Coffs Harbour Bypass

State Significant Infrastructure Assessment SSI-7666

October 2020

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Title: Coffs Harbour Bypass

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Cover image: Components of the Coffs Harbour Bypass (TfNSW)

Glossary

Abbreviation	Definition
AHD	Australian Height Datum
Council	Coffs Harbour City Council
Crown Lands	Crown Lands, DPIE
CSSI	Critical State Significant Infrastructure
DAWE	Department of Agriculture, Water and the Environment (formerly DoEE)
Department	Department of Planning, Industry and Environment
DPI	Department of Primary Industries, DPIE
EESG	Environment, Energy and Science Group, DPIE
EIS	Environmental Impact Statement
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	Environmental Planning and Assessment Regulation 2000
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPL	Environment Protection Licence
ESD	Ecologically Sustainable Development
Heritage NSW	Heritage NSW, Department of Premier and Cabinet
MNES	Matters of National Environmental Significance
Minister	Minister for Planning and Public Spaces
NPWS	National Parks & Wildlife Service, DPIE
SEARs	Planning Secretary's Environmental Assessment Requirements
Planning Secretary	Secretary of the Department of Planning, Industry and Environment
RtS	Response to Submissions
SEPP	State Environmental Planning Policy
TfNSW	Transport for NSW
VPD	Vehicles Per Day

Executive Summary

Transport for NSW (formerly Roads and Maritimes Services) (the Proponent) is seeking approval to construct and operate the Coffs Harbour Bypass (the project). The project involves a new multi lane road approximately 14 kilometres in length from north of the Sawtell Road Interchange to the southern end of the Sapphire to Woolgoolga upgrade project. The project includes the following:

- A new four-lane divided highway with three grade-separated interchanges;
- Three tunnels through ridges, ranging from 190 metres to 450 metres in length;
- Bridges over local roads and creeks, and a bridge over the North Coast Railway;
- Pedestrian and cycling facilities; and
- A new Korora bus interchange.

The upgrade of the Pacific Highway is one of the largest road infrastructure programs in NSW which aims to provide a four-lane divided road from Hexham to the Queensland border. By the end of 2020, 95 per cent of the Pacific Highway north and south of Coffs Harbour will be upgraded to free-flowing dual carriageways. Currently, Coffs Harbour and Hexham / Heatherbrae are the only two locations linking Brisbane, Sydney, Canberra and Melbourne where the route is an urban road with traffic signals.

The Department has found that the benefits outweigh localised negative impacts by:

- Provision of free-flowing dual carriageway conditions between Hexham and the Queensland border;
- Improved reliability of journey times, particularly during peak travel periods;
- Improved road safety, by removing through traffic and some local traffic from the existing road network;
- Provision of increased road capacity to cater for increasing traffic volumes and future traffic volumes; and
- Improved accessibility of and amenity along the existing Pacific Highway.

The project is Critical State Significant Infrastructure (CSSI) under section 5.13 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Minister for Planning and Public Spaces is the approval authority. The project complies with the objects of the EP&A Act and is consistent with the Government's key priorities and transport planning framework.

Engagement with the Community

The Department undertook a range of discussions with the community, including a community action group and Registered Aboriginal Parties (RAPs), Coffs Harbour City Council (Council), and other State agencies during its assessment of the project.

The Secretary's Environmental Assessment Requirements (SEARs) were prepared in consultation with regulatory agencies and Council, including hosting a Planning Focus Meeting. The exhibition of the EIS resulted in the receipt of 186 submissions from 182 submitters, of which nine were from State and local agencies, one from the Greens political party, nine from special interest groups, organisations and Aboriginal groups, three from peak bodies and 160 from community submitters.

Key assessment issues

Transport and traffic

Overall, the project will provide benefits across the road network, particularly removing through traffic along the existing Pacific Highway and local intersections. The project has been designed in consideration of surrounding residents and schools and will provide a safer road for motorists, cyclists and pedestrians.

Construction traffic impacts are considered acceptable and will be managed proactively through the implementation of traffic management measures. The Englands Road and Korora Hill interchange designs have been amended to improve access to and from the bypass (allowing better wayfinding and more direct access).

Noise and vibration

The project will result in both construction and operational noise impacts. Construction noise and vibration impacts are consistent with projects of this scale and will be managed through standard practices and the early application of operational noise mitigation. Works undertaken outside of standard construction hours will be limited due to the general greenfield nature of the route. Notwithstanding, the Department supports 24 hours, 7 days a week tunnelling as this can be managed through acoustic sheds and limits to vehicle movements during the night-time period.

By using tunnels and lowering road grades, the project design has reduced operational noise impacts. However, noise impacts in excess of operational traffic noise criteria are expected along the corridor. To reduce these impacts, the Proponent has proposed low noise pavement, noise barriers and at-property architectural treatment measures. To ensure the efficacy of these measures, the Department has required the Proponent to review the noise model and mitigation measures, and to undertake comprehensive noise monitoring.

Aboriginal heritage

The project will directly impact Aboriginal archaeological sites and sites with intangible cultural significance within the project corridor. While the revised deign of the project has minimised these impacts, particularly in relation to cultural pathways, residual impacts are required to be managed in collaboration with the Aboriginal community.

Four of the five identified cultural sites are located partially within the construction footprint and would be impacted to varying extents. The archaeological sites (with potential archaeological deposits (PAD)) assessed as having moderate heritage significance will be subject to archaeological salvage. The Proponent has committed to minimising the extent of impact through detailed design and managing residual impacts through the salvage of items and artefacts, archival recording and providing interpretive signage.

To address the community's concerns, the Department has recommended the preparation of a Heritage Management Sub-plan and has recommended that the Proponent give the Registered Aboriginal Parties (RAPs) the opportunity to inspect the project corridor and determine which areas require cultural salvage.

Flooding and hydrology

The project has relatively minor flooding impacts and no significant flooding impacts will occur to residential properties. As the project has been designed to meet the afflux flood management objectives, the Department considers these objectives should inform the recommended conditions of approval. As part of the detailed design process, the Proponent will undertake further flood modelling to ensure that the project complies with the flood objectives.

The Department supports the Proponent working with Council and the Environment, Energy and Science Group's flood management team on a co-ordinated approach to managing flood impacts from the project on future urban development in the North Boambee Valley. Irrespective of whether project specific measures or a whole of government approach is adopted, the Proponent must comply with the flood management objectives set in the conditions of approval.

Biodiversity

The project will impact the biodiversity values of the project area. The Proponent has identified direct impacts to threatened ecological communities under the *Biodiversity Conservation Act 2016* (BC Act) and threatened species under the BC Act and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) within and adjoining the road alignment.

The project has been designed to avoid impacts to biodiversity, however, impacts could be further reduced during the detailed design phase. Impacts to biodiversity values will be offset under the *NSW Biodiversity Offsets Policy for Major Projects*, including the acquisition and retirement of ecological and species credits through biodiversity stewardship agreements, management of land added to the National Parks estate and supplementary measures.

Mitigation measures include the provision of connectivity across the alignment for terrestrial and arboreal fauna, revegetation of disturbed land and the translocation of a threatened flora species. The Department has recommended conditions of approval which identify the ecosystem and species credits required for the project, require enhancement of koala habitat on the key ridgeline corridors and implementation of a Biodiversity Management Sub-plan to manage impacts on biodiversity during the construction of the project.

Surface and groundwater

The construction and operation of the project is likely to generate potential impacts on water quality as the alignment traverses' watercourses which flow from the Great Dividing Range to the coast. Due to the proximity of environmentally sensitive areas such as the Solitary Islands Marine Park, the Proponent is required to implement construction measures to manage water quality risks. With these measures in place the sensitive receiving environments can be appropriately protected.

Groundwater impacts are relatively minor and localised and can generally be managed to meet relevant flow and drawdown levels. The Proponent will implement mitigation measures to capture and treat construction and operational water, return intercepted groundwater to the aquifer during operation and ensure that water supply bores affected by the project are reinstated.

Agriculture

The Department recognises the importance of agriculture to the Coffs Harbour community and economy and considers that the Proponent has avoided and/or reduced impacts on agricultural land

use where practicable. The Proponent is committed to implementing mitigation measures to manage farm practice impacts.

Panama disease is a significant risk to banana growers in the region. Its potential spread during construction will be controlled in accordance with current standards and in consultation with banana growers.

The loss of six banana farms is not considered to have a detrimental effect on the broader local agricultural industry due to the large number of farms in operation within the region. Further, the overall production of bananas over recent years has seen a transition to blueberry farming. No blueberry farms are expected to cease operation as a result of the project.

Socio-economic, property and land use

Social and economic impacts from the project are relatively minor with minimal impacts on community cohesion, access or economic activities. This is primarily a result of the early identification of the road corridor, as well as refinement of the concept design within the established road corridor reservation.

The Department accepts that some local economic impacts are inevitable, but also notes the benefits provided include the removal of the majority of heavy vehicles from the existing Pacific Highway through the centre of Coffs Harbour, leading to increased road safety and amenity, and economic growth in the region due to increased freight efficiency, travel times, and level of service.

Design and landscape

An Urban Design and Landscape Character Strategy has informed key engineering aspects of the project. This Strategy incorporates design objectives with supporting principles that reflect the visual context of the area. Notwithstanding, the project's significant engineering works will result in visual impacts which were identified in the Proponent's visual and landscape impact assessment.

The Department is satisfied that the assessment has clearly identified the landscape characteristics of the locale and has been conservative in its identification of both visual and landscape impacts. While a project of this scale will have initial visual impacts, the Department considers these impacts can be managed during construction and will diminish over time as landscaping matures and more effectively screens infrastructure associated with the project.

Key Outcomes and Initiatives

Key initiatives proposed by the Department include:

- Requiring biodiversity offsets for impacts to koalas, restoration of key koala corridors on top of the Roberts Hill and Gatelys Road tunnels, and connectivity structures to minimise fragmentation of koala habitat;
- Early implementation of at-property noise treatment to reduce construction noise impacts, 24-hour tunnelling works within an acoustic shed, and additional operational traffic noise monitoring to confirm the effectiveness of noise mitigation measures;
- Vegetative screening to create / maintain a visual buffer between residents and the road;
- Implementation of erosion control and water quality measures during construction and operation to minimise impacts to the Solitary Islands Marine Park; and
- Allowing Aboriginal parties to undertake cultural salvage in areas that they identified as having Aboriginal cultural heritage significance.

Contents

1 Introduction

Transport for NSW (formerly Roads and Maritimes Services) (the Proponent) is seeking approval to construct and operate the Coffs Harbour Bypass (the project). The project involves a new multi lane road approximately 14 kilometres in length from north of the Sawtell Road Interchange to the southern end of the Sapphire to Woolgoolga upgrade project. The proposed alignment is shown in **Figure 1** and includes:

- A new four-lane divided highway with three grade-separated interchanges;
- Three tunnels through ridges, ranging from 190 metres to 450 metres in length;
- Bridges over local roads and creeks, and a bridge over the North Coast Railway;
- Active transport facilities including a shared path tying into the existing shared path on Solitary Islands Way, and a new pedestrian bridge to replace the existing Luke Bowen footbridge; and
- A new Korora bus interchange and a formal bus stop at Coramba Road near Spagnolos Road.

The project is in the Coffs Harbour Local Government Area (LGA), about 3 kilometres west of the Coffs Harbour City Centre and traverses the coastal ridges of the Great Dividing Ranges, and bush / rural land to the south west, west and north west of Coffs Harbour. The Coffs Harbour Bypass is part of the Proponent's long-term strategy for the Pacific Highway Upgrade Program, which aims to increase safety and reduce travel times between Sydney and Brisbane by providing dual carriageways between Hexham to the Queensland Border.

The proposed route is undulating in parts and relatively steep in others and is characterised by prominent ridgelines and valleys leading east to the Pacific Ocean. Key land uses within the project area include:

- Agriculture, including banana and blueberry plantations;
- Ulidarra National Park and Kororo Nature Reserve;
- Residential developments, including the suburbs of western Coffs Harbour, North Boambee Valley and Korora; and
- The North Coast Railway.

Coffs Harbour is one of only two locations on the east coast corridor linking Brisbane, Sydney, Canberra and Melbourne where the existing route is an urban road with traffic signals. By providing a bypass of Coffs Harbour consistent with the standards of the Pacific Highway upgrade program, the project would address declining transport efficiency, urban congestion and road safety issues caused by the interaction of through and local traffic, including pedestrians and cyclists.

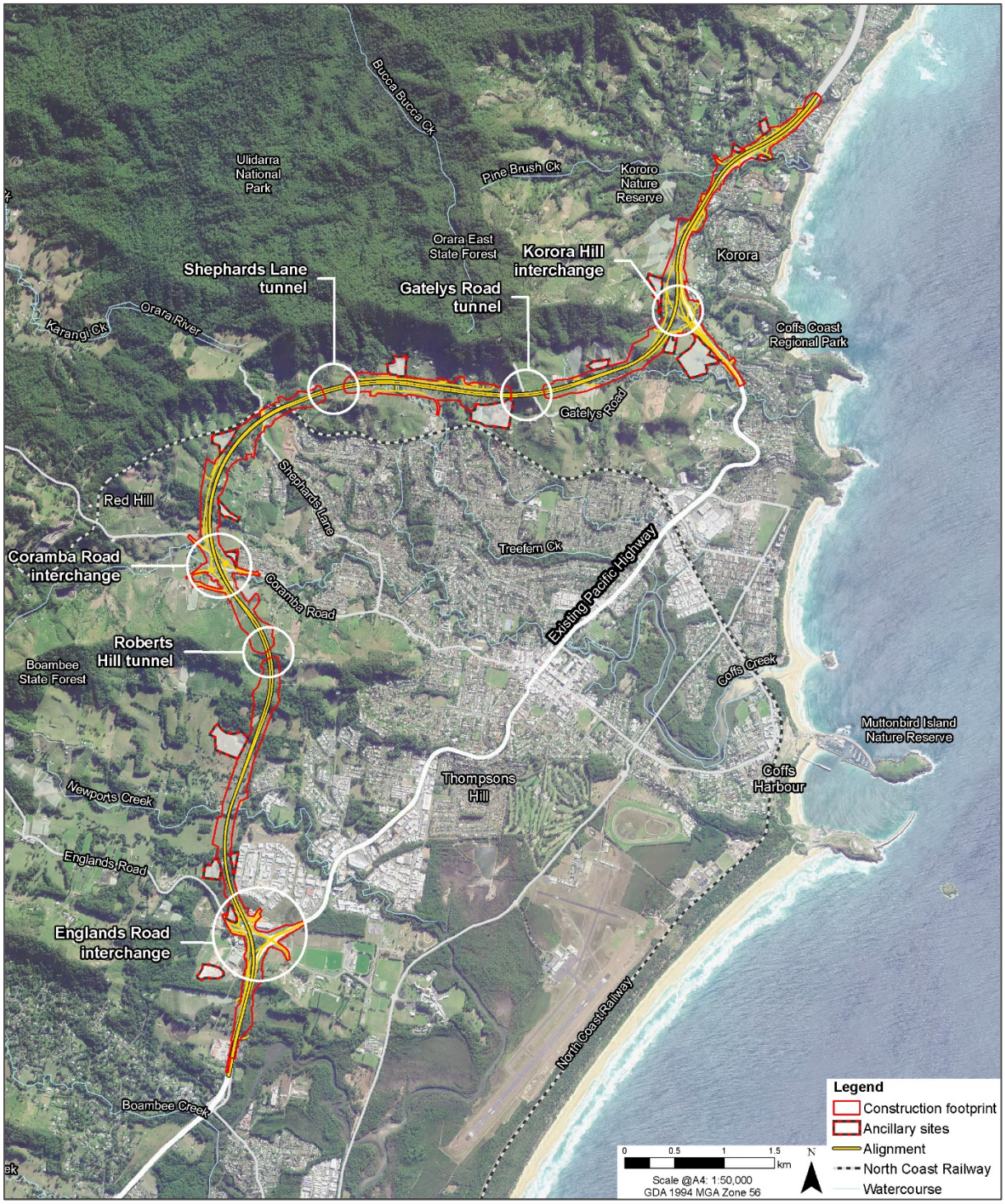

Figure 1 | Project Alignment (Source: Amendment Report)

2 Project

The main components of the project are described in **Table 1**.

Table 1 | Main components of the project (Source: Amendment Report)

Aspect	Description
Project Summary	• A new four-lane divided highway from Boambee north of Sawtell Road Interchange to the dual carriageway highway at Sapphire Beach. • Three grade separated interchanges at Englands Road, Coramba Road and Korora Hill. • Three tunnels through Roberts Hill, Shephards Lane and Gatelys Road. • Bridges over the project, local roads, creeks and the North Coast Railway. • Changes and upgrades to the local road network and pedestrian/cycle connections. • Structures along the road for drainage, and fauna crossings and fencing. • Large cut and fill embankments due to steep and undulating terrain. • Low noise pavement, noise barriers and architectural treatment as required. • Temporary ancillary construction facilities and temporary works. • Adjustment and relocation of public utilities and services. • A bus interchange at Kororo Public School and a formal bus stop at Coramba Road near Spagnolos Road.
Interchanges	• Three interchanges, being the: o Southern interchange at Englands Road, providing access to the existing road network, including Stadium Drive, Coffs Harbour Health Campus and the Isles Drive industrial area; o Central interchange at Coramba Road, providing access to the western Coffs Harbour urban area and the existing road network; and o Northern interchange at Korora Hill, providing access to the existing highway at Korora and the northern urban area business precinct of Coffs Harbour.
Bridges	• Twenty bridges are proposed, including: o 11 highway bridges, including a bridge over the North Coast Railway and waterways; o 3 highway overpasses; o 2 local road overpasses; o 2 local road underpasses; and o A replacement for the Luke Bowen footbridge bridge at Kororo Public School.
Tunnels	• Three tunnels are proposed, including: o Roberts Hill tunnel, approximately 190 metres long; o Shephards Lane tunnel, approximately 360 metres long and an additional acceleration lane (northbound) and jet fans; and o Gatelys Road tunnel, approximately 450 metres long and an additional deceleration lane (southbound) and jet fans.
Noise abatement structures	• Low noise pavement for the majority of the project, excluding tunnels. • Noise barriers and earth mounds. • At-property acoustic treatment at noise sensitive land uses, including residential receivers.
Drainage and flood protection	• New infrastructure including road surface drains, longitudinal catch drains and cross drains / culverts. • Flood mitigation works including new farm floodways and flood storage basins.

	• Construction and operational water quality basins.
Creek adjustments	• Realignment of a northern tributary of Newports Creek. • Pine Brush Creek and Williams Creek realignments. • Extension of the existing culvert under Bennetts Road. • Realignment of Coffs Creek where the project crosses the creek south of Coramba Road. • Replacement of the upper reaches of Treefern Creek with longitudinal catch drains and cross drains.
Fauna crossing structures	• Two dedicated fauna underpasses. • 3 combined fauna and drainage underpasses. • 8 bridges crossing roads, watercourses and the North Coast railway, with fauna passage. • One set of glider poles for arboreal fauna. • Exclusion fencing to guide fauna towards crossing structures. • Retention of vegetated ridges over each of the three tunnels to provide fauna connectivity across the alignment.
Pedestrian and cycling facilities	• Pedestrian and cycle facilities are proposed, including: o 1.5 metre-wide shared path (behind safety barrier) within the tunnels; o 2.5 metre-wide shoulders along the alignment; o 2.5 metre-wide shared user path on the eastern side of the service road; o New pedestrian footbridge replacing the existing Luke Bowen footbridge; and o Widening of all local road underpasses to facilitate future paths for pedestrians and cyclists, separated from the local road.

2.1 Construction Activities

The project would take approximately four years to construct under a staged delivery program. The key construction activities are summarised in **Table 2**. **Table 3** provides an indicative construction timeline based on a four year construction program.

Construction of the project would occur during the standard construction hours of 7:00 am to 6:00 pm on weekdays and 8:00 am to 1:00 pm on Saturdays. Blasting works would occur during standard construction hours, starting at 9:00 am and finishing by 5:00 pm on weekdays, except for blasting associated with the three tunnels which may commence at 7.00am. Some out-of-hours works may be required in the Korora Hill to Sapphire Beach section of the project, due to works within the existing Pacific Highway being carried out under live traffic situations. Other activities that would require out-of-hours works include construction of bridges over Englands Road and the North Coast Railway, utility relocations, concrete pours / paving and concrete saw cutting. Tunnel excavations works are also proposed to be undertaken 24 hours per day seven days a week. The tunnelling construction activities are summarised in **Table 4**.

