment Guidelines (DEC, 2004). Only one sub-adult individual was found within the study area, indicating the potential for a viable low-density population. Roads and Maritime’s experienced specialist consultants concluded that, considering the wider population and habitat, combined with appropriate mitigation measures, the impacts would not be considered significant. An assessment of significance under Part 5 of the Environmental Planning and Assessment Act 1979 (EP&A Act) determined that the impacts of the proposal would not be significant.
Soil and Water quality impacts and safeguards

Neutral or Beneficial effect on water quality

Concerns were raised that the proposal may not achieve the Neutral or Beneficial Effects (NorBE) for water quality.

Roads and Maritime would ensure a neutral or beneficial effect (NorBE) is achieved for any areas of the proposal that drain to WaterNSW catchment area. A concept operational water management system was developed for the REF (refer to Appendix E, Section 6.3.1) to identify potential treatment measures to achieve NorBE requirements. Typical water quality management measures which could be used to achieve NorBE requirements include water quality basins, swales, biofiltration swales and vegetated channels.

The NorBE assessment concluded that a neutral or beneficial effect on water quality could be achieved, with improvements to water quality ranging from two to 100 per cent, through the provision of various water quality management measures (which would be further investigated and finalised during detailed design).

There would be a neutral or beneficial improvement compared to the existing situation as the current road does not have any operational water quality control measures.

Erosion and sediment control

EPA and DPI (Fisheries) requested further consultation during the development of the Erosion and Sediment Control Plan and Water Management Plan. WaterNSW commented that appropriate erosion and sediment controls, and tannin leachate controls must be implemented and maintained to manage runoff from the stockpile.

Roads and Maritime would consult with EPA, WaterNSW and DPI (Fisheries) during detailed design and the preparation of the Soil and Water Management plan and Erosion and Sediment Control Plans. An additional safeguard has been included in this submissions report for the management of tannins.

Roadside memorial access and rest area

One respondent requested that access to a road-side memorial site be retained and suggested that a light vehicle rest stop should be located next to the memorial.

Further consultation would be carried out with the respondent to ensure that any access arrangement needed in the future is suitable and appropriate. Potential access to the memorial would be considered further during detailed design. There is currently no proposal to develop a light vehicle rest area along this section of the M1 Princes Motorway.

Design refinements and additional investigations

Following the examination of all submissions, no design refinements or additional investigations were considered necessary. An Options Analysis Report has been prepared to provide additional detail surrounding the options analysis and project development (Appendix A).

Revised safeguards and management measures

As a result of the submissions received, the following safeguards, Biodiversity 17 and Biodiversity 19 relating to Coastal Upland Swamps were reworded for clarity:

- assessing the effectiveness of damming (bunding) the swamp edge and the reincorporation of appropriate material to ensure no indirect impacts on surrounding Upland Swamps have occurred as a result of the works;
• revegetating the batters with species associated with the particular swamp habitat and/or tubestock planting will be used where appropriate.

As a result of the submissions received, one safeguard - Surface Water 6, was added in relation to the management of tannins from mulch stockpiles and additional measures have been added to safeguard - Surface Water 1:

• tannins from mulch stockpiles would be managed in accordance with *RTA Environmental Direction - Management of Tannins from Vegetation Mulch* (Jan 2012);

• operational water quality control measures will be developed during detailed design to ensure that a neutral or beneficial effect (NorBE) on water quality is achieved. Water treatment structures should be designed to be accessible for structural and vegetation maintenance and for removal of sediment. A risk assessment will be carried out during detailed design to assess the likelihood and consequence of a major spill and determine practical control measures to be implemented as necessary.

**Next steps**

Following the determination of the REF, Roads and Maritime will finalise the concept design and would start detailed design in second half of 2017. Roads and Maritime will continue to consult with relevant stakeholders and agencies throughout the design phase.

Subject to project approval, the construction of Stage 1 would start in 2018 and be delivered over two years.
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### Appendices

Appendix A: Options Analysis Report

Appendix B: Transverse Drainage Concept Design Drawings

Appendix C: Hollow Bearing Tree Survey Information
1 Introduction and background

1.1 The proposal

A more detailed description of the proposal is found in the M1 Princes Motorway Improvements, Picton Road to Bulli Tops (Stage 1 – Picton Road to Bellambi Creek) review of environmental factors (REF) prepared by Roads and Maritime in December 2016. This is available on the project website www.rms.nsw.gov.au/m1improvements.

The location and overview of the proposal is provided in Figure 1-1.

1.2 REF display

Roads and Maritime prepared the REF to assess the environmental impacts of the proposal. The REF was placed on public display from the 21 December 2016 to 3 February 2017. During this time three staffed ‘information kiosks’ were set up at two locations as detailed in Table 1.1. The REF was also placed on the Roads and Maritime project website for download. In addition to the staffed displays, copies and information on the REF were available at Wollongong City Council and the University of Wollongong. A Facebook post advertising the display was also done during the display period.

Table 1.1: Information kiosk locations

<table>
<thead>
<tr>
<th>Location (date)</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wollongong Traders Market (13/01/17)</td>
<td>Crown Street Mall, Wollongong</td>
</tr>
<tr>
<td>Wollongong Central (14/01/17 and 19/01/17)</td>
<td>200 Crown Street, Wollongong</td>
</tr>
</tbody>
</table>

Roads and Maritime spoke to nearly 100 people during these sessions.

1.3 Purpose of the report

This report relates to submissions received by Roads and Maritime in response to the review of environmental factors (REF) prepared for the M1 Princes Motorway Improvements, Picton Road to Bulli Tops (Stage 1 – Picton Road to Bellambi Creek).

The REF document is available on www.rms.nsw.gov.au/m1improvements and was placed on public display between December 2016 and February 2017. This report summarises the issues and questions raised by submissions and provides responses to each issue (see Chapter 2). It also identifies new or revised environmental management measures (see Chapter 3) as a result of these submissions.

No project changes are proposed that would require the preparation of a preferred infrastructure report.
Figure 1-1: Proposal location
2 Response to issues

Roads and Maritime Services received 11 submissions, accepted up until the 3 February 2017. Table 2.1 lists the respondents and each respondent’s allocated submission number. The table also indicates where the issues from each submission have been addressed in Chapter 3 of this report.

Table 2.1: Respondents

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Submission No.</th>
<th>Section number where issues are addressed</th>
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<td>Busabout</td>
<td>1</td>
<td>2.5.1</td>
</tr>
<tr>
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<td>2</td>
<td>2.5.2</td>
</tr>
<tr>
<td>Endeavour Energy</td>
<td>3</td>
<td>2.6.1 and 2.6.2</td>
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<td>4</td>
<td>2.5.5</td>
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<tr>
<td>Department of Primary Industries (Fisheries)</td>
<td>5</td>
<td>2.3.7 and 2.4.2</td>
</tr>
<tr>
<td>NSW Rural Fire Service</td>
<td>6</td>
<td>2.5.3 and 2.5.4</td>
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<tr>
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<td>7</td>
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<td>Community member</td>
<td>9</td>
<td>2.5.6</td>
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<tr>
<td>WaterNSW</td>
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<td>Environment Protection Authority (EPA)</td>
<td>11</td>
<td>2.8.1, 2.8.2, 2.9.1, 2.10.1, 2.11.1 and 2.12.1</td>
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2.1 Overview of issues raised

A total of 11 submissions were received in response to the display of the REF. This included submissions from five government agencies, Endeavour Energy, one bus company and four from members of the community.

Each submission has been examined individually to understand the issues being raised. The issues raised in each submission have been collated and responded to. Where similar issues have been raised in different submissions, only one response has been provided. The issues raised and the Roads and Maritime response to these issues forms the basis of this chapter.

Of the submissions received one was supportive of the proposal, one objected and all other submissions did not offer a position.
The main issues raised by the government agencies included:

- Construction arrangements and the concept design of accesses (eg. Fire trails) to and from the proposal
- Construction and operational water quality management
- Property acquisition and fencing
- Biodiversity offsetting and rehabilitation of disturbed land
- General construction impacts and licensing
- Design of drainage

The main issues raised by the public included:

- Options development and assessment
- Justification of the proposal
- Biodiversity impacts and safeguards
- Water quality impacts and safeguards
- Groundwater impacts and safeguards
- Other road upgrades.

### 2.2 Alternative options

#### 2.2.1 Assessment of alternative options

**Submission number(s)**
7 (community member)

**Issue description**

- Concerns raised about the level of adequacy of the options assessment, the methodology used and project justification
- Comment raised regarding the lack of consideration of the overall environmental impact or cost in the project objectives
- Concerns raised regarding the lack of traffic assessment for the major realignment option.
- Concerns raised that the 'base case/do nothing' option is dismissed without proper analysis
- Concerns raised about whether other potentially viable low-impact options have been considered such as dedicated lanes for heavy vehicle, the use of climbing lanes, smart motorway and average speed cameras.

**Response**

An Options Analysis Report (Appendix A) presents additional information on the options assessment process, the assessment methodology, the alternative sub-options, the base case and the criteria used to compare different options. Although not listed as specific project objectives, minimising environmental impacts and providing value for money are important considerations for all Roads and Maritime projects and were considered in the design development of options – impacts were avoided and/or minimised wherever possible.

The number of potential options that would achieve the project objectives is limited because of the local topography, surrounding land uses and the existing road alignment. In terms of the major realignment, Roads and Maritime determined that this option would have greater environmental impacts, require additional property acquisition and result in a higher overall cost compared to the
upgrade and minor realignment option (the preferred option), while delivering similar project benefits. Based on this assessment, detailed traffic modelling was not undertaken for this option.

An assessment of the base case was completed as part of the REF in Section 6.6. The traffic analysis determined that without upgrades the M1 Princes Motorway would operate at an unacceptable level of service (LoS), therefore not meeting the project objectives. Traffic modelling of the M1 LoS for 2038 AM peak indicated that without the proposed upgrade, the LoS on the M1 would be E/F for the majority of the alignment between Bellambi Creek and Picton Road. The proposed upgrade would substantially improve traffic flow on the M1 between Bellambi Creek and Picton Road to LoS A/B.

