Australian Government

NSW GOVERNMENT

Coffs Harbour Bypass

Submissions Report

Volume 1. Executive summary, Chapters 1-3

TfNSW 20.216
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Contents

Glossary of terms and abbreviations

Term	Meaning
AADT	Average annual daily traffic. The total volume of traffic passing a roadside observation point over a period of a year, divided by the number of days per year. It is calculated from mechanically obtained axle counts.
Abutments	An end support of a bridge.
Access road	A road providing access to a property or another road.
AEP	Annual exceedance probability. The probability of a rainfall or flood event exceeding a nominated level in a year. A 1% AEP is the probability of an event exceeding a nominated level in 100 years.
Afflux	An increase in water level resulting from a constriction in the flow path.
AHD	Australian Height Datum. The standard reference level used to express the relative height of various features. A height given in metres AHD is essentially the height above sea level. Mean sea level is set at zero elevation.
AHMP	Aboriginal Heritage Management Plan.
Alignment	The geometric layout (of a road) in plan (horizontal) and elevation (vertical).
Amended design	The concept design as presented in the EIS, incorporating the design and construction changes as described in Chapter 1, Introduction of this report.
Ancillary work	Works that assist in the conduct of larger construction works such as the installation of scaffolding and compacting of soil.
AQMP	Air Quality Management Plan.
Aquifer	Geologic formation, group or formations, or part of a formation capable of transmitting and yielding quantities of water.
ARI	Average recurrence interval.

Term	Meaning
	Used to describe the frequency or probability of floods occurring. (e.g. a 100-year ARI flood is a flood that occurs or is exceeded on average once every 100 years).
ARTC	Australian Rail Track Corporation.
Arterial road	The main or trunk roads of the State road network that mostly carry traffic between regions.
AS	Australian Standard.
AS/NZ	Australian/New Zealand Standard.
ASJ RTN model	Road Traffic Noise Prediction Model.
ASSMP	Acid Sulfate Soils Management Plan.
At grade	A road at ground level, not on an embankment or in a cutting.
BAR	Biodiversity Assessment Report.
BBAM	BioBanking Assessment Methodology.
BC Act	*Biodiversity Conservation Act 2016* (NSW).
Bioregion	A region defined by the characteristics of the natural environment rather than the man-made environment.
BOS	Biodiversity Offset Strategy.
Carriageway	The portion of a roadway used by vehicles including shoulders and ancillary lanes.
Catch drains	An open channel constructed along the high side of a road cutting or embankment outside the batter to intercept and redirect surface water.
CBD	Central business district.
CE	Critically Endangered.
CEMP	Construction Environmental Management Plan. A site-specific plan developed for the construction phase of a project to ensure that all contractors and sub-contractors comply with the

Term	Meaning
	environmental conditions of approval for the project and that environmental risks are properly managed.
CFMP	Construction Flood Management Plan.
CHAR	Cultural Heritage Assessment Report.
CHCC	Coffs Harbour City Council.
CHDLALC	Coffs Harbour and District Local Aboriginal Land Council.
CHHPS	Coffs Harbour Highway Planning Strategy.
CHMP	Cultural Heritage Management Plan.
Clearway	A section of a road where stopping and parking is not allowed during defined times.
CLM Act	*Contaminated Land Management Act 1997.*
Coffs Harbour LEP	Coffs Harbour Local Environment Plan 2013.
Concept design	Initial functional layout design for a road or road system, to establish feasibility, to provide a basis for estimating, and to determine further investigations needed for detailed design.
Construction footprint	Defines the likely extent of the area required for construction of the project. This includes the area required for temporary work such as sedimentation basins, drainage channels, access roads, construction compounds and ancillary sites.
Corridor	The area investigated for environmental impact statement.
CPTED	Crime prevention through environmental design
Crown land	Land that is owned and managed by the NSW Government.
CSIRO	Commonwealth Scientific and Industrial Research Organisation.
CSSI	Critical State Significance Infrastructure; refers to a State significant infrastructure project which is essential for the State for economic, environmental or social reasons.

Term	Meaning
Culvert	One or more adjacent enclosed channels for conveying a stream below formation level.
Cut/cutting	Formation resulting from the construction of the road below existing ground level – the material is cut out or excavated.
CZMP	Coastal Zone Management Plan.
DAWE	Department of Agriculture, Water and the Environment (Australian Government).
dB	Decibel. An absolute indicator of sound power per unit in acoustics.
DEC	Department of Environment and Conservation (NSW) (former).
DECC	Department of Environment and Climate Change (NSW) (former).
DECCW	Department of Environment, Climate Change and Water (NSW) (former).
Design standards	Defined standards which are at a minimum, able to be enforced by regulatory bodies and are imposed by agencies.
Detailed design	The detailed design details the final project. It includes designs, plans and construction drawings for all elements, including: • Road alignment and geometry • Retaining wall, pavements and traffic signals • Urban design, landscaping and street lighting • Construction staging and traffic management Drainage and utilities.
DIWA	Directory of Important Wetlands of Australia.
DoEE	Department of Environment and Energy (Australian Government) (former), now DAWE.
DP&E	Department of Planning and Environment (former), now DPIE.
DPC	Department of Premier and Cabinet (NSW).
DPI	Department of Primary Industries – Agriculture (former). Department of Primary Industries – Fisheries (former).

Term	Meaning
	Now Regions, Industry, Agriculture & Resources, DPIE.
DPIE	Department of Planning, Industry and Environment.
Earthworks	All operations involved in loosening, excavating, placing, shaping and compacting soil or rock.
EESG	Environment, Energy and Science Group, DPIE.
EIS	Environmental impact statement. An environmental impact assessment document prepared in accordance with the requirements of Part 5.1 of the *Environmental Planning and Assessment Act 1979* (NSW), and written generally to comply with the requirements issued by the Secretary of the DPIE.
Embankment	An earthen structure where the road (or other infrastructure) subgrade level is above the natural surface.
ENMM	Environmental Noise Management Manual.
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW). Provides the legislative framework for land use planning and development assessment in NSW.
EP&A Regulation	Environmental Planning and Assessment Regulations 2000.
EPA	NSW Environment Protection Authority.
EPBC Act	*Environmental Protection and Biodiversity Conservation Act 1999* (Commonwealth). Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process.
EPL	Environment Protection Licence.
ESCP	Erosion and Sediment Control Plan.
ESSG	Environment, Energy and Science Group, DPIE.
EWMS	Environmental Work Method Statement.

Term	Meaning
FBA	Framework for Biodiversity Assessment. The Framework for Biodiversity Assessment prepared by the NSW Office of Heritage and Environment underpins the Biodiversity Offsets Policy for Major Projects. It contains the assessment methodology that is adopted by the policy to quantify and describe the impact assessment requirements and offset guidance that apply to Major Projects.
FFMP	Flora and Fauna Management Plan.
Fill	The material placed in an embankment.
FM Act	*Fisheries Management Act 1994.*
FRNSW	Fire and Rescue NSW.
GDE	Groundwater Dependent Ecosystem. Ecosystems which have their species composition and natural ecological processes wholly or partially determined by groundwater.
GPT	Gross pollutant traps. Filters that catch stormwater pollutants (litter and silt) before they enter the waterway.
Heavy vehicles	A heavy vehicle is classed as a Class 3 vehicle (a two-axle truck) or larger, in accordance with the Austroads Vehicle Classification System.
IBRA	Interim Biogeographic Regionalisation for Australia.
Interchange	A grade-separated junction between roads where a road passes over or under the highway via a bridge or underpass structure with one or more interconnecting roads.
ISEPP	State Environmental Planning Policy (Infrastructure) 2007 (NSW).
LEP	Local Environmental Plan. A type of planning instrument made under Part 3 of the EP&A Act.
LGA	Local government area.
Local road	A road or street used primarily for access to abutting properties.
LOS	Level of service.

Term	Meaning
	A qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers.
Lot	A parcel of land defined by measurement as a lot in a deposited plan (DP) or as a Crown portion or allotment.
Median	The central reservation which separates carriageways from traffic travelling in the opposite direction.
Microclimate	The climate of a small-scale area, such as valley or part of a city. The weather variables in a microclimate, such as temperature, rainfall, wind or humidity, may be subtly different from the conditions prevailing over the area as a whole.
Mined tunnel	A tunnel which is excavated without removing the overlaying rock or soil and open to the surface at one or both ends during construction (apart from shaft connections).
MNES	Matters of National Environmental Significance under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.
NCAs	Noise catchment areas. An area where receivers are likely to have similar noise exposure to traffic noise.
NML	Noise management level.
Nord2005 model	Acoustic Source Modelling of Nordic Road Vehicles.
NPI	Noise Policy for Industry.
NVMP	Noise and Vibration Management Plan.
OEH	Office of Environment and Heritage (NSW) (former). Functions have been split between Environment, Energy and Science, DPIE and Heritage NSW, DPC.
PACHCI	Procedure for Aboriginal Cultural Heritage Consultation and Investigation.
PCT	Plant community type.
PMF	Probable maximum flood. Largest flood that could theoretically occur at a particular location and defines the extent of flood prone land (the floodplain).

Term	Meaning
POEO Act	*Protection of the Environmental Operations Act 1997* (NSW).
RAPs	Registered Aboriginal Parties.
Receiver	An environmental modelling term used to describe a map reference point where the impact is predicted. A sensitive receptor is a home, work place, school or other place where people spend some time. An elevated receptor is a point above ground level.
RFS	NSW Rural Fire Service.
RIARG	Regions, Industry, Agriculture and Resources Group, DPIE.
RMS	Roads and Maritime Services (former) now TfNSW.
Road reserve	A legally defined area of land within which facilities such as roads, footpaths and associated features may be constructed for public travel.
RTA	Roads and Traffic Authority (former) now TfNSW.
Scour	The erosion of material by the action of flowing water.
SEARs	Secretary's Environmental Assessment Requirements. Requirements and specifications for an environmental assessment prepared by the Secretary of the Department of Planning under section 5.16 of the *Environmental Planning & Assessment Act 1979*.
SEIA	Socio-economic impact assessment.
SEPP	State Environmental Planning Policy. A type of planning instrument made under Part 3 of the EP&A Act.
SES	NSW State Emergency Service.
SHR	State Heritage Register.
SI NSW	School Infrastructure NSW.
Sight distance	The distance measured along the carriageway over which objects of defined height are visible to a driver whose eyes are at a specified height above the pavement surface level.
Spoil	Surplus excavated material.

Term	Meaning
SSI	State significant infrastructure; refers to major infrastructure, in particular linear infrastructure such as roads, railway lines or pipes which often cross a number of council boundaries, or where development may have a significant environmental impact (in the meaning of the EP&A Act).
Stockpile	Temporarily stored materials such as soil, sand, gravel and spoil/waste.
Swale	A shallow, grass-lined drainage channel.
SWMP	Soil and Water Management Plan.
Table drain	The drain adjacent to the shoulders of a road, having an invert lower that the subgrade level and formed as part of the formation.
TASAC	NSW Government's Tourist Attraction Signposting Assessment Committee.
TfNSW	Transport for New South Wales.
TMP	Traffic Management Plan.
TSC Act	*Threatened Species Conservation Act 1995* (NSW).
TSMP	Threatened Species Management Plan.
UDLP	Urban Design and Landscape Plan.
URA	Urban release area.
WARR Act	*Waste Avoidance and Resource Recovery Act 2001.*
Wetland	A swamp or marsh in which the soil is frequently or permanently saturated with water, or under water.
WM Act	*Water Management Act 2000.*
WMP	Waste Management Plan.
Zoning	Zoning regulates land use within an environmental planning instrument (usually by different colour codes on a map accompanying a local environmental plan). Land use tables set out the various purposes for which land may or may not be used or developed in each zone.

Executive summary

Executive Summary

Background

Transport for New South Wales (TfNSW, formerly Roads and Maritime Services) is planning to build a 12-kilometre bypass of Coffs Harbour from south of Englands Road to Korora Hill in the north and a two-kilometre upgrade of the existing highway between Korora Hill and Sapphire. The project would provide a four-lane divided highway that bypasses Coffs Harbour, passing through the North Boambee Valley, Roberts Hill and then traversing the foothills of the Coffs Harbour basin to the west and north to Korora Hill.

The project is subject to an approval under Division 5.2 of the *NSW Environmental Planning and Assessment Act 1979* (EP&A Act) as Critical State Significant Infrastructure (CSSI). The project is also a controlled action under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) and would need separate approval from the Australian Minister for the Environment. Accordingly, an environmental impact statement (EIS) was prepared, which described and assessed the Coffs Harbour Bypass. The EIS was exhibited by the Department of Planning, Industry and Environment (DPIE) for 47 days from 11 September 2019 to 27 October 2019.

Purpose of this report

During the exhibition of the EIS, 186 submissions were received from government agencies, stakeholders and the community. The Secretary of DPIE provided copies of the submissions to TfNSW. In accordance with section 5.17 of the EP&A Act, the Secretary requested TfNSW to provide a response to the submissions on 7 November 2019 that addresses the issues identified.

TfNSW has prepared this Submissions Report to respond to issues raised in submissions made during the exhibition of the EIS.

Key issues raised by submissions

Of the 186 submissions received for the project, 10 were from local and State government agencies (two of these were from the same agency), 21 were from community groups and organisations and 158 from individuals and businesses. The submissions are available on the DPIE website: ***https://www.planningportal.nsw.gov.au/major-projects/project/10461*.**

The key issues raised by local and State government agencies are shown in Table 1.

Table 1 Key issues raised by local and State government

Government agency	Issue summary
Coffs Harbour City Council	• Project design, traffic and transport, noise and vibration, biodiversity, non-Aboriginal cultural heritage, hydrology and flooding, socio-economic impacts, landscape character and visual amenity, soils and contamination, and transport of dangerous goods

Government agency	Issue summary
Crown Lands, DPIE	• Acquisition of Crown Land
Regions, Industry, Agriculture and Resources Group, DPIE	• Protection and management of agricultural lands, and impacts to key fish habitat and aquatic ecosystems
Environment, Energy and Science Group, DPIE	• Assessment and management of Aboriginal cultural heritage, flooding and hydrology, and biodiversity impacts including methodology and EPBC Act assessment matters
Heritage NSW, Department of Premier and Cabinet	• Management of non-Aboriginal cultural heritage impacts
NSW Environment Protection Agency	• Assessment and management of noise and vibration, flooding and hydrology, surface water quality, groundwater, air quality and waste
Fire and Rescue NSW	• Expectation of further consultation throughout the various project phases to ensure agency requirements and considerations are addressed.
Water Group, DPIE	• Assessment and management of surface water quality and works within waterfront land, licencing and approvals and groundwater impacts
School Infrastructure NSW, Department of Education	• Impacts to the Kororo Public School

The key issues raised by community groups, organisations, individuals and businesses are included in **Table 2** below with a summary of the TfNSW response.

Table 2 Key issues raised by community groups, organisations, individuals and businesses

Key issue	Summary response
Concerns around construction delivery including the need for a construct only contract so the community can be certain the design will not change.	TfNSW will consider and select the most suitable procurement method for project construction delivery. To facilitate this decision, TfNSW are in the process of developing a procurement strategy. Due to the size and complexity of the project, more than one project contract is expected to be awarded. Before tenders are advertised, the community and industry will be briefed on the procurement strategy. It is important to note that the overall design and function of the project will not change whatever the form of the contract. The inclusion of the three

Key issue	Summary response
	tunnels at Roberts Hill, north of Shephards Lane and west of Gatelys Road will be a key contractual requirement under any form of the contract chosen to the deliver the project.
Issues from business and community stakeholders regarding whether tunnels would allow the transportation of dangerous goods. This included both support for and objection to adopting dangerous goods protocols used for the St Helena tunnel on the Pacific Highway at Ewingsdale.	The project will be built to meet current standards in relation to road and fire safety. All tunnels greater than approximately 100 metres in length are required to meet these standards irrespective of which vehicles and what goods travel through them. Current policy is that vehicles carrying certified dangerous goods are generally not allowed in tunnels. TfNSW is working with relevant authorities and industry groups to develop a State wide policy on how to best accommodate dangerous goods on the road network in the future, including working towards an agreed evidence-based, customer and safety focussed approach to determining if dangerous goods should be permitted in a tunnel. With completion of the project, dangerous goods vehicles will still need to access Coffs Harbour which is a major regional centre and a destination for dangerous goods vehicles which provide essential services to the area.
Various issues relating to noise and vibration including the need for additional noise walls in the design, particularly at Coachmans Close, Korora and North Boambee Valley sections of the project. A large number of submitters requested an independent noise audit be undertaken including a review of baseline monitoring to verify current noise measurements and requests for further noise measurements where information gaps were perceived. General construction noise and vibration impacts were also raised including concerns around	A feasible and reasonable assessment was undertaken in accordance with the Noise Mitigation Guideline (Roads and Maritime Services 2015a) to determine noise mitigation for the project. Along with low noise pavement and earth mounds, it was determined that eight new noise walls up to five metres high will be required. Specific locations mentioned in submissions were checked and found not to be feasible and reasonable. The noise assessment that supported the EIS has undergone significant review and evaluation from both external and TfNSW noise specialists. There will be further noise testing which will undergo a high level of scrutiny during detailed design and operation. This process is consistent with other State significant infrastructure projects and the project will most likely be required to submit regular construction compliance reports relating to noise and vibration management. The noise monitoring survey for the project was conducted at 21 locations across Coffs Harbour and is considered representative of the noise environment throughout the project. Locations were chosen taking into account their close proximity to construction and operational noise impacts as well as areas raised by the community to be particularly sensitive to noise. All monitoring for the project was carried out in accordance with the requirements of the Secretary's Environmental Assessment Requirements issued by DPIE and relevant Australian Standards.

Key issue	Summary response
construction noise levels and mitigation measures as well as vibration impacts and its effects on residences.	TfNSW will be going beyond the requirements to minimise noise construction impacts. Where possible, at-property operational noise mitigation measures will be implemented during the pre-construction and early construction phases of the project with priority given to properties that are the closest to the construction footprint. Residents who are eligible would be contacted during the pre-construction phase of the project following project approval.
Concerns around the design of the Coramba Road interchange, noting that a 'donut' design or similar would be preferred as it could reduce the overall footprint and impacts on residents of Roselands Estate and more broadly across West Coffs.	TfNSW will investigate alternative designs for the Coramba Road interchange, including a 'donut' style interchange during detailed design. The investigation will consider issues raised in the submissions and would be guided by the standards developed during the concept design and EIS phase. Any changes to the design of the Coramba Road interchange design would need to be consistent with the function of the interchange described in the EIS. Some flexibility has been provided in the concept design to: • Allow for refinement during detailed design to consider alternative construction techniques • Allow for refinement in response to submissions received following the exhibition of the EIS • Minimise environmental impacts • Respond to improved technologies or materials • Improve value for money.
Concerns relating to project impacts on surrounding property value through perceived impact on accessibility and various amenity related impacts.	TfNSW recognises that neighbouring property owners near the project may be impacted. A number of measures have been provided to manage the types of impacts that could affect these properties such as noise and visual impacts. Future property values are difficult to forecast as they are subject to many variables, including specific attributes of the property, local amenity and accessibility, demand and supply factors and other wider changes in the property market.

In addition, 62 submissions expressed support, both generally and for more specific elements of the project such as inclusion of tunnels, a lowered alignment compared to the 2018 concept design and use of low noise pavement.

Responses to issues have drawn on the assessments carried out for the EIS and supplemented by further assessments where necessary to provide clarification or allow for additional consideration of issues. Supplementary design investigation has also been undertaken where it was required to provide clarification on the design included in the EIS or to provide further support for the responses prepared. Where required, the environmental management measures provided in the EIS have been revised or new measures prepared to assist in responding to community and agency submissions. These environmental management measures, detailed in **Chapter 6, revised environmental management measures**, will guide subsequent development and delivery phases of the project.

TfNSW has also made a number of amendments and refinements to the concept design as exhibited in the EIS. This was done in response to feedback from stakeholders and the community, landowner discussions and further development of the concept design to improve functionality and minimise environmental impacts where possible. The amendments and refinements relate to the design of the project, eg Englands Road interchange and Korora Hill interchange, and the construction methodology, eg revised traffic management during construction.

A separate Amendment Report has been prepared which outlines the proposed design and construction amendments to the project and assesses the environmental impact of these changes. Where necessary, the Amendment Report has made provisions for additional management measures. The report is available on the DPIE website: ***https://www.planningportal.nsw.gov.au/major-projects/project/10461*.**

Clarifications, corrections and further information

In addition to responding to submissions, a number of clarifications and corrections have been identified which mainly relate to minor errors in figures, tables and project and construction methodology descriptions. Further clarification regarding tunnelling activities outside standard construction hours has also been provided to ensure the community and government agencies are fully informed of what is proposed to occur and when.

Further information obtained during and/or following the EIS exhibition, which has resulted in updates to the EIS assessment, description of the existing environment or proposed environmental management measures, is also presented. Further site investigations and survey discovered a previously unidentified culvert, headwall and dry argillite retaining wall associated with North Coast Railway. A supplementary non-Aboriginal cultural heritage assessment has been carried out to assess the heritage significance of the items, document potential impacts and identify any additional mitigation measures required. The clarifications, corrections and further information are discussed **in Chapter 5, Clarifications, corrections and further information**.

Next steps

DPIE will consider this Submissions Report and the Amendment Report during its assessment of the project. The Secretary will prepare an environmental assessment report in accordance with section 5.18 of the EP&A Act. The Minister for Planning and Public Spaces will then decide whether or not to approve the project and identify any conditions of approval which will apply.

As the project is being assessed under the Assessment Bilateral Agreement (2015) between the Australian and NSW Governments, this only accredits the assessment process under Division 5.2 of the EP&A Act. Accordingly, should the Minister for Planning and Public Spaces approve the project, the Australian Minister for the Environment would then need to issue a separate approval for the project as a controlled action.

If approved by the Australian and NSW Governments, TfNSW will continue to consult with community members, government agencies and other stakeholders during the detailed design and construction phases of the project.

Chapter 1

Introduction

1. Introduction

1.1 The project as described in the EIS

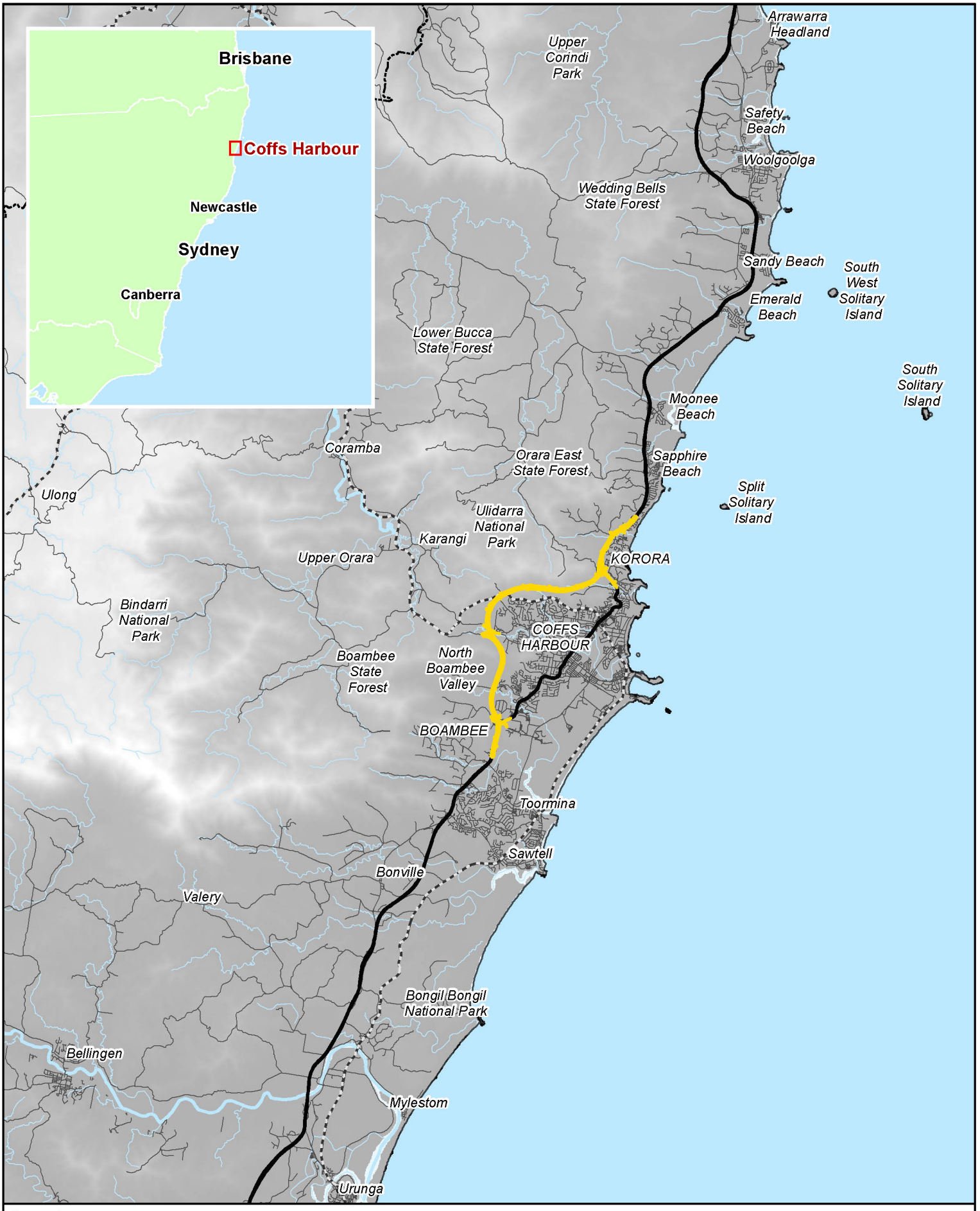
Transport for New South Wales (TfNSW, formerly Roads and Maritime Services) is seeking approval to construct the Coffs Harbour Bypass (the project). The project is located in the Coffs Harbour local government area (LGA) about three kilometres west of the Coffs Harbour central business district (CBD), about 540 kilometres north of Sydney and about 400 kilometres south of Brisbane. The location of the project is shown in **Figure 1-1**.

The project includes a 12-kilometre bypass of Coffs Harbour from south of Englands Road to Korora Hill in the north and a two-kilometre upgrade of the existing highway between Korora Hill and Sapphire. The project would provide a four-lane divided highway that bypasses Coffs Harbour, passing through the North Boambee Valley, Roberts Hill and then traversing the foothills of the Coffs Harbour basin to the west and north to Korora Hill.

Key features of the project are shown in **Figure 1-2** and include:

- Four-lane divided highway from south of Englands Road roundabout to the dual carriageway highway at Sapphire
- Bypass of the Coffs Harbour urban area from south of Englands Road intersection to Korora Hill
- Upgrade of the existing Pacific Highway between Korora Hill and the dual carriageway highway at Sapphire
- Grade-separated interchanges at Englands Road, Coramba Road and Korora Hill
- A one-way local access road along the western side of the project between the southern tie-in and Englands Road, connecting properties to the road network via Englands Road
- A new service road, located east of the project, connecting Solitary Islands Way with James Small Drive and the existing Pacific Highway near Bruxner Park Road
- Three short tunnels through ridges at Roberts Hill (around 190 metres long), Shephards Lane (around 360 metres long), and Gatelys Road (around 450 metres long)
- Relocation of the Kororo Public School bus interchange and Luke Bowen footbridge.

A more detailed description of the project is found in Chapter 5 of the Coffs Harbour Bypass environmental impact statement (EIS) (TfNSW 2019).



Legend

- Coffs Harbour Bypass
- Existing Pacific Highway
- North Coast Railway

Coffs Harbour Bypass
Location of project
Figure 1-1

NOTE: Elements are indicative only for the purpose of project planning and may change prior to construction.

0 2 4 6 km

Scale @A4: 1:18,000,000
GDA 1994 MGA Zone 56

N


Bucca Bucca Ck
Ulidarra National Park
Pine Brush Ck
Korora Nature Reserve
Orara East State Forest
Korora Hill interchange
Korora
Shephards Lane tunnel
Gatelys Road tunnel
Karangi Ck
Orara River
Coffs Coast Regional Park
Gatelys Road
Red Hill
Shephards Lane
Treefern Ck
Coramba Road interchange
Coramba Road
Existing Pacific Highway
Roberts Hill tunnel
Boambee State Forest
Coffs Creek
Muttonbird Island Nature Reserve
Coffs Harbour
Thompsons Hill
Newports Creek
Englands Road
Englands Road interchange
North Coast Railway
Boambee Creek
Legend
Construction footprint
Ancillary sites
Alignment
North Coast Railway
Watercourse
Coffs Harbour Bypass
Key features of the project
Figure 1-2
0
0.5
1
1.5
km
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Scale @A4: 1:50,000
GDA 1994 MGA Zone 56

1.2 Environmental impact statement exhibition

The EIS was exhibited by DPIE from 11 September to 27 October 2019. As part of the exhibition, a number of activities were carried out by TfNSW to engage with the community. These included community drop-in sessions, pop up displays, static displays at various locations, continuation of the project display office, preparation of a project update, social media engagement, advertisements, letters and email updates, various briefings and meetings and updates on the project website. Further details of key engagement activities during the EIS exhibition are provided in **Table 1-1**.

Table 1-1 Engagement activities

Tool	Dates	Details
Community drop-in sessions held during the exhibition period to allow community members to ask questions and seek further information	September and October 2019 – various dates	• Pacific Bay Resort from 4pm to 7pm (17 September 2019) and 9am to 12pm (12 October 2019) • Coffs Harbour Showgrounds from 4pm to 7pm (26 September 2019) • Narranga Public School from 4pm to 7pm (1 October 2019) • Coffs Harbour Golf Club from 4pm to 7pm (16 October 2019) • More than 100 people attended • Materials made available during the community drop-in sessions included the EIS, project update, a postcard and fact sheet with information on how to make a submission, information posters and an interactive 3D model of the project.
Pop-up displays	September and October 2019 – various dates	• Bunnings Warehouse, Coffs Harbour from 10am to 2pm (21 September 2019) • Park Beach Plaza from 10am to 2pm (24 September 2019) and 4pm to 7pm (10 October 2019) • Coffs Central from 10am to 2pm (2 October 2019) • Toormina Gardens from 10am to 2pm (17 October 2019) • Moonee Market from 10am to 2pm (22 October 2019) • Over 300 people attended.
Static displays of the EIS	11 September to 27 October 2019	• Transport for NSW, 76 Victoria Street, Grafton • Project display office, 11a Park Avenue, Coffs Harbour • Coffs Harbour City Council, corner of Coffs and Castle Streets, Coffs Harbour

Tool	Dates	Details
		• Harry Bailey Memorial Library, corner of Coffs and Duke Streets, Coffs Harbour • Toormina Library, Minorie Drive, Toormina • Nature Conservation Council, 14/338 Pitt Street, Sydney • Department of Planning, Industry and Environment, 320 Pitt Street, Sydney.
Project display office	11 September to 27 October 2019	• The project display office at 11a Park Avenue, Coffs Harbour was open from Monday to Friday, 10am to 4pm • Almost 600 people visited during the display period
Project update providing information on how to make a submission, details on drop-in sessions and where to find further information	7 September 2019	• About 30,000 copies of the project update were distributed to households in Coffs Harbour, Bonville, Coramba, Moonee Beach, North Boambee Valley, Toormina, Dorrigo and Woolgoolga • The update was also available at the project display office, Council chambers and electorate offices in Coffs Harbour as well as TfNSW office in Grafton • Distributed to about 1220 individuals via email.
Media release to inform the community of the public display period	11 September 2019	• Coffs Coast Advocate and Coffs Outlook • Prime 7 and NBN • Triple M Coffs Coast, ABC Coffs Coast, ABC Mid North Coast and 2HC Coffs Coast radio stations.
Social media – NSW Roads Facebook page	September and October 2019 – various dates	• 'EIS now on display' post (12 September 2019) • 'What is an EIS' video post (20 September 2019) • 'Check out the EIS web portal' post (4 October 2019) • 'Have Your Say Call for feedback and EIS full report available online' post (15 October 2019) • 'Submit your feedback by 27 October' post (22 October 2019).

Tool	Dates	Details
Face-to-face briefings/meetings with key stakeholders	September and October 2019 – various dates	• A briefing with local members of parliament (10 September 2019) • A briefing with representatives of Coffs Harbour City Council (17 September 2019) • A briefing with representatives of key government agencies, including DPIE, to discuss the EIS and a summary of impacts (19-20 September 2019) • A briefing was held for the National Indigenous Australians Agency Employment Yarn Up (23 October 2019).
Meetings with directly impacted property owners	September and October 2019 – various dates	• 10 face-to-face meetings held with impacted property owners • 15 phone calls with directly impacted property owners.
Community Consultative Committee meeting	25 September 2019	• A meeting of the Community Consultative Committee was held in Coffs Harbour to discuss the EIS.
Aboriginal focus group (AFG) meeting	23 September 2019	• A meeting of registered Aboriginal parties (RAPs) for the project was held to provide an update on the project including the EIS display.
Project website updates	Ongoing	• An interactive web portal was made available on the project website, this included a drive through video showing the key features and benefits of the project • There were 4544 unique visitors to the project website and 14,349 page views during the EIS display.

1.3 Purpose of this document

During the exhibition of the EIS, 186 submissions were made. The Secretary of DPIE provided copies of the submissions to TfNSW. In accordance with section 5.17 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), the Secretary requested TfNSW to provide a response to submissions on 7 November 2019 that addresses the issues identified in the submissions from members of the public, interest groups and government agencies.

The Submissions Report includes:

- **Chapter 1, Introduction** – Provides a background to the project and overview of the EIS exhibition and proposed amendments and refinements since following display of the EIS
- **Chapter 2, Submissions received** – Gives details on numbers of submissions received and methodology used to summarise the issues

- **Chapter 3, Response to agency submissions** – Provides an overview of agency submissions with responses to the issues raised
- **Chapter 4, Response to community submissions** – Provides an overview of community submissions with responses to the issue raised
- **Chapter 5, Clarifications, corrections and further information** – Provides clarifications and corrections to errors made in the EIS, as well as outlining further information available since the exhibition of the EIS
- **Chapter 6, Revised environmental management measures**.

1.4 Amendment report

Following the exhibition of the EIS, TfNSW has made a number of amendments and refinements to the concept design as exhibited in the EIS. This was done in response to feedback from stakeholders and the community, landowner discussions and further development of the concept design to improve functionality and minimise environmental impacts where possible.

A separate Amendment Report has been prepared which outlines the proposed design and construction amendments to the project and assesses the environmental impact of these changes. Where necessary, the Amendment Report has made provisions for additional management measures. The report is available on the DPIE website https://www.planningportal.nsw.gov.au/major-projects/project/10461. An overview of the proposed changes is found in Chapter 1, Introduction and background of the Amendment Report.

Refinements have also been made as part of the ongoing development of the project since the EIS was exhibited. Refinements are changes that are consistent with the parameters of the project description as described in the EIS.

These refinements include:

- Minor updates to the horizontal and vertical alignment of the design within the overall road corridor
- Minor changes to bridge span, soffit level and pier arrangement at waterway crossings
- Modifications to the length, capacity (eg size and blockage) and in some cases the location of transverse drainage
- Minor updates to local access roads
- Introduction of localised flood detention areas, including the localised flood detention area within the construction footprint
- Minor location changes to construction and operational water quality basins within the construction footprint to optimise treatment performance and/or address constructability issues.

However, for completeness these refinements have been considered in any modelling or impact assessment described in the Amendment Report where relevant.

It should be noted the concept design has incorporated the proposed design and construction amendments and refinements described above and is referred to as the amended design in this report.

Chapter 2

Submissions received

2. Submissions received

2.1 Submitters

A total of 186 submissions were received in response to the EIS during the exhibition period. Of the total submissions received, ten were from local and State government agencies (two of these were from the same agency), 21 were from community groups and organisations and 155 from individuals and businesses. The submissions are available on the DPIE website https://www.planningportal.nsw.gov.au/major-projects/project/10461.

Each submission was allocated a submission ID number and has been examined individually to understand the issues being raised.

Appendix A, Submission ID table lists each submission by the ID number and provides a cross-reference to the section of this report where the issues raised are addressed.

2.2 Methodology for addressing issues raised

Each submission was examined individually to identify and understand issues raised. The content of each submission was reviewed and allocated against key issue categories (eg noise and vibration) and sub-issues (eg construction noise impacts). Submissions frequently raised issues which aligned with several key issue categories.

The issues in each submission were then extracted and collated, enabling the grouping and summarising of similar submissions which were then responded to with an overarching response. This means that while the exact wording of a particular submission may not be presented in the issue summary, the intent of each individual issue raised is captured and responded to. Where similar issues have been raised in different submissions, only one response is provided.

Responses to the agency issues are provided in **Chapter 3, Response to agency submissions** and responses to the community issues are provided in **Chapter 4, Response to community submissions**. **Chapter 3, Response to agency submissions** summarises the issues raised in each of the nine agency submissions. The issue categories raised by all community submitters are outlined in **Chapter 4, Response to community submissions** and illustrated in **Figure 4-1**.

Chapter 3

Response to agency submissions

3. Response to agency submissions

This chapter addresses submissions received from government agencies. Agency submissions were received from:

- Coffs Harbour City Council (CHCC)
- Crown Lands, DPIE
- Regions, Industry, Agriculture and Resources Group, DPIE
- Environment, Energy and Science Group, DPIE
- Heritage NSW, Department of Premier and Cabinet (DPC)
- NSW Environment Protection Authority (EPA)
- Fire and Rescue NSW (FRNSW)
- Water Group, DPIE
- School Infrastructure NSW (SI NSW), NSW Department of Education.

Issues raised by government agencies generally relate to their respective statutory responsibilities and a summary of issues is provided in **Table 3-1**.

Table 3-1 Key issues raised by government agencies and Council

Section	Government agency	Issue summary
3.1	CHCC	Project design, traffic and transport, noise and vibration, biodiversity, non-Aboriginal cultural heritage, and hydrology and flooding, socio-economic impacts, landscape character and visual amenity, soils and contamination, and dangerous goods
3.2	Crown Lands, DPIE	Acquisition of Crown Land
3.3	Regions, Industry, Agriculture and Resources Group, DPIE	Protection and management of agricultural lands, impacts to key fish habitat and aquatic ecosystems
3.4	Environment, Energy and Science Group, DPIE	Assessment and management of Aboriginal heritage, flooding and hydrology, and biodiversity impacts including methodology and *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) assessment matters
3.5	Heritage NSW, DPC	Management of non-Aboriginal heritage impacts
3.6	EPA	Assessment and management of noise and vibration, flooding and hydrology, surface water quality, groundwater, air quality and waste

Section	Government agency	Issue summary
3.7	FRNSW	Expectation of further consultation throughout the various project phases to ensure agency requirements and considerations are addressed.
3.8	Water Group, DPIE	Assessment and management of surface water quality and groundwater impacts
3.9	SI NSW	Impacts to the Kororo Public School

3.1 Coffs Harbour City Council

3.1.1 Support

Issue description

- CHCC are highly appreciative of the adoption of tunnels over cuttings. CHCC appreciates the extent of work that has occurred behind the scenes by the project team to bring this outcome to the project.

Response

CHCC support for the project is noted.

3.1.2 Consultation

Issue description

- CHCC acknowledges TfNSW's approach to undertake ongoing consultation on several issues including Kororo Public School bus interchange and the Coramba Road bus stop locations, development areas, James Small Drive, management of pedestrians and cyclists during construction and others.

Response

TfNSW will continue to consult with CHCC during the detailed design on a wide range of issues. Following the exhibition of the EIS, TfNSW has engaged with CHCC on numerous occasions to discuss a number of issues including but not limited to proposed design and construction changes described in the Amendment Report, the whole-of-government response to mitigate flooding in North Boambee Valley catchment and issues raised in CHCC's EIS submissions. For further information on consultation with government agencies, community and other stakeholders, refer to Chapter 4, Consultation of the Amendment Report.

TfNSW will continue to consult with CHCC about the issues raised above and addressed in the responses below as required.

3.1.3 Design standards

Issue description

- In relation to local road geometrical standards, CHCC has previously supplied TfNSW with generic development specifications which are applied to new roads built within the network. In consultation with TfNSW, there have been implications to the wider project in applying these standards which result in general inefficiencies to the overall project and to CHCC as the long-term manager of the local roads. CHCC has provided a table of information that details existing and proposed widths of local roads. This information can be used to inform the design. CHCC recognises that as the design progresses, further optimisations may be possibly provided through adequate consultation with CHCC and other stakeholders
- CHCC will consider some deviations from the local road specification where applicable to reduce property and community impacts, whilst reducing long term road maintenance for CHCC.

Response

The advice CHCC has provided regarding local road geometrical standards is appreciated. TfNSW will continue to consult with CHCC during detailed design regarding applying this information and any deviations that would be justified in terms of very low use roads and other similar situations.

3.1.4 Construction

Issue description

CHCC have concerns over the use of Mackays Road north as a proposed construction access route. TfNSW states this road is a collector road which is the case for the segment south of Bray Street to Beryl Street, however from Bray Street north the road is a local access road. This road contains a private hospital, retirement village and residential areas. The road is regularly parked to capacity, leaving only a six-metre travel width. There are many vulnerable pedestrians in this area that access the retirement village and hospital regularly. As a result, the congested environment may not be the best access point to the road corridor. CHCC recognises there are limited access points in this area but offers two alternative access points that pose less of a threat to the community:

- Access via Vera Drive – This area is residential only and there would also be considerable disruption to the residents during construction. The road width however, is between 10.5 metres and 11 metres wide, reducing congestion and vehicle conflict risks. There are less vulnerable pedestrians in the area as well
- Access via Gatelys Road – This is a far longer access route and potentially steeper. There are far less residences to be impacted but may require residential agreements. This would have the least impact to the local community.

CHCC requests TfNSW investigate these options and others to ensure the safest approach with minimal disruption to local traffic and pedestrians in the construction phase.

Response

The only public road access to the section of the project located between the Shephards Lane tunnel and the Gatelys Road tunnel is via Mackays Road. TfNSW acknowledges construction access via Vera Drive may be feasible as an alternative to using the section of Mackays Road near Baringa Hospital. However, both routes would have impacts on adjoining community and road users that would need to be effectively managed during construction.

Construction access to the section of the project located between the Shephards Lane tunnel and the Gatelys Road tunnel is not proposed via Gatelys Road because of the steep terrain between the top of Gatelys Road and the Mackays Road valley. The steep terrain would present unreasonable safety risks, particularly for heavy vehicles and construction machinery.

TfNSW will investigate alternative construction access arrangements, including access via Vera Drive, for this area of the project during detailed design as part of the process to develop the Traffic Management Plan (TMP). As a result, environmental management measure TT06 has been revised to reflect this commitment (see **Chapter 6, Revised environmental management measures**). The TMP will confirm the construction access arrangements for the project and will include but not be limited to site specific traffic control measures (including signage) to manage and regulate traffic movement, consultation and community notification requirements and monitoring requirements to ensure the traffic control measures and access arrangements satisfy the plan's objectives.

3.1.5 Traffic and transport

Methodology used to calculate traffic volumes

Issue description

In relation to local road traffic volumes, **Table 3.1-1** contains data provided by CHCC to back up and refine the TfNSW data around traffic volumes on a number of roads that will be upgraded or impacted due to the project.

Table 3.1-1 Updated traffic volumes provided by CHCC

Location	TfNSW volume data (2016)	CHCC volume data
Hogbin Drive (north of Park Beach Road)	9500 (7%)*	2016 - 14,600 (7 day) between Boultwood and Prince Street
Hogbin Drive (north of Harbour Drive)	17,200 (3%)	No data available
Hogbin Drive (north of Stadium Drive)	20,700 (7%)*	2016 – 19,382 (5 day)
Stadium Drive (east of Pacific Highway)	8900 (9%)	2018 – 9,550 (5 day)
Englands Road (west of Pacific Highway)	5300 (18%	2004 – 2,012 (5 day)
Bray Street (east of Joyce Street)	8100 (2%)*	2012 – 11,147 (5 day)
Coramba Road (from Robin Street to Shephards Lane)	10,200 (4%)*	No data available
Coramba Road (from Shephards Lane to Bennetts Road)	6300 (9%)	2018 – 6,716 (4.9%)
Coramba Road (west of Bennetts Road)	5900 (5%)*	2016 – 5,758 (5 day)
Bennetts Road (west of Coramba Road)	300 (10%)	2013 – 283 (5 day)
James Small Drive (east of Pacific Highway)	3000 (1%)*	No data available
Bruxner Park Road (west of Pacific Highway)	700 (6%)	2012 – 495 (7 day)

*These daily volumes are derived from 12-hour turning movement counts using conversion factors.

Response

As described in Chapter 4, Appendix F Traffic and transport of the EIS, the traffic model developed for the project is based on AM and PM peak hours and used the peak hour traffic counts collected for the model calibration and validation process (note in many cases the daily traffic volumes reported in the EIS are derived by factoring a 12-hour count up to a daily equivalent). Notwithstanding, the daily traffic count data provided by CHCC has been reviewed and compared with the count data reported in the EIS.

Traffic count data provided by CHCC at Englands Road, Bray Street, Bennetts Road and Bruxner Park Road are considered too dated to provide a reliable comparison.

The TfNSW count for Hogbin Drive (north of Park Beach Road) (9500 vehicles) shows a significant difference to the CHCC count, which is located south of Park Beach Road (14,600 vehicles). This difference is because of the different locations for the count data. There is a significant level of traffic that uses Park Beach Road, resulting in higher volumes south of Park Beach Road compared to north of Park Beach Road, which accounts for the difference in the count data at this location.

At the Stadium Drive location, the CHCC count was done in 2018 (9550 vehicles) compared to the TfNSW count that was counted in 2016 (8900 vehicles). The difference of 650 vehicles between CHCC and TfNSW counts equates to an annual growth of about 3.5 per cent, which is within reasonable annual growth limits. As such, the use of the TfNSW count data remains appropriate.

Similarly, at the Coramba Road location between Shephards Land and Bennetts Road, the CHCC count was done in 2018 (6716 vehicles) compared to the TfNSW count from 2016 (6300 vehicles). The difference of 416 vehicles between CHCC and TfNSW counts equates to an annual growth of about 3.3 per cent, which is within reasonable annual growth limits. As such, the use of the TfNSW count data remains appropriate.

Although the CHCC count for the Bray Street location is considered too dated to provide a reliable comparison to current conditions, the CHCC count (11,147 vehicles) was significantly higher compared to the TfNSW count (8100 vehicles). The reason for the difference is likely to be because of the difference in the locations of the counts. The TfNSW count was located at the Bray Street/Joyce Street intersection and the CHCC count was located much closer to the Pacific Highway with several side streets between the two locations. The difference between the two counts would be caused by side streets contributing extra traffic and resulting in higher volumes at the CHCC count location.

For the remaining locations, both the TfNSW and CHCC counts are consistent, or the TfNSW count is slightly higher, which provides additional confidence in the TfNSW counts used.

Overall, the comparison between the TfNSW and CHCC traffic count data showed differences at several locations. As noted above, there are reasonable explanations for the differences and as such, there have been no changes to the base count data used to inform validation and calibration of the traffic model.

Issue description

- In relation to local traffic volume changes, CHCC has reviewed the logic behind the TfNSW traffic changes. CHCC have also reviewed data obtained by TfNSW and the logic applied to the Coffs Harbour Strategic Traffic Model (CHSTM) used in the study. CHCC has not had access to the model to do a detailed review thus can only review the general logic applied based on knowledge of how traffic moves in the current and proposed arrangement. CHCC believes the logic applied is sound.

Response

CHCC comments on the logic behind the TfNSW traffic changes and logic applied to the CHSTM used in the study are noted.

Issue description

- There appears to be significant discrepancy in traffic volume figures in Appendix F, Traffic and transport assessment of the EIS. Specifically, in relation to Hogbin Drive, there appears to be discrepancies between 2016 survey data in Table 6 (20,700 vehicles per day (vpd)) and 2016 daily volumes in Table 12 (27,500 vpd). TfNSW should clarify why there is such a significant discrepancy.

Response

The discrepancy in the traffic volumes between Table 6 and Table 12 of Appendix F, Traffic and transport assessment of the EIS for Hogbin Drive (north of Stadium Drive) is because of the different source for the volumes and different factoring processes used to produce estimates of daily traffic volumes.

The daily traffic volumes provided in Table 6 are derived from traffic count data. The traffic count was an intersection turning movement count at the Hogbin Drive/Stadium Drive roundabout. This 12-hour count was factored up to a daily volume count using 24-hour count data from a location on Hogbin Drive, north of Orlando Street.

Whereas, the daily traffic volumes given in Table 12 are derived from the traffic model, where the AM and PM peak hour traffic model volumes are factored up to a daily volume using factors from the strategic traffic model.

The accuracy of both source volumes has been checked and verified by TfNSW since the exhibition of the EIS. The estimated daily volumes are provided for illustrative and comparative purposes in the EIS. These daily volumes are estimated using different data sources and are therefore likely to result in different volumes. The traffic model produces predicted peak hour volumes and it is these volumes that are used for traffic design purposes. A check of the traffic model's accuracy showed the model predicted peak hour volumes at the Hogbin Drive/Stadium Drive roundabout compared closely to the traffic count data. This is shown in Appendix F of Appendix B of Appendix F, Traffic and transport assessment of the EIS.

Footpaths

Issue description

- CHCC requests consideration of centre island crossings of the footpath/cycleway for the north-south and east-west paths.

Response

The need for centre island crossings, also known as pedestrian refuges, have been considered in the design and included where necessary. There are currently two locations where centre island crossings are proposed. The first is between the Englands Road/existing Pacific Highway/Stadium Drive intersection, and the roundabout at Englands Road interchange. The second is adjacent to Coachmans Close on approach to the underpass, linking the service road with the local access road on the western side of the project (via the underpass at Fernleigh Avenue).

In determining whether centre island crossings are necessary, the distance and time required by a pedestrian or cyclist to travel through the signalised intersection is considered. If appropriate time is allowed for within the green cycle time, then centre islands or pedestrian refuges are not warranted. The appropriate time for the green cycle time is dependent on the length of the crossing and varies at each location. The design allows for pedestrians to walk at a speed of 1.2m/s, which is the speed nominated in the Austroads guidelines. If a pedestrian triggers the crossing sequence, they will have sufficient time to completely cross the intersection at the nominal speed.

A mid-block island crossing is proposed on the service road near Coachmans Close, between the underpass at Fernleigh Avenue and Opal Boulevard. A mid-block island crossing is proposed at this location to provide clear designation of the desired route for users, to maximise the space between the crossing and the adjacent intersections, and to limit the crossing so that only one lane of traffic is crossed at each stage.

The requirement for centre island crossings has been minimised by the project's active transport strategy. The strategy considers which side of the road the paths should be placed on to meet the desired route for users, while also reducing the need to cross roads.

Issue description

- CHCC aims to construct all new footpaths to a minimum width of 1.5 metres. Where a cycleway forms part of the network in the location, a shared path width of 2.5 metres should be adopted. CHCC does not object to greater widths being provided where there is an identified need.

Response

TfNSW will consult with CHCC on a strategy for pedestrians and cyclists during the development of the detailed design. The design standards for footpaths and shared user paths would meet TfNSW and CHCC requirements. This commitment to consult with CHCC is reflected in an additional environmental management measure TT10 in **Chapter 6, Revised environmental management measures**.

Review of operational network performance

Issue description

- Environmental management measure TT11 in the EIS states that a review of operational network performance will be undertaken 12 months from the opening of the project to confirm the operational traffic and transport impacts of the project on the surrounding road network
- It is noted that CHCC is currently working with TfNSW to develop a collaborative approach to managing and maintaining a traffic model for the Coffs Harbour road network. It is expected that TT11 will be undertaken in consultation with both TfNSW and CHCC to ensure the most up-to-date model is used or network modifications are incorporated.

Response

TfNSW will consult with CHCC as part of the review of operational network performance as outlined in environmental management measure TT11. For further information refer to **Chapter 6, Revised environmental management measures**.

3.1.6 Englands Road interchange

Issue description

- CHCC has indicated to TfNSW that investigation of future employment lands in North Boambee Valley West has been suspended. However, a more recent draft Employment Land Strategy (HillPDA 2019) recommends investigating this area for the opportunity for a general industrial precinct. This area is generally located immediately north of Englands Road and west of the proposed bypass. The draft Employment Land Strategy notes that this area could provide around 13 hectares for industrial uses and is similarly identified as an investigation area in the North Coast Regional Plan 2036. Therefore, it is recommended that the interchange design allows for traffic movements associated with this potential industrial precinct.

Response

As described in Chapter 4 of Appendix F, Traffic and transport assessment of the EIS, traffic modelling for the project was carried out using a three-tiered approach. The regional strategic model (CHSTM) was used to provide forecast traffic demands for the modelled area. A more detailed project specific network model (Coffs Harbour Traffic Model (CHTM)) was then completed to predict the traffic distribution on the road network and performance of the road network with and without the project. A

detailed interchange and intersection capacity analysis was also carried out using microsimulation and intersection models.

A range of forecast land use and population growth, provided by CHCC, have been adopted to develop the CHSTM future year forecasts and is described in detail in Chapter 6, Traffic Model Development Report of the EIS (as part of Appendix F, Traffic and transport assessment). This information has then been used to determine traffic volume predictions to inform the design of the interchange. Comments received from CHCC between September 2017 and January 2018 on land use and population forecasts were incorporated into the model.