Table 2 | Construction works overview (Source: Response to Submissions Report)

Type	Typical activities
Pre-construction and site establishment	• Translocation of native vegetation and threatened species • Installation of safety, environmental controls, temporary and permanent acoustic treatments • Property acquisition • Geotechnical and site investigations including investigative drilling, contamination investigations and excavation • Establishment of construction ancillary facilities • Property acquisition adjustment works including installation of property fencing, demolition and removal of buildings and relocation and adjustments of property utility connections including water supply, sewer, telecommunications and electricity.
Enabling works	• Coramba Road overpass bridge (BR09) • Bridge over North Coast Railway near Shephards Lane (BR12) • Shephards Lane overpass (BR11) • Tunnel preparatory work and extractive activities • Bridge over North Boambee Road (BR04) • Construction of bridges over waterways • Construction of the new Luke Bowen footbridge (BR24) • Relocation of the Kororo Public School bus interchange and parking • Construction of bridges over Pine Brush Creek (BR21) and new service road • Relocation of 66 kV power line and other adjacent utility services.
Bulk earthworks activities	• Excavating cuttings using excavators, graders, scrapers and bulldozers • Hauling materials from excavated cuttings and external sources to fill embankment locations • Constructing fill embankments • Stockpiling material • Blasting • Benching and stabilising cut and fill batter slopes • Permanent stockpiling of excess or unsuitable material.
Drainage and structures	• Construction of piers, abutments, headstocks, bridge deck, slab and girders • Realignment of watercourses beneath bridges • Installing culverts and drainage pipes.
Bridge construction	• Construction of piers, abutments, headstocks, bridge deck, slab and girders.
Tunnelling	• Preparation of the tunnelling face and establishing portal sites including temporary ventilation plant, water supply, construction water treatment plants including sedimentation basins, acoustic sheds and workforce facilities • Blasting and removal of loosened material (mucking out) for external processing • Tunnel fit out, testing and commissioning.
Local road changes or upgrades	• Existing road network adjustments including minor upgrades to existing local roads and the existing Pacific Highway network • Upgrade of existing intersections to cater for construction traffic and the installation of temporary project signage.
Finishing work	• Line marking of new road surface • Erecting directional signage and other roadside furniture such as street lighting • Landscaping works • Site demobilisation and rehabilitation of temporary construction ancillary facilities.

Table 3 | Indicative construction timeline based on a four year construction program (Source: EIS)

Principal activities	Year 1	Year 2	Year 3	Year 4
Preliminary activities and site establishment				
Site preparation and bulk earthworks				
Drainage and structures				
Bridges				
Tunnels				
Road work and road surfacing				
Finishing work				

Table 4 | Proposed tunnelling activities (Source: Amendment Report)

Activity	Time / Day	Locations
• Portal and tunnel earthworks • Blast preparation • Mucking out of tunnel spoil • Haulage of spoil and delivery of material • Ground support such as drilling/bolting/shotcrete	• 7:00 am – 6:00 pm, Monday to Sunday • Delivery of material and spoil haulage associated with tunnelling is not permitted between the hours of 10.00 pm and 7.00 am Monday to Sunday	• Portal area • Within tunnel
• Blasting	• 7:00 am to 6:00 pm, Mondays to Fridays, inclusive	• Portal area • Within tunnel
• Drill and blast preparation • Mucking out of tunnel spoil (no external haulage) • Ground support such as drilling/bolting/shotcrete • Tunnel mechanical and electrical fit out • Testing/commissioning	• 6:00 pm – 6:00 am, Monday to Sunday	• Within tunnel

The construction footprint is approximately 301.55 hectares in area, including 17 construction ancillary work sites. The project is divided into three construction zones and each zone will have its own main construction compound and satellite sites along the construction corridor. **Figure 2** to **Figure 4** show the location of the proposed construction ancillary sites.

Figure 2 | Location of construction ancillary sites (Source: Amendment Report)

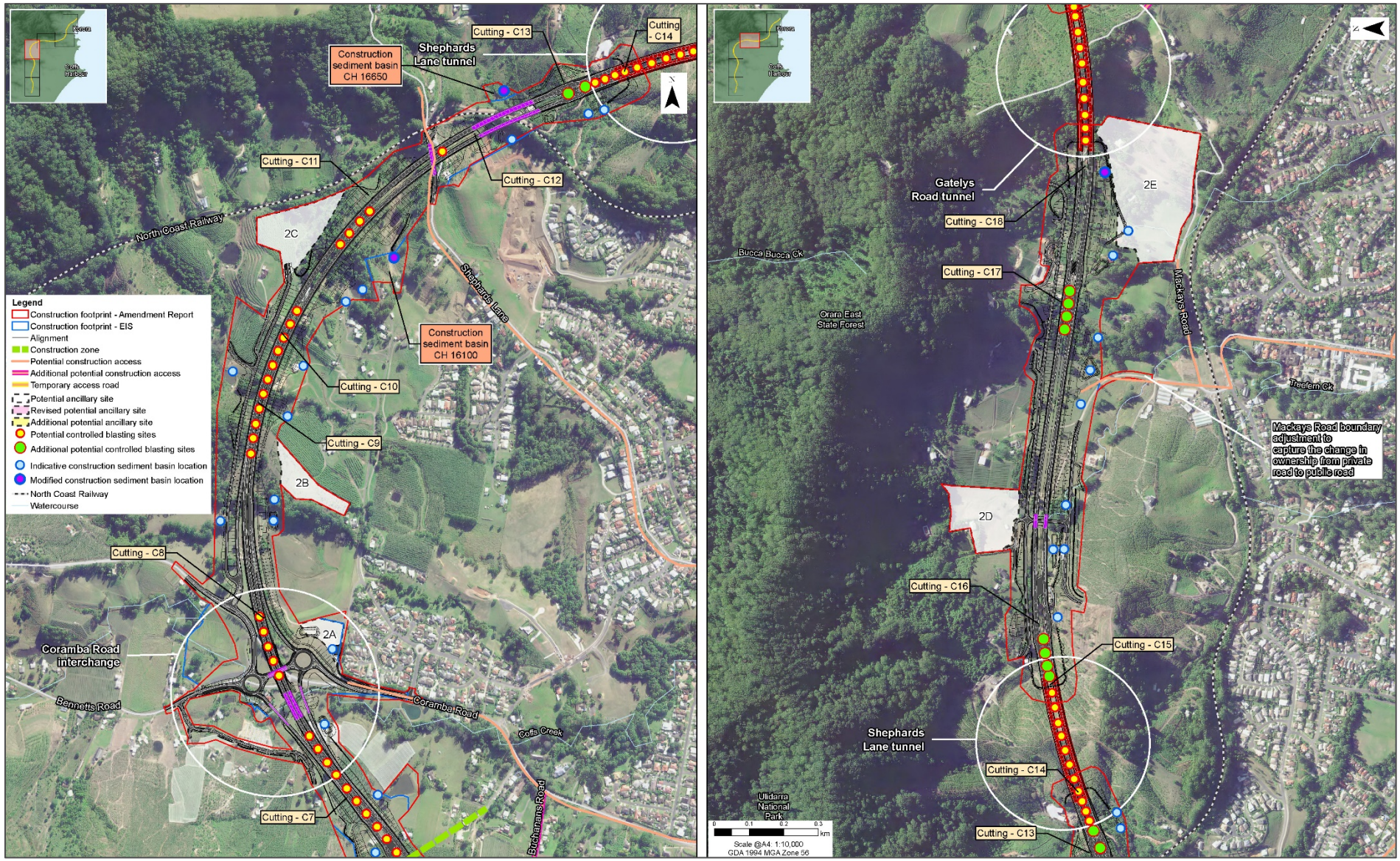

Figure 3 | Location of construction ancillary sites (Source: Amendment Report)

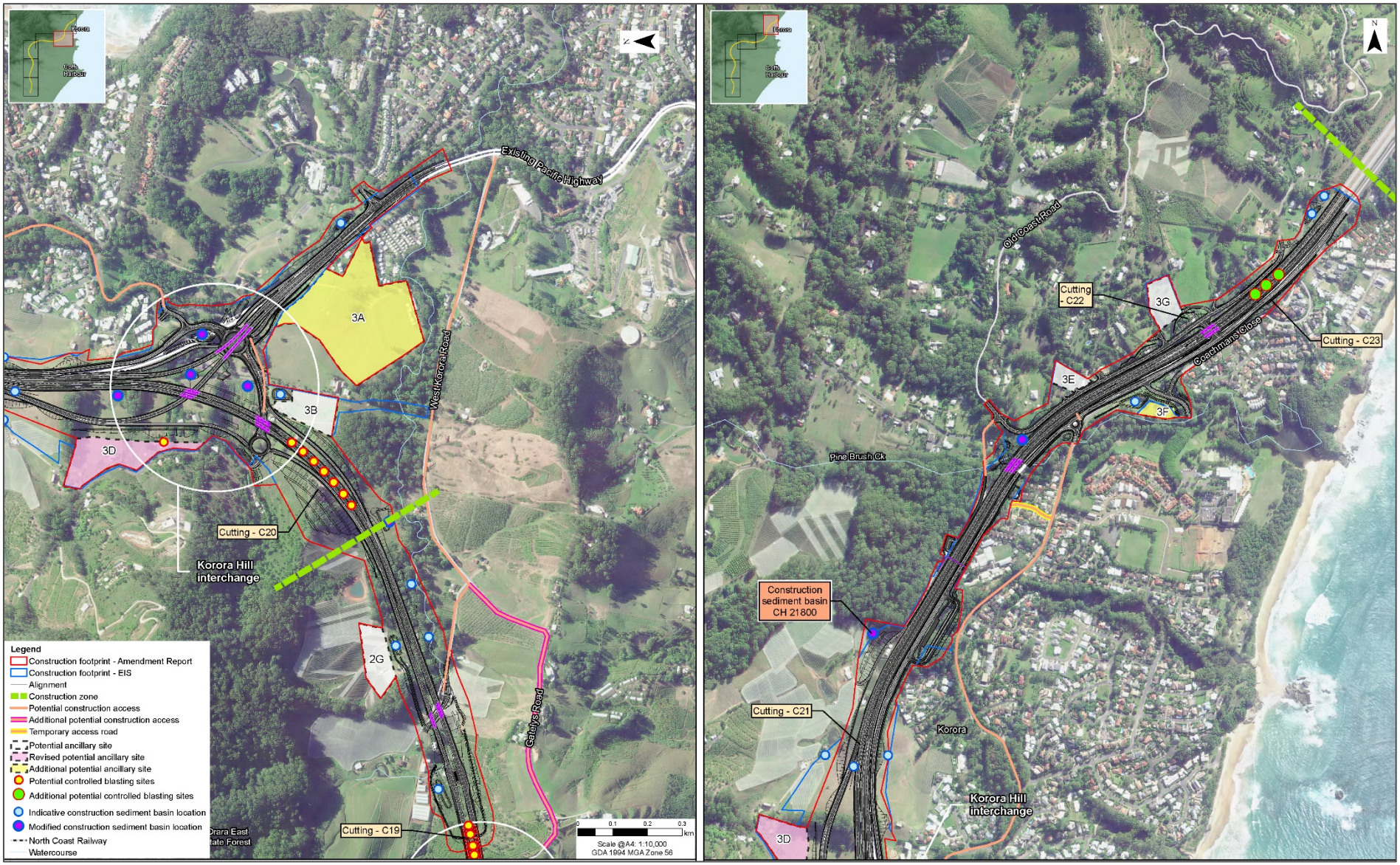

Figure 4 | Location of construction ancillary sites (Source: Amendment Report)

3 Strategic context

3.1 Project Justification

The upgrade of the Pacific Highway is one of the largest road infrastructure programs in NSW which aims to provide a four-lane divided road from Hexham to the Queensland border. By the end of 2020, 95 per cent of the Pacific Highway north and south of Coffs Harbour will be upgraded to free-flowing dual carriageways. Currently, Coffs Harbour and Hexham / Heatherbrae are the only two locations linking Brisbane, Sydney, Canberra and Melbourne where the route remains an urban road with traffic signals.

The existing Pacific Highway through Coffs Harbour is a 12 kilometre low speed arterial road with 12 sets of traffic signals, a major roundabout and 26 other intersections (**Figure 5**). Traffic volumes along the existing route without the proposed bypass are predicted to increase from 30,000 – 35,000 vehicles per day (vpd) in 2016 to 40,400 – 49,000 vpd in 2044.

Key benefits provided by the project include:

- Provision of free-flowing dual carriageway conditions between Hexham and the Queensland border;
- Improved reliability of journey times, particularly during peak travel periods;
- Improved road safety by removing through traffic and some local traffic from the existing road network;
- Provision of increased road capacity to cater for increasing traffic volumes and future traffic volumes; and
- Improved accessibility of and amenity along the existing Pacific Highway.

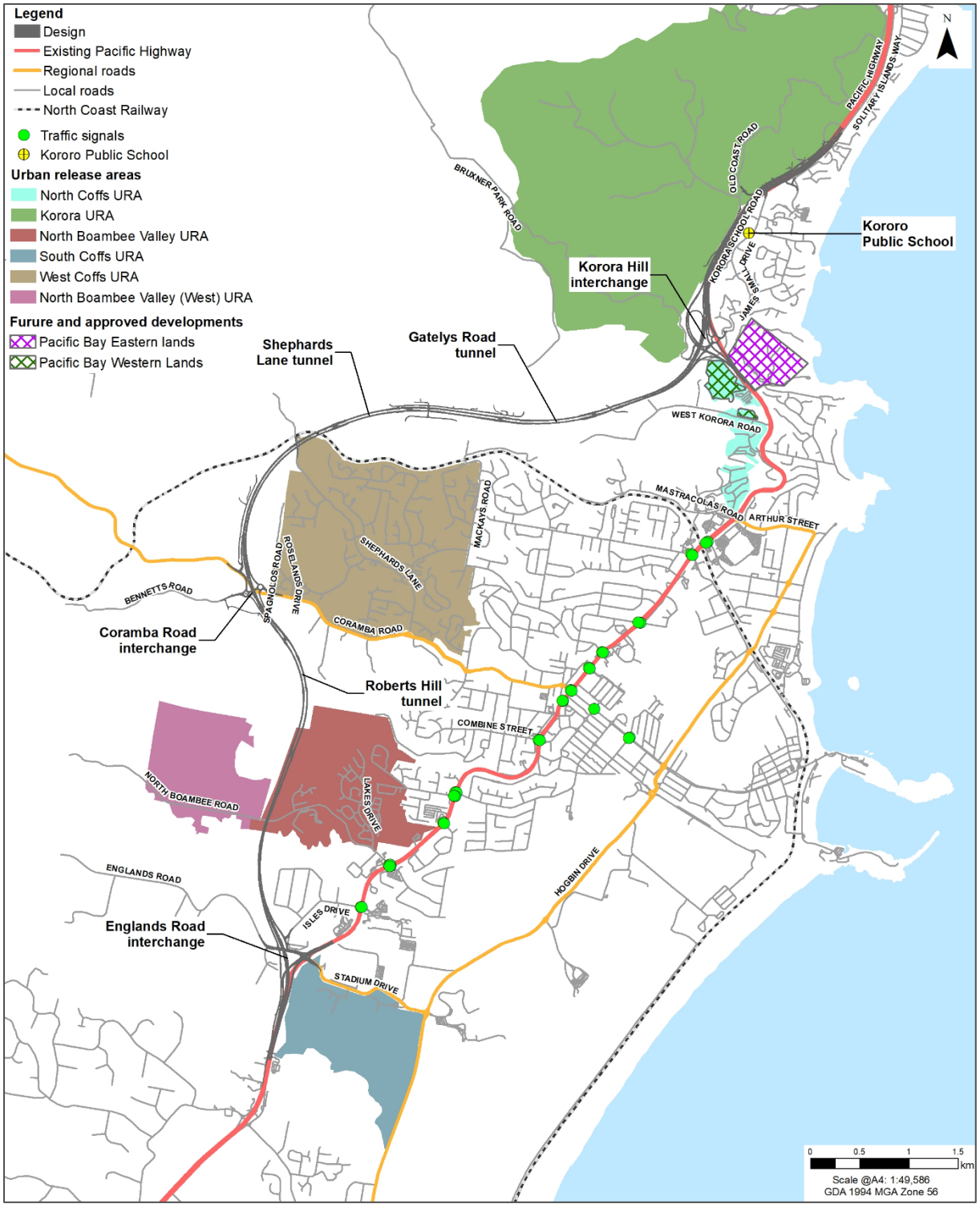

Figure 5 | Existing route (Source: EIS)

3.2 Strategic Justification

The Department considers the project is strategically justified and consistent with government priorities and transport strategies including:

NSW State Infrastructure Strategy (Infrastructure NSW 2018)

The strategy adopts several infrastructure priorities for regional NSW, including improvement of local transport networks. The project aligns with the strategy as it would improve traffic flow and travel times for freight as well as safety for local traffic.

Making it Happen in the Regions: Regional Development Framework (DPI 2017)

The Framework focuses on providing quality services and infrastructure in regional NSW. The project aligns with the Framework as it would provide travel time savings for traffic, including freight, and would provide safer road conditions to support growth and tourism.

Future Transport Strategy 2056 (TfNSW 2018a)

The project has been identified in the *Future Transport Strategy 2056* which is an update of NSW's *Long-Term Transport Master Plan*. The project addresses Future Transport Strategy outcomes by providing for quick and more efficient travel, providing better connections to activate regional and metropolitan centres and the delivery of safer roads that support optimum speeds and are resilient to weather events.

National Road Safety Strategy 2011 – 2020 (Australian Transport Council 2011)

The Strategy represents the commitment of Federal, State and Territory governments to reduce fatal and serious injury crashes on Australian roads.

An objective of the Pacific Highway upgrade program is to significantly reduce road crashes and injuries, and this project would provide safer road conditions by removing through traffic from the local road network.

NSW Freight and Ports Plan 2018 - 2023

The *NSW Freight and Ports Plan* requires government and industry to work together to make the freight system more efficient, more accessible, safer and more sustainable. The project will provide an efficient freight route resulting in reduced travel times for regional heavy vehicle movements through Coffs Harbour.

North Coast Regional Plan 2036

The *North Coast Regional Plan* sets out a 20-year plan for the future of the region. The Plan identifies the Pacific Highway as a critical link for Australia, NSW and the North Coast. The project is identified in the Plan.

Coffs Harbour 2030 Plan (CHCC 2009a)

The *Coffs Harbour 2030 Plan* sets out the potential future of the Coffs Harbour community. The project aligns with several of the objectives outlined in the Plan, including "having a system of well-maintained and safe roads for all users." In addition, removing traffic off the existing Pacific Highway will assist Coffs Harbour City Council in achieving its objective of developing the city centre as a social and cultural focus for Coffs Harbour.

Coffs Harbour City Council Bike Plan 2014 – 2019 (CHCC 2014)

The Bike Plan outlines cycling infrastructure programs to 2019. The main objective of the Plan is to make cycling safer and plan and deliver a connected cycling network. The project meets the objectives of the Plan by providing additional cycling infrastructure along the extension of Solitary Islands Way and the use of shoulders along the project route.

3.3 Preferred Route Selection

A bypass of Coffs Harbour has been considered since the 1970's, with the first route identified in 1973 along the Hogbin Drive arterial route. This alignment generally followed the existing Hogbin Drive and included a southern connection to the existing highway in the vicinity of the Coffs Harbour Airport and a northern connection to the existing highway near West Korora Road. This route was abandoned in 1989 due to strong community, Chamber of Commerce and Council opposition.

In 2001, further planning for the preferred route commenced which included four corridor options (of which one was proposed by the community) (as shown in **Figure 6**) which were subject to design analysis, preliminary cost estimates, traffic modelling, road user cost-benefit analysis and consideration of biodiversity and land-use planning issues. The outcome of the investigations determined that the Inner Corridor was the preferred option as it was the best performing in terms of relative costs and road-user benefits. It was acknowledged at the time that all options would involve significant property acquisition. The Inner Corridor option would impinge more on urban release areas (which would necessitate a review of Council's strategic development plans) while the options further west would impinge more on rural and agricultural areas and have greater biodiversity impacts.

Due to high levels of community concerns in relation to the selection of the Inner Corridor, Council engaged an independent peer review of the selected corridor option. The review concluded that the Inner Corridor was preferred and that the planning process had provided for the delivery of the best option for the community.

In 2003, Council still preferred a western bypass of Coffs Harbour, which led to the then Minister for Roads commissioning additional route selection analysis. This review concluded that a western corridor had significant topographical constraints and engineering challenges associated with locating the alignment outside the coastal plains and into the steep and mountainous terrain associated with the coastal ridges; had poor functional performance; high cost and poor economic viability; and significant impacts to biodiversity and landscapes of Aboriginal cultural heritage importance.

In 2004, the preferred corridor was announced (i.e. the Inner Corridor as identified in the 2001 route selection process) as shown in **Figure 7**. In 2008, the preferred route within the Inner Corridor was announced which included potential locations for tunnels as shown in **Figure 8**. In 2013, the preferred route was gazetted in the Coffs Harbour Local Environmental Plan 2013.