The implementation of smart motorway infrastructure, variable speed limit and point-to-point camera were considered as part of the Base Case option. However, these options were considered to be unsuitable for the project due to limits of technology currently available and not being able to address all the project objectives. Refer to Appendix A for further details.

The provision of extra climbing lanes in steep sections of existing road alignment was also considered, however this option did not meet all the project objectives and is detailed further in Appendix A.

A keep left requirement for all heavy vehicles would impact travel efficiency. All heavy vehicles would be travelling at the speed of the slowest vehicle in front of them. This may introduce an increased crash risk (particularly for rear-end crashes) for heavy vehicles.

2.2.2 Options assessment criteria

Submission number(s)
7 (community member)

Issue description
- Comment raised regarding the definition of ‘travel efficiency’ in the project objectives
- Concerns raised on the selection of the preferred option based on minor improvements in travel times
- Concerns that the separation of traffic objective is too narrow and eliminates the base case option immediately
- Comment raised on the provision of safe access for utilities and other reasons which are considered a minor objective
- Clarification requested on how the proposal increases reliability of access
- Clarification requested on the public interest benefits of the project.

Response

Additional information on the options assessment process, the assessment methodology alternative sub-options, the base case and the criteria used to compare different options is presented in Appendix A.

Travel efficiency when referring to road traffic is generally the ratio of the average travel speed to the posted travel speed (or free flow speed, if available). Travel efficiency can be impacted by the distance travelled, traffic volume, capacity of the road network, composition of the road fleet (eg proportion of heavy vehicles) and the geometry of the road eg, grades and curves can impact overall efficiency.
Travel time improvements are typically incremental across the range of network improvements that are undertaken. Travel time improvements would be one of the many benefits this proposal delivers. It should also be noted that the length of the upgrade is relatively short, so travel time improvements would appear low in terms of actual minutes and the travel time improvements do not take in consideration any reduction in traffic incidents. Traffic incidents can cause major delays and increases in travel times.

The proposal would provide greater efficiency and reliability for road traffic during operation and would reduce the potential of car vehicle crashes through the provision of additional lanes.

While the separation of slowing moving and fast moving traffic may appear to be a narrow objective, on roads with high grades and a high proportion of heavy vehicles such as the existing road alignment, this is a key objective and method to achieving a safer road environment and reducing traffic incidents. Consequently this was included as an assessment criteria between options.

There are numerous access locations along the proposal used for catchment management, fire fighting and utilities purposes. These are used frequently and many of them are substandard and pose additional safety risks to road users and vehicles using the accesses. Maintaining and improving the design of these access locations would have road safety benefits and also provide improved access for relevant agencies. It should also be recognised that the submissions from the relevant agencies identified the need to maintain and/or improve accesses along the proposal. Roads and Maritime has a legal obligation to consider the safety of all aspects of the projects life-cycle for both the road user and those involved in operation and maintenance activities as well as secondary users. Access for maintenance requires adequate line of sight and distances. Maintaining safe access for agencies onto the motorway is also a key consideration for this project.

The proposal would be in the public interest as it would improve the safe and efficient movement of people, goods and materials in a manner appropriate both for the present and the foreseeable future. Impacts on property, utilities and other items (such as water quality and threatened species) have been identified and are not considered to be significant.

2.3  Biodiversity

2.3.1  Coastal Upland Swamps

Submission number(s)
7 (community member)

Issue description
- Concerns raised on the level of impact of the proposal on Coastal Upland Swamps
- Concerns raised about the effectiveness of the Coastal Upland Swamps management plan being developed post approval of the REF
- Concerns raised about the lack of remedial actions that complement the Coastal Upland Swamp monitoring strategy
- Clarification requested of the proposed mitigation measures ‘bunding revegetation’ and planting the batter slopes with Coastal Upland Swamp species
- Concerns raised about the possibility of major spills impacting Coastal Upland Swamps.
Response

A specialist biodiversity assessment was undertaken in accordance with relevant legislation, policies and guidelines. The impact of the proposal on Coastal Upland Swamps has been assessed in accordance with Draft Upland Swamp Environmental Assessment Guidelines (OEH, 2013). The proposal would impact 2.27 hectares of Coastal Uplands Swamp endangered ecological community (EEC) however, 53.59 hectares of adjoining Coastal Upland Swamp EEC would not be impacted. Furthermore, none of the impacted Coastal Upland Swamps were determined to be swamps of special significance. The assessment determined that the proposal would not result in a significant impact on Upland Coastal Swamps.

The biodiversity assessment within the REF identifies the impacts on Coastal Upland Swamps. This information would be incorporated into the Coastal Upland Swamp management plan and would include targeted proven mitigation measures for Coastal Upland Swamps proposed in the biodiversity assessment.

Monitoring of Coastal Upland Swamps prior to, during and after construction would provide valuable information to design of other projects. The Coastal Upland Swamp Management Plan would have management action triggers which would be implemented if the monitoring indicates that there are impacts on the swamps from the proposal.

The proposed mitigation measure to implement “bunding revegetation” has been re-worded to

"Assessing the effectiveness of damming (bunding) the swamp edge and the reincorporation of appropriate material to ensure no indirect impacts on surrounding Upland Swamps have occurred as a result of the works"

The proposed mitigation measure to plant batters with Coastal Upland Swamps has been re-worded to

"In particular, revegetating the batters with species associated with the particular swamp habitat and/or tubestock planting will be used where appropriate."

A portion of the Coastal Upland Swamps is located above the road level, and as such road drainage would not drain into them. Additionally, a risk assessment would be carried out during detailed design to assess the likelihood of a major spill and its effect, and to determine practical control measures to be implemented as necessary.

2.3.2 Groundwater impacts on Coastal Upland Swamps

Submission number(s)

7 (community member), 8 (OEH)

Issue description

- Concerns raised about the validity of the statements contained within the groundwater assessment on Coastal Upland Swamps, and their reliance on aquifers and lateral flow.
- Concerns raised about the adequacy of investigations carried out for the groundwater assessment and whether the findings are sufficiently informed
- Concerns that construction in swamp areas would cause damage to swamps.
- Suggestion made to establish a groundwater monitoring program and commit to remedial actions
A hydrological assessment was undertaken in accordance with relevant legislation, polices and guidelines (refer to Section 6.3.1 of the REF). The assessment determined that the proposal would not result in any impacts on the regional groundwater systems and would not result in draining of Coastal Upland Swamps. The proposal is not anticipated to have any effects on adjoining swamps to the east or downgradient of the proposal or to the west of the existing roads. This indicates that groundwater flow to lower altitudes has been considered and as such there is unlikely to be indirect impacts on the swamps at lower altitudes.

A specialist biodiversity assessment was also undertaken in accordance with relevant legislation, polices and guidelines (refer to Section 6.4.1 of the REF). The impact of the proposal on Coastal Upland Swamps has been assessed in accordance with Draft Upland Swamp Environmental Assessment Guidelines (OEH, 2013). The proposal would impact 2.27 hectares of Coastal Uplands Swamp EEC however, 53.59 hectares of adjoining Coastal Upland Swamp EEC would not be impacted. Furthermore, none of the impacted Coastal Upland Swamps were determined to be swamps of special significance. The assessment determined that the proposal would not result in a significant impact on Upland Coastal Swamps.

The monitoring investigations undertaken to inform the Groundwater Assessment are considered sufficient to determine the characteristics of the site and to assess rainfall response for the purposes of the REF.

Roads and Maritime would continue consultation with OEH on the post-construction groundwater monitoring requirement in the vicinity of the Coastal Upland Swamps. Practical remedial measures would be developed and implemented where impacts on groundwater is identified. Furthermore, Roads and Maritime would consider, where relevant, adopting swamp monitoring regimes suggested in the Addendum to NSW Biodiversity Offsets Policy for Major Projects (Upland swamps impacted by longwall mining subsidence)(Dec 2016).

### 2.3.3 Impacts on Eastern Pygmy Possums

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<td>7 (community member)</td>
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**Issue description**

- Concerns raised regarding the adequacy of the assessment undertaken on the impacts to Eastern Pygmy Possums and the conclusions regarding significance of impact.
- Concerns raised regarding the adequacy of the proposed mitigation measures for Eastern Pygmy Possums

**Response**

Targeted surveys for Eastern Pygmy-possums were undertaken in compliance with the Draft Threatened Biodiversity Survey and Assessment Guidelines (DEC, 2004) and only one sub-adult individual was found within the study area. Mapping prepared as part of the Wollongong Bioregional Assessment (NPWS, 2002) indicates that the proposal area is on the western edge of a much larger viable population and a 90 hectare area of prime possum habitat. This adjacent habitat is considered higher quality than habitat in the proposal area as it has been mapped to have similar vegetation communities and is substantially less disturbed by human activities and infrastructure.

An assessment of significance under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) determined that the impacts of the proposal would not be significant. This was
based on the likelihood of the proposal putting a viable local population at risk of extinction. As 90 hectares of high quality habitat would not be impacted by the proposal and that mitigation measures to provide connectivity in the area would be implemented, it was determined that the proposal would be unlikely to put any viable local population at risk of extinction.

2.3.4 Threatened species assessment

Submission number(s)
7 (community member), 8 (OEH)

Issue description
- Concerns raised about the adequacy of the threatened species assessment in terms of species abundance, habitat (and its fragmentation), foraging resources and populations
- Comment on the need to assess the impacts of the proposal in accordance with principles and legislation established by OEH

Response
Impacts have and would continue to be assessed in accordance with principles and legislation established by OEH. Roads and Maritime would consider, where relevant, adopting swamp monitoring regimes suggested in the Addendum to NSW Biodiversity Offsets Policy for Major Projects (Upland swamps impacted by longwall mining subsidence)(Dec 2016).

All threatened species and ecological communities with a likelihood of occurrence of medium and above were further assessed in accordance with statutory guidelines (refer to Biodiversity Assessment Report) - Appendix H).