For the catchment area accessed by Englands Road immediately west of the bypass, the model includes provision for development of a potential industrial precinct by including around 930 additional jobs in that area by 2044 in the land-use assumptions. As such, the model and the design of the Englands Road interchange, includes traffic movements that would be generated by the potential industrial precinct.

Additionally, the interchange has been designed for B-doubles in accordance with Upgrading the Pacific Highway – Design Guidelines (Roads and Maritime Services 2015b) which would support a future industrial precinct if developed.

Issue description

- The Englands Road roundabout has had seven rollover crashes in the past five years (TfNSW data). The upgrade to an at-grade traffic lighted intersection proposes to reduce this type of crash occurring and provides for higher level of service of the general traffic flow. While the risk of rollovers is reduced with these types of intersections, the risk of T-bone style crashes is increased. CHCC is concerned that there may be an increase in serious and fatal accidents as a result of this change. CHCC requests the inclusion of red-light cameras and speed control measures on approach from the north and the south in particular.

Response

The project has been designed in general accordance with Upgrading the Pacific Highway – Design Guidelines (Roads and Maritime Services 2015b), Austroads guidelines, Australian Standards, and TfNSW supplementary documents. In applying these guidelines, road, pedestrian and cyclist safety has been a key consideration in overall design of the project, including for the signalised intersection at Englands Road, Stadium Drive and the existing Pacific Highway.

The use of red-light speed (safety) cameras or other speed control measures has not been considered as part of the concept design development for the project. The use of measures such as red-light speed cameras is managed in accordance with the NSW Speed Camera Strategy (TfNSW 2012) and are installed to reduce crashes at high-risk intersections with traffic lights. Red-light speed cameras are also location-specific as they address speeding and red-light running at signalised intersections where drivers and pedestrians are vulnerable to right angle crashes.

As described in the NSW Speed Camera Strategy (TfNSW 2012), intersections are prioritised for the installation of red-light speed cameras based on the frequency and severity of crashes and a risk assessment of the intersection in relation to the broader road network. All signalised intersections in NSW are routinely ranked based on crash history to ensure that intersections that need enforcement most are prioritised. Consideration is also given to placing red-light speed cameras at locations where there is a potential for severe crashes. This pre-emptive deployment is also used in Victoria where it has been recognised that waiting for a potential crash to occur to justify enforcement is not always the most suitable methodology. The overall deployment of red-light speed cameras also considers the location of enforcement in relation to other red-light speed cameras and other types of camera

enforcement. This ensures that there is a sufficient geographic spread and a minimum amount of deployment in regional areas.

The need for red-light speed cameras or other speed control measures for the new signalised intersection with the existing Pacific Highway, Englands Road and Stadium Drive would be considered during detailed design in accordance with requirements of the NSW Speed Camera Strategy (TfNSW 2012).

Coffs Coast Resource Recovery Park

Issue description

- CHCC has previously identified that a western service road connecting to the Sawtell Road intersection instead of Englands Road would bring considerable benefits in minimising conflicts with the Coffs Coast Resource Recovery Park. By doing this, it would require an upgrade of the Sawtell Road interchange, which is a future priority for TfNSW. It also brings considerable benefits to the local community in crash reduction.
- Ultimately CHCC desires an outcome which minimises impact to the waste facility and maximises the road safety of all users. CHCC believes the current solution is not holistic in considering all the issues raised in the area and requests TfNSW consider a solution that helps solve future priorities and the local community.

Response

TfNSW acknowledges and appreciates the important role Coffs Coast Resource Recovery Park plays in the local Coffs Harbour economy. TfNSW understands the facilities provide key waste services to three local government areas as well as running education sessions for a variety of student groups.

Following the exhibition of the EIS, the concept design for the Englands Road interchange was changed and the proposed design is documented in Chapter 2, Design changes of the Amendment Report. Among other reasons, the design changes have been proposed to maintain full access between Englands Road and Isles Drive industrial area, which includes the Coffs Coast Resource Recovery Park. A revised alignment for the northbound exit ramp and the new one-way local access road, located on the western side of the project, is proposed to reduce impacts on the Coffs Coast Resource Recovery Park.

In addition to reduced access impacts, the amended design is anticipated to significantly reduce the impact to each waste business. The change to socio-economic impact on each business is outlined below and in further detail within Table 5.8-2 of Section 5.8, Socio-economic of the Amendment Report:

- Handy Bin Waste Services – the proposed design changes would no longer require the demolition of the eastern end of the main shed, which provides a beneficial change that would ensure operations can continue with minimal alterations. Impacts to the existing car parking would still be required but would be undertaken in consultation with Handy Bin Waste Services to ensure there is minimal disruption to staff and customer access
- Coffs Coast Waste Services – the EIS identified direct impacts to an onsite parking area and vehicle maintenance sheds. These impacts would be avoided with the proposed design change, which would be a beneficial change when compared with the EIS
- CHCC Community Recycling Centre – the proposed design changes would not alter the impacts reported in the EIS. Access to the centre would still be directly impacted during construction, but alternative access would be provided

- Biomass solutions – the stockpiling yard, car parking areas and access routes would be avoided as a result of the proposed design changes. This would mean that the business can continue on site, with minimal alterations to current operations. This would be a beneficial change from the EIS, which reported the required demolition and subsequent impacts on business operations.

Overall, the proposed design changes results in a significant beneficial reduction in property and business impacts within the Coffs Coast Resource Recovery Park.

Additionally, the amended Englands Road interchange design provides improved traffic flows, reduces delays through the removal of two sets of traffic lights and improves functionality and simplicity for motorists in way finding. **Section 4.4.4** of this report addresses in detail the concerns raised by community members in regards to the Englands Road interchange.

It should also be noted that TfNSW has engaged in consultation and discussions with CHCC to produce the amended design. TfNSW will continue to engage with CHCC and businesses within Coffs Coast Resource Recovery Park during detailed design to identify opportunities to reduce temporary construction impacts on the operation of the waste management facilities.

Notwithstanding the above, TfNSW has also discussed the potential for a western service road connecting to the Sawtell Road interchange raised by CHCC at a meeting in March 2020. While it is considered outside of the scope of the project, TfNSW will continue to review this issue in combination with alternative access arrangements for the section of the Pacific Highway between Englands Road and Sawtell Road as described in **Section 4.7.7**.

C.ex Coffs International Stadium and Stadium Drive

Issue description

- Consideration should be given to an additional access point to the C.ex Coffs International Stadium precinct from the south on the existing Pacific Highway. This is identified in CHCC documents such as the Sports Facility Plan 2016 and the Coffs Coast Sport and Leisure Park Masterplan. An additional access point (not on Stadium Drive) will take considerable pressure off the Englands Road interchange during major events
- Stadium Drive is an increasingly busy link road from the Pacific Highway to Hogbin Drive to industrial areas. It is highly utilised by the community as well as large transport vehicles. CHCC requests that adequate holding lanes (long and wide) at the Stadium Drive traffic lights be provided, allow for large event egress (on top of everyday traffic use). As well as adequate turn left lane space when travelling south on the Pacific highway and turn right space when travelling north to prevent backing up on the interchange.

Response

As identified in Section 5.2 of the EIS, the project has been designed in accordance with Upgrading the Pacific Highway – Design Guidelines (Roads and Maritime 2015b), Austroads guidelines, Australian Standards, and TfNSW supplementary documents. In addition, the interchange has been designed for future growth, including consideration of the South Coffs Urban Release Area (URA).

The Englands Road interchange has been designed to operate at a level of service C 20 years after opening (based on a nominal opening year of 2024), for the forecast hundredth highest hourly volume. As described in Chapter 8, Traffic and transport of the EIS, level of service refers to a method of assessing intersection performance. Table 8-5 in Chapter 8, Traffic and transport of the EIS provides a description level of criteria, ranging from A (very good) to F (unsatisfactory). A level of service C means the interchange will operate with a ‘stable’ flow of traffic, with restrictions on vehicles being able to complete some manoeuvres.

Provision of additional storage (holding lanes) on Stadium Drive or an additional access point to the Coffs Coast Sport and Leisure Park precinct from the Pacific Highway is considered outside the scope of the project. Notwithstanding, the project design at this location would not preclude an additional access point should CHCC or another proponent want to construct one in the future, subject to consultation with TfNSW and appropriate traffic impact assessments to determine the impact of an additional access point.

TfNSW will continue to consult with CHCC during construction of the project to coordinate traffic management with any special events held at Coffs Coast Sport and Leisure Park precinct. This will be facilitated by the implementation of the Community Liaison Implementation Plan, as described in environmental management measure SE01. As a result, amendments have been made to environmental management measure SE01 to reflect TfNSW commitment to consult with CHCC regarding special event traffic to minimise community impact. For more information, refer to **Chapter 6, Revised environmental management measures**.

Isles Drive

Issue description

- In relation to Isles Drive left turn (from south), CHCC has previously indicated that modifications would likely be required to enable a 'left turn in' from the south for B-doubles due to the imposed turning restriction in place. CHCC would like to thank TfNSW for acknowledging the need to provide necessary modifications to enable this left turn in to be possible under the proposed new arrangement. CHCC would gladly take part in further discussions regarding these alterations
- Regarding Isles Drive right turn (from north), CHCC has previously indicated the need to upgrade the Isles Drive intersection specifically to cope with added traffic stress on the right turn in from the north approach. TfNSW has stated that the intersection upgrades are out of the scope of the project, however acknowledges some alterations for the left turn in.

Response

Following the exhibition of the EIS, the concept design for the Englands Road interchange was changed and the proposed design is documented in Chapter 2, Design changes of the Amendment Report.

The amended design for the Englands Road interchange enables vehicles to turn right from Englands Road into Isles Drive and allows vehicles to turn right from Isles Drive into Englands Road. This design change maintains existing B double movements into and out of Isles Drive.

For clarity, the existing Pacific Highway and Englands Road (from existing Pacific Highway to Isles Drive) form part of the approved B-double network, and TfNSW is not proposing to modify the network at this location. Local access routes from the Pacific Highway along Orlando Drive, Hurley Drive and Cook Drive also form part of the approved B-double network. Isles Drive is an approved 25 metre B-double route with the restriction that the left-turn from the Pacific Highway is not permitted. Stadium Drive and parts of Hogbin Drive are approved 25 metre B-double routes but with conditions to prevent interference with peak school drop off and pick up times.

Recent consultation with CHCC has confirmed existing B-double movements at this location will be maintained.

Furthermore, traffic volumes on the existing Pacific Highway and accessing Isles Drive from the existing Pacific Highway are forecast to decrease once the project is operational. This would result in better traffic performance for the intersection and decreased queuing in the right-turn lane in question. This is discussed in Section 5.2, Traffic and transport of the Amendment Report, which forecasts that the intersection would operate at a level of service D with the EIS design in 2044, compared with a

level of service C with the amended design. As such, the previous commitment to providing modifications to the left turn in, are no longer required for the amended design.

Issue description

- The performance of the Pacific Highway and Isles Drive intersection is reported to provide a current overall level of service C for AM period, and level of service D for PM period with a level of service E for the worst movements (east and west approaches). The modelled 2044 intersection level of service is similar for overall performance level of service D for AM period, and level of service C for PM period) but the worst movement level of service degrades to a level of service F, unsatisfactory as described in Section 3.5 of Appendix F, Traffic and transport assessment of the EIS. CHCC recommends that the Pacific Highway and Isles Drive intersection needs to be improved to provide a level of service higher than F' for the worst movement. It is noted this should be done in consultation with CHCC together with the proposed modifications to permit B-doubles to access Isles Drive.

Response

As discussed above, the level of service of the Pacific Highway and Isles Drive intersection for the amended design is improved compared to the EIS as shown in Section 5.2, Traffic and transport of the Amendment Report. The overall level of service of the intersection in 2044 improves to level of service C and B for the AM and PM peaks respectively. However, the worst performing movement, being the right turn out of Isles Drive, is still shown to be level of service F.

There is opportunity to further optimise the traffic signal timings if congestion at this intersection becomes a problem in the future (eg 20 years after opening of the project). Initial testing using a traffic model known as SIDRA Intersection, indicates a change in signal timing would result in a worst movement level of service E in the AM peak in 2044.

Pedestrian and cyclist network

Issue description

CHCC believes there would be considerable challenges with management of cyclists on the Englands Road interchange which is made increasingly complex with the one-way local access road. There are three main conflicts with wayfinding:

- The need for cyclists to leave the highway up to one kilometre prior to the intersection to travel on the one-way local access road in order to re-access the highway from the northbound entry ramp at Englands Road
- The need for cyclists who miss this to utilise the northbound exit ramp and navigate the upgraded intersection, head west and re-join the pacific highway from the northbound entry ramp. This causes them to navigate two sets of traffic lights which is difficult for cyclists and causes impacts to traffic
- The risk of cyclists ignoring these desired usage paths and travelling through on the highway, risking vehicular conflicts at the northbound exit ramp, considering there are two lanes of exiting traffic.

In addition to these challenges for cyclists, the Englands Road interchange creates safety risks for pedestrians. This interchange already does and will continue to see large volumes of pedestrians coming from the Coffs Coast Sports and Leisure Park wanting access to the fast food on the western side of the Pacific Highway on event days. TfNSW should ensure a safe, pedestrian friendly crossing point to service neighbouring sport and education facilities, noting a high volume of users will be

children. TfNSW should also ensure footpath connectivity from the traffic lights to the fast food outlets to ensure there is no pedestrian activity along the road.

The signalised pedestrian/cycle crossings should be designed in consultation with CHCC to ensure it aligns with CHCC's Bike Plan which is currently being redeveloped (unpublished). CHCC can work with TfNSW to inform them of any refinements to the cycleway networks outlined in CHCC's Bike Plan. This comment also applies generally to all proposed cycleway works.

Response

Following exhibition of the EIS, the concept design for the Englands Road interchange was changed and the proposed design is detailed in Chapter 2, Design changes of the Amendment Report.

The proposed design changes are anticipated to result in improvements to the local cycle network, including off-road shared pathways for pedestrians and cyclists at the proposed Englands Road interchange. Pedestrian refuges would also be provided on roundabout approaches, to ensure cyclists are only required to cross one to two lanes of traffic at a time. The location of the crossing points on approach to the intersection, would ensure vehicle speeds are minimised (as compared to the high speeds on the bypass) as drivers would either be turning into or out of the roundabout. The proposed strategy for pedestrians and cyclists at Englands Road interchange is shown in **Figure 3.1-1.**

These proposed design changes at Englands Road interchange would also reduce safety concerns on event days, where many pedestrians cross the road to access fast food outlets or the Coffs Coast Sports and Leisure Park itself. The off road pedestrian and cycle route shown in **Figure 3.1-1** provides an opportunity for pedestrians to use a safe and dedicated path to access the fast food outlets, rather than use informal crossings of the Pacific Highway.

TfNSW will continue to consult with CHCC on a strategy for pedestrians and cyclists during the development of the detailed design. This commitment to consult with CHCC is reflected in an additional environmental management measure TT10 in **Chapter 6, Revised environmental management measures**.

Issue description

- TfNSW plans note a 'new footpath' to be constructed at the Englands Road interchange southbound entry ramp. CHCC request this be a new cycleway, given the existing condition is a cycleway.

Response

The plans provided by TfNSW in Chapter 5, Project description of the EIS (Figure 5-21-02) identified the 'proposed footpath' at Englands Road interchange incorrectly. However, as identified throughout Chapter 5, Project description of the EIS and by CHCC, this is an existing shared user path. This shared user path would be reinstated to its existing condition on the eastern side of the project. This means the path can be used by both pedestrians and cyclists. The plans have since been updated with the correct terminology (refer to Figure 2-1 of Chapter 2, Design changes of the Amendment Report).

In addition, signalised pedestrian crossings would be provided at the signalised intersection with the existing Pacific Highway, Englands Road and Stadium Drive. As shown in **Figure 3.1-1**, these crossings would enable pedestrians and cyclists to safely cross the intersection.

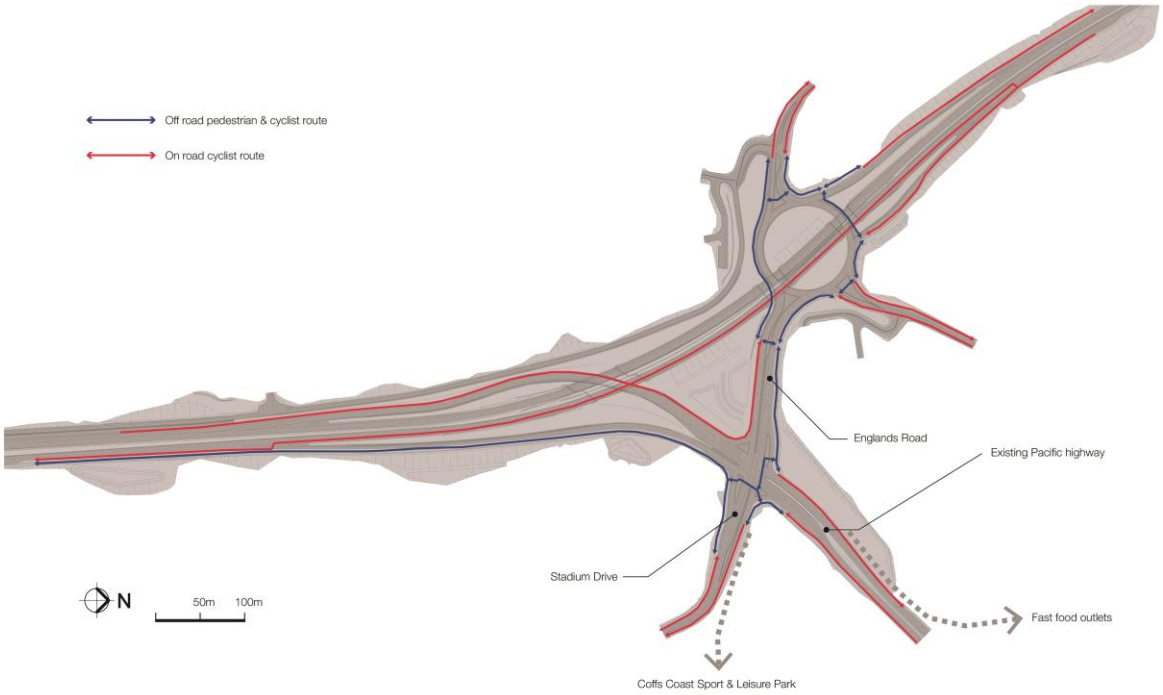


Figure 3.1-1 Englands Road Interchange strategy for pedestrians and cyclists

3.1.7 Coramba Road

Coramba Road bus stop

Issue description

- In relation to the Coramba Road bus stop, the EIS design does not specifically nominate a new location for a bus stop/interchange impacted by the project. CHCC notes a pedestrian refuge is shown on the plan in this location indicating that a possible solution is a bus stop on either side of the road. The current location does not require pedestrians to cross Coramba Road at any point. The design proposes an increase in traffic on this stretch of road. This increases the exposure of risk to pedestrians, which does not currently exist as there is no reason for any to cross the road. CHCC welcomes TfNSW suggestions that further consultation is required. CHCC will actively participate to achieve the best outcome but does not encourage the routine crossing of high-speed roads. A speed reduction may need to be considered by TfNSW at minimum or an alternative crossing method such as an underpass or footbridge
- TfNSW should review the need for bus bays on both sides to cater for the AM and PM pickup and drop off, and safe pedestrian access across Coramba Road.

Response

As identified in Chapter 5, Project description and Chapter 8, Traffic and transport of the EIS, the design of the Coramba Road interchange required the removal of the existing informal school bus stop at the intersection of Coramba Road and Spagnolos Road. It was proposed in the EIS that the bus stop would likely be reinstated further east along Coramba Road.

Following the exhibition of the EIS, the concept design for the Coramba Road bus stop has been developed and the proposed design is documented in Chapter 2, Design changes of the Amendment Report. The proposed bus stop would be located on the north side of Coramba Road near its current location. The proposed design of the bus stop and the inclusion of a roundabout means that buses travelling in either direction would pick up passengers on the north side of Coramba Road.

As noted by CHCC, the current location of the bus stop does not require pedestrians to cross Coramba Road. Retaining the bus stop on the north side of Coramba Road near its current location maintains this situation where pedestrians do no need to cross Coramba Road to access the bus stop.

Issue description

CHCC has no objections to the proposed closure of Spagnolos Road for vehicular traffic from Coramba Road. CHCC believes this provides a safer means for vehicular access via Roselands Drive and reduces the turning locations into and out of Coramba Road. CHCC notes that the laydown in this location is currently utilised as a bus interchange with many students walking along the section of Spagnolos Road to access the interchange and from the laneway off Tiffany Close. A walkway should be retained in this location to enable a designated path during construction and post completion. This may require a temporary break in the noise wall to achieve

- CHCC will support the proposed closure provided the pedestrian access is safe and not so heavily screened that antisocial behaviour eventuates.

Response

TfNSW understands the importance of providing a safe and designated pathway for students to access the Coramba Road bus stop. Following the exhibition of the EIS, the concept design for the Coramba Road bus stop has been developed and the proposed design is documented Chapter 2, Design changes of the Amendment Report, which includes a designated pathway between the end of Spagnolos Road and the new bus stop on Coramba Road refer to Figure 2.5 of Chapter 2, Design changes of the Amendment Report.

This pedestrian path would enable pedestrians to access the bus stop via the existing laneway off Tiffany Close. The proposed design includes overlapping noise walls to enable the path to connect to Spagnolos Road and the bus stop on Coramba Road without creating a gap in the proposed noise walls (refer Section 5.3, Noise and vibration of the Amendment Report).

As identified in environmental management measure TT06, a Traffic Management Plan will be prepared and implemented as part of the Construction Environment Management Plan (CEMP), which will include measures to maintain pedestrian and cyclist access during construction, including access between Spagnolos Road and Coramba Road, and from the existing laneway off Tiffany Close. Where this is not feasible, or if temporary closure is needed, temporary alternative access arrangements would be provided. The local community would be informed of any impacts to pedestrian access during construction.

TfNSW acknowledges the potential risks associated with antisocial behaviour around the proposed bus stop on Coramba Road. The bus stop would include various design elements which enable clear visibility from surrounding areas. These design elements have been described in Appendix J, Urban design, landscape character and visual impact assessment of the EIS, and include adequate lighting, transparent materials as part of the bus shelter and no physical obstructions from road furniture or planting. Examples of how these design elements would be incorporated have been demonstrated in figures within the preliminary crime prevention through environmental design (CPTED) assessment which is included in Appendix A of Appendix J Urban design, landscape character and visual impact

assessment of the EIS. Antisocial behaviour has also been considered in the Appendix A of Appendix E, Supplementary urban design, landscape character and visual impact assessment of the Amendment Report.

In addition, a detailed CPTED assessment will be carried out as part of the development of the Urban Design and Landscape Plan (UDLP) in accordance with environmental management measure UD01. This assessment will be used to inform design elements to be incorporated into the detailed design to reduce potential risks associated with antisocial behaviour around the proposed bus stop on Coramba Road and will be undertaken in accordance with Crime Prevention and the Assessment of Development Applications – Guidelines under section 79C of the *Environmental Planning and Assessment Act 1979* (NSW Department of Urban Affairs and Planning 2001).

Coramba Road traffic volumes

Issue description

- CHCC notes that the section of Coramba Road between Shephards Lane and Robin Street sees 11,300 vehicles per day (vpd) (see Table 8-9 of the EIS). The predicted result is a decrease to the traffic flow in the order of 1800 vpd bringing the daily traffic to 9500 vpd. CHCC is very supportive of a reduction of vehicular traffic in this location and is hopeful that the project will also reduce use from heavy vehicles in this area as well
- If this decrease was not realised and an increase was observed, due to increased use of the Coramba Road interchange, the split-level nature of the road, minimal lane width and under-width footpath would make the road unsafe and makes any upgrades extremely challenging and costly to CHCC. CHCC would request TfNSW consideration and funding for a suitable upgrade/outcome.

Response

TfNSW acknowledges there are existing road safety issues for the section of Coramba Road between Shepherds Lane and Robin Street. As stated by CHCC and in Chapter 8, Traffic and transport of the EIS, traffic numbers would reduce from 11,300 vpd (without project) to 9500 vpd (with project) by 2024. Under the amended design, traffic would still be reduced to 9600 vpd (with project) by 2024. Although the amended design allows for a slight increase in traffic compared to the EIS design, it still allows for a significant reduction of 1700 vpd and would still satisfy the road safety concerns raised by CHCC. For more information on traffic volumes, see Section 5.2, Traffic and transport of the Amendment Report.

As provided for in environmental management measure TT11, a review of operational network performance will be carried out 12 months from the opening of the project to confirm the operational traffic and transport impacts of the project on the surrounding road network. This assessment will be carried out at particular intersection/interchange locations, including Coramba Road (refer to **Chapter 6, Revised environmental management measures**).

3.1.8 Shephards Lane

Issue description

- CHCC supports the inclusion of a footpath on Shephards Lane bridge. The current drawings nominate a footpath on the eastern side of the road. Given the existing footpath on Shephards Lane (500 metres away) is on the western side, it may be most practical to keep the footpath on the western side in the event that CHCC or a development connect the footpaths in the future.

Response

TfNSW acknowledges that it may be more practical to keep the footpath on the western side of Shephards Lane bridge. In response to this submission, TfNSW will investigate changing the design so that the footpath is on the western side of Shephards Lane during detailed design.

3.1.9 Korora Hill interchange

Issue description

The complexity of the Korora Hill interchange will create numerous challenges for vehicles, trucks, cyclists and pedestrians. CHCC believes the traffic flows in the area demonstrate a high confusion environment, with little available reaction time for drivers. CHCC recognises there are significant challenges with levels, traffic volumes and side roads in this area but would strongly support a complete redesign to simplify the entire interchange. CHCC offers two space reduction suggestions which reduce ramping on the western side of the highway and wayfinding simplicity. CHCC recognises the vast amount of work TfNSW has put into the design and does not suppose that TfNSW has not already considered these options but offers them regardless.

- Option 1 – Reduction of ramping on the western side of highway
- Option 2 – Double signaled interchange with offset roundabout, see page 24 of the CHCC submission for more information (***https://www.planningportal.nsw.gov.au/major-projects/project/10461/submissions/13111/3251***).

Response

Following the exhibition of the EIS, the concept design for the Korora Hill interchange has changed and the proposed design is documented in Chapter 2, Design changes of the Amendment Report. The design changes are proposed to simplify the design and improve way finding for motorists. The amended design provides more free flow movement between the existing highway into Coffs Harbour and the bypass for traffic travelling to and from the north, and it provides greater separation between highway traffic (both the bypass and the existing highway) and local road movements on Bruxner Park Road, James Small Drive and the proposed service road.

Consultation with CHCC regarding the amended Korora Hill interchange design is documented in Chapter 4, Consultation of the Amendment Report.

3.1.10 Kororo Public School bus interchange

Issue description

- CHCC is supportive of additional parking, pedestrian access to the proposed service road and Old Coast Road. However, the proposed design of the Kororo Public School bus interchange increases the risk of conflicts between buses, pedestrians and vehicles, as noted by TfNSW in Section 8.4.5 of the EIS. Given the increase in traffic on James Small Drive, CHCC believes the outcomes may not be better overall for Kororo Public School. CHCC requests TfNSW to develop further options for the bus bay, including options that consider bus access on the proposed service road
- The Kororo Public School bus interchange creates a need for buses to travel in two-directions on James Small Drive. Sections of this road are only seven metres wide (north of Plantain Road) and would pose additional safety risks. TfNSW notes the bus bay would increase safety but in Chapter 8, the EIS notes this increases the risk of pedestrian, vehicle and bus conflicts. CHCC requests review of the design and add additional safety features or even isolate bus bays from car bays.

Response

Following the exhibition of the EIS, the concept design for the Korora Public School bus interchange and the Luke Bowen footbridge has been amended and the proposed design changes are documented in Chapter 2, Design changes of the Amendment Report. These design changes were developed to:

- Address CHCC, Kororo Public School and community feedback on the design of the bus interchange and footbridge
- Change the access point to the bus interchange to be from James Small Drive to the service road to remove the need for additional bus traffic on James Small Drive
- Separate bus and light vehicle entry points with barriers and fencing to remove conflict points between pedestrians and vehicles
- Reduce the need for light vehicle school drop-off and pick-up movements on James Small Drive
- Reduce the potential for congestion on the service road during school peaks
- Provide grade separated crossing points to remove all conflict points between pedestrians and vehicles
- Provide a bus interchange that caters for the operational requirements of bus operators (capacity for up to eight 12.5 metre long buses)
- Improve the location of the new Luke Bowen footbridge in relation to the school and bus interchange.

The design of the Kororo Public School bus interchange has been amended so that access to the bus interchange would be via the service road instead of from James Small Drive. This design change avoids the need for buses accessing the bus interchange to travel along James Small Drive, avoiding the risks associated with buses interacting with pedestrians and vehicles as well as navigating a narrow road.

A similar issue was raised by SI NSW and a response has been provided in **Section 3.9** of this report. For more information on the proposed design changes, refer to Chapter 2, Design changes of the Amendment Report.

James Small Drive

Issue description

CHCC expresses its concern regarding the change in use of James Small Drive as a result of the Kororo Public School bus interchange. Concerns relate to increased traffic volumes and road geometry. Specifically, CHCC are concerned about the following:

- The project seeks to increase traffic volumes by 1900 vpd to 6000 vpd. CHCC specifications recommend roads of this capacity require an upgrade to 'collector road' standards. CHCC requests TfNSW to upgrade the southern section of James Small Drive between Solitary Islands Way and Breakers Way in order to provide a suitable curve radius and lane and shoulder widths. This will alleviate risks of additional traffic in sub-standard length of road
- There is a tight radius curve located between Tranquillity Drive and Ballantine Drive. The radius is only 16 metres and TfNSW proposes a minimum radius of 40 metres for any roads at 40 km/h. Given there is an increase to this road of 1900 vpd (now up to 6000 vpd) CHCC requests this tie-in extend beyond Tranquillity Drive to improve safety and allow for buses using the Kororo Public School bus interchange

- A section of road north of Plantain Road is only 6.9 metres wide. Routinely there are cars parked on this section of road which reduces the width further.

Response

The EIS overestimated the increase of traffic demands at the southern end of James Small Drive. This was because the EIS model did not include the proposed parking and pick up/drop-off opportunities on the service road and instead modelled all traffic accessing Kororo Public School via James Small Drive. The amended design model has been corrected to ensure traffic accessing the Kororo Public School can do so by either James Small Drive or the service road, as per the proposed design changes. The revised modelling approach combined with the improvements associated with the amended design results in a reported decrease of 2300 vehicles per day at the southern end of James Small Drive when compared to the EIS, see Chapter 5.2, Traffic and transport of the Amendment Report.

As such, the amended design would result in a reduction in traffic volumes on the southern end of James Small Drive (reduced from 4000 vpd in the existing case, to 3600 vpd when the project is operational (in 2024)). The reduction of daily traffic volumes would alleviate existing road safety concerns and as a result, lessen the need to modify the southern end of James Small Drive. As such, an upgrade of James Small Drive would be outside the scope of the project.

Using the service road to access the bus interchange, rather than James Small Drive, also satisfies the concerns raised about the narrow nature of the road between Tranquillity Drive and Ballantine Drive, as well as the section of James Small Drive north of Plantain Road. These narrow sections of James Small Drive would no longer be required for buses to access the Kororo Public School bus interchange.

During construction, access to Korora School Road from the existing Pacific Highway would be closed and a temporary connection would be provided via Russ Hammond Close to provide access to Kororo Public School and residential access to existing properties on Korora School Road. The temporary access would be in place for up to 18 months while the service road and bus interchange are constructed and would not be used for construction traffic. Traffic that would use the temporary access includes school traffic (eg staff, deliveries, and parents and carers) and residential access to existing properties on Korora School Road. As such, it is anticipated that an additional 170 vehicles per day would use James Small Drive to access Russ Hammond Close to pick-up/drop-off children at Kororo Public School. Given the relative low volume, it is anticipate that this extra traffic during construction would not result in road safety concerns. In addition, school buses would not use the temporary access via Russ Hammond Close, and would continue to use the existing interchange for as long as practical. In accordance with environmental management measure TT01, any temporary changes required during construction will be confirmed following further consultation with school bus operators and Kororo Public School. Further detail regarding the temporary connection via Russ Hammond Close is provided in Chapter 3, Construction updates of the Amendment Report.

Old Coast Road

Issue description

- The usage of Old Coast Road is substantially altered in the project scenario changing the usage of Old Coast Bridge No. 1 and Old Coast Bridge No. 2
- The position of the new Luke Bowen footbridge and closure of Old Coast Road to the highway creates a pick-up and drop-off location for students near Kororo Public School. At present, the

concept design shows a cul-de-sac arrangement, but the plans allow for a possible car park location

- Old Coast Bridge No. 1 is a single lane timber bridge with a concrete deck. There is a dedicated pedestrian access path on the northern side of the bridge. The changed arrangement creates a need for vehicles to enter the cul-de-sac to drop off or pick up students then leave. There is a risk of conflicts at the AM and PM peaks where there will potentially be high frequency usage of this access point and only a single lane bridge to manage in and out vehicles. There is a risk conflict on or near the bridge during these times. Given the changed use and minimal space on the cul-de-sac side, CHCC requests TfNSW to provide a wider bridge in this location that meets the needs of the area
- Old Coast Bridge No. 2 is a single lane timber bridge located between Korora Basin Road and the new local access road. The road and bridge are on a substantial skew at this location, reducing the width of six metres to an apparent width of four metres. Current traffic volumes are low as this bridge provides access to up to 24 properties on Old Coast Road
- The alteration of the western service road channels all the vehicles from Korora Basin Road over this bridge. Currently Old Coast Bridge No. 2 traffic is 273 vpd (2018 data). Korora Basin Road traffic is 721 vpd (2013 data). This would see a minimum three-fold increase in local traffic over this bridge, in addition to school-based traffic which is designed to use this access point as well
- CHCC requests TfNSW upgrade of Old Coast Bridge No. 2 to a suitable width concrete bridge based on the changed traffic conditions in the area.

Response

The project would result in changes to the volume of traffic that would use Old Coast Road Bridge No. 1 and Old Coast Road Bridge No. 2. Estimated daily traffic volumes on each bridge with and without the project are provided below in **Table 3.1-2**.

Table 3.1-2 Estimated daily traffic volumes on Old Coast Road bridges

Location	Without project (2024)	With project (2024)
Old Coast Road Bridge No. 1	970	120
Old Coast Road Bridge No. 2	320	1,520

Old Coast Road Bridge No. 1 is predicted to have a reduction in traffic volumes, while Old Coast Road Bridge No. 2 is predicted to have an increase in traffic volumes. This change is largely because of the change in access arrangements with the closure of direct access from Old Coast Road to the Pacific Highway (access would be provided via the local access road on the western side of the highway and the service road located on the eastern side of the highway). It is noted that currently all vehicles accessing the existing Pacific Highway from Korora Basin Road travel across Old Coast Road Bridge No. 1.

As identified in **Table 3.1-2**, the project would result in an increase in traffic volumes on Old Coast Road Bridge No. 2. This change in traffic volumes may have an impact on the operation of the Korora Basin Road and Old Coast Road intersection because of the change in travel patterns. TfNSW will review the existing intersection during detailed design to determine if the intersection needs to be reconfigured to accommodate the predicted change in travel patterns and for road safety purposes. Reconfiguration of the intersection may include introduction of give way or stop signs to define the priority movements.

Further design investigation of Old Coast Road Bridge No. 2 will also be carried out during detailed design to determine if an upgrade of the bridge may be needed. The design investigation would review the structural integrity of Old Coast Road Bridge No. 2 and any road safety requirements in accordance with Upgrading the Pacific Highway – Design Guidelines (Roads and Maritime Services 2015b), Austroads guidelines, Australian Standards, and TfNSW supplementary documents. The outcomes of the investigation could range from do nothing to minor adjustments to replacement of the bridge. This investigation would be carried out in consultation with CHCC and would need to consider the biodiversity and non-Aboriginal heritage issues at this location, the project objectives and value for money considerations.

As identified in **Table 3.1-2**, the project would result in a decrease in traffic volumes on Old Coast Road Bridge No. 1. This would be an improvement on the existing situation and as such, an upgrade of Old Coast Road Bridge No. 1 is outside the scope of this project and will not be considered further.

Environmental management measure TT12 has been added to capture the commitment for further design and road safety investigation of the Korora Basin Road and Old Coast Road intersection and Old Coast Road Bridge No.2 (refer to **Chapter 6, Revised environmental management measures**).

3.1.11 Noise and vibration

Independent audit

Issue description

- The community has raised concerns relating to the potential noise impacts from the project, particularly members of the community who live in areas closer to the proposed bypass route. CHCC is aware of the Coffs Bypass Action Group's proposal for the noise measurements, collection methodology, and modelling outputs and conclusions presented in the EIS to be validated by an audit and conducted by a suitably qualified and experienced, independent person. CHCC expresses explicit support for the action group's proposal.

Response

As indicated by CHCC, this issue was also raised by members of the Coffs Bypass Action Group. Responses to the noise issues raised by Coffs Bypass Action Group (submitter ID 12) are provided in **Section 4.8** of this report.

The noise and vibration assessment carried out to support the EIS has been updated and documented within Appendix B, Updated noise and vibration assessment of the Amendment Report. This updated assessment incorporates and responds to proposed design changes, submissions from agency and community and ongoing consultation.

The assessment carried out for the EIS and the updated assessment carried out for the Amendment Report have both been undertaken in accordance with the requirements of the SEARs for the project. These requirements also refer to the relevant noise and vibration guidelines to be followed, including for noise monitoring and modelling. Noise monitoring has been undertaken in strict accordance with the relevant Australian Standards (AS 2702 Acoustic Methods of Measurement of Road Traffic Noise).

Section 3.1 and Section 4.5 of Appendix B, Updated noise and vibration assessment of the Amendment Report outline the criteria and methodology used to prepare and inform the noise and vibration assessment.

The predicted noise and vibration levels of the project during construction and operation are presented in Appendix J and Appendix G of both Appendix G, Noise and vibration assessment of the

EIS and Appendix B, Updated noise and vibration assessment of the Amendment Report. The noise impacts are discussed in Section 9.4 of Chapter 9, Noise and vibration of the EIS and Section 5.3.4 of Section 5.3, Noise and vibration of the Amendment Report.

Both the EIS and Amendment Report have undergone substantial review and evaluation from both external and TfNSW noise specialists. Further assessment reports detailed below for the project will also undergo a high level of scrutiny as the project progresses into delivery and operation as follows:

- During detailed design, the operational noise mitigation measures, including noise barriers and at-property treatments, would be confirmed. This would be carried out through updated noise modelling for the detailed design (refer to environmental management measure NV11)
- At-property operational noise mitigation measures will be implemented during the pre-construction and early construction phases of the project, where reasonable and feasible, to assist in reduction impacts associated with construction (including out of hours work). At-property treatments will be prioritised for those properties likely to be most affected by construction noise impacts (refer to environmental management measure NV07)
- An operational noise review will be carried out 12 months after the opening of the project to confirm the operational noise impacts identified during the EIS development and detailed design. This will be based on an updated traffic survey and carried out in accordance with the Noise Mitigation Guideline (Roads and Maritime Services 2015a) and Practice Note viii of the Environmental Noise Management Manual (RTA 2001b). The review will assess the actual noise performance compared to the predicted noise performance. The performance and effectiveness of noise and vibration mitigation measures would also be assessed and where deficiencies are identified, recommendations for additional feasible and reasonable measures would be provided (refer to environmental management measure NV12).

The above environmental management measures and processes are consistent with the likely approval conditions for the project and reflect requirements for other similar State significant infrastructure projects. It is likely the project would be required to submit regular construction compliance reports which among other matters detail any non-compliance with conditions of approval including relating to noise and vibration management. These reports will be made publicly accessible via the project website. An auditing program of the project as a whole would also be required and would be subject to DPIE's review and approval before implementation.

For more information on environmental management measures, refer to **Chapter 6, Revised environmental management measures**.

Noise walls and low noise pavement

Issue description

- The assessment of development applications for residential accommodation and other sensitive land uses includes the consideration of the potential impact of noise on the proposed development. The provisions of the State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) and in particular the impact of road noise or vibration is currently a consideration by CHCC for development adjacent to the existing Pacific Highway. CHCC will assess development adjacent to the project in accordance with the ISEPP and apply noise mitigation on the development where necessary
- It is important that noise mitigation measures such as the proposed low noise pavement and suitable barriers be provided for the benefit of existing development and to assist with new development achieving compliance with the provisions of the ISEPP.

Response

TfNSW confirms that any noise mitigation or at-property treatment proposed is consistent with State Environmental Planning Policy (SEPP) and the Noise Mitigation Guideline (Roads and Maritime Services 2015a) and will not prevent CHCC from meeting compliance requirements on future developments.

Following the display of the 2018 concept design, a project decision was made to adopt low noise pavement for the full length of the project (except within the tunnels) to address community concerns.

If noise sensitive receivers are identified to exceed the noise criteria, after implementing low noise pavement, a combination of feasible and reasonable noise barriers (ie noise mounds and noise walls) and at-property noise treatment has been considered across the entire extent of the project. As a result, noise barriers are proposed at various points along the project, and are shown in Appendix B, Updated noise and vibration assessment of the Amendment Report.

As stated in environmental management measures NV11, the operational noise mitigation measures, including noise barriers and/or at-property treatments, will be confirmed during detailed design. As identified in environmental management measure NV07, at-property operational noise mitigation measures will be implemented during the pre-construction and early construction phases of the project, where reasonable and feasible, to assist in reduction of impacts associated with construction (including out of hours work). At-property treatments will be prioritised for those properties likely to be most affected by construction noise impacts.

3.1.12 Biodiversity

Koala habitat mapping

Issue description

- CHCC, in collaboration with EESG, DPIE and Biolink Ecological Consultants has recently finished a local government area (LGA) wide koala habitat study that remaps koala habitat and linkages. This study included extensive field work and in-depth analysis of fine scale vegetation mapping. Although the mapping has not yet been adopted by CHCC (anticipated to be reported to CHCC for approval to exhibit in early 2020), CHCC would be willing to share the updated draft mapping to help achieve improved outcomes such as the fine tuning of fauna underpass locations and where to focus rehabilitation works. CHCC recommends that TfNSW make use of this data in the Amendment Report and that any approval includes a condition requiring consultation with CHCC.

Response

The habitat mapping and koala corridor presented in Appendix H, Biodiversity assessment report of the EIS and updated in Appendix C, Updated biodiversity assessment report of the Amendment Report, was prepared based on detailed vegetation mapping and habitat assessments across the project construction footprint and surrounding landscape. Vegetation communities within the construction footprint were mapped using the Development of a Fine-Scale Vegetation Map for the Coffs Harbour Local Government Area (OEH 2012), which were then verified using field surveys to classify plant community type (PCT) (more than 70 person hours of field time). Vegetation condition and structure was then assessed through 44 detailed plots using the Framework for Biodiversity Assessment (FBA) method (OEH 2014a).

Targeted surveys were completed for koalas using both nocturnal spotlighting to detect presence and the Spot Assessment Technique (SAT) to assess koala activity levels within the construction footprint. Additional SATs were also completed in the wider landscape to assess koala activity to the east and

west of the construction footprint. Spotlighting was completed across 27 sites and totalled 140 person hours and 38 SATs were completed.

Following the display of the EIS, TfNSW sought CHCC's updated draft koala mapping and reviewed the data against the project koala mapping. It is recognised the CHCC mapping is prepared at the local government area scale and includes additional detail on generational persistence to understand the importance of areas of habitat to the koala population over three generations. The scale of the habitat mapping prepared for the EIS used vegetation mapping prepared at the project scale and incorporated site-specific vegetation mapping.

The mapping was generally consistent, except for four locations within the footprint that were not mapped as koala habitat in the EIS but were mapped as 'core habitat' in the CHCC mapping. The four locations are described below:

- For the area to the west of Gatelys Road tunnel, field surveys completed for the EIS ground-truthed this vegetation as 'urban native/exotic mix' that does not align with a PCT. Therefore, the vegetation does not align with koala habitat
- At the small patch of PCT 695 to the south of Roberts Hill tunnel, koala 'habitat polygons' determined in accordance with the FBA method were based on "vegetation present within the study area where it occurs in association with connecting links considered likely to be used by koala, and in the proximity of records of the species" (Section 4.2.5 of Appendix H, Biodiversity assessment report of the EIS). The small patch of PCT 695 is isolated and on the edge of a larger patch of vegetation, and therefore was not assessed as part of a connecting link. The vegetation to the north and south that has been included in the 'koala polygon' are part of connecting links and as such were included in the impact calculation for the determination of credits
- The small patch of PCT 695 in ancillary site 1G, was not assessed as being part of a connecting link despite being mapped as a eucalypt forest PCT
- The small patch of mapped PCT 747 to the west of Spagnolos Road was not assessed as being part of a connecting link despite being mapped as a eucalypt forest PCT.

The remainder of the CHCC mapped core habitat in the construction footprint has been mapped in Appendix H, Biodiversity assessment report of the EIS and updated in Appendix C, Updated biodiversity assessment report of the Amendment Report. Also, large areas of CHCC mapped potential habitat within the construction footprint has been ground-truthed as part of the fieldwork and mapped as koala habitat in the Appendix H, Biodiversity assessment report of the EIS and in Appendix C, Updated biodiversity assessment report of the Amendment Report.

Fauna connectivity

Issue description

- CHCC acknowledges the improved outcomes for fauna connectivity that has been achieved by the three tunnels. However, given the high levels of koala activity around Roberts Hill, CHCC is concerned that the location of the tunnel will not result in a meaningful connection without extensive rehabilitation works, especially given the high population of koalas at Roberts Hill. Even with rehabilitation the lag effect will be extensive because the road will sever patches of existing koala habitat in the Roberts Hill vicinity while the tunnel itself preserves low quality regrowth vegetation that was a previously a banana plantation. CHCC is coordinating a number of grants around the Robert Hill area and welcomes opportunities to work with TfNSW to improve fauna connectivity in the area
- CHCC considers it imperative that an extensive rehabilitation plan focusing on Roberts Hill, and connectivity more broadly, be included in the Amendment Report and be conditioned as part of any approval. CHCC would like to be consulted on any such plan. While this may mean that some areas of agricultural lands become environmental lands. CHCC believes that the Robert Hill corridor is critical to the long-term survival of koalas in the Coffs Harbour area and that the EIS, while acknowledging the importance of this area for koalas, has not done enough to protect this essential link
- An extensive rehabilitation/revegetation plan is required as part of any approval. CHCC's input, will ensure that local biodiversity impacts are more effectively mitigated.

Response

The fauna connectivity strategy is described in detail in the project's Threatened Species Management Plan (TSMP) (Appendix D, Updated threatened species management plan of the Amendment Report). It includes identification of fauna movement corridors and locations for crossing structures. The strategy has taken into account the existing koala movement corridors across the study area, which were defined with reference to the CHCC koala habitat mapping and field-verified information. The fieldwork assessment for koalas also included several survey sites to the east and west of the corridor, which consisted of SAT surveys to assess koala occurrence in the wider landscape.

The retained ridgelines at Roberts Hill, Gatelys Road and Shephards Lane form part of an overall fauna connectivity strategy that also includes dedicated fauna culverts, drainage culverts, bridges over waterways and local road underpasses under the main carriageway of the project. In addition, the strategy outlines indicative extents of fauna fencing that has been located to tie into crossing structures to 'funnel' target species away from road crossings.

The retained ridgelines form an important component of the fauna connectivity strategy, by maintaining large areas of landscape in their existing condition and topography. Field surveys completed for the project, as well as review of the CHCC koala mapping, demonstrates the Roberts Hill ridge area and the North Boambee Valley area provide important habitat and movement corridors for koala. Substantial design effort to achieve fauna connectivity in these areas has been included to reduce impacts associated with fragmenting ecological corridors. From Roberts Hill to the southern extent of the project there are eight fauna crossing structures located along about 3.6 kilometres of the project. Across the entire 14 kilometre length of the project, there are 16 locations provided for fauna connectivity structures. The location and dimensions of all crossing structures are summarised in **Table 3.1-3**.

Table 3.1-3 Fauna connectivity structures

Site No.	Design chainage	Connectivity structure type	Description, indicative dimensions and target species
1	10160	Dedicated fauna underpass. Glider poles.	Existing fauna underpass under the Pacific Highway would be demolished and new fauna underpass to replace this 10 m north of the existing. Cross-sectional dimensions to match existing (2.7 m high, 5.5 m wide at base). Length about 80 m. Target species: Koala, spotted-tail quoll, common planigale and gliders
2	11100	Combined fauna and drainage underpass.	Culvert crossing across unnamed tributary of Newports Creek (Class 2 waterway) (five 2.7 m wide x 1.5 m high culverts and one 3 m wide x 3 m high culvert and about 90 m long). Target species: koala, spotted-tail quoll, giant barred frog, fish.
3	11650	Combined waterway bridge incorporated fauna underpass.	Bridge crossing across unnamed tributary of Newports Creek (Class 2 waterway) (80 m long x 24.5 m wide). Target species: Koala, spotted-tail quoll, giant barred frog, pale-vented bush hen and fish
4	12000	Combined waterway bridge incorporated fauna underpass.	Bridge crossing Newports Creek (Class 2 waterway) (90 m long x 25 m wide). Target species: Koala, spotted-tail quoll, common planigale, giant barred frog, pale-vented bush hen and fish
5	12150	Combined road bridge incorporating fauna underpass.	Bridge crossing of North Boambee Road (99 m long x 23 m wide). Target species: Koala and spotted-tail quoll
6	12400	Combined fauna and drainage underpass.	Culvert crossing across unnamed tributary of Newports Creek (Class 2 waterway) (six 2.4 m x 2.4 m culverts about 45 m long). Target species: koala, spotted-tail quoll, giant barred frog, pale-vented bush hen, fish.
7	12800	Dedicated fauna underpass.	Vegetation corridor identified for terrestrial fauna movement (1 x 3000W x 3000H RCBC about 89 m long). Target species: Koala, spotted-tail quoll, common planigale and pale-vented bush hen
8	13750	Retained ridgeline over tunnel overpass	Roberts Hill ridgeline, 190 m ridgeline retained Target species: Koala, spotted-tail quoll and pale-vented bush hen

Site No.	Design chainage	Connectivity structure type	Description, indicative dimensions and target species
9	14600	Combined waterway bridges incorporating fauna underpass.	Three bridge crossings across Coffs Creek (Class 2) (64 m long x 8m wide; 64 m long x 25.5 m wide; and 72 m long x 8m wide). Target species: Koala, spotted-tail quoll, pale-vented bush hen and fish
10	16600	Combined rail bridge incorporating fauna underpass	Bridge crossing over North Coast Rail Line. Vegetated corridor along rail verge (180 m long x 28.5 m wide). Target species: Koala and spotted-tail quoll
11	17200	Retained ridgeline over tunnel overpass	Shephards Lane tunnel, 360 m ridgeline retained Target species: Highly mobile threatened and non-threatened fauna
12	17800	Combined road bridge incorporating fauna underpass.	Fauna passage included with access road underpass (30 m long x 24.5 m wide). Target species: Koala, spotted-tail quoll and common planigale
13	19000	Retained ridgeline over tunnel overpass	Gatelys Road tunnel, 450 m ridgeline retained Target species: Koala, spotted-tail quoll and pale-vented bush hen
14	19750	Combined road bridge incorporating fauna underpass.	Fauna passage included with West Korora Road underpass (34 m long x 27 m wide). Target species: Koala, spotted-tail quoll and pale-vented bush hen
15	20150	Combined fauna and drainage underpass.	Culvert crossing across tributary of Jordans Creek (Class 3) (1 x 3000W x 3000H, about 60 m long). Target species: Koala, spotted-tail quoll, pale-vented bush hen and fish
16	22450	Combined waterway bridge incorporating fauna underpass.	Bridge crossing across Pine Brush Creek (Class 1) (37 m length x 32 m width).Target species: Koala, spotted-tail quoll, pale-vented bush hen and giant barred frog.

The importance of the Roberts Hill ridge area and surrounding landscape for the maintenance of the Coffs Harbour koala population has been recognised through the inclusion of a dedicated fauna underpass at chainage 12800. At this location there is an important koala corridor that has been mapped and identified. This underpass has been specified to be a three metre x three metre box culvert.

During detailed design, TfNSW will investigate opportunities to carry out revegetation works adjacent the ridgelines on land within the indicative road corridor. Any revegetation works of Roberts Hill,

Shephards Lane and Gatelys Road ridgelines needs to balance existing land uses and property ownership. Existing agricultural land will remain as agricultural land and some ridges have easements for utilities or property access. As such, fauna movement across these ridges will be maintained based on current conditions supplemented by any opportunities to carry out revegetation works adjacent the ridgelines on land within the indicative road corridor.

TfNSW will consult with CHCC regarding the proposed revegetation works in these areas as part of development of the UDLP.

Issue description

- CHCC proposes using the underpass west of Spagnolos Road to connect core koala habitat. The project also presents an opportunity to create a linear corridor alongside the carriageway to funnel animals to fauna crossing points and connect areas of dispersed habitat.

Response

As part of the amended design, several opportunities to include a fauna underpass at this location were investigated. The amended design does not include a road underpass west of Spagnolos Road and options have been considered to provide an alternative structure for fauna connectivity in this location. However, constraints associated with topography, design levels and flooding have made designing a functional fauna underpass in this location challenging.