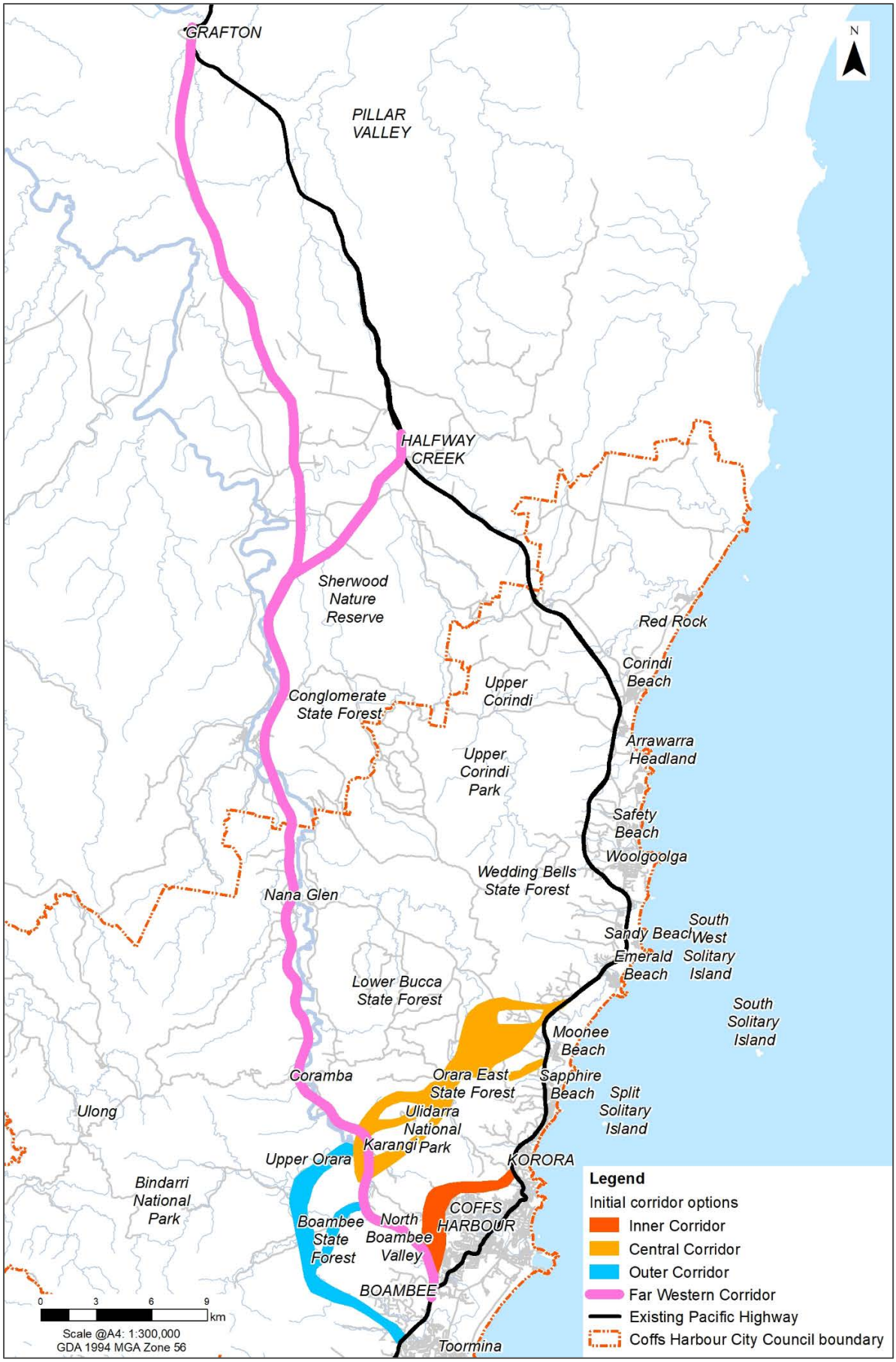

Figure 6 | 2001 Proposed routes (Source: EIS)

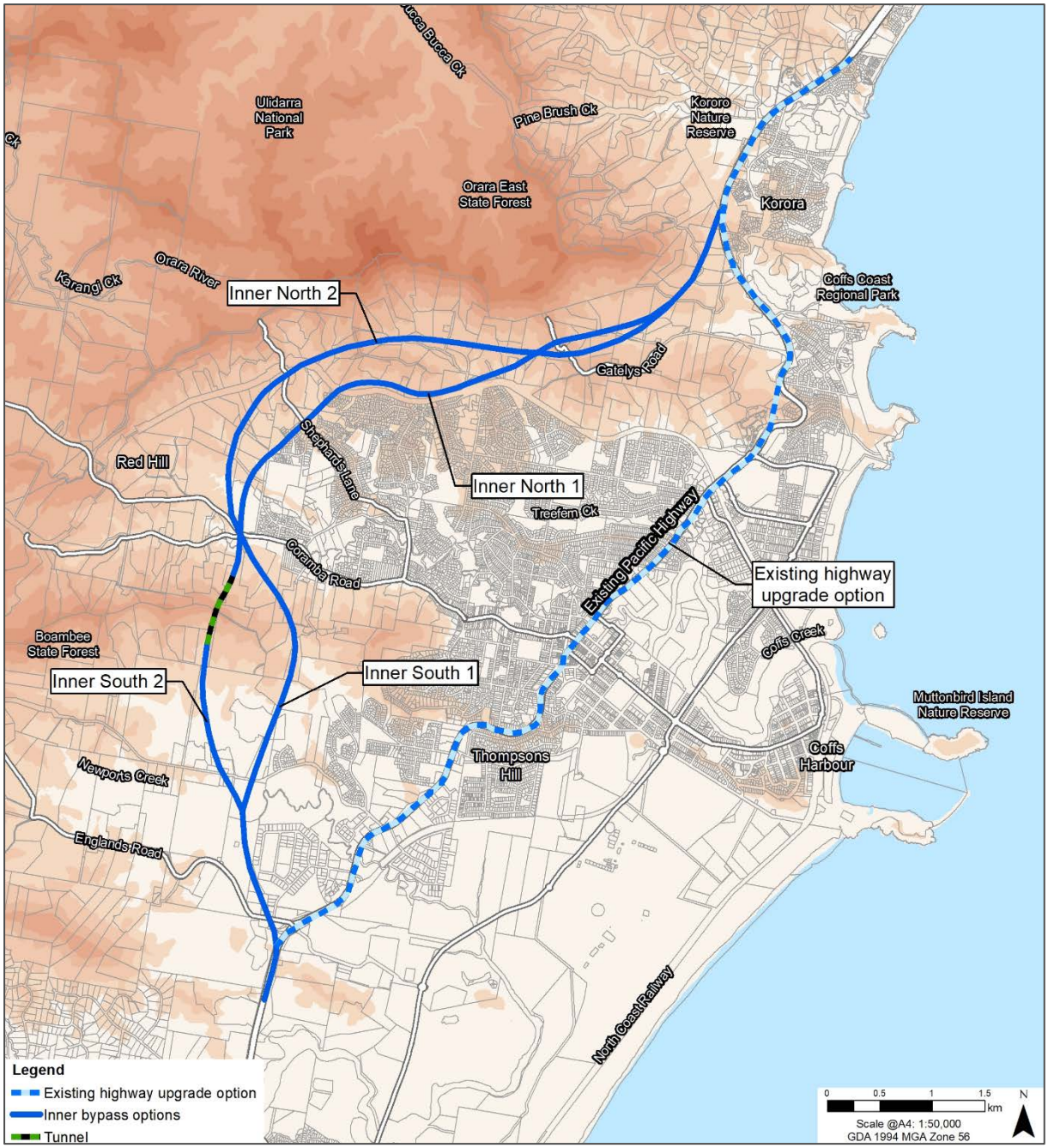

Figure 7 | Inner corridor options 2004 (Source: EIS)

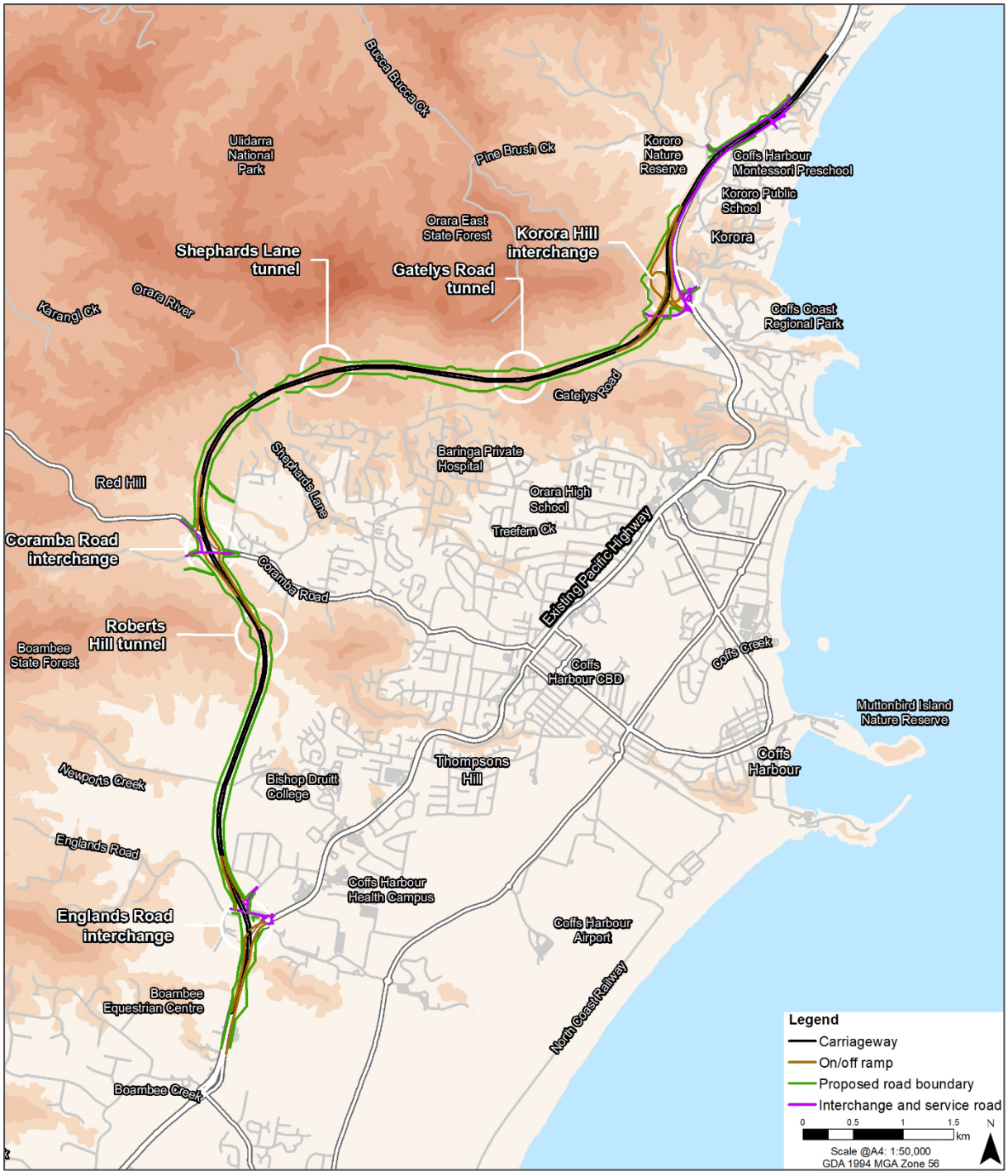

Figure 8 | Preferred option - concept design 2008 (Source: EIS)

In 2016, a preliminary concept design was presented to the community which included the option of three tunnels. In 2018, a new concept design was announced for public comment with the most notable change being the removal of the tunnels for a design with cuttings. The main justification for the cutting design was to avoid the need for a managed tunnel system and to ensure all vehicles carrying dangerous goods could use the bypass and avoid residential and urban areas. However, due to strong community objections and comments, the design was further refined to include three tunnels as part of the EIS project.

The concept design with cuttings does not form part of the project.

4 Statutory Context

4.1 State significance

The project is Critical State Significant Infrastructure (CSSI) pursuant to section 5.13 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Minister for Planning and Public Spaces is the approval authority.

4.2 Permissibility

The project is for the purpose of a road or road infrastructure facilities and is characterised as development permitted without consent, in accordance with clause 94 of the *State Environmental Planning Policy (Infrastructure) 2007* (the Infrastructure SEPP).

In accordance with section 5.22(2) of the EP&A Act, the only environmental planning instruments that apply to the project are the Infrastructure SEPP insofar as it relates to the declaration of development that does not require consent and *State Environmental Planning Policy (State and Regional Development) 2011* as it pertains to the declaration of infrastructure as State significant infrastructure. No other environmental planning instruments govern the carrying out of the project.

4.3 Mandatory Matters for Consideration

Objects of the *Environmental Planning and Assessment Act 1979*

The determination must have regard to the objects of the EP&A Act. The Department has considered the objects of the EP&A Act including:

- Ecologically sustainable development (see **Sections 4.5** and **6**);
- Social and economic welfare (see **Section 6**);
- Protection of the environment, including in relation to biodiversity, traffic, noise and vibration, air quality, surface and groundwater hydrology, urban design, amenity and socioeconomic issues (see **Section 6**);
- Sustainable management of built and cultural heritage, including Aboriginal cultural heritage (see **Section 6**);
- Good design and amenity of the built environment (see **Section 6**);
- Promoting sharing of the responsibility for environmental planning and assessment between the different levels of government (see **Section 5**); and
- Community participation in the assessment of the project (see **Section 5**).

Ecologically Sustainable Development

The EP&A Act adopts the definition of ESD in the *Protection of the Environment Administration Act 1991*. Section 6(2) of that Act states that ESD requires the effective integration of economic and environmental considerations in the decision-making process and that ESD be achieved through the implementation of:

a) the precautionary principle;
b) inter-generational equity;
c) conservation of biological diversity and ecological integrity; and
d) improved valuation, pricing and incentive mechanisms.

Project objectives which guide the delivery and operation of the project would contribute to the sustainability of the project and the meeting of ESD principles. In addition to the objectives, the Proponent has addressed the above principles directly in both the EIS and Submissions Report and has identified a broad range of mitigation measures to manage impacts associated with these issues.

The Department has also recommended conditions of approval requiring:

- Preparation of a Sustainability Strategy, that will be implemented throughout construction and operation of the project; and
- Achievement of a minimum "Excellent" 'Design' and 'As built' rating under the Infrastructure Sustainability Council of Australia infrastructure rating tool (Version 1.2).

The precautionary principle is applied throughout the EIS and the Department considers the assessment and the range of mitigation measures adequately adopt the principle. The Department is satisfied that the valuation and pricing of the environmental resources associated with the project have been adequately undertaken and internalised through the project design and mitigation measures.

4.4 Framework for Biodiversity Assessment

The project is a pending planning application under the *Biodiversity Conservation (Savings and Transitional) Regulation 2017.* Clause 28 of this Regulation states that the former planning provisions under the *Threatened Species Conservation Act 1995* (TSC Act) continue to apply (and Part 7 of the *Biodiversity Conservation Act 2016* (the BC Act) does not apply) to the determination of a pending or interim planning application.

In accordance with the TSC Act, the biodiversity values of the project have been assessed in accordance with the Framework for Biodiversity Assessment (FBA). A Biodiversity Assessment Report (BAR) of the concept design, updated for the amended project, accompanied the Amendment Report. The Department's assessment of impacts to biodiversity is contained in **Section 6.5** of this report.

The BAR assessed impacts to the biodiversity values of the project area from the clearing of threatened ecological communities (7.16 ha), removal of threatened flora species (Rusty Plum and Scrub Turpentine), clearing of 48.17 ha of known and potential habitat for threatened flora and fauna species, and impacts to fauna connectivity through the fragmentation of habitats to the east and west of the alignment. The BAR identified mitigation measures to further reduce and minimise these unavoidable impacts. These measures include maintenance of connectivity through fauna crossings, landscaping and revegetation of fauna habitats, bridging of riparian vegetation providing fauna habitat and pre-clearance surveys to reduce direct impacts to threatened fauna. The assessment of Matters of National Environmental Significance concluded the project would have a significant impact to the Koala and Giant Barred Frog.

As a result of the unavoidable impacts of the project, the Proponent will secure offsets in accordance with the *NSW Biodiversity Offsets Policy for Major Projects* and for significantly impacted Commonwealth listed species the *EPBC Act Environmental Offsets Policy.* The required offsets include the retirement of biodiversity credits in the form of ecosystem credits and species credits. As the Scrub Turpentine is a newly listed species, biodiversity credits under the FBA are not available and impacts to the species would be through direct offsets and/or supplementary measures. The Department has recommended conditions of approval which requires the Proponent to:

- Secure ecosystem and species credits in accordance with the NSW Biodiversity Offsets Policy for Major Projects;
- Provide supplementary measures to offset impacts to the Scrub Turpentine;
- Revegetate koala habitat above the Roberts Hill and Gatelys Road tunnels;
- Develop a threatened species management plan for the Koala and Giant Barred Frog;
- Translocate the Rusty Plum in accordance with a Salvage and Re-establishment Plan; and
- Develop a Biodiversity Management Sub-plan to manage construction impacts on biodiversity in the alignment.

4.5 Commonwealth matters

On 15 October 2015, the Commonwealth Department of the Environment and Energy, now the Department of Agriculture, Water and the Environment (DAWE) determined the project to be a 'controlled action' under sections 18 and 18A of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), as it was considered likely that the project could have a significant impact on listed threatened species and communities.

Following notification from the Commonwealth of the decision that the project was a controlled action, the Department confirmed that the project would be assessed under the then NSW Bilateral Agreement with the Commonwealth (now the Amending Agreement No. 1). Under this agreement, the Commonwealth accredited the assessment process under the EP&A Act for the purposes of the EPBC Act, enabling a single assessment of the project. Accordingly, NSW has assessed the potential impacts on the relevant Matters of National Environmental Significance (MNES) in accordance with the requirements of the bilateral agreement.

The relevant controlling provision of the EPBC Act is threatened species and ecological communities. The assessment of MNES is provided in **Section 6.5** of this report and includes sufficient detail such that the Commonwealth decision-maker may consider those impacts when determining whether to approve the project. Additionally, this Assessment Report makes a recommendation and proposes conditions to the Commonwealth Minister for the Environment in relation to an approval decision.

5 Engagement

5.1 Department's engagement

Under section 5.28(1)(c) of the EP&A Act, the Planning Secretary is required to make the EIS publicly available. The EIS (**Appendix B**) was made publicly available from 11 September 2019 to 27 October 2019 (47 days) on the Department's website and electronically at NSW Service Centres. The EIS was also made publicly available at the following locations:

- Coffs Harbour City Council;
- Harry Bailey Memorial Library;
- Toormina Library; and
- Nature Conservation Council (electronic copy).

Notification of the exhibition of the EIS was advertised in the Coffs Coast Advocate and The Australian newspapers on 11 September 2019 to inform the public of the exhibition details and how to comment on the project.

The Department also undertook a range of discussions with the community, including a community action group and Registered Aboriginal Parties (RAPs), Coffs Harbour City Council (the Council), and various State agencies during its assessment of the project. The Secretary's Environmental Assessment Requirements (SEARs) were prepared in consultation with regulatory agencies and Council, including hosting a Planning Focus Meeting.

Community Engagement

Coffs Bypass Action Group

During and following the exhibition of the EIS, Department staff met with the community action group Coffs Bypass Action Group (CBAG) on three occasions about the project. At these meetings, the accuracy of the operational noise modelling, the concept design (tunnels, not cuttings) and noise mitigation measures were discussed. CBAG's noise representatives were concerned the background noise levels adopted by the noise model did not give a true representation of the noise environment of communities adjoining the project, resulting in higher predicted operational noise levels than would be the case. The CBAG representatives presented their own noise measurements which indicated lower background noise levels than those used in the noise model. The Department raised the CBAG's concerns with the Proponent, who advised they have also corresponded and met with CBAG. The CBAG representatives have advised that agreement has been reached with the Proponent that background noise levels would be measured at CBAG's nominated locations and used in the noise model for the detailed design of the project.

The CBAG was concerned that the proposed tunnels would be replaced with cuttings during the detailed design of the project and wanted assurances that the project would be constructed with tunnels. The Department advised that any design changes which were inconsistent with an approved project would require the approval to be modified and an environmental assessment of any proposed modifications to be undertaken.

Registered Aboriginal Parities

The Department and officers from Heritage NSW met with the Coffs Harbour and District Local Aboriginal Land Council (CHDLALC) and the Registered Aboriginal Parties (RAPs) for the project. The RAPs who attended the meeting were Garby Elders, Jagun Aged & Community Care and Muurrbay Bundani Aboriginal Corporation. The CHDLALC and RAPs raised concerns that the heritage assessment of the project only considered scientific archaeological values and not the cultural values of the area impacted by the project. Greater onsite involvement was requested, particularly the ability to undertake a site walkover to identify sites where cultural salvage would be undertaken. The RAPs also sought greater involvement during the construction of the project.

The Department discussed the CHDLALC and RAPs concerns with the Proponent and Heritage NSW and has recommended conditions to address the cultural salvage of archaeological relics. The Department's assessment of Aboriginal heritage issues is discussed in **Section 6.3**.

Community Consultative Committee

The Proponent established a Community Consultative Committee (CCC) in January 2019 to provide a forum for discussions between it and representatives of the Coffs Harbour community on issues related to the project. The Independent Chair (IC), Dr Colin Gellatly, was appointed on 26 February 2019. Community members were appointed on 25 March 2019 and the CCC held its first meeting on 29 April 2019.The Department has attended all four meetings of the CCC as an observer and gave presentations on the State significant infrastructure assessment process and answered queries on the different stages in the assessment of a project.

Council Engagement

Following the exhibition of the EIS, the Department met with Council staff and discussed Council's comments on the project. These included impacts to Council's Coffs Coast Waste Services facility, traffic, flooding impacts and biodiversity.

5.2 Summary of submissions

The exhibition of the EIS resulted in 186 submissions from 182 submitters, of which nine were from State and local agencies, one from the Greens political party, nine from special interest groups, organisations and Aboriginal groups, three from peak bodies and 160 from community submitters.

Copies of the submissions are attached in **Appendix C**.

5.3 Key issues raised in submissions

Neither Coffs Harbour City Council nor any State government agency objected to the project, however all raised issues for consideration.