The Wollongong Bioregional Assessment (NPWS, 2002) was used to guide the assessment of alternative adjacent habitat. National Parks and Wildlife Service (NPWS) mapping or other assessments are typically used in biodiversity assessments to identify other areas of habitat near projects. This adjacent habitat is considered higher quality than habitat in the proposal area as it has been mapped to have similar vegetation communities and is substantially less disturbed by human activities and infrastructure.

Habitat fragmentation on threatened fauna species has been considered in Section 4.2.1 and in each of the assessments of significance under Part 5A of the EP&A Act. This can be found in section d(ii) of each assessment.

2.3.5 Connectivity impacts and mitigation

Submission number(s)
7 (community member)

Issue description
- Opinion expressed that the existing motorway is not a barrier to connectivity
- Opinion expressed about the appropriate timing for the preparation of the Fauna Connectivity Strategy
- Concern raised about the effectiveness of the use of fauna exclusion fencing and fauna crossing structures.
- Comment made on the need to include remedial actions as part of the fauna crossings monitoring strategy
Response

High volumes of existing road traffic and the extent of the existing concrete barrier, which runs for the length of the proposal result provides a significant barrier to the movement of fauna species. Furthermore, viable local populations exist in the presence of this significant barrier and in the place of proposed connectivity mitigation measures, the proposal is unlikely to exacerbate the current connectivity issues.

A fauna connectivity strategy would be prepared and it would identify the most effective fauna connectivity structures to be included in the detailed design. It is expected that the connectivity strategy would be an improvement to the current connectivity for target species as the current road is considered a barrier to most target species and the existing road has no existing specific fauna connectivity structures.

Fauna fencing would primarily be used to direct/funnel target species to any new fauna connectivity structures. Monitoring of crossing structures would provide valuable information for the design of other projects as well as assessing the effectiveness of the proposal's crossing structures.

2.3.6 Impacts on hollow bearing tress

Submission number(s)

7 (community member)

Issue description

- Clarification requested on how the proposed nest box management plan would 'ameliorate the reduction in habitat features'
- Clarification sought on how a 'no net loss' of habitat is to be achieved with the removal of hollow bearing trees
- Concerns raised with the removal of 191 hollow bearing trees not being consistent with the aim of 'retaining large glide trees'.

Response

The nest box management plan would identify the type, timing and location/height of proposed nest boxes which assists in restoring habitat features.

Nest boxes would be installed at a 1:1 ratio to those removed ensuring that there will be no net loss of Eastern Pygmy-possum habitat as a result of hollow-bearing tree removal. Foraging habitat in the form of Banksia's etc. would remain in higher quality adjacent habitat.

During the detailed design and construction planning phase, opportunities to retain glide and hollow-bearing trees would be further investigated.

The REF incorrectly stated that there were 191 hollow bearing trees and 87 large hollows to be removed. Roads and Maritime has subsequently reviewed the figures and confirmed the figure contained within the Biodiversity Technical Assessment as correct. A total of 173 hollow bearing trees and no large hollows within the approved Stage 1 footprint would be removed.

Clearing for the proposal would remove 173 hollow bearing trees which contain 57 small hollows, 173 medium, no large and 37 extra-large hollows. All hollows would be replaced at a 1:1 ratio in adjacent areas with suitable nest boxes.
2.3.7 Fish passage
Submission number(s)
5 (DPI Fisheries)
Issue description
- Requested further consultation during detailed design with respect to maintaining fish passage, including the design of culvert extensions.

Response
Roads and Maritime would consult with DPI Fisheries on the detailed design of any structures that may impact on fish passage. Design would be undertaken in consideration of relevant fish passage guidelines.

A new environmental safeguard and management measure has been proposed:
*The maintenance of fish passage will be addressed during detailed design and construction in consultation with DPI Fisheries.*

2.3.8 Biodiversity offsets
Submission number(s)
8 (OEH), 10 (WaterNSW)
Issue description
- OEH noted that the appropriate measures to avoid, minimise and offset impacts of the proposal should be fully considered, and that a biodiversity offset strategy (BOS) be prepared in accordance with the NSW BioBanking Assessment Methodology (BBAM).
- WaterNSW requested that land for biodiversity offsets be located in located in the Cataract Dam catchment.

Response
Roads and Maritime would prepare a Biodiversity Offset Strategy in accordance with the Roads and Maritime Guideline for Biodiversity Offsets (Nov 2016).

Roads and Maritime would continue to consult with WaterNSW on biodiversity offset opportunities and feasible locations.

2.3.9 Rehabilitation of redundant roads and construction areas
Submission number(s)
7 (community member), 10 (WaterNSW)
Issue description
- The project description does not include any firm commitment for the redundant road section other than the possibilities that it ‘may’ be retained for a heavy vehicle weighing or inspection station. This lack of commitment fails to justify Roads and Maritime not rehabilitating the redundant road surface for the benefit of pygmy possum. In addition, the edge effects of a truck stop such as this are significant (e.g. rubbish dumping, people using it as an open air toilet etc.) and would further impact on this species.
- The main site compound should be rehabilitated at the conclusion of Stage One activities to assist in maintaining the ecological integrity of the land on the western side of the new road alignment.
WaterNSW requests the rehabilitation of the Stage One southern section of Mount Ousley Road that would be replaced with the realignment and transferred to WaterNSW, as well as other redundant sections of road on the western side of Mount Ousley Road.

Response
The final use or rehabilitation of redundant road areas has yet to be determined. Initial assessments indicated that full rehabilitation of all the redundant road areas would incur substantial cost and would not necessarily provide a high quality habitat for pygmy possums or other fauna species.

However, some areas of existing road pavement would be removed and rehabilitated and other areas disturbed by construction (eg. Site compounds) would be rehabilitated to an acceptable standard at the completion of construction. Roads and Maritime would continue to consult with WaterNSW on the final use and other environmental safeguards for the redundant road.

2.3.10 Revocation of the Illawarra Escarpment SCA
Submission number(s)
8 (OEH)
Issue description
- Stage 2 of M1 Motorway improvements, which are separate from the current project, would require some revocation of the Illawarra Escarpment SCA. OEH recommend engaging with NPWS officers early in the process of preparing the Stage 2 REF to progress any proposed revocation that may be required.

Response

2.3.11 Weeds and edge effects
Submission number(s)
7 (community member)
Issue description
- The new alignment would double the edge zone especially considering there is no commitment to remove any redundant road surfaces. This would result in an increased weed zone.

Response
As most of the construction would be within the existing edge zone of the existing road it is not considered that there would be a double edge effect. In addition, as the existing road area would no longer be active, the edge effects in this area would be greatly reduced. Weeds would be managed during construction in accordance with Roads and Maritime biodiversity guidelines.

2.4 Water quality
2.4.1 Design of operational water quality control basins
Submission number(s)
7 (community member), 10 (WaterNSW)
**Issue description**

- Concerns raised that the proposal may not achieve the Neutral or Beneficial Effects (NorBE) for water quality
- Reminder that the works occur in the Metropolitan Special Area. The Special Areas are subject to the provisions of the 'Special Areas Strategic Plan of Management' (SASPoM), and are jointly managed by WaterNSW and the Office of Environment and Heritage under the Water NSW Act 2014.
- Concern raised on the potential impact on water quality from major spills resulting from traffic incidents

**Response**

Roads and Maritime is committed to meeting the neutral or beneficial effect (NorBE) requirement for any areas of the proposal that drain to WaterNSW catchment area. A concept operational water management system was developed for the REF (refer to Appendix E, Section 6.3.1) to identify potential treatment measures to achieve NorBE requirements. Typical proposed water quality management measures which could be used to achieve NorBE requirements could include water quality basins, swales, bio filtration swales and vegetated channels.

The NorBE assessment concluded that a neutral or beneficial effect on water quality could be achieved, with improvements to water quality ranging from 2 to 100 per cent, through the provision of various water quality management measures (to be further investigated and finalised during detailed design).

There would be a neutral or beneficial improvement compared to the existing situation as the current road does not have any operational water quality control measures.

Roads and Maritime would continue to consult with WaterNSW to identify appropriate locations and operational water quality controls. Additionally, a risk assessment would be carried out during detailed design to assess the likelihood and consequence of a major spill, and to determine practical control measures to be implemented as necessary.

### 2.4.2 Construction water quality management measures

**Submission number(s)**

5 (DPI (Fisheries)), 10 (WaterNSW), 11 (EPA)

**Issue description**

- DPI (Fisheries) requested that further consultation be undertaken during detailed design with regard to adverse impacts upon water quality during the construction phase. Specific consultation required in relation to the following documents Soil and Water Management Plan, Erosion and Sediment Control Plan and the Construction Environmental Management Plan.
- WaterNSW noted that two construction compounds are in close proximity to creeks and appropriate controls would be required to minimise water quality impacts.
- WaterNSW and EPA identified potential water quality impacts from erosion and sedimentation, fuels, hazardous substances, tannins and plant maintenance, refuelling and cleaning.

**Response**

Roads and Maritime would consult with EPA, DPI Fisheries and WaterNSW during the detailed design process and the preparation of the Soil and Water Management Plan, Erosion and
Sediment Control Plans and the Construction Environmental Management Plan. Water quality controls identified in the appropriate management plans would be implemented during construction.

A new environmental safeguard and management measure has been proposed for the management of tannins:

*Tannins from mulch stockpiles would be managed in accordance with RTA Environmental Direction - Management of Tannins from Vegetation Mulch (Jan 2012).*

In addition, all stockpile sites would be managed in accordance with Roads and Maritime Stockpile Site Management Guideline (May 2015). It is considered that the safeguards in the REF adequately address this issue.

### 2.4.3 Impacts on creeks

**Submission number(s)**

7 (community member)

**Issue description**

- Concerns raised about the impacts assessed in the REF on Cataract, Bellambi and Allen's Creeks.
- Comments raised about the lack of assessment in the REF for the diversion of Cataract Creek during construction
- Concerns raised about whether stockpile sites can be practically located sufficiently away from any watercourses and/or EECs.

**Response**

Roads and Maritime would continue to work with WaterNSW, NSW DPI (Fisheries) and the NSW EPA through the detailed design and construction phases of the proposal to ensure that appropriate water quality goals and outcomes are met, including the Neutral or Beneficial Effect.