The current design for flood mitigation at this location requires a reduced culvert opening to mitigate afflux in residential areas downstream of the Spagnolos Road detention basin. The design includes three 1.5 metre diameter pipe culverts that extend for about 130 metres. Flood modelling of increases in the cross-sectional area of the culverts in this location indicates downstream afflux on properties.

The design considered alternative options to co-locate a fauna crossing in this location, however the dimensions of the crossing would be too small for koalas, especially given the likely 130 metre length of the underpass. Due to requirements to limit the opening of the culvert in this section, to manage flood impacts, it was not possible to increase the culvert width and height to make the opening more favourable to koalas.

Notwithstanding the above, TfNSW will continue to investigate strategies to manage fauna connectivity issues associated with design at this location during detailed design.

Biodiversity offset strategy

Issue description

- CHCC understands that the majority of the offsets required for the project have already been sourced however some credits, especially species credits are still needed. Many of the offsets are not within the Coffs Harbour LGA and CHCC would like to be consulted on the offset plan and any credit needs prior to any approval.

Response

The Biodiversity Offset Strategy (BOS) has been prepared in accordance with the requirements of the relevant State and Commonwealth guidelines. The BOS has been prepared in accordance with the requirements of the *Threatened Species Conservation Act 1995* and the FBA method (OEH 2014a). Biodiversity impacts have been assessed and documented in accordance with the FBA method and the NSW Biodiversity Offsets Policy for Major Projects (OEH 2014b).

This process also meets the requirements of any offsets required under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The project has also been referred under the EPBC Act referral (2017/8005) and deemed a controlled action to be assessed under the Bilateral

agreement made under section 45 of the EPBC Act relating to environmental assessment between the Commonwealth of Australia and the State of New South Wales. The bilateral agreement endorses the FBA method and the NSW Biodiversity Offsets Policy for Major Projects as accredited processes.

The BOS identifies the impacts associated with the project and presents these impacts through offset credits generated using the BioBanking Credit Calculator. TfNSW has made significant progress in sponsoring landholders to participate in the former BioBanking scheme and the current Biodiversity Offset Scheme, as well as using its own residual land portfolio as a source of credits. TfNSW has also purchased a property for this project for use as an offset. These sites will be subject to Biodiversity Stewardship Agreements which will allow for their ongoing protection and management for biodiversity conservation.

Coastal management plans

Issue description

- Certified Coastal Zone Management Plans (CZMP) for Coffs Creek and Boambee Newport's have not been addressed. The draft Bonville Pine Creek CZMP is expected to be certified early 2020.

Response

The mitigation measures described in the EIS and Amendment Report (Chapter 10, Biodiversity and Chapter 19, Surface water quality of the EIS, and Section 5.4, Biodiversity and Section 5.12, Surface water quality of the Amendment Report) provide for protection of the coastal zones located downstream of the project. The certified CZMPs for Coffs Creek and Boambee/Newports Estuary set out management actions to maintain and improve the environmental values of these areas. The certified CZMPs define high priority management actions for the coastal zones they relate to. Common to both CZMPs are high priority actions relating to the protection and retention of riparian vegetation and the protection of water quality through the management of stormwater runoff.

Several of the environmental management measures identified in **Chapter 6, Revised environmental management measures** align with the high priority management actions described in the certified CZMPs. This includes the management measures designed to provide for the retention and protection of riparian vegetation along all creeks where possible, and commitments to include riparian revegetation and restoration in the landscape plans. Commitments have also been made to include natural channel design principles in creek realignments, to maintain hydrological and environmental conditions within the creeks, where reasonable and feasible. Specific measures include:

- FH04: Creek realignments and/or adjustments will be designed to behave in a similar hydrologic and geomorphic manner as existing conditions and will consider the requirements of the Policy and Guidelines for Fish Habitat Conservation and Management (DPI 2013). Revegetation and adequate scour protection will be provided so there are no hydraulic impacts on bed and bank stability, erosion, sedimentation or riparian vegetation in accordance with the Guidelines for Instream Works on Waterfront Land (DPI 2012a)
- FF03: Native vegetation and fauna habitat removal would be minimised through detailed design where reasonable and feasible. Particular focus would be given to avoiding and minimising the removal of:
    - Hollow bearing trees
    - Native vegetation in riparian zones
    - Native vegetation from known fauna connectivity corridors and near proposed fauna crossing structures.

- FF09: The limits of clearing within the construction footprint would be delineated using appropriate signage and barriers, identified on site construction drawings and communicated to construction staff during induction. Vegetation and habitat features to be retained, such as hollow-bearing trees, would be clearly identified and protected by suitable fencing, signage and/or markings
- FF24: Aquatic habitat would be protected in accordance with Guide 10: Aquatic habitats and riparian zones of the Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects (RTA 2011a) and Section 3.3.2 Standard precautions and mitigation measures of the Policy and Guidelines for Fish Habitat Conservation and Management Update 2013 (DPI 2013) and with reference to Guidelines for Controlled Activities on Waterfront Land – Riparian Corridors (DPI 2018d).

The protection of water quality in the downstream catchments and sensitive receiving environments has also been assessed in the EIS and Amendment Report (Chapter 10, Biodiversity and Chapter 19, Surface water quality of the EIS, and Section 5.4, Biodiversity and Section 5.12, Surface water quality of the Amendment Report). This included catchment-scale Model for Urban Stormwater Improvement Conceptualisation (MUSIC) modelling to assess any changes in pollutants entering sensitive receiving environments associated with downstream freshwater and estuarine environments at Pine Brush Creek wetlands, Coffs Creek wetlands and Boambee wetlands. The water quality treatment devices included and modelled in the EIS for the operational phase will provide suitable protection to the downstream sensitive receiving environments. Given the proximity of the project to the Solitary Islands Marine Park, Pine Brush Creek wetlands and the Boambee wetlands, additional stormwater pollution controls such as dual-purpose spill containment and water quality treatment devices have been incorporated to further reduce potential impact from road runoff, as well as potentially improving upon the existing condition pollution load.

In addition to the stormwater quality treatment included in the design, **Chapter 6, Revised environmental management measures** includes several commitments that relate to the protection and management of water quality associated with stormwater runoff, such as:

- A range of mitigation measures specific to managing surface water quality are outlined in detail in SW01 to SW08. These address design and construction phase management measures to protect stormwater quality in the directly adjacent freshwater environments, as well as downstream estuarine areas covered by the CZMPs. These measures include:
    - Stormwater and road runoff will be directed towards operational water quality treatment structures. The type and design of the specific stormwater treatment measures will continue to be refined as part of the detailed design process with the aim of achieving the NSW water quality objectives where reasonable and feasible. This will include review of the proposed stormwater treatment train and consideration of best management practice guidelines
    - Development and implementation of a Water Quality Monitoring Program
    - Dewatering to avoid direct discharge into waterways and to be undertaken in accordance with the Roads and Maritime Technical Guideline: Environmental Management of Construction Site Dewatering (RTA 2011b), in a manner that prevents pollution of waters
    - Management of any mulch stockpiles to minimise tannin leachates.
- SC04: A Soil and Water Management Plan (SWMP) will be prepared in accordance with Landcom (Blue Book) Erosion and Sediment Control Principles and Procedures (Landcom 2004) and Erosion and Sediment Management Report: Coffs Harbour Bypass (SEEC 2020), and implemented as part of the CEMP. The plan will identify all reasonably foreseeable risks relating to soil erosion and water pollution associated with carrying out the activity and describe how these

risks will be managed and minimised during construction. The plan will include arrangements for managing pollution risks associated with spillage or contamination on the site and adjoining areas.

At the time of writing, the draft Bonville Pine Creek CZMP had not been certified. Notwithstanding, the same environmental management measures are likely to be relevant to the CZMP. TfNSW will continue to consult with CHCC regarding this plan.

Native vegetation

Issue description

- An important remnant area of lowland rainforest exists on the Mackay property in West Coffs that CHCC believes has not been adequately addressed in the EIS. This pocket of remnant rainforest is considered by many local bush regenerators as one of the best examples of rainforest remaining in the Coffs Harbour basin and is regularly used as a seed source and for education activities. If this remnant cannot be retained, a concerted effort should be made to undertake extensive propagation from the remnant over a number of seasons prior to its removal.

Response

The clearing of the patch of lowland rainforest identified by CHCC cannot be avoided. The impacts to this patch of mapped PCT 1302 (White Booyong - Fig subtropical rainforest of the NSW North Coast Bioregion) have been assessed in accordance with the FBA method and the offset credits calculated in Appendix C, Updated biodiversity assessment report of the Amendment Report.

As described in environmental management measure SE05, seed collection and salvage of representative species within this patch of rainforest impacted by the project will be carried out before construction where reasonable and feasible. The purpose of the seed collection and salvage is to re-establish a portion of the rainforest within adjacent landscaping associated with the project. Where possible, the location would allow for access from the realigned Mackays Road/new local access roads.

Re-use of timber

Issue description

- In relation to the re-use of timber, TfNSW should contact Landcare and other volunteer groups to determine if the removed vegetation can be reused.

Response

Millable timber will be salvaged as part of the clearing operations of the project. There are also several opportunities to re-use salvaged timber in ecological restoration, including the re-use of timber for habitat enhancement within the construction footprint, use as fauna furniture associated with fauna connectivity structures and use in the design of waterway realignments as soft engineering approaches.

As identified in environmental management measure FF04, habitat will be replaced or re-instated in accordance with Guide 5: Re-use of woody debris and bushrock of the Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects (RTA 2011a). This approach can be extended to salvaging some habitat logs such as root balls and providing them for re-use to CHCC and other organisations where these organisations have the capacity to accept this material.

TfNSW will discuss further with CHCC opportunities for providing salvaged timber for ecological restoration projects.

Fauna connectivity structures

Issue description

- Maintenance of artificial hollows, fauna connectivity structures and fencing should be required as a condition of approval. Fencing and connectivity are maintained in perpetuity, while artificial hollows should be maintained for a minimum of 15 years.

Response

Ongoing maintenance of fauna connectivity structures including fencing is incorporated into the TfNSW asset management system which includes a schedule for regular inspection and intervention.

As identified in environmental management measure FF07, nest boxes/artificial hollows will be managed in accordance with the Nest Box Management Plan (NBMP). It is important to note that nest boxes are a temporary mitigation measure as opposed to long term biodiversity offset and will not be monitored for 15 years or greater. The NBMP will include maintenance and monitoring component to ensure that nest boxes perform as intended.

Issue description

- TfNSW should include a plan detailing temporary fencing that will exclude fauna from entering the construction area or making its way onto any roads that are currently excluded by fencing.

Response

Section 6 of Appendix D, Updated threatened species management plan of the Amendment Report outlines where temporary fauna fencing will be used during construction. As identified in environment management measure FF17, temporary fauna fencing will be installed if existing fauna fence at the southern end of the project on the Pacific Highway is removed during the construction period (refer to **Chapter 6, Revised environmental management measures**).

Issue description

- A comprehensive monitoring plan, particularly for the fauna crossing points must be conditioned as part of any approval.

Response

Section 8 of Appendix D, Updated threatened species management plan of the Amendment Report includes details of monitoring actions to be implemented for the project. This includes, among other aspects, monitoring of fauna connectivity structures.

3.1.13 Urban design, landscape and visual amenity

Consultation

Issue description

- Requests an opportunity for CHCC to comment or be involved in the design of the solid noise feature walls, specifically the shape and patterning, and design of the mounding and artworks.

Response

As identified in environmental management measure UD01, an Urban Design Landscape Plan will be prepared to support the detailed design of the project. The plan will present an integrated urban design for the project, and will include built elements including retaining walls, bridges and noise barriers. TfNSW will consult with CHCC in the development of this plan which will provide CHCC with the opportunity to input on the design, shape, patterns and artwork of solid noise walls and noise mounds.

Landscape design

Issue description

In relation to species used in landscaping:

- Remove wild iris *Dietes grandiflora* from the palette
- Remove lilly pilly *Acmena smithii* as it does not perform well in this area and native frangipani *Hymenosporum flavum* grows sparse canopy unless heavily maintained. Switch for golden penda *Xanthostemon chrysanthus* as these perform well in the area
- At the Korora Hill interchange remove giant white bird of paradise *Strelitzea* and *Philodendron martianum.* There is potential to use grevillea moonlight *Grevillea* or coconut ice *Grevillea* instead. Reinforce the native plant palette to exemplify the direct and abrupt transition from agricultural land to bushland. This emanates the existing conditions where agricultural land use practices and bushland exist and interact, and it does not need to be softened or blurred with further exotic planting.

Response

TfNSW acknowledges CHCC concern that some plant species used from the grass mix are not appropriate for the Coffs Harbour region. The following changes to the grass mix have been made to address these concerns:

- Wild iris *Dietes grandiflora* is considered an environmental weed in Western Australia, Queensland and Lord Howe Island. It has been removed from the grass mix
- Lilly pilly *Acmena smithii* and native frangipani *Hymenosporum flavum* have been removed and replaced by golden penda *Xanthostemon chrysanthu*s
- Giant white bird of paradise *Strelitzea* has been removed from all plant communities. *Philodendron martianum* will be considered as it would complement the form of the adjoining banana plantation
- Grevillea moonlight *Grevillea* and coconut ice *Grevillea* will be considered at tunnel portals.

Notwithstanding this, the planting design developed as part of the Urban Design Landscape Plan will ensure a sympathetic design response.

Refer to Appendix E, Supplementary urban design, landscape character and visual impact assessment of the Amendment Report for the updated planting mixes proposed for the project.

Issue description

In relation to landscaping design:

- Is there opportunity for larger trees on the batters or gullies/ditches so treetops can be viewed by commuters from the highway and local roads?
- More trees need to be added to enhance the 'green corridor' experience and to maximise the screening for adjacent residents
- There should be more planting of trees in clusters along noise walls to break up the rigidity and monotony of the wall providing visual interest and framing for commuters and further screening for residents.

Response

TfNSW acknowledges CHCC request for additional trees along the project to add to road user experience, as well as maximise screening for residents. Chapter 2 of Appendix E, Supplementary urban design, landscape character and visual impact assessment of the Amendment Report details the proposed planting design concepts plans for the project. The plans show that at various points along the project, where noise walls are proposed, planting of feature trees, street trees or groups of trees are also proposed. Where trees are not proposed, due to space or safety constraints, a variety of different plant mixes would be used to vegetate noise walls including wet sclerophyll forest mix, open forest mix, grass mix and riparian corridor mix. Notwithstanding, the following points are made in response to the issues raised in regard to landscape design:

- As stated in Chapter 5 of Appendix J, Urban design, landscape character and visual impact assessment of the EIS, the landscape design will aim to retain open views to rural pasture-land through low ground cover/grassland planting. Vegetated cuttings and batters would be used to frame the highway and enhance driver legibility of the road. However, the opportunity for larger trees on batters, as raised by CHCC, is limited. For road safety purposes, non-frangible vegetation needs to be located at a minimum of 11 metres from the edge of travel lane
- The current proposal for vegetated mounds with noise walls includes shrubs and trees. Further detail and density would be considered during detailed design as part of preparation of the Urban Design Landscape Plan in accordance with environmental management measure UD01.

Planting of trees in clusters along walls will be investigated in detailed design, in an effort to provide visual interest for road users and additional screening for residents. However, the solution must consider road safety and space constraints.

Visual impacts at Coachmans Close

Issue description

- Visual viewpoints created for the project show the project fitting in seamlessly in surrounding areas, which for the most part is true. Viewpoint two selected at the entrance to Coachmans Close is noted as having a high magnitude visual disruption. However, there is no enhanced image to show the magnitude of the highway retaining wall in this location. At present the location fronts directly to the existing highway. This will be replaced by a four to five metre high retaining wall
- The roadway at Coachmans Close currently has significant screening from dense trees which provides residents a visual screen to the highway and a sense of seclusion. The intention in this

area as far as CHCC can determine from the plan views is that this will be removed to provide the proposed service road and the underpass to the local access road on the western side of the project. This will result in views of the 8.3 metre and nine metre high retaining walls. TfNSW note that screen planting will be placed at this location however space appears very constrained and CHCC are concerned vegetation will be omitted.

Response

TfNSW acknowledges CHCC and the community's concern regarding the loss of vegetation and amenity at Coachmans Close. Additional information has been prepared to provide an indication of what the project would look like from Coachmans Close in response. Additional information has been provided to illustrate the visual impact near Coachmans Close, and includes:

- Before and after artist's impression from two locations along Coachmans Close. The first is from the top of Coachmans Close looking towards the south (refer to **Figure 3.1-2** for the existing view and **Figure 3.1-3** for the view with the project). The second from near Fernleigh Avenue, looking towards the south (refer to **Figure 3.1-4** for the existing view and **Figure 3.1-5** for the view with the project)
- Cross-sections at two locations along Coachmans Close showing the relationship between Coachmans Close and the service road, including the width available for vegetation screening between the two roads (refer to **Figure 3.1-6** and **Figure 3.1-7**). These cross-sections highlight the varying width available for between the two roads, which range from about 10 metres at its widest and about 1.5 metres at its narrowest.

The key constraints for the design of the project near Coachmans Close are Kororo Nature Reserve, Kororo Public School and the tie-in to the existing dual carriageway highway at Sapphire. The effect of these key constraints on the concept design is outlined below:

- The section of the project between Kororo Nature Reserve and Kororo Public School is very tightly constrained. There is just enough space to fit the service road on the eastern side of the project, the main carriageway (including provision for future widening to six lanes), and a property access road to maintain access to an existing property south of Kororo Nature Reserve
- The service road is needed on the eastern side of the project as it provides an important link between Solitary Islands Way and the existing highway near James Small Drive, and to provide access to the Kororo Public School bus interchange
- There is not enough space to fit another service road on the western side of the project to connect Old Coast Road and Korora Basin Road with Bruxner Park Road. Access to the broader road network for residents west of the project along Old Coast Road and Korora Basin Road would be via the underpass to the service road near Fernleigh Avenue
- The location of the underpass near Fernleigh Avenue is governed by the crossing of Pine Brush Creek and the tie-in to the existing dual carriageway at Sapphire. These two locations influence the vertical and horizontal alignment through this area, which limits the locations where there is enough space to provide the vertical clearance needed for an underpass
- The tie-in to the existing dual carriageway at Sapphire sets the northern extent of the project.

TfNSW acknowledges the vegetation within this area is of importance to the community and provides screening value. As illustrated in **Figure 3.1-33**, Coachmans Close north of Fernleigh Avenue, vegetation would be retained where possible to assist with screening views towards the project. During detailed design, an arborist assessment will be carried out to confirm the extent of vegetation that could be retained along Coachmans Close within the construction footprint (refer to

environmental management measure UD10 in **Chapter 6, Revised environmental management measures**).

As the road descends to the south and the space narrows, it is anticipated that shrub planting would be provided to screen lower level views from the adjacent properties, as illustrated in **Figure 3.1-55**. As identified in environmental management measure UD01, an Urban Design Landscape Plan will be prepared to support the detailed design of the project. The plan will include identification of existing vegetation and proposed landscape areas, including areas along Coachmans Close. As part of this plan TfNSW will explore the opportunities to provide shrub planting in the form of a maintained hedge to allow the screening value to improve over time.

Figure 3.1-2 Coachmans Close, north of Fernleigh Avenue – Existing view

Figure 3.1-3 Coachmans Close, north of Fernleigh Avenue – Proposed view

Figure 3.1-4 Coachmans Close near Fernleigh Avenue – Existing view

Figure 3.1-5 Coachmans Close near Fernleigh Avenue – Proposed view

Figure 3.1-6 Coachmans Close cross section (section AA)

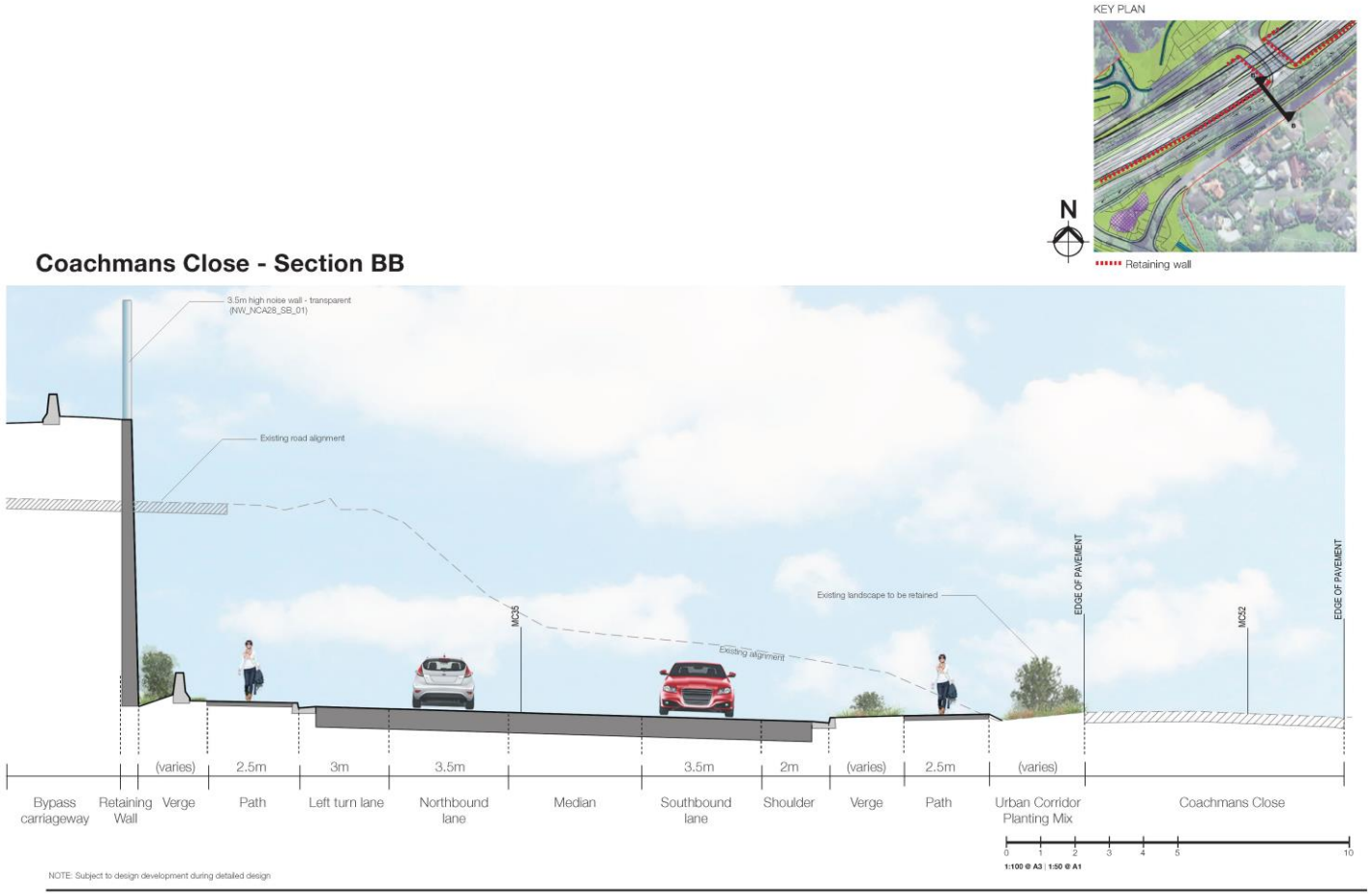


Figure 3.1-7 Coachmans Close cross section (section BB)

Luke Bowen footbridge

Issue description

- In Appendix J, Urban design, landscape character and visual impact assessment of the EIS the design 'family' of the new Luke Bowen footbridge is suggested to be like the Lloyd Poynting Bridge at Billinudgel. The urban design notes also suggest the bridge is a single span bridge. Photos provided show bridges that are similar to the current Luke Bowen footbridge, which are not like the 'family' of bridges such as the Lloyd Poynting Bridge. The Lloyd Poynting Bridge is a multi-span bridge with an enclosed cage structure. It does not rely on large truss configurations to support the spans and bears little to no resemblance to the photos provided or the current Luke Bowen footbridge. CHCC are currently unsure as to the design for the Luke Bowen footbridge and request further clarification is provided.

Response

As identified in Section 4, Urban design strategy of Appendix J, Urban design, landscape character and visual impact assessment of the EIS, shared path bridges allow pedestrians and cyclists to cross the highway safely and easily. As these bridges are less frequent along the Pacific Highway and are a smaller scale with different safety requirements, opportunities become available for alternatives in bridge design. For the design of shared path bridges, key design criteria were established, including:

- Provide a high quality and elegant design that considers the view setting and provides a visual landmark for the Coffs Harbour entry/exit journey
- Integrate the design of adjacent noise wall and bridge to present a unified appearance
- Provide visual transparency for users as well as views out for safety and a scenic vista.

As identified in Chapter 5, Project description of the EIS, the proposed replacement footbridge structure was a multi-span steel box girder bridge, which would have an enclosed cage for safety screens (like the existing Luke Bowen footbridge). TfNSW acknowledges the reference to a 'single span structure' in the Section 5.5, Bridges of Appendix J, Urban design, landscape character and visual impact assessment of the EIS, was an error and this should have read 'multi-span structure'.

Notwithstanding this, the urban design approach for the Luke Bowen footbridge outlined above remains the same. In addition, following the exhibition of the EIS, the concept design for the Luke Bowen footbridge has been changed and the proposed design documented in Chapter 2, Design changes of the Amendment Report. The Luke Bowen footbridge would be replaced with a new pedestrian bridge over the project just south of the existing bridge. The new bridge would retain the name Luke Bowen footbridge and would provide a pedestrian and cyclist connection between Old Coast Road and the proposed service road next to Kororo Public School. The design of the new Luke Bowen footbridge would consist of an arched structure, similar to the existing Luke Bowen footbridge and the rail overbridge south of Park Beach Road and Pacific Highway intersection further south towards the Coffs Harbour CBD.

3.1.14 Socio-economic

Coffs Harbour 2030 Plan

Issue description

- There are several references in the EIS to the Coffs Harbour 2030 Plan. The Coffs Harbour 2030 Plan is not a current policy document of CHCC and has been replaced by the MyCoffs Community Strategic Plan 2017 which can be found on the CHCC website. CHCC request that references and policy context throughout the EIS document are updated to the MyCoffs Community Strategic Plan 2017.

Response

Chapter 14, Socio-economic of the EIS includes a comprehensive policy context for Coffs Harbour. The inclusion of the Coffs Harbour 2030 Plan provides context to historical planning for Coffs Harbour community. It is noted the current plan is the 2017 MyCoffs Community Strategic Plan, which is detailed in Section 14.2 of the EIS. It is acknowledged that Coffs Harbour 2030 Plan was superseded by the MyCoffs Community Strategic Plan in 2017.

The MyCoffs Community Strategic Plan was developed in consultation with the community and sets out the long-term aspirations for Coffs Harbour. A broad vision is to be: connected, sustainable and thriving. There are four overarching themes with objectives and outcomes which will be measured against for Community Wellbeing, Community Prosperity, A Place for Community and Sustainable Community Leadership.

Key objectives outlined within the MyCoffs Community Strategic Plan 2017 relevant for the project and subsequent assessments include B1.2 “We attract people to work, live and visit the Coffs Harbour Local government area” which is measured by urban and business centres with amenity, connectivity, lifestyle and liveability options that encourage businesses and professionals to relocate to Coffs Harbour. The project is consistent with this and other strategic goals through increasing the connectivity benefits and removing heavy vehicle traffic from city centres to allow for greater flourishing lifestyle and amenity through the city centre.

Additionally, the objective D2.1 “We effectively manage the planning and provision of regional public services and infrastructure” specifically outlines that the Coffs Harbour Bypass is completed as an outcome that is desirable for all community. There is a general outcome to have effective and long-term consideration within the MyCoffs Strategic Plan of future generations.

The project satisfies the objectives of the MyCoffs Strategic Plan 2017 and is consistent with the approach within Section 14.2 of the EIS.

SEIA study area

Issue description

- The socio-economic impact assessment (SEIA) study area does not include residential areas and communities such as Boambee East, Toormina and the Northern Beaches. This is of particular relevance when understanding the potential impact on affordable housing and service provision across the Coffs Harbour LGA. Figure 14-4 of the EIS indicates areas near to the SEIA study area boundary that are in the lower decile of disadvantage. Potential impacts on these areas from the project should be considered. It is acknowledged that some data and associated analysis is compared at the local government level and State level, but key service and community areas appear to have been excluded from the broader analysis and impact assessment

- SEIA study area and associated analysis should include additional SA1 areas in order to properly consider social and economic impacts including affordable housing and rentals and services such as health and education.

Response

The SEIA study area was identified to provide relevant demographic and economic information for impacted residents and businesses. The SEIA study area was established in accordance with Environmental Impact Assessment Practice Note: Socio-economic Assessment (Roads and Maritime 2013a) as required by the SEARs. It considered the potential extent and scale of impacts, both direct and indirect and the combination of urban and rural context of the areas surrounding the project.

To allow for effective demographic profiling, the study area was established to align with the Statistical Areas level 1 (SA1) geographies of Australian Bureau of Statistics (ABS) data. The SEIA study area was established by selecting all 86 SA1s within 500 metres of the project and the existing Pacific Highway alignment and all other SA1s located between them. However, there was one exception, SA1 1108613, which was not included. The potential for the project to impact on this community was considered to be negligible because of the topography and settlement of the community in this area.

Additionally, a core impact area had been established to enable more refined reporting of demographic data for the communities immediately adjacent to the project, which consists of 27 SA1s. The communities immediately adjacent to the project would experience more direct impacts than those of the broader SEIA study area.

However, to address CHCC's concerns regarding the potential social and economic impacts of the project in this area, additional assessment has been carried out for the Boambee East-Toormina area (shown in **Figure 3.1-8**). The Northern Beaches (Sapphire Beach and Moonee Beach) are more than 1.5 kilometres and six kilometres north of the project respectively, and these communities are unlikely to be impacted by the project. It is noted that the project would improve access and connectivity between the northern beaches and the SEIA study area, which contain social services and facilities which serve these communities.

Demographic profile

The Boambee East-Toormina residential communities (as shown in **Figure 3.1-8**) span across 32 SA1s. The 2016 census recorded 11,397 people living in the Boambee East-Toormina area, split fairly evenly between males (48 per cent) and females (52 per cent). The median age of the population in the Boambee East-Toormina area was 42 years old, similar to the EIS SEIA study area of 43 years old.

The median total household income was $1,117 per week. One SA1, in the suburb of Toormina, reported a median household income lower than the national minimum wage of $672.70 per week in 2016 (ABC News 2016).

The median monthly mortgage repayment in the area was $1,505 and the median weekly rent was $337.50. Based on the area's median household income, mortgage repayments, and weekly rent households spent 30 per cent or 31 per cent of their weekly income on rent or mortgage respectively. CHCC in their Affordable Housing Discussion Paper (2019), identify a rental stress rate where rent exceeds 30 per cent of gross income. As such, the communities in the Boambee East-Toormina area in general sit on the threshold of the rental stress rate.

The average household size was 2.2 persons per household. Of the 4355 dwellings in the study area, none were owned outright, 32 per cent were owned with a mortgage and 32 per cent were rented. Of those rented, 19 per cent were rented from the state housing authority. More than half of the

population lived in the same address five years ago, indicating a large proportion of the community are settled in the area.

The unemployment rate in the SA1s that form the Boambee East-Toormina area range from zero per cent to 23.6 per cent. With an average unemployment rate of almost nine per cent, the area has a high level of unemployment. This is higher than the unemployment rate of the EIS SEIA study area (seven per cent), Coffs Harbour LGA (7.3 per cent) and NSW (6.3 per cent). Of those who had completed post-school qualifications, for most (45 per cent) their highest level of education was a certificate III or IV; for 20 per cent, this was a bachelor's degree. For the EIS SEIA study area, the split was higher for the completion of a bachelor's degree (38 per cent) than certificate III or IV (20 per cent).

The Index of Relative Socio-Economic Advantage/Disadvantage (IRSAD), is an indicator of advantage and disadvantage expressed as a continuum. It considers indicators relating to income, education, occupation, wealth and living conditions. Generally, the Boambee East-Toormina area had lower values on the index, which indicates an area of disadvantage. The Socio-economic Indexes for Areas (SEIFA) index is shown spatially in the EIS in Figure 14-4.

Construction of the project and potential employment opportunities is unlikely to change the demographic composition of the Boambee East-Toormina community. The project construction, which would require a maximum of 520 workers at its peak, would seek to draw upon the local workforce where possible. This would present opportunities for direct and indirect employment for people in the SEIA and its surrounds including the Boambee East-Toormina area. Workers not from the Coffs Harbour region would likely be accommodated across the study area, avoiding an influx and significant change in population in local communities.

Social infrastructure and services

There is a range of social infrastructure and services in the Boambee East-Toormina area which generally serves the needs of its local community. These include:

- **Schools**: Toormina Public School, Coffs Harbour Learning Centre, William Bayldon Public School, Mary Help of Christians Primary School, Toormina High School, Sawtell Public School
- **Pre-schools and child care centres**: Toormina Community Pre-School, Hopscotch Boambee Child Care, Lilly Pilly South Learning Centre
- **Community centres and libraries**: Toormina Community Centre, Boambee East Community Centre, Toormina Library
- **Health and medical centres**: Toormina Medical Centre, Toormina Physiotherapy and Sports Injury Clinic, Coffs Eye Surgery, Sullivan Nicolaides Pathology, AAA Massage and Acupuncture, Enriched Health Centre
- **Emergency**: Sawtell Fire Station
- **Aged care**: Mater Christi Residential Toormina, Boambee Gardens Retirement Village.

Some of these facilities were shown in the EIS mapping for contextual purposes. Given their distance to the construction footprint, the social infrastructure and services in the Boambee East-Toormina area are unlikely to be affected by the project. The introduction of a workforce of around 450-520 workers in the peak construction phase is unlikely to have an adverse impact on the facilities and services in the Boambee East-Toormina area as the construction workforce would be spread across the EIS SEIA study area and surrounds and would access the social infrastructure across the SEIA, which includes a range of established activity centres, community support services, health, sport,

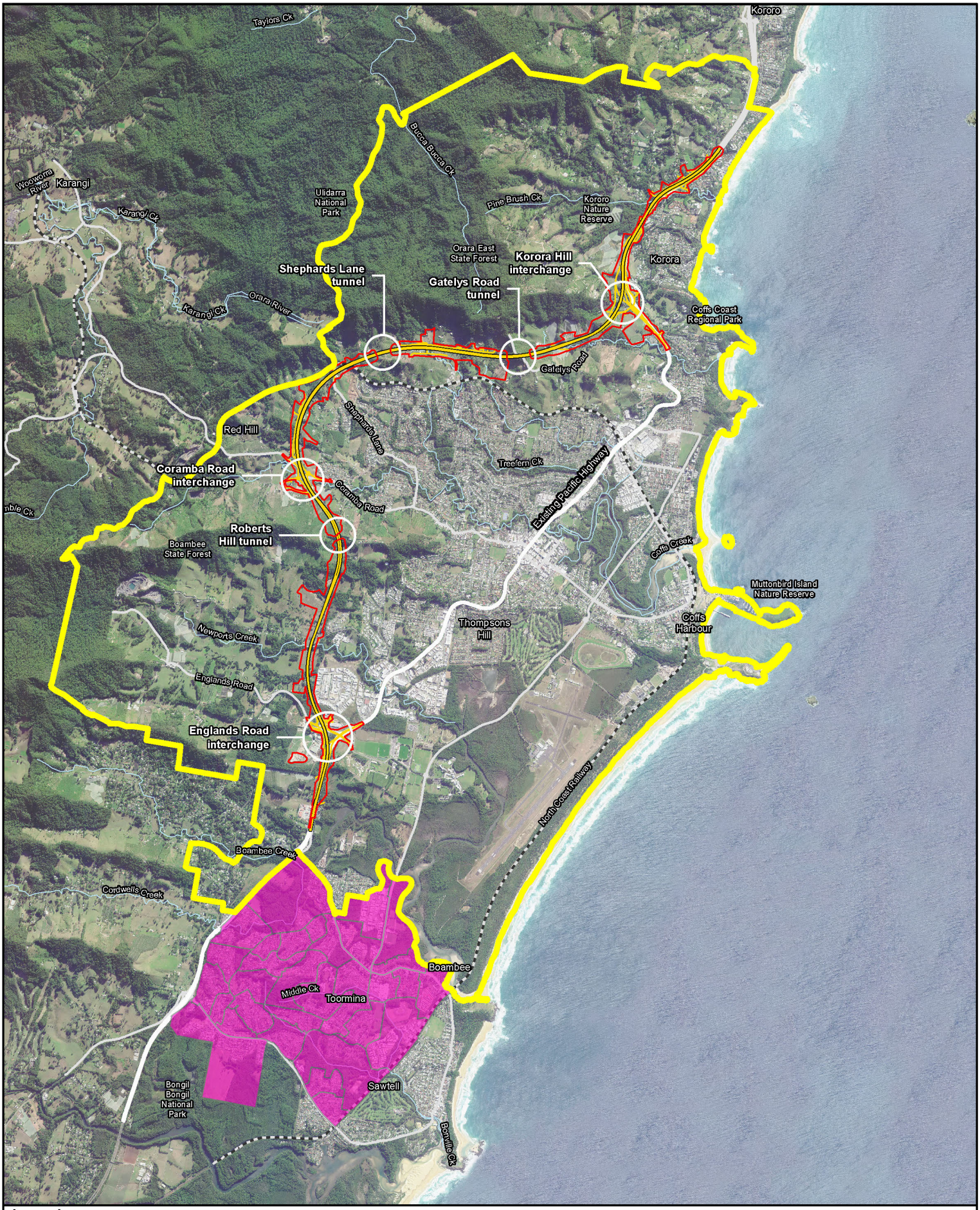
recreational and cultural facilities. Impacts to social infrastructure located within the EIS SEIA study area have been assessed in the EIS and the impacts identified (eg changes to noise levels and access) would not affect communities of Boambee East-Toormina in particular.

Housing affordability

The staged construction of the project would mean that in the peak of construction, there would be about 450-520 workers on site. Given that some of the workforce would be comprised of local workers, the influx of construction workers in the Boambee East-Toormina, and even the EIS SEIA study area and surrounds, is not expected to be significant. Further, the workers would be accommodated in a variety of premises located across the EIS SEIA study area and its surrounds. With this approach, the potential impact of the construction workforce on housing in the Boambee East-Toormina area is not considered to be significant.

The Construction Workforce Accommodation Study undertaken in 2016 by Pacific Complete for the Woolgoolga to Ballina Pacific Highway upgrade, showed that with a proactive and planned approach, construction workers had minimal impacts on availability and affordability of rentals and tourism accommodation within the property market. Impacts were minimised by using a combination of existing accommodation options, across the length of the project to reduce impact in a single location, and a transportation strategy to limit the use of private vehicles by the construction workforce. Where possible, the project's approach to workforce accommodation would be consistent with this, noting the smaller scale of Coffs Harbour Bypass and construction workforce required.

Using accommodation from a range of locations could also minimise the impact on the availability of the already limited stock of one to two-bedroom dwellings, particularly in the outer suburbs of Coffs Harbour. This issue was identified in the CHCC Affordable Housing Discussion Paper (2019) as a key contributing issue to housing affordability in the LGA.



Legend

- Construction footprint
- Alignment
- North Coast Railway
- Watercourse
- SEIA study area
- Boambee East - Toormina area

Coffs Harbour Bypass

Figure 3.1-8 SEIA study area and Boambee East -Toormina area

0 0.7 1.4 2.1 km

Scale @A4: 1:70,000

GDA 1994 MGA Zone 56

N

Socio-economic impacts during construction

Issue description

- The construction phase of the project will have a detrimental impact on the availability and affordability of rental accommodation affecting both residents, refugee resettlement programs, seasonal workforces (such as blueberries) and the tourism and major events sectors
- The shortage of rental stock and expected rental prices increases combined with possible increase in cost of various services (eg food services) during the construction phase of the project is expected to place pressure on various lower socio-economic communities, leading to an increase in potential social issues
- The construction phase of the project may result in an increase in road safety issues, due to an increase in construction related vehicles on local roads, as well as anti-social behaviour/offences around licenced premises or 'gender-related impacts' such as temporary masculinisation of the town
- The influx of construction workers, some with families, is expected to impact public facilities and services provided by CHCC such as libraries, cultural facilities, sporting and recreational facilities and lifeguard services, potentially requiring additional resourcing to maintain levels of service
- The influx of construction workers, some with families, is expected to have a detrimental impact on availability of health services for the community, in particular GPs
- There is expected to be some impact on local education facilities of construction workers who bring their families to the area, as some schools are at capacity. School bus services may also be impacted, including through potential traffic delays during construction. Some schools in proximity to the construction may at times be impacted by noise and vibration.

Response

The construction phase of the bypass is unlikely to have a detrimental impact on the availability and affordability of rental accommodation, public safety, and the capacity of community infrastructure and services. While the construction of the project is expected to create 2,000 local direct and indirect jobs including administration roles, this is over the course of a four to five year construction period. The project would not require a workforce of 2,000 in Coffs Harbour at one time, rather, as indicated in Chapter 6, Construction of the EIS, peak workforce during the construction phase is anticipated to be 450-520 with an average workforce of 270. Further, TfNSW and its contractor(s) would endeavour to use local workforce and services for the project as is done for all major infrastructure projects. Notwithstanding, further consideration is provided below to the issues raised by CHCC.

Impacts on housing affordability and lower-socio economic communities

A typical construction workforce consists of workers sourced from the local area, workers utilising 'fly in and fly out' (FIFO) or 'drive in and drive out' (DIDO) arrangements and workers who relocate for the period construction. FIFO and DIDO workers typically utilise short-term, self-contained or tourist style accommodation whereas relocated workers would likely take private long-term rental accommodation options. As such, it is likely that the project's construction workforce would use several accommodation options spread over various locations. This would minimise the impact on the LGA's hotels and avoid concentration of impacts to locations in a way that would impact on the area's rental availability and affordability.

As discussed above, a Construction Workforce Accommodation Study (Pacific Complete 2016) was carried out for the Woolgoolga to Ballina Pacific Highway upgrade project. The study showed construction workers had minimal impacts on availability and affordability of rentals and tourism

accommodation within the property market. This was because of the management of workers using a combination of existing accommodation options, across the length of the project to reduce impact in a single location, and a transportation strategy to limit the use of private vehicles by the construction workforce. The use of camps to accommodate workers was not used as a part of the Woolgoolga to Ballina project for a variety of reasons as well as noting the requirement for campsite approval by the local council via the development application process.

The flow on effects of this workforce management had possible positive socio-economic outcomes as the workforce was integrated in nearby townships with increased population, employment, social capital, business use, economic growth and social cohesion.

Considering that the Coffs Harbour Bypass project is anticipated be a much smaller scale project than Woolgoolga to Ballina, and therefore requiring a smaller workforce, it is not expected that the project would have an impact on housing affordability. The range of housing options available to lower socio-economic communities and affordability would not necessarily be negatively impacted by the anticipated peak 450-520 workforce. This is because of the likely make up of the workforce as described above and expected distribution of workers across the local area would ensure the impact was not all at one location.

Road safety and anti-social behaviour

The construction phase will involve the use of local roads by construction vehicles, particularly around construction ancillary facility sites. The safety of road users will be managed through the preparation and implementation of the TMP as described in environmental management measure TT06 during construction and general site induction process.

Given the likely program of construction activities over the four to five year construction period as shown in Table 6-3 of the EIS, its implications on the total workforce requirements, and the requirements for a mix of day and night workers across trade, functional and administrative roles, there is minimal likelihood of increased anti-social behaviour/offences around licenced premises as suggested by CHCC.

In addition, TfNSW has a Code of Conduct that covers all permanent, temporary and casual staff and contractors. It outlines expectations for the workplace and in certain circumstances, expectations of employees outside the workplace. The Code of Conduct can be found at: ***https://www.transport.nsw.gov.au/sites/default/files/media/documents/2017/code-of-conduct-transport_0.pdf***.

Impacts on social infrastructure

Given the duration of construction and timeline of activities, its implications on the total workforce requirements and their spread across various locations, the impact on social infrastructure such as schools, medical centres, libraries, cultural and sporting facilities, and lifeguard services is likely to be minimal.

Further, any demand for additional services as a result of project workers and their families moving into the area may present employment opportunities for the new residents. As documented in the Woolgoolga to Ballina Construction Workforce Accommodation Study (Pacific Complete 2016) ‘accommodating workers locally will result in direct benefits to local communities and townships and could include (but are not limited to) indirect employment opportunities, an increase in social capital, use of local services, use of local businesses, lifestyle and wellbeing benefits for workers, development of social networks and community cohesion’.

As discussed in Chapter 8, Traffic and transport of the EIS, temporary delays may occur for buses travelling through the construction footprint due to the impact of temporary traffic measures associated with construction of the project. However, consultation with bus operators has commenced and will continue to be undertaken to ensure potential impacts during construction are communicated and managed. For further information see Chapter 4, Consultation of the Amendment Report.

Noise impacts on schools as a result of construction activities have been addressed in Chapter 9, Noise and vibration in the EIS and updated in Appendix B, Updated noise and vibration assessment. Some schools in proximity to the construction sites will experience noise and vibration impacts. As identified in environmental management measure NV01, a Noise and Vibration Management Plan will be prepared and implemented during construction. Wherever possible, activities that could generate high noise levels around the schools would seek to avoid school hours and/or not timetabled during examination periods. However, this would need to be balanced against the impacts of carrying out these works during the night and other work program considerations.

House affordability during construction

Issue description

- The project overview acknowledges that the impact of the bypass on affordable housing had been raised by the community and Section 14.2.2 of the EIS further highlights the issue. CHCC has updated the Affordable Housing Discussion Paper in 2019. Some analysis in Section 14.2.2 differs from the data and analysis CHCC has undertaken. It appears that there is no commentary on how to address or mitigate this impact in Section 14.4. CHCC recommend that housing cost and tenure is included in Section 14.3.2 Operational Impacts and Section 14.4 Environmental management measures to mitigate impacts. It is recommended that a review and comparison of the CHCC Affordable Housing Discussion Paper (2019) be undertaken.

Response

As discussed in responses provided above, the impact on an area's rental availability and affordability is expected to be minimal.

A review of the CHCC Affordable Housing Discussion Paper (2019) indicates that the 2016 rental stress rate in Coffs Harbour LGA (where rent exceeds 30 per cent of gross income) was 37 per cent of all renting households. This was higher than the NSW rate of 28.4 per cent. The discussion paper concludes this was because of high housing costs and discrepancy between housing stock available and resident's housing needs. This can be attributed to the high proportion of low-income households across the Coffs Harbour LGA and a shortage of one and two-bedroom dwellings.

Chapter 14, Socio-economic of the EIS discussed housing tenure and costs. Some of the findings differ to that contained in the discussion paper as the EIS assessment focussed on the SEIA study area (using ABS data for the 86 SA1s in the study area) while the discussion paper studied the Coffs Harbour LGA as a whole, which encompasses areas as far north as Barcoongere and as far south as Bundagen. The shortage of one and two-bedroom dwellings cited in the discussion paper as a factor in housing affordability, is generally more of an issue in outer suburbs. Given the EIS SEIA study area covers the central area of Coffs Harbour and its surrounding suburbs, a greater mix and choice of housing is seen in the study area.

As discussed in Chapter 6, Construction of the EIS, the project would require about 450-520 workers during the peak of its construction. This workforce is expected to consist of workers sourced from the local area, FIFO and DIDO workers and workers who relocate for the period construction. At this stage of the project, the likely proportion of these categories if workers, and anticipated need for long-term accommodation is not yet determined. However, consistent with the approach documented in the Woolgoolga to Ballina Construction Workforce Accommodation Study (Pacific Complete 2016), workers would likely use a number of different accommodation types and a range of locations which would minimise impacts on housing affordability.

Business and Industry

Issue description

CHCC notes that there is representation of a tourism body on the advisory panels and recommends the following:

- An invitation is extended to CHCC S355 committee, Destination Coffs Coast Committee (Tourism industry committee) to provide feedback on pre and post activity including signage, impact on visitation pre and post construction in relation to directional signage, impact on transport through the city (particularly during construction with diversions) and access off highway. CHCC Economic Development Strategy 2017 – 2022 recognises tourism as another of the key sectors for economic health
- Timely communication to business and visitors around changes in access is particularly important for advance notice to be given to tourism businesses to communicate with visitors. Planned signage for directional purposes throughout construction and after should be included. This should consider the needs of tourists around cycling tracks, public transport needs and tourist drive development and promotion
- Development of tourist drive routes and promotion to ensure movement of tourists through the destination in consultation with NSW Government's Tourist Attraction Signposting Assessment Committee (TASAC) should be undertaken.

Response

Both the construction and operation of the project have the potential to impact the businesses along the existing highway through changes to access. Appendix D, draft Community consultation framework of the EIS provides an overview of the communication and engagement activities that would be carried out with key stakeholders during construction of the project to assist in minimising a number of impacts such as changes to access. The stakeholders identified for consultation include various tourism businesses and operators.

The draft Community consultation framework will be used to prepare the Community Liaison Implementation Plan for the project (see environmental management measure SE01). This plan will be used to provide specific and timely information in relation to the affected community during construction, so they are aware of upcoming work and impacts and details of design and construction. Environmental management measure SE01 has been revised to specifically include businesses to ensure procedures and practices take into account their varying needs.

The importance of temporary signage during construction for reducing confusion resulting from changes to access is acknowledged. As identified in environmental management measure TT06 listed in **Chapter 6, Revised environmental management measures**, a TMP will be prepared and implemented during construction. The TMP will be prepared in accordance with Traffic Control at Work Sites Manual (Roads and Maritime Services 2018c) and would include site specific traffic

control measures (including signage) to manage and regulate traffic movement in addition to measures to maintain pedestrian and cyclist access.

In addition, temporary signage including use of variable message signs will be used to identify any revised access changes to tourism businesses. The temporary signage will be installed in consultation with affected tourism businesses and in accordance with Traffic Control at Work Sites Manual (Roads and Maritime Services 2018c). This commitment has been included as a new environmental management measure (SE07) in **Chapter 6, Revised environmental management measures**.

To minimise loss of passing trade as identified in Chapter 14, Socio-economic of the EIS, a Directional Signage Plan will be developed in accordance with TfNSW and Destination NSW signage guidelines to ensure effective and appropriate signposting for key locations along the project in accordance with environmental management measure SE02. The plan will identify the range of services that Coffs Harbour provides and will be prepared in consultation with CHCC, Coffs Harbour Chamber of Commerce and TASAC.

The development of tourist drive routes is considered outside the scope of the project and best led by CHCC. However, consultation with CHCC is proposed as part of the development of the Directional Signage Plan as described above. This consultation and involvement in the preparation of the Directional Signage Plan could assist CHCC in the tourist drive nominating process with TASAC.

Issue description

In relation to the movement of business goods during construction and delay in times and availability. CHCC recommends the following:

- Direct and timely communication to business community before and during construction be provided
- Advance warning for businesses close to construction to minimise impact on business and to ensure work, health and safety needs for businesses can be met
- Development of business diversification ideas and marketing skills in partnership with local business networks be undertaken. This should consider social and economic impact to community based on business closure and impact to individual sectors, rather than industries, of Coffs Harbour's economy
- Examination of the impact at SA1 levels and also in sub-category level not just as an impact to whole Gross Regional Product (GRP) be undertaken.

Response

Chapter 14, Socio-economic of the EIS and Section 5.8, Socio-economic of the Amendment Report discussed the impacts to business and industry. The approach within the EIS fulfilled the purpose of providing an assessment of potential impacts of the project on businesses and industry within Coffs Harbour. The EIS investigated businesses reliant on passing trade and the potential impacts on these businesses as a result of the project. It also assessed the impacts on agricultural businesses and the overall impact on the industry. The socio-economic impact assessment conducted for the EIS cannot identify the potential impacts on the operation and business continuity of individual businesses as these are dependent on a range of factors, many of which are outside the influence of the project. This is not considered to be practical to complete at this stage of the project and level of detail. Likewise, the impact on businesses and employment at a SA1 level is not considered practical.

The key areas where businesses would be affected are those along the existing Pacific Highway and the Isles Drive industrial precinct. Additionally, agricultural businesses in the western part of the EIS

SEIA study area would be impacted because of the construction of the project and direct impacts on agricultural properties.

Businesses along the existing Pacific Highway would be impacted by changes to temporary and permanent access arrangements. The main and permanent impact to businesses along the highway relates to changes to passing trade as a result of the project during operation. Figure 14-14 of the EIS shows the types of businesses dependent on passing trade which include service station, accommodation, and fast food outlets. They span across a number of SA1s. The industries most likely to be impacted are the accommodation and food services industry and the retail trade industry. By drawing upon previous studies, the EIS assessed the impact on businesses reliant on passing trade to be of low significance. It is not considered practical to assess the likelihood of closure of individual businesses and therefore, the resultant impact on their industries and those employed in these industries cannot be anticipated.