Coffs Harbour City Council (Council) – indicated support for the project including the provision of tunnels and made a number of comments on the project including:

- Request to be involved in the development of the final urban design outcomes;
- Request for the provision of a western service road from Sawtell Road intersection to Lindsay's Transport facility;

- Concerns with Isles Drive access;
- Concern over the potential impacts on Council's waste management facility;
- Request that James Small Drive be upgraded to accommodate additional traffic movements;
- Refinements to the Kororo Public School bus bay;
- Upgrading of bridges along Old Coast Road;
- Request for an additional access point to the Coffs Coast Sport and Leisure Park precinct from the South on the existing Pacific Highway;
- Concerns with construction traffic using MacKays Road and local roads in general, noting that access to the site is generally via local roads;
- Koala connectivity, the ridgeline above the Roberts Hill tunnel has poor quality vegetation;
- Supports a whole of Government approach to address existing flooding; and
- Council also made representations on behalf of the Coffs Bypass Action Group on the noise modelling.

Environment Protection Authority (EPA) – sought clarification on construction and operational noise modelling, including further justification for out-of-hours activities. The EPA indicated support for the early implementation of operational noise mitigation and encouraged the on-site reuse of mulch produced from vegetation clearing works. It made a number of recommendations in regard to water quality including the use of high efficiency sediment basins, noting that further assessment is required to determine the localised impacts on sediment basin discharges into waterways and that further information is required on the treatment of waters captured within the bypass. The EPA also recommended that surface water discharge impact assessment be undertaken.

Environment, Energy and Science Group (EESG) – recommended the inclusion of cultural salvage of Aboriginal objects and continued consultation with RAPs if potential burial sites are found. Errors and inconsistencies within the Framework for Biodiversity Assessment were identified. EESG requested the provision of additional survey data and recalculation of biodiversity credits. It also requested to review any amendments to the flooding and hydrology assessment.

DPIE –Water Group and the NSW Natural Resources Access Regulator (NRAR) recommended that groundwater flows must not exceed 1L/s per kilometre and requested ongoing consultation regarding impacts on groundwater bores and any make good provisions. It also indicated that groundwater used for construction purposes should be licenced.

DPI – Agriculture indicated support for the mitigation and management measures proposed for potential agricultural impacts and requested to be involved in the development of a Panama Disease Management Plan. The agency indicated that it does not support water take from local waterways for use in construction.

DPI – Fisheries did not support the sourcing of water from waterways within the project area for construction activities, noting that key fish habitat and aquatic ecosystems can be impacted by over abstraction of water from creeks.

Education – School Infrastructure NSW advised that the location of the replacement Luke Bowen footbridge should be closer to Kororo Public School, and that safe and accessible access be provided between the school and the new bus interchange.

Heritage Council of NSW noted there are no impacts to any State heritage registered items.

Fire and Rescue advised it has no comments or recommendations on the EIS.

Crown Lands advised any Crown Land required for the project should be formally acquired.

5.4 Key Issues – Community/Special Interest Groups

The following key issues were raised by the community and special interest groups. Further details of the issues raised in submissions are provided in each of the key assessment issues in **Section 6**.

Project development and alternatives

- Residents are opposed to a design and construction contract. Residents prefer a construct only contract in fear of tunnels being changed to cuttings following project approval.
- The bypass route should be located further west and not through residential areas.
- Request a redesign of the Coramba Road interchange.
- The Englands Road and Korora Hill interchanges are too complex.

Traffic and access

- Increased construction and operational traffic impacts to the local road network.
- All Dangerous Goods vehicles must be permitted to use the bypass / tunnels.
- Traffic modelling is out of date.
- Improved cyclist connection required to the bypass and along the bypass.
- Residents north of the Korora interchange do not benefit from the bypass.

Noise and vibration

- Western Coffs Harbour has low background noise levels and the project will increase noise levels.
- Additional noise barriers and at-house property treatment requested.
- Construction noise and vibrations impacts.
- The noise modelling is inaccurate, and an independent noise audit must be undertaken.
- The NSW Government should adopt the World Health Organisation *Noise Guidelines for the European Region* (2018) to assess road noise impacts.

Aboriginal cultural heritage

- The Proponent failed to properly engage with the Registered Aboriginal Parties (RAPs).
- Requests that RAPs undertake a pre-construction inspection.
- Aboriginal Cultural officers should be employed during the construction of the project.
- All Aboriginal heritage items must be salvaged.
- Potential for unexpected finds – i.e. burial sites.

Biodiversity

- Local native species should be used for bushland regeneration.
- Clearing of vegetation will have impacts to koala and other animals in the area.
- General concerns regarding effectiveness of environmental management measures for protection of flora and fauna.

Land use, property and socio economic

- Some businesses including resorts and farms raised concerns regarding impacts to their operations during construction and operation of the project.

- Reduced property values.
- Amenity of the area adjacent to the project will be reduced.
- Some residents requested to be connected to the town water supply due to reliance on rainwater tanks.

Air quality

- Construction dust impacts.
- Operational air quality will worsen.

Urban design, landscape and visual amenity

- Additional landscaping is required near residents.
- Visual impacts of long bridges and cuttings.
- Visual amenity impacts through loss of vegetation.

Other comments

- Potential for increased flooding impacts.
- Impacts to drinking water bores.
- The Solitary Islands Marine Park is easily affected by turbidity and other runoff.
- Lack of transparency and trust.

5.5 Response to Submissions and Amendment Report

Following the exhibition of the EIS, the Department directed the Proponent to prepare a response to the submissions received on the EIS. In addition, the Proponent undertook additional community consultation between 27 November 2019 and 13 December 2019 on proposed changes to the design and construction of the project. These included refinements to the Englands Road and Korora Hill interchanges, the bus stop on Coramba Road near Spagnolos Road, and the bus interchange at Kororo Public School. The Proponent's community consultation included a project office in the Coffs Harbour CBD, community engagement sessions, and online information and community feedback.

The proposed changes to the project were assessed and reported in an Amendment Report (see **Appendix E**) and included:

- Revisions to the Englands Road interchange to reduce impacts on Council's recycling facility, a lower carriageway alignment, improved property access to businesses, improved access to the bypass, a new fauna underpass and minor adjustments to the operational water quality basins;
- Lowering the vertical alignment of the carriageways through the North Boambee Valley and reduced earthworks on the floodplains;
- Formalisation of the Coramba Road bus stop with a new bus shelter, a shared user path to residential areas, and a 'kiss and ride' cul-de-sac;
- Provision of additional flood storage upstream and downstream of Coffs Creek resulting in no impact to Council's Bennetts Road detention basin;
- Construction of a dumbbell interchange at Korora Hill that provides simpler access on and off the bypass and a new set of traffic lights at the Charlesworth Bay Drive intersection;
- Revised design to the Kororo Public School bus interchange, increased capacity for eight buses, bus shelters, 30 staff carpark spaces, and pick up/drop off bays;

- Relocation of the Luke Bowen footbridge to improve access to Kororo Public School and the bus interchange, formalisation of parking/drop-off on the western side of the Pacific Highway and relocation of the existing Solitary Rural Fire Services shed facility to a new location;
- Realignment of Pine Brush Creek and Williams Creek;
- Optimising the design of construction and operational water quality basins;
- Revised construction traffic management, including additional construction access roads and a temporary local traffic connection between Russ Hammond Close and Korora School Road;
- Inclusion of additional blasting locations; and
- New and revised construction ancillary facilities to support the delivery of the project.

The Submissions Report and Amendment Report were made publicly available on the Department's website on 26 June 2020. Comments were sought from state agencies and Council on both reports. The state agencies and Council did not raise any concerns with the amended design and assessment in the Amendment Report.

Following publication of the Submissions Report and Amendment Report, the Department received feedback from the community on the amended project. Issues raised include:

- Inadequate response to issues relating to truck noise and assessment of maximum noise levels;
- Permit dangerous goods to travel through tunnels and associated risk assessments;
- The project should fix existing black spots along Coramba Road; and
- The provision of a noise wall / barrier along Coachmans Close, provision of a vegetated road reserve and moving the road alignment further to the west, away from residents on the eastern side of the highway.

The Department has considered the issues raised in submissions received from exhibition of the EIS and feedback on the amended project in its assessment of the project as detailed in **Section 6** of this report.

6 Assessment

The Department in its assessment of the project, has considered the EIS, RtS, Amendment Report and submissions / feedback received on the project. The Department has identified the key issues for assessment are Traffic and Transport (**Section 6.1**), Noise and Vibration (**Section 6.2**), Aboriginal Heritage (**Section 6.3**), Flooding and Hydrology (**Section 6.4**), Biodiversity (**Section 6.5**), Surface and Groundwater (**Section 6.6**), Agriculture (**Section 6.7**), Socio-economic, Property and Land Use **(Section 6.8**); and Design and Landscape (**Section 6.9**). Other Issues are discussed in **Section 6.10**.

6.1 Traffic and Transport

Overall the project will provide benefits across the road network, particularly through the removal of through traffic along the existing Pacific Highway and local intersections. The project has been designed in consideration of surrounding residents and schools and will provide a safer road for motorists, cyclists and pedestrians.

Construction traffic impacts are considered acceptable and will be managed proactively through the implementation of traffic management measures. The Englands Road and Korora Hill interchange designs have been amended to improve access to and from the bypass (better wayfinding and more direct access).

Issue

Existing and future conditions without the project are expected to worsen

The Pacific Highway has experienced a significant increase in traffic volumes within the Coffs Harbour LGA, particularly from heavy vehicles. This increase is due to through traffic to regional centres, local trips to commercial and retail centres throughout Coffs Harbour and access to industrial land uses. Up to 12 sets of traffic signals, numerous intersections and property accesses along the existing highway (**Figure 5)** create a stop-start traffic environment. In 2016, approximately 30,000 - 35,000 vehicles travelled through the Coffs Harbour CBD on a weekday. **Table 5** summarises the growth in traffic volumes between 2007 and 2016.

Table 5 | Two-way average weekday traffic volume between 2007 - 2016 (Source: EIS)

Current Location	Vehicles Per Day (per cent Heavy Vehicles)		
	2007	2011	2016
Pacific Highway - south of Coffs Harbour (1km south of Englands Road)	31,300 (-)	33,700 (-)	31,500 (14%)
Pacific Highway – Coffs Harbour CBD (north of Harbour Drive)	28,600 (-)	29,300 (-)	35,200 (15%)
Pacific Highway – north of Coffs Harbour (at 1km south of Moonee Beach Road)	18,600 (12%)	22,00 (13%)	24,200 (15%)

In 2016, during the peak periods, northbound travel times were between 18-24 minutes, while southbound travel times were 16-19 minutes. Travel times are predicted to increase to 29 minutes by 2044 during the morning peak (southbound) and to 20.4 minutes during the morning peak (northbound), without the bypass. The predicted travel times along the existing Pacific Highway with and without the project are shown in **Table 6**.

Table 6 | Predicted daily travel time savings (mins) with and without the project (Source: Amendment Report)

Scenario	Direction	Travel times (minutes)					
		2024		2034		2044	
		AM	PM	AM	PM	AM	PM
Base case (without project)	Southbound	21.0	19.3	20.7	20.7	29.2	21.8
	Northbound	19.6	19.6	20.5	21.4	20.4	23.7
Project case (with project)	Southbound	8.5	8.5	8.5	8.6	8.6	8.6
	Northbound	8.3	8.4	8.3	8.5	8.4	8.5
Travel time savings	**Southbound**	**12.5**	**10.8**	**12.2**	**12.1**	**20.6**	**13.2**
	Northbound	**11.3**	**11.2**	**12.2**	**12.9**	**12.0**	**15.2**

A Level of Service (LoS) assessment of the intersection performance of key Pacific Highway intersections was undertaken in 2016. The assessment was based on the average delay of vehicles at key intersections and roads along the existing route, with LoS ranges from A (very good) to F (unsatisfactory). The LoS are C's and D's along some intersections along the Pacific Highway during peak periods. The Pacific Highway / Orlando Street intersection has a LoS C during AM peak periods and D during the PM peak periods. Similarly, the Pacific Highway / Albany Street intersection has a LoS D during the AM period and C in the PM period. Isles Drive and Stadium Drive intersections along the Pacific Highway have a LoS C during the AM period and D in the PM peak. It is expected that by 2044 the LOS at these intersections will reduce with increased waiting times and delay.

The operation of the project improves traffic conditions on the existing Pacific Highway

Once opened, the project will carry approximately 24,700 vehicles (south of Coramba Road) and 19,700 vehicles (north of Coramba Road) on a typical weekday (two-way). Predicted daily traffic volumes on the existing Pacific Highway and key local roads in 2024 (modelled year of opening) with and without (do nothing scenario) the project are shown in **Figure 9**. Overall, the traffic model shows higher traffic volumes using the bypass and a reduction in traffic volumes (by 13,600 vehicles per day south of Albany Street and 10,800 vehicles per day, north of Orlando Street (through traffic)) along the north-south movements on the existing Pacific Highway through the Coffs Harbour CBD.

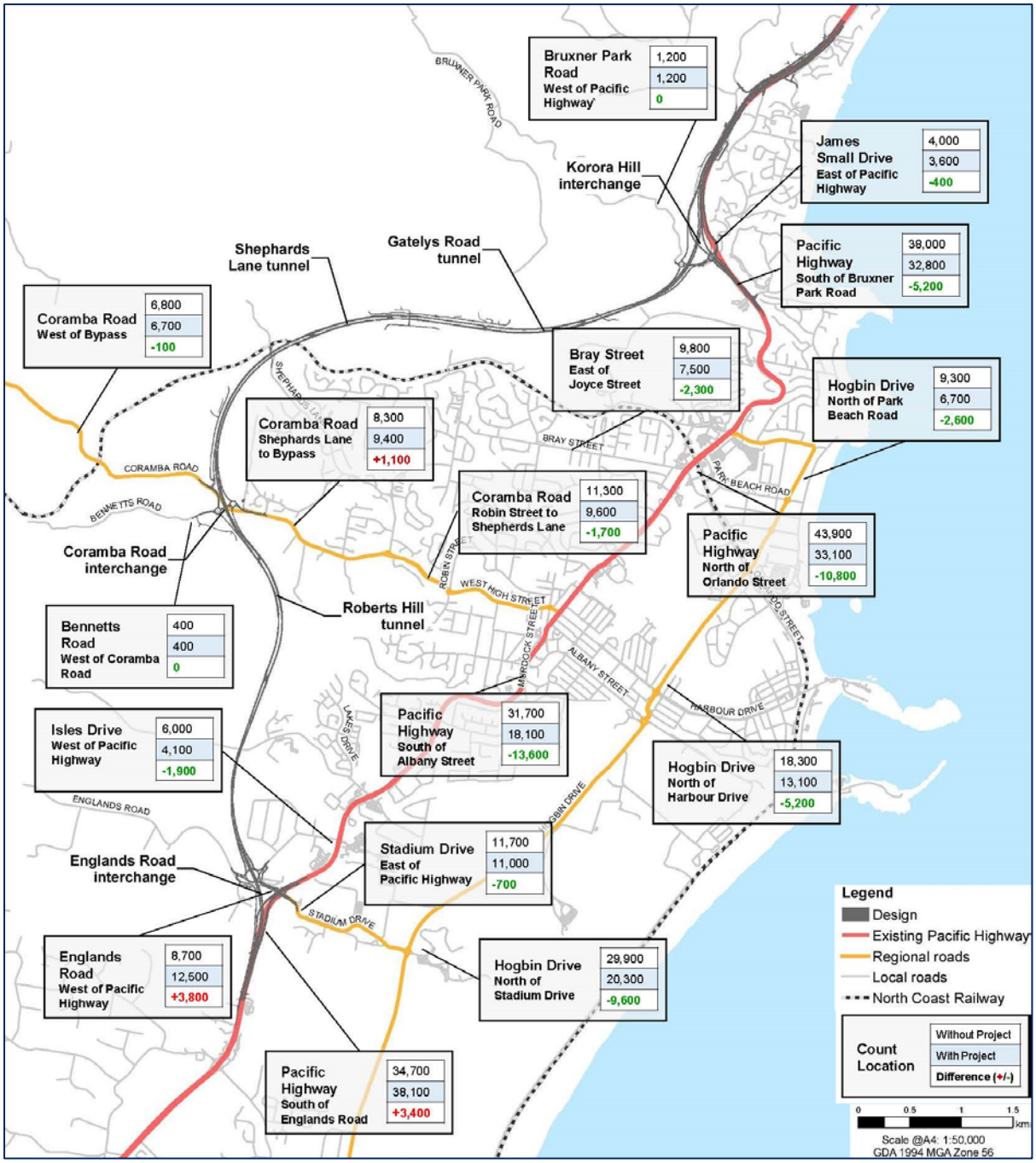

Figure 9 | Daily 2024 traffic volumes with and without the project (Source: Amendment Report Appendix A)

The Department has considered the impact on the existing Pacific Highway and key local intersections, and notes that the project would provide benefits to road users on the Pacific Highway, local and through traffic by carrying approximately 24,700 vehicles (south of Coramba Road) and 19,700 vehicles (north of Coramba Road) on a typical weekday (two-way).

Construction traffic

Access to the construction zones would be from the Pacific Highway and existing local road network (**Figure 10**). The local roads proposed to be used by construction vehicles would experience an increase in daily traffic (both light and heavy vehicles) volumes. The estimated daily traffic volumes due to construction are summarised in **Table 7**.

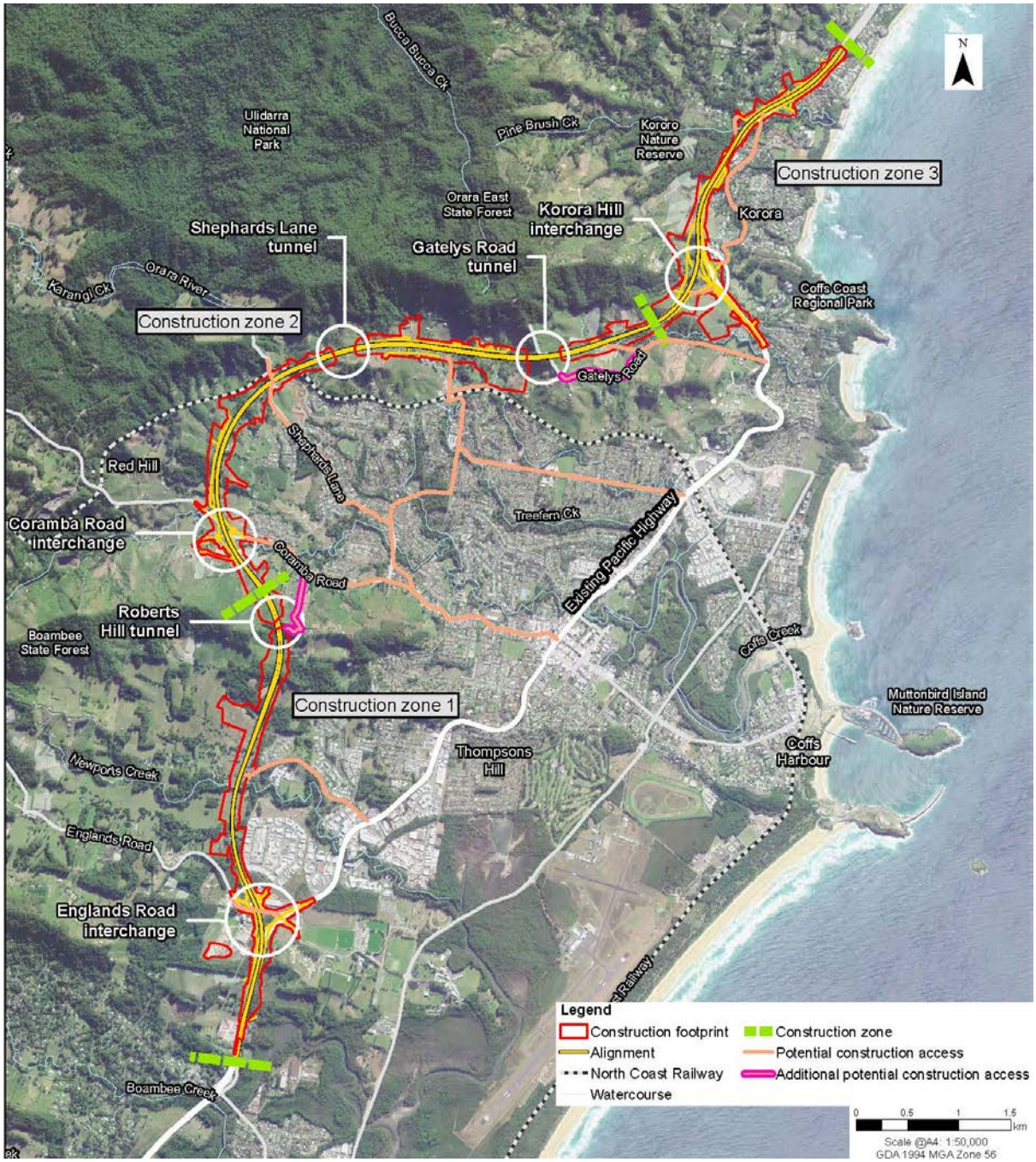

Figure 10 | Proposed construction zones (Source: Amendment Report Appendix B)

Other changes to the local road network during the construction of the project include an alternative access to Korora School Road. The existing access from the Pacific Highway will be required to be closed and a temporary access route would be provided via Russ Hammond Close.