The scope and scale of the diversion of Cataract Creek required during construction would be further investigated during detailed design and in consultation with NSW EPA, WaterNSW and DPI (Fisheries). Additional environmental assessments on the creek diversion would be undertaken as necessary.

### 2.5 Traffic and transport

#### 2.5.1 Motorway closures

**Submission number(s)**

1 (Busabout)

**Issue description**

- No objection to the proposal provided the Princes Motorway remains open during construction.

**Response**

During construction of the proposal, the Princes Motorway would remain open to traffic at all times and there would no change in access to the proposal. A traffic management plan would be prepared and implemented to management traffic and access during construction. Road users
including bus providers would be informed of any changes in traffic management which may impact upon travel times.

2.5.2 Access to memorial site

Submission number(s)
2 (community member)

Issue description
- Requested that access to a road-side memorial site be retained and suggested that a light vehicle rest stop be located adjacent to the memorial

Response
Access arrangements to the memorial site during construction would be considered during detailed design. Further consultation would be undertaken with the respondent to ensure that the access proposed is suitable and appropriate.

Currently there is no proposal to develop a light vehicle rest area along this section of the M1 Princes Motorway. Road and Maritime would continue to monitor the need for light vehicle rest area along this section of the M1 Princes Motorway.

2.5.3 Road shoulder access for emergency vehicles

Submission number(s)
6 (NSW RFS)

Issue description
- Comment made on the existing road shoulder width being restrictive for emergency vehicles accessing accidents or other incidents when there is traffic congestion on the motorway.

Response
The proposal would have a three metre road shoulder along the full length of the proposal alignment. In addition, the improved alignment and roadside drainage (gutter) arrangement would improve the access and safety for emergency vehicles responding to traffic or other incidents.

2.5.4 Access to fire trails

Submission number(s)
6 (NSW RFS), 10 (WaterNSW)

Issue description
The NSW RFS and other organisations requested further clarification on access arrangement to existing fire trails including:
- RFS requested confirmation that the southbound Brokers Nose access would be available as both an exit from the Motorway and entry to the Motorway.
- RFS preference is to retain the old road formation west of Brokers Nose Fire Trail for access and management purposes (hazard reduction burns).
- RFS requested that access to the western side of the Motorway (South of Bellambi Creek) remains, as access to a supply of emergency water needs to be available.
- RFS and WaterNSW all requested access to Sassafras Fire Trail

**Response**

Access to the Brokers Nose fire trail would be a ‘left-in, left-out’ access at a new location. The access at the new location would have improved sight distances with suitable road design. It is envisaged that the new access would substantially improve safety for vehicles particularly service vehicles such as fire tankers.

The existing road formation west of Brokers Nose Fire Trail would be retained. Access to this area would be determined during detailed design and RFS and WaterNSW would be consulted to ensure that appropriate access arrangements are provided.

The area west of the Motorway and south of Bellambi would generally be not affected by the works. Access to this area for emergency water supplies would be a balance between safe and controlled access and would be considered during the detailed design.

Southbound access (left-in, left-out) to the Sassafras Fire Trail has been included in the current design. Northbound access to the Sassafras Fire Trail would also be provided. However the access arrangements have yet to be determined and would be considered during the detailed design in consultation with RFS.

### 2.5.5 Other road upgrades

**Submission number(s)**
4 (community member)

**Issue description**

- Comment made that an upgrade of the M1 Princes Highway from Clive Bissell Drive to Picton Road should be considered.

- Concerned that slow moving heavy vehicles in this section would increase following the opening of the truck rest stop (currently under construction). Suggested the provision of a third lane would provide improved traffic flow especially since a lot of heavy vehicles turn left into Picton Road.

**Response**

Roads and Maritime would continue to monitor this length of the M1 Princes Highway for network optimisation and efficiency. However, this area is outside the scope of the current proposal.

### 2.5.6 Design criteria

**Submission number(s)**
9 (community member)

**Issue description**

- Comments made in relation to the design criteria should be of a higher geometric standard so as to facilitate 110 km/h posted speed limit along the entirety of the proposed upgrade.

**Response**

Posted speed limits for this part of the network are constrained by the topography, which minimises the opportunities for a higher speed design. A range of design alignments which investigated the potential for improved grades and curves potentially suitable for a higher posted speed limit were
undertaken, and are further discussed in Appendix A. It was not considered feasible to adopt designs of a generally higher limit.

2.5.7 Traffic modelling and economic appraisal

Submission number(s)
7 (community member)

Issue description
- Concerns raised about how the travel time costs savings and the Cost Benefit Ratios are calculated using inconsistent distance figures and not taking into account of the effect of speed reduction down to 40km/h during construction.
- Concern raised about the applicability of the traffic modelling and economic appraisal given it is two years old.

Response
The economic analysis completed for the project provides an indicative benefit to cost ratio (BCR) that reflects the current status of the project, i.e. concept development phase.

The analysis has considered the traffic benefits for the entire study area as well as that of a Stage 1 proposal and is therefore considered appropriate for the current stage of development. Although a guide for possible funding considerations, the economic analysis would be updated as the project progresses through its concept development into detailed design and would be subject to independent review processes.

Roads and Maritime notes the inconsistency in Section 2.3.3 Crash Data and Tables 2-3 and Table 2-4 of the Traffic Modelling and Economic Appraisal report. Roads and Maritime has reviewed these sections of the report and confirms that the crash analysis was completed for the 3.5 kilometre Stage 1 length (Picton Road to Bellambi Creek) as detailed in Appendix A of the report.

Roads and Maritime is yet to determine specific traffic control measures, such as possible speed reductions, for the construction phase of the project. These potential measures are not typically considered in the development of BCR’s.

Although completed in 2014 the traffic modelling used to assess the proposal is still considered relevant, given the minor increase in traffic since the report was completed.

2.5.8 Road safety

Submission number(s)
7 (community member)

Issue description
- Concerns raised about the lack of information in the traffic modelling and economic appraisal, in the areas of existing safety performance and the effect of traffic safety with improved average speed in poor weather conditions.
- Concerns raised about the lack of reasoning to substantiate the reduction in crashes delivered by the proposal as suggested in the traffic modelling and economic appraisal.
Response
The proposed alignment is anticipated to be a marked improvement over the existing conditions, with improved sight distances, vertical grade and horizontal curves for a 100km/hr posted speed limit. In conditions which are not optimal, such as wet weather, drivers should drive to the conditions and reduce speed and increase the distance between vehicles.

The proposed upgrade would improve travel speed conditions on the M1 which would reduce the travel speed differential between slow vehicles (typically trucks) and faster vehicles (typically cars). The proposed upgrade would therefore reduce the likelihood of rear-end crashes.

Crash reduction analysis was determined based on the typical treatments suggested by Roads and Maritime guidelines. Most of the treatments were based on “treatment type 94-Alignment – change horizontal & vertical”.

2.6 Property and landuse
2.6.1 Acquisition of property
Submission number(s)
3 (Endeavour Energy), 10 (WaterNSW)
Issue description
- Requested further information on the property acquisition boundaries, timeframe and process
- Endeavour Energy had no objection to acquisition but requested fencing be relocated, no works on Endeavour Energy land without consent and protection of overhead powerlines
- WaterNSW noted land acquisition and requested that Road and Maritime acquire all WaterNSW land to the east of the proposal to provide a logical boundary for ownership and management.

Response
Roads and Maritime would continue to consult with Endeavour Energy and WaterNSW regarding acquisition and access requirements. Property acquisition would be undertaken prior to construction – generally when sufficient detailed design information is available to confidently identify the area and the new boundary locations for acquisition. Other issues such as ongoing land management and residual land areas would also be considered in the acquisition process. Impacted boundary fences would be replaced on a like-for-like basis at the new boundary locations. If works are required on Endeavour Energy or Water NSW land, consultation and consent would be obtained before undertaking those works. Construction risk assessment and planning would consider the risks around the overhead powerlines and appropriate measures would be implemented to eliminate any risks.

2.6.2 Access to substation
Submission number(s)
3 (Endeavour Energy)
Issue description
- Access to the substation from the M1 must be maintained at all times
- Temporary vehicle access should be designed to suit a heavy rigid vehicle.
Response
Roads and Maritime would continue to consult with Endeavour Energy on access requirements and recognises the need for continuous access to the electricity substation. This would be included in the Traffic Management Plan and considered during the construction works design.

2.7 Project staging

2.7.1 Cumulative impacts

Submission number(s)
7 (community member)

Issue description
- Respondent commented that Stage 1 and 2 should be treated as a single project to assess cumulative impacts and an EIS should be prepared.

Response
During the planning of the proposal, consideration was given to the environmental impacts of the stages 1 and 2 combined; it was determined by Roads and Maritime that a significant impact was unlikely for the combined stages and therefore an EIS was not required.

Stage 2 of the project is not currently funded and the scope of this stage has not yet been fully defined. Therefore stage 1 has been assessed separately.

The REF has assessed the impacts of stage 1 and determined that there are no significant impacts. The environmental assessment for stage 1 has been prepared to comply with the requirements of the EP&A Act.

Stage 1 would be constructed as a stand-alone project and is not reliant upon stage 2 proceeding. If stage 2 is funded and proposed to proceed, a separate environmental assessment would be prepared that would include consideration of the cumulative impacts of other relevant projects including stage 1.

2.8 Statutory Approvals

2.8.1 Environment Protection Licence

Submission number(s)
11 (EPA)

Issue description
- EPA noted the construction of the proposal would require an EPL and the scheduled activities would be road construction and extractive activities.

Response
Roads and Maritime recognise that an EPL would be required and would continue to consult with the EPA regarding the scheduled activities and as well as the timing for the EPL.

2.8.2 Complaints and incidents

Submission number(s)
11 (EPA)
Issue description

- Adequate procedures should be established including notification requirements to the appropriate regulatory authority and other relevant authorities for incidents that cause, or have the potential to cause, material harm to the environment

- Respondent requested a complaints handling system to be implemented during construction.