Businesses located in the Isles Drive industrial precinct would experience changes to access arrangements during construction and in operation. Businesses in this area are focussed on industrial activities, and retail of bulky goods (such as motor vehicles) and are not considered to be reliant on passing trade. The businesses located in this area can be categorised in the transport, postal and warehousing industry, and the retail trade industry. As described in Chapter 14, Socio-economic impact assessment of EIS, several businesses in this area would be directly impacted and would need to close and/or relocate. However, based on the proposed design changes, access to these businesses would improve. A new direct access between Englands Road and Isles Drive would be provided which would maintain all turning movements to the Isles Drive Industrial area and local businesses. This would remove the need for vehicles to travel north to access the industrial area via the existing Pacific Highway/Isles Drive intersection. During operation, this would result in improved access for local businesses and their customers and reduce congestion at the existing Pacific Highway/Isles Drive intersection compared to the EIS. The proposed design change would improve access and travel time to the Oz Group Packhouse (37/51 Isles Drive) located in the southern end of Isles Drive. For more information refer to Section 5.8, Socio-economic of the Amendment Report.

Farms in the western part of the EIS SEIA study area would be directly impacted by the construction of the projects. Although a total of 24 farms would be impacted, only six farms (all banana) would need to close. This would impact the individuals employed in the agriculture industry. While the operators and employees of these farms would be sensitive to this impact, the socio-economic impacts associated with the agriculture industry was considered to be of moderate-low significance.

The EIS provides a description of the GRP for Coffs Harbour LGA. Providing a breakdown of GRP by industry highlights the ‘economic specialisation’ of a region and role of industries within a region. In doing so, the EIS highlighted the diversity of the Coffs Harbour region. It identified the following top eight industries by their contribution to GRP:

- Health care and social assistance
- Construction
- Retail trade
- Education and training
- Public administration and safety
- Agriculture, forestry and fishing
- Manufacturing

- Professional, scientific and technical services.

To minimise the impacts to business operations, including those that would need to close/relocate, direct and timely communication with businesses will be carried out. Appendix D, draft Community consultation framework of the EIS details the stakeholders that would be regularly updated through the construction of the project and includes directly affected businesses, businesses along the existing Pacific Highway and agricultural representatives. It will involve specific communication regarding noise and vibration, air quality and traffic management.

The impacts of the project on businesses in Coffs Harbour is anticipated to be minor as Coffs Harbour will remain a key destination in the wider region for both tourism and commercial purposes. Environmental management measure SE02, involving the preparation of a Directional Signage Plan, would identify a range of services that Coffs Harbour provides to facilitate movement along the existing highway through the CBD.

As discussed in the response above, a number of new or revised environmental management measures have been developed to help minimise the impact on businesses including SE01, SE02 and SE07 of **Chapter 6, Revised environmental management measures**.

Issue description

- Closures or relocation of businesses particularly agricultural and industrial businesses are identified in the EIS. However, it should be noted there is a limit to the amount of industrial and agricultural land that is currently available in the LGA. The CHCC Economic Development Strategy 2017 – 2022 recognises agriculture as one of the key sectors for economic health. CHCC recommends that consideration be given to the LGA's development plans and controls when recommendations are made to affected business and their sites.

Response

As identified in Chapter 4, Project development and alternatives of the EIS, planning for the project began in 2001 as part of the Coffs Harbour Highway Planning Strategy (CHHPS) (RTA 2001a). The CHHPS was developed by TfNSW in association with the DPIE and CHCC. It involved extensive consultation with a wide range of community groups and individuals. The purpose of the CHHPS was to:

- Address the need to upgrade the Pacific Highway between Sapphire and Woolgoolga
- Plan for future traffic needs within the Coffs Harbour urban area
- Provide planning certainty for CHCC and the community.

In September 2008, the preliminary concept design for the project was announced and displayed for community comment. In response to community submissions received during the display, the concept design was further refined. This allowed CHCC to reserve the route in the local environmental plan (LEP) to provide planning certainty for CHCC and the local community. The road corridor based on this design was incorporated into the Coffs Harbour LEP 2013 (Coffs Harbour LEP) with a SP2 zoning for infrastructure.

It is acknowledged there is a limit to industrial and agricultural land available within the Coffs Harbour region, and that agriculture has been and is recognised as a key sector for economic health. The design of the project sought to contain the project within the designated road corridor as identified in 2004. The small percentage of land needed outside of the designated corridor for the project has been guided by optimising the design to minimise impact on residential, industrial, and agricultural land, and fragmentation and sterilisation of land. Chapter 12, Land use and property of the EIS and

Section 5.6, Land use and property of the Amendment Report refers to 53.4 hectares of direct impact to land zoned RU2 Rural Landscape and 5.1 hectares to R2 Large Lot Residential.

These zoning designations provide for farming practices of varying scales and intensity. Impact to industrial land is reported to be limited, with only 3.1 hectares of construction footprint impacting IN1 General Industrial land. The amended design has further minimised impact on industrial and agricultural land, as outlined in Section 5.6, Land use and property of the Amendment Report. The amended Englands Road interchange design minimises impacts on industrial land specifically for Isles Drive and Coffs Coast Resource Recovery Park.

While there would be some closures and relocations of businesses, the impacts are not considered to be significant within the overall context of agricultural and industrial production of the Coffs Harbour LGA. The loss of six banana farms out of the 111 in Coffs Harbour LGA is not considered to have a significant impact on the agriculture industry. The project will not require the closure of any blueberry farms. Overall, the scale of the farms impacted, and the land area impacted is minimal. Impacts to agricultural businesses was assessed in detail in Chapter 13, Agriculture of the EIS and updated in Section 5.7, Agriculture of the Amendment Report. The proposed design amendments would result in minor increases to impacts but overall, property impacts have been assessed as consistent with the EIS.

Additionally, land required for the construction of the project but not its operation (eg for the purpose of a construction ancillary site), would generally be reinstated based on its current land use zoning and condition as described in environmental management measure LUP03.

Impacts to the Coast Coffs Resource Recovery Park

Issue description

- CHCC operates a number of waste businesses within the Coffs Coast Resource Recovery Park. These facilities are important local infrastructure as they currently deliver key waste services to the three local governments and have long-term capacity to continue to deliver these services
- The proposed design of the Englands Road interchange indicates very significant impact on access to and from the Coffs Coast Resource Recovery Park and potential for excessive impacts to the operations of the waste facilities themselves. The EIS does not adequately assess or understand the operational impacts of the design. The Englands Road interchange design is considered excessive, which leads to excessive impacts on CHCC's waste facilities[1].

Response

TfNSW acknowledges and appreciates the important role Coffs Coast Resource Recovery Park plays in the local Coffs Harbour economy. TfNSW understands the facility provides key waste services to three local government areas as well as running education sessions for a variety of student groups.

Following the exhibition of the EIS, the concept design for the Englands Road interchange was changed and the proposed design is documented in Chapter 2, Design changes of the Amendment Report. Among other reasons, the design changes have been proposed to maintain full access between Englands Road and Isles Drive industrial area, which includes the Coffs Coast Resource Recovery Park. A revised alignment for the northbound exit ramp and the new one-way local access

1 For the purposes of clarity, the original words of this issue have been summarised from the original submission from CHCC. For the full original submission please refer to https://www.planningportal.nsw.gov.au/major-projects/project/10461/submissions/13111/3251

road, located on the western side of the project, is proposed to reduce impacts on the Coffs Coast Resource Recovery Park.

In addition to reduced access impacts, the amended design is anticipated to significantly reduce the impact on each waste business. The change to socio-economic impact on each business is outlined below and in further detail within Table 5.8-1 of Section 5.8, Socio-economic of the Amendment Report:

- Handy Bin Waste Services – the proposed design changes would no longer require the demolition of the eastern end of the main shed, which provides a beneficial change that would ensure operations can continue with minimal alterations. Impacts to the existing car parking would still be required but would be undertaken in consultation with Handy Bin Waste Services to ensure there is minimal disruption to staff and customer access
- Coffs Coast Waste Services – the EIS identified direct impacts to an onsite parking area and vehicle maintenance sheds. These impacts would be avoided with the proposed design change, which would be a beneficial change when compared with the EIS
- CHCC Community Recycling Centre – the proposed design change would not alter the impacts reported in the EIS. Access to the centre would still be directly impacted during construction, but alternative access would be provided
- Biomass solutions – the stockpiling area, car parking areas and access routes would be avoided as a result of the proposed design changes. This would mean the business could continue on site, with minimal alterations to current operations. This would be a beneficial change from the EIS, which reported the required demolition and subsequent impacts on business operations.

Overall, the proposed design change results in a significant beneficial reduction in property and business impacts within the Coffs Coast Resource Recovery Park. The EIS reported a direct property impact of 3.35 hectares on the Coffs Coast Resource Recovery Park. The proposed design change would reduce the impacts by about 0.43 hectares (to 2.92 hectares overall). This would result in more functional operations for Coffs Coast Resource Recovery Park and a decrease compared to the impacts described within the EIS.

It should also be noted that TfNSW has engaged in consultation and discussions with CHCC to produce the amended design. TfNSW will continue to engage with CHCC and businesses within Coffs Coast Resource Recovery Park during detailed design to identify opportunities to reduce temporary construction impacts on the operation of the waste management facilities.

3.1.15 Non-Aboriginal cultural heritage

Old Coast Road Bridges

Issue description

- Chapter 16, Non-Aboriginal cultural heritage of the EIS notes that Old Coast Road Bridge No. 1 and Old Coast Road Bridge No. 2 are heritage items. Both Old Coast Road Bridge No. 1 and Old Coast Road Bridge No. 2 have had considerable reconstruction and upgrade works carried out previously and as recently as 2016 (girder replacements). Both bridges have concrete decks, which have no heritage value. CHCC does not recognise these as current or possible heritage items, nor do we believe the bridges warrant preservation as heritage items. CHCC requests TfNSW review the need to upgrade the bridges in line with the proposed changes to traffic flows and usage.

Response

TfNSW acknowledges CHCC request to upgrade Old Coast Bridge No. 1 and No. 2 to cater for increased traffic volumes. A response to the traffic issues raised by CHCC in relation to the bridges are discussed in **Section 3.1.10**, which states, TfNSW will engage in further consultation with CHCC regarding Old Coast Road Bridge No. 2.

Chapter 16, Non-Aboriginal cultural heritage and Appendix M, Non-Aboriginal heritage assessment assessed the heritage value of both bridges. The assessment was completed in accordance with the SEARS as well as current heritage guidelines including Assessing Heritage Significance (NSW Heritage Office 2001*),* Assessing Significance for Historical Archaeological Sites and 'Relics' (Heritage Branch, Department of Planning 2009), Burra Charter (ICOMOS 2013) and Statements of Heritage Impact (NSW Heritage Office and Department of Urban Affairs & Planning 1996 (revised 2002) and associated guidelines).

As stated in Table 16-5 and 16-6 of the Chapter 16, Non-Aboriginal cultural heritage of the EIS, Old Coast Road Bridge No. 1 has moderate archaeological potential and a local level of heritage significance. The bridge is representative of the use of timber beam bridge technology in the construction of the local road networks. Based upon a review of local heritage registers, the bridge appears to be unique within the local area and may be one of few surviving early 20th century timber beam bridges in the Coffs Harbour region. It appears that no major modifications or repairs have been made to the sub-structure and demonstrates aesthetic characteristics of a design uncommon in this area. Remnants of an earlier bridge can be seen under the current structure, indicating multiple phases of construction and it has the potential to yield information that will contribute to the development of the local area.

Old Coast Road Bridge No. 2 has low archaeological potential and a local level of heritage significance. Similar to Old Coast Road Bridge No. 1, this bridge is representative of the use of timber beam bridge technology in the construction of the local road networks and may be one of few surviving early 20th century timber beam bridges in the Coffs Harbour region. Repairs/modifications have been made, including plywood boards and steel bracing to reinforce the abutment planks and concrete additions to the piles to hold back the abutment fill. While the Old Coast Road Bridge No.1 is a more intact structure with multiple phases of construction, the Old Coast Road Bridge No.2 also still retains local significance and demonstrates the later, more modern phases of construction.

3.1.16 Flooding and hydrology

Methodology

Issue description

- The EIS flood modelling does not match up with CHCC's adopted flood modelling in the downstream reaches of Boambee and Newports creek. In particular, the model does not show overtopping of the Pacific Highway near the Coffs Coast Sport and Leisure Park. The model should be updated to better coincide with CHCC's model results, and the bypass should investigate whether it can provide flood protection to the Pacific Highway as this is an access point to the hospital. Extending the model is recommended to at least the confluence downstream of the tributary through the sports fields and Newports Creek. This should improve the simulated levels around the existing Pacific Highway and the Coffs Coast Sport and Leisure Park.

Response

Following exhibition of the EIS, the North Boambee Valley flood models have been extended to include additional downstream sub-catchments and floodplain areas. Terrain data, structure information and downstream water level boundaries were extracted from the TUFLOW model adopted by CHCC (GHD 2016). Verification was carried out of the extended model to validate the model against the CHCC modelling. This is discussed in further detail in Section 2.7.1 of Appendix H, Updated flooding and hydrology assessment of the Amendment Report.

The downstream boundary was extended sufficiently so that boundary conditions would not influence flooding impacts caused by the project. Modelled flooding behaviour now shows the existing Pacific Highway, at the southern tributary crossing, inundated in more frequent flood events. At this location, the northbound lanes are affected in the 10 per cent annual exceedance probability (AEP) event while the southbound lanes are affected in the two per cent AEP event. Revised existing flooding conditions are described in further detail in Section 3.1 of Appendix H, Updated flooding and hydrology assessment of the Amendment Report.

Further improvement to the flood immunity of the existing highway would be discussed and progressed with CHCC as part of detailed design. TfNSW has provided the flood models to CHCC to assist in collaboration on this matter. TfNSW is committed to a whole-of-government approach to managing flood risk in North Boambee Valley and to ongoing consultation with CHCC and EESG, DPIE as the project progresses.

Flooding on James Small Drive

Issue description

- In relation to the flooding on James Small Drive, Table 17-17 notes the existing flood immunity to numerous roads and the proposed immunity with the project scenario. Currently James Small Drive is listed as overtopping by 75 mm in a one per cent AEP event. This is a low risk scenario at present and likely a short duration given the vertical geometry in the area. Under the project scenario, the table shows the road will be inundated by 130 mm in an 18 per cent AEP event. No comments are provided by TfNSW to show the inundation in the one per cent AEP for a like for like comparison. CHCC expects the one per cent AEP under the design would be far higher than 130 mm. The existing case is considered ‘accessible’ as the current road has the possibility of water over it. CHCC notes that 130 mm in flood conditions is substantially higher than 75 mm and do not agree that this road is ‘accessible’ in this situation. CHCC request TfNSW to assess the one per cent AEP flood effects and report the true flood immunity of this road. CHCC note TfNSW desire to refine the drainage design at this location but do not support flood increases combined with traffic increases. Given the vertical levels downstream of this road, achieving a similar or better than existing immunity should be targeted.

Response

The objectives of the flooding assessment are stated in Section 2.1 of Appendix H, Updated flooding and hydrology assessment of the Amendment Report. The objectives and criteria seek to define reasonable and justifiable limits on the impact of the project on flood behaviour. This is in accordance with the SEARs and the NSW Government Floodplain Development Manual (DIPNR 2005).

An updated flooding and hydrology assessment was carried out to assess any changes in impacts to hydrology and flooding because of model updates, proposed design changes and proposed design refinements. The updated assessment is provided in Appendix H, Updated flooding and hydrology assessment of the Amendment Report.

Revised existing case flood behaviour does not predict James Small Drive to be flood affected. This is a result of improved modelling methodologies including the relocation of inflow points in the hydraulic model to more accurately represent the existing flow path.

The inflow location was previously directly on Ballantine Drive. This resulted in flooding of James Small Drive in all flood events. In addition, there is no existing culvert under James Small Drive at this location, suggesting that there is no dominant flow path through this section of James Small Drive. The location of the inflow has been reviewed to be downstream (ie further south-east) within the natural flow path so the inflow is not applied directly to the road. The design of James Small Drive in this area has also been reviewed as part of the Korora Hill interchange design change and is now proposed to have a higher (around two metre increase) vertical alignment. As such, the amended design is not forecast to result in flood impacts on James Small Drive.

Flood Risk in North Boambee Valley and Newports Creek

Issue description

- Due to the potential flood mitigation work, and new development occurring across the North Boambee Valley and Newports Creek catchment, it is an opportune time for TfNSW and CHCC to work together to provide benefits to the community by reducing flood risk. In particular, improving the flood affectation and access to the Coffs Harbour Health Campus should be a key driver to achieving a positive outcome in this catchment. Option P16 of the Boambee Newports Floodplain Risk Management Study and Plan (GHD, 2016) recommended improving the conveyance across the Pacific Highway near the Coffs Coast Sport and Leisure Park. Currently the Pacific Highway at this location is impacted in the one per cent AEP design event, meaning there is no access to the Coffs Harbour Health Campus from the south. The option can provide a better level of flood immunity to the Pacific Highway at this location to above the one per cent AEP event. As this area is in the scope of works for the project, TfNSW and CHCC should work collaboratively to achieve this recommendation
- Flood mitigation works as recommended in the Boambee Newports Floodplain Risk Management Study and Plan (GHD, 2016) are currently being investigated by CHCC. The sharing of modelling information will be beneficial to both parties to assess the potential impacts of the mitigation work on the bypass and vice-versa
- A large area of floodway and flood storage is being taken up by the highway embankments in the North Boambee Valley. Increasing some of the bridge spans through this area may improve afflux upstream and minimise impacts of filling in the floodway and flood storage areas.

Response

Following exhibition of the EIS, the North Boambee vertical alignment design change and other design refinements, including the addition of further cross drainage structures under the existing Pacific Highway north of the playing fields and south west of the Coffs Harbour Health Campus, have been incorporated into the project to mitigate adverse impacts caused by the project. The North Boambee vertical alignment design change includes the optimisation of bridge spans across the North Boambee Valley floodplain to meet the flood management objectives.

Further improvement to the flood immunity of the existing Pacific Highway would be discussed and progressed with CHCC as part of detailed design. TfNSW has provided the flood models to CHCC to assist in collaboration on this matter. TfNSW is committed to a whole-of-government approach to managing flood risk in this area and to ongoing consultation with CHCC and EESG, DPIE as the project progresses.

Increased flood risk in northern creeks

Issue description

- There is some significant afflux in the downstream reaches of Pine Brush Creek, Jordans Creek and other unnamed creeks. These levels are unacceptable as they increase flood levels on multiple properties, and do not meet the objectives set for the project (see Table 6 of Appendix O, Flooding and hydrology assessment of the EIS). In particular, the most significant impacts are to the Pacific Bay Resort, Nautilus Villas and properties on Pine Brush Crescent. There is also a reduced level of access to certain properties and routes in these catchments. Of note is the reduction in access to Lot 19, DP771618, James Small Drive and Lot 1 DP527497. The same or better access should be provided to all routes and properties. Mitigation measures should be further investigated, and design changes proposed to reduce these impacts in consultation with CHCC.

Response

An updated flooding and hydrology assessment was carried out to assess any changes to flood impacts because of model updates, proposed design amendments and proposed design refinements. The updated assessment is documented in Appendix H, Updated flooding and hydrology assessment of the Amendment Report.

The updated assessment concludes that the project is no longer predicted to impact Pacific Bay Resort, Nautilus Villas and properties backing on to Pine Brush Creek. The updated impact assessment also concludes that no change in the level of access is predicted for all locations reported in the EIS. Further details on the impact assessment can be found in Section 5 of Appendix H, Updated flooding and hydrology assessment of the Amendment Report.

Impacts on detention basins and Coffs Creek

Issue description

- The proposed design shows some impact on Bennetts Road and Spagnolos Road detention basins including some changes being made to their sizing. The design changes cause the majority of the afflux upstream of the basins, with some unacceptable afflux downstream around Coramba Road (at point of interest AQ). Mitigation measures should be further investigated to reduce the level of impact at this location. It is also recommended that TfNSW consult with CHCC around any future design changes to the project which impacts the detention basins. CHCC considers that a joint funding approach between the TfNSW and CHCC could lead to significant gains in flood mitigation that will benefit both the project design and the township of Coffs Harbour. CHCC looks forward to discussing this further with TfNSW.

Response

An updated flooding and hydrology assessment was carried out to assess any changes in impacts to hydrology and flooding due to model updates, proposed design changes and proposed design refinements. The updated assessment is provided in Appendix H, Updated flooding and hydrology assessment of the Amendment Report.

The amended design does not include or require changes to the size of Bennetts Road detention basin or cause impacts within the basin. In addition to this, impacts downstream around Coramba Road (at point of interest AQ) have been improved. Predicted afflux on the residential property has been reduced from 50 mm to 27 mm in the one per cent AEP event for the amended design. This is because of new data, improved modelling methodologies, outcomes of consultation with CHCC and because of the additional storage provided south of Coramba interchange (at point of interest H, about 500 metres south of the interchange) which is part of the Coffs Creek flood mitigation design

change. The residential property at point of interest AQ remains impacted by the project with the updated assessment carried out for the amended design. However, a floor level survey of the residential building carried out since the exhibition of the EIS determined the floor level is about 900 mm above the predicted peak flood level for the one per cent AEP event. The flooding impact at point of interest AQ would be restricted to the rear of the property.

Further detail is provided in Section 5.10, Flooding and hydrology of the Amendment Report.

Whole-of-government approach

Issue description

- A significant part of the project passes through flood prone land, crossing Newports Creek, Coffs Creek, Jordans Creek, Pine Brush Creek and various other tributaries. While there are some reductions or no changes in flood levels in certain areas, there is still some significant impacts that require mitigation measures to be investigated further. CHCC believes it is in the best interest of all parties to work collaboratively in a whole-of-government approach, in particular to provide a better level of access to the Coffs Harbour Health Campus.

Response

Following exhibition of the EIS, new data, improved modelling methodologies, design changes, and design refinements have led to the resolution of several of the flood related impacts presented in the EIS. It is acknowledged there would be unresolved flooding and hydrology impacts which require additional mitigation measures. These measures will be developed in subsequent stages of the project in consultation with CHCC and EESG, DPIE.

Further improvement to the flood immunity of the existing Pacific Highway would be discussed and progressed with CHCC as part of subsequent stages of the project. TfNSW has provided the flood models to CHCC to assist in collaboration on this matter. TfNSW is committed to a whole-of-government approach to managing flood risk in North Boambee Valley and to ongoing consultation with CHCC and EESG, DPIE as the project progresses.

3.1.17 Soils and contamination

Issue description

- It is understood that past banana lands have been assessed for soil contamination. CHCC recommends that any approval includes a condition requiring TfNSW to investigate if any areas of newer horticulture activity, not previously farmed for banana, also require remediation as part of the project. CHCC and Southern Cross University have undertaken some preliminary work in this area, reports can be found on the CHCC website.

Response

As identified in environmental management measure SC01, Phase 2 contamination investigations will be carried out in areas of potential contamination identified during the preliminary site investigation. This would include soil sampling from targeted areas including:

- Former and existing banana plantations within the construction footprint (analysed for arsenic, lead and organochlorine pesticides including DDT, Aldrin and Dieldrin)
- Incremental soil sampling along construction footprint at the existing Pacific Highway where there is a history of truck accidents to assess potential lead and hydrocarbon contamination
- Targeted soil sampling at locations with dumped materials, fill materials and other agricultural uses

- Areas of potential acid sulfate soils (PASS) within construction footprint to determine oxidised pH level.

As identified in environmental management measure SC02, a Contaminated Land Management Plan will be prepared and implemented during construction for any areas of existing contaminated land or to address land contamination likely to be caused by the activity. As a minimum the Contaminated Land Management Plan will address the following matters:

- Control measures to divert surface runoff away from the contaminated land
- Capture and manage of any surface runoff contaminated by exposure to the contaminated land
- Further investigations required to determine the extent, concentration and type of contamination, as identified in the Phase 2 contamination investigations
- Manage the remediation and subsequent validation any certification land, including any certification required
- Measures to ensure the safety of site personnel and local communities during construction
- Procedures to identify and manage any unexpected contamination finds during construction.

Refer to **Chapter 6, Revised environmental management measures** for further detail. CHCC and Southern Cross University reports will be considered in developing surveys and investigations prior to construction.

3.1.18 Surface water quality

Environmental management measures

Issue description

- Gross pollutant traps (GPTs) proposed around the tunnels and interchanges appear to target heavy metals, motor oils, etc. CHCC note that all GPTs perform different functions and general litter can routinely block GPTs that perform other functions. Typically, highway alignments produce significant amounts of litter. CHCC recommend TfNSW review the possibility of tandem GPTs in these locations to ensure optimum performance and a better environmental outcome. These would include a bulk litter style GPT, followed by the TfNSW recommended oils GPT.

Response

As identified in Chapter 19, Surface water quality of the EIS, proprietary devices such as gross pollutant traps are proposed where there is insufficient space for grass swales or sediment basins. As part of the design changes describe in Chapter 2, Design changes of the Amendment Report, there have been revisions to the location and size of the operational water quality basins and proprietary devices for the project. The updated number of proprietary devices and locations in the amended design are described in Section 5.12, Surface water quality of the Amendment Report.

TfNSW has discussed the use of tandem gross pollutant traps with CHCC following the exhibition of the EIS. TfNSW will investigate opportunities to incorporate tandem gross pollutant traps, or other measures to reduce the amount of litter that would enter gross pollutant traps, during detailed design. This will be done in accordance with environmental management measure SW08 (**Chapter 6, Revised environmental management measures**), which states the type and design of the specific stormwater treatment measures will continue to be refined as part of the detail design process, including review of the proposed stormwater treatment train and consideration of best management practice guidelines.

3.1.19 Hazard and risk

Dangerous goods

Issue description

- TfNSW studies quantify vehicles by type only and do not differentiate between vehicles which are passing through and vehicles which are required to deliver goods to Coffs Harbour. CHCC request TfNSW to conduct a study on this and report the number for each vehicle class that is making deliveries compared to those passing by to ascertain the true impact of the project. CHCC would also like to thank TfNSW for the inclusion of three tunnels in the project and note the outcome is a great improvement to the 2018 concept design.

Response

As part of the dangerous goods risk assessment for the project and as summarised in Chapter 24, Hazard and risk of the EIS, traffic surveys were undertaken in March 2019 to determine the number of dangerous goods using the Pacific Highway at two locations to the south and north of the Coffs Harbour CBD. A comparison was undertaken with a standard vehicle traffic survey carried out in September 2018 at the same locations. This comparison identified that dangerous goods vehicles make up around 0.19 per cent of all vehicles for Coffs Harbour. While, it is noted the survey may not reflect some weekly or seasonal fluctuations in the cycle of distribution/delivery of dangerous goods, the total volume dangerous goods vehicles is minor compared to overall traffic volumes.

TfNSW is working with relevant authorities and industry groups to develop a State wide policy on how to best accommodate dangerous goods on the road network in the future, including working towards an agreed evidence-based, customer and safety focussed approach to determining if dangerous goods should be permitted in a tunnel.

With completion of the project, dangerous goods vehicles will still need to access Coffs Harbour which is a major regional centre and a destination for dangerous goods vehicles which provide essential services to the area.

The dangerous goods risk assessment process for the project is ongoing. Further assessment and consultation with relevant authorities and stakeholders will occur as part of this process. To support this TfNSW has identified the need for a dangerous goods destination survey.

Issue description

- Will the continued need to enable dangerous goods vehicles to travel through the CBD impart any planning restrictions on CHCC when the current highway is handed over to CHCC to own and operate at the completion of the project?

Response

As noted in Chapter 24, Hazard and risk of the EIS, Coffs Harbour is a destination for dangerous goods deliveries such as Class 2.1 (flammable gases) and Class 3 (flammable liquids). This observation was based on consultation with industrial businesses within Isles Drive industrial estate and that over 10 petrol stations are located within and surrounding the Coffs Harbour CBD. It is also anticipated that other sites or industries within and surrounding the Coffs Harbour CBD such as the Coffs Harbour Airport or Boral asphalt plant would require dangerous goods deliveries. As such, during operation of the project, dangerous goods vehicles will continue to use the existing Pacific Highway and surrounding road network in order to service customers in the Coffs Harbour CBD.

Any planning restrictions for the existing Pacific Highway would be discussed with CHCC as part of the asset handover process, if required.

Issue description

There are a number of statements in Chapter 24, Hazard and risk which need further clarification from:

- Section 24.1.2 states that ‘under current standards, vehicles carrying dangerous good cannot travel through tunnels.’
- Section 24.3.2 states that ‘under current standards, vehicles carrying dangerous goods, particularly Classes 1 and 2.1, would not be able to travel on the project.’ These statements appear to contradict each other
- Section 24.3.2 state that ‘the St Helena tunnels and Tugun Bypass tunnels exclude Class 1 and Class 2.1’, which agrees with the second statement.

CHCC are under the assumption that expected outcome of the bypass project is that Class 1 and Class 2.1 will be restricted, and all other classes will be allowed, based on risk reduction measures applied by the TfNSW in the tunnel design. CHCC request clarification in this regard.

Section 24.1.2 indicates that policy development is currently underway but does not indicate whether this would be looking to increase dangerous goods usage or reduce dangerous goods usage. CHCC have reviewed the Austroads’ Dangerous Goods in Tunnels: Application and Methodology (Austroads 2019) and note that the document contains a risk-based approach to dangerous goods, rather than offering rigid outcomes. This makes it difficult for CHCC to predict a possible result. Can the TfNSW please provide clarification on the current thinking regarding likelihood of all dangerous goods being allowable through the tunnels?

Response

The project will be built to meet current standards in relation to road and fire safety. All tunnels greater than approximately 100 metres in length are required to meet these standards irrespective of which vehicles and what goods travel through them.

Current policy is that vehicles carrying certified dangerous goods are generally not allowed in tunnels.

TfNSW is working with relevant authorities and industry groups to develop a State wide policy on how to best accommodate dangerous goods on the road network in the future, including working towards an agreed evidence-based, customer and safety focussed approach to determining if dangerous goods should be permitted in a tunnel.

With completion of the project, dangerous goods vehicles will still need to access Coffs Harbour which is a major regional centre and a destination for dangerous goods vehicles which provide essential services to the area.

Issue description

- While Coffs Harbour represents a significant destination, a majority of deliveries would still be expected to bypass the town. The origin-destination survey conducted in Chapter 8, Traffic and transport of the EIS does not consider dangerous goods travel and does not comment on the quantity of other heavy vehicles (Austroads class 6-12) that would be required to make deliveries in Coffs Harbour, therefore not using the bypass. CHCC request TfNSW conduct these studies to enable CHCC to determine the true impacts of the bypass and the possible future traffic flows and amenity on the existing Pacific Highway.

Response

As discussed above and to support the ongoing dangerous goods risk assessment process, TfNSW has identified the need for a dangerous goods destination survey.

3.1.20 Project operation

Management of existing Pacific Highway

Issue description

- Is there scope for CHCC to establish a more pedestrian friendly environment lowering car speeds and to plant and establish street trees along the existing Pacific Highway extending from Albany Street to Beryl Street once the project is operation?

Response

As part of the Regional NSW Services and Infrastructure Plan (TfNSW 2018), the need to undertake a NSW Roads Classification Review was identified to ensure investment and asset management is funded and managed by the appropriate levels of government to meet future movements. In February 2019, the NSW Government announced that up to 15,000 kilometres of Council-owned roads will be transferred back to the State under the NSW Government's Regional Roads Package.

The policy framework, guiding principles and process for the transfer and review of Council-owned roads are currently being developed. The outcomes of this process would be applied to the bypassed routes to ensure a consistent approach to the rest of NSW.

TfNSW will continue to consult with CHCC throughout the project to ensure that assets to be transferred or retained by the State are appropriately identified and assessed.

Issue description

- The infrastructure in the Korora Hill Interchange is highly complex and will likely be considered a part of the regional or local road network which CHCC will likely be responsible for. CHCC believe there will be challenges with managing signal efficiency, damaged islands, damaged signage and signal infrastructure, ongoing complaints and vegetation management. CHCC are not willing to accept such complex and challenging infrastructure without ongoing financial assistance from the TfNSW.

Response

As discussed above, TfNSW will continue to consult with CHCC throughout the project to ensure that assets to be transferred or retained by the state are appropriately identified and assessed.

Notwithstanding, following the exhibition of the EIS, the concept design for the Korora Hill interchange has changed and the amended design is documented in Chapter 2, Design changes of the Amendment Report. The design amendments address CHCC and community feedback on the design of the interchange and are proposed to simplify the design. Regarding issues raised by CHCC, the amended design has reduced the footprint of the interchange and removed two sets of traffic lights.

Issue description

In the event that the existing Pacific Highway is transferred to CHCC it is expected that suitable financial assistance will be provided and support to achieve:

- Adequate levels of service for the network
- Appropriate road space reallocation
- Streetscape amenity.

The road space reallocation and streetscape amenity particularly applies to the city centre between the intersections with Albany Street and Beryl Street. It is expected that road space allocation and streetscape amenity of this key section will be developed in a cooperative process between CHCC

and TfNSW and in accordance with the NSW Government Movement and Place Framework, CHCC's City Centre Masterplan, transport strategy and other relevant documents.

Response

As discussed above, TfNSW will continue to consult with CHCC throughout the project to ensure that assets to be transferred or retained by the state are appropriately identified and assessed.

However, as detailed in Chapter 8, Traffic and transport of the EIS, while the project will divert traffic from the existing Pacific Highway, it is expected that the bypassed section of the existing Pacific Highway would still remain a key link in the road network for Coffs Harbour with traffic volumes around 20,000 – 40,000 vpd (see Table 8-9 of the EIS). This traffic would consist of heavy vehicles with destinations in Coffs Harbour CBD and any dangerous goods vehicles unable to travel along the bypass (noting that the dangerous goods risk assessment process is ongoing and consultation with relevant authorities and stakeholders will occur as part of this process). Additionally, the traffic model developed for the project shows that the amount of traffic on any particular route is affected by the performance of the overall road network, ie changes which may affect the performance of the existing bypassed section of the Pacific Highway need to be considered more broadly for any consequential impacts across the Coffs Harbour road network.

Traffic management

Issue description

- CHCC note that median crossovers have been included at five locations in the design. These are noted as emergency crossovers and for contraflows in the event of incidents. As a part of the tunnel management, maintenance of systems takes place on a regular basis closing a tunnel. This would require regular contraflows to manage this process. Historically, crashes and significant maintenance on other projects have required contraflows to occur on the local road network. The justification is often that median crossovers do not have adequate length to allow large vehicles to traverse safely through them. Maintenance crossovers that have been constructed on other projects have a very different design which enables large vehicle traversing, which is not evident in the current design
- CHCC would like TfNSW to actively commit to contraflow operations for maintenance within the alignment only (unless under extreme circumstances two tunnels were required to close). This is important as the likelihood of changes to the current Pacific Highway arrangement is very high and future arrangements would simply not cope with local contraflows
- Median crossover design appears to be standard emergency vehicle crossovers which cannot be utilised for contraflow. Given the high maintenance demand of tunnels, CHCC requests full contraflow capable crossovers to eliminate the need to run traffic through the CBD.

Response

Chapter 5, Project description of the EIS provides the proposed locations of, and discussion on, the proposed median crossovers for the project. The facilities would provide for the turning of emergency vehicles and/or blocked highway traffic in the event of a crash or the management of traffic flows onto the alternate carriageway in the event of a major incident on the bypass. The median crossovers would be designed in accordance with Upgrading the Pacific Highway – Design Guidelines (Roads and Maritime 2015b), Austroads guidelines, Australian Standards, and TfNSW supplementary documents.

However, it should be noted that there may be times where it will be necessary to divert traffic to the existing Pacific Highway for safety, operational and incident management reasons. This would be undertaken for a planned event (such as a tunnel maintenance closure) during the low traffic volume

periods. This would minimise any traffic and community impacts. Notwithstanding and as discussed above, it is expected that the bypassed section of the existing Pacific Highway would still remain a key link in the road network for Coffs Harbour with traffic volumes around 20,000 – 40,000 vpd (see Table 8-9 of the EIS).

3.2 Crown Lands, DPIE

3.2.1 Property

Issue description

Any Crown Land required for the project should be formally acquired. Potential impacts include:

- Reserve 755536 – Lot 392 DP 704229 for Future Public Requirements
- Reserve 94742 – Lot 391 DP 704229 for Bush Fire Brigade Purposes.

Response

TfNSW will acquire Crown Land in accordance with the Land Acquisition Information Guide (Roads and Maritime Services 2014a) and the *Land Acquisition (Just Terms Compensation) Act, 1991*. Acquisition will be undertaken in consultation with the Crown Land, DPIE acquisitions team, as required. These properties were both assessed under Property ID 9 of Appendix K, Property impacts of the EIS and were identified for total acquisition.

Notwithstanding the above, further consultation with Coffs Harbour and District Local Aboriginal Land Council (CHDLALC) following the exhibition of the EIS has identified that claims have been lodged over Lot 392 DP 704229 and Lot 391 DP 704229 under section 36 of the NSW *Aboriginal Land Rights Act 1983*. The land claims were lodged on 16 July 2018. TfNSW will continue discussions with CHDLALC regarding the land claims and engage further with Crowns Land, DPIE.

3.3 Regions, Industry, Agriculture and Resources Group, DPIE

3.3.1 Construction water usage

Issue description

Regions, Industry, Agriculture and Resources Group, DPIE (RIARG, DPIE) notes that the EIS has addressed most issues of concern. Chapter 6, Construction of the EIS states that the project may seek to utilise local waterways for construction water. The local waterways on the alignment do not usually have the volume required for construction except during high flow events. Key fish habitat and aquatic ecosystems can be impacted by over-abstraction of water from creeks. Accordingly, RIARG, DPIE does not support the abstraction of water from waterways within the construction footprint for the purpose of facilitating construction activities.

Response

Chapter 6, Construction of the EIS provides indicative water requirements for the project and the varying water quality requirements for the different activities listed. The use of water sourced from local waterways was considered to be lower quality water (non-potable) and likely would only be used for dust control, earthwork compaction control, and landscape watering.

Following exhibition of the EIS, TfNSW has been in consultation with CHCC regarding the use of their reclaimed water for construction of the project. As such and subject to formal agreement and preparation of a site management plan in consultation with CHCC, reclaimed water would likely be a key source of non-potable water for the project.

Furthermore, and following further consideration of sources of construction water, groundwater is also considered to present an opportunity as a source of construction water because of the likely consistent supply during excavation of the tunnels and major cuttings. Therefore, captured groundwater in addition to water from construction sediment basins and water from farm dams within the construction footprint would be treated on site and used as a non-potable source of water for construction.

While the above sources of non-potable water would be prioritised over extraction from local waterways, there may be a need to use this source during construction. As identified in new environmental management measure FF25 in **Chapter 6, Revised environmental management measures**, in the event that water is required to be extracted from local waterways, water levels will be monitored to ensure key fish habitat/aquatic ecosystems are protected (eg during periods of low and/or no flow, extraction from local waterways will not occur).

3.3.2 Agriculture

Environmental management measures

Issue description

RIARG, DPIE supports the mitigation and management measures for potential agricultural impacts identified in Table 14 of the Agricultural Assessment, (Appendix K2 of the EIS).

These measures should be reflected within the approval conditions for the project and further strengthened with the following:

- Where 'replacement' measures are not feasible or do not adequately provide at a minimum 'like for like' replacement, negotiations with affected landowners should identify and implement an acceptable compensatory resolution between the two parties. This includes any impacts to farm dams from a drawdown in groundwater levels
- The Air Quality Management Plan should include 'make good' provisions should it be identified that crops are being impacted by dust. Blueberry crops in particular are highly susceptible to dust impacts and a loss of production could result.

Response

Several property-specific measures for managing impacts to agricultural properties are outlined in Table 13-13 of Chapter 13, Agriculture of the EIS. These measures would be implemented in consultation with affected properties. Through this consultation, it is anticipated there would be alternative property specific management measures which could be implemented as a form of compensation to help manage impacts to affected properties during construction.

Additionally, affected properties which are seriously or critically impacted by the project will have access to a specialist agricultural consultant to help with assessing opportunities for agricultural diversification and/or revised farm management practices, as identified in environmental management measure AG01.

As identified in environmental management measure AG02, impacted irrigation water sources and/or infrastructure will be restored, replaced, relocated or compensated for in consultation with affected property owners. This would include any impacts to farm dams from a drawdown in groundwater levels.

The Air Quality Management Plan (AQMP) implemented during construction will identify potential sources of air pollution (including dust), identify sensitive receivers (including blueberry farms), identify air quality management objectives and mitigation and suppression measures to manage potential impacts on sensitive receivers, including agricultural properties (see environmental management measure AQ01). The AQMP will also include provisions for real time dust monitoring to assess the effectiveness of the applied management measures for sensitive agricultural receivers.

Further mitigation and suppression measures could be applied if controls aren't found to be effective, to help minimise impacts to blueberry farms including loss of production. Further mitigation and suppression measures to that already detailed under AQ01 could include designing haul roads to take the most direct route, adding speed humps to manage speed limits, orientation of stockpiles to offer the minimum cross-sectional area to prevailing winds, establishment of artificial wind breaks such as bund walls or use of automatic sprinklers that are triggered by wind speed/direction. The final selection of additional mitigation and suppression measures would be subject to a reasonable and feasible evaluation.

Panama disease

Issue description

- RIARG, DPIE has significant concerns in relation to the spread of Panama disease within the project area. The further development of a Panama disease management control plan is noted and RIARG, DPIE seeks continued involvement. TfNSW staff and contractors should undertake best biosecurity practice as detailed in protocols developed in consultation with RIARG, DPIE
- The Sediment and Erosion Management Plan should consider potential impacts to agricultural properties and the movement of contaminated soil, for example Panama disease-affected soil.

Response

As identified in environmental management measure AG08, a Panama disease control management plan will be prepared and implemented prior to and during construction in consultation with RIARG, DPIE and representatives of the Banana Growers Association of Coffs Harbour & District. TfNSW has committed to preparing this plan in accordance with relevant Queensland Department of Agriculture and Fisheries guidelines including Panama disease tropical race 4: Biosecurity standards and guidelines (Department of Agriculture and Fisheries 2015) and Panama disease tropical race 4: Decontamination guide (Department of Agriculture and Fisheries 2016).

Since exhibition of the EIS, TfNSW has progressed planning and development of the Panama disease control management plan. This has included consultation with the Queensland Department of Agriculture and Fisheries and the Australian Banana Growers' Council to understand current best biosecurity practice measures being implemented to manage Panama disease risks in North Queensland. TfNSW will continue to engage with all relevant agencies and stakeholders, including RIARG, DPIE and local banana farmers to ensure risks associated with Panama disease are effectively managed.

As part of preparing the Panama disease control management plan, several specific management measures and controls will be developed including but not limited to:

- Clearing and grubbing practices
- Stockpile management procedures for topsoil and other materials
- Procedures for the management and/or disposal of contaminated and/or potentially contaminated Panama disease soils including its identification as such to prevent accidental spread of the disease by others
- Erosion and sediment control requirements
- Dust management controls
- The movement of construction plant, vehicles and equipment and personnel both within the project and externally, including where construction plant and equipment may have previously worked in other affected areas such as north east Queensland
- Revegetation and rehabilitation practices.

The development of the above listed specific management measures and controls will ensure potential impacts to agricultural properties and the movement of contaminated soil are adequately addressed.

3.3.3 Socio-economic

Business and industry

Issue description

Consultation with Oz Group Packhouse is required to consider how the project will impact existing operations, development approval consent conditions and any potential expansion to their packing facility.

Response

The Oz Group Packhouse was identified as a key stakeholder for the project and an important facility for the local agricultural industry in the EIS. Potential construction and operational impacts have been described in Chapter 8, Traffic and transport, Chapter 13, Agricultural and Chapter 14, Socio-economic of the EIS and updated in Section 5.2, Traffic and transport, Section 5.7, Agriculture and Section 5.8, Socio-economic of the Amendment Report.

Following the exhibition of the EIS, the concept design for the Englands Road interchange has changed and the proposed design is documented in Chapter 2, Design changes of the Amendment Report. The proposed design change at Englands Road interchange would result in about 0.1 hectares of additional land being needed from the car park of the Oz Group Packhouse. The proposed design change would also result in more beneficial access arrangements compared to the EIS design. Vehicles would be able to turn right from Englands Road into Isles Drive, which would improve access to Isles Drive and the Oz Group Packhouse. The additional land that would be required as a result of the Englands Road interchange design change would result in a negligible additional impact and access would be maintained at all times to minimise impacts on business operations.

Several environmental management measures have been included in **Chapter 6, Revised environmental management measures** to manage the potential impacts and involve further consultation about maintaining access and confirming the extent of temporary and/or permanent parking impacts. In addition, as a property subject to partial acquisition, property adjustments would be needed, which would need to consider potential impacts to the existing operations and any potential expansion to the packing facility. Property adjustments will be determined through further consultation with the property owner as part of the property acquisition process.

TfNSW has already engaged with Oz Group Packhouse and details of the consultation carried out so far are provided in Chapter 4, Consultation of the Amendment Report. Meetings were held in October and November of 2019 to outline the amended design and discuss any concerns or submissions received by the stakeholder. Property acquisition discussions will consider development approval conditions where relevant.

3.4 Environment, Energy and Science Group, DPIE

3.4.1 Aboriginal cultural heritage

Issue description

The Aboriginal Cultural Heritage Assessment (CHAR) should be amended to:

- Include a cultural salvage component within Section 9 'Impact Assessment and Mitigation Strategies', Section 10 'Management Outcomes' and Appendix E Salvage Excavation Methodology
- Require continued consultation with the Registered Aboriginal Parties (RAPs), particularly for the management of potential burials that may occur within the construction footprint.

Response

Following exhibition of the EIS, additional archaeological investigations were carried out in response to proposed design and construction changes, as well as submissions made by RAPs and the Environment, Energy and Science Group, DPIE (EESG, DPIE). These additional investigations have resulted in an update of the CHAR which can be found in Appendix G, Updated Aboriginal cultural heritage assessment report of the Amendment Report. The revised impacts are summarised in Section 5.9, Aboriginal cultural heritage of the Amendment Report.

Additionally, the assessment was updated to include a cultural salvage component within Section 9, Section 10 and Appendix F of Appendix G, Updated Aboriginal cultural heritage assessment report of the Amendment Report. Cultural salvage will be undertaken by RAPs and is independent of the archaeological salvage program. The cultural salvage methodology has been revised to include provision for cultural salvage at sites exhibiting moderate or potentially moderate densities of archaeological objects. Surface collection or cultural salvage at other locations may be unproductive given the lack of Aboriginal objects and absence of cultural material on the ground surface.

TfNSW's preferred approach is to give RAPs the opportunity to undertake cultural salvage at all archaeologically salvaged sites which have been assessed as displaying at least moderate archaeological significance as these sites offer the best opportunity for the recovery of cultural material. It is also noted that RAPs have advised that the primary purpose for RAPs wishing to collect artefacts is for their own community benefit, to assist with cultural learning. As such all material collected as part of the cultural salvage will be in the care and custodianship of the Aboriginal community. TfNSW will not be responsible for ownership, care or control of material.

The cultural salvage would be carried out following the archaeological salvage. The cultural salvage methodology includes the use of earthmoving/excavating equipment to scrape the topsoil within the boundaries of the archaeological site to be impacted by construction. Aboriginal site officers would then carry out collection of any exposed archaeological or cultural material. Collected material will be retained by the RAPs and managed via a Care Agreement pursuant to section 85A(1)(c) of the *National Parks and Wildlife Act 1974* or similar, or reburial. The long-term management of culturally salvaged material will be determined by the RAPs.

Further detail can be found in Appendix F of Appendix G, Updated Aboriginal cultural heritage assessment of the Amendment Report.

As described in Section 4 of Appendix G, Updated Aboriginal cultural heritage assessment report of the Amendment Report, the risk of potential burials (human remains) was determined to be low within the construction footprint because of unfavourable geology, moderate levels of erosion and poor soil

formation. No evidence of Aboriginal burials was identified during the archaeological assessment process.

Notwithstanding this, in the unlikely event that construction activity reveals possible human skeletal material (remains), all work will halt at that location immediately and the steps outlined in the TfNSW's Unexpected Heritage Items: Heritage Procedure 02 (Roads and Maritime Services 2015e) will be followed in accordance with environmental management measure AH07. This will include notifying RAPs and cultural knowledge holders within 24 hours of any confirmed discovery of Aboriginal skeletal remains. For more information refer to **Chapter 6, Revised environmental management measures**.

TfNSW will continue to consult with RAPs throughout the project. Section 9 of Appendix G, Updated Aboriginal cultural heritage assessment report of the Amendment Report outlines how consultation with RAPs will continue to be carried out.

3.4.2 Flooding and hydrology

Issue description

- Based on a briefing during the EIS exhibition, EESG, DPIE considered that the information provided on flooding was out of date. As such, EESG, DPIE requested that an updated flooding and hydrology assessment be provided for comment once finalised.

Response

A flooding and hydrology assessment was prepared as part of the EIS (Chapter 17, Flooding and hydrology and Appendix O, Flooding and hydrology assessment).

Following exhibition of the EIS, TfNSW has amended several aspects of the project. This was in response to consultation with the community and landowners during the EIS exhibition, submissions received during the EIS exhibition period and continued development and refinement of the concept design and consultation with government agencies. As such, an updated flooding and hydrology assessment was completed based on updates to the hydrologic and hydraulic models and the amended design. Refer to Appendix H, Updated flooding and hydrology assessment of the Amendment Report. The updated flood model including modelling results for the amended design was provided to EESG, DPIE in mid-March 2020 for review.

In early May 2020, EESG, DPIE provided comments regarding the updated hydrologic and hydraulic models. TfNSW will continue to consult with EESG, DPIE regarding flooding and hydrology related issues through the detailed design phase of the project as relevant.

3.4.3 Biodiversity – Framework for Biodiversity Assessment review

EESG, DPIE is responsible for reviewing the biodiversity assessment for the project to ensure it meets the requirements of the NSW Framework for Biodiversity Assessment (FBA). Preliminary biodiversity comments on the Biodiversity Assessment Report prepared for the EIS were provided by the EESG, DPIE in a letter dated 3 October 2019. These comments have been incorporated into the responses below.

Assessing landscape features

Issue description

- The regional fauna corridor identified in the Northern Rivers Regional Biodiversity Management Plan must be included as a regional biodiversity link in the Biodiversity Assessment Report.

Response

The regional fauna corridor identified in the Northern Rivers Regional Biodiversity Management Plan has been included in Appendix C, Updated biodiversity assessment report of the Amendment Report. The link comprises seven regionally significant biodiversity links identified as separate sub-regional corridors which all form part of the Coffs Harbour koala links.

Refer to Section 2.1.5 and Figure 3.1 of Appendix C, Updated biodiversity assessment report of the Amendment Report for the location and description of this regional fauna corridor.

Assessing native vegetation

Issue description

- The area of the development site must not be restricted to the area of construction footprint, rather, it must include areas that are likely to be subject to indirect impacts
- The development site must be revised to extend to a distance determined in consultation with the EESG, DPIE either side of the construction footprint to ensure indirect impacts are assessed and offset.

Response

The development site was assessed in accordance with the FBA for both the EIS and the amended design and consists of the construction footprint for the project, which typically incorporates a 15 metre buffer from the edge of the design extent and any proposed ancillary facilities. The construction footprint is the area proposed to be impacted, cleared and/or disturbed during construction. The 15 metre buffer either side of the design extents would account for indirect impacts to retained habitats, native vegetation and other biodiversity values. Consultation with EESG, DPIE following exhibition of the EIS confirmed the adopted 15 metre buffer was appropriate.

The construction footprint has also been defined as the study area within Section 1.4 of Appendix C, Updated biodiversity assessment report of the Amendment Report. This includes the 15 metre buffer either side of the design extent to account for indirect impacts as described above. The study area has been assessed as fully cleared, and as such the impacts have been quantified and will be offset with biodiversity credits.

Issue description

- The extent of native vegetation within the revised development site must be displayed on aerial photography and on the site map.

Response

The extent of native vegetation cover is quantified and mapped in Section 3 of Appendix C, Updated biodiversity assessment report of the Amendment Report, specifically, Table 3.2 and Figure 4.1 to Figure 4.7. These figures are replicated below, refer to **Figure 3.4-1-01** to **Figure 3.4-1-06**. The native vegetation has been assessed and mapped for the entire development site, including an allowance for indirect impacts as noted in the response above.

Issue description

- Any areas of freshwater wetland within the development site must be mapped and assessed, and the results presented in the Biodiversity Assessment Report
- Any freshwater wetlands identified must be assessed to determine whether they align with the freshwater wetland on coastal floodplains endangered ecological community (EEC) determination.