The Proponent has committed to implementing measures to manage and mitigate traffic impacts during construction of the project. Prior to commencing construction, the Proponent will prepare a construction traffic management plan, which will include details on the construction traffic access arrangements to ancillary sites and scheduling of construction activities such as deliveries. In consultation with Council, the traffic management plan will also include details on alternative property access arrangements to impacted properties and pedestrian and cyclist access plans. Details on construction and non-construction traffic performance will be reviewed and included in the plan during

construction. The Proponent has also committed to preparing a vehicle movement plan for construction haulage routes, which would address impacts associated with materials haulage during construction.

Table 7 | Proposed use of local roads for construction access (Source: Amendment Report Appendix A)

Road	Design Capacity (upper limit) [vpd]	2016 daily volumes [vpd]	Peak daily construction vehicles [vpd]			Total with construction traffic	% increase due to construction traffic
			No. HV	No. LV	Total VPD		
North Boambee Road	6,000	6,980	240	290	530	7,510	8%
Shephards Lane	6,000	6,700	20	470	490	7,190	7%
Coramba Road (West High Street)	10,000	10,160	470	520	990	11,150	10%
Old Coast Road	2,000	2,160	100	200	300	2,460	14%
Buchanans Road	300	80	40	80	120	200	150%
Gatelys Road	2,000	300	10	40	50	350	17%

Submissions

Community submissions

Issues raised in community submissions, including businesses, special interest groups and peak bodies included:

- Request for a redesign of the Coramba Road Interchange;
- Increased traffic on local roads and changes to the local road network;
- The project alignment should be further west;
- Traffic modelling is out of date;
- Request for improved cyclist connection to the bypass and along the bypass;
- All Dangerous Goods vehicles must be permitted to use the bypass / tunnels;
- Concerns raised regarding inability to merge on and off the motorway;
- Increased speed limit to 110kph is likely to cause more accidents;
- Proposed onramp from Stadium Drive causes difficulty entering and exiting the park;
- Request to include further works along Englands Road interchange towards Lyons Road for breakdown/safety/bicycle lanes in both directions;
- Concerns raised regarding the change to access arrangements during construction and operation to residential and commercial businesses (motels / resorts); and
- Objection to Korora Hill interchange which includes access to the existing Pacific Highway, James Small Drive, and Bay Drive.

Government agencies and Council's submissions

Council generally supports the project and provided the following comments:

- The Sawtell Road Interchange should be upgraded to provide a local service road to the Lindsay Brothers depot;
- Improved wayfinding for cyclists is required;
- Isles Drive intersection needs to be upgraded to cater for increased traffic volumes;
- Safety issue with pedestrians crossing the road to access the Coramba Road bus stop;
- Construction traffic using local roads, however acknowledged the only way to access the project alignment is via local roads;
- Dangerous goods should be permitted to use the tunnels;
- Englands Road and Korora Hill interchanges are complex and need to be simplified; and
- Upgrade James Small Drive to accommodate the increase in traffic volumes.

Fire and Rescue New South Wales provided no comments.

School Infrastructure New South Wales provided comments on the proposed relocation of the Kororo Public School bus interchange from the Pacific Highway slip road to James Small Drive, Luke Bowen footbridge, closure of Korora School Road and changes to local traffic conditions during construction.

Consideration

The use of local roads by construction vehicles can be managed

Local roads are required to provide access to the construction area. Whilst construction activities will increase daily traffic volumes on local roads, potentially causing delays and disruptions to the local road network, these impacts are considered relatively minor with most increases in traffic volumes being less than 10% of current volume. Roads with greater increases including West Korora Road and Bruxner Park Road will remain within their nominated design capacity.

To mitigate the potential impacts on local roads from construction traffic, the Proponent has committed to developing a Traffic Management Plan (TMP) to manage traffic on the local roads. The TMP will address and manage traffic impacts by adjusting traffic signals or restricting certain movements during peak periods. The Department notes that the use of local roads for construction traffic is temporary and may be further reduced as internal haul roads are established.

The Englands Road Interchange has been simplified, improving access and removing impacts to Council Waste Management Facilities

The replacement of the traffic lights at the Englands Road interchange with a roundabout improves access to the bypass as the design has been simplified (**Figure 11**). The roundabout arrangement (along Englands Road) will also provide a secondary access point to Isles Drive. This secondary access will allow vehicles to enter and exit the industrial estate and alleviate traffic pressures at the existing Pacific Highway / Isles Drive intersection. In addition, the amended design will no longer have impacts to Council's waste management facilities.

Though the amended design will provide improved access to the bypass, reduced impacts on Council facilities and improved traffic flows along Isles Drive, it does not address Council's request for a western service road between Sawtell Road and Englands Road, or additional access to the C.ex

Coffs International Stadium precinct from the Pacific Highway. The Proponent considers Council's requests for a western service road and additional access to the International Stadium precinct are outside the scope of the project. The key constraints to providing access along this section of the Pacific Highway include the need to reconfigure existing property access and changes to the interchange arrangements at Sawtell Road, safety issues with entry and exit ramps spaced closely together, and potential impacts on koala habitats and existing koala corridors on both sides of the Pacific Highway.

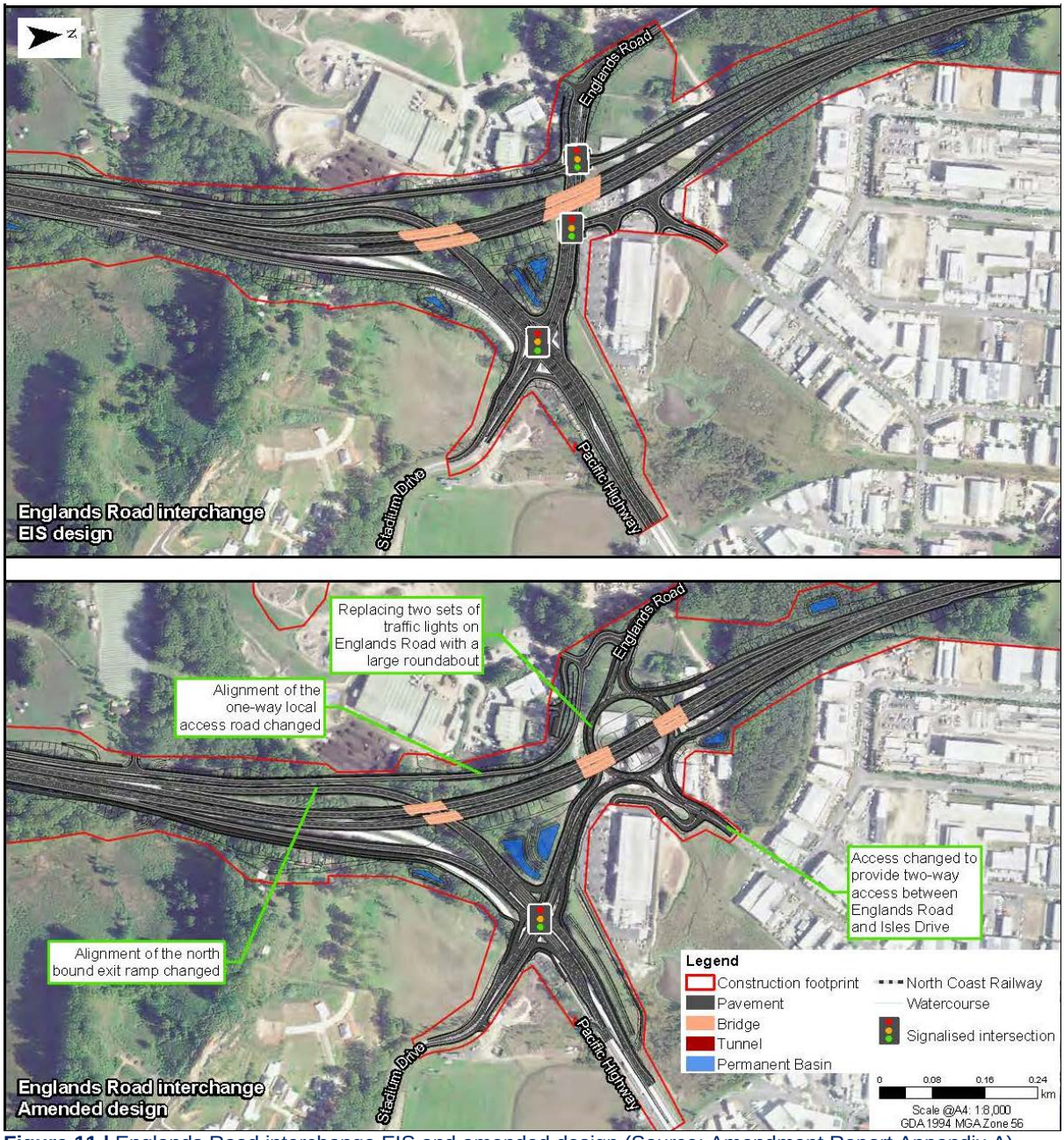

Figure 11 | Englands Road interchange EIS and amended design (Source: Amendment Report Appendix A)

The Proponent has committed to, in consultation with Council, implement a Community Liaison Implementation Plan to coordinate traffic management with any special events held at the Coffs Coast Sport and Leisure Park precinct. During detailed design, the Proponent will review alternative access arrangements to the Pacific Highway. The Department notes the constraints associated with Council's proposals for Sawtell Road and the Stadium access and supports ongoing discussions between the

Proponent and Council on design improvements, and with businesses within the Coffs Coast Resource Recovery Park to identify opportunities to reduce impacts during the detailed design of the project.

Traffic impacts along Coramba Road are considered acceptable, and will be further reviewed during detailed design and operation

Community submissions on the Coramba Road interchange requested that it be redesigned to reduce its overall footprint and noise impact on the Roselands Estate. The Proponent states the Coramba Road interchange was designed to minimise impacts on the Bennetts Road and Spagnolos Road detention basins (further discussion about the basins is in **Section 6.4**). In response to community concerns, the Proponent has advised that alternative designs would be further investigated during the detailed design stage, a commitment that is supported by the Department.

Figure 12 | Coramba Road Interchange EIS and amended design (Source: Amendment Report Appendix A)

Concerns about traffic congestion on Coramba Road between the interchange and Shephards Lane were made by Council and the community. The traffic assessment predicted that motorists travelling to/from the Bray Street catchment would likely access the bypass through the Coramba Road interchange, instead of the Korora Hill interchange. Two-way traffic volumes on Coramba Road between Shephards Lane and the bypass are expected to increase from 8,900 (EIS) to 9,400 vehicles per day in 2024, which is considered a relatively minor impact along the short section of Coramba Road. Traffic volumes along Coramba Road (Robin Street to Shephards Lane) to the east of the bypass are expected to reduce by 1,700 vehicles per day at the year of opening.

To confirm the operational traffic and transport impacts, the Proponent has committed to review the operational network performance of the project including Coramba Road, within 12 months of the commencement of operation. Updated traffic surveys will be undertaken to determine whether the traffic impacts on major roads such as Coramba Road are acceptable or whether road improvement measures would be required. The Proponent's commitment to undertake a review of the operational network performance of the project is supported.

Student access to Kororo Public School will be improved and made safer

A new bus interchange will be provided to the south of Kororo Public School, with access provided via the service road (**Figure 13**). The bus interchange would have capacity for eight buses and 30 staff car parking spaces, shelters adjacent to the bus bays and a 'kiss-and-drop' zone. The amended design provides direct access to the bus interchange along the new service road. This addresses Council's concerns that James Small Drive is not suitable for school buses because of the poor geometry and narrowness of the road.

The amended bus interchange design includes a pedestrian underpass to allow grade separated access to the school from the new car park, separating bus and passenger vehicle movements from road users along the new service road. The Department considers the design amendments at the Kororo Public School bus interchange are an improvement on the EIS design, as it provides a safer and more cohesive relationship between pedestrians and cyclists, buses, passenger vehicles and other motorists.

The project will reinstate about 93 parking spaces within the Kororo Public School vicinity. However, the new parking arrangements provide a shortfall of approximately five parking spaces. While an additional five parking spaces is desirable, the Department considers that the shortfall would not create significant adverse impacts in the long term. The use of parking spaces by Kororo Public School staff would generally be limited to school hours, therefore, it would not be in demand throughout the year.

The existing Luke Bowen footbridge will be replaced by a new bridge, located to the south of the existing bridge. It would provide pedestrian and cyclist connection between Old Coast Road and the proposed service road and the Kororo Public School. **Figure 13** shows the Korora Public School bus interchange and Luke Bowen footbridge amended design. The proposed bridge location in the amended design is considered to be an improvement from the EIS proposal. The new bridge will provide a safer connection for students and other users. The Department supports the amended design of the footbridge and recommends that it be fully operational before the existing footbridge is demolished. A condition to ensure the existing footbridge is retained until the new footbridge is operational has been recommended.

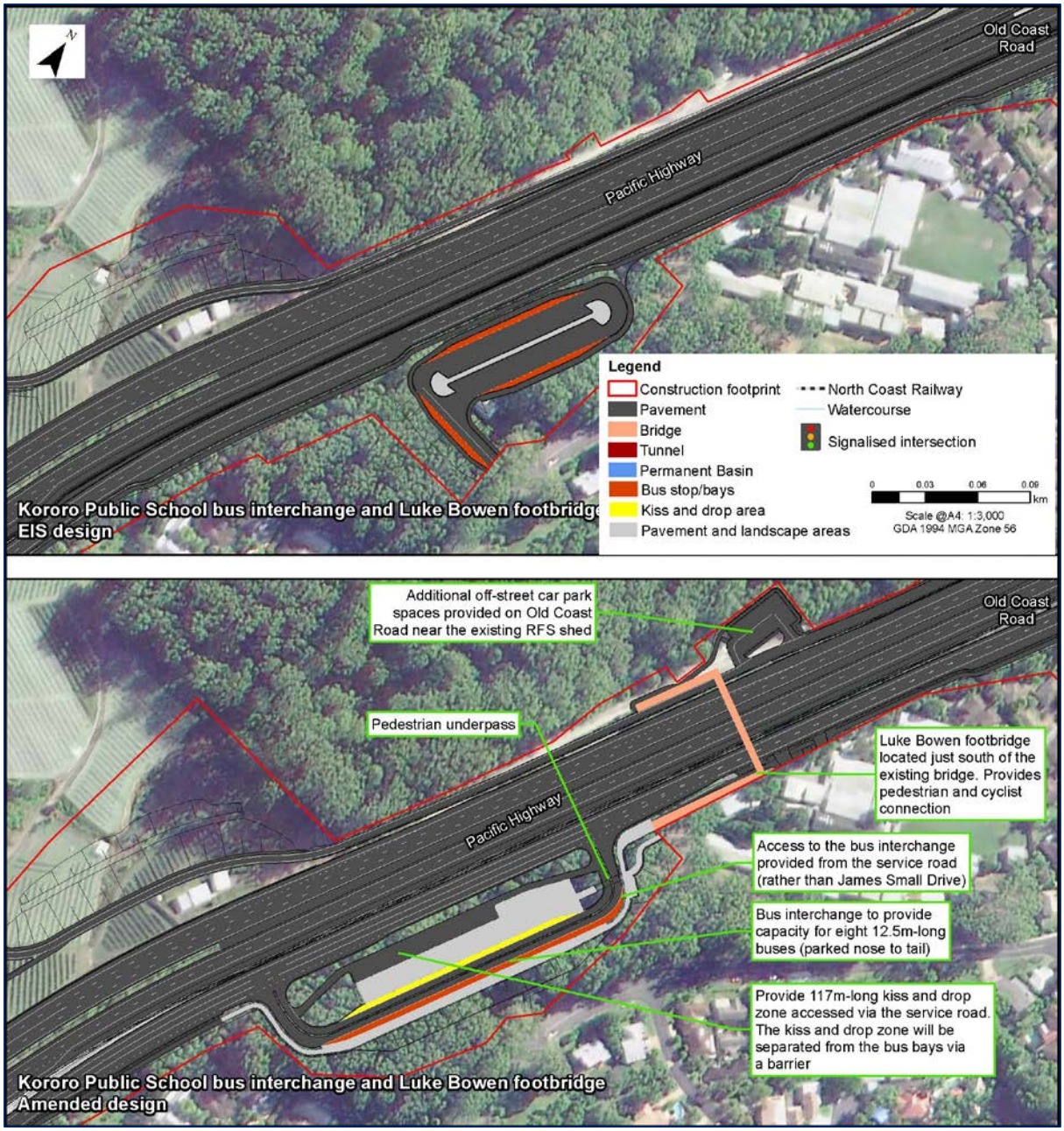

Figure 13 | Kororo Public School bus interchange designs (Source: Amendment Report Appendix A)

Property access will be maintained

The Proponent has committed to reinstate access to affected properties. The Department acknowledges and supports the Proponent's commitment to consult with affected property owners regarding impacts to property access as a result of the project. A condition has been included to ensure that the Proponent reinstates access to properties affected by construction.

In addition, the Proponent has advised it has reached an agreement with the Rural Fire Service (RFS) Mid North Coast Team on an alternative location for the RFS's Solitary Island RFS shed at Old Coast Road. The existing shed would be directly impacted and require relocation because of the new Luke Bowen footbridge and additional car parking spaces on the western side of the highway. A replacement site has been identified on TfNSW owned land within construction ancillary facility site 3B. A new shed and facilities are proposed to be constructed as part of the project, and a condition to

ensure the existing shed and its access are retained until the new shed and its access are operational has been recommended.

Cycleways and pedestrian access will be provided to connect and improve the local network

The project will introduce a formalised shared path linking Spagnolos Road to the proposed Coramba Road bus stop and improved safety for pedestrians and cyclists at the Pacific Highway and Charlesworth Bay Road intersection. The distance between the replacement Luke Bowen footbridge and the Kororo Public School will be reduced and connectivity between the footbridge, the school and the bus interchange will be improved.

An off-road footpath, along the length of the local access road located on the western side of the project, to the Luke Bowen footbridge would improve pedestrian connectivity and safety to the Kororo Public School from Old Coast Road. Grade separated access through the provision of an underpass will be provided from the bus interchange car park to Kororo Public School.

Shared pathways will be provided at the proposed roundabout at the Englands Road and Korora Hill interchanges for cyclists and accompanied by refuge areas at roundabout approaches to ensure crossing is limited to one to two lanes of traffic at any time. Cycle lanes within the shoulder of the bypass will be provided in both northbound and southbound directions, and the existing shared path on Solitary Islands Way will be extended for the length of the new service road. The existing path on Solitary Islands Way will link to a newly constructed 2.5m wide pedestrian path extending to the eastern side of the service road from James Small Drive.

The project will include a 1.5m wide cycle path on both sides of each tunnel, separated from the traffic lanes by a concrete barrier. The tunnels will also include one metre wide and 2.1m high emergency walkways for pedestrians, which would also be separated from traffic lanes by a concrete barrier.

The Department is satisfied with the proposals for pedestrians and cyclists, particularly the extension of the existing shared path on Solitary Islands Way along its southern extension (the service road).

6.2 Noise and Vibration

The project will result in both construction and operational noise impacts. Construction noise and vibration impacts are consistent with projects of this scale and will be managed through standard practices and the early application of operational noise mitigation. Works undertaken outside of normal construction hours will be limited due to the general greenfield nature of the route. Notwithstanding, the Department supports 24 hours, 7 days a week tunnelling as this can be managed through acoustic sheds and limits to vehicle movements during the night-time period.

By using tunnels and lowering grades, the project design has lowered operational noise impacts. However, noise impacts in excess of noise criteria are expected along the corridor. To reduce these impacts, the Proponent has proposed low noise pavement, noise barriers and at-property architectural treatment measures. To ensure the efficacy of these measures, the Department has required the Proponent to review the noise model and mitigation measures during detailed design and to undertake comprehensive noise monitoring within twelve months and ten years after opening to confirm the performance of mitigation measures.

Issue

The existing noise environment along the project corridor varies. Noise levels are generally higher near the existing highway compared to western Coffs Harbour which has low background noise levels consistent with a rural residential setting, although the North Coast Railway is a noticeable noise source. To understand the existing and future noise environments, 28 noise catchment areas (NCAs) were identified based on similar land uses (**Figure 14** to **Figure 16)**.

Construction and operational noise impacts will exceed relevant criteria and will need to be mitigated

Once built and open to traffic, the project will introduce a new noise source to nearby residences and other sensitive receivers, predicted to exceed the *NSW Road Noise Policy's* (RNP) (DECCW 2011) noise criteria. The Proponent has committed to providing noise mitigation measures to address the operational noise impacts of the project. These measures include low noise pavement, noise walls, noise mounds or noise insulation / at-property treatment.

The construction of the project will generate noise and vibration of varying levels, depending on the activities being carried out and proximity to residences and other sensitive receivers. The construction of road infrastructure projects often involves the use of large plant and machinery, sometimes moving along the alignment (clearing and bulk earthworks) and sometimes working in fixed locations (bridge construction and compound sites). The project involves blasting of cuttings and mined tunnelling. The Proponent has committed to implement standard noise and vibration measures to address construction noise and vibration impacts.