Response

Complaints management procedures would be established in the construction environmental management plan (CEMP) prior to construction. The procedures would include processes for documenting and resolving issues and complaints. The procedures would also address and conform to all complaints management requirements as detailed in the project Environmental Protection Licence.

Environmental incidents would be assessed in accordance with Roads and Maritime’s Environmental Incident Classification and Report Procedure and reported to the relevant authorities as required.

2.9 Air quality

2.9.1 Construction air quality

Submission number(s)
11 (EPA)

Issue description

- EPA noted that while there are no sensitive receivers near the proposal, air quality objectives and impacts must comply with relevant guidelines and legislation

- Dust and plant emissions need to managed and all reasonable and feasible measures should be implemented.

Response

Section 7 of the REF contains safeguards relating to air quality that would be implemented during construction. This includes complying with relevant standards and guidelines, implementing all reasonable and feasible measures to minimise dust and ensuring that all plant meets the relevant emission standards. These safeguards would be included in the CEMP or a specific construction air quality management plan.

2.10 Noise and vibration

2.10.1 Construction noise and vibration

Submission number(s)
11 (EPA)

Issue description

- EPA provided information on construction noise and vibration guidelines and requested that these be considered in the CEMP.
Response
A Construction Noise and Vibration Management Plan would be prepared and implemented. The relevant guidelines provided by the EPA would be used in the preparation of the management plan. It should be noted that because the nearest sensitive receiver is over 1200 metres from the proposal, construction noise and vibration impacts would not be expected.

2.11 Contamination
2.11.1 Contamination guidelines
Submission number(s)
11 (EPA)
Issue description
• EPA provided information on contamination guidelines, legislation and policy
Response
The Erosion and Sedimentation Management Report prepared for the REF (Appendix E) found that there is a low risk of the proposal encountering contaminated land during construction along the existing corridor and proposed ancillary sites. However if previously unknown contamination is encountered, the contaminated areas and material would be managed in accordance with Roads and Maritime’s Guideline for the Management of Contamination (Sept 2013) and would comply with relevant guidelines, legislation and policy.

2.12 Waste
2.12.1 Waste management
Submission number(s)
11 (EPA)
Issue description
• EPA provided information on waste guidelines, legislation and policy and requested that a Construction Waste Management Plan be prepared
Response
A Construction Waste Management Plan (CWMP) would be prepared and implemented, to address the requirements identified by the EPA in the EPL and would also comply with relevant guidelines, policies and legislation.

2.13 Aboriginal heritage
2.13.1 Assessment procedures
Submission number(s)
8 (OEH)
Issue description
- OEH will not approve or certify a person’s compliance with their due diligence requirements carried out under their own process. This is the responsibility of the company or individual doing the activity.

Response
Roads and Maritime understands this provision and are confident that the individuals and the PACHCI process meets due diligence requirements.

2.13.2 Discovery of unknown heritage items
Submission number(s)
8 (OEH)

Issue description
- 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. In this event, contact the relevant OEH office for advice and follow the Roads and Maritime (2015) Standard Management Procedure: Unexpected Heritage Items. An Aboriginal Heritage Impact Permit may be required if Aboriginal objects cannot subsequently be avoided as part of construction works.

Response
Roads and Maritime would follow the Roads and Maritime (2015) Standard Management Procedure: Unexpected Heritage Items. It is recognised that an Aboriginal Heritage Impact Permit may be required if Aboriginal objects cannot subsequently be avoided as part of construction works.

2.13.3 Location of Aboriginal heritage sites
Submission number(s)
7 (community member)

Issue description
- Aboriginal sensitive sites are included in figures available on the project website.

Response
The locations of Aboriginal sensitive sites have been removed from publically available material on the web site and other media.

2.14 Hydrology

2.14.1 Design of drainage and flooding
Submission number(s)
8 (OEH)

Issue description
- The respondent requests all existing cross drainage structures as well as concept designs for the proposed transverse drainage infrastructure be provided as part of this report.
• The respondent requests that the design consider floodplain risk management; safety and access for emergency vehicles, implications of climate change, adverse impacts and transverse drainage concept designs

Response

Roads and Maritime have provided concept design drawings of the proposed transverse drainage infrastructure in Appendix B of this report.

Roads and Maritime would consider the minimum freeboard requirements, blockage assumptions, climate change considerations, suitable IFD data and emergency vehicle access during development of the detailed design. Issues relating to flood plain risk management would be communicated to other relevant agencies including the OEH, NSW EPA, WaterNSW and DPI (Fisheries).
3 Environmental management

The REF for the M1 Princes Motorway Improvements, Picton Road to Bulli Tops (Stage 1 – Picton Road to Bellambi Creek) identified the framework for environmental management, including safeguards and management measures that would be adopted to avoid or reduce environmental impacts (Section 7 of the review of environmental factors).

After consideration of the issues raised in the public submissions and changes to the proposal, the safeguard and management measures have been revised and are detailed in Section 3.2.

Should the proposal proceed, environmental management would be guided by the framework and measures outlined below.

3.1 Environmental management plans (or system)

A number of safeguards and management measures have been identified in order to minimise adverse environmental impacts, including social impacts, which could potentially arise as a result of the proposal. Should the proposal proceed, these management measures would be incorporated into the detailed design and applied during the construction and operation of the proposal.

A Project Environmental Management Plan (PEMP) and a Construction Environmental Management Plan (CEMP) would be prepared to describe safeguards and management measures identified. The PEMP and CEMP would provide a framework for establishing how these measures would be implemented and who would be responsible for their implementation.

The PEMP and CEMP would be prepared prior to construction of the proposal and must be reviewed and certified by environment staff, southern region, prior to the commencement of any on-site works. The CEMP would be a working document, subject to ongoing change and updated as necessary to respond to specific requirements. The PEMP and CEMP would be developed in accordance with the specifications set out in the [adjust as necessary: QA Specification G36 – Environmental Protection (Management System), QA Specification G38 – Soil and Water Management (Soil and Water Plan), QA Specification G40 – Clearing and Grubbing and QA Specification G10 - Traffic Management].

3.2 Summary of safeguards and management measures

The review of environmental factors for the M1 Princes Motorway Improvements, Picton Road to Bulli Tops (Stage 1 – Picton Road to Bellambi Creek) identified a range of environmental outcomes and management measures that would be required to avoid or reduce the environmental impacts.

After consideration of the issues raised in the public submissions, the environmental management measures for the project (refer to Chapter 7 of the REF) have been revised. Should the project proceed, the environmental management measures in Table 3.1 would guide the subsequent phases of the M1 Princes Motorway Improvements, Picton Road to Bulli Tops (Stage 1 – Picton Road to Bellambi Creek) development. Additional and/or modified environmental safeguards and management measures to those presented in the REF have been underlined and deleted measures, or parts of measures, have been struck out.
### Table 3.1: Summary of environmental safeguards and management measures