Response

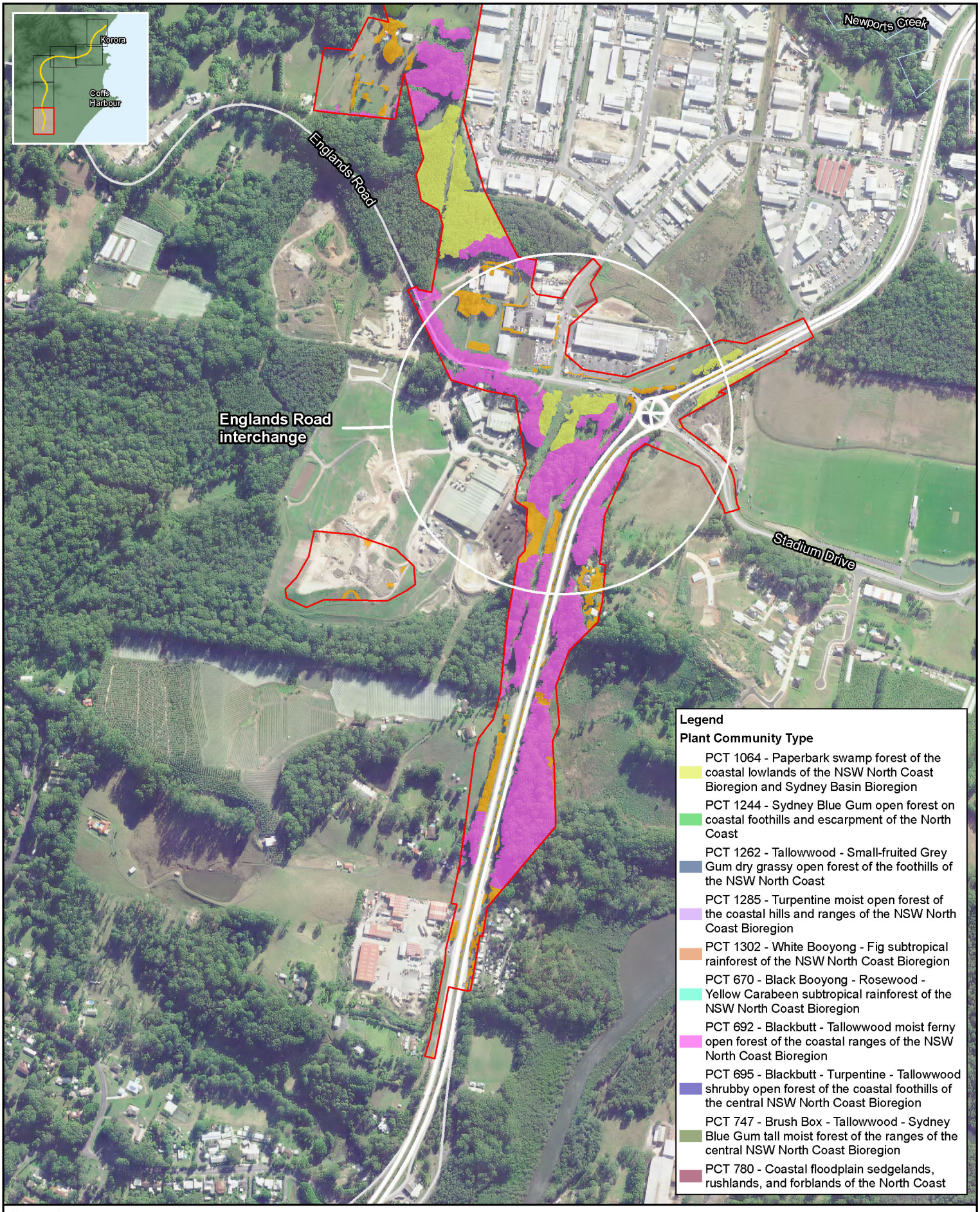
All dams and other areas that may periodically hold water within the study area were assessed for their potential to support native wetland vegetation that would conform to a listed plant community type (PCT) during preparation of the biodiversity assessment for the EIS and for the amended design. These assessments occurred during the initial vegetation mapping stage in 2016, over the course of the numerous field campaigns, and again in January 2020. The mapped native wetland vegetation that would conform to a listed PCT are shown in Section 3.1.4 and Figure 4.1 to Figure 4.7 of Appendix C, Updated biodiversity assessment report of the Amendment Report, which includes two patches that are considered to align with the Freshwater Wetlands on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions endangered ecological community. A summary of the key findings from the assessment of freshwater wetlands for the project is provided below:

- The majority of the dams within the study area were found to be highly modified with either deep water and steep banks, or flatter banks degraded by weed infestation, run-off and potentially historical trampling from stock. These modified dams were generally not considered to support wetland PCTs because of their deep water and modified banks, and a general lack of cover and abundance of native wetland plants. The exception is a dam south of North Boambee Road.
- There were three patches of vegetation considered to meet the definition of Coastal floodplain sedgelands, rushlands, and forblands of the North Coast (PCT 780):
    - One, east of the Englands Road interchange, occurs within a newly added portion of the study area as part of the Englands Road interchange design change (refer to Chapter 2, Design changes of the Amendment Report).
    - The two patches of wetland vegetation, north and south of North Boambee Road, have been added because of a change in the condition of the vegetation since the original PCT mapping was carried out in 2016. These areas are described in detail in Section 3.1.2 of Appendix C, Updated biodiversity assessment report of the Amendment Report and shown on Figures 4.1 to 4.7. Locations of updated PCT 780 are provided in **Figure 3.4-1-01** to **Figure 3.4-1-06**.
- Square-stemmed spike-rush *Eleocharis tetraquetra* and tall knotweed *Persicaria elatior* were targeted via transect searches and targeted meanders within and around newly mapped wetland areas (PCT 780) in January 2020, by two qualified botanists. Potential habitat for these two species was assessed as present within the study area where native wetland vegetation occurred at high levels of cover and abundance, the waterbodies (or swampy areas) were not substantially modified or disturbed, where the water was not too deep to support emergent macrophytes, and the wetland vegetation occurred along or close to natural watercourses. Areas of potential habitat aligned to the areas mapped as PCT 780 within the study area.
- During the surveys and impact assessment competed as part of the EIS in 2016, 2017 and 2018, all dams were considered during threatened fauna habitat assessments, and their suitability to support threatened species was determined. Where potential habitat for threatened and migratory species was considered to be present, targeted surveys were carried out. Surveys for wetland birds and frogs were carried out comprehensively across dams within the study area and remote cameras were deployed in areas where higher quality native vegetation was present around the fringes (refer to Figure 8 of Appendix C, Updated biodiversity assessment report of the Amendment Report).

Two patches of PCT 780 identified within the study area were considered to meet the definition of Freshwater Wetlands on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions endangered ecological community. These include:

- The wetland vegetation east of the Englands Road interchange occurs within a newly added portion of the study area.
- The wetland vegetation north of North Boambee Road, which has been added because of a change in the condition of the vegetation since the original PCT mapping was carried out in 2016.

These areas are described in detail in Section 3.1.2 of Appendix C, Updated biodiversity assessment report of the Amendment Report and shown on **Figure 3.4-1-01** to **Figure 3.4-1-06**.



Legend

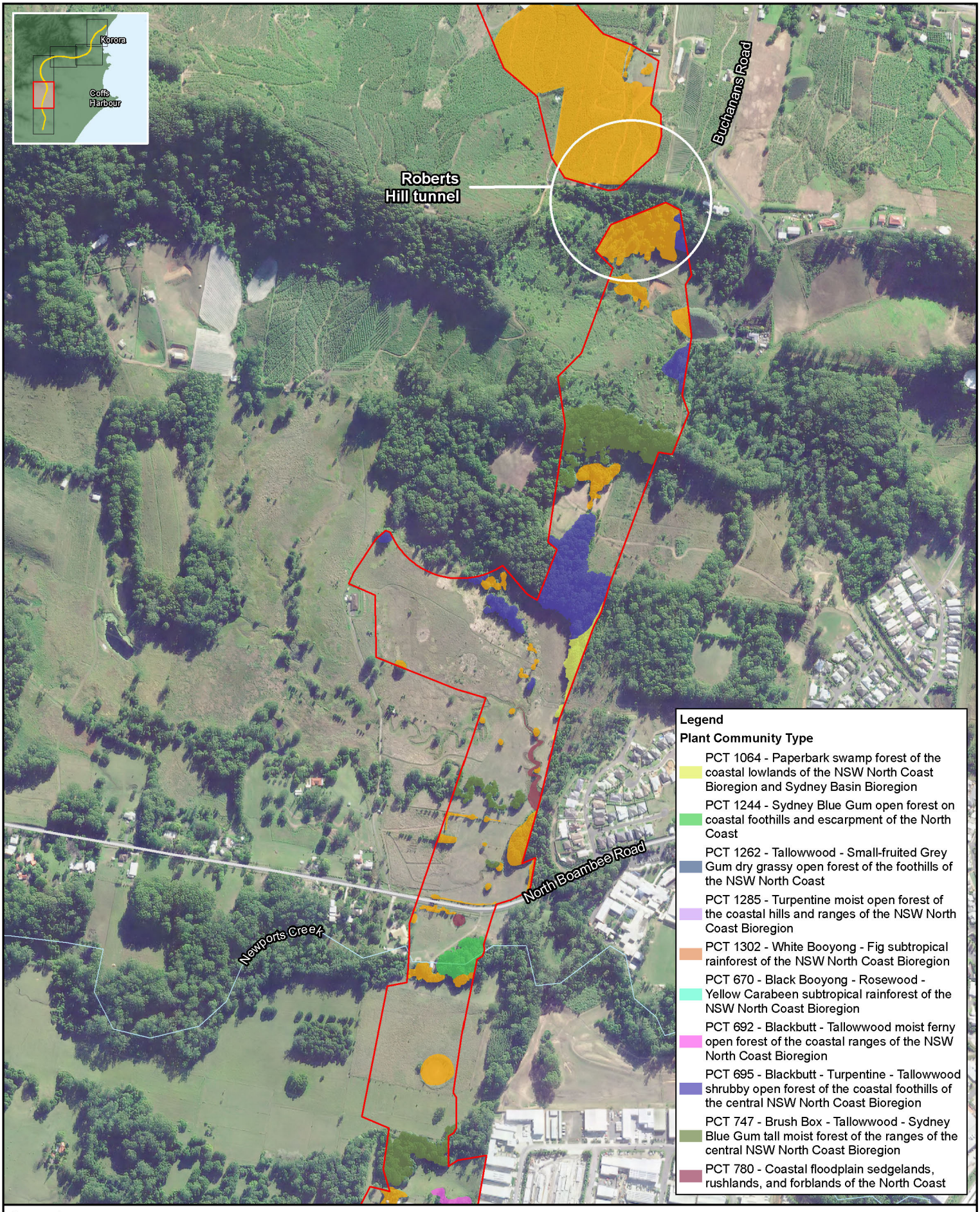
- Construction footprint
- North Coast Railway
- Watercourse
- Urban native / exotic

Coffs Harbour Bypass
Native vegetation
Figure 3.4-1-01

0 0.1 0.2 0.3 km

Scale @A4: 1:10,000
GDA 1994 MGA Zone 56

N



Legend

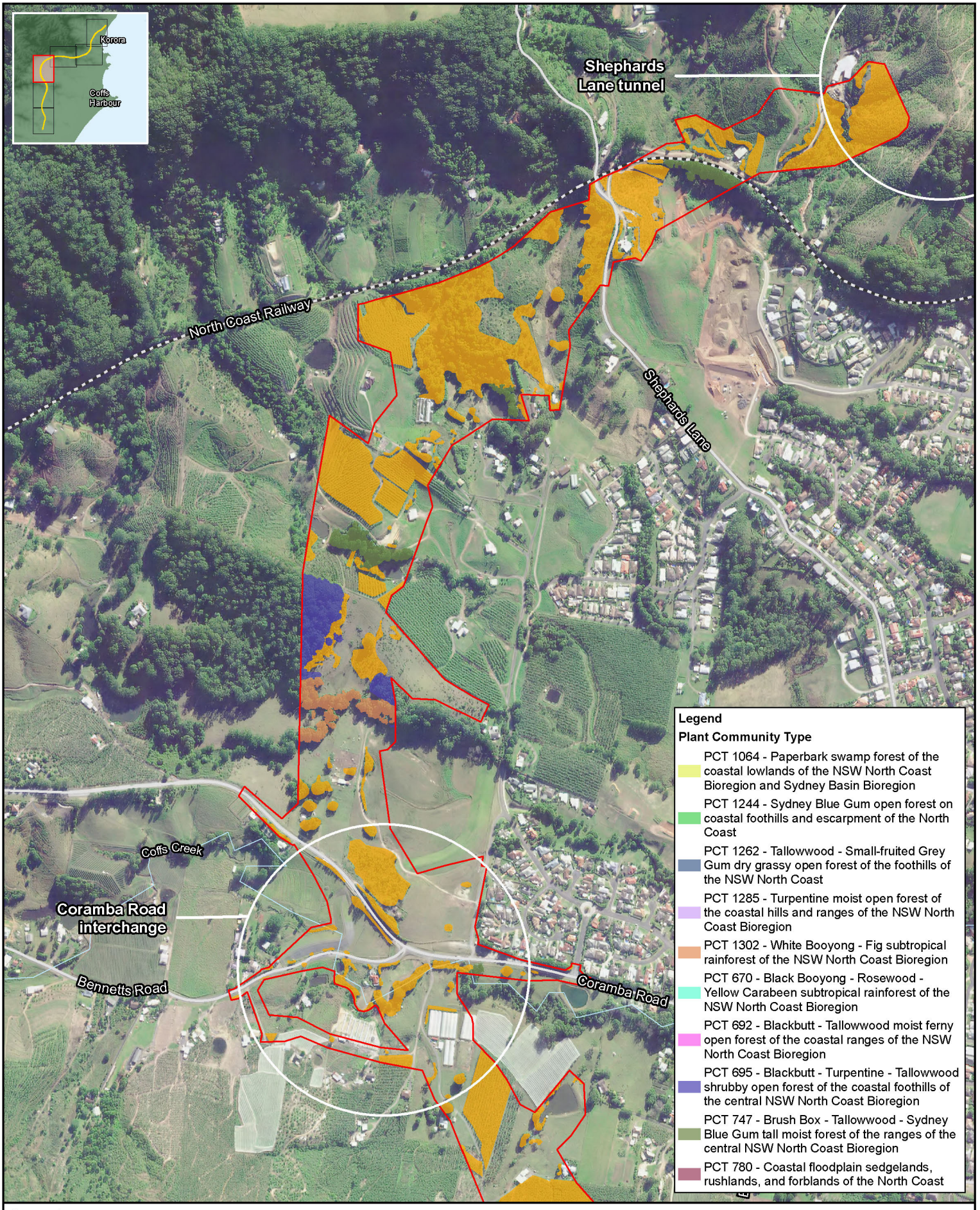
- Construction footprint
- North Coast Railway
- Watercourse
- Urban native / exotic

Coffs Harbour Bypass
Native vegetation
Figure 3.4-1-02

0 0.1 0.2 0.3 km

Scale @A4: 1:10,000
GDA 1994 MGA Zone 56

N



Legend

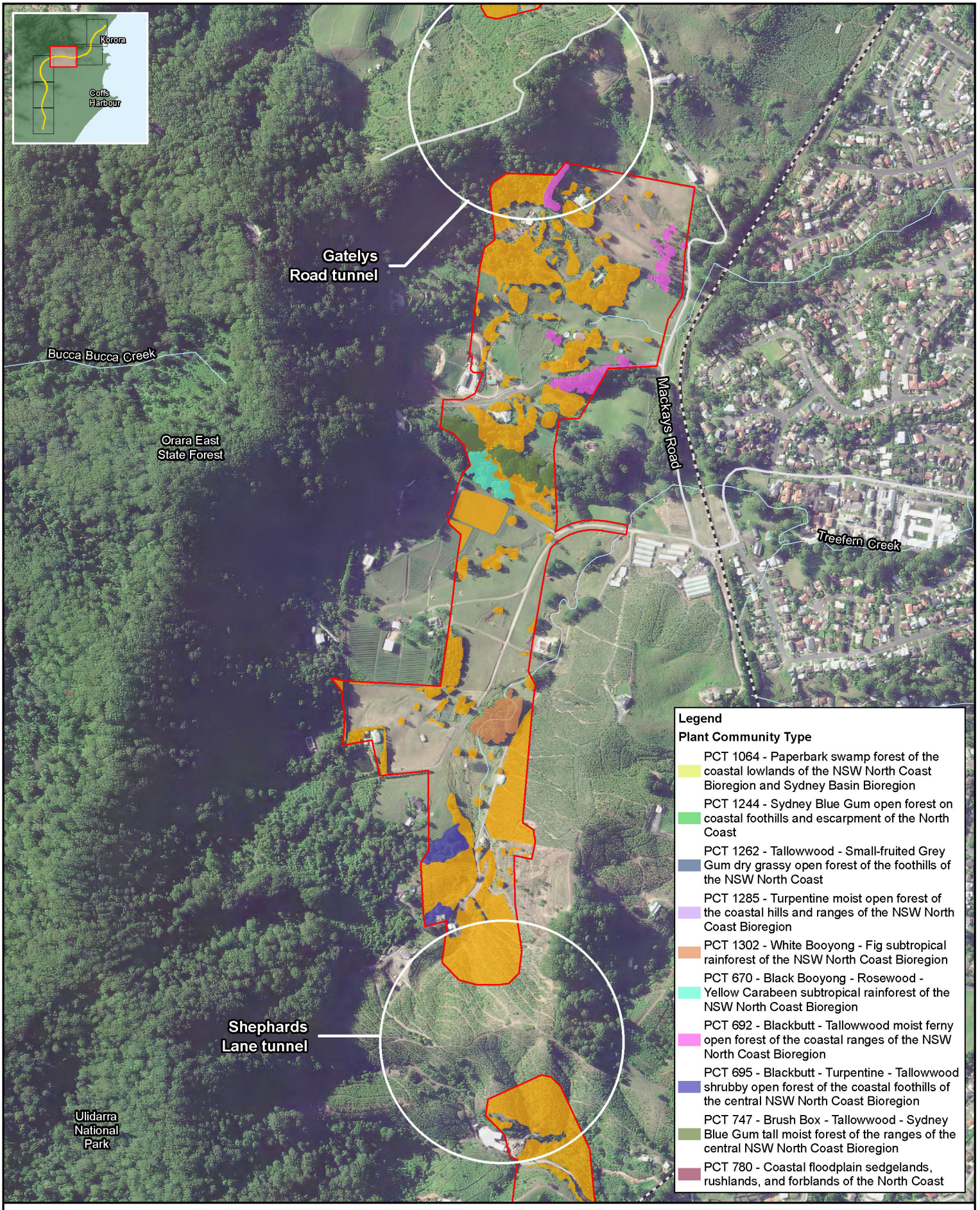
- Construction footprint
- North Coast Railway
- Watercourse
- Urban native / exotic

Coffs Harbour Bypass
Native vegetation
Figure 3.4-1-03

0 0.1 0.2 0.3 km

Scale @A4: 1:10,000
GDA 1994 MGA Zone 56

N



Legend

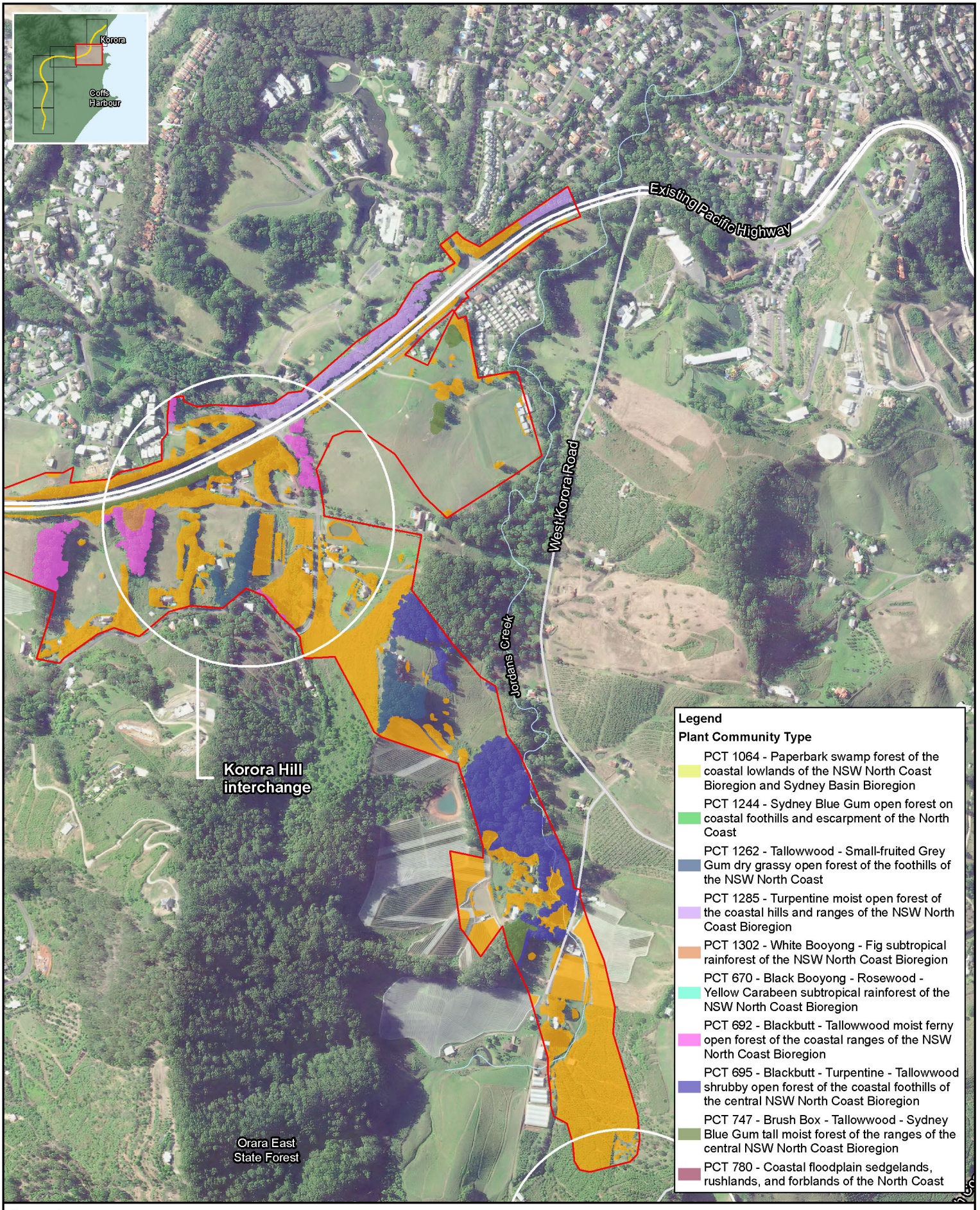
- Construction footprint
- North Coast Railway
- Watercourse
- Urban native / exotic

Coffs Harbour Bypass
Native vegetation
Figure 3.4-1-04

0 0.1 0.2 0.3 km

Scale @A4: 1:10,000
GDA 1994 MGA Zone 56

N



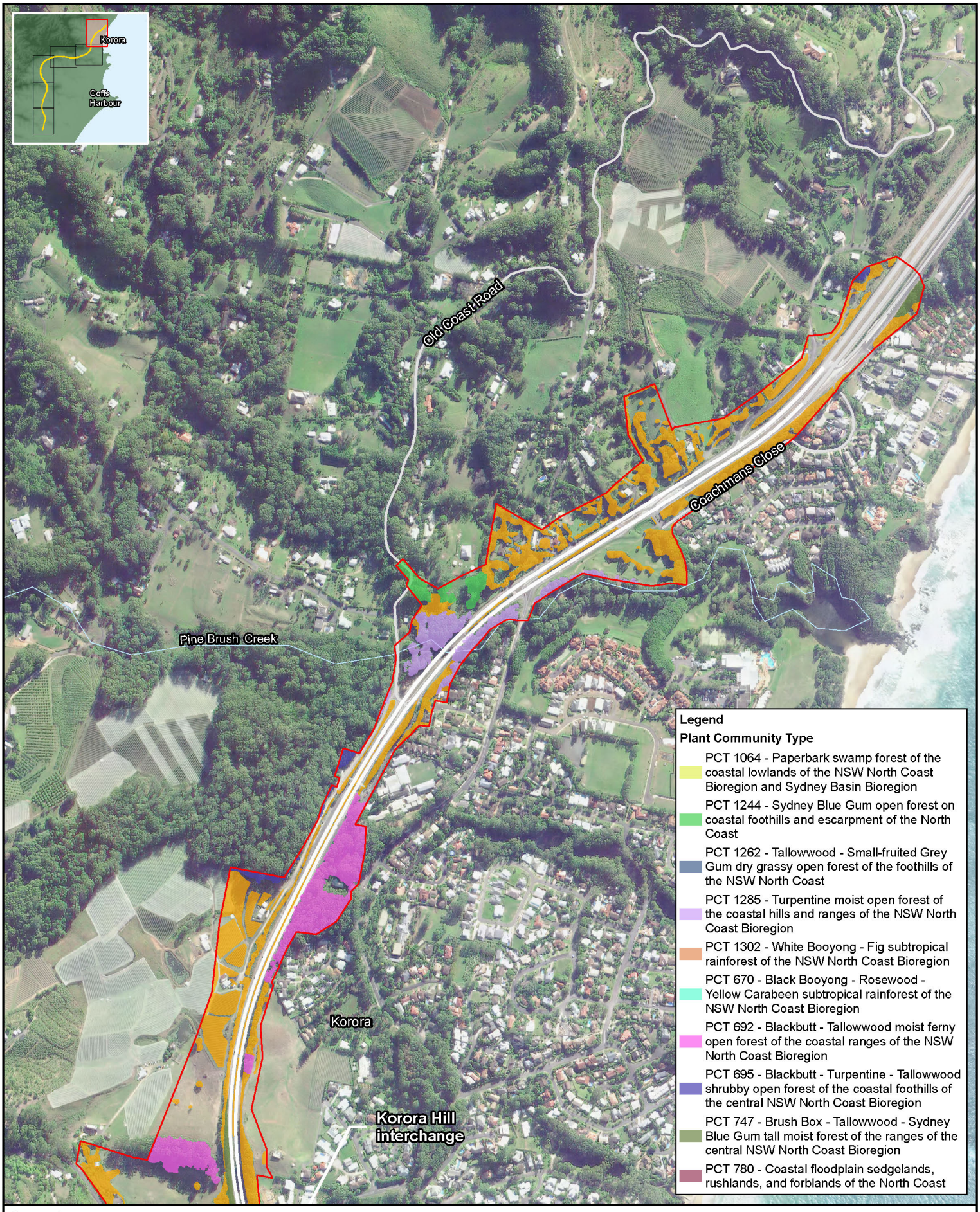
Legend

- Construction footprint
- North Coast Railway
- Watercourse
- Urban native / exotic

Coffs Harbour Bypass
Native vegetation
Figure 3.4-1-05

0 0.1 0.2 0.3 km

Scale @A4: 1:10,000
GDA 1994 MGA Zone 56



Coffs Harbour Bypass
Native vegetation
Figure 3.4-1-06

Issue description

- All remnants of vegetation that contain native species within the revised development site, including areas that appear to be weed-infested, must be mapped and assessed in accordance with the FBA. This is to include areas adjacent to the construction footprint, for a distance determined in consultation with the EESG, DPIE either side of the development (construction) footprint.

Response

Areas that were not mapped in Appendix H, Biodiversity assessment report of the EIS largely relate to non-native vegetation. In response to this issue, supplementary vegetation surveys were carried out in January 2020. Areas targeted included vegetation in the Appendix H, Biodiversity assessment report of the EIS that was not mapped as either a PCT or urban native/exotic (non-native), in figures, as well as areas of potential re-growth identified from aerial imagery, areas potentially supporting wetland vegetation, and newly impacted areas as a result of the construction footprint update as part of the proposed design and construction changes described in the Amendment Report. As a result of these supplementary surveys, Appendix C, Updated biodiversity assessment report of the Amendment Report has been updated to include urban native/exotic vegetation.

Figure 3.4-1-01 to **Figure 3.4-1-06** shows the extent of vegetation within the study area that has been assessed as urban native/exotic dominant communities. These figures are also included in Appendix C, Updated biodiversity assessment report of the Amendment Report (Figures 4.1 to 4.7). These communities do not have the floristic composition or structure to be assigned a PCT type.

Additionally, the study area includes a 15 metre buffer from the edge of the design extent and any proposed ancillary facilities, which would account for indirect impacts to retained habitats, native vegetation and other biodiversity values. Consultation with EESG, DPIE following exhibition of the EIS confirmed the adopted 15 metre buffer was appropriate.

Issue description

- The mapping and assessment of PCTs is to include the allocation of the appropriate PCT.

Response

As described in Section 3 of Appendix H, Biodiversity assessment report of the EIS, the extent of native vegetation within the study area was determined using Section 5 of the FBA (OEH 2014a). The method used to develop the project's native vegetation map is outlined within Section 3 of Appendix H, Biodiversity assessment report of the EIS and Appendix C, Updated biodiversity assessment report of the Amendment Report.

Detailed mapping of the vegetation communities was conducted in August 2016 and areas of native vegetation for which a PCT could validly be assigned were identified and delineated in the field and their condition determined. As such, areas of vegetation that did not meet the requirements to be considered a PCT, at the time of the 2016 field survey and analysis, were not mapped as native vegetation. Vegetation that was not allocated a PCT did not meet the floristic requirements for the PCT because of levels of disturbance associated with weeds or evidence of artificial modification, such as landscaped or planted areas. These areas were not mapped as native vegetation in the Appendix H, Biodiversity assessment report of the EIS.

Supplementary vegetation surveys were carried out in January 2020 to verify PCTs and identify any changes in PCT type and distribution since the August 2016 surveys. Areas targeted for PCT verification included vegetation in the Appendix H, Biodiversity assessment report of the EIS that was not mapped as either a PCT or urban native/exotic (non-native), as well as areas of potential re-growth identified from aerial imagery, areas potentially supporting wetland vegetation, and newly impacted areas as a result of the construction footprint update as part of the proposed design and construction changes described in the Amendment Report. All remnants of vegetation that contain native species within the study area for the amended design, including areas that are weed-infested, have been mapped and assessed in accordance with the FBA (OEH 2014a).

Changes to the mapping and allocation of PCTs from those presented in Appendix H, Biodiversity assessment report of the EIS, were identified following the additional fieldwork completed in January 2020. Collection of plot data in areas of disturbed and wetlands, with high levels of weed cover determined the actual presence of PCT 780, which was not recorded in the August 2016 surveys. At the time of the original PCT mapping, the wetland area north of North Boambee Road, which occurs at the confluence of two streams and has been dammed to hold additional water, was dominated by exotics including a dense cover of parrot's feather *Myriophyllum aquaticum* with only occasional native macrophytes present. As such, it was determined to not be representative of a native wetland community. Upon follow-up assessment of this wetland area in January 2020, the vegetation was found to be dominated by native species including *Eleocharis equisetina*, water primrose *Ludwigia peploides* subsp. *montevidensis*, and *Persicaria strigosa*, with exotics occurring at low densities, and as such the wetland vegetation is now considered to represent PCT 780. It should be noted that despite not being assessed as a native PCT in the original assessment, the wetland area was assessed for its value as potential fauna habitat.

Section 3.1.4 and Figure 4.1 to Figure 4.7 of Appendix C, Updated biodiversity assessment report of the Amendment Report, describe and map all PCTs observed in the study area, this includes the recently identified and mapped freshwater wetland PCTs. The updated figures are included as **Figure 3.4-1-01** to **Figure 3.4-1-06** of this report. Section 3.1.4 of the Appendix C, Updated biodiversity assessment report of the Amendment Report provides detailed justification for the allocation of all PCTs to vegetation mapping by presenting the floristic summary from plot data. This includes detail on dominant flora species and average heights and cover of different strata. There is also a description of the condition of the PCT across the study area, with reference to the level of weed incursion, fragmentation and grazing pressure.

Section 3.1.4 of Appendix C, Updated biodiversity assessment report of the Amendment Report provides detailed justification for the allocation of all PCTs to vegetation mapping by presenting the floristic summary from plot data. This includes detail on dominant flora species and average heights and cover of different strata. There is also a description of the condition of the PCT across the study area, with reference to level of weed incursion, fragmentation and grazing pressure.

Figure 4.1 to Figure 4.7 of Appendix C, Updated biodiversity assessment report of the Amendment Report have also been updated to show extents of vegetation within the study area that have been assessed as urban native/exotic dominant communities. These communities do not have the floristic composition or structure to be assigned a PCT type.

Appendix C, Updated biodiversity assessment report of the Amendment Report includes mapping of all areas of native vegetation within the study area, and regrowth vegetation has been assigned to a PCT where they meet the floristic composition or structure descriptions relevant for that PCT.

Issue description

- TfNSW must consider that any changes to the extent and types of native vegetation identified as occurring within the development site will also likely result in changes to the extent of habitat available to threatened species and must make those changes.

Response

Supplementary vegetation surveys were carried out in January 2020, which resulted in updates to PCT mapping and additional mapped areas of urban native/exotic vegetation. Appendix C, Updated biodiversity assessment report of the Amendment Report was amended to reflect the supplementary surveys and changes to threatened species habitat. Threatened species habitat is outlined in Section 4 of Appendix C, Updated biodiversity assessment report of the Amendment Report and Section 5.4, Biodiversity of the Amendment Report highlights the changes in impact compared to the project outlined in the EIS.

Assessing threatened species and populations

Issue description

- Given the presence of suitable habitat and the known or likely occurrence of needle-leaf fern, red-flowered king of the fairies and native guava within the Coffs Coast and Escarpment Interim Biogeographic Regionalisation for Australia (IBRA) subregion, these species must be considered as candidate species for the FBA.
- The presence of needle-leaf fern, red-flowered king of the fairies and native guava needs to be determined in accordance with section 6.5.1.9 of the FBA either by targeted survey, assumed presence or expert report.

Response

In mid-2019, species listed under the schedules of the *Biodiversity Conservation Act 2016* (BC Act) changed with some flora species added. This occurred after the completion of the fieldwork for the EIS. Native guava *Rhodomyrtus psidioides* was newly listed as Critically Endangered. Due to the availability of habitat for the species and the presence of records within 10 kilometres of the study area, native guava was identified as having a high likelihood of occurrence within the study area.

Targeted surveys were carried out for native guava in January 2020. The methodology for this survey is described in Section 4.2.1 of Appendix C, Updated biodiversity assessment report of the Amendment Report, including the location of survey tracks in Figure 7.1 to Figure 7.7.

No native guava plants were recorded during the targeted survey and no further impact assessment has been include for this species.

A habitat assessment for needle-leaf fern *Belvisia mucronata* and red-flowered king of the fairies *Oberonia titania*, included in Appendix B of Appendix C, Updated biodiversity assessment report of the Amendment Report, provides justification for a low likelihood of occurrence for these two species. An extract of this information is included below for clarity. Targeted flora surveys presented in Appendix C, Updated biodiversity assessment report of the Amendment Report were also sufficient to detect these species.

- **Needle-leaf fern**: The needle-leaf fern is a lithophyte/epiphyte that grows on trees or rocks in dry rainforest or along creeks in moist open forest, with habitat constraints including escarpments and boulders. A single record from 2012 occurs more than 15 kilometres from site (more records occur 50-150 kilometres further north). The microhabitat elements required by the species are not present within the development site. The likelihood of occurrence of the species in the study area

is low. Additional survey for the needle-leaf fern was not carried out in January 2020 as the previous targeted flora surveys are considered sufficient to detect the species.

- **Red-flowered king of the fairies**: The likelihood of the red-flowered king of the fairies occurring in the study area is considered to be low. The species habitat includes include littoral and subtropical rainforest and paperbark swamps, eucalypt-forested gorges, and mangroves. The species' habitat constraints are cliffs, the species being epiphytic on rocks and trees, the presence of rocky areas, and fallen/standing dead timber and logs. Additional survey for the red-flowered king of the fairies was not carried out in January 2020 as the previous targeted flora surveys are considered sufficient to detect the species.

  The closest coastal record is from 1954 and more than five kilometres south of the development site. This record occurs within two to three kilometres of the coast at the mouth (and confluence) of Bonville Creek and Pine Creek, in either intact Coastal Swamp Forest/Floodplain Forest, or Mangrove vegetation (the record has been de-natured in BioNet). The remainder of records within the Interim Biogeographic Regionalisation for Australia (IBRA) subregion is up or over the escarpment at higher elevation on different soil types, in large intact areas of forest vegetation, and between 12 and 45 kilometres from the development site.

  Marginal and somewhat degraded habitat occurs in the construction footprint within the small and isolated patches of subtropical rainforest and within the paperbark swamp vegetation. These areas have been comprehensively surveyed via five metre separated transect surveys carried out for both the targeted flora surveys (once in spring 2017 and late summer/autumn 2017) and for the coastal petaltail surveys (twice in spring/summer 2017-18), and the species was not recorded.

Issue description

- Given the recording of the critically endangered scrub turpentine, it must be assessed further to determine the extent of this species across the development site, where suitable habitat exists. This assessment can be undertaken by either assuming the species is present, undertaking a targeted survey, or by obtaining an expert report.

Response

In mid-2019, species listed under the schedules of the BC Act changed with some flora species added. This occurred after the completion of the fieldwork for the EIS. Scrub turpentine *Rhodamnia rubescens* was newly listed as critically endangered (CE). Due to the availability of habitat for the species, the presence of records within 10 kilometres of the study area and known records of scrub turpentine within the construction footprint, scrub turpentine was identified as having a high likelihood of occurrence within the study area.

Targeted surveys were carried out for scrub turpentine in January 2020. The methodology for this survey is described in Section 4.2.1 of Appendix C, Updated biodiversity assessment report of the Amendment Report, and the location of survey tracks is included in Figure 7.1 to Figure 7.7.

A total of 14 individuals were recorded within the study area during the January 2020 surveys and all are likely to be impacted by the project. The species was located across four PCTs with most records within PCT 692 Blackbutt –Tallowwood moist ferny open forest of the coastal ranges of the NSW North Coast Bioregion. Many of the plants recorded during surveys showed signs of myrtle rust infection. **Table 3.4-1** provides a comparison of the broad threatened flora habitat types impacted by the amended design and those remaining within 10 kilometres of the study area.

Table 3.4-1 Impacts to scrub turpentine habitat

Threatened flora species	Individuals impacted	Key habitat features	Area to be impacted	Estimate remaining within 10 km of the study area*	Percentage habitat removed
Scrub turpentine	14	Wet sclerophyll forest vegetation	39.30 ha	10,180 ha	0.4%
		Rainforest vegetation	2.37 ha	1190 ha	0.2%
		Riparian areas^	9.73 ha	2200 ha	0.4%

* Estimates remaining are based on equivalent vegetated areas mapped by the Coffs Harbour local government area mapping (OEH 2012) with non-equivalent vegetation types excluded where appropriate.
^ Riparian areas are based on mapped vegetation (TfNSW 2019 and OEH 2012) within 20 metres of either side of watercourses mapped on the 1:25,000 hydro line dataset from the LPI Digital Topographic Database (DTDB). Riparian areas occur within the other two key habitat feature types.

The project is being assessed under the BC Act transitional arrangement with the FBA and BioBanking method being used to calculate offset credits. Due to the listing of scrub turpentine after the introduction of the BC Act, calculation of offset requirements under the FBA cannot be directly carried out. Using the BAM Calculator 42 offset credits are required. Offsetting of impacts may be achieved through direct offsets or by carrying out supplementary measures as negotiated by TfNSW and EESG, DPIE. Supplementary measures would be targeted towards research into matters such as gaining a better understanding of the myrtle rust pathogen and ways to combat its spread, and potentially treating infected plants.

Appendix C, Updated biodiversity assessment report of the Amendment Report, has been updated to include scrub turpentine. A Biodiversity Offset Strategy (BOS) has been prepared and is included as Appendix E of Appendix C, Updated biodiversity assessment report of the Amendment Report. The BOS identifies the mechanism for delivery of offsets in accordance with the FBA, which has been endorsed by the Australian Government as part of the EPBC Act assessment bilateral agreement. The BOS establishes the process for identifying and securing offsets for the project.

Threatened flora survey

Issue description

- The Biodiversity Assessment Report must be revised to:
    - Provide a detailed description for how the threatened plant survey guidelines were implemented
    - Include maps used to identify areas of potential habitat at the development site for each flora species targeted from which the field survey plan was developed, as per the guidelines
    - Provide evidence of the field survey plan
    - Describe the field survey techniques utilised for each species targeted
    - Specify the timing of targeted surveys
    - Include a description of the extent, scope and timing of the surveys undertaken for each threatened flora species targeted.

Response

Appendix C, Updated biodiversity assessment report of the Amendment Report has been revised to include the requested information. Refer to **Table 3.4-2** for the location of the requested information within Appendix C, Updated biodiversity assessment report of the Amendment Report.

Table 3.4-2 Location within Appendix C, Updated biodiversity assessment report of the Amendment Report of the requested information

Issue description	Section of Appendix C, Updated biodiversity assessment report
Detailed description of how threatened plant survey guidelines were implemented	Section 4.2.1 describes how the NSW Guide to Surveying Threatened Plants (OEH 2016) was implemented for the targeted surveys. It includes a summary of which species were targeted, describes the field survey plan, describes the methods applied to search for threatened flora species, shows the seasons that each survey was completed and the weather observations for each survey event.
Maps to identify areas of potential habitat for each flora species targeted	All areas of native vegetation across the study area were assessed as containing potential habitat for at least one species of threatened flora and were subject to targeted surveys. Figure 7.1 to Figure 7.7 shows the survey track logs for the targeted flora survey and provides evidence that all areas of native vegetation were searched for the target flora species.
Evidence of the field survey plan	Section 4.2.1 outlines a field survey plan prepared in accordance with the NSW Guide to Surveying Threatened Plants (OEH 2016). It describes the desktop and field methods followed to assess potential habitat for threatened species, references the desktop sources of information accesses, sets out the process used for determining survey timing and effort and describes resources used to assist with field identification.
Describe the field survey techniques for each species targeted	Section 4.2.1 describes the field methods that were applied during the targeted flora surveys. The field techniques included parallel traverses through all native vegetation within the study area with distances between traverses established in accordance with target species growth forms required in the NSW Guide to Surveying Threatened Plants (OEH 2016). This methodology (for initial 2016/2017 surveys) involved ecologists traversing parallel transects five metres apart through all native vegetation considered to support potential habitat for the target species within the study area. The distance between parallel transects was determined by the target species growth form with smaller species such as herbs, forbs, and grasses requiring the smaller five metre distance between parallel transects. Additional targeted surveys carried out for scrub turpentine and native guava in January 2020 involved parallel transects separated by 20 metres through all areas of potential habitat in accordance with the maximum distance allowed between field traverses when assessing trees in dense vegetation.

Issue description	Section of Appendix C, Updated biodiversity assessment report
Timing of targeted surveys	Section 4.2.1, Table 4.2, Table 4.3 and Figure 7.1 to Figure 7.7 provide detail on the timing of targeted surveys. Targeted surveys were completed in accordance with relevant guidelines to enhance detection of relevant species due to flowering or fruiting periods.
Description of the extent, scope and timing of the surveys undertaken for each threatened flora species targeted	The extent, scope and timing of the targeted surveys for threatened flora is provided in Section 4.2.1, with details shown in: • Figure 7.1 to Figure 7.7 shows the track logs of all parallel transects completed through all areas of native vegetation that was assessed to provide suitable habitat for threatened flora. • The scope of the field surveys is described to demonstrate how they met the requirements of the NSW Guide to Surveying Threatened Plants (OEH 2016). This includes showing suitable survey effort, as shown by the parallel transect track logs on Figure 7.1 to Figure 7.7. • The initial targeted surveys were carried out over two survey phases; spring (October and November) 2016 and summer (February) 2017. The survey period was split over these two phases to meet the seasonal survey requirements of cryptic taxa and ensure optimum detectability of for all species. All areas of suitable habitat for the species targeted during each survey phase were surveyed during each field campaign. Additional targeted surveys for scrub turpentine, native guava, square-stemmed spike-rush and tall knotweed were carried out in January 2020 following the listing of the tree species under BC Act, and the assessment of potential habitat associated with newly mapped areas of PCT 780. The seasonal timing for each species is provided in Table 4.2 and shown on Figure 7.1 to Figure 7.7.

Threatened species recorded

Issue description

- The Biodiversity Assessment Report must specify the date the southern swamp orchid was recorded and whether the specimen observed was in flower.
- If available, a photograph of the southern swamp orchid observed in the field should also be included in the Biodiversity Assessment Report.
- If sought, the results obtained from the National Herbarium of NSW following a request for species identification should also be included.

Response

Section 4.2.4 of Appendix C, Updated biodiversity assessment report of the Amendment Report describes the timeline and process that was followed to confirm the identification of southern swamp orchid *Phaius australis*.

Southern swamp orchid was previously assumed present within the study area in the EIS through application of the precautionary principle and based on the occurrence of an orchid similar in terms of leaf morphology. When recorded in October 2016 the plant was not in flower, and the plant was re-visited multiple times through to January 2018 in an attempt to identify the species in flower. In the

absence of observing the specimen in flower, the precautionary principle was applied, and the orchid was assumed to be southern swamp orchid.

The plant was visited again in December 2019 and was found to be in the early stages of flowering. The orchid was confirmed not to be southern swamp orchid, but the non-threatened Christmas orchid *Calanthe triplicate*. Confirmation of the genetic identification of the plant as a Christmas orchid was also received from the National Herbarium in February 2020.

Issue description

- Accurate justification must be provided for the removal from the list of candidate fauna species of pale headed snake, rufous bettong, white-crowned snake, white-eared monarch and southern pink underwing moth.
- If accurate justification cannot be provided for the species above, then these fauna species credit species must be assessed as candidate species. As such, TfNSW must determine whether the species are present within the development site in accordance with section 6.5.1.9 of the FBA by either assuming the species is present, by undertaking a threatened fauna survey, or by obtaining an expert report.

Response

An assessment of candidate species requiring further assessment was completed in accordance with Section 6.5.1.3 of the FBA. An assessment of the habitat components for each species was completed and it was determined that either key habitat components were not present within the study area or they were substantially degraded such that the particular species was considered unlikely to occur in the study area. The justification for this assessment was completed in accordance with Section 6.5.1.3 of the FBA and presented as a likelihood of occurrence assessment in Appendix B of Appendix C, Updated biodiversity assessment report of the Amendment Report.

After completing the assessment of likelihood of occurrence for candidate threatened species, a field survey was designed and implemented for all species considered likely to occur in the site, in accordance with Section 6.5.1.9(a) of the FBA.

Detailed justification for not including the pale-headed snake, rufous bettong, white-crowned snake, white-eared monarch and southern pink underwing moth are summarised below.

Pale-headed snake

The pale-headed snake *Hoplocephalus bitorquatus* has been observed in the IBRA subregion with a single record within 10 kilometres of the study area.

This record is located about 5.6 kilometres from the study area. This species is not considered likely to occur within the subject site based on:

- Its specific habitat requirements of a high density of live large hollow-bearing trees over 70 centimetres diameter at breast height (DBH)
- Only one record of the species in the sub-region within a large patch of remnant vegetation
- The disturbed nature of the study area
- The distribution of the species within the Brigalow Bioregions with extant records occurring within or contiguous with the National Parks Estate (DECC 2009, Shelton, Phillips, & Goldingay 2020).

With consideration of the number of records and the lack of habitat within the area, it has been determined the species is not considered to be present within the development site in accordance with 6.5.1.3 (d) of the FBA (OEH 2014a).

Rufous bettong

The rufous bettong *Aepyprymnus rufescens* has been recorded as present in the IBRA subregion however only two records of the species occur within a 10-kilometre radius of the study area, with the most recent record dated over 20 years ago, in 1998 (OEH 2019).

The understorey is unsuitable in most areas and is often weedy. The forest patches are quite fragmented and disturbed.

With consideration of the limited number of records and their currency from the region, it has been determined the species is not considered to be present within the development site in accordance with 6.5.1.3 (d) of the FBA (OEH 2014a). This is considered sufficient for not addressing the species within the BAR and no further explanation is required to detail the differences between the high-quality habitats used by the species and the low-quality habitats within the study area.

White-crowned snake

Three records of the white-crowned snake *Cacophis harriettae* occur within the Coffs Coast and Escarpment IBRA Subregion dated 2012, 2015 and 2018. None of these records occur within a 10-kilometre radius of the study area and no further consideration is required in accordance with 6.5.1.3(d) of the FBA.

General reptile surveys carried out during the field surveys included a substantial amount of suitable survey for the detection of a white-crowned snake within potential habitat and the species was not recorded. Further, a golden-crowned snake *Cacophis squamulosus* was recorded during the field investigation and the two species are not commonly known to overlap in habitat or occurrence.

White-eared monarch

The white-eared monarch *Carterornis leucotis* has not been recorded in the IBRA subregion but is predicted to occur. There are no records of the species within 10 kilometres of the study area on BioNet, however one recent record (ALA 2017) is available. The species is closely associated with large continuous tracts of vegetation, as is likely the case of the Atlas of Living Australia (ALA) record. The study area is comprised mostly of fragmented vegetation and there is no suitable habitat structure for this transient species. Therefore, the white-eared monarch has been removed from the candidate species list in accordance with 6.5.1.3(a) of the FBA.

Southern pink underwing moth

Three records of the southern pink underwing moth *Phyllodes imperialis southern subspecies* occur within 10 kilometres of the study area dated 2017 and 2019. It is assumed this species was not detected in the original database searches of the study area as the searches were carried out in 2016. Targeted surveys for this species have since been carried out via comprehensive searches for the species' known food source, the native rainforest vine *Carronia multisepalea*. The vine was not recorded in the study area, and the species was removed as a candidate in accordance with section 6.5.1.3(a) of the FBA.

Issue description

- The Biodiversity Assessment Report must document the timing of the relevant surveys, so these can be assessed against the timing requirements specified in the Threatened Species Profiles Database.
- The Biodiversity Assessment Report must be revised to provide a detailed description of how the threatened fauna survey guidelines were implemented.

Response

Extensive surveys for candidate threatened flora and fauna species were carried out across the study area in August 2016, October 2016, November 2016, February 2017, March 2017, November 2017, January 2018, February 2018, May 2018 and January 2020.

Before surveys for threatened species, a preliminary assessment was carried out using the OEH BioBanking Credit Calculator for Major Projects and BioBanking – Version 4.1 to identify any additional threatened species not identified by database searches. Threatened species identified by the preliminary assessment were included in the list of candidate species for further consideration.

The full list of candidate species was further analysed and was used to develop a list of candidates threatened species requiring further assessment. Species habitat requirements, the presence of these habitats within the study area, the presence of existing records of threatened species in the vicinity of the project and an overall likelihood of occurrence within the study area was determined for each candidate species. This process identified the need for targeted survey of 24 threatened flora species and 34 threatened fauna species. The full list of these species is listed in Section 4 of Appendix C, Updated biodiversity assessment report of the Amendment Report and a summary is provided below.

Threatened flora surveys

The initial targeted surveys were carried out over two survey phases; spring (October and November) 2016 and summer (February) 2017. The survey period was split over these two phases to meet the seasonal survey requirements of cryptic taxa and ensure optimum detectability for all species. All areas of suitable habitat for the species targeted during each survey phase were surveyed during each field campaign. There were areas of native vegetation that were sampled during all three field survey campaigns for threatened flora. The survey track logs shown in Figure 7.1 to Figure 7.7 of Appendix H, Biodiversity assessment report of the EIS show which areas were surveyed during each sampling event.

Additional targeted surveys for scrub turpentine, native guava, square-stemmed spike-rush and tall knotweed were carried out in January 2020 following the listing of the tree species under the BC Act, and the assessment of potential habitat associated with newly mapped areas of PCT 780.

Section 4.2.1 of Appendix C, Updated biodiversity assessment report of the Amendment Report details the target species, field survey plan, survey techniques and guidelines and survey timing for threatened flora.

Threatened fauna surveys

Threatened fauna surveys were conducted for the candidate fauna species across several separate field campaigns during winter (August) 2016, spring (October and November) 2016, autumn (March 2017), spring (November) 2017, summer (January and February) 2018 and autumn (May) 2018. The surveys were carried out in accordance with relevant State and Australian government guidelines. Targeted survey details and survey effort carried out for each species are provided in **Table 3.4-3** and **Table 3.4-4**. Additional information, including further detail on fauna survey methods and weather observations during survey is provided in Section 4.2.2 of Appendix C, Updated biodiversity assessment report of the Amendment Report.