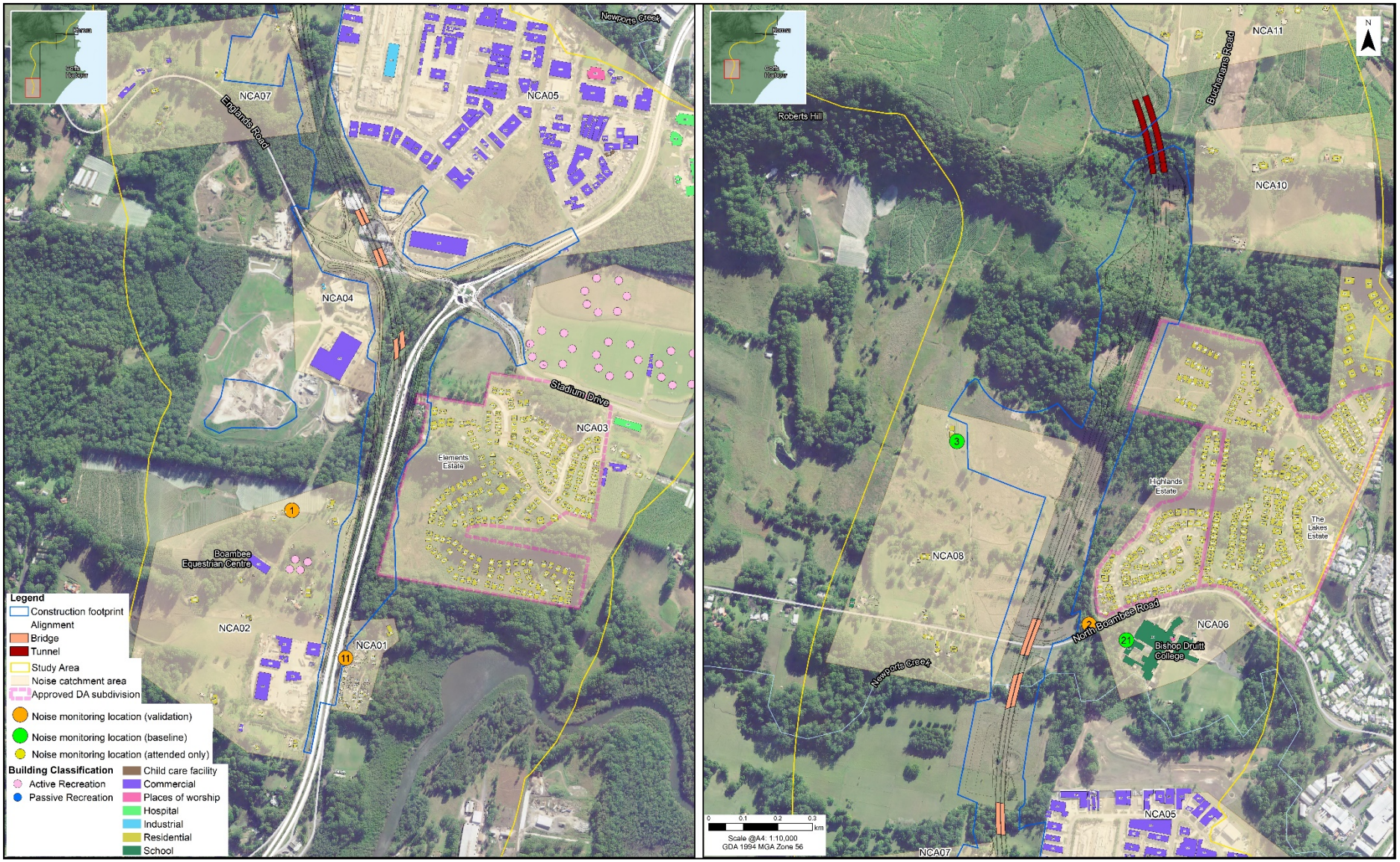

Figure 14 | Noise catchment areas (Source: Amendment Report Appendix B)

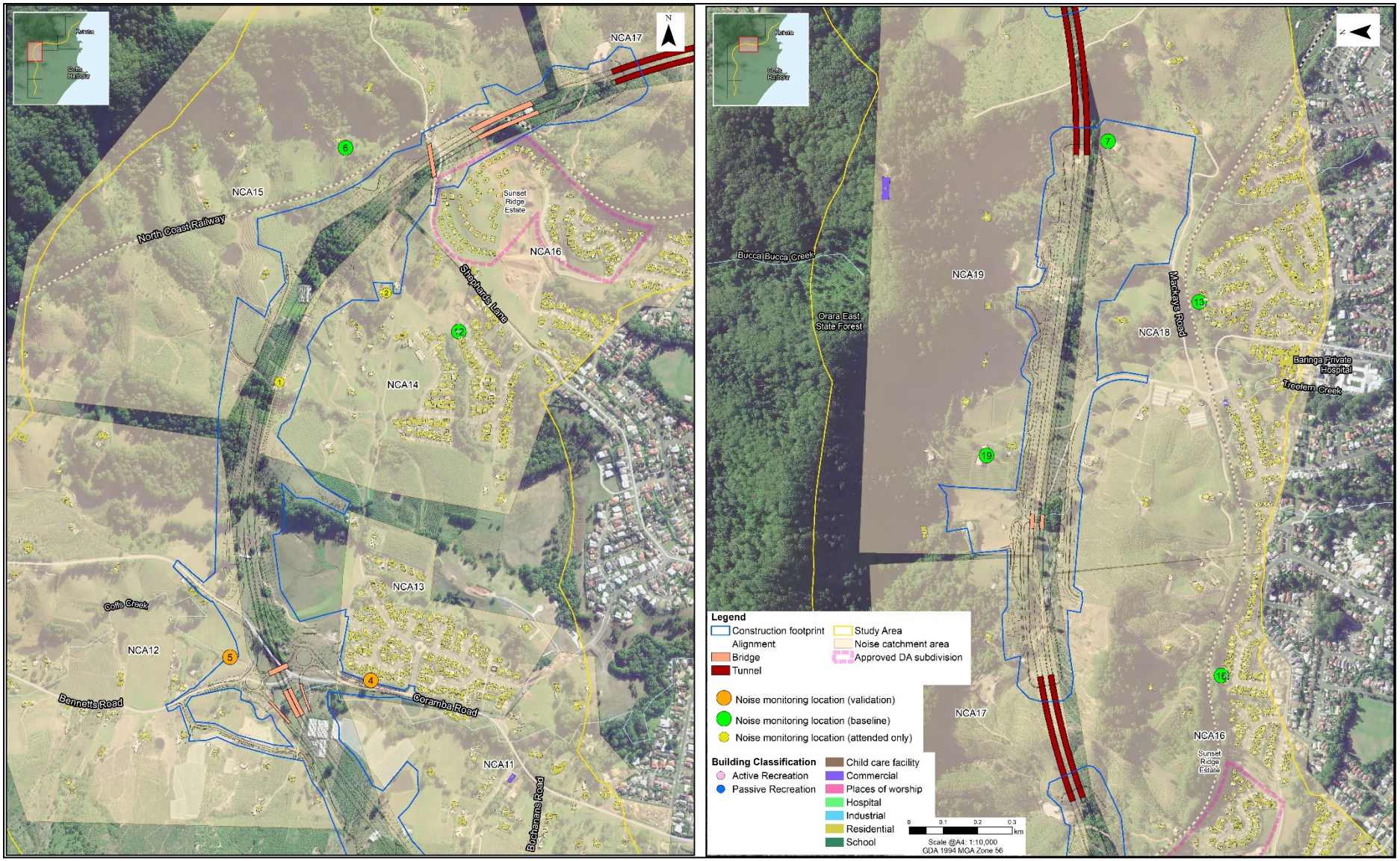

Figure 15 | Noise catchment areas (Source: Amendment Report Appendix B)

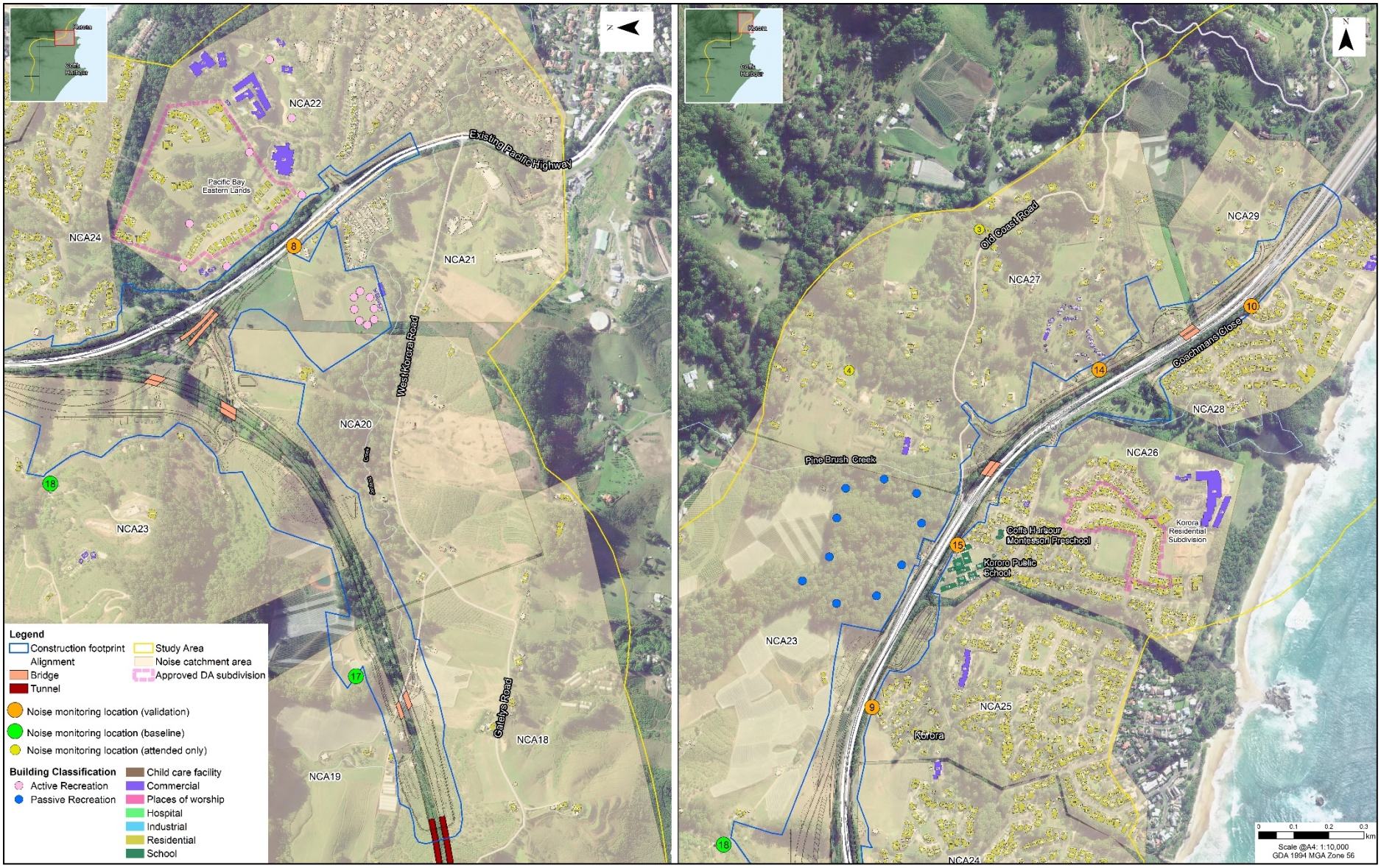

Figure 16 | Noise catchment areas (Source: Amendment Report Appendix B)

Submissions

Community and special interest group submissions

Key issues raised in the community submissions included:

- Construction noise and vibration impacts, including vibration impacts from blasting causing structural damage to properties;
- Increased traffic on local roads will lead to increased traffic noise;
- The project will introduce a new and increased source of noise to Western Coffs Harbour;
- Additional noise mitigation required to address high noise levels;
- The noise modelling undertaken is inaccurate and an independent noise audit must be undertaken. Baseline noise monitoring should exclude non-traffic noise data;
- The project must meet the noise levels and targets identified in the World Health Organisation (WHO) 2018 guideline for night-time noise exposure;
- Further assessment and consideration of truck noise during the night-time;
- All properties including recently built / approved subdivisions must be provided at property treatment; and
- The local landscape will create an amphitheatre effect which will enhance traffic noise.

Government agency and Council submissions

The **Environment Protection Authority (EPA)** provided the following comments:

- Work activities should be undertaken during the day-time with limited night-time works and at-property treatment should be provided to residents before any out-of-hours works commences.
- Requested a more detailed assessment of potential construction noise and vibration impacts.
- Inconsistences in the noise assessment relating to the identification of sensitive receivers.
- Requested further assessment / clarification in relation to operational traffic noise impacts and mitigation including addressing truck compression braking and tunnel jet fans;
- Queried the noise assessment relating to the Kororo Public School bus interchange.

Council recommends that low noise pavement and noise barriers / walls be provided. Council advised it had representations made to them by the Coffs Bypass Action Group regarding deficiencies in the noise monitoring, modelling, and request an independent noise audit review.

Department's consideration

The mitigation and management of construction noise and vibration will be undertaken prior to impact, and overseen by an independent Acoustic Consultant

The construction process will have unavoidable noise impacts to residents adjoining and near the project footprint. Due to the linear nature of the project, construction stages will vary from a number of weeks to months and will generally move along the road corridor as construction progresses.

To address these impacts, the Proponent has committed to preparing a construction noise and vibration management plan which will provide details of mitigation and management measures. These may include (but are not limited to) measures 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. In addition, the Proponent has committed to provide at-property operational noise mitigation measures during the pre-

construction and early construction phases of the project to assist in reducing construction noise impacts (including out of hours work). At-property treatments will be prioritised for those properties likely to be most affected by construction noise impacts.

At-property mitigation measures are generally provided prior to the commencement of operation to provide mitigation to operational traffic noise impacts. The early provision of these measures prior to or during the pre-construction program will provide additional benefits to residents during the construction works. The Department supports the early treatment of properties identified as requiring at-property noise mitigation and has reinforced this commitment through a condition of approval that requires the early delivery of at-property treatment.

The Department also recommended that the Proponent engage an independent Acoustic Advisor to oversee:

- Construction methods as they relate to managing noise and vibration;
- Construction noise and vibration planning, management and mitigation;
- Construction noise and vibration monitoring and reporting; and
- Verification of compliance and auditing of noise and vibration management practices.

This role is considered integral to the success of construction across the project by providing the community certainty that construction noise and vibration impacts will be managed and minimised. The Acoustic Advisor will also be required to review all construction noise and vibration documents, out of hours works requests and recommend best practice measures to improve construction performance.

Activities that need to be undertaken near live traffic will be done outside standard construction hours and will be managed in consultation with the community

As part of the delivery of the project, some construction activities are required to be undertaken outside the standard construction hours identified in the *Interim Construction Noise Guideline* (EPA 2009) (ICNG). These activities, known as out of hours work (OOHW), may include bridge construction, replacement of the Luke Bowen footbridge, operation of compound sites, paving works and tie-in to existing roads and utility relocations.

OOHW is generally unavoidable for large linear infrastructure projects, particularly where works are required to occur under live traffic situations, and to minimise traffic impacts to the Pacific Highway. The majority of OOHW will occur in the southern section of the Englands Road interchange and the Korora Hill to Sapphire section of the project. The activities within these sections will be programmed to give residents respite.

As the project will require an Environment Protection Licence (EPL) under the *Protection of the Environment Operations Act 1997* (POEO Act), most works occurring outside the standard construction hours will be subject to review by the EPA under the EPL. OOHW not covered by an EPL will be managed through an OOHW protocol. The Department considers that through these processes, activities occurring outside standard construction hours can be undertaken appropriately with the implementation of appropriate mitigation and management measures including but not limited to community consultation, provision of respite and the early implementation of at-house noise treatments.

Tunnelling activities can be undertaken 24/7 with minimal impact to the community using acoustic sheds and restricting truck movements

To expedite the excavation of the tunnels, the Proponent proposes these activities be undertaken 24 hours, 7 days a week under controlled drilling and blasting methods. Day-time activities will include blasting and haulage of excavated spoil, while excavation preparation activities will be undertaken during the night-time period and will be limited to drill and blast preparation and underground construction (mucking out, ground support such as drilling / rock bolting / shotcrete and tunnel mechanical and electrical fit out and testing / commissioning). No blasting is proposed outside the standard construction hours. Night-time activities will be undertaken in an enclosed environment either in tunnels with acoustic doors or acoustic sheds.

The use of acoustic sheds and doors is supported, as these measures are engineered to provide significant noise mitigation benefits. These measures are often used in the construction of major infrastructure projects to allow for 24 hours 7 days a week works to occur with minimal disruption to the community.

Although acoustic sheds provide noise mitigation benefits, the Department has some concerns regarding the proposed 24 hours 7 days a week activity. The concerns relate to the initial stages of drilling and blasting and mucking out when acoustic sheds at the tunnel portals have not yet been installed, and the haulage and delivery of material during the night-time period. To ensure that night-time amenity of residents is maintained, a condition has been recommended that no night-time works associated with tunnelling can occur until acoustic sheds / doors have been installed at the tunnel portals. Once these measures are put in place, 24 hours 7 days a week activity within the tunnels can occur. In relation to the haulage of material and deliveries to the tunnelling locations, these have been restricted to the day-time and evening (to 10.00pm) periods. This will ensure that large volumes of heavy vehicle movements do not occur at night, to protect the amenity of nearby residents.

Blasting will reduce construction timeframes and will be undertaken within strict criteria

Up to 21 locations across the project alignment (shown in **Figure 2**, **Figure 3** and **Figure 4**) have been identified as requiring controlled blasting for the excavation of cuttings. The Proponent states that blasting may not occur all the time at these locations and would only be used when hard rock is encountered. Rock breaking alternatives such as penetrating cone fracture, hydraulic rock breakers, or a non-explosive demolition agent (chemical expanding compounds) may also be used where blasting is not feasible. Blasting will only occur during day-time hours to assist in reducing the time taken to excavate the cuttings and reduce the overall rock breaking noise impacts. Blasts are generally short in duration (matter of seconds) and will be sized to comply with the ground vibration and airblast overpressure criteria, unless higher limits are negotiated with affected receivers.

Controlled blasting activities of hard rock near residential receivers has been successfully carried out on the Pacific Highway Banora Point Upgrade project and the Sapphire to Woolgoolga project, with the closest residence less than 100 metres from the blasting zone. The Proponent has committed to undertake a site and blast specific assessment to ensure overpressure and ground vibration limits are appropriate to the geological conditions, local shielding and meteorological factors at the site. Blasting will be carried out in accordance with a Blast Management Strategy, which would include details of the blasting program, management and mitigation measures, and community involvement. The Department has recommended vibration criteria for human comfort and structural damage to manage potential construction vibration impacts. Additionally, the Proponent would be responsible for

rectifying damage caused by blasting, and commitments have been made to undertake pre- and post-blasting building and structure condition surveys.

Operational traffic noise mitigation will be subject to design review and monitoring

To address operational traffic noise impacts the Proponent has identified and committed to providing noise mitigation measures. These include at-source measures such as low noise pavement (open graded asphalt (OGA) from the southern tie-in to the northern extent of the project (excluding the tunnels) and noise barriers (noise walls). The indicative locations of these at-source noise mitigation measures are shown in **Figure 17**. The noise assessment concluded that with the provision of at-source measures, approximately 619 receivers (including schools, hospital, childcare facility, and a place of worship) would still be exposed to traffic noise levels above the RNP criteria and would be considered for at-property noise treatments.

The number of properties considered for at-property noise mitigation would be finalised during detailed design. To address community concerns regarding noise modelling only covering a 600 metre radius from the project alignment (as required under the RNP), additional investigations will be undertaken during detailed design to confirm requirements for mitigation including at-property treatments. This approach is consistent with other major road projects where the Proponent investigated and provided at-property mitigation to receivers beyond the 600-metre initial noise model.

The Department is satisfied that appropriate mitigation measures have been considered for the project in accordance with the RNP and the *Noise Criteria Guideline* (RMS, 2015) (NCG). Similarly, the proposal to undertake a noise review during detailed design is appropriate and consistent with the approach taken for other major road projects. To ensure that receivers have been appropriately considered for noise mitigation measures, the Department has recommended a two-staged approach to addressing operational traffic noise, with the:

- submission of a review of the mitigation measures following detailed design, and
- an operational noise compliance review within twelve months and ten years after opening.

The operational noise compliance process will include traffic counts and background noise monitoring to inform compliance with the predicted noise levels (modelled during detailed design) and whether additional mitigation measures are required to address non-compliances with the RNP operational noise criteria.

As part of the operational noise review process, the Proponent is required to consider the predicted noise levels generated from the project including industrial noise sources such as the operation of jet fans in the Shephards Lane and Gatelys Road tunnels and the bus interchange at the Kororo Public School.

Though open grade / low noise pavement (OGA) is proposed for much of the project alignment, this mitigation measure provides the greatest noise benefits within the first few years and then starts to degrade over time. To ensure the noise traffic objectives of the RNP are met, the standard practice of operational traffic noise compliance monitoring will be extended beyond the first year of operation to ten years after opening (the design life of OGA is generally ten years). The Department considers the requirement for additional noise compliance monitoring will inform the level of pavement degradation and whether the RNP noise objectives are met. If the pavement is degraded and the RNP's noise criteria are not met, the Proponent will be required to review mitigation measures to address the RNP noise objectives.