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| GEN1  | General - minimise environmental impacts during construction | A CEMP will be prepared and submitted for review and endorsement of the Roads and Maritime Environment Manager prior to commencement of the activity. As a minimum, the CEMP will address the following:  
• any requirements associated with statutory approvals  
• details of how the project will implement the identified safeguards outlined in the REF  
• issue-specific environmental management plans  
• roles and responsibilities  
• communication requirements  
• induction and training requirements  
• procedures for monitoring and evaluating environmental performance, and for corrective action  
• reporting requirements and record-keeping  
• procedures for emergency and incident management  
• procedures for audit and review. The endorsed CEMP will be | Contractor / Roads and Maritime project manager | Pre-construction / detailed design | Core standard safeguard GEN1 |
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<tr>
<td>GEN2</td>
<td>General - notification</td>
<td>All businesses, residential properties and other key stakeholders (e.g., schools, local councils) affected by the activity will be notified at least five days prior to commencement of the activity.</td>
<td>Contractor / Roads and Maritime project manager</td>
<td>Pre-construction</td>
<td>Core standard safeguard GEN2</td>
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| GEN3 | General – environmental awareness | All personnel working on site will receive training to ensure awareness of environment protection requirements to be implemented during the project. This will include up-front site induction and regular "toolbox" style briefings. Site-specific training will be provided to personnel engaged in activities or areas of higher risk. These include:  
• threatened species habitat (Coastal Upland Swamp areas)  
• adjoining private properties and accesses (Endeavour Energy, Wollongong Coal Limited) | Contractor / Roads and Maritime project manager | Pre-construction / detailed design | Core standard safeguard GEN3 |
<p>| Soils 1 | Erosion and sedimentation | Work areas are to be stabilised progressively during the works. | Contractor | Pre-construction/construction |
| Soils 2 | Erosion and sedimentation | The maintenance of established stockpile sites during construction is to be in accordance with the Roads and Maritime project guidelines. | Contractor | Pre-construction/construction |</p>
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<td>Soils 3 Erosion and sedimentation</td>
<td>Maritime Services Stockpile Site Management Guideline (EMS-TG-10). A Soil and Water Management Plan (SWMP) will be prepared and implemented as part of the CEMP. The SWMP will identify all reasonably foreseeable risks relating to soil erosion and water pollution and describe how these risks will be addressed during construction. The SWMP will be reviewed by a soil conservationist on the Roads and Maritime list of Registered Contractors for Erosion, Sedimentation and Soil Conservation Consultancy Services. The SWMP should contain at a minimum the following elements: - Consideration of appropriate erosion and sediment control. - Consideration of appropriate erosion and sediment controls at ancillary sites with particular consideration of sediment basins at sites where material processing or stockpiling would occur. - Procedure to be developed for early warnings of imminent and severe weather approaching site and...</td>
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Contractor | Pre-construction/construction | Core standard safeguard SW1 Section 2.1 of QA G38 Soil and Water Management |
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<td>• Identification of site conditions or construction activities that could potentially result in erosion and associated sediment runoff.</td>
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<td>• Methods to minimise potential adverse impacts of construction activities on the water quality within surrounding waterways.</td>
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<td>• Details of specific measures to protect sensitive areas including drinking water catchments and sensitive vegetation such as (EECs).</td>
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<td>• Details of measures to minimise any adverse impacts of sedimentation on the surrounding environment.</td>
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<td>• Details of measures to minimise soil erosion caused by all construction works including clearing, grubbing and earthworks.</td>
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<td>• Details of measures to provide spill management and basin discharge procedures</td>
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<td>• Details of measures to make site personnel aware of the requirements of the SWMP by providing information within induction, toolbox and training sessions.</td>
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<td>• Details of the roles and responsibilities of personnel</td>
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<td>Section 2.2 of QA G38 Soil and Water Management</td>
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<td>Soils 4</td>
<td>Erosion and sedimentation</td>
<td>A site specific Erosion and Sediment Control Plan/s (ESCP) will be prepared and implemented as part of the SWMP. The plan will include site specific erosion and sediment controls, size and locations of sedimentation basins (as well as detailed erosion and sedimentation control design), arrangements for managing wet weather events, including monitoring of potential high risk events (such as storms) and specific controls and follow-up measures to be applied in the event of wet weather.</td>
<td>Contractor</td>
<td>Pre-construction/construction</td>
<td>Core standard safeguard SW2</td>
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<tr>
<td>Soils 5</td>
<td>Erosion and sedimentation</td>
<td>Roads and Maritime will develop an ESCP in parallel during the concept/detailed design phase in consultation with WaterNSW.</td>
<td>Roads and Maritime/Design contractor</td>
<td>Detailed design</td>
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<td>Surface water 1</td>
<td>Operational water quality</td>
<td>Detailed design will seek to minimise water quality impacts by incorporating the following design principles:</td>
<td>Roads and Maritime</td>
<td>Detailed design/Pre-construction</td>
<td>Safeguard reworded in Submissions</td>
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<td>• Vegetated drainage lines should be used in preference to engineered structures wherever practicable.</td>
<td>Contractor</td>
<td>Pre-construction/ construction</td>
<td>Report</td>
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<td>• Operational water quality control measures will be developed during detailed design to ensure that a neutral or beneficial effect (NorBE) on water quality is achieved. Water treatment structures should be designed to be accessible for structural and vegetation maintenance and for removal of sediment. <strong>A risk assessment will be carried out during detailed design to assess the likelihood and consequence of a major spill and determine practical control measures to be implemented as necessary.</strong></td>
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<td>• Appropriate energy dissipation and scour prevention measures will be incorporated downstream of culverts and other drainage structures to minimise soil erosion.</td>
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<td>A Surface Water Quality Monitoring Program will be designed and implemented to detect and respond to any changes in water quality in Bellambi Creek and Cataract Creek waterways downstream of the proposal during</td>
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<td>construction. The Program will include monthly and post rainfall visual monitoring of local water quality (ie turbidity, hydrocarbon spills/slicks) to identify any potential spills or deficient erosion and sediment controls.</td>
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<td>Surface water 3 Local water quality impacts</td>
<td>Contractor</td>
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<td>If an incident (eg spill) occurs, the Roads and Maritime Services Environmental Incident Classification and Reporting Procedure is to be followed and the Roads and Maritime Services Contract Manager notified as soon as practicable.</td>
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<td>Roads and Maritime would immediately advise WaterNSW on the WaterNSW incident number 1800 061 069.</td>
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<td>Surface water 4 Local water quality impacts</td>
<td>Contractor</td>
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<td>Spill kits, including hydrocarbon absorbent booms would be kept at the ancillary site compounds in clearly marked and accessible locations</td>
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<td>Surface water 5 Local water quality impacts</td>
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<td>The refuelling of plant and equipment would occur in designated impervious bunded areas. Bunded areas will be located as far as possible from drainage lines or waterways.</td>
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<td>Surface water 6</td>
<td>Local water quality impacts</td>
<td>Tannins from mulch stockpiles would be managed in accordance with <em>RTA Environmental Direction - Management of Tannins from Vegetation Mulch</em> (Jan 2012).</td>
<td>Contractor</td>
<td>Pre-construction/construction</td>
<td>Additional safeguard identified in Submissions Report</td>
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<td>Ground water 1</td>
<td>Pollution or reduction in stream base flows</td>
<td>Drainage systems and water management measures will be designed to reduce sediment-related pollution of stream/aquifers and any reduction in base flows.</td>
<td>Roads and Maritime/Contractor</td>
<td>Detailed design</td>
<td>Additional safeguard</td>
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</table>
| Biodiversity 1 | General biodiversity impacts               | A Flora and Fauna Management Plan (FFMP) will be prepared in accordance with Roads and Maritime's *Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects* (RTA, 2011) and implemented as part of the CEMP. It will include, but not be limited to:  
  - plans showing areas to be cleared and areas to be protected, including exclusion zones, protected habitat features and revegetation areas (a map showing the Coastal Upland Swamp EEC and other native vegetation to be retained)  
  - management strategies for pre-construction, construction activities including control measures for the pre-clearing process | Contractor              | Pre-construction              | Core standard safeguard B1  
Section 4.8 of QA G36 Environment Protection |
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|     |                                | • requirements set out in the *Landscape Guideline* (RTA, 2008)  
• pre-clearing survey requirements including specific requirements for protected fauna (Ecological pre-clearing surveys to be undertaken prior to the commencement of the clearing, comprising searches for nest sites, maternal roosting sites for microchiropteran bats, and breeding sites for large forest birds such as Owls and the Glossy Black-Cockatoo) by a suitably qualified ecologist in accordance with the *Roads and Maritime Biodiversity Guidelines* (Pre-clearing process) (RTA, 2011)  
• procedures for unexpected threatened species finds and fauna handling  
• protocols to manage weeds and pathogens  
• proposed strategies for re-use of coarse woody debris and bushrock  
• fauna rescue and release procedure. | Roads and Maritime Maritime/Contractor | Detailed design/pre-construction | Core standard safeguard B2 |

Biodiversity 2 | General biodiversity impacts | Measures to further avoid and minimise the construction footprint and native vegetation or habitat removal will be investigated during detailed design and implemented where practicable and | Roads and Maritime Maritime/Contractor | Detailed design/pre-construction | Core standard safeguard B2 |
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<td>Biodiversity 3</td>
<td>Native vegetation</td>
<td>Detailed design will seek to minimise the construction footprint to the extent possible. A Clearing Limits Report (or similar) will be prepared which identifies reduced clearing limits achieved by detailed design, compared to the original planned clearing limits. The report will clearly explain / justify the proposed clearing limits at any locations that a reduction cannot be achieved, or only minor reductions can be achieved. The report will be approved by the Roads and Maritime Environment Manager.</td>
<td>Roads and Maritime/Contractor</td>
<td>Detailed design/pre-construction</td>
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| Biodiversity 4 | Native vegetation | Ensure exclusion zones areas are established prior to vegetation clearing through fencing and signage and these Management of exclusion zones should address the following matters:  
- Ensure that any trees to be felled to establish exclusion zones are felled away from the exclusion zone and not into retained bushland habitats  
- Signs should be clearly visible from a distance of at least 20 metres and be general in nature, such as ‘Exclusion Zone’ or ‘Environmental | Contractor | Pre-construction |                                 |
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<td>Protection Zone’</td>
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<td>• No clearing, stockpiling of plant and material shall take place in the established exclusion zones</td>
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<td>• Regular inspections of exclusion zone boundaries, and repairs to fencing should be undertaken. Additional checks should be undertaken following storms where there is a higher risk of material falling on fencing. Where possible, inspections of exclusion zones should form part of regular site environmental checks</td>
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<td>• Communication of the locations and purpose of the exclusion zones should be provided to all site staff (eg in toolbox talks and formal inductions).</td>
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<td>Biodiversity 5</td>
<td>ROTAP species - <em>Darwinia grandiflora</em></td>
<td>Investigate options for salvage of the <em>Darwinia grandiflora</em> plant. Consultation with the local botanic gardens and council would be undertaken to investigate opportunities to collect seed from the plant or accepting individual plants that can be salvaged.</td>
<td>Roads and Maritime/Contractor</td>
<td>Pre-construction/construction</td>
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<td>Biodiversity 6</td>
<td>Native vegetation</td>
<td>Landscape and Urban Design Plan to be prepared following project approval. This is to include:</td>
<td>Road and Maritime</td>
<td>Detailed design/construction/post-construction</td>
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<td>• Areas that are to be revegetated</td>
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<td>• Areas that are to be stabilised</td>
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<td>• Topsoil requirements for revegetation</td>
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<td>Ensure plant species used for revegetation are suitable for the habitat and where practicable indigenous species may be used.</td>
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<tr>
<td>Biodiversity 7</td>
<td>Native vegetation</td>
<td>Management of access into the project area through gating/fencing of existing tracks to reduce the impacts of human disturbance and dumping on the retained vegetation adjacent to the site.</td>
<td>Contractor</td>
<td>Construction</td>
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<td>Biodiversity 8</td>
<td>Invasive species and pathogens</td>
<td>The Site Erosion and Sediment Control Plan will be implemented in accordance with the Blue Book (Landcom 2004) during construction to minimise the movement of the soil borne organism, <em>Phytophthora cinnamomi</em> and weed seeds.</td>
<td>Contractor</td>
<td>Construction</td>
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</table>
| Biodiversity 9 | Invasive species and pathogens     | A Weed Management Plan (WMP) will be developed for the site as part of the CEMP and in accordance with the *Biodiversity Guidelines - Guide 6* (RTA 2001). It will include, but not be limited to:  
• A procedure for stockpile management | Contractor     | Construction |
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<td>• Requirements for the use of pesticides&lt;br&gt;• Wash down procedure for vehicles to prevent the spread of weeds</td>
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<td>Undertake weed management and control in accordance with the <em>Roads and Maritime Biodiversity Guidelines</em> (RTA, 2011) during and post-construction. Stockpiling of topsoil from cleared areas for re-use in site revegetation is only to be sourced from areas classified as ‘weed free’ by a site ecologist.</td>
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<td>Biodiversity 10</td>
<td>Invasive species and pathogens</td>
<td>Establish a protocol to prevent introduction or spread of <em>Phytophthora cinnamomi</em> and Myrtle Rust consistent with <em>Roads and Maritime Biodiversity Guidelines - Guide 7 (Pathogen Management)</em> (RTA, 2011) during construction. The protocols used should be either the <em>Sydney Region Pest Management Strategy</em> or Best Practice Guidelines for Phytophthora cinnamomi (DECC 2008) and the DPI handout prepared for Myrtle rust response 2010–11: <em>Preventing spread of Myrtle Rust in bushland</em> or the OEH Interim management plan for Myrtle rust in</td>
<td>Contractor</td>
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| Biodiversity 11 | Habitat corridor and wildlife connectivity fragmentation                  | Produce a fauna connectivity strategy in consultation with Roads and Maritime environmental staff and an experienced fauna consultant to investigate and determine what types of wildlife connectivity structures will be included in the detailed design and facilitate the movement of threatened species. Target species include forest owls, Glossy Black Cockatoo, Little Lorikeet, Gang-gang Cockatoo, microchiropteran bats, Greater Glider, Yellow-bellied Glider and Eastern Pygmy-possum. The fauna connectivity strategy will consider:  
- Enhancing the likelihood of culvert use with fauna exclusion fencing to funnel wildlife towards culvert openings and promote tree growth near entrances to encourage use of culverts as wildlife underpasses and reduce barrier effect of the motorway.  
- Retention of large glide trees adjacent to the road to facilitate Glider movement.  
- The location of the fauna exclusion | Roads and Maritime/Contractor                                            | Detailed design                      |                         |                                 |
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<tr>
<td>Biodiversity 12</td>
<td>Habitat corridor and wildlife connectivity fragmentation</td>
<td>Fencing to be determined and shown on the detailed design.</td>
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<tr>
<td>Biodiversity 12</td>
<td>Habitat corridor and wildlife connectivity fragmentation</td>
<td>A monitoring program will be designed and implemented to assess the effectiveness of fauna connectivity measures installed (once determined).</td>
<td>Roads and Maritime</td>
<td>Detailed design/post-construction</td>
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<td>Biodiversity 13</td>
<td>Loss of fauna habitat areas</td>
<td>Undertake staged habitat removal of hollow-bearing trees in accordance with the <em>Roads and Maritime Biodiversity Guidelines</em> (RTA, 2011). All habitat trees proposed for removal shall be tagged in the field with surveyors flagging tape and spray paint and clearly mapped for clearing Contractors. Felled habitat trees should be relocated into suitable retained habitats, where practicable, under the supervision of the project ecologist. Lost hollows shall be replaced by the installation of nest boxes in suitable habitats at a 1:1 ratio prior to their felling in accordance with the Nest Box Management Plan.</td>
<td>Contractor</td>
<td>Pre-construction/construction</td>
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<tr>
<td>Biodiversity 14</td>
<td>Loss of fauna habitat areas</td>
<td>A Nest Box Management Plan would be prepared in accordance with the <em>Roads and Maritime Biodiversity Guidelines-Guide 8 (Nestboxes)</em> (RTA 2011) and in consultation with a suitably experienced</td>
<td>Contractor</td>
<td>Pre-construction/during construction/post construction</td>
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<td>Biodiversity 15</td>
<td>Protected fauna</td>
<td>Contractor</td>
<td>Construction</td>
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Fauna ecologist, to ameliorate the reduction in habitat features and loss of tree hollows.