Table 3.4-3 Survey dates and weather observations during survey periods

Survey carried out	Survey date
Wallum froglet survey	22/08/2016, 23/08/2016, 24/08/2016
Arboreal and Terrestrial trapping, harp trapping, spotlight, call playback, diurnal waterbody searches, nocturnal waterbody searches, SAT survey, HBT survey, diurnal bird survey	31/10/2016, 1/11/2016, 2/11/2016, 3/11/2016, 4/11/2016, 5/11/2016, 20/11/2016, 21/11/2016, 22/11/2016, 23/11/2016, 24/11/2016, 25/11/2016
Spotlight, call playback, diurnal waterbody searches, nocturnal waterbody searches, SAT survey, Habitat tree survey, diurnal bird survey	13/03/2017, 14/03/2017, 15/03/2017, 16/03/2017, 17/03/2017
Coastal petaltail survey, koala SAT, culvert inspections, pink underwing moth survey	26/11/2017, 27/11/2017, 28/11/2017
Coastal petaltail survey	10/01/2018, 11/01/2018, 12/01/2018, 30/01/2018, 31/01/2018, 01/02/2018
Koala SAT, Spotlighting, culvert inspection	07/05/2018, 08/05/2018, 09/05/2018, 10/05/2018, 11/05/2018, 12/05/2018

Table 3.4-4 Summary of targeted survey effort

Survey method	Survey guidelines	Method details	Threatened species targeted	Survey effort
Koala SAT	EPBC Act referral guidelines for the vulnerable koala (CoA 2014): Phillips & Callaghan 2011 The Spot Assessment Technique: a tool for determining localised levels of habitat use by koalas *Phascolarctos cinereus*.	Each koala SAT survey included a koala scat search within 1 m around the base of thirty trees greater than 10 cm DBH (Phillips and Callaghan 2011).	Koala	38 SAT surveys
Terrestrial Elliot A trapping	Working Draft Threatened Species Survey and Assessment Guidelines (DEC 2004): 100 trap nights over 3-4 consecutive nights per stratification unit up to 50ha, additional effort for every additional 100ha.	Twenty A Elliott traps (9 x 10 x 33 cm) were placed along a line transect approximately 10 m apart at seven sites. Each trap contained dry bedding and was baited with a standard peanut butter and oat mix bait. Traps were active for a minimum of three nights and maximum of four nights. Trapping was conducted over two separate weeks in November.	Common planigale, brush-tailed phascogale	546 trap nights over 7 sites
Arboreal Elliot B trapping	Working Draft Threatened Species Survey and Assessment Guidelines (DEC 2004): 24 trap nights over three to four consecutive nights per stratification unit up to 50 ha, additional effort for every additional 100 ha.	Ten B Elliott traps (15 x 15.5 x 46 cm) placed in trees along a line transect approximately 20 m apart at six sites. Each trap contained dry bedding and was baited with a standard peanut butter and oat mix bait. The area surrounding the trap was sprayed with a sugar spray as an additional attractant.	Squirrel glider, eastern pygmy-possum, brush-tailed phascogale, yellow-bellied glider	240 trap nights over 6 sites

Survey method	Survey guidelines	Method details	Threatened species targeted	Survey effort
		Traps were active for a minimum of three nights and maximum of four nights. Trapping was conducted over two separate weeks in November.		
Diurnal bird surveys	Working Draft Threatened Species Survey and Assessment Guidelines (DEC 2004): Area search of 1 ha over a minimum 20-minute period (altered to 2 ha as per best practice Birdlife Australia). Systematic fixed radius point counts over 20 min (BirdLife Australia 2020).	20-minute surveys over a 200 m transect or a 20-minute point survey in rainforest, wet sclerophyll forest and swamp forest.	Regent honeyeater, swift parrot	14 person-hours over 12 sites (Nov 2016, March and July 2017)
Harp trap		Harp traps erected at six sites in November.	Southern myotis, little bent winged bat, large bent-winged bat	18 trap nights over 6 sites
Culvert / bridge and tunnel Inspection	Working Draft Threatened Species Survey and Assessment Guidelines (DEC 2004): Roost searches of possible habitat within the alignment.	Inspection of bridges, culverts and tunnels within the alignment.	Southern myotis, little bent winged bat, large bent-winged bat	All possible habitat within the alignment

Survey method	Survey guidelines	Method details	Threatened species targeted	Survey effort
Nocturnal spotlight survey	Working Draft Threatened Species Survey and Assessment Guidelines (DEC 2004): Minimum effort of one hour and one km on two occasions up to 200 ha of stratification unit, walking at approximately 1 km per hour on two separate nights.	Spotlighting was carried out by two observers using 50-100 Watt head or hand-held torches.	Squirrel glider, koala, yellow-bellied glider, eastern pygmy-possum, brush-tailed phascogale, spotted-tailed quoll, common planigale, grey-headed flying fox, Stephens banded snake, giant barred frog, stuttering frog, green-thighed frog, green and golden bell frog, wallum froglet, barking owl, powerful owl, masked owl, sooty owl.	140 person hours across 27 sites
Nocturnal waterbody search	Working Draft Threatened Species Survey and Assessment Guidelines (DEC 2004): Frogs: 30 minutes on two separate nights per stratification unit Frogs: At least one call playback on each of two separate nights Frogs: Two hours per 200 m of water body edge Birds: as per call playback below, walking through suitable habitat to flush cryptic species.	Sites with suitable creek line or ephemeral water habitat as well as dams were inspected on two occasions. Spotlighting transects including call playback was undertaken. Waterways were traversed by observers along a minimum of 200 m transects, the entire perimeter of suitable dams was traversed and searched including within vegetation providing suitable microhabitat.	Giant barred frog, stuttering frog, green thighed frog, wallum froglet, green and golden bell frog, black bittern, Australasian bittern, Australian painted snipe.	39 person hours over 11 waterbodies (dams). Additional survey effort for waterways are included in spotlight survey effort.

Survey method	Survey guidelines	Method details	Threatened species targeted	Survey effort
Nocturnal call playback	Working Draft Threatened Species Survey and Assessment Guidelines (DEC 2004): Birds/mammals: Two sites per stratification unit up to 200 ha, additional site per 100 ha above the initial 200 ha. Each site must have the session conducted twice on separate nights Frogs: at least one call playback on each of two separate nights.	Calls of gliders, koala and owls were played during standard call playback sessions including an initial 10-minute listening, 5 minutes of playing a species call followed by 5-minute listening period. The other species calls were played opportunistically in suitable habitat under suitable conditions.	Squirrel glider, koala, yellow-bellied glider, giant barred frog, stuttering frog, green-thighed grog, green and golden bell frog, wallum froglet, barking owl, powerful owl, masked owl, sooty owl	21 hours across 16 call playback sites
Diurnal waterbody searches	Working Draft Threatened Species Survey and Assessment Guidelines (DEC 2004): Area search on two occasions using a species-time curve approach.	Dams and creek lines with suitable fringing vegetation were inspected during the morning or afternoon on two occasions.	Black-necked stork, comb-crested jacana, black bittern, Australian fritillary, Australasian bittern, Australian painted snipe, pale-vented bush-hen	22 person-hours
Diurnal call playback	Working Draft Threatened Species Survey and Assessment Guidelines (DEC 2004): Adapted from guidelines using personal experience and knowledge of experienced Biosis Zoologists.	Species calls were played opportunistically in suitable habitat under suitable conditions (low-light conditions generally including cloud cover in the late afternoon and/or early morning).	Pale-vented bush-hen, black bittern	3.5 hours over 3 sites

Survey method	Survey guidelines	Method details	Threatened species targeted	Survey effort
Camera trap spring/summer	Survey guidelines for Australia's threatened mammals (CoA 2011): Cameras should be deployed for at least 14 nights About 10 cameras should be deployed per ha.	Reconyx Hyperfire cameras were set at 36 locations throughout the alignment. Cameras were baited with bread mixed with peanut butter and fish based cat food and set with the following parameters: Medium sensitivity, three photos per trigger with no delay, quiet period of three seconds between triggers.	Common planigale, spotted-tailed quoll, eastern pygmy-possum, koala, brush-tailed phascogale	1332 nights (minimum 37 nights per camera)
Camera trap winter	Survey guidelines for Australia's threatened mammals (CoA 2011): Cameras should be deployed for at least 14 nights. Approximately 10 cameras should be deployed per ha.	Reconyx Hyperfire cameras were set at 30 locations throughout the alignment. 24 cameras were baited with raw chicken necks to target spotted-tailed quoll. Six cameras were baited with peanut butter and oat bait with pistachio oil to target long-nosed potoroo. All cameras were set with the following parameters: Medium sensitivity, three photos per trigger with no delay, quiet period of three seconds between triggers.	Common planigale, spotted-tailed quoll, eastern pygmy-possum, koala, brush-tailed phascogale, long-nosed potoroo	756 nights (minimum 25 nights per camera)

Survey method	Survey guidelines	Method details	Threatened species targeted	Survey effort
Winter frog survey	Threatened species survey and assessment guidelines: field survey methods for fauna – Amphibians (DECC 2009a): • Call surveys, nocturnal searches and tadpole surveys in suitable weather and conditions around swamps, dams and flooded roadside ditches • Minimum one 200 m transect per water body or inundated area, repeated a minimum of two separate nights. • Working Draft Threatened Species Survey and Assessment Guidelines (DEC 2004): • 30 minutes on two separate nights per stratification unit.	Swamp forest habitat was inspected on two evenings during suitable conditions in winter. Suitable habitat was located within one stratification unit only.	Wallum froglet	8 person-hours
Invertebrate area search	Opportunistic searches during the flight seasons.	Additional diurnal transects through suitable habitat. Australian fritillary lays eggs on or near the arrowhead violet *Viola betonicifolia* and caterpillars are thought to feed exclusively on it (OEH 2018)	Australian fritillary, black grass-dart butterfly, coastal petaltail	2.5 person-hours

Survey method	Survey guidelines	Method details	Threatened species targeted	Survey effort
		Black grass-dart butterfly relies on larval food plant floyd's grass *Alexfloydia repens* (OEH 2018). Larval food plants were not detected during flora and fauna surveys.		
Invertebrate transect search	Standardised transect searches adapted for *P. litorea* survey to search for flying adults, exuviae and potential burrows. Information sources: • The Wetland habitats, biogeography and population dynamics of *Petalura gigantean* (Odonata: Petaluridae) in the Blue Mountains of New South Wales. (Baird I 2012) • A review of current knowledge of the coastal petaltail dragonfly *Petalura litorea* (Odonata: Petaluridae). (Baird I 2017).	5 m transects across suitable habitat within the alignment.	Coastal petaltail	90 person-hours across 2 sites
Pink underwing moth survey	NSW Guide to Surveying Threatened Plants (OEH 2016): Survey for host plant using 10 m transect search.	10 m transects across suitable habitat for larval food vine *Carronia multisepalea*.	Southern pink underwing moth	18 person-hours across 6 sites

Survey method	Survey guidelines	Method details	Threatened species targeted	Survey effort
Ultrasonic bat call recording	Working Draft Threatened Species Survey and Assessment Guidelines (DEC 2004): Two sound activated recording devices utilised for the entire night (a minimum four hours) starting at dusk for two nights.	Anabat Express ultrasonic bat recorders were set to record entire nights at 12 sites for a minimum two nights.	Southern myotis, little bent-winged bat, large bent-winged bat	446 hours
Hollow bearing and habitat tree assessment	Habitat assessment in Working Draft Threatened Species Survey and Assessment Guidelines (DEC 2004) BioBanking Assessment Methodology (OEH 2014c). NSW Roads and Maritime Services 2011. Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects.	Searches were conducted for fauna habitat trees including hollow-bearing trees and stick nests. Records were collected throughout the Project with specific searches conducted during and following SAT surveys, fauna trapping, setting of camera traps and setting of Anabat units. Hollow-bearing trees within the study area were recorded in accordance with the Biodiversity Banking Assessment Methodology (BBAM) (OEH 2014c). The following attributes were recorded for all hollow bearing trees where access was available. • GPS location • Scientific name • Common name • Condition (dead or alive) • Tree height	white-bellied sea eagle, squirrel glider, yellow-bellied glider, sooty owl, masked owl, barking owl, powerful owl, southern myotis, eastern pygmy-possum, brush-tailed phascogale	Ongoing during all fauna survey efforts. >16 person-hours

Survey method	Survey guidelines	Method details	Threatened species targeted	Survey effort
		• Diameter at breast height (DBH) • Hollow count (approximate number of hollows) • Position of hollows (trunk / limb) • Size class (small =<50 mm; medium = 50-150 mm; large = >150 mm).		
Grey-headed flying-fox camp assessment	Working Draft Threatened Species Survey and Assessment Guidelines (DEC 2004).	During fauna surveys undertaken evidence of potential grey-headed flying-fox camps was noted to assess potential “species credit” impacts to the dual credit species.	Grey-headed flying-fox	Ongoing during all fauna survey efforts

Threatened fauna survey

Issue description

- Given pitfall traps have not been used across the development site, TfNSW must establish whether the common planigale is present on site by either assuming the species is present, by conducting further surveys utilising pit fall traps or obtaining an expert report in accordance with Section 6.5.1.9 of the FBA.
- Should the option of further surveys be pursued, the following are required:
    - Prior to field survey, the development site must be stratified to determine the most likely locations of planigale habitat into which pitfall lines should be established. Stratification must be determined based on the presence of ecotonal areas, on fire and logging history, type of groundcover, proximity to riparian areas, topographic position in the landscape including aspect, presence of exfoliating rocks and areas with deep leaf litter and other preferred habitat features.
    - The subsequent survey must be sufficiently robust to demonstrate, with a high degree of confidence that common planigales are present or absent on the development site. Therefore, surveys would require one line of five 400 mm deep pitfall buckets for each hectare of planigale habitat, with individual pitfall buckets spaced at four metres to five metres apart, with a drift fence between them composed of a material which resists the climbing of small mammals and which is buried up to five centimetres into the soil. The drift fence must also extend beyond the last pitfall bucket at each end of the pitfall line to at least five metres. Pitfall traps must remain in place for a minimum of four nights.

Response

Although not detected through the application of multiple targeted fauna survey methods across a range of seasons, common planigale is often difficult to detect in part because of its small size and cryptic nature. Therefore, a precautionary approach has been adopted to assume presence and, as extensive survey of fauna habitats has been carried out, presence is assumed only within the highest quality habitats available within the study area.

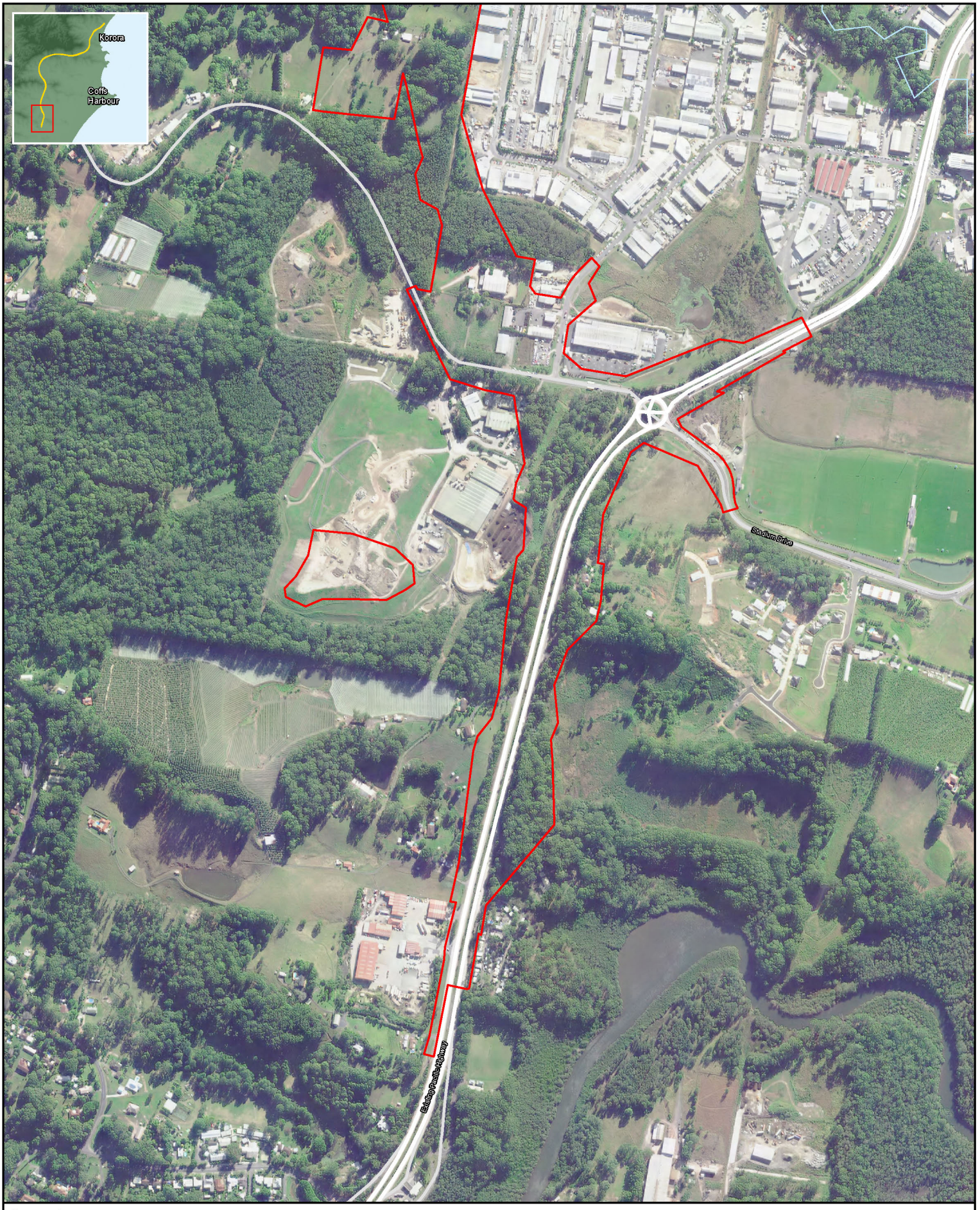
Suitable habitat for common planigale within the construction footprint is limited, as the majority of patches of potential habitat within the study area are subject to edge effects and substantial disturbance. Consequently, common planigale habitat has been mapped only where patches of high-quality habitat remain, and where suitable micro-habitats necessary for the life-cycle of the species exist.

High quality habitat within the study area includes rainforest and wetter forest areas with low weed presence, a patchy distribution of ground cover, areas interspersed with hollow logs, bark and deep leaf litter. Within the study area there is little to no surface or exfoliating rock that could be used by the common planigale. Mapped habitat is also generally connected to larger areas of protected bushland through riparian corridors.

The approach for mapping species credit polygons for common planigale is provided in Table 4.14 of Appendix C, Updated biodiversity assessment report of the Amendment Report and mapped in Figure 11.1 to Figure 11.8. These figures are replicated below, refer to **Figure 3.4-2-01** to **Figure 3.4-2-06**.

This species has a high likelihood of occurrence within the study area based on previous records to the north and south of the locality and habitat present in the study area, and broader vicinity.

Threatened species polygons include high quality vegetation in larger or well-connected vegetation patches, in areas that were not saturated with both Elliot A traps and camera traps during targeted surveys. Areas where patches with a high degree of disturbance from weeds, domestic pets, invasive species, livestock, pedestrian and vehicular movement were excluded. This approach to the assessment of the common planigale has been agreed in consultation with EESG, DPIE and is detailed in Appendix C, Updated biodiversity assessment report of the Amendment Report.



Legend

Construction footprint **Threatened species habitat**

North Coast Railway Common Planigale

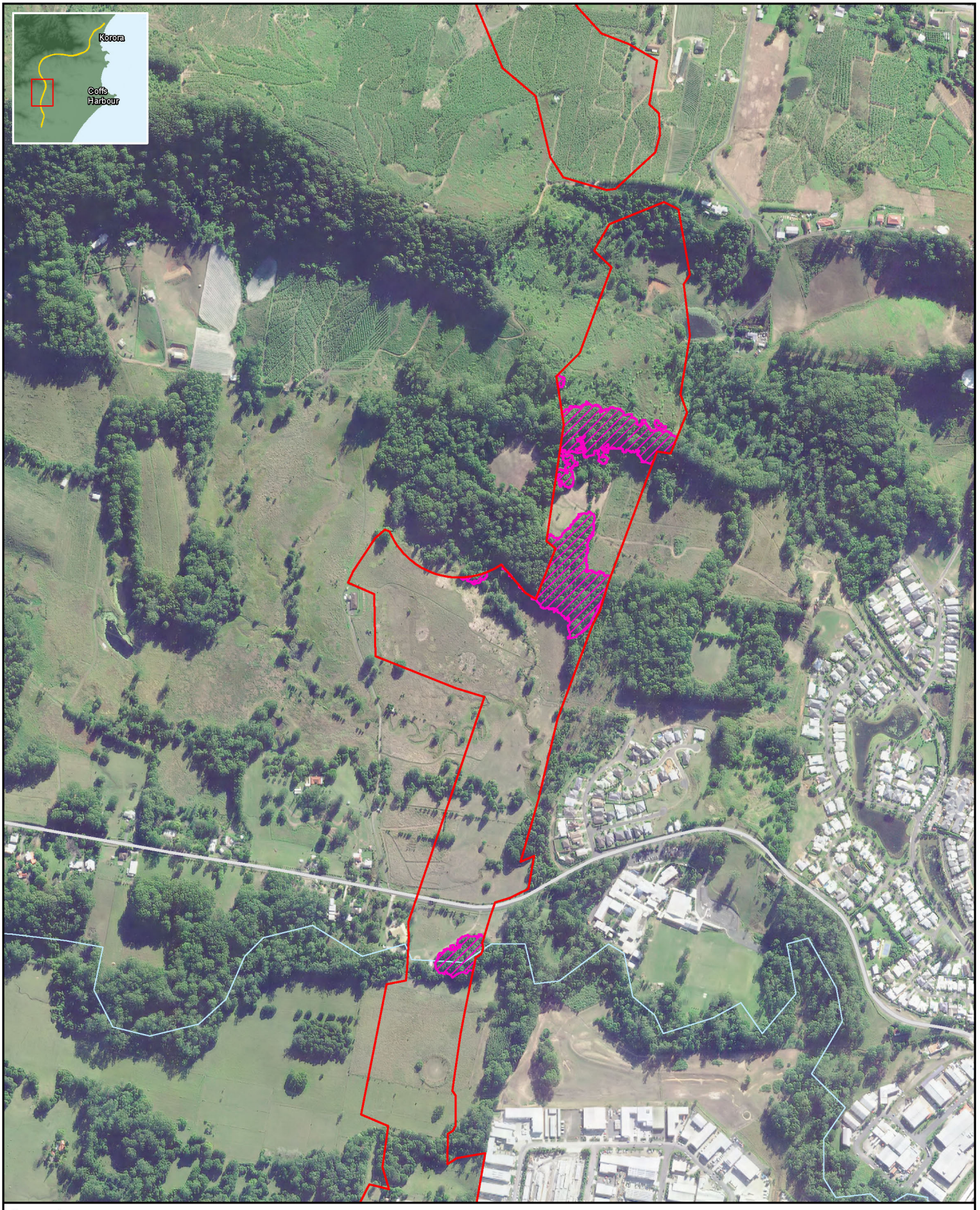
Watercourse

Coffs Harbour Bypass
Common planigale habitat
Figure 3.4-2-01

0 0.1 0.2 0.3 km

Scale @A4: 1:10,000
GDA 1994 MGA Zone 56

N



Legend

Construction footprint **Threatened species habitat**

North Coast Railway Common Planigale

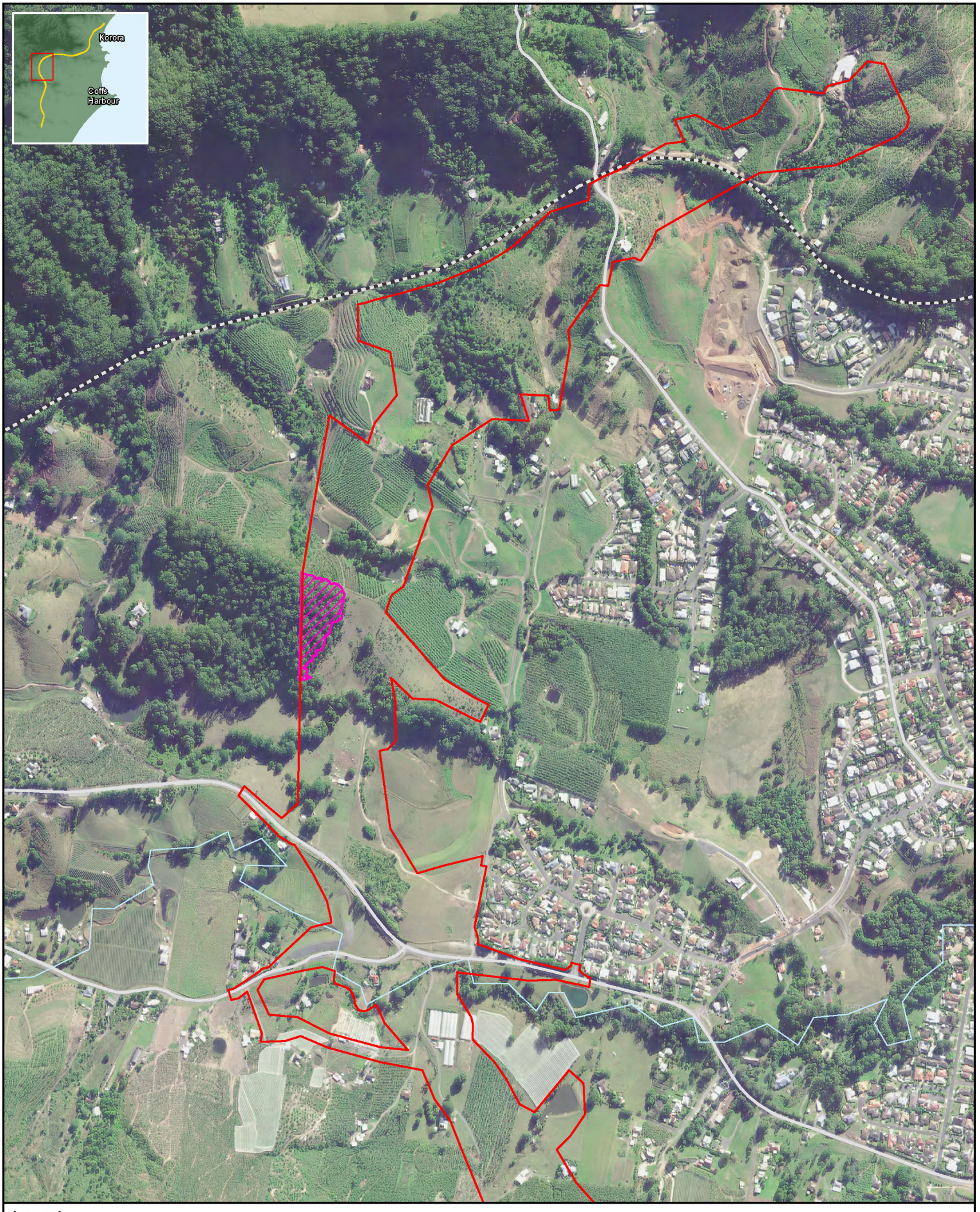
Watercourse

Coffs Harbour Bypass
Common planigale habitat
Figure 3.4-2-02

0 0.1 0.2 0.3 km

Scale @A4: 1:10,000
GDA 1994 MGA Zone 56

N



Legend

Construction footprint **Threatened species habitat**

North Coast Railway Common Planigale

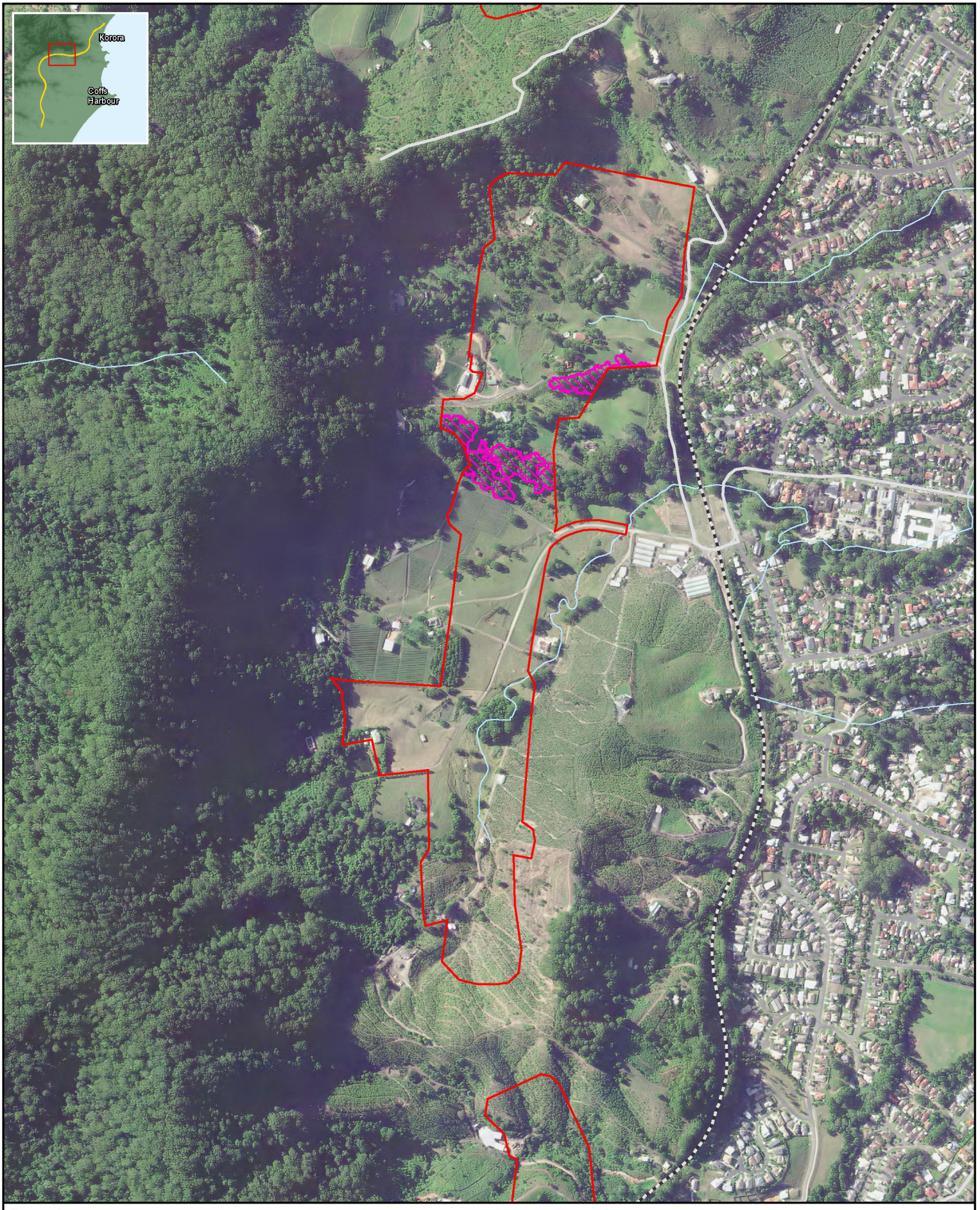
Watercourse

Coffs Harbour Bypass
Common planigale habitat
Figure 3.4-2-03

0 0.1 0.2 0.3 km

Scale @A4: 1:10,000
GDA 1994 MGA Zone 56

N



Legend

Construction footprint **Threatened species habitat**

North Coast Railway Common Planigale

Watercourse

Coffs Harbour Bypass
Common planigale habitat
Figure 3.4-2-04

0 0.1 0.2 0.3 km

Scale @A4: 1:10,000
GDA 1994 MGA Zone 56

Legend

Construction footprint **Threatened species habitat**

North Coast Railway Common Planigale

Watercourse

Coffs Harbour Bypass
Common planigale habitat
Figure 3.4-2-05

0 0.1 0.2 0.3 km

N

Scale @A4: 1:10,000
GDA 1994 MGA Zone 56

Legend

Construction footprint **Threatened species habitat**

North Coast Railway Common Planigale

Watercourse

Coffs Harbour Bypass
Common planigale habitat
Figure 3.4-2-06

0 0.1 0.2 0.3 km

N

Scale @A4: 1:10,000
GDA 1994 MGA Zone 56

Threatened fauna species recorded

Issue description

Table 4.11 and Appendix A of Appendix H, Biodiversity assessment report of the EIS, identify white-bellied sea-eagle as an ecosystem credit species. However, this is an error. For the purposes of the FBA, the white-bellied sea-eagle is a dual credit species. Given the white-bellied sea-eagle has been observed on site by both accredited assessors conducting field surveys and by Biodiversity and Conservation Division, Senior Conservation Planning Officer, Ms Nicky Owner (also an accredited assessor), further assessment of the potential for breeding sites (ie the species credit components of this species dual credit status) to occur within the development site is required.

It is a requirement of section 6.5.1.9 of the FBA that the presence of the white-bellied sea-eagle breeding locations be determined by either assuming the species is present, by conducting relevant surveys or obtaining an expert report.

Should the survey option be pursued, surveys should be undertaken between June and November to detect nesting sites. These are usually live large old trees within one kilometre of rivers, lakes, large dams or creeks, wetlands and coastlines along with a large stick nest within the tree canopy. In addition, evidence of the presence of breeding animals can include an adult with nest material, or adults observed duetting within the breeding period.

Due to the similarities in nest structure and use of the same nests by white-bellied sea-eagles and wedge-tailed eagles, where a nest is observed without a bird present, searches for prey remains/feathers below the structure should be undertaken. The differing diets of both species and distinctive adult feathers, should provide evidence of nest use, however; where prey items/feathers are absent, repeat visits to the nest until a bird is observed should be undertaken.

Response

It is acknowledged Table 4.11 and Appendix A of Appendix H, Biodiversity assessment report of the EIS identify white-bellied sea-eagle as an ecosystem credit species only. White-bellied sea-eagle was not assessed as a species credit species because field surveys did not identify any breeding habitat in the form of stick nests used by the species. Notwithstanding the lack of identified breeding habitat for white-bellied sea-eagle, Table 4.13 of Appendix C, Updated biodiversity assessment report of the Amendment Report has been amended to show that white-bellied sea-eagle has been considered as a species credit species and an ecosystem credit species, in accordance with FBA requirements.

A summary of the key findings from the assessment of white-bellied sea-eagle is provided below:

- Species habitat polygons were not defined for white-bellied sea-eagles as no breeding sites were recorded within the study area for the species.
- Surveys of the entirety of the study area were carried out to identify hollow-bearing trees, stick nests and other relevant fauna habitat features, as well as numerous diurnal bird surveys. These surveys were carried out within the species' breeding season on three separate occasions (October and November 2016 and March 2017), and no evidence of breeding activity was recorded.

- Habitat tree surveys were carried out in October and November 2016 and March 2017 and the white-bellied sea-eagle was specifically targeted. Records were collected throughout the study area with specific searches conducted during and following SAT surveys, fauna trapping, setting of camera traps and setting of Anabat units. Habitat trees within the study area were recorded in accordance with the Biodiversity Banking Assessment Methodology (BBAM) (OEH 2014c). Section 4.2.2 of Appendix C, Updated biodiversity assessment report of the Amendment Report includes additional detail on threatened fauna species carried out. No evidence of breeding was recorded during these surveys. **Table 3.4-3** describes the methods applied for this survey, and Table 4.6 of Appendix C, Updated biodiversity assessment report of the Amendment Report summarises the seasons over which these surveys were completed.
- Additionally, repeat visits to large raptor nests, particularly white-bellied sea-eagle, little eagle and square-tailed kite can result in the abandonment of nests, with nesting sites only to be approached if essential. The below is an excerpt from the Australian Government Department of Agriculture, Water and the Environment (DAWE) Species Profiles and Threats Database (SPRAT) for white-bellied sea-eagle:

  "The white-bellied sea-eagle is sensitive to disturbance when nesting, especially during the early stages of the breeding season, and may desert nests and young if confronted by humans or exposed to human activity (Clunie 1994; Hollands 2003; Mooney & Brothers 1986; Stokes 1996). The disturbance of nesting pairs by human activity can thus lower breeding success, and has been associated with some local population declines, for example, abandoned territories on the Eyre Peninsula and far west coast of South Australia were located in areas that had been developed for tourism or that contained recreational sites accessible by vehicles (Clunie 1994; Dennis & Lashmar 1996; Mooney & Brothers 1986)."

Issue description

- The Biodiversity Assessment Report must be amended to clearly state the date of survey during which the green-thighed frog was recorded.
- If available, a photo of the green-thighed frog individual/s caught in the field must be included within the Biodiversity Assessment Report.

Response

Additional information regarding green-thighed frog has been provided to the EESG, DPIE following exhibition of the EIS, as well as seeking further advice from frog specialists. It is acknowledged the previous observation of green-thighed frog was an error and the identified frog was a stony creek frog. Reference to the green-thighed frog has been removed from Appendix C, Updated biodiversity assessment report of the Amendment Report and the biodiversity credit calculations have been amended.

Issue description

- Confirmation of whether the following species occur within the development site is required and the Biodiversity Assessment Report amended as required:
  - Olive whistler
  - Large toadlet
  - Northern toadlet
  - Green-backed gerygone
  - Grey currawong.

- Should the northern toadlet and/or the green-backed gerygone be confirmed to be present, these are highly significant range extensions, and their presence in NSW of very high importance, and the Biodiversity Assessment Report should consider the impacts of the proposal on these species.

Response

Appendix C, Updated biodiversity assessment report of the Amendment Report has been updated to remove the incorrect recordings of northern toadlet *Uperoleia borealis*, large toadlet *Pseudophryne major* and green-backed gerygone *Gerygone chloronota* from Appendix A and substituted with the correct species observed, the brown gerygone *Pseudophryne bibroni* and smooth toadlet *Uperoleia laevigata* which are not listed as threatened in NSW or Australia.

The records of these species are a result of errors associated with the methods used to record species in the field, not as a result of incorrect observations by experienced zoologists. The field teams completing the surveys use tablets, with pre-populated drop-down menus that contain all Australian fauna. Northern toadlet and green-backed gerygone are within the same genus of the correct species that were recorded during the fieldwork, and the error was made in selecting the wrong species. The recording of species well outside their known range was not a result of incorrect observations in the field, rather an error in how the species were recorded.

The grey currawong *Strepera versicolor* and olive whistler *Pachycephala olivacea* observations were made by an experienced zoologist with experience in bird surveys and have been retained in Appendix A of Appendix C, Updated biodiversity assessment report of the Amendment Report:

- Olive whistler was identified from call only, however the call was identified by an experienced zoologist who specialises in birds and was noted as different from golden and rufous whistler calls. As there was considered to be strong possibility that it was the threatened species, the precautionary principle was applied and the impacts of the project to the olive whistler were assessed. The olive whistler has not been removed from Appendix C, Updated biodiversity assessment report of the Amendment Report nor the biodiversity credit calculations.
- The grey currawong was directly observed by an experienced zoologist.

Issue description

- The extent of the koala species polygons must include the full extent of those PCTs that are likely to provide koala habitat, as per the Threatened Species Profiles Database.

Response

The koala habitat polygons presented in Appendix H, Biodiversity assessment report of the EIS were developed in accordance with 6.5.1.17 of the FBA (OEH 2014a), and the FBA does not specify that the full extent of a PCT is to be incorporated into the species polygon. The portions of the PCTs that have not been included within koala species polygon are the poor condition sections that do not provide a specific habitat feature or habitat component associated with the species. This conforms to item 6.5.1.17 (d) of the FBA (OEH 2014a).

Appendix C, Updated biodiversity assessment report of the Amendment Report has been updated to address the description of these habitats in accordance with 6.5.1.8 of the FBA (OEH 2014a).

Issue description

- Describe, with accuracy, the anticipated impact of the project, including the construction of the proposed bridges and the realignment of the unnamed creek (tributary of Newports Creek) and Pine Brush Creek, on riparian vegetation as required by section 9.2.3 of the FBA.

Response

Section 8.2.1 of Appendix C, Updated biodiversity assessment report of the Amendment Report, outlines the impacts on landscape features because of the project. Two higher order streams occur within the study area, Pine Brush Creek (fifth order) and an unnamed tributary of Newports Creek (fourth order). While both of these creeks will be crossed by bridge and impacts will be limited to a narrow section of the riparian corridor, an assessment in accordance with Section 9.2.3 of the FBA has been prepared for each to demonstrate the impacts anticipated as a result of the project.

Table 8.6 and Table 8.7 of Appendix C, Updated biodiversity assessment report of the Amendment Report includes an impact assessment in accordance with the five criteria outlined in Section 9.2.3 of the FBA (OEH 2014a) for the realignment of Pine Brush Creek and Williams Creek, and the unnamed tributary of Newports Creek respectively (referred to as the southern tributary of Newports Creek within the EIS).

These tables describe the impacts and proposed mitigation measures that address the additional information requirements stipulated in Section 9.2.3 of the FBA to the level of accuracy possible given the design development. **Table 3.4-5** provides the assessment of impacts to Pine Brush Creek and **Table 3.4-6** provides the assessment for the unnamed tributary of Newports Creek.

Table 3.4-5 Additional information required for impacts to Pine Brush Creek (fifth order)

Additional information required	Comment
(a) the name and stream order of the riparian buffer being impacted	Pine Brush Creek (fifth order waterway)
(b) the total area of the riparian buffer that is impacted by the Major Project, the extent to which the width of the link will be reduced and over what length, and the size of gaps being created or expanded	The proposed development includes the construction of three permanent single span bridges with vertical retaining walls crossing over Pine Brush Creek as well as the realignment of the waterway and its tributary Williams Creek. A new confluence of Pine Brush and Williams Creek would be constructed about 20 m upstream of the new bridge. The realignment of Williams Creek would extend for about 90 m upstream of the new confluence and would require construction of a new low flow channel and waterway corridor. The low flow channel would need to meander within the realigned waterway corridor to ensure existing waterway lengths, velocities and hydraulic grades are maintained. Realignment of Pine Brush Creek would require construction of a new 85 m channel slightly north of the existing channel. The realignment would generally remain within extents of the existing riparian corridor and would be located between the new bridge (BR 21) and the existing bridge over Old Coast Road. For clarity, the works would not result in a reduction in width of the riparian corridor. These works will result in impacts to approximately 1.34 ha of the riparian corridor, 1.231 ha of which is native vegetation, within the vicinity of the proposed bridge construction. A gap of about 45 m in the riparian corridor already exists in this area due to the Pacific Highway, and the proposed works will result in an around 64 m of additional vegetation removal, increasing the total riparian gap to about 110 m. A further 0.28 ha of disturbed native and other exotic dominated riparian vegetation will be lost downstream of the proposed bridge works. This is due to the proximity of the creek and the study area boundary and will reduce the width of the riparian corridor by between 1 and 20 metres along the northern side of the creek, for a distance of about 500 m. The riparian corridor in this area is already highly modified. Partial revegetation of the riparian corridor will occur following construction. The proposed bridge works also include construction of a fauna underpass targeting koala, spotted-tail quoll, pale-vented bush hen, and giant barred frog, and as such are subject to additional mitigation design principles outlined below.

Additional information required	Comment
(c) the PCT and condition of the vegetation in the riparian buffer being impacted	The riparian vegetation being impacted is consistent with PCT 1285 Turpentine moist open forest of the coastal hills and ranges of the NSW North Coast Bioregion and was assessed as being in moderate/good condition. A small portion of urban native/exotic vegetation will also be removed.
(d) any direct impacts on wetlands or watercourses downstream of the development site	An estuarine wetland is mapped approximately 800 m downstream, and the Solitary Island Marine Park boundary is about 200 m downstream of the proposed bridge works. This estuary (or small lagoon) is mapped on the NSW Wetlands 2006 spatial layer (OEH 2006) and forms part of the Solitary Islands Marine Park which extends north from Coffs Harbour to Sandon River along about 75 km of coastline. The construction of the waterway crossing and realignment of the waterway has the potential to result in increased turbidity within the waterway and downstream sedimentation. Flow alteration associated with the waterway crossing and stream realignment may also result in changes to hydrology, potentially leading to erosion and scour of banks and riparian areas/vegetation. However due to the proximity of the works to the marine park additional mitigation measures have been proposed and are outlined below.
(e) the mitigation measures proposed to minimise the impact on the biodiversity values of the riparian or downstream area	Specific mitigation measures to minimise impacts to riparian vegetation and downstream areas include (but are not limited to): • Limits of clearing within the construction site to be delineated using appropriate signage and barriers to prevent against encroachment. Vegetation to be retained will be clearly identified and protected by suitable fencing, signage or markings • Investigation of opportunities to minimise riparian vegetation removal required at bridge locations during the detailed design phase • Creek realignment to be constructed to maintain natural flow conditions and carried out in accordance with the requirements of the DPI Policy and Guidelines for Fish Conservation and Management (DPI 2013). Construction of creek realignments would begin by installing erosion and sediment control measures (including scour protection) around the existing watercourses to avoid erosion impacts. A range of structures such as plunge pools and rock chutes would be installed to control water flow as required • Ensure new creek channel is sufficiently stabilised prior to diversion of the water to prevent scour and erosion and sedimentation of high quality aquatic habitats downstream

Additional information required	Comment
	• Undertake regular monitoring to allow for adaptive management to ensure the success of the realignment, successful reestablishment of natural flow conditions and riparian habitats. Mitigation measures relating to the realignment of Pine Brush Creek and its proximity to the Solitary Islands Marine Park include: • Ensure quality of water discharge from construction activities associated with the realignment of Pine Brush Creek and Williams Creek are in accordance with requirements of the Protection of the Environment Operations Act 1997 (PoEO Act) and sediment basins within the catchment of Solitary Islands Marine Park would be designed to contain the five-day 90th percentile rainfall event. Mitigation measures relating to bridges incorporating fauna underpasses design principles include: • Bridges should be designed with a natural substrate at the abutment • Scour protection associated with the entries and exits to bridges should accommodate and provide for the safe and effective passage of fauna • A minimum width of 3 m is to be retained between the toe of the scour protection or the abutment and the edge of the road to maintain fauna passage • Bridges should be designed (height, carriageway separation) to allow sufficient light and moisture to encourage growth of vegetation between the structures, with a minimum height of 1.5 m allowed for terrestrial fauna passage • Revegetation works should be completed as soon as practicable following bridge construction and include restoration of a natural, vegetation community underneath the bridge structure. Where possible, the revegetation works is to match the PCT of the retained vegetation communities. Planting underneath the bridge structures should include the use of groundcovers, with shrubs to be used when the height and light penetration allow for larger species to establish. All plant species are to be known to occur in the relevant PCT retained on either side of the bridge.

Table 3.4-6 Additional information required for impacts to unnamed southern tributary of Newports Creek (fourth order)

Additional information required	Comment
(a) the name and stream order of the riparian buffer being impacted	Unnamed southern tributary of Newport Creek (fourth order waterway).
(b) the total area of the riparian buffer that is impacted by the Major Project, the extent to which the width of the link will be reduced and over what length, and the size of gaps being created or expanded	The proposed development includes the construction of a 23 m (maximum span) permanent bridge crossing over an unnamed Strahler order four tributary of Newports Creek. These works will result in impacts to about 0.82 ha of riparian corridor, including 0.56 ha of native vegetation, within the vicinity of the proposed works. This will result in a gap in the riparian corridor vegetation of about 171 m wide to allow for the permanent road crossing. For clarity, the works would not result in a reduction in width of the riparian corridor. Partial revegetation of the riparian corridor will occur following construction. The proposed bridge works also include construction of a fauna underpass targeting koala, spotted-tail quoll, pale-vented bush hen, and giant barred frog, and as such are subject to additional mitigation design principles outlined below.
(c) the PCT and condition of the vegetation in the riparian buffer being impacted	The riparian vegetation being impacted is consistent with PCT 747 Brush Box – Tallowwood – Sydney Blue Gum tall moist forest of the ranges of the central NSW North Coast Bioregion and was assessed as being in Moderate/good – Poor condition.
(d) any direct impacts on wetlands or watercourses downstream of the development site	There are no wetlands mapped immediately downstream of the proposed works, the tributary joins Newports Creek about 350m downstream in a north-easterly direction, which then meets wetland mapped on the NSW Wetlands 2006 spatial layer (OEH 2006) a further 3 km to the south-east. The construction of the waterway crossing has the potential to result in increased turbidity within the waterway and downstream sedimentation. Flow alteration associated with the waterway crossing and stream realignment may also result in changes to hydrology, potentially leading to erosion and scour of banks and riparian areas/vegetation.

Additional information required	Comment
(e) the mitigation measures proposed to minimise the impact on the biodiversity values of the riparian or downstream area	Specific mitigation measures to minimise impacts to riparian vegetation and downstream areas include (but are not limited to): • Limits of clearing within the construction site to be delineated using appropriate signage and barriers to prevent against encroachment. Vegetation to be retained will be clearly identified and protected by suitable fencing, signage or markings • Investigation of opportunities to minimise riparian vegetation removal required at bridge locations during the detailed design phase • Undertake regular monitoring to allow for adaptive management to ensure the success of the realignment, successful reestablishment of natural flow conditions and riparian habitats. Mitigation measures relating to bridges incorporating fauna underpasses design principles include: • Bridges should be designed with a natural substrate at the abutment • Scour protection associated with the entries and exits to bridges should accommodate and provide for the safe and effective passage of fauna • A minimum width of 3 m is to be retained between the toe of the scour protection or the abutment and the edge of the road to maintain fauna passage • Bridges should be designed (height, carriageway separation) to allow sufficient light and moisture to encourage growth of vegetation between the structures, with a minimum height of 1.5 m allowed for terrestrial fauna passage • Revegetation works should be completed as soon as practicable following bridge construction and include restoration of a natural, vegetation community underneath the bridge structure. Where possible, the revegetation works is to match the PCT of the retained vegetation communities. Planting underneath the bridge structures should include the use of groundcovers, with shrubs to be used when the height and light penetration allow for larger species to establish. All plant species are to be known to occur in the relevant PCT retained on either side of the bridge.

Issue description

- The Biodiversity Assessment Report must document all matters stipulated at section 9.2.5.2 of the FBA in relation to scrub turpentine.

Response

In mid-2019, species listed under the schedules of the BC Act changed with some flora species added. This occurred after the completion of the fieldwork for the EIS. Scrub turpentine was newly listed as CE. Due to the availability of habitat for the species, the presence of records within 10 kilometres of the study area and known records of scrub turpentine within the construction footprint, scrub turpentine was identified as having a high likelihood of occurrence within the study area.

Targeted surveys were carried out for scrub turpentine in January 2020. The methodology for this survey is described in Section 4.2.1 of Appendix C, Updated biodiversity assessment report of the Amendment Report, and the location of survey tracks is included in Figure 7.1 to Figure 7.7.

A total of 14 individuals were recorded within the study area during the investigations, supported by about 2.94 hectares of known habitat. A further 30.11 hectares of potential habitat is also present within the study area. The individuals and known and potential habitat would be directly impacted by the project however at a regional scale this impact is likely to be only a small percentage of mature individuals and about 0.37 per cent of the potential habitat for the species. Indirect impacts on the species because of the project includes the potential spread of myrtle rust through construction activities.

Most of the individuals recorded exhibited signs of myrtle rust infection, which indicates there is likely already some reduced capability of individuals within the study area to successfully reproduce. As a result, recovery of the species within the local area is likely to be poor.

Section 8.2.3 and Table 8.8 of Appendix C, Updated biodiversity assessment report of the Amendment Report, includes additional information on scrub turpentine and presents a detailed assessment against Section 9.2.5 of the FBA (OEH 2014a).

Issue description

- In relation to the pale-vented bush-hen which was also recorded within the development site, given it has been previously recorded (multiple times) within the Coffs Coast and Escarpment IBRA subregion, as determined from examination of Bionet records, no further consideration is required for this species. Delete the assessment prepared for the pale-vented bush-hen from the Biodiversity Assessment Report.

Response

Pale-vented bush-hen *Amaurornis moluccana* was directly observed during field investigations and has been subject to assessment as a species credit species in Appendix H, Biodiversity assessment report of the EIS and in Appendix C, Updated biodiversity assessment of the Amendment Report.

In the EIS, pale-vented bush-hen was determined to require further assessment under Section 9.2.5.1(c) of the FBA (OEH 2014a). This further assessment was required as there was no available evidence the species had been previously recorded in the IBRA subregion according to records in the NSW Wildlife Atlas.

Since the initial fauna surveys detected this species in 2016, there have been a number of records of this species in the bioregion and its presence in the study area no longer triggers the requirement for further assessment under the FBA. The further assessments for pale-vented bush-hen have been removed from Appendix C, Updated biodiversity assessment of the Amendment Report.

BioBanking Credit Calculator

Issue description

- The total number of ecosystem credits and species credits required to offset the impact of the project will need to be recalculated following fulfilment of the above listed EESG, DPIE requirements. This will necessitate significant amendments to the Biodiversity Assessment Report and the re-running of the BioBanking Credit Calculator.
- The likely extent of indirect impacts must be quantified using the BioBanking Credit Calculator. The preferred approach for this is by identifying the vegetation types and zones within a corridor width determined in consultation with the EESG, DPIE adjacent to both sides of the alignment, then using the calculator to calculate a credit requirement based on a reduction in the future condition score of those vegetation zones also determined in consultation with the EESG, DPIE.

Response

Following exhibition of the EIS, TfNSW has refined several aspects of the project. This was in response to consultation with the community and landowners during the EIS exhibition, submissions received during the EIS exhibition period and continued development and refinement of the concept design and consultation with government agencies.

Supplementary vegetation surveys along with targeted surveys for native guava and scrub turpentine were carried out in January 2020. Areas targeted included vegetation in the Appendix H, Biodiversity assessment report of the EIS that was not mapped in the figures as either a PCT or urban native/exotic (non-native), as well as areas of potential re-growth identified from aerial imagery, areas potentially supporting wetland vegetation, and newly impacted areas as a result of the construction footprint update as part of the proposed design and construction changes described in the Amendment Report.

The study area for the amended design consists of the construction footprint for the project, which typically incorporates a 15 metre buffer from the edge of the design extent and any proposed ancillary facilities. The amended design is the EIS design, inclusive of design and construction changes described in the Amendment Report. The construction footprint is the area proposed to be impacted, cleared and/or disturbed during construction. The 15 metre buffer either side of the design extents would account for indirect impacts to retained habitats, native vegetation and other biodiversity values.

The impacts and offset credit calculations have been updated based on revisions to vegetation community mapping and species credit species habitat polygon mapping. The revised credit calculations are summarised in Section 9 of Appendix C, Updated biodiversity assessment report of the Amendment Report, which also includes the outputs from the BBAM calculator.

The BOS has been prepared and is included as Appendix E of Appendix C, Updated biodiversity assessment report of the Amendment Report. This BOS identifies the mechanism for delivery of offsets in accordance with the FBA, which has been endorsed by the Australian Government as part of the EPBC Act assessment bilateral agreement. The BOS establishes the process for identifying and securing offsets before commencement of the action.