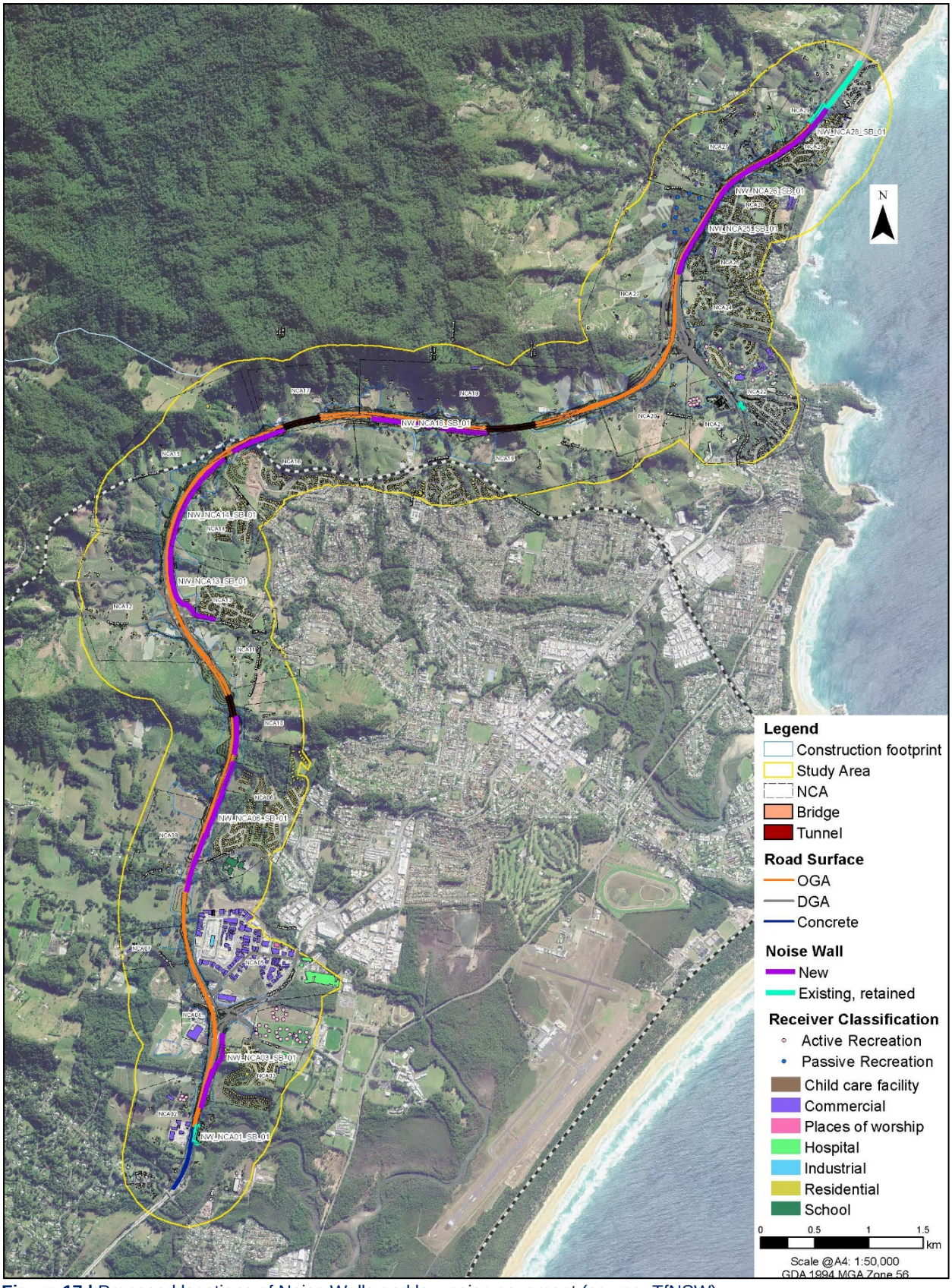

Figure 17 | Proposed locations of Noise Walls and low noise pavement (source: TfNSW)

Consideration of heavy vehicle noise / engine braking impacts

Various submissions raised concerns about the modelling and prediction of heavy vehicle noise and engine braking during the night-time, including measures to mitigate and manage truck noise. Currently, other sections of the Pacific Highway experience large volumes of truck movements at night, and the Department notes that the predicted traffic mix for this project is different to other sections of the Pacific Highway. Currently, other sections to the south of Coffs Harbour have heavy vehicle traffic volumes of 40% – 50% at night, while the project is predicted to have volumes of about 13% – 15% heavy vehicles. The lower heavy vehicle traffic mix for this project reflects Coffs Harbour's position as a large regional centre that is also an origin or destination for heavy vehicles. However, to address any operational traffic noise impacts, the Department has recommended a condition that requires the Proponent to undertake operational traffic noise monitoring to verify its predicted noise levels. Should the detailed design modelling under-predict the operational noise levels, the Proponent will be required to provided additional mitigation measures to meet the noise objectives of the RNP.

The Department also notes that one of the key changes of the concept design of this project, compared to the 2018 cutting design, was lowering the vertical alignment of the main carriageways to help reduce noise and visual impacts. The changes in road gradients included:

- Lowering the southern approach to the Shephards Lane ridge from 4.5 per cent to 3.5 per cent;
- Lowering the southern approach to the Gatelys Road ridge from 3.8 per cent to 2.0 per cent; and
- Lowering the northern approach to the Gatelys Road ridge from 4.6 per cent to 3.4 per cent.

These lower road gradients are possible because of the tunnel design compared to having large cuttings at the ridge lines. Lowering the road gradient is considered a better design outcome, because it will provide improved traffic noise outcomes and potentially fewer heavy vehicle compression braking events along the road inclines and declines. However, the Department has recommended a condition that requires the Proponent to undertake operational traffic noise monitoring to verify its predicted noise levels, including traffic counts.

6.3 Aboriginal Heritage

The project will directly impact Aboriginal archaeological sites and sites with intangible cultural significance within the project corridor. While the revised deign of the project has minimised these impacts, particularly in relation to cultural pathways, residual impacts are required to be managed in collaboration with the Aboriginal community.

Four of the five identified cultural areas are located partially within the construction footprint and would be impacted to varying extents. The archaeological sites (with potential archaeological deposits (PAD)) assessed as having moderate heritage significance will be subject to archaeological salvage. The Proponent has committed to minimising the extent of impact through detailed design and managing residual impacts by the salvage of items and artefacts, archival recording and providing interpretive signage.

To address the community's concerns, the Department has recommended the preparation of a Heritage Management Sub-plan and requires the Proponent to give Registered Aboriginal Parties (RAPs) the opportunity to inspect the project corridor and determine which areas should be subject to cultural salvage.

Whilst there is a low likelihood, to address any unexpected burial sites discovered during construction activities, an unexpected human remains procedure has been developed in accordance with guidelines and standards prepared by Heritage NSW. This is an established process that applies to all construction activities in NSW.

The Department is satisfied that these measures would ensure that Aboriginal heritage impacts are managed during the construction of the project.

Issue

The project falls within the Country of the Gumbaynggirr People and the administrative boundaries of the Coffs Harbour and District Local Aboriginal Land Council (CHDLALC). An Aboriginal Cultural Heritage assessment was undertaken in consultation with the CHDLALC and RAPs. Twenty-six PADs will be directly impacted by construction, as well as five cultural areas of intangible Aboriginal heritage value which includes storylines, pathways and camping sites. The location of the cultural areas are shown in **Figure 18**.

Seven PAD sites will to be salvaged by the Proponent as they demonstrated moderate scientific heritage values. A further eight sites will be subject to surface artefact collection and the remaining PAD sites were assessed as having low significance because they displayed high disturbance or limited archaeological information.

In response to its engagement with the community and the Department, the Proponent has committed to allowing the RAPs to undertake their own cultural salvage of seven sites to collect items or objects not collected during the archaeological salvage, to further assist their community with cultural learning of their Country. This would be undertaken following the archaeological salvage of the PAD sites. In relation to impacts on sites with intangible cultural significance, the inclusion of tunnels avoids severing the pathways within the Roberts Hill Pathway and Sealy Point Pathways cultural sites.

Site rehabilitation and revegetation using local Indigenous plant species will also be undertaken along the construction footprint, in consultation with the identified knowledge holders and RAPs, to offset site disturbance.

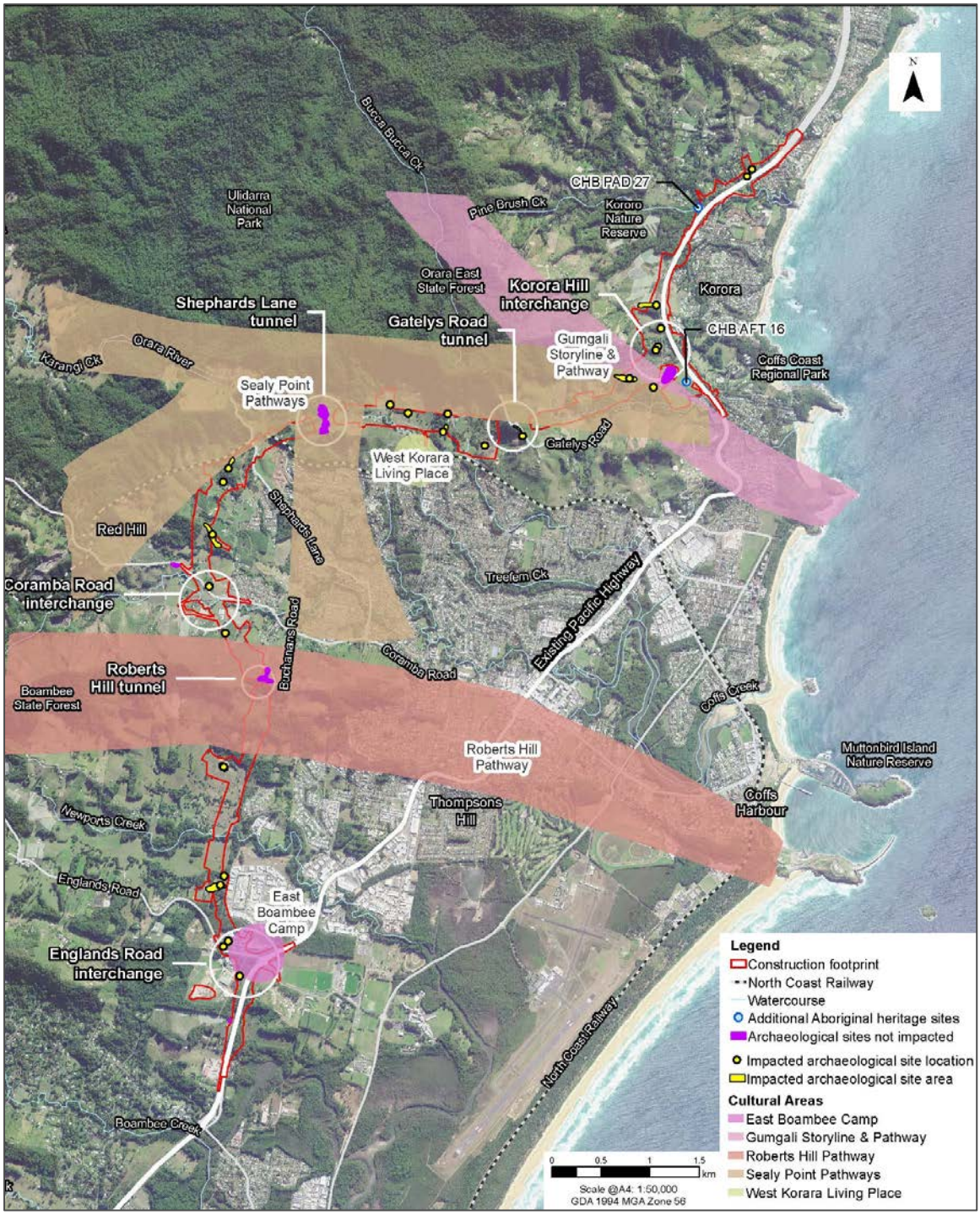

Figure 18 | Aboriginal heritage sites and pathways (Source: TfNSW)

Submissions

Community and special interest group submissions

The CHDLALC and RAPs requested more involvement in future site investigations, to record previously unidentified PADs, and in determining the cultural values of impacted sites. They also requested the ability to review relevant construction management documentation and to inspect construction activities in areas with PADs and cultural significance. The CHDLALC and RAPs recommended all Aboriginal artefacts within the construction footprint be salvaged and for RAPs to undertake further site inspections to determine the method of salvage. The submissions also

requested the ongoing engagement of RAP representatives, or employment of Aboriginal Cultural Compliance Safety Officers, additional surveys, monitoring and salvage, and noted there was potential for burial sites along the project corridor.

Government agency and Council submissions

Heritage NSW provided the following comments:

- Supports the RAPs request for the use of grader scrapers during the salvage process;
- Cultural salvage should form part of the Aboriginal Cultural Heritage Assessment Report (ACHAR);
- A "care agreement" should be entered into with the RAPs, with a preference of reburial of items within the project corridor; and
- The potential for burial sites within the project corridor is acknowledged.

Department's Considerations

RAPs will be provided the opportunity to undertake the salvage of culturally significant sites

The RAPs expressed concern that they have had limited input and engagement in identifying PAD sites and requested the ability to undertake additional site inspections to determine the cultural significance of the sites, including what areas should be culturally salvaged and the salvage methodology.

The Proponent has undertaken its assessment of Aboriginal heritage issues in accordance with relevant legislation, polices and guidelines and applied methodology and processes used for other linear infrastructure projects. However, the RAPs believe that the Aboriginal Cultural Heritage Assessment of the project is overly based on scientific values which are assigned in terms of landscape and geology, and which do not capture the cultural values of the project site. The RAPs considered that the only way to determine the cultural value of a site is to stand on it and inspect the area, as certain stories can only be told while on Country.

The Proponent is required to undertake an archaeological salvage of nominated PAD sites and to interpret the archaeological relics to gain an understanding of the Aboriginal archaeology of the project area. Heritage NSW considers that the RAPs should be given the opportunity to undertake a final inspection to determine what areas should be subject to cultural salvage. This approach is supported by the Department, as the RAPs are best placed to determine areas of cultural significance. Should additional sites be identified for cultural salvage, the items uncovered will assist the RAPs and their communities with ongoing cultural learnings of their Country. It is noted that the cultural salvage requested by the RAPs is not a statutory requirement and is additional to the archaeological salvage recommended by the ACHAR.

The Department has recommended conditions which requires the Proponent to undertake consultation with the RAPs on the identification of sites with cultural significance prior to the archaeological salvage of the PAD sites commencing, and provide the RAPs a period to undertake salvage of cultural material from the sites they identified for cultural salvage. Additional items found during the cultural salvage process will remain in the custody of the RAPs.

Further, the Proponent is required to prepare an Aboriginal Heritage Salvage Report of the seven PAD sites that will be subject to archaeological salvage. The report must include details of any archival recordings, further archaeological research and archaeological and cultural excavations, and a final repository for finds. This is in addition to the Proponent's commitment to prepare a booklet and

interpretative signage to document the objects uncovered by the salvage process. The Department considers the recommended conditions and Proponent's proposed commitments / mitigation measures assist in addressing the RAPs concerns and would lead to be an increased cultural understanding of the region.

RAPS will be consulted on the construction heritage management sub-plan

The Proponent has committed to prepare a cultural heritage management sub-plan to manage construction impacts on Aboriginal heritage sites. The RAPs requested that they be involved in the preparation of the management plan, to ensure that potential impacts to Aboriginal sites are appropriately identified and managed. In addition, the Proponent has committed to preparing heritage site maps which identify all Aboriginal sites to be excavated and involve the RAPs in training contractors / construction workers on the protection and avoidance of Aboriginal sites as part of the construction staff induction process.

The recommended conditions of approval require the Proponent to consult with the RAPs in the preparation of the Heritage Management Sub-plan. The Department considers that recommended conditions and the Proponent's commitments to provide the opportunity for the RAPs to provide input into the construction management process ensures that there is an appropriate level of involvement of the Aboriginal community in the construction of the project.

Management of potential burial sites will be in accordance with current guidelines and standards

The RAPs noted the potential for burial sites to occur in the project footprint and raised concerns over how such sites would be managed, should they be identified. The RAPs requested that they have a presence on site to monitor vegetation clearing and topsoil stripping to ensure that ancestral burial sites are not damaged or destroyed. While the Proponent's assessment of Aboriginal heritage impacts and site investigations of the corridor did not identify any potential burial sites, to address potential future discoveries during construction activities, an unexpected human remains procedure has been developed in accordance with guidelines and standards prepared by Heritage NSW. This procedure forms part of the updated Aboriginal heritage assessment. The guidance material / procedure requires all work to stop should human remains be uncovered during construction, the site to be secured and police notified. The police have carriage of the process until such time as the remains are confirmed to be Aboriginal or of a historic nature.

The Proponent has included these process requirements in its mitigation measures, to form part of the Heritage Management Sub-plan for the project. The Department and Heritage NSW consider that any human remains / burial sites uncovered during construction can be managed within the existing framework and governance procedures. The Department does not consider that it is necessary for the RAPs to monitor vegetation clearing and topsoil stripping. Notwithstanding, training for workers on Aboriginal heritage is required as part of the construction environmental management process.

6.4 Flooding and Hydrology

The project will have relatively minor flooding impacts and no significant flooding impacts will occur to residential properties. As the project has been designed to meet afflux flood management objectives, the Department considers these objectives should inform the recommended conditions of approval. As part of the detailed design process, the Proponent will undertake further flood modelling to ensure that the project complies with the flood objectives.

The Department supports the Proponent working with Council and EESG's flood management team on a co-ordinated approach to manage flood impacts from the project on future urban development. Irrespective of whether project specific measures or a whole of government approach is adopted, the Proponent must comply with the flood management objectives set in the conditions of approval.

Issue

The project traverses the catchments of Newports Creek (North Boambee Valley), Coffs Creek (west Coffs Harbour) and Jordans Creek and Pine Brush Creek in the northern suburbs of Coffs Harbour, as shown in **Figure 19**. The project skirts around and through major ridge lines from the Great Dividing Range. Most of the steep slopes and ridges are either forested or used for agricultural (banana / blueberry) cultivation. The project also passes through some lowland areas which are characterised by low undulating hills with gentle gradients and alluvial floodplains.

Coffs Harbour has a history of periodic and significant flooding, with the exiting 1% annual exceedance probability (AEP) flooding extent shown in **Figure 20**, **Figure 21** and **Figure 22**. The project has been designed to provide the following flood immunity:

(a) mainline alignment: 1% AEP;
(b) ramps and interchanges: 5% AEP;
(c) tunnel portals: above the Probable Maximum Flood (PMF) or the 1% AEP flood level +0.5 m (whichever is greater), where ingress of floodwaters would collect at the sag in the tunnel; and
(d) waterway structures: bridge soffits >0.5 m above 1% AEP flood level. Appropriate scour protection designed for areas at risk of scour due to the project to ensure long term bed and bank stability.