Target species for nest boxes would include forest owls, Glossy Black Cockatoo, The Little Lorikeet and the Gang-gang Cockatoo, microchiropteran bats and Greater Glider, Yellow Bellied Glider and Eastern Pygmy-possum.

The Nest Box Management Plan is to ensure no net loss of suitable Eastern Pygmy-possum habitat occurs as a result of hollow-bearing tree removal. Eastern Pygmy-possum nest boxes would be installed in suitable habitats at a frequency of one every 30-50 metres.

Undertake post-construction nest box installation maintenance and monitoring checks in accordance with the prepared Nest Box Management Plan and Roads and Maritime Biodiversity Guidelines (RTA, 2011).

In the unlikely event any nest sites of the larger sized birds such as the Square-tailed Kite and other raptors, Powerful Owl, and Masked Owl are located within the clearing area, the clearing contractor will move the nest from the construction site to the nearest...
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<td>suitable area outside of the construction site under direction of an ecologist.</td>
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| Biodiversity 16 | Coastal Upland Swamps | An Upland Swamp Management Plan will be developed that will incorporate measures to minimise the impacts on Upland Swamps. This will include:  
  • Identification of impacts to upland swamps  
  • Methods to minimise impacts on upland swamps  
  • Undertake a monitoring program at upland swamp locations prior to, during and for 12 months following, construction. | Contractor/Roads and Maritime | Pre-construction/construction/post construction | Safeguard reworded in Submissions Report |
| Biodiversity 17 | Coastal Upland Swamps | As part of an Upland Swamp Management Plan, post construction checks in line with the Roads and Maritime Biodiversity Guidelines (RTA 2011), will be implemented as part of the plan and will consider but not be limited to:  
  • Assessing the effectiveness of damming (bunding) the swamp edge and the reincorporation of appropriate material to revegetation and ensure no indirect impacts on surrounding Upland Swamps have occurred as a result | Contractor/Roads and Maritime | Pre-construction/construction/post construction | Safeguard reworded in Submissions Report |
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<td>• Should indirect impacts be encountered, remedial actions will be investigated and if practicable implemented.</td>
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<td>Biodiversity 18</td>
<td>Coastal Upland Swamps</td>
<td>Spill management policy / guidelines to be followed to protect the retained Coastal Upland Swamp vegetation from any spills during construction of batters.</td>
<td>Contractor/Roads and Maritime</td>
<td>Construction</td>
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<tr>
<td>Biodiversity 19</td>
<td>Coastal Upland Swamps</td>
<td>Batters between the new road cuttings and remaining swamps will be established to minimise impacts to the remaining Coastal Upland Swamps by preventing draining of the dissected Coastal Upland Swamps. Revegetating the batters with species associated with the particular swamp habitat and/or tubestock planting will be used where appropriate.</td>
<td>Contractor/Roads and Maritime</td>
<td>Construction</td>
<td>Safeguard reworded in Submissions Report</td>
</tr>
<tr>
<td>Biodiversity 20</td>
<td>Coastal Upland Swamps</td>
<td>The Landscape and Urban Design Plan is to incorporate progressive construction revegetation and restoration of cleared areas of Coastal Upland Swamp EEC in accordance with Roads and Maritime Biodiversity Guidelines (RTA, 2011). In particular, revegetating the batters installed with species associated with</td>
<td>Roads and Maritime</td>
<td>Construction</td>
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<td>that particular swamp to prevent drainage of the Coastal Upland Swamps. Stockpiled topsoil and/or tubestock planting will be used where appropriate.</td>
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| Biodiversity 21 | Eastern Pygmy-possum | The Fauna Connectivity Strategy plan within the Construction FFMP will incorporate all of the mitigation measures, monitoring and control measures specific to Eastern Pygmy-possum in line with the *Roads and Maritime Biodiversity Guidelines* (RTA, 2011). These are to include:  
  - Measures to mitigate habitat fragmentation: including removal of concrete barriers on the old road alignment at the southern end of the project to provide additional connectivity for the existing Eastern Pygmy-possum population to the wider locality.  
  - Enhance likelihood of culvert use with fauna fencing to funnel wildlife towards culvert openings and promote tree growth near entrances to encourage use of culverts as wildlife underpasses and reduce barrier effect of the motorway.  
The Nest Box Strategy will incorporate specific measures to ensure no net loss. | Contractor      | Pre-construction/construction |                                 |
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<td>of suitable Eastern Pygmy-possum habitat as a result of hollow-bearing tree removal within their habitat in accordance with the <em>Roads and Maritime Biodiversity Guidelines - Guide 8</em> (nestboxes) (RTA, 2011). And in consultation with a suitably experienced Fauna ecologist Twenty five EPP nestboxes are currently installed within the study area within suitable habitat and those not within the construction footprint can be retained. Undertake post-construction nest box installation maintenance and monitoring checks in accordance with the prepared nest box strategy and <em>Roads and Maritime Biodiversity Guidelines</em> (RTA, 2011).</td>
<td>Roads and Maritime Construction contractor</td>
<td>Detailed design Construction</td>
<td>Additional safeguard identified in Submissions Report</td>
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<tr>
<td>Biodiversity 22</td>
<td>Fish passage</td>
<td>The maintenance of fish passage will be addressed during detailed design and construction in consultation with DPI Fisheries.</td>
<td>Roads and Maritime Construction contractor</td>
<td>Detailed design Construction</td>
<td>Additional safeguard identified in Submissions Report</td>
</tr>
<tr>
<td>Air quality 1</td>
<td>General air quality impacts</td>
<td>An Air Quality Management Plan (AQMP) will be prepared for construction of the Proposal and implemented as part of the CEMP. The plan would detail air quality control measures and procedures to be implemented during the construction.</td>
<td>Contractor</td>
<td>Construction</td>
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<td>undertaken during construction.</td>
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| Air quality 2 | Impacts on local air quality during construction. | • Areas of exposed surfaces are to be minimised through construction site planning and programming, to reduce the area of potential construction dust emission sources.  
• Control measures would be implemented in order to minimise dust from stockpile sites.  
• Dust suppression measures, such as the use of water carts or soil binders, would be used on any unsealed surfaces and other exposed areas.  
• All trucks would be covered when transporting materials to and from the site.  
• Construction activities that would generate dust would be avoided or modified during high wind periods.  
• Work activities would be reviewed if the dust suppression measures are not adequately restricting dust generation.  
• Rehabilitation of completed sections would be progressively undertaken. | Contractor | Construction |                                |
<p>| Traffic 1 | Traffic and transport | A Traffic Management Plan (TMP) will be prepared and implemented as part of the CEMP. The TMP will be prepared in accordance with the Roads and | Contractor | Pre-construction/construction | Core standard safeguard TT1 Section 4.8 of |</p>
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<th>Responsibility</th>
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<th>Standard / additional safeguard</th>
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</table>
|     |        | Maritime Traffic Control at Work Sites Manual (RTA, 2010) and QA Specification G10 Control of Traffic (Roads and Maritime, 2008). The TMP will include:  
- confirmation of haulage routes  
- measures to maintain access to local roads  
- site specific traffic control measures (including signage) to manage and regulate traffic movement  
- measures to maintain cyclist access and provision of alternative cyclist routes during construction  
- requirements and methods to consult and inform Busways and the local community of impacts on the local road network  
- access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads.  
- a response plan for any construction traffic incident  
- consideration of other developments that may be under construction to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic  
- processes to monitor and review the | | | | QA G36 Environment Protection |
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<td>effectiveness of traffic control measures and to amend the TMP should this be necessary.</td>
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<td></td>
<td>Traffic 2</td>
<td>Property access An access strategy for construction and operational phases will be developed and agreed with relevant agencies to maintain access to fire trails and other service roads</td>
<td>Design and construction contractors/ Roads and Maritime</td>
<td>Pre-construction, construction and operation</td>
<td>Additional safeguard</td>
</tr>
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<td></td>
<td>Aboriginal 1</td>
<td>Aboriginal heritage The <em>Standard Management Procedure - Unexpected Heritage Items</em> (Roads and Maritime, 2015) will be followed in the event that an unknown or potential Aboriginal object/s, including skeletal remains, is found during construction. This applies where Roads and Maritime does not have approval to disturb the object/s or where a specific safeguard for managing the disturbance (apart from the Procedure) is not in place. Work will only re-commence once the requirements of that Procedure have been satisfied.</td>
<td>Contractor</td>
<td>Pre-construction/construction</td>
<td>Core standard safeguard AH2</td>
</tr>
<tr>
<td></td>
<td>Landscape and visual 1</td>
<td>Landscape character and visual impact A Landscape and Urban Design Plan (LUDP) will be prepared during the detailed design phase of the project and implemented as part of the CEMP. The LUDP will present an integrated</td>
<td>Roads and Maritime/ Design contractor</td>
<td>Detailed design</td>
<td>Landscape character and visual impact</td>
</tr>
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<td>No.</td>
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|     |        | landscape and urban design for the project, providing practical detail on the application of design principles and objectives identified in the environmental assessment. The Plan will include design treatments for:  
  - location and identification of existing vegetation and proposed landscaped areas, including species to be used, density and size  
  - Areas of the redundant road pavement that will be removed and revegetated  
  - Hydromulch seed mix designs and locations  
  - built elements including any retaining walls and bridge walls  
  - pedestrian and cyclist elements if necessary  
  - fixtures such as lighting, fencing and signs  
  - details of the staging of landscape works taking account of related environmental controls such as erosion and sedimentation controls and drainage  
  - procedures for monitoring and maintaining landscaped or rehabilitated areas.  
  The Landscape and Urban Design Plan | | | |