3.4.4 Biodiversity – EPBC Act assessment

Preliminary biodiversity comments on the Biodiversity Assessment Report were provided by the EESG, DPIE in a letter dated 3 October 2019. These comments have been incorporated into the responses below.

Identifying Matters of National Environmental Significance

Issue description

- All threatened species listed under the EPBC Act that are known or likely to occur, including those species listed in the DAWE referral decision brief, have been identified in Appendix F of the Biodiversity Assessment Report.
- EESG, DPIE considers the resources used by the assessors to derive the list of threatened species known or likely to occur on the development site to be appropriate.

Response

Noted.

Threatened species and communities likely to be impacted by the project

Issue description

- EESG, DPIE has identified several errors in the application of the FBA that are likely to affect the determination of the offset obligation for those threatened species recorded within the development site. This includes the failure to identify, map and assess all native vegetation within the development footprint, as well as vegetation occurring for a distance determined in consultation with EESG, DPIE either side of the development (construction) footprint (ie the parts of the development site where direct and indirect impacts are likely).
- EESG, DPIE have also identified numerous issues and omissions with respect to the carrying out of the necessary targeted surveys for the threatened species likely to occur on site.
- As such, reassessment of various biodiversity values will be required, and substantial amendments to the Biodiversity Assessment Report and the Matters of National Environmental Significance (MNES) assessment are likely to be necessary.

Response

Detail on how this issue has been addressed are provided above in **Section 3.4.3**. To summarise the specific updates that are relevant to MNES assessment include:

- To account for indirect impacts to MNES fauna species, including koala *Phascolarctos cinereus* and giant barred frog *Mixophyes iteratus*, the study area assessed for the EIS included a 15 metre buffer from the edge of the design extent and any proposed ancillary facilities. This is also referred to as the construction footprint. The construction footprint is the area proposed to be impacted, cleared and/or disturbed during construction. The 15 metre buffer either side of the design extents would account for indirect impacts to retained habitats, native vegetation and other biodiversity values. Consultation with EESG, DPIE confirmed the adopted 15 metre buffer was appropriate.

  For clarity, the study area has been clearly defined in Section 1.4 of Appendix C, Updated biodiversity assessment report of the Amendment Report. The amended design is the EIS design, inclusive of design and construction changes described in the Amendment Report. The construction footprint is the area proposed to be impacted, cleared and/or disturbed during construction and includes the 15 metre buffer identified above. This buffer area has been

assessed as fully cleared to capture the indirect impacts to retained habitats, native vegetation and other biodiversity values

- Southern swamp orchid has been removed from the assessment because of confirmation of identification of the individual as a Christmas orchid, a least concern species. Additional information is included in Section 4.2.4 of Appendix C, Updated biodiversity assessment report of the Amendment Report
- Provided more detail on method for mapping koala habitat polygons. Additional information is included in Section 4.2.4 of Appendix C, Updated biodiversity assessment report of the Amendment Report.

Further field investigations were carried out in January 2020 and these investigations have been included in Appendix C, Updated biodiversity assessment report of the Amendment Report. The MNES assessment has been updated and is included in Section 8.3 of Appendix C, Updated biodiversity assessment report of the Amendment Report.

Assessment of relevant impacts

Issue description

- The types of direct impacts of the project have been comprehensively addressed within the Biodiversity Assessment Report.

Response

Noted.

Determination of the significance of the impacts

Issue description

TfNSW has determined that the project is likely to have a significant effect on the koala and the giant barred frog *Mixophyes iteratus* for which EESG, DPIE agrees.

Despite the DAWE determining that the project is likely to have a significant effect on the spotted-tailed quoll *Dasyurus maculatus maculatus* (as per Annexure A of the Guidelines for preparing Assessment Documentation relevant to the *Environment Protection and Biodiversity Conservation Act 1999*), TfNSW has determined that the proposed project is unlikely to have a significant effect on the spotted-tailed quoll. EESG, DPIE agrees with the findings given the areas proposed to be affected by the project are unlikely to provide extensive high-quality habitat for the species, along with the proposed underpass structures that will allow for the continued movement of this species across the landscape. Despite this, because the development site does provide likely habitat for the quoll, and the quoll is an ecosystem credit species, ecosystem (PCT) offsets are required, and those offsets will include habitat for the spotted-tailed quoll.

In addition, TfNSW has also determined that the project will not have a significant impact on the southern swamp orchid due to the assumption that the proposed translocation of the single specimen will be successful.

EESG, DPIE questions whether the specimen recorded is in fact the southern swamp orchid, given it is easy to confuse with the Christmas orchid if the specimen was not in flower. If the southern swamp orchid is verified to be present, and it is translocated, there is the risk that the plant will not survive the translocation process. Given the very small number of records for the species within the locality, should the translocation process be unsuccessful, this would result in a further reduction in the (already very small) total population occurring within the locality, and further risk of extinction of the plant within the IBRA subregion. As such, EESG, DPIE is of the view that the proposed translocation

should be considered as a loss of this plant and that further consideration is required on whether the project will have a significant effect on the southern swamp orchid.

Response

Spotted-tailed quoll is predicted to occur within most of the PCTs recorded within the study area and about 47.84 hectares of potentially suitable habitat for the spotted-tailed quoll occurs within the study area. No individuals were recorded within the targeted fauna surveys carried out across the study area. The PCTs that the spotted-tailed quoll is predicted to occur in within the study area are PCT670, PCT692, PCT695, PCT747, PCT1064, PCT1244, PCT1262, PCT1285, PCT1302.

The EPBC Act significant impact criteria was applied to the spotted-tailed quoll and is detailed in Appendix F of Appendix C, Updated biodiversity assessment report of the Amendment Report. It was determined that with suitable mitigation measures in place to reduce the impacts of habitat fragmentation on the spotted tailed quoll, the project would not result in a significant impact to the species.

Despite the project being assessed as not having a significant impact to spotted-tailed quoll under the EPBC Act, habitat for this species would still be impacted by the project. As such, it is proposed to provide offsets for the species habitat through ecosystem credits for potential suitable PCTs. The total ecosystem credits that would be provided for the species habitat is 2,903.

The orchid previously identified as southern swamp orchid has been confirmed as Christmas orchid and validated through genetic analysis received from the National Herbarium of Australia in February 2020. As such it was removed from the Appendix C, Updated biodiversity assessment report of the Amendment Report. Further detail is included in Section 4.2.4 of Appendix C, Updated biodiversity assessment report of the Amendment Report.

Avoidance and mitigation

Issue description

- EESG, DPIE is of the view that the project has sought to avoid and minimise impacts. The corridor selected for the construction of the project, and the suite of measures proposed to avoid and minimise impacts, including the construction of tunnels at Roberts Hill ridge, Shephards Lane and Gatelys Road, will substantially reduce the biodiversity impacts of the construction of the project, when compared to other route options originally considered, and the once proposed cut and cover tunnel construction method
- In addition, it appears that several measures and strategies to minimise the impact of the development on biodiversity values will be implemented via a comprehensive Threatened Species Management Plan. EESG, DPIE is satisfied with this approach.

Response

Noted.

Proposed biodiversity offsets

Issue description

- The offset strategy has been reviewed and it is satisfactory in meeting the credit obligations identified to date. However, the total number of ecosystem credits and species credits required to offset the impact of the project will need to be recalculated following satisfaction of EESG, DPIE requirements outlined in Attachment A of this submission. EESG, DPIE requirements may necessitate significant amendments to the Biodiversity Assessment Report and the re-running of the BioBanking Credit Calculator, along with likely amendments to the MNES assessment. It is also understood that the offset strategy is an iterative document that will be updated should detailed design result in changes to the anticipated impacts to biodiversity. In addition, the strategy will also be updated as more information comes to hand regarding the securing of the required ecosystem and species credits.

Response

The impacts and offset credit calculations have been updated based on revisions to vegetation community mapping and species credit species habitat polygon mapping. The revised credit calculations are summarised in Section 9 of Appendix C, Updated biodiversity assessment report of the Amendment Report, which also includes outputs from the BBAM calculator.

A BOS has been prepared and is included in Appendix C, Updated biodiversity assessment report of the Amendment Report. This BOS identifies the mechanism for delivery of offsets in accordance with the FBA, which has been endorsed by the Australian Government as part of the EPBC Act assessment bilateral agreement. The BOS establishes the process for identifying and securing offsets before commencement of the action.

Biodiversity offsets will be progressed and documented in accordance with the project's Conditions of Approval. TfNSW will continue to consult with EESG, DPIE.

3.5 Heritage NSW, Department of Premier and Cabinet

3.5.1 Non-Aboriginal cultural heritage

Issue description

The subject site is not listed on the State Heritage Register (SHR), and although it is noted that the High Conservation Value Old Growth Forest (SHR 01487), is in the vicinity of the project, there will be no physical impacts to this SHR item. There are no known historical archaeological sites requiring management. Therefore, no further Heritage NSW comments are required.

TfNSW does not need to refer subsequent stages of this proposal to the Heritage NSW.

Response

Noted.

3.6 NSW Environment Protection Authority

3.6.1 Construction

Out of hours work

Issue description

- It is recognised that there are some activities which may justifiably be carried out outside of standard hours however, since the majority of the alignment is a greenfield site, EPA expects that construction activities are carried out during standard hours wherever possible and work during the evening and night is kept to an absolute minimum
- Table 6-13 of the EIS includes refueling operations and maintenance as activities to occur out of normal hours in all areas to maximise plant and machinery operations and therefore reduce the overall duration of the project. The justification provided is not adequately supported by the Interim Construction Noise Guideline (DECC 2009b). A reduction in the overall duration of the project alone is not enough to justify this activity occurring out of hours.

Response

Wherever possible, construction activities would be carried out during standard hours with work during the evening and night periods kept to a minimum. However, as discussed in Chapter 6, Construction of the EIS, there are several activities which may need to be undertaken outside of standard hours because of technical, safety and/or environment and community related issues. Table 6-13 of the EIS provides justification for the activities and likely locations. The majority of these activities would be carried out between Korora Hill and Sapphire (ie not the greenfield section of the project) because of the need to coordinate work with existing Pacific Highway traffic (about 30,000 vehicles per day (vpd) at this location), road occupancy licence (ROL) restrictions needed to minimise road user delays and traffic queuing, and the need to consider safety of construction personnel and road users.

Other potentially long duration out of hours work includes tunnelling activities. Most of this work would be carried out within the tunnel excavation with acoustic sheds included around tunnel portals to shield noise from within the tunnel during evening and night periods to minimise impacts at nearby sensitive receivers. These acoustic sheds would be installed to minimise noise from within the tunnel during out of hours work and to meet the noise management level of the measured rating background level (RBL) + 5dB in accordance with the Interim Construction Noise Guideline. Further detail on the out of hours tunnelling activities is included in **Chapter 5, Clarifications, corrections and further information**.

In acknowledgment of the extent of out of hours work proposed, the following environmental management measures are proposed to help reduce potential noise impacts as a result of out of hours work:

- NV06: Implementation of an Out of Hours Work Procedure, including use of alternative plant and equipment and/or construction techniques to minimise noise, community notification and consultation requirements, use of temporary noise barriers and respite periods
- NV07: At-property operational noise mitigation measures will be implemented during the pre-construction and early construction phases of the project, where reasonable and feasible, to assist in reducing noise impacts associated with construction (including out of hours work). At-

property treatments will be prioritised for those properties likely to be most affected by construction noise impacts.

As discussed in Chapter 6, Construction of the EIS, undertaking refueling and maintenance activities outside of standard hours would maximise plant and machinery operations and therefore reduce the overall duration of the project. By reducing the overall duration of the project, the adjacent community would experience a reduced duration of amenity impacts and roads users would have the duration of construction traffic related impacts also reduced. Undertaking refueling and maintenance activities outside of standard hours also allows for the improved management of safety risks to construction personnel. When undertaken outside of standard hours, the interaction of refueling and maintenance activities with other main construction activities, eg bulk earthworks is removed and a safer work environment provided. In addition, refueling and maintenance activities have been typically undertaken outside of standard hours on Pacific Highway upgrade projects, eg Woolgoolga to Ballina project, and are effectively managed through the implementation of a NVMP and Out of Hours Work Procedure, as described in environmental management measure NV01 and NV06 (refer **Chapter 6, Revised environmental management measures**).

Enabling works

Issue description

- The EPA notes there are a number of potential enabling work activities listed, some of which would involve some significant construction activities and present substantial environmental risks. Bridge construction, tunnel preparatory work and earthwork associated with cuttings south of Roberts Hill and south of Korora pose a high level of risk. Table 6-2 in Chapter 6, Construction of the EIS suggests that these works could be carried out by construction contractors independent of the main construction works contractor
- Table 6-2 lists potential enabling work activities with a level of environmental risk high enough to warrant an approved Construction Environmental Management Plan (CEMP) and Environment Protection Licence (EPL). The EPA suggests that this aspect of the EIS be reviewed to minimise the number of activities that occur prior to the approval of a CEMP and issuing of an EPL.

Response

Table 6-2 (and Section 6.2.2) in Chapter 6, Construction of the EIS describes enabling work that is proposed to be carried out before the start of main construction work. This work is considered different to pre-construction activities which are typically of low impact to the community and environment and would not need an approved CEMP or EPL before commencement. Pre-construction activities are described in Section 6.4.1 in Chapter 6, Construction of the EIS and include activities such as survey work, site investigation, establishing ancillary facilities, utilities and implementation of management measures in advance of construction commencing.

The decision on possible staging of the enabling work described in Section 6.4.1 in Chapter 6, Construction of the EIS would be made after project approval and during the pre-construction stage. If a decision is made to stage the relevant work, a staging report would be prepared and would include the final description of the enabling work and refer to project conditions of approval. If there is potential for environmental impacts that have not been addressed as part of the EIS, consideration of these will be included within the staging report.

The staging report would be submitted to the Secretary of DPIE typically one month before commencement of construction. It is likely the enabling work described in Table 6-2 in Chapter 6, Construction of the EIS would be subject to approval of a CEMP and other relevant management plans (as described within the staging report). The need for an EPL for the enabling work would be discussed further with EPA once the final description is known.

Construction and ancillary facilities

Issue description

- In relation to Table 6-10 in Chapter 6, Construction of the EIS, the EPA notes that of the six potential ancillary sites identified for construction zone 2, all sites are less than 121 metres from the nearest residence with one having a residence next to the eastern boundary. Of the five ancillary sites identified in zone 3, all sites are less than 41 metres from the nearest residence. Given there will potentially be numerous occasions in zone 3 where out of hours works will be required, using any of these sites during the night may potentially impact on nearby residents.
- If one of these sites is required, the EPA recommends selecting a site which is the furthest from residents. Ensure at-property treatments are complete at eligible properties, particularly in zone 3, prior to operating the ancillary facility.

Response

As identified in Section 6.5 in Chapter 6, Construction of the EIS, the final use, locations and layout of ancillary facilities will be determined by the construction contractor(s). There are limited opportunities for alternative construction ancillary facility sites in construction zone 3 given the tightly constrained nature of the corridor and proximity of residences to the existing highway and the construction zone.

As identified in environmental management measure NV08, ancillary facilities will be designed to maximise the distance between primary noise sources within ancillary sites and nearby residences (where reasonable and feasible), with solid structures (shed, containers, etc.) placed between residences and noise sources (and as close to the noise sources as is practical). Any work outside of standard hours at the ancillary facility sites will be in accordance with the Out of Hours Work Procedure described in environmental management measure NV06.

In addition to the environmental management measures discussed above, a NVMP will be prepared and implemented as part of the CEMP. The plan will assist in ensuring noise associated with the operation of the ancillary facility sites will be minimised. The plan will provide details of relevant noise and vibration management measures for the ancillary facility sites and procedures to be carried out to minimise and manage noise impacts on adjacent sensitive receivers, including a monitoring program to assess performance against relevant noise and vibration criteria and a process for the implementation of respite periods to provide residents with respite from ongoing impacts where needed.

Additionally, the nearest sensitive receivers in construction zone 3 have also been identified for at-property treatment to manage operational noise impacts from the project. As identified in environmental management measure NV07, at-property operational noise mitigation measures will be implemented during the pre-construction and early construction phases of the project, where reasonable and feasible, to assist in reducing noise impacts associated with construction (including out of hours work). At-property treatments will be prioritised for those properties likely to be most affected by construction noise impacts for further noise and vibration environmental management measures, refer to **Chapter 6, Revised environmental management measures**.

Source of materials

Issue description

- In the EIS a number of quarries in the local area are listed as potential sources of material for the project. It is recommended that TfNSW put an effective process in place to verify and monitor the extraction limits of quarries providing material to the project. The process should allow for ongoing verification and monitoring to prevent the project from receiving material from potentially unlawful extraction activities.

Response

As discussed in Chapter 6, Construction of the EIS, there are several existing quarries near the project, and it is expected that sufficient material resources are available in the local area to build the project. Before sourcing material, TfNSW will ensure quarries supplying material to the project have the appropriate planning approvals and EPL (if required) in place for the amount of material being sourced for the project.

3.6.2 Noise and vibration

Kororo Public School bus interchange

Issue description

- In relation to the Kororo Public School bus interchange, TfNSW is requested to justify that it is a reasonable assumption that only one bus would enter and exit the bus interchange in a 15-minute period during peak usage for the school. Given that there are eight buses using the interchange in peak usage periods, it appears to be an underestimation that only one bus would enter and exit within a 15-minute period.

Response

The noise and vibration assessment for the project has been updated to incorporate the proposed design and construction changes documented in Chapter 2, Design changes of the Amendment Report. This includes an update to the industrial noise assessment carried out for the Kororo Public School bus interchange, which is based on up to eight buses using the bus interchange within a 15-minute period during peak usage periods. Assumptions of vehicle movements throughout the day used in the updated assessment are summarised below:

- During the morning peak period:
  - Eight buses entering the site during a 15-minute period (8am – 8.15am) and idling for the remainder of the period
  - Eight buses idling during the first 10 minutes of the following 15-minute period and departing simultaneously (8.25am).
- Up to three buses movements (entering, idling and departing) during a 15-minute period during the afternoon peak period (3.20pm – 3.40pm)
- One bus entering, idling and exiting the site within a 15-minute period during the evening time.

The updated industrial noise assessment is documented in Section 4.12 of Appendix B, Updated noise and vibration assessment of the Amendment Report. Predicted noise levels are expected to be below target criteria for all nearby receivers during the morning peak arrival period. Two receivers immediately south of the bus interchange are identified to exceed the daytime criterion during the morning peak departure period by 2 and 5 dB respectively at the first floor. An exceedance of up to 4 dB during the evening period for commuter bus operations is observed at the nearest affected receiver. Due to the identified exceedances and that the receivers do not qualify for at-property noise treatment, further investigation will be undertaken during detail design to manage this exceedance. This could include a combination of localised screening and at-property treatment options where reasonable and feasible. Refer to environmental management measure NV11 in **Chapter 6, Revised environmental management measures**.

Noise monitoring

Issue description

- There does not appear to be a consistent logic for excluding certain periods marked as extraneous in the noise monitoring graphs in Appendix D of the noise and vibration assessment (Appendix G of the EIS). There are multiple occasions where noise monitoring data are not excluded where wind speeds are above 5 m/s, without explanation. TfNSW is requested to review the data exclusion in the noise monitoring and provide an explanation of the process for excluding periods of noise monitoring data.

Response

The inconsistencies with data exclusion as described above are because of formatting issues with wind speeds on the noise logger data plots. When weather data was imported to Excel, formatting functions were applied to generate plots. These formatting functions failed to consistently display some wind speeds. Despite the formatting issues, the excluded periods are consistent with the weather data used for processing logger results. This means that although some wind speeds were not consistently displayed on plots, the data was still processed correctly and had no impact on results.

The formatting issue has been rectified and wind speed trace has been updated in logger graphs 5, 11, 12, 13, 16, 17, 19, 20 in Appendix D of Appendix B, Updated noise and vibration assessment of the Amendment Report.

Issue description

- The wind speed data presented for the June 2016 monitoring appears to show that there was a significant amount of time where the wind was in excess of 5 m/s. The periods excluded in the graphs in Appendix D (assumed to be those periods marked extraneous) indicate that in many cases only three to four valid days of data were collected. TfNSW should provide a justification that there is sufficient data to base both the background noise levels and noise modelling validation data on or provide additional data to support the assessment.

Response

As described above, the inconsistency is noted as being a result of formatting issues with wind speed on the noise logger data plots. Despite the formatting issues, the excluded periods are consistent with the weather data used for processing logger results. This means that although some wind speeds were not consistently displayed on plots, the data was still processed correctly and had no impact on results. These inconsistencies have been corrected in Appendix D of Appendix B, Updated noise and vibration assessment of the Amendment Report and have no impact on the results.

Location 5 and 17 are the only two locations where less than five days of data was collected. The data collected from these two locations is considered representative of the noise environment because only the 15-minute periods where extraneous data was identified were excluded from the assessment. The remaining data collected for the daytime/evening/night-time period is considered to be representative of the existing noise environment.

Location 5 was used for validation of the baseline noise model. The existing noise data collected at this location is sufficient to establish the trend of noise levels throughout the day and the baseline noise model results are consistent with the monitoring data. This indicates the monitoring data is sufficient at this location.

The noise monitoring data for Location 17 is consistent with the noise levels expected from a location in a rural setting where background noise level does not present a trending increase during the day and drop-off during night-time. The resulting low background noise is seldom subject to discrete noise events and the data is considered representative of a rural setting.

Notwithstanding the above, as identified in environmental management measure NV11 (refer **Chapter 6, Revised environmental management measures**), the operational noise mitigation measures will be confirmed during detailed design. This will involve an update to the noise model to incorporate the detailed design and include additional baseline and validation noise monitoring.

Issue description

- The wind speed data shown on the graphs in Appendix D are not consistent across all the monitoring data taken in June 2016. However, the noise report states that only one source of meteorological data was used. This indicates that there may have been an error in the noise monitoring processing. The data should be reprocessed using appropriate meteorological data and data exclusion rules. The potentially affected locations include but are not limited to Locations 9 to 11 and Locations 16 to 21.

Response

As described above, the inconsistency is noted as being a result of formatting issues with the wind speed on noise logger data plots. Despite the formatting issues, the excluded periods are consistent with the weather data used for processing logger results. This means that although some wind speeds were not consistently displayed on plots, the data was still processed correctly and had no impact on results.

Wind speed trace has been updated in logger graphs 5, 11, 12, 13, 16, 17, 19, 20 in Appendix D of Appendix B, Updated noise and vibration assessment of the Amendment Report. The excluded periods are consistent with the weather data used for processing logger results.

The data does not need to be reprocessed using appropriate meteorological data and exclusion rules, because the inconsistencies in the wind speed data on the graphs were a result of formatting issues. Those formatting issues have been addressed and the wind speed data is consistent with the weather data used for processing logger results.

Issue description

- Wind speed has not been included on the graphs of Locations 14, 15 and 21. TfNSW should update the graphs to include the wind speed, consistent with the other graphs in Appendix D of the noise and vibration assessment.

Response

Wind speed data has been included in plots for loggers 3, 8, 14, 15, 21 in Appendix B, Updated noise and vibration assessment of the Amendment Report.

Issue description

- Some of the noise monitoring data appears to be potentially affected by extraneous noise, other than caused by adverse meteorological conditions, which has not been marked extraneous in the graphs. For example:
    - Location 3 appears to have extraneous noise during some day, evening and night periods
    - Location 20 appears to have extraneous noise during some night periods
    - Location 21 appears to have been affected during the evening and some night periods.
- These periods may have been affected by insects or some other temporary or seasonal noise source. As a result, TfNSW should either provide a justification that the monitoring is representative of long-term background noise levels or provide additional data to support the assessment.

Response

All three examples provided by EPA correspond to noise monitoring locations used to measure background noise levels at areas away from traffic noise sources. For each of these locations, in addition to adverse weather conditions, extraneous noise data was excluded by identifying periods that show a significant variation from the monitoring trend at each location.

In the absence of recorded WAV files, it is not possible to definitively confirm noise contribution beyond attempting to discern patterns in the recorded data. It is noted that such trends are subject to a higher variance at rural locations such as these (eg remote from diurnal noise sources such as road traffic).

For each of these locations, where there was not a clear emerging pattern that indicated an extraneous event affecting the noise monitoring data, then the data was considered characteristic of the noise environment and representative of long-term background noise levels that may typically occur in rural areas. Also, the noise monitoring data at these locations are consistent with noise monitoring data from other similar locations in the study area, indicating the noise monitoring data is representative of long-term background noise levels for these locations.

Noise catchment areas and receivers

Issue description

- Noise catchment area (NCA) 09 is not marked on the maps in Appendix A.

Response

NCA09 has not been used for any of the noise sensitive receivers as stated in the footnotes in Tables 34, 35 and 37 of Appendix G, Noise and vibration assessment of the EIS. A footnote has been added to all maps in Appendix B, Updated noise and vibration assessment of the Amendment Report to clarify that NCA09 has not been used.

Issue description

- The maps in Appendix A of the Noise and vibration assessment do not show the full receiver ID number and receivers do not appear to be numbered in a logical way which makes finding receivers difficult. TfNSW is requested to review the maps in Appendix A and clarify the receiver numbering process.

Response

TfNSW understands the maps in Appendix A of EIS Appendix G, Noise and vibration assessment included labelling that made finding receivers difficult. These maps have been amended to include three-digit labels to assist in finding receivers and cross-referencing result tables. These amended maps have been included in Appendix B, Updated noise and vibration assessment of the Amendment Report.

Issue description

- TfNSW is requested to clarify the following issues identified with receivers in Appendix J of the Noise and vibration assessment:
    - There appear to be multiple receivers marked with an address of 9 Ballantine Drive in Appendix J. TfNSW is requested to review and clarify duplicate receiver addresses
    - There appears to be multiple receivers marked with an address of 11 Tranquility Drive, however there only appears to be one dwelling at the address. TfNSW is requested to review and clarify the identification of residential receivers.

Response

A full review of residential addresses and unique identifiers has been carried out in response to the issue raised by EPA and the references for identifying receivers have been updated to address these issues. The updated receiver classifications and unique identifiers are included in Appendix B, Updated noise and vibration assessment of the Amendment Report.

With regards to the two locations identified by EPA, please note the following clarifications:

- The property at 9 Ballantine Drive consists of seven residential units, which is the reason for multiple receivers at this location with the same address. The database used to derive unique addresses does not include differentiation between unit numbers, however these seven residential units have been assessed individually and property owners can identify each unit using the unique property ID for each building.
- Two buildings were identified within the residential lot at 11 Tranquillity Drive. A further review has resulted in one of these buildings being identified as a non-residential building (ie a garage). This non-residential building has been removed from the results and assessment of residential receivers in the updated noise and vibration assessment.

In response the issues raised by EPA, a detailed review of property addresses was carried out for the properties within the acoustic model extents. From this review it was identified that several buildings were incorrectly identified as residential receivers and these buildings were sheds or other non-residential structures. These buildings have been reclassified as non-residential buildings in the updated noise and vibration assessment for the project. These buildings are listed below:

- NCA20.RES.0004.01
- NCA06.RES.0029.01
- NCA24.RES.0092.01
- NCA06.RES.0001.01
- NCA25.RES.0212.01
- NCA26.RES.0159.01
- NCA29.RES.0010.01
- NCA25.RES.0249.01
- NCA26.RES.0110.01
- NCA27.RES.0014.01
- NCA27.RES.0016.01
- NCA27.RES.0023.01
- NCA27.RES.0024.01
- NCA27.RES.0025.01
- NCA27.RES.0026.01
- NCA27.RES.0027.01
- NCA27.RES.0029.01
- NCA27.RES.0056.01
- NCA27.RES.0057.01
- NCA27.RES.0030.01
- NCA27.RES.0069.01.

These changes to receiver classifications have been incorporated into the updated acoustic model for the project and used for updated the noise and vibration assessment in Appendix B, Updated noise and vibration assessment of the Amendment Report.

Operational noise assessment

Issue description

- There appears to be a typographical error in Table 32 for the calculated median of the Pacific Highway north of Coffs Harbour validation location during the night.

Response

TfNSW acknowledges there was a typographical error in Table 32 in Appendix G, Noise and vibration assessment of the EIS. This has been reviewed and the night-time median of Pacific Highway north of Coffs Harbour has been amended to 0.0 in Appendix B, Updated noise and vibration assessment of the Amendment Report. This typographical error has had no impact on the outcome of the assessment.

Issue description

- Inconsistencies were identified in the assessment of predicted noise levels in Appendix G of the noise and vibration assessment which require further clarification as follows:
    - There are receivers which have the same increase in noise level between build and no build scenarios that have different outcomes for the relative increase criteria
    - Receivers have been marked as exceeding the relative increase criteria which are not identified as being considered for further treatment
    - Receivers which have predicted an increase greater than the relative increase criteria, which have not been marked as exceeding the relative increase criteria nor identified for consideration of treatment.

Response

TfNSW acknowledges there were inconsistencies within Appendix G of Appendix G, Noise and vibration assessment of the EIS. Appendix B, Updated noise and vibration assessment of the Amendment Report has been updated to address these inconsistencies and provide further clarity to the results presented.

To provide further clarity, the column header 'Do noise levels exceed NCG relative increase criteria?' has been amended to read 'Is predicted noise level Build > No Build + 12dB?' to reflect the results presented in Appendix G of the updated noise and vibration assessment.

In response to the individual points raised by the EPA, the following explanation is provided:

- It should be noted that reported noise levels are rounded to whole numbers as per the Environmental Noise Management Manual (RTA 2001b). Because of rounding, it is possible for two receivers which have the same reported increase in noise level between build and no build scenarios to have different outcomes in the relative increase criteria columns. This is demonstrated below in **Table 3.6-1**
- It is acknowledged, in accordance with the Noise Mitigation Guideline (Roads and Maritime Services 2015a), there should be no receivers marked as exceeding the relative increase criteria which are not identified as being considered for further treatment. The tables in the EIS incorrectly displayed the results based on the difference between the no build and build cases based on the results to one decimal place, instead of to whole numbers as per the Environmental Noise Management Manual. This resulted in situations like Receiver 2 in **Table 3.6-1**, where the difference is greater than 12 dB when considering results to one decimal place but do not exceed 12 dB when using whole numbers. This has been reviewed and updated in Appendix B, Update noise and vibration assessment of the Amendment Report and this is no longer the case for any receiver. Note this update does not impact the outcome of the operational noise assessment
- It is possible for a receiver to exceed the no build noise level by more than 12 dB and not be flagged as exceeding the relative increase because the predicted noise levels are assessed as whole numbers. This is shown for Receiver 2 in Table **3.6-1.**

Table 3.6-1 Demonstration of how build and no build scenarios can have same increase in noise level but have different outcomes in relative increase criteria

Scenario	Receiver 1	Receiver 2
No build	36.4 (36)	36.6 (37)
Build	48.5 (49)	48.7 (49)
Difference	12.1	12.1
Criteria	48.4 (48)	48.6 (49)
Is predicted noise level Build > No Build + 12dB?	Yes	No
Scenario	36.4 (36)	36.6 (37)
No build	48.5 (49)	48.7 (49)

*Predicted noise level for each receiver is calculated with one decimal point in the acoustic model. Results in brackets are those presented in the report results table as per Environmental Noise Management Manual.

Based on the above explanation and the update to the presentation of results tables in Appendix B, Noise and vibration assessment of the Amendment Report, it is considered the perceived inconsistencies in presented results have been addressed.

Issue description

- TfNSW is requested to provide a reference for the heavy vehicle modification factors used in the noise modelling mentioned in Section 4.5 of the noise and vibration assessment.

Response

Heavy vehicle modification factors used in the noise modelling relies on guidance from a journal article written by J. Peng, J. Parnell and N. Kessissoglou titled, “A six-category heavy vehicle noise emission model in free-flowing condition,” published in Applied Acoustics in 2019. Further details for this reference can be found in **Chapter 8, References**. This reference has also been provided in the relevant section of Appendix B, Updated noise and vibration assessment of the Amendment Report.

Issue description

- TfNSW is requested to confirm the assessment of existing noise walls has considered earth berms/mounds that form part of the overall noise barrier height.

Response

Existing noise walls, for both the no-build and build (including retained and relocated noise walls), include any earth berms/mounds that form part of the overall noise barrier height. As noted in Section 4.8.2 of Appendix B, Updated noise and vibration assessment of the Amendment Report, at locations where the project extends over existing noise barriers (walls, mounds or a combination of both), the existing barrier top of height has been relocated to an adjacent location within the design after investigating the implementation of low noise pavement. The barrier top of height at the new location would be to the same top of height as the existing barrier, including any earth berms/mounds that form part of the overall noise barrier height.

Issue description

- If the project is approved, a requirement for an assessment of the final design and an assessment of noise levels once the project is completed should be included in any project approval conditions.

Response

This is considered a standard approval condition for SSI projects and has been reflected in environmental management measure NV12 (see **Chapter 6, Revised environmental management measures**).

Issue description

- The operational noise levels in the Road Noise Policy are set approximately at the point where the majority of a community would not be highly annoyed by the noise (DECCW 2011). An operational road satisfying the criteria will however be clearly audible and will change the acoustic environment of nearby lands. It is essential that EIS documentation assessing the noise impacts of the proposal makes this fact clear so that community engagement on the proposal is well informed.

Response

Noted. The following statement has been included in Section 3.1.1 of Appendix B, Updated noise and vibration assessment of the Amendment Report:

"The operational noise criteria in the Road Noise Policy aims to stop 90 per cent of the community from becoming highly annoyed by traffic noise. In principle, the intention is to protect existing quiet areas from excessive changes in acoustic amenity due to traffic noise.

It is noted that an operational road satisfying the criteria still has the potential to be audible in the vicinity of the road corridor".

Construction noise impacts

Issue description

- The EIS presents worst case noise impacts for receivers affected by construction noise over the four-year period of construction. However, due to the information constraints, it is not possible at this stage to determine how individual receivers would be affected over the course of construction. Therefore, TfNSW should provide a clear indication of the works that will affect receivers in each NCA, the time of day when the works will occur, the proposed duration they will be impacted and how often they will be impacted, including making distinctions between works that happen during and outside of standard construction hours. This information should be included in the construction noise management plan and form part of the community engagement strategy. The adoption of the provisions in the TfNSW Construction Noise and Vibration Guideline (Roads and Maritime Services 2016a) in any construction noise management plan should be considered to guide the provision of additional construction noise and vibration mitigation measures including: community engagement, notification (letterbox drop or equivalent), specific notifications, phone calls, individual briefings, respite offers (movie tickets, coffee vouchers, etc.), respite construction periods, duration respite, verification noise monitoring and the extreme measure of alternative accommodation. Site specific modifications to trigger thresholds in the guideline could be considered to account for the semi-rural nature of the receiver area.

Response

The project construction program and methodology have not been confirmed at this stage and it is therefore not possible to provide a more detailed assessment of potential construction noise and vibration impacts. Notwithstanding this, additional construction scenarios have been included in the updated noise and vibration assessment to provide information for both typical and worst-case impacts to noise sensitive receivers. The results of these additional assessments have been provided in Appendix B, Updated noise and vibration assessment of the Amendment Report.

Table 39 to Table 41 in Appendix B, Updated noise and vibration assessment of the Amendment Report, provide an overview of the main construction activities to be carried out within each construction zone. The relevant NCAs for each construction zone are listed below:

- Construction zone 1: NCA01 to NCA08 and NCA10[1]
- Construction zone 2: NCA11 to NCA19
- Construction zone 3: NCA20 to NCA29.

Table 42 in the updated noise and vibration assessment provides an overview of the anticipated construction activities likely to be used during construction of the project. It includes a list of typical

[1] As noted above in **Section 3.6.2**, NCA09 has not been used for any of the noise sensitive receivers.

construction activities and typical construction plant and equipment for each of the main components for construction of the project. It is noted that all noise sensitive receivers across the entire study area have been included in the assessment of construction noise impacts for all construction scenarios. All NCAs would be affected by construction noise for most construction scenarios. Noise impacts would be greater in NCAs immediately adjacent to more localised construction scenarios. The more localised construction scenarios and the affected NCAs are listed below:

- Tunnelling work: NCA06, NCA10, NCA11, and NCA15 to NCA20
- Bridge work: NCA06 to NCA08, NCA12 to NCA20, NCA23, NCA26 and NCA27
- Ancillary sites: NCA02, NCA06 to NCA08, NCA12 to NCA20, NCA23 and NCA26.

The descriptions of the construction activities, construction equipment and locations for where these activities would be carried out, along with the general construction timeline provided in Table 44 of the updated noise and vibration assessment have been provided to give an indication of the works that would affect receivers in each NCA, the time of day when those works would occur and likely duration of the works. Table 6-14 of Chapter 6, Construction of the EIS also provides estimated durations of out of hours work.

The information available to carry out the construction noise and vibration assessments is based on a concept design level of information. More detailed information on the types, timing and duration of construction activities and the associated potential noise and vibration impacts would be provided in the NVMP to be developed before construction starts.

As identified in environmental management measure NV01, a NVMP will be prepared and implemented in accordance with the Construction Noise and Vibration Guideline (Roads and Maritime Services 2016a), and the interim Construction Noise Guideline (DECC 2009b). Section 5.5 of Appendix B, Updated noise and vibration assessment of the Amendment Report specifically addresses out of hours work and Table 64 of the report provides standard noise mitigation measures in accordance with the Construction Noise and Vibration Guideline. These mitigation measures would be developed further as more detailed information on construction activities becomes available during the development of the detailed design.

As identified in environmental management measure SE01, consultation with potentially affected residences will be carried out before and during construction work in accordance with the community liaison implementation plan. The plan will be based on the draft Community consultation framework in Appendix D of the EIS. The plan would include specific information about the location of impacted properties with a register of potential construction impacts and timings, mitigation strategies to minimise impacts on stakeholders and procedures for managing and responding to enquiries and complaints. It will also include information on how the community will be notified of upcoming work and impacts along with the procedures for communicating the details of design and construction.

As identified in environmental management measure NV06, an Out of Hours Work Procedure will be included as part of the NVMP. This procedure would complement the community liaison implementation plan and would include specific information about notification and consultation requirements (including a six month ‘look ahead’ program for likely out of hours work), respite periods, offers of good will, and offers of reasonable and temporary alternative accommodation.

For further information refer to **Chapter 6, Revised environmental management measures**.

Maximum noise levels

Issue description

- Section 4.9 of the Noise and vibration assessment provides significant commentary on the potential changes in impacts at receivers adjacent to the existing Pacific Highway however, the report does not sufficiently address the potential impacts on those receivers adjacent to the new sections of the bypass which do not currently experience significant maximum noise events. TfNSW should provide clear and concise summaries regarding the impact from maximum noise levels on greenfield areas of the project and provide commentary on how the proposed mitigation measures for other operational noise levels would affect maximum noise levels.

Response

Assessment of maximum noise levels has been carried out in accordance with provisions of the Environmental Noise Management Manual (RTA 2001b) where it is possible to carry out measurements of existing maximum noise exposure. Extrapolation of this quantitative assessment to locations where maximum noise impacts from road traffic are not a feature of the prevailing ambient environment is not feasible as there is no road traffic to measure.

Section 4.10 of Appendix B, Updated noise and vibration assessment of the Amendment Report notes that locations which are not currently near major sources of industrial or road traffic noise (ie greenfield areas) would likely experience a greater change in the acoustic environment than those adjacent to major sources of noise such as the existing Pacific Highway. Consequently, the project has more stringent noise criteria in these locations and corresponding noise mitigation measures.

The Environmental Noise Management Manual acknowledges the maximum noise assessment should be used as a tool to help prioritise and rank mitigation strategies but should not be applied as a decisive criterion in itself. Section 5.1 of the NSW Road Noise Policy (DECCW 2011) identifies treatment to dwellings as being appropriate to mitigate against maximum noise impacts from road traffic.

The noise and vibration assessment prepared for the EIS and updated for the Amendment Report has identified receivers which qualify for at-property treatment because of the project. The implementation of at-property treatments is significant within greenfield areas (refer to Appendix B, Updated noise and vibration assessment of the Amendment Report) and is largely regarded as a prioritised mitigation measure for maximum noise events such as compression braking. The extent of at-property treatment is extensive in greenfield sites because of the more stringent noise criteria being applied in this section of the project.

The most effective measure for addressing engine brake noise is at the source through Australian Design Rules (ADR) and in-service standard for engine brake noise. These measures are outside the scope of the project. However, it is noted the character of maximum noise level events related to traffic noise would be affected by design features such as road gradients and areas that cause vehicle acceleration or deceleration. Through the design process and by incorporating tunnels into the project with lower and flatter grades, eliminating tighter curves and integrating the project with the natural terrain, the project has already implemented design measures to help reduce peak noise events/engine brake noise.

Generally, signage is found across the Pacific Highway indicating areas of noise sensitive receivers where maximum noise level events such as compression braking should be limited to reduce the number of adverse noise impacts.

Issue description

- Section 4.9.3 of the noise and vibration assessment presents some data which concludes that noise levels from compression braking is not significantly higher than non-compression braking events for vehicles travelling downhill. However, the noise monitoring data of maximum noise level events in Appendix I show that at the majority of monitoring locations, the emergence of maximum noise events is greater than 15 dB above the Leq,1hour noise level. In light of this, TfNSW is requested to comment on how the data presented in Section 4.9.3 is relevant to the measured data on the existing Pacific Highway in Appendix I of the noise and vibration assessment. TfNSW should also explain how the measured data has been taken into consideration to rank and prioritise design options and noise mitigation strategies.

Response

This comment specifically refers to Section 4.9.3 and Appendix I of Appendix G, Noise and vibration assessment of the EIS and the relationship between the two. It is important to note these sections of the report are mutually exclusive and not directly comparable. This is explained further below to provide clarity.

The maximum noise level assessment documented in the two report sections identified above are based on two independent information sources which represent two different approaches to assessment:

- Section 4.9.3 of the report is based on a study produced by the Transportation Research Board and presents differences in overall maximum noise level for various events (eg pass-by's and compression braking) and uses the acoustical parameter L_A,dB(A). This data aims to highlight potential difference in maximum noise impact for individual event types
- Appendix I of the report is based on site measurements carried out at locations adjacent to the existing Pacific Highway and presents an hourly noise level logarithmic average ($L_{eq,1h}$) and a linear average of individual maximum noise level events (L_{max}). This data aims to highlight existing emergence of maximum noise level events (compression braking or otherwise) above energy averaged traffic levels for comparison against Environmental Noise Management Manual criteria.

Based on the above, the information presented in Section 4.9.3 is not directly related to the data presented in Appendix I but rather supplementary information to provide further insight into potential impacts because of different maximum noise events.

As noted in the response to the previous issue, the implementation of at-property treatments is largely regarded as a prioritised mitigation measure for maximum noise events such as compression braking and is significant for the project, particularly within greenfield areas. The extent of at-property treatment is extensive in greenfield sites because of the more stringent noise criteria being applied in this section of the project.

Tunnel ventilation fans

Issue description

- Section 3.1.4.5 of Appendix G, noise and vibration assessment states the project noise trigger level for the Shephards Lane and Gatelys Road tunnel portals have not had the duration correction applied. However, in Section 4.11.2 a 5 dB correction has been applied to the Noise Policy for Industry (EPA, 2017) project noise trigger level

- Using the upper estimate of operational times of one hour operation means the project noise trigger level would be $L_{eq,\ 15\ min}$ 42 dBA with a duration correction. The information in Section 4.11.2 implies a predicted noise level from the fans of 44 dBA at the nearest receiver, which is a 2 dB exceedance. TfNSW should continue to review reasonable and feasible noise mitigation for the tunnel ventilation fans as part of the detailed design process for the fans to meet the requirements of the Noise Policy for Industry.

Response

The industrial noise criteria have been set in accordance with the Noise Policy for Industry for NCAs and this information is provided in Section 3.1.4.5 of Appendix B, Updated noise and vibration assessment of the Amendment Report. Duration corrections have not been applied to the baseline industrial noise criteria because duration corrections would not apply to all industrial noise sources within a given NCA. Duration corrections are applied in addition to the baseline industrial noise criteria and only apply to specific sources that are expected to operate for short durations. The duration correction factors to be applied for a given duration of a noise event are provided in Section 3.1.4.3 of the updated noise and vibration assessment.

Jet fans would be operated in the unlikely event of a fire to prevent smoke spreading to where traffic is likely to be stopped behind an incident and to prevent smoke from entering the adjacent tunnel, or during routine maintenance testing of the jet fans. The most common occurrence for the operation of jet fans would be during routine maintenance testing of the jet fans and the testing procedures would be designed to occur during the daytime period and for a duration not longer than one hour. In accordance with the Noise Policy for Industry, assuming the jet fans would operate for less than an hour, the appropriate duration correction to be applied to the baseline noise criteria is +5 dB.

With respect to the EPA comment about the project noise trigger level for the operation of jet fans, because the duration for operation of the jet fans is expected to be less than an hour, the duration correction to be applied to the baseline industrial noise criteria is +5 dB. This means the project noise trigger level would be 45 dB(A) $L_{eq,\ 15\ min}$ in accordance with the Noise Policy for Industry.

Notwithstanding, further analysis of noise emissions from in-tunnel jet fans would be carried out during detailed design. Based on the outcomes of the further analysis any mitigation measures will be confirmed as part of environmental management measure NV11 (see **Chapter 6, Revised environmental management measures**).

Construction impacts

Issue description

- Table 48 appears to include construction equipment that is not used in any of the scenarios. TfNSW is requested to clarify this.

Response

It is acknowledged that Table 48 includes construction equipment which is not listed under any of the construction scenarios. The equipment which has been listed but not used in any of the scenarios has been included to:

- Provide an indicative noise level from an alternative construction method, eg bored vs impact piling rig
- Compare noise impacts from equipment used for similar purposes with little difference in noise level, eg concrete vs asphalt batching plant
- Compare noise impacts from two pieces of equipment with significantly different noise level, eg percussive vs hydraulic drills.

Information has therefore been retained in Appendix B, Updated noise and vibration assessment of the Amendment Report to provide further context for scenarios beyond those presented in the assessment.

Issue description

- The total sound power levels of the $L_{eq,\ 15\ min}$ and L_{max} levels for each construction scenario in Table 48 requires further clarification. In a number of cases the total L_{max} level is lower than the $L_{eq,15\ min}$ level, which would not be observed if measured in the field. TfNSW is requested to clarify this approach and comment on how this would affect the management of sleep disturbance from construction activities.

Response

As identified by EPA, it is acknowledged the some of the assessment results provide in Table 48 of Appendix G, Noise and vibration assessment of the EIS are not intuitive. Further explanation of how construction noise impacts have been calculated is provided below to provide clarity.

The total sound power level for each construction scenario is calculated as follows:

- Calculation of activity $L_{eq,15min}$ considers a correction of number of units and penalties for tonality, eg $L_{eq,15min}$ for four dump trucks (108 dBA each) = 114 dBA. This is to address energy averaged noise impacts across a 15-minute period
- Calculation of activity L_{max} considers maximum level of individual loudest equipment units, eg L_{max} for four dump trucks (112 dBA each) = 112 dBA. This is to address maximum noise impacts from any one piece of machinery at a given moment (ie not energy averaged).

Propagation of the sound power level of each source is calculated as follows:

- $L_{eq,15min}$ propagation considers the sound power noise level spread across the construction area
- L_{max} propagation considers the maximum sound power noise level placed at the construction area boundary (ie closest to the nearest receiver).

The outcome of this approach is observed graphically in the construction noise contours provided in Appendix J of Appendix B, Updated noise and vibration assessment of the Amendment Report. Despite the $L_{eq,15min}$ sound power source being greater than the L_{max} in some cases, the resulting contours show a greater impact from the L_{max} relative to the Leq,15min.

The sleep disturbance assessment of construction noise impacts provided in Section 5.2.2 of Appendix B, Updated noise and vibration assessment of the Amendment Report does not consider the predicted L_{eq} predictions or the relationship to the predicted L_{max}. This assessment has been carried out using the Interim Construction Noise Guideline and Construction Noise and Vibration Guideline 'screening criterion' of RBL + 15 dB and maximum external 65 dB(A) criterion (awakening reaction) against the predicted L_{max} level.

Issue description

- TfNSW is requested to review the values in Table 50. Review of the noise contour and receiver maps in Appendix J and Appendix A within the noise and vibration assessment respectively indicates that some numbers in Table 50 are not consistent with the maps. For example, Table 50 states that there will be 192 receivers impacted above the NMLs in NCA27, however there appears to be less than 110 receivers in this NCA. Another example is that Table 50 states that there will be 215 receivers impacted above the NML in NCA 18, however there appears to be more than this number indicated on the contour maps in Appendix J of the noise and vibration assessment.

Response

It is acknowledged there were inconsistencies between the tables and maps for construction noise affected receivers. This discrepancy was because of a transcription error resulting in some numbers in Table 50 not being consistent with the construction noise assessment maps provided. A review of Tables 49 to 56 of Appendix G, Noise and vibration assessment of the EIS has been carried out and the tables and maps have been updated to correct this. Updated tables and maps are available within Appendix B, Updated noise and vibration assessment of the Amendment Report.

Issue description

- It is not clear why West High Street has been excluded from the construction traffic noise assessment as stated in the note to Table 47. The assessment area for road traffic noise is defined as 600 metres from the centreline of the outermost traffic lane on each side of the subject road. It follows that the assessment area for construction traffic noise is not defined by the assessment area of the bypass but should be defined by roads potentially impacted by additional construction vehicles. In this case, West High Street would be a subject road because there is potential for the project to create noise impacts on it. TfNSW is requested to update the assessment accordingly in consideration of this.

Response

It is acknowledged the EIS did not incorporate all construction haulage routes outside the 600 metre study area and this omission has been addressed in the updated noise and vibration assessment as part of the Amendment Report. The updated construction traffic noise assessment in Appendix B, Updated noise and vibration assessment of the Amendment Report includes all construction haulage routes (see Table 47 and Figure 18) potentially impacted by additional construction vehicles.

These additional haulage routes include the following:

- West High Street
- Bray Street
- Buchanans Road
- Gatelys Road.

It should be noted that the inclusion of Buchanans Road and Gatelys Road is from further constructability reviews undertaken following EIS exhibition and are not roads identified the EIS. Refer to Chapter 3, Construction updates of the Amendment Report for further information.

Environmental management measures

Issue description

The EPA encourages TfNSW to maximise the number of properties eligible for at-property treatments have treatments completed prior to commencing out-of-hours works in areas where residents are likely to be highly impacted. The proponent must ensure the (NVMP) incorporates the principles of the Interim Construction Noise Guidelines.

- Mitigation measure NV01 of Chapter 9 of the EIS states a construction NVMP will be prepared and implemented in accordance with the Construction Noise and Vibration Guideline (Roads and Maritime Services 2016a). There is no reference here of the Interim Construction Noise Guidelines (DECC 2009b)

- Mitigation measure NV07 says at-property operational noise mitigation measures will be implemented during the pre-construction and early construction phases of the project, where reasonable and feasible, to assist in reducing noise impacts associated with construction (including out of hours work). At-property treatments will be prioritised for those properties likely to be most affected by construction noise impacts.
- Mitigation measure NV06 refers to TfNSW guideline documents only and makes no mention of the Interim Construction Noise Guideline.

Response

The project is committed to following the Construction Noise and Vibration Guideline (Roads and Maritime Services, 2016a). As noted in Appendix B, Updated noise and vibration assessment of the Amendment Report, in accordance with the Construction Noise and Vibration Guideline, construction noise management levels are to be established in accordance with the Interim Construction Noise Guideline. The Interim Construction Noise Guideline calls for the application of feasible and reasonable measures to mitigate construction noise and vibration. The Construction Noise and Vibration Guideline provides the detail needed to identify feasible and reasonable noise mitigation measures for construction, minor works and maintenance projects. As such, the NVMP will incorporate the principles of the Interim Construction Noise Guideline.

Notwithstanding, environmental management measures NV01 and NV06 have been updated to include a reference to the Interim Construction Noise Guideline. The updated environmental management measures are in **Chapter 6, Revised environmental management measures**.

As identified in environmental management measure NV07, at-property operational noise mitigation measures will be implemented during the pre-construction and early construction phases of the project, where reasonable and feasible, to assist in reducing noise impacts associated with construction (including out of hours work). At-property treatments will be prioritised for those properties likely to be most affected by construction noise impacts. For the purposes of this environmental management measure, early construction phases of the project would typically mean within nine to 12 months following commencement of construction, where reasonable and feasible.

3.6.3 Flooding and hydrology

Temporary waterway crossings

Issue description

- In relation to FH03, the EPA considers the loss of sediment to waterways that originates from, on or adjacent to temporary crossings to be a risk to the environment during construction. The typical design for a temporary crossing in Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom 2004) is unlikely to provide an appropriate level of protection given the volume and intensity of rainfall in the Coffs Harbour region, the extended period of time that the crossings are likely to remain in place and the impact of heavy vehicles utilising the crossings
- The EPA notes that “Erosion and sediment controls will be included in accordance with Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom 2004) and Volume 2 (A. Installation of Services; B. Waste Landfills; C. Unsealed Roads; D. Main Roads; E. Mines and Quarries) (DECC 2008)”

- The EPA considers that the loss of sediment to waterways that originates from, on or adjacent to temporary crossings is a risk to the environment during construction. The typical design for a temporary crossing in Volume 1 is unlikely to provide an appropriate level of protection given the volume and intensity of rainfall in the Coffs Harbour region, the extended period of time that the crossings are likely to remain in place and the impact of heavy vehicles utilising the crossings. The EPA seeks clarification on the design principles for temporary crossings. The EPA seeks clarification on the rainfall intensity event that temporary waterway crossings will be designed to. For example, would they be designed to convey water and remain structurally sound in a 1 in 2 year storm event or a 1 in 10 year event?

Response

The construction and operation of temporary waterway crossings was identified as an activity that had a high risk of impacting water quality during construction and assessed in Section 19.3.1 of Chapter 19, Surface water quality of the EIS. While it was considered that this activity is unlikely to result in a significant impact to water quality in receiving environments, there would remain the potential for sediments to be released into receiving environments.

Detail on temporary waterway crossings was included in Chapter 6, Construction of the EIS. This provided a number of requirements for the design, construction and operation of the crossings, which were included in environmental management measure FH03. The requirements include::

- Low-flow conditions would be maintained
- Fish passage would be maintained in accordance with the waterway classification and DPIE (Regions, Industry, Agriculture and Resources) guideline Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (Fairfull & Witheridge 2003)
- Material used in temporary crossings would be selected to minimise risk of fine sediment material entering the waterway
- Include erosion and sediment controls in accordance with Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom 2004)
- Any material used in the temporary creek crossing would be removed following construction and the site rehabilitated to its existing condition.

The above requirements will be supplemented by learnings from the Woolgoolga to Ballina Pacific Highway upgrade project, specifically the requirements of the Technical Briefing Note: Temporary Waterway Crossings Minimum Standards (Pacific Complete 2017) developed in consultation with EPA and other relevant government agencies.

A number of environmental management measures have also been proposed as part of the EIS to minimise the potential impact from temporary waterway crossings. The key management measures include:

- SC04 and SC05: A Soil and Water Management Plan (SWMP) and primary Erosion and Sediment Control Plan (ESCP) would provide the overarching management documents for identifying sediment and water quality risks associated with the establishment and operation of temporary waterway crossings. The plans would also describe the site-specific management measures and general monitoring requirements

- SW04: A detailed Environmental Work Method Statement (EWMS) will be prepared and implemented for the establishment of the temporary waterway crossings. The EWMS would incorporate relevant mitigation measures and controls from the SWMP and ESCP and would be specifically prepared to communicate site-specific requirements, actions, processes and controls to construction personnel using plans, diagrams and simply written instructions.

The above requirements for temporary waterway crossings and key management measures supplemented by best management practice adopted from other Pacific Highway upgrade projects is considered appropriate to identify and manage the risks identified by EPA and allow for site-specific temporary waterway crossings to be constructed and operated for the project. EPA and other relevant government agencies would be consulted further during detailed design and construction to ensure temporary waterway crossings are adequately designed and operated.

In addition, temporary waterway crossings would generally be designed for a 10-year average recurrence interval (ARI) storm event if the crossing was proposed to remain in place for less than or equal to 12 months. For crossings expected to be in place for greater than 12 months, a 20-year ARI storm event would be used. Consideration of the appropriate storm event would be undertaken when preparing the EWMS describe above.

For further information refer to **Chapter 6, Revised environmental management measures**.

3.6.4 Surface water quality

Operational water quality design

Issue description

- Recent learnings relating to spill containment drainage systems have occurred on the Woolgoolga to Ballina Pacific Highway upgrade project. The design included a system which used a series of Ellis pipes set on an angle to allow structures to drain water but retain a hydrocarbon spill within the structure. Government agencies including the EPA identified a number of issues with this design during construction including the failure to adequately capture a 40,000 litre spill event as intended. The EPA seeks clarification on the design of swales.

Response

Chapter 5, Project description of the EIS identified the operational water quality management strategy for the project. This included the need for operational water quality basins and proprietary spill capture units to be designed to accommodate a spill volume of up to 40,000 litre which would contain a major accidental spill from a traffic accident.

The location of the operational water quality basins and proprietary spill capture units has been revised as part of the amended design. Figures 5.12-1-01 to 5.12-1-06 of the Amendment Report provides indicative locations for the operational water quality basins and proprietary spill capture units as part of the amended design These have generally been located near waterways/drainage lines within all sub-catchments that drain into the Solitary Islands Marine Park and/or where the project crosses Class 1 or Class 2 waterways classified in accordance with the Policy and Guidelines for Fish Habitat Conservation and Management (DPI 2013).

The spill containment design would continue to be developed as part of detailed design, this would include a combination of basins, gross pollutant traps and swales. This would be carried out in accordance with environmental management measures SW07 and SW08 and would include consultation with EPA and other relevant government agencies as needed (see **Chapter, 6 Revised environmental management measures**).

General environmental management measures

Issue description

- In relation to SW05, the EPA recommends a number of additional mulch management measures be taken into consideration to provide a higher level of protection to the environment. [2]

Response

In response to this issue and the need to provide a higher level of protection to the environment, environmental management measure SW05 has been revised to include consideration of EPA's mulch management measures and a commitment to develop a procedure to manage tannins from vegetation mulch provided. The procedure will form part of the SWMP which will be prepared in consultation with EPA. For further information refer to **Chapter 6, Revised environmental management measures**.

Issue description

- In relation to SW04, the mitigation measure should also consider the relevant principles within the Blue Book - Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom 2004) to ensure erosion and sediment control management measures are suitable to manage the risks.

Response

In response to this issue, SW04 has been revised to include consideration of the relevant principles of the Blue Book – Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom, 2004). For further information refer to **Chapter 6, Revised environmental management measures**.

Issue description

- The EPA recommends the inclusion of a condition to facilitate the re-use of root balls. During vegetation clearing, timber and root balls must be retained for reuse in habitat enhancement and rehabilitation work. The retained timber and root balls may be used on or off the project site. TfNSW must consult with community and land care groups and government agencies to determine if retained timber and root balls can be used for environmental rehabilitation projects, before pursuing other disposal options.

Response

As described in **Section 3.1.12** in a response to a similar issue raised by CHCC, millable timber or timber with specific habitat value (eg root balls) will be salvaged as part of the clearing operations of the project. There are several opportunities to re-use salvaged timber in ecological restoration, including the re-use of timber for habitat enhancement within the construction footprint, use as fauna furniture associated with fauna connectivity structures and use in the design of waterway realignments as soft engineering techniques.

Environmental management measure FF04 states that habitat would be replaced or re-instated in accordance with Guide 5: Re-use of woody debris and bushrock of the Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects (RTA 2011a). The approach outlined in this guideline can be extended to salvaging some habitat logs such as root balls and providing them for re-use to CHCC and other organisations where these organisations have the capacity to accept this material. Refer to **Chapter 6, Revised environmental management measures** for further information.

[2] For more information relating to the details contained in the submission provided by EPA refer to following website for the full submission https://www.planningportal.nsw.gov.au/major-projects.

Erosion and sediment control management measures

Issue description

- Where site constraints preclude installation of basins designed consistent with DECC (2008), including the 95th percentile rainfall event for sensitive receiving environments and the 90th percentile rainfall event for standard receiving environments, this is clearly documented, and enhanced erosion measures are detailed and implemented.

Response

Sediment basins will be needed for most catchments disturbed during construction (indicative basin locations are shown in Figure 5.12-1-01 to Figure 5.12-1-06 of the Amendment Report). The final location and size of all sediment basins would be determined during detailed design. Sediment basins would be designed to contain the five-day 90th percentile rainfall event within all sub-catchments that drain into the Solitary Islands Marine Park. All other sub-catchments would include sediment basins designed for five-day 85th percentile rainfall event.

The use of the five-day 95th percentile rainfall event for sensitive receiving environments (ie Solitary Islands Marine Park) and the five-day 90th percentile rainfall event for standard receiving environments to design sediment basins is not considered reasonable for the project. As detailed in the Blue Book – Managing Urban Stormwater: Soils and Construction Volume 2D Main road construction (DECC 2008), the use of the five-day 95th/90th percentile rainfall events for sediment basin design relates to catchments that are disturbed for greater than three years. While the construction period for the project is proposed to be four to five years it is unlikely that a single sub-catchment within the construction footprint would remain exposed for longer than three years. Subsequently, it is unlikely that any single sediment basin would be in use for longer than three years. As such, the use of the five-day 90th/85th percentile rainfall events for sensitive and standard receiving environments is considered a more balanced approach to protecting the environment and minimising property acquisition and construction costs associated with very large sediment basins that would be needed if the five-day 95th/90th percentile rainfall events is applied.

Notwithstanding, as described in the Chapter 19, Surface water quality of the EIS (see Section 19.3.1), there would be occurrences when the required sediment basin cannot be provided due to site constraints. Where this is the case, TfNSW has committed to alternative erosion and sediment control measures including undersized sediment basins, sediment sumps, mulch bunds, sediment fences or similar combinations of thereof being used. However, to manage potential associated risks, enhanced erosion control measures and best management practice, such as limiting the size of disturbed land at any one time, would also be implemented. The enhanced erosion control measures will be mainly in the form of temporary ground cover and/or soil binders over high-risk areas (ie steep (>30 per cent) batters and concentrated flowpaths) whenever significant rainfall is imminent.

As detailed in Chapter 6, Construction of the EIS (see Section 6.8.3), an Erosion and Sediment Management Report was prepared for the project in accordance with the Blue Book – Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom 2004). This report detailed the methods that would be implemented to mitigate and manage potential erosion and sedimentation impacts from the project, including impacts to water quality. Due to the development of the proposed design and construction changes detailed in the Amendment Report, the Erosion and Sediment Management Report has been updated and is provided as **Appendix B, Updated erosion and sediment management report**. The updated Erosion and Sediment Management Report provides further detail on the above.

Issue description

- For catchments that drain directly to the Solitary Island Marine Park, the EPA recommends the use of enhanced erosion and sediment control measures are clearly documented, including an emphasis on management principles such as erosion control as a pollution prevention strategy.

Response

Chapter 19, Surface water quality of the EIS addresses the potential impacts to Solitary Island Marine Park during construction. As a result of the sensitivity of the Solitary Island Marine Park and potential water quality impacts during construction, TfNSW has committed to designing sediment basins to contain the five-day 90th percentile rainfall event within all sub-catchments that drain into the marine park. This area includes from north of Roberts Hill ridge to the northern extent of the project which equates to about 50 per cent of the construction footprint.

As described above, where a five-day 90th percentile sediment basin cannot be provided due to site constraints, TfNSW has committed to alternative erosion and sediment control measures, enhanced erosion control measures and best management practice to minimise the potential water quality impacts during construction.

In addition, the SWMP and associated ESCP would provide the overarching management documents for identifying sediment and water quality risks and a pollution prevention strategy associated with working in the sub-catchments that drain into the Solitary Island Marine Park. The plans would describe the site-specific management measures and general monitoring requirements to ensure the implemented controls are effective. Refer to **Chapter 6, Revised environmental management measures** and **Appendix B, Updated erosion and sediment management report** for further information.

Issue description

- The use of high efficiency sediment basins should be considered.

Response

The use of high efficiency sediment basins was investigated during the preparation of the Erosion and Sediment Management Report for the project. However, the investigation did not support further consideration due to:

- The existing topography (high efficiency sediment basins typically require more flat terrain when compared to the existing topography of the project)
- The characteristic high intensity rainfall experienced for Coffs Harbour - high efficiency sediment basins general do not perform well with high intensity rainfall events
- Limited space due to constrained construction footprint, which limits the shape, size and inlet point(s) available for many sediment basins – high efficiency sediment basins must have an inlet forebay and all inflows must be into that forebay
- Potential management issues associated with the use of high-efficiency coagulants and flocculants.

Stormwater discharges

Issue description

- Identify and estimate the quality and quantity of all pollutants that may be introduced into the water cycle by source and discharge point and describe the nature and degree of impact that any discharge(s) may have on the receiving environment, including consideration of all pollutants that pose a risk of non - trivial harm to human health and the environment

- Assessment of the potential impact of discharges on the environmental values of the receiving waterway should be done with reference to the national Water Quality Guideline criteria for relevant chemical and non-chemical parameters, including average or typical through to worst-case scenarios
- Where a mixing zone is required, demonstrate how the national Water Quality Guideline criteria for relevant chemical and non-chemical parameters are met at the edge of the initial mixing zone of the discharge
- Demonstrate how the proposal will be designed and operated to:
    - Protect the Water Quality Objectives for receiving waters where they are currently being achieved
    - Contribute towards achievement of the Water Quality Objectives over time where they are not currently being achieved.
- Demonstrate that all practical and reasonable measures to avoid or minimise water pollution and protect human health and the environment from harm are investigated and implemented.

Response

As described in Chapter 19, Surface water quality of the EIS, construction phase impacts to surface water quality in waterways and sensitive receiving environments were identified through the development of a conceptual Erosion and Sediment Management Report (SEEC 2019), which included a preliminary ESCP identifying treatment and mitigation strategies.

As part of the preparation of the Erosion and Sediment Management Report, preliminary water quality modelling of the proposed construction-phase sediment basin discharge limits was also carried out using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) to assess against the NSW Water Quality Objectives (NSW WQOs). Similar to the operational modelling, the three pollutants of concern assessed for the construction phase were total suspended solids (TSS), total nitrogen (TN) and total phosphorous (TP).

As discussed above, the Erosion and Sediment Management Report has been updated due to the development of the proposed design and construction changes detailed in the Amendment Report (see **Appendix B, Updated erosion and sediment management report**). Accordingly, an Updated Construction Sediment Basin Discharge Assessment Report has been prepared and is included as **Appendix C, Construction sediment basin discharge assessment report**.

The updated Construction Sediment Basin Discharge Assessment Report expands on the assessment prepared for the EIS and considers issues and recommendations raised by EPA. Specifically, the updated Construction Sediment Basin Discharge Assessment Report has been prepared to:

- Assess water quality issues associated with discharge from sediment control structures to be constructed as part of the project against the NSW WQOs
- Consider the sensitive receiving environments of Solitary Islands Marine Park and wetlands identified under the State Environmental Planning Policy (Coastal Management) 2018 (Coastal Management SEPP wetlands) including Boambee wetlands, Coffs Creek wetlands and Pine Brush Creek wetlands
- Address the project SEARs as relevant
- Meet the 10 steps to implement the Water Quality Management Framework as the part of the National Water Quality Management Strategy.

MUSIC modelling was carried out to assess the impacts of proposed construction sediment basin discharge limits on the receiving environment of the project and determine whether the recommended discharge limit for TSS (ie 50 mg/L) from the Blue Book – Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom 2004) is appropriate for this site or needs to be amended to account for the NSW WQOs in the receiving environment and the potential for impacts on watercourses as a result of sediment basin discharges. The catchments modelled are similar to those included in the EIS and consists of Boambee Creek, Coffs Creek and Korora Basin.

In conducting the modelling, the assessment focused on the three pollutants of concern for the construction phase of the project (TSS, TP and TN). Other pollutants and key indicators such as pH, conductivity, visual clarity and colour, temperature that may be introduced into the water cycle by source and discharge points were also qualitatively assessed and are detailed in Section 10 of **Appendix C, Construction sediment basin discharge assessment report**. The assessment describes the potential impact on the receiving environment and to human health.

Similar to the assessment described in Chapter 19, Surface water quality of the EIS, the construction phase sediment basins are assumed to be discharged within five days of the cessation of a rainfall event when the receiving water quality is at (or below) the proposed discharge limit of 50 mg/L. The construction-phase basin discharge has been assumed to be completed using a nominal pump rate over a 24-48 hour period.

Results are provided for flows from the upstream catchment on discharge days (ie basin discharge after treatment, not overflows from rainfall in excess of the basin design event). As a comparison, results are also provided for all days modelled (ie all events including discharge days and basin overflows during heavy rain events). See **Table 3.6-2** for a summary of MUSIC modelling results for Boambee Creek, Coffs Creek and Korora Basin catchments. Refer to **Appendix C, Construction sediment basin discharge assessment report** for a full discussion on the MUSIC modelling results including consideration of other pollutants and key indicators as described above.

The results have been compared against the NSW WQOs trigger values for turbidity (NTU) and TP and TN. As the MUSIC modelling results are not available in NTU, the TSS results were converted to NTU using the assumed conversion ratio of 1:2 for TSS:Turbidity (ie 10 NTU has been converted to 5mg/L), which is consistent with the approach in Chapter 19, Surface water quality of the EIS. In addition, MUSIC modelling results for TP and TN have been converted from mg/L to µg/L to allow a simpler comparison to the trigger values.

The results can be summarised as follows:

- Following construction phase sediment basin discharge events, average TSS levels are predicted to increase on average by around 12.8 per cent however median values will increase around 10.2 per cent. The maximum increase observed in the modelling was 16.4 per cent. Historical monitoring results indicate that the average mean turbidity is 2.3 NTU. Increasing the historical mean turbidity value by the maximum predicted increase in MUSIC of 16.4 per cent, results in a turbidity level of 2.68 NTU which is still well below the trigger value of 10 NTU
- The predicted average TN concentrations are expected to decrease by around 1.1 per cent on days of basin discharge to approximately 335 µg/L. This exceeds the trigger value for estuaries of 300 µg/L, however the model estimates that the average water quality within the existing receiving environment is 339 µg/L
- The predicted TP concentrations are expected to decrease by around 0.5 per cent on days of basin discharge to approximately 23.7 µg/L. This is below the trigger value of 30 µg/L

- TSS, TP and TN concentrations are predicted to be close to, or above, the NSW WQOs trigger values for these indicators, but do not increase significantly over the background catchment conditions. Given the small loads associated with proposed construction phase basin discharge limits, it is considered these exceedances are representative of the prevailing catchment conditions rather than any impacts associated with the main construction phase of the project.

Consideration of the need for mixing zone has also been provided in the updated construction sediment basin discharge assessment report to address EPA's recommendations. Section 10.1 of **Appendix C, Construction sediment basin discharge assessment report** describes that where the NSW WQOs are not met, detailed modelling of mixing zones can be undertaken to define the extent around a discharge. However, as discussed above, the assessment indicates that the impacts are minor and are not expected to increase pollutant concentrations above the guideline trigger values. The only exception was TN where the existing water quality already exceeds the trigger values.

Notwithstanding, a simplified assessment has been undertaken for Pine Brush Creek to determine the extent of the potential mixing zone. Pine Brush Creek was chosen due to the boundary of the Solitary Islands Marine Park occurring about 150 metres downstream of the construction footprint in addition to the Pine Brush Creek wetlands being located about 800 metres downstream. The simplified assessment indicated that a construction sediment basin discharge plume (at a TSS concentration of 50 mg/L) from the construction footprint boundary would be mixed sufficiently within 25 metres to meet the NSW WQOs trigger value for turbidity.

As discussed in responses above and in Chapter 6, Construction and Chapter 19, Surface water quality of the EIS, TfNSW have committed to implementing a comprehensive suite of erosion and sediment control measures to manage the risks to surface water quality and protection of human health and the environment during construction. These are further described in **Appendix B, Updated erosion and sediment management report, Appendix C, Construction sediment basin discharge assessment report** and **Chapter 6, Revised environmental management measures**. The SWMP and associated ESCP would provide the overarching management documents during construction and will describe the site-specific management measures and general monitoring requirements to ensure the implemented controls are effective.

In addition, during detailed design and prior to applying for an environmental protection licence for road construction under chapter 3 of the *Protection of the Environment Operations Act 1997*, TfNSW will undertake further updates to the erosion and sediment management report and associated preliminary ESCP to reflect the advancement of the design.

Table 3.6-2 Summary of MUSIC modelling results for Boambee Creek, Coffs Creek and Korora Basin catchments

Variable	Boambee Creek			Coffs Creek			Korora Basin		
	Existing Scenario	During construction	Per cent change	Existing Scenario	During construction	Per cent change	Existing Scenario	During construction	Per cent change
Ave TSS Conc - All data/days (mg/L)	39.55	39.49	-0.2	45.93	45.72	-0.4	40.90	44.92	9.8
Median TSS Conc All data/days (mg/L)	4.90	5.41	10.5	5.49	6.07	10.5	4.78	5.24	9.6
Ave TSS Conc - Basin discharge data/days (mg/L)	4.32	4.72	9.3	4.54	5.12	12.6	4.19	4.88	16.4
Median TSS Conc Basin discharge data/days (mg/L)	3.64	3.74	2.9	3.91	3.76	-3.8	3.49	3.11	-10.7
Ave TP Conc - All data (mg/L)	0.071	0.070	-1.8	0.097	0.093	-4.0	0.063	0.057	-9.7
Ave TN Conc - All data (mg/L)	0.553	0.553	0.0	0.681	0.684	0.5	0.515	0.484	-6.0
Ave TP Concentrations Basin discharge data (mg/L)	0.022	0.023	5.2	0.028	0.027	-5.0	0.021	0.021	0.3
Ave TN Concentrations Basin discharge data (mg/L)	0.322	0.337	4.3	0.374	0.369	-1.1	0.320	0.300	-6.5

3.6.5 Groundwater

Water treatment prior to local recharge/discharge

Issue description

- Throughout the EIS it is detailed that the collection of groundwater inflows into the bypass infrastructure is to be collected via a series of longitudinal pits and pipes and drain towards offsite basins (tunnel water into infiltration basins, cutting water into sediment basins). The EPA understands that once seepage is retained in these basins, collected inflows would then percolate through the pond floor to recharge the underlying strata or discharge into local waterways
- There are concerns relating to the potential for impact as a result of vehicle contaminants and road surface runoff mixing with the cleaner groundwater inflows once the tunnel is commissioned. It is unknown if groundwater seepage drains are to act as clean water diversion conduits on route to the infiltration pits, or if all sources of water within the tunnels and cuttings are to be collected in the same drainage system and treated prior to their storage in the offsite dams
- No detailed information or schematic illustrating the isolation between groundwater infiltration and road runoff for the series of tunnels and cuttings could be located in the EIS
- The EPA seeks further information relating to the treatment of waters captured within the bypass infrastructure, prior to its retention in nearby infiltration dams
- The EPA strongly encourages EPL discharge conditions are adopted for proposed infiltration dams used to store seepage collected from tunnel walls
- The EPA has concerns regarding the proposed collection and diversion of tunnel and cutting groundwater seepage. Further information is sought regarding the separation of tunnel and cutting seepage drains from roadside runoff.

Response

To minimise the potential for groundwater pollution to occur as a result of the project, all groundwater collected at cuttings and tunnels would be segregated from surface run-off (which could be contaminated as a result of road surface run-off). At cuttings, groundwater would be intercepted by subsurface drains installed along the lower part of the cut face, comprising of a permeable stone backfill and slotted drain system (see **Figure 3.6-1**). All captured groundwater would be conveyed to the infiltration discharge basin location through a series of longitudinal drains surrounded by rock fill located below the highway. This drainage system is designed as a clean water diversion for the groundwater, separating it from any surface or road run-off within the cutting, which discharges into a separate surface water drainage system. Surface water run-off will be prevented from entering the subsurface drainage system by a clay capping layer installed over the stone backfill.

All groundwater captured within the tunnel system will be segregated from surface water or road run-off. A drainage system would be installed behind the tunnel face comprising strip drains which would capture groundwater seepage preventing it reaching the tunnel face (see **Figure 3.6-2**). The groundwater would be conveyed to infiltration basins located at the tunnel portals via a longitudinal drain system located below the highway. These systems would be separated from the surface water drainage system within the tunnels.

The proposed drainage design with separation of the groundwater and surface water flows reduces the risk of detrimental changes to the groundwater quality occurring during the operation of the project. As a result, groundwater discharged through infiltration basins would be the same quality as that prior to capture within the tunnel or cutting.

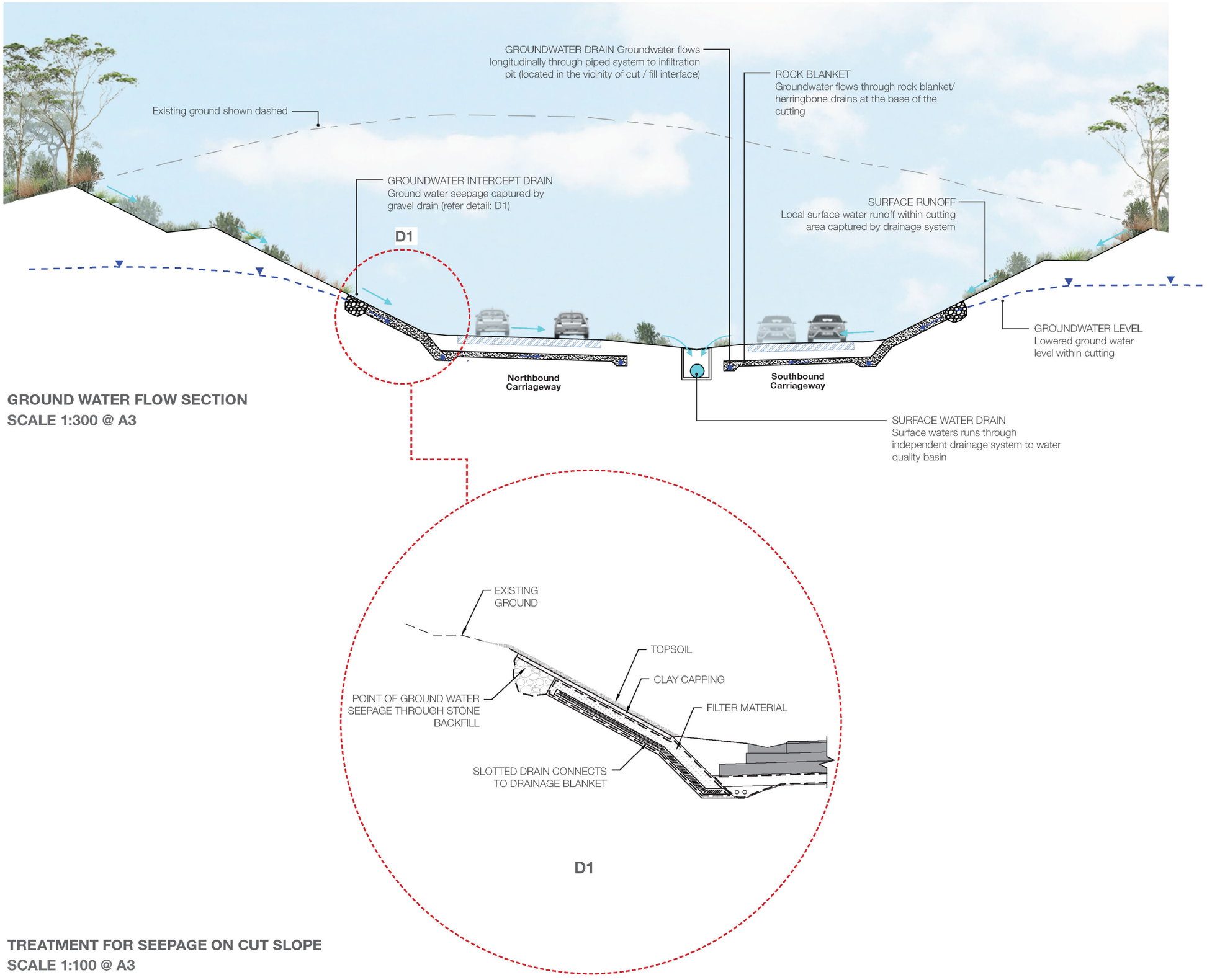
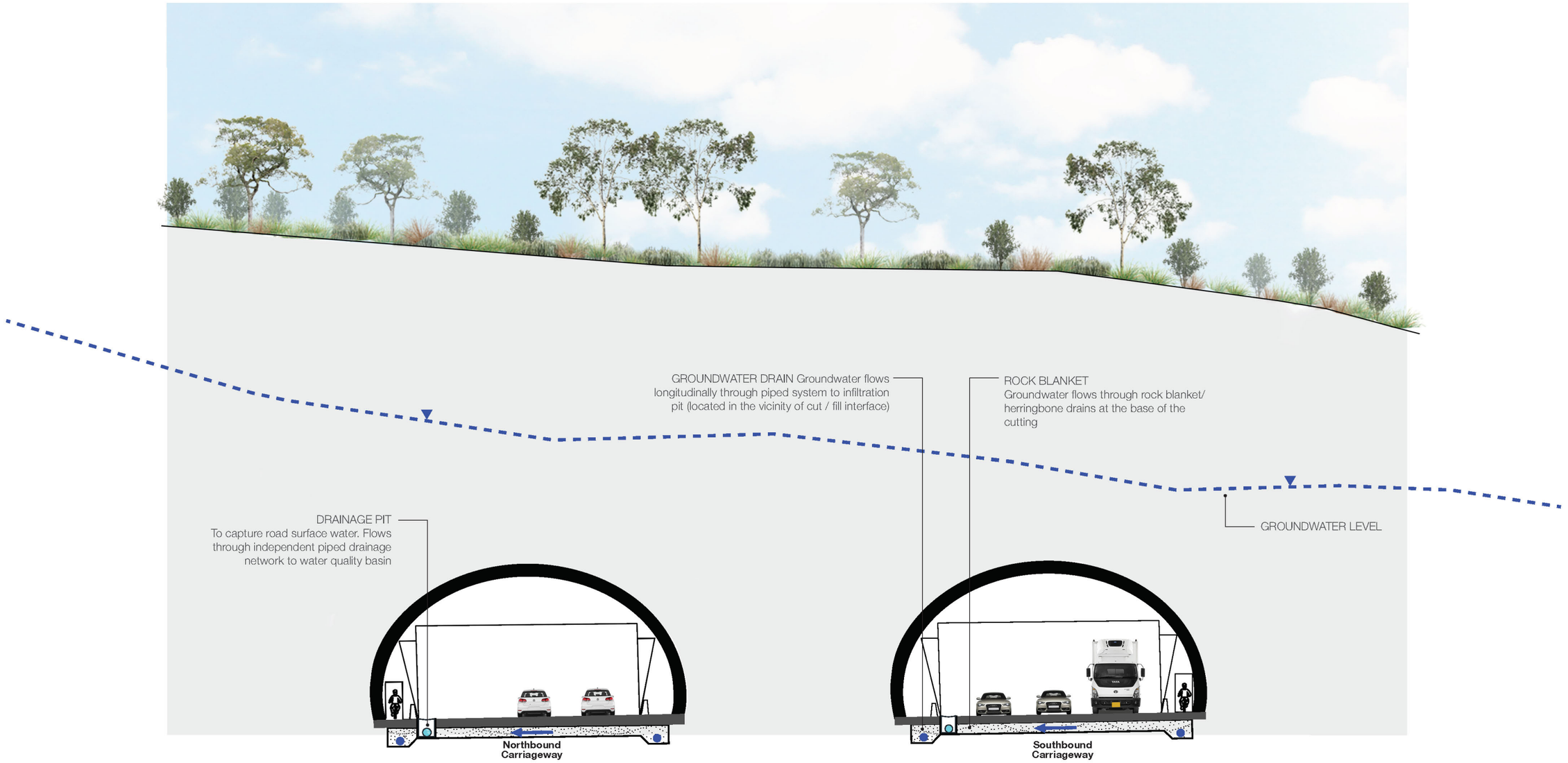


Figure 3.6-1: Typical detail for separating groundwater and surface water at cuttings and tunnels



TUNNEL GROUND WATER SECTION

Figure 3.6-2: Typical detail for separating groundwater and surface water at cuttings and tunnels

Management of intercepted groundwater

Issue description

- The EIS proposes directing groundwater that is intercepted by tunnelling activities to wastewater treatment plants and sediment basins for treatment prior to discharge. The EIS states that the project has adopted the Pacific Highway design guidelines (Roads and Maritime Services 2015b) for mean annual load pollution reduction for the water treatment design which include an 80 per cent and 45 per cent load reduction for total suspended solids and total phosphorus respectively. The EIS states that proposed discharge limits would be developed in consultation with EPA however, no discharge impact assessment is provided.
- Consistent with the recommendations for stormwater discharges, TfNSW should conduct a discharge impact assessment with the level of assessment commensurate with the potential water pollution risk for each proposed wastewater discharge point.

Response

Following the exhibition of EIS and after further consideration of sources of non-potable construction water, groundwater is now considered to present an opportunity as a source of construction water because of the likely consistency of supply. Therefore, groundwater that is captured during construction of tunnels would be treated on site and used for construction activities, rather than being discharged to surface water.

Groundwater would be transferred to storage dams following treatment. These would be installed for construction in the vicinity of tunnel portals, to enable this approach and ongoing reuse of captured groundwater. Although preference would be given to reusing as much water as practicable, should any groundwater discharge to the surface water be required, it would be treated to a quality in accordance with the project surface water EPL discharge criteria before discharge.

This above approach would appropriately mitigate impacts to groundwater during tunnelling activities and therefore there is no need to carry out a discharge impact assessment as discussed with EPA during consultation carried out after the exhibition of the EIS. This approach has been included in revised environmental management measure GW03 (see **Chapter, 6 Revised environmental management measures**).

3.6.6 Air quality

Issue description

- In addition to the proposed mitigation measures identified in the EIS, a key consideration is selecting an appropriate site for an asphalt batch plant. Asphalt batch plants have the potential to cause offensive odours during operation. The EPA recommends that an assessment of prevailing winds and the location and direction of receivers be considered when selecting an appropriate site.

Response

In response to this issue, environmental management measure AQ04 has been amended to include an assessment of prevailing winds and the location and direction of receivers when selecting an appropriate asphalt batch plant site. For further information refer to **Chapter 6, Revised environmental management measures**.

3.6.7 Urban design, landscape and visual amenity

Issue description

- The EPA encourages the on-site re-use of mulch produced from vegetation clearing on the project. Previous Pacific Highway upgrade projects in the region have successfully utilised mulch combined with topsoil to assist in stabilising and establishing vegetation on batters.

Response

The success of combining mulch with topsoil to assist in stabilising and establishing vegetation on batters on other Pacific Highway upgrade projects is acknowledged. However, the existing environment of the project is a more modified rural/agricultural environment when compared to projects where use of mulch in topsoil has been a success, eg Glenugie upgrade.

Notwithstanding this, further investigation into the combination of mulch and topsoil, in stablishing vegetation on batters for the project would be carried out during detailed design and/or construction, in accordance with environmental management measure SC07 (see **Chapter, 6 Revised environmental management measures**). However, should this approach be adopted, it would need to be developed in consideration of potential impacts including the spread of contaminants such as Panama disease and also ensure the topsoil/mulch mixture has the appropriate biological, chemical and physical characteristics to support plant germination and growth.

3.7 Fire and Rescue NSW

3.7.1 Fire and life safety systems

Issue description

FRNSW offer no comments or recommendations in regard to the submitted EIS given that limited information is available relating to the fire and life safety systems. It is expected that extensive stakeholder consultation will be undertaken throughout the various project phases as part of the design development. This will ensure agency requirements and considerations are addressed.

Response

As discussed in Section 5.3 of Chapter 5, Project description of the EIS, the proposed fire and life safety systems for the project's three tunnels will be confirmed during detailed design in accordance with Australian Standard AS4825.

Key objectives of the fire and life safety design would be to protect life and assets, control the incident and facilitate intervention by the emergency services.

As part of the above process, TfNSW will develop controls and operating procedures to respond to all tunnel incidents in consultation with FRNSW and other relevant stakeholders. These would include clearly defined responsibilities with respect to access, traffic management and tunnel equipment, to ensure a rapid and coordinated response to emergencies. These procedures, including trial incident response/simulated rescue activities with all key stakeholders responding, would be tested during both desk and field commissioning trials prior to opening the tunnels and at regular intervals post opening to ensure operational readiness in the rare event of an incident.

3.8 Water Group, DPIE

3.8.1 Surface water quality

Works on waterfront land

Issue description

- Prior to approval, TfNSW should confirm that works on waterfront land (particularly major instream works and proposed watercourse diversions) will be designed in accordance with the Guidelines for Controlled Activities for Works on Waterfront Land (2012). This includes, but is not limited to the following:
    - In-stream works
    - Outlet structures
    - Riparian corridors
    - Vegetation Management Plan
    - Watercourse crossings.

Response

Where applicable, the project has been designed in accordance with the relevant guidelines for controlled activities for works on waterfront land administered by the Water Group, DPIE, previously Guidelines for Controlled Activities for Works on Waterfront Land (2012), and more recently Guidelines for Controlled Activities for Works on Waterfront Land – Riparian Corridors (2018). These guidelines will continue to be considered during subsequent phases of the project as described below.

As identified in Chapter 5, Project description of the EIS, the project crosses several waterways and the concept design has been developed to minimise potential impacts on water quality and flows into nearby creeks, generally in accordance with the Guidelines for Controlled Activities for Works on Waterfront Land – Watercourse Crossings (DPI 2012b). Further design investigation of waterway crossings and potential impacts has also occurred for the amended design, including further detail on the extent of the Pine Brush Creek and Williams Creek realignment (see Chapter 2, Design changes of the Amendment Report).

The design of the project aims to allow the natural flow regimes to be maintained to minimise impacts on riparian corridors. Culverts and bridges would be provided to convey surface water runoff. Culverts would be designed to minimise potential for bank erosion. Bridges would be designed to avoid placement of piers in waterways. Bridge abutments would generally be located to minimise scour velocities and impacts on flood behaviour. Appropriate scour protection would be provided where increased velocities have the potential to cause scour. Scour protection for bridges and culverts will be designed in accordance with the Guidelines for Controlled Activities for Works on Waterfront Land – Outlet Structures (DPI 2012c), where reasonable and feasible. A number of environmental management measures have been included in **Chapter 6, Revised environmental management measures** to minimise scour, control erosion and sedimentation and to manage the impacts on watercourses including FF29, FH04, FH06 and SC05.

During detailed design, any required realigned drainage line or watercourse will be designed to behave in a similar hydrologic and geomorphic manner as existing conditions and will consider the requirements of the Policy and Guidelines for Fish Habitat Conservation and Management (DPI 2013) and Guidelines for Controlled Activities for Works on Waterfront Land – In-stream Works (DPI 2012a).

Specific requirements identified in Chapter 5, Project description of the EIS and **Chapter 6, Revised environmental management measures** include:

- Investigation of opportunities to reduce or avoid waterway realignments to maintain existing creek alignments including locating piers outside of the waterway
- Retention of existing riparian vegetation where possible, including retention of tree stumps where trees are removed
- Maintaining existing waterway lengths, velocities and hydraulic grades
- Use of soft engineering approaches to scour protection where landscaping is provided over the rock scour
- Maintaining fish passage in accordance with the waterway classification and RIARG, DPIE guideline Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (Fairfull & Witheridge 2003).

Additionally, protection and enhancement of vegetated riparian zones would be undertaken to improve opportunities for fauna movement and aquatic habitat would be protected in accordance with mitigation measures of the Policy and Guidelines for Fish Habitat Conservation and Management (DPI 2013) and with reference to Guidelines for controlled activities on waterfront land – Riparian corridors (DPI 2018). These requirements have been captured in environmental management measure FF05 and FF24 respectively (see **Chapter 6, Revised environmental management measures**).

As described in environmental management measure UD01, a UDLP will be prepared for the project during detailed design in accordance with best practice guidelines, such as the Guidelines for Controlled Activities for Works on Waterfront Land – Vegetation Management Plan (DPI 2012d). The UDLP will include location and identification of existing vegetation and proposed landscaped areas, including species to be used and procedures for monitoring and maintaining landscaped areas. For further details on what will be included as part of the UDLP, refer to **Chapter 6, Revised environmental management measures**.

Consultation

Issue description

- Post approval, the detailed design regarding works on waterfront land should be reviewed and assessed by Water Group, DPIE.

Response

TfNSW will continue to engage in consultation with Water Group, DPIE throughout detailed design as relevant.

3.8.2 Groundwater

Groundwater flows

Issue description

- Further consultation is needed with respect to the long-term discharge volume from the Gatelys Road tunnel. Whilst the Roberts Hill and Shephards Lane tunnel are modelled to discharge less than 1 L/s per kilometre, being 0.65 L/s per kilometre (0.123 L/s over 190 metres) and 0.71 L/s per kilometre (0.2558 L/s over 360 metres) respectively, the Gatelys Road tunnel is modelled to

discharge 1.415 L/s per kilometre (0.6366 L/s over 450 metres). Despite this modelling there has been no proposal to line Gatelys Road tunnel

- Prior to approval, consideration should be given to line the Gatelys Road tunnel or refine the assessment to evaluate alternative preventative or remedial solutions regarding the quantum of water take. Ongoing groundwater flows must not exceed 1 L/s per kilometre.
-

Response

Consideration of lining of Gatelys Road tunnel was carried out during the comparative assessment of the 2018 concept design and the alternative option described in Chapter 4, Project development and alternatives of the EIS. However, it was not considered reasonable and feasible and other mitigation measures, eg grouting, were likely to be preferable if required.

Notwithstanding, additional design investigation is proposed to be undertaken during detailed design with the aim of limiting groundwater ingress to less than 1 L/s per kilometre. The investigations would include:

1. Additional geotechnical and hydrogeological investigations would be carried out for Gatelys Road tunnel during detailed design (eg groundwater monitoring, hydrogeological testing and advance probing) to provide additional information on the hydrogeology and geological features at this location
2. Revised groundwater modelling would be carried out following the investigations to improve predictions of likely groundwater inflows and to inform construction methodology and potential mitigation measures that may be implemented during construction
3. If the inflow rates are still anticipated to exceed 1 L/s per kilometre for any kilometre length of tunnel, detailed design and/or construction methodology techniques to reduce groundwater ingress would be implemented. This would include consideration of advance mitigation grouting to limit permeability around the tunnel to reduce ongoing groundwater inflow.

The above approach will be undertaken in consultation with Water Group, DPIE and is included as new environmental management measure GW07 (see **Chapter 6, Revised environmental management measures**).

Post approval consultation

Issue description

- Water Group, DPIE should be consulted during the further development of the Groundwater Management Plan
- Water Group, DPIE should be consulted with outcomes from further proposed impact assessment of bore number GW068986 (at Gatelys Road tunnel), including enactment of any make good provisions.

Response

Groundwater management and associated performance outcomes will be included in the SWMP, as identified in environmental management measure SC04. In addition, groundwater monitoring requirements will be included in the Water Quality Monitoring Program as identified in environmental management measures GW08 and SW01 (refer to **Chapter 6, Revised environmental management measures**). Water Group, DPIE would be consulted during the development of the SWMP and monitoring program during detailed design.

Chapter 20, Groundwater of the EIS identifies impacts to groundwater bores and cumulative pressure head decline and groundwater drawdown. Predictive modelling indicates that most of the project meets the minimal impact consideration of less than two metre pressure head decline at any water supply work. The exception to this is at Gatelys Road tunnel where predictions indicate GW068986 would experience a drawdown of around four metres. Environmental management measures GW10 has been established to mitigate these impacts. As a result, additional ground truthing and site inspections will be undertaken for potentially impacted groundwater bores/supply wells (including supply well GW068986), springs, specifically Jordans Creek, and agricultural dams within and immediately surrounding the zone of drawdown. The purpose of the ground truthing and site inspections is to confirm predicted impacts and develop make good provisions where required in consultation with affected property owners.

Consultation with Water Group, DPIE regarding the outcome of the ground truthing and further design investigations regarding supply well GW068986 would be carried out during detailed design as relevant.

Approvals and licences

Issue description

- Prior to approval, the project must obtain the necessary Water Access Licenses prior to commencement of works
- Post approval, any groundwater used for construction purposes should be appropriately licensed.

Response

Before commencement of any works, the project would obtain any necessary licence required under the *Water Management Act 2000*. However, as a declared Critical State Significant Infrastructure (CSSI) subject to approval under Division 5.2 of the EP&A Act, the project would not require certain approvals under the *Water Management Act 2000*, including water use approvals under section 89, water management work approvals under section 90, and activity approvals (other than aquifer interference approvals) under section 91.

The need for an aquifer interference approval was investigated during the assessment of impact to groundwater contained in Appendix N, Groundwater assessment of the EIS. Generally, the need for an aquifer interference approval is required for any work that involves:

- The penetration of an aquifer
- The interference with water in an aquifer
- The obstruction of flow of water in an aquifer
- The taking of water from an aquifer in the course of carrying out mining or any other activity prescribed by the regulations
- The disposal of water from an aquifer.

The need for an aquifer interference approval would be confirmed during detailed design in consultation with Water Group, DPIE and following proposed ground truthing and design investigations detailed in Appendix N, Groundwater assessment of the EIS and included as environmental management measure GW11 in **Chapter 6, Revised environmental management measures**.

3.9 School Infrastructure NSW

3.9.1 Impacts to Kororo Public School

Issue description

SI NSW is generally supportive of the project and acknowledges its benefits. However, there are several aspects that may potentially impact the school and/or the school community. These include:

- Relocation of Kororo Public School bus interchange from the Pacific Highway slip road to James Small Drive, a relatively narrow local road immediately to the east of the school
- Demolition/replacement of Luke Bowen Bridge over the Highway. It is noted that the new bridge is proposed to be located some 250 metres north of its current location, thereby increasing the distance from the school
- Closure of Korora School Road and construction of a new service road, including parking
- Changes to local traffic conditions during the construction phase and associated safety concerns
- Construction noise and associated disruption
- Impacts on air quality during the construction phase.

In order to manage these impacts, SI NSW supports the relocation of the bus interchange, the Luke Bowen pedestrian bridge and the construction of the new service road and associated parking as enabling works, prior to commencement of the main construction.

Response

Further design investigation of Kororo Public School bus interchange and Luke Bowen footbridge has been carried out since the exhibition of the EIS, resulting in changes to the design of the bus interchange and design and location of the footbridge, as discussed in detail in Chapter 2, Design changes of the Amendment Report. These design changes were developed to:

- Address CHCC, Kororo Public School and community feedback on the design of the bus interchange and footbridge
- Change the access point to the bus interchange from James Small Drive to the service road to remove the need for additional bus traffic on James Small Drive
- Separate bus and light vehicle entry points with barriers and fencing to remove conflict points between pedestrians and vehicles
- Reduce the need for light vehicle school drop-off and pick-up movements on James Small Drive
- Reduce the potential for congestion on the service road during school peaks
- Provide grade separated crossing points to remove all conflict points between pedestrians and vehicles
- Provide a bus interchange that caters for the operational requirements of bus operators (capacity for up to eight 12.5 metre long buses)
- Improve the location of the new Luke Bowen footbridge in relation to the school and bus interchange.

The existing Luke Bowen footbridge would be replaced with a new pedestrian bridge over the project just south of the existing bridge location, thereby keeping the bridge closer to the school compared to the location of the bridge proposed in the EIS. The new bridge would retain the name Luke Bowen footbridge. This bridge would provide a pedestrian and cyclist connection between Old Coast Road and the proposed service road next to Kororo Public School.

A visualisation of the Kororo Public School bus interchange and Luke Bowen footbridge is shown in **Figure 3.9-1**.

Figure 3.9-1: Visualisation of the amended Kororo Public School bus interchange and Luke Bowen footbridge

As detailed in Chapter 3, Construction updates of the Amendment Report, there is also the need for a temporary access via Russ Hammond Close to manage access to and from the school during construction. During construction, access to Korora School Road from the existing Pacific Highway would be closed and a temporary connection would be provided via Russ Hammond Close to provide access to Kororo Public School and residential access to existing properties on Korora School Road. The temporary access would be in place for up to 18 months while the service road and bus interchange are constructed and would not be used for construction traffic. Traffic that would use the temporary access includes school traffic (eg staff, deliveries, and parents and carers) and residential access to existing properties on Korora School Road. School buses would not use the temporary access via Russ Hammond Close, and would continue to use the existing interchange for as long as practical. In accordance with environmental management measure TT01, any temporary changes required during construction will be confirmed following further consultation with school bus operators and Kororo Public School. Associated traffic and safety concerns would be managed through the implementation of the Traffic Management Plan (TMP) for the project, as detailed in Section 5.2 of the Amendment Report.

As described in Chapter 8, Traffic and transport of the EIS, there would also be impacts to parking at and around Kororo Public School during construction of the project. Parking at the school would be managed through the implementation of the TMP and consultation with the Kororo Public School.

In addition to the TMP, other construction traffic management mitigation measures relevant to Kororo Public School are outlined in **Chapter 6, Revised environmental management measures** and include the following:

- TT01: Operational access for public transport services, including school bus services will be maintained as part of the project. The requirements for any temporary changes during construction will be confirmed following further consultation with the school bus operators, CHCC, Kororo Public School and Bishop Druitt College.
- TT02: Further consultation with Kororo Public School and School Infrastructure NSW to confirm final parking arrangements and access during construction.

The TMP will be prepared during detailed design in accordance with Traffic Control at Work Sites Manual (Roads and Maritime Services 2018c). The TMP will include measures to maintain access to local roads, properties and Kororo Public School as well as measures that consider the operation of Kororo Public School and road user safety.

As discussed in the Chapter 9, Noise and vibration of the EIS, there are expected to be significant noise management level (NML) exceedances for all construction activities. Outcomes of the updated construction noise assessment are summarised in Section 5.2 of Appendix B, Updated noise and vibration assessment of the Amendment Report, and the noise catchment area assessment relevant to the school is NCA24. The noise impact to the school during the construction of the project depends on the level of noise, distance to the school and the duration of the works. The assessment has been based on representative worse case scenarios, and as such, noise levels at nearby receivers are likely to be lower than predicted.

Without mitigation, exceedances of the NML from a number or activities would be expected at the school, including demolition, drainage, earthworks, finishing works, road works, and utility relocation works.

Notwithstanding, as identified in Section 9.5 of the EIS and included in **Chapter 6, Revised environmental management measures**, a Noise and Vibration Management Plan (NVMP) will be prepared and implemented during construction (see environmental management measure NV01). It will be prepared in accordance with the details provided in the Construction Noise and Vibration Guideline (Roads and Maritime Services 2016a) and the Interim Construction Noise Guidelines (DECC 2009b). The NVMP constitutes the main process for managing construction noise and vibration impacts and will identify:

- All potential significant noise and vibration generating activities associated with the activity
- Measures to be implemented during construction to minimise noise and vibration impacts, such as restrictions on working hours, respite periods, staging placement and operation of ancillary facilities, temporary noise barriers, haul road maintenance, and controlling the location and use of vibration generation activity
- A monitoring program to assess performance against relevant noise and vibration criteria
- A process for implementation of respite periods to provide residents with respite from ongoing impact

- Arrangements for consultation with affected receivers, including notification and complaint handling procedures
- Contingency measures to be implemented in the event of non-compliance with noise and vibration criteria.

Also, out of hours work is proposed for the section of the project adjacent to Kororo Public School. Implementing out of hours work would reduce the total time of construction adjacent to the school during school hours.

In addition, Kororo Public School qualifies for at-property treatment as per environmental management measure NV11 which allows for at-property operational noise treatment to be implemented before or early in the construction phase of the project where reasonable and feasible. The implementation of at-property operational noise treatment would greatly assist in managing the potential construction impacts.

As outlined in Chapter 21, Air quality of the EIS, the main air quality impacts during construction would be primarily because of dust generation. There is potential for adverse dust impacts at sensitive receivers surrounding the construction footprint as winds could be capable of transporting emissions. Adverse impacts from high dust levels include health effects (from smaller particles) and soiling and amenity impacts (due to fallout of the larger particles). The impacts are generally greater during dry weather periods and high wind conditions.

For all construction activity, the aim would be to prevent significant impacts on sensitive receivers, through the implementation and use of effective mitigation measures. Given the proximity of the Kororo Public School to the construction footprint, there is the risk they would experience some occasional dust spoiling impacts. However, it is anticipated that impacts would be local and temporary.

Notwithstanding, **Chapter 6, Revised environmental management measures** outlines environmental management measures for air quality during construction. Environmental management measure AQ01 which relates to an Air Quality Management Plan (AQMP) would be the main mechanism to manage air quality impacts during construction. Relevant to the Kororo Public School, the AQMP will include identification of all dust sensitive receivers including educational institutions, community notification procedures and mitigation and suppression measures, such as soil binders, provision of vehicle clean down areas and use of water carts and street cleaning.

Ongoing consultation

Issue Description

- To further manage the potential impacts of the proposal, SI NSW requires TfNSW to engage in ongoing consultation with the Kororo Public School to ensure:
    - The final location of the pedestrian bridge is located as close to the school as possible
    - Safe and accessible access is provided between the school and the new bus interchange.

Response

Further design investigation of Kororo Public School bus interchange and Luke Bowen footbridge has been carried out since the exhibition of the EIS, resulting in changes to the design of the bus interchange and footbridge. These design changes were developed to address CHCC, Kororo Public School and community feedback on the design of the bus interchange and footbridge.

The proposed design changes include provision of a new location for the Luke Bowen footbridge close to the existing footbridge and the main entrance to the school and provides a new pedestrian underpass to allow grade separated access to the school from the car park. This would separate vulnerable road users from bus and passenger car movements removing the risk of vehicle/pedestrian conflict at the bus interchange. Refer to Chapter 2, Design changes of the Amendment Report for further detail on the proposed design changes.

In addition, following exhibition of the EIS, Kororo Public School have been further consulted about the amendments to the bus interchange and Luke Bowen footbridge. This included a face-to-face briefing with representatives of Kororo Public School on 4 November 2019 and an information display/presentation session held at the school for parents and staff on 28 November 2019. Further detail can be found in Chapter 4 of the Amendment Report.

TfNSW will continue to engage in consultation with the Kororo Public School and SI NSW during development of the detailed design and into construction.