M1 Princes Motorway Improvements, Picton Road to Bulli Tops (Stage 1 – Picton Road to Bellambi Creek)  
Submissions Report
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<td></td>
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<td>will be prepared in accordance with relevant guidelines, including:</td>
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<td>• <em>Beyond the Pavement urban design policy, process and principles</em> (Roads and Maritime, 2014)</td>
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<td></td>
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<td>• <em>Landscape Guideline</em> (RTA, 2008)</td>
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<td>• <em>Bridge Aesthetics</em> (Roads and Maritime 2012)</td>
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<td></td>
<td></td>
<td>• <em>Shotcrete Design Guideline</em> (RTA, 2005).</td>
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<tr>
<td></td>
<td>Landscape and visual 2</td>
<td>Visual impacts of construction activities</td>
<td>Construction contractor</td>
<td>Construction</td>
<td>Visual impacts of construction activities</td>
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<td>To reduce the potential visual impact of construction activities:</td>
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<td>• Work sites will be left tidy at the end of each work day</td>
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<td>• Where appropriate, fencing with material attached (eg shade cloth) will be provided around the construction compound to screen views from adjoining properties</td>
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<td>Lighting for night-time work will comply with relevant Australian Standards, including <em>AS4282-1997 (Control of the obtrusive effects of outdoor lighting).</em></td>
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<tr>
<td></td>
<td>Access 1</td>
<td>Property acquisition</td>
<td>Roads and Maritime project manager</td>
<td>Pre-construction/construction</td>
<td>Core standard safeguard PL1</td>
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<td>All property acquisition will be carried out in accordance with the <em>Land Acquisition Information Guide</em> (Roads and Maritime, 2012) and the <em>Land Acquisition (Just Terms Compensation) Act 1991.</em></td>
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<tr>
<td>Access 2</td>
<td>Wollongong Coal Limited overhead power line</td>
<td>Roads and Maritime will work with Wollongong Coal to minimise impacts during potential power line relocation. Undergrounding the cable in this area or an amended overhead power supply would be further investigated in detailed design.</td>
<td>Roads and Maritime</td>
<td>Detailed design/pre-construction,</td>
<td>Additional standard safeguard</td>
</tr>
</tbody>
</table>
| Waste 1 | Construction waste impacts to the local environment as a result of the proposal | A Waste Management Plan (WMP) will be prepared and implemented as part of the CEMP. The WMP will include but not be limited to:  
- measures to avoid and minimise waste associated with the project  
- classification of wastes and management options (re-use, recycle, stockpile, disposal)  
- statutory approvals required for managing both on and off-site waste, or application of any relevant resource recovery exemptions  
- procedures for storage, transport and disposal  
- monitoring, record keeping and reporting.  
- The WMP will be prepared taking into account the Environmental Procedure - Management of Wastes on Roads and Maritime Services Land (Roads and Maritime, 2014) and relevant Roads and Maritime | Contractor | Pre-construction/construction |
<table>
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<td></td>
<td>Waste Fact Sheets.</td>
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<td>Hazards and risks 1</td>
<td>Bushfire</td>
<td>Contractor</td>
<td>Pre-construction/construction</td>
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<td></td>
<td>A Bushfire Management Plan would be prepared and include provisions to minimise the potential for ignition or spread of fire. Consultation with the local Rural Fire Service would be undertaken during the preparation of the Bushfire Management Plan.</td>
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<td></td>
<td>Hazards and risks 2</td>
<td>Traffic access</td>
<td>Contractor</td>
<td>Pre-construction/construction</td>
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<td>The TMP, would include measures to facilitate emergency vehicle access through the site (including appropriately spaced divides in the central median), as well as access into or from adjacent lands in the event of an incident (eg. vehicle crash).</td>
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<td></td>
<td>Climate 1</td>
<td>Impacts to the proposal as a result of climate change</td>
<td>Roads and Maritime Services</td>
<td>Detailed design</td>
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<td>Opportunities to increase the resilience of the road to the impacts of climate change would be investigated during detailed design where possible, as new information about the impact of climate change on performance of materials (for road foundation, fill, asphalt, bitumen etc.) and drainage structures becomes available. The review would aim to identify materials that are less susceptible to degradation impacts of climate change.</td>
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| Climate 2 | Impacts of the proposal on climate change  | Detailed design is to include consideration of the following as a minimum to minimise the potential for GHG emissions:  
  • Preferential use of local materials (where feasible and practicable) to reduce quantities of fuel consumption associated with material transportation.  
  • Delivery of materials with full loads where feasible.  
  • Ensure that all plant and vehicles are maintained regularly to maintain fuel efficiency.  
  • Seek opportunities to reduce the quantity of construction materials used through innovative design and construction methodologies.  
  • Where reasonable and feasible, procure recycled content road construction and maintenance materials such as recycled aggregates in road pavement and surfacing (including crushed concrete, granulated blast furnace slag, glass, slate waste and fly ash). This measure forms part of ROADS AND MARITIME’ implementation of the NSW | Contractor | Pre-construction/construction |                               |
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<td>Government’s ‘Waste Reduction and Purchasing Policy’ (WRAPP).</td>
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<td>Cumulative 1</td>
<td>Traffic</td>
<td>If any other road works projects in the regional network have overlapping construction periods with the proposal, consultation between the construction contractors would be undertaken to identify any measures to minimise traffic impacts on road users</td>
<td>Roads and Maritime/Construction contractor</td>
<td>Pre-construction/construction</td>
<td>Additional safeguard</td>
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</table>
3.3 Licensing and approvals

In addition to project approval under Part 5 of the EP&A Act, the separate licenses, permits, notifications and/or approvals listed in Table 5-2 may be required to construct/operate the proposal.

Table 3.2: Summary of licensing and approval required

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<tr>
<th>Instrument</th>
<th>Requirement</th>
<th>Timing</th>
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<td>Water NSW Act 2014</td>
<td>The proposed work would be undertaken within a WaterNSW ‘special area’, as identified in Schedule 1 of the Water NSW Regulation 2013. Roads and Maritime would continue to liaise with WaterNSW in regard to access and work for the proposal within the ‘special area’.</td>
<td>Prior to start of the activity.</td>
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<tr>
<td>Water NSW Regulation 2013</td>
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<tr>
<td>Protection of the Environment Operations Act 1997 (Schedule 1, Parts 1(35)(2a) and 1(19)(1))</td>
<td>The proposal is classified as a scheduled activity on two accounts; i) extraction of more than 30,000 tonnes of material and ii) a road greater than four lanes in width and for a distance of more than one kilometre in the metropolitan area. An EPL would be required for the proposal and would be applied for through EPA.</td>
<td>Prior to start of the activity.</td>
</tr>
<tr>
<td>Threatened Species Conservation Act 1995 (s91)</td>
<td>Licence to harm or pick threatened species, populations or ecological communities or damage habitat from the Chief Executive of OEH.</td>
<td>Prior to start of the activity</td>
</tr>
<tr>
<td>Water Act 1912 (s10/s18F)</td>
<td>Licence and/or permit for construction or use of a ‘work’ (eg water conservation, irrigation, water supply, drainage or changing the course of a river) for certain purposes from the DPI (Water).</td>
<td>Prior to start of the activity</td>
</tr>
</tbody>
</table>
4 References

SMEC (2016). M1 Princes Motorway Improvements, Picton Road to Bulli Tops (Stage 1 – Picton Road to Bellambi Creek). December 2016.