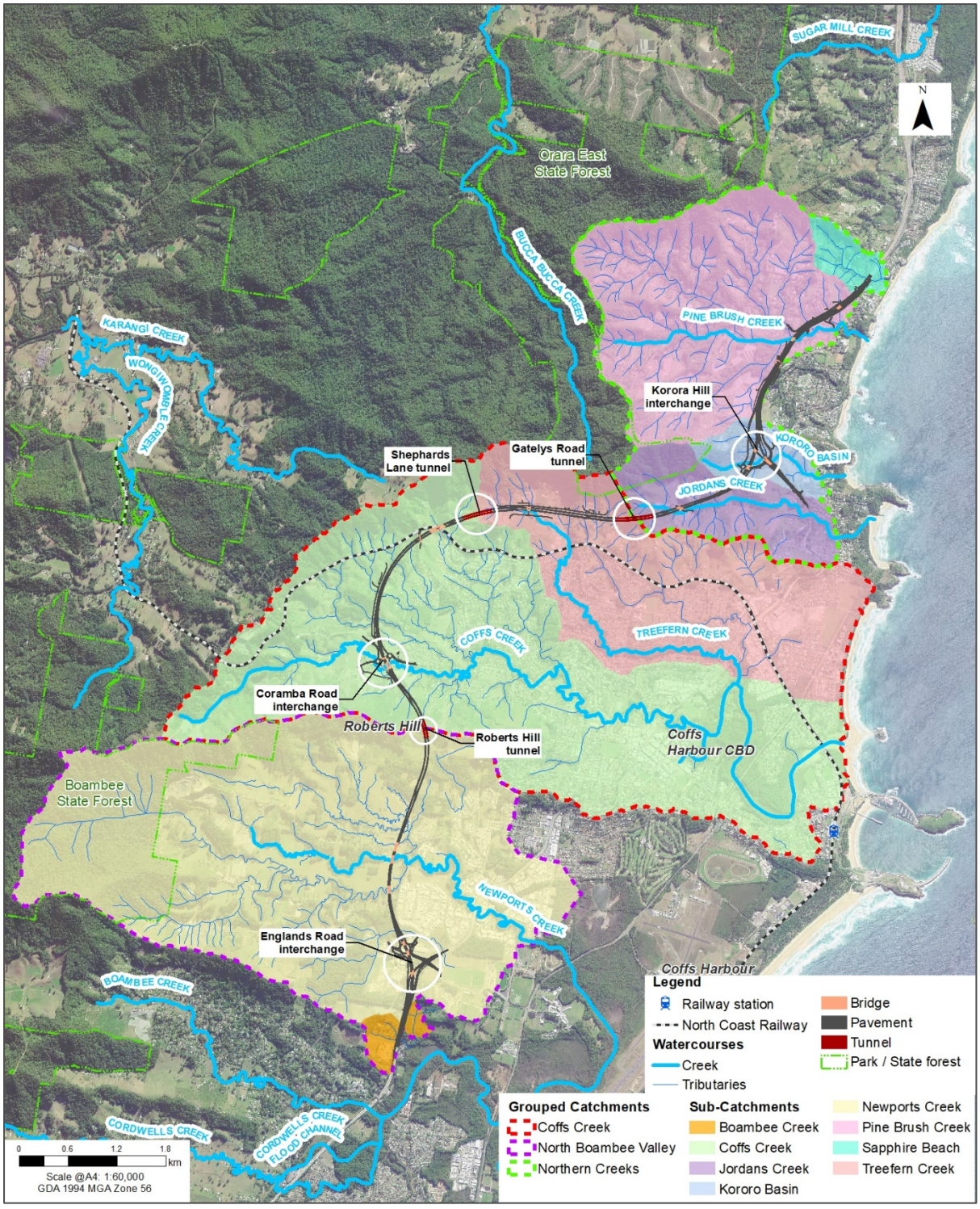

Figure 19 | Catchments Traversed by the Project (Source: Amendment Report Appendix H)

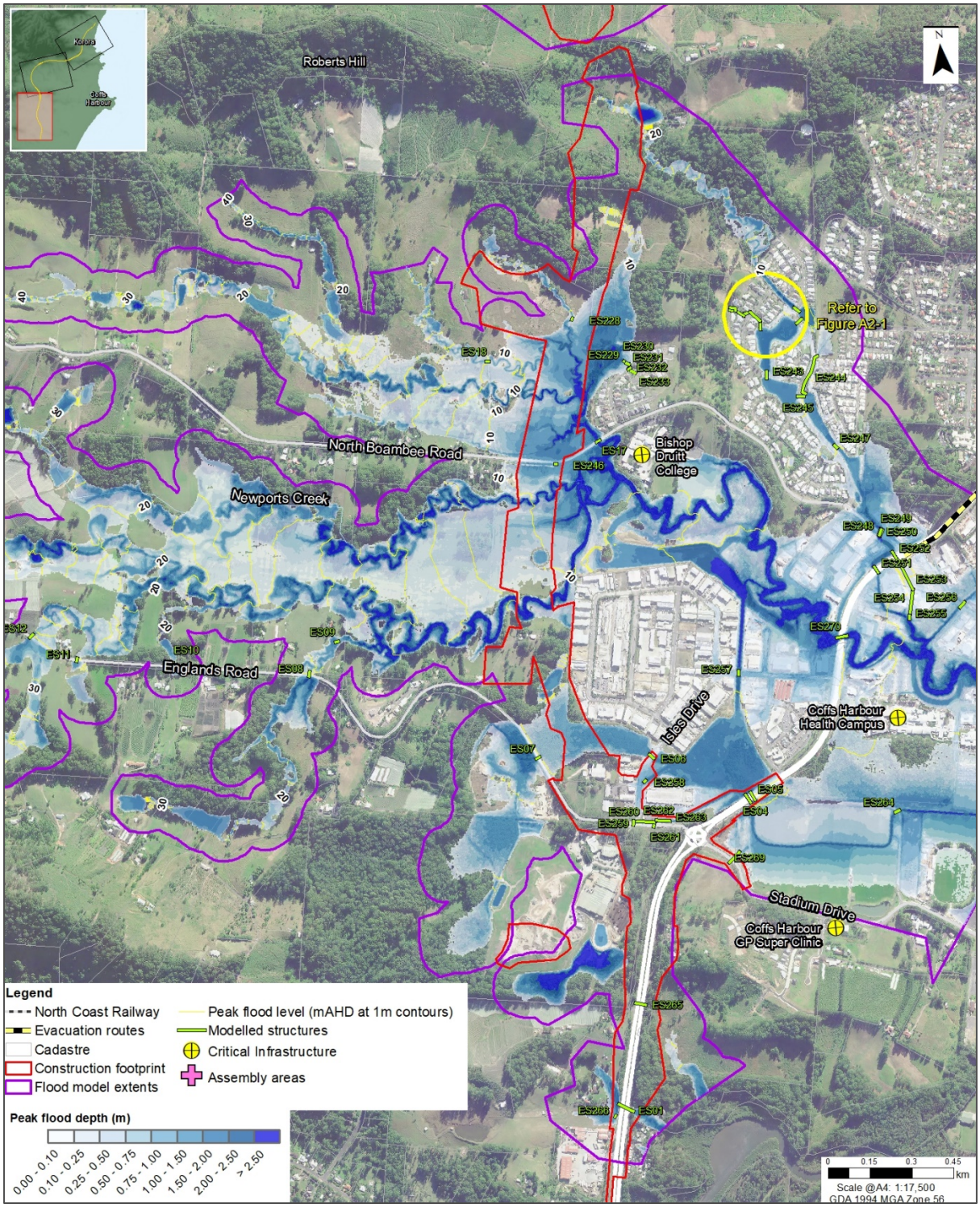

Figure 20 | Existing 1% AEP event - North Boambee Valley (Source: Amendment Report Appendix H)

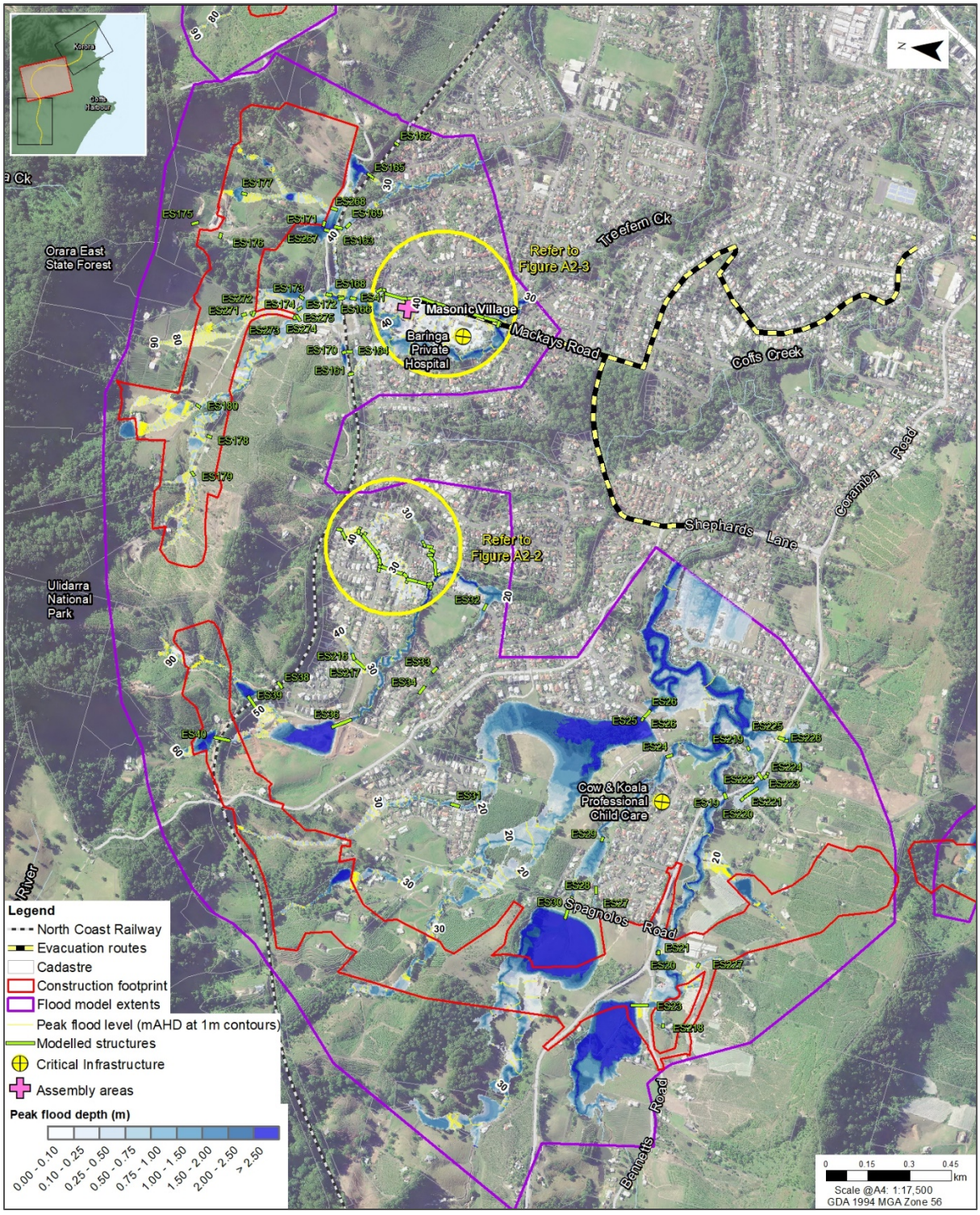

Figure 21 | Existing 1% AEP event - Coffs Creek (Source: Amendment Report Appendix H)

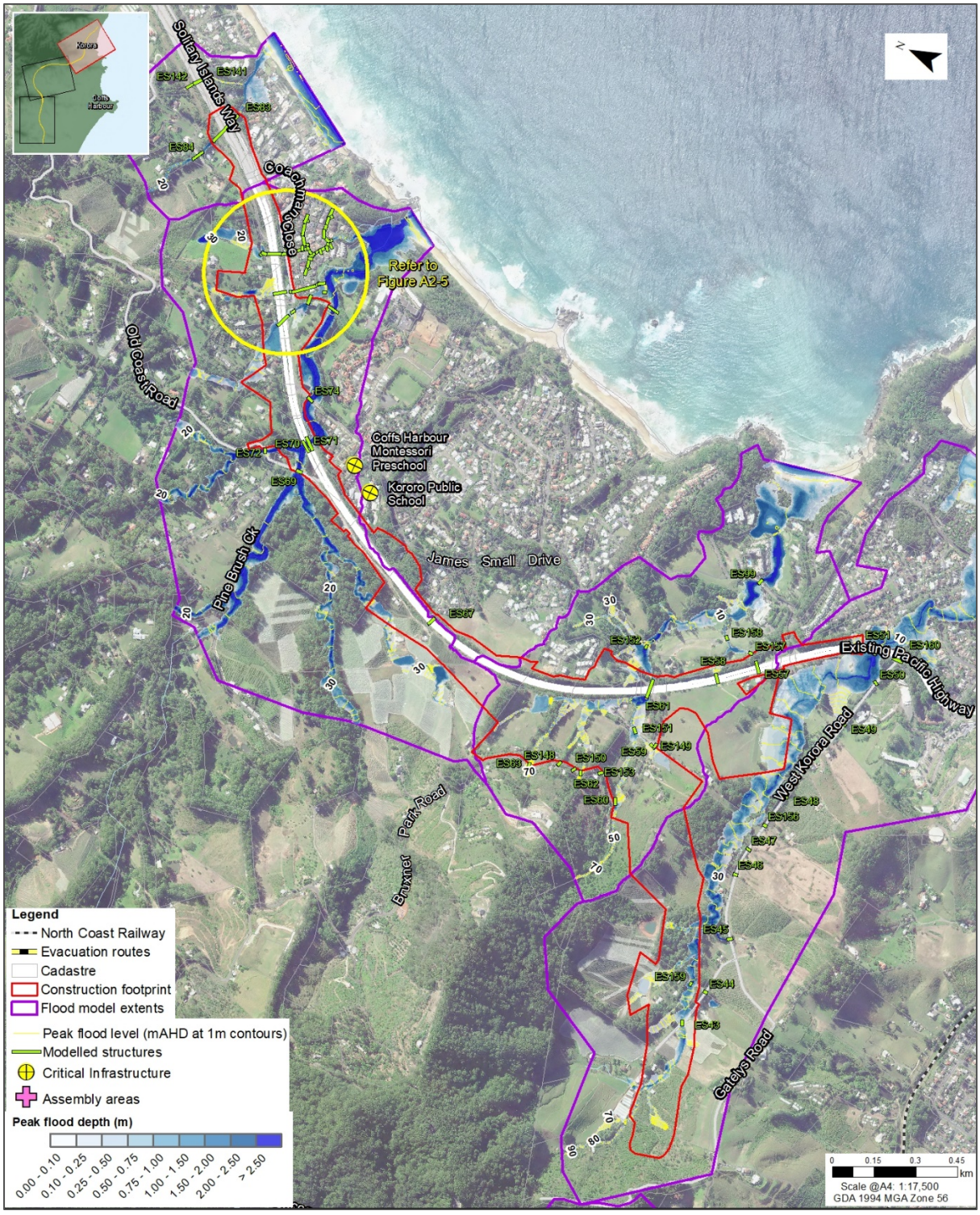

Figure 22 | Existing 1% AEP event - Northern creeks (Source: Amendment Report Appendix H)

Due to the history and severity of flooding events, Council has constructed several detention basins to mitigate the risk to the community in extreme flood events. The amended design generally avoids impacts to these basins, however there are minor impacts to the Spagnolos Road detention basin, as shown in **Figure 23**.

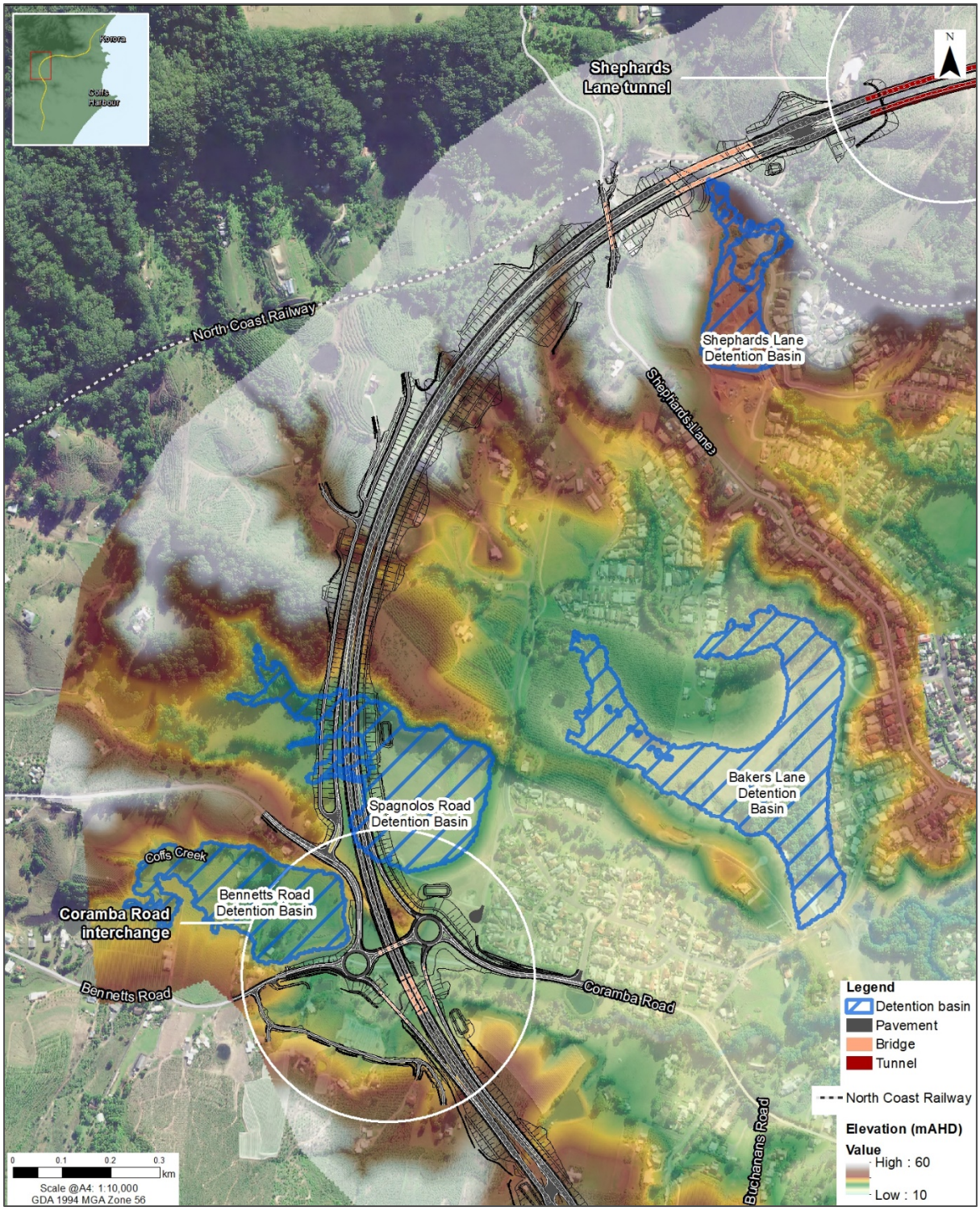

Figure 23 | Council detention basins near the project (Source: Amendment Report Appendix H)

Submissions

Community submissions

The community provided the following comments:

- the project should have no residual flooding impacts; and
- supplementary flooding mitigation measures are required.

Government agency and Council submissions

Council supports a whole of government approach to address existing flooding, as it will provide a greater benefit to a larger catchment than project specific mitigation measures. Council also commented:

- flood modelling does not match up with Council's adopted flood modelling in the downstream reaches of Boambee Newports Creek;
- requested long bridge spans within the North Boambee Valley to reduce upstream afflux;
- requested clarification on areas that will have increased downstream afflux's as a result of the project;
- consideration should be given to mitigating existing flooding along the existing Pacific Highway near the hospital and stadium precinct;
- the project will increase downstream flood levels along the northern creeks; and
- requested future consultation to address impacts to Bennetts Road and Spagnolos Road detention basins.

EESG advised comments would be provided on the updated flood model once completed. Following the provision of the updated flood model, EESG advised it was satisfied with the flood model and had no comments.

Consideration

Construction impacts can be managed through ancillary facility site placement and facilitation of operational conditions

Twelve of the 17 proposed ancillary facilities sites are located within potential flood hazard areas (areas within the 5% AEP flood extent). Due to the scale of existing flooding around the construction footprint, all ancillary sites have been placed in areas where only parts of the ancillary facilities are predicted to be impacted by flooding. To manage residual flooding impacts, stockpiling and plant machinery would be placed outside the flood hazard area.

Substantial earthworks are required for the construction and will be managed in flood affected areas by facilitating operational conditions and mitigation measures. As such, flood impacts should not be greater than those documented in the assessment of operational impacts.

It is also noted that there is sufficient warning of a potential flood event to allow the Proponent to move plant and equipment and secure construction sites and ancillary sites. Similarly, the Department considers the implementation of standard practice measures to ensure construction activities do not result in adverse flooding, and that plant and equipment would not become flood debris and hazards, is appropriate to manage potential flooding impacts.

Updated flood modelling identified reduced flooding impacts

The Proponent updated the flood model to incorporate the amended project design as well as including new data from additional topographical surveys, culvert dimensions and inverts, improvements to modelling methodologies and input and review from Council and EESG (who are supportive of the model and its predictions). The updated flood model provides more accurate information on flood flows up and downstream of the project. As a result, areas in the EIS that appeared to be heavily impacted by the project are now not affected. The updated flood model now predicts localised impacts which are considered in the following sections.

The project has been designed to not increase downstream flooding

Due to existing flooding conditions experienced in the Coffs Harbour region, the project has been designed to meet the following flooding objectives so that afflux is not exceeded for events up to the 1% AEP:

(a) Less than 10 mm for residential, commercial and industrial areas and buildings affected by Flood Floor Level inundation;
(b) Less than 50 mm for agricultural land; and
(c) Less than 250 mm pastural, forest and recreational areas.

These flood management objectives are consistent with those adopted by the Pacific Highway Upgrade projects and other TfNSW road upgrade projects across the State.

To achieve the flood management objectives, the Proponent incorporated project specific measures into the concept design of the road, which include extensive bridging, culverts and additional floodplain storage north of North Boambee Road, additional flood detention areas (upstream and downstream) of Coffs Creek, additional culverts and drainage pipes and creek realignments. With the implementation of these measures and design features, the afflux flooding objectives are met except at a couple of locations where the project will act as a barrier (similar to a dam wall).

The areas that currently experience flooding, shown as A, B, E and Z in the North Boambee Valley (**Figure 24**) and AQ in the Coffs Creek catchment (**Figure 25**), are predicted to receive increased flood afflux as a result of the project. In these areas the impacts are localised, negligible or can be mitigated. As the project generally meets flooding objectives, a condition has been recommended that requires the flood objectives to be met.

There is no increase of flooding on new or existing residential subdivisions within the North Boambee Valley Catchment

The flood assessment concluded that residual flooding impacts within the North Boambee Valley does not affect future urban development to the west of the project (points of interest Z and F). The flood modelling predicted upstream afflux impacts would occur in an Environmental Management area under Council's draft North Boambee Valley (West) DCP Masterplan. Therefore, the flood impacts of the project do not impact land proposed for future residential development. Currently, the existing property flood free floor level at point of interest Z with the project will still be above the 1% AEP event. The additional flooding impacts at points of interest B and E are improved under the amended deign, however these areas will still experience additional flood afflux. It is noted that these properties are owned by the Proponent. In relation to point of interest AA (**Figure 24**), additional afflux of up to 16mm is predicted in the northern extent of Highlander Drive in the 1% AEP event however no residential properties are impacted.

The Department is satisfied the project has minimal impact on existing flooding behaviour and does not increase flood afflux at residential properties that are currently inundated above the floor level. The project does not affect upstream land that is proposed for urban development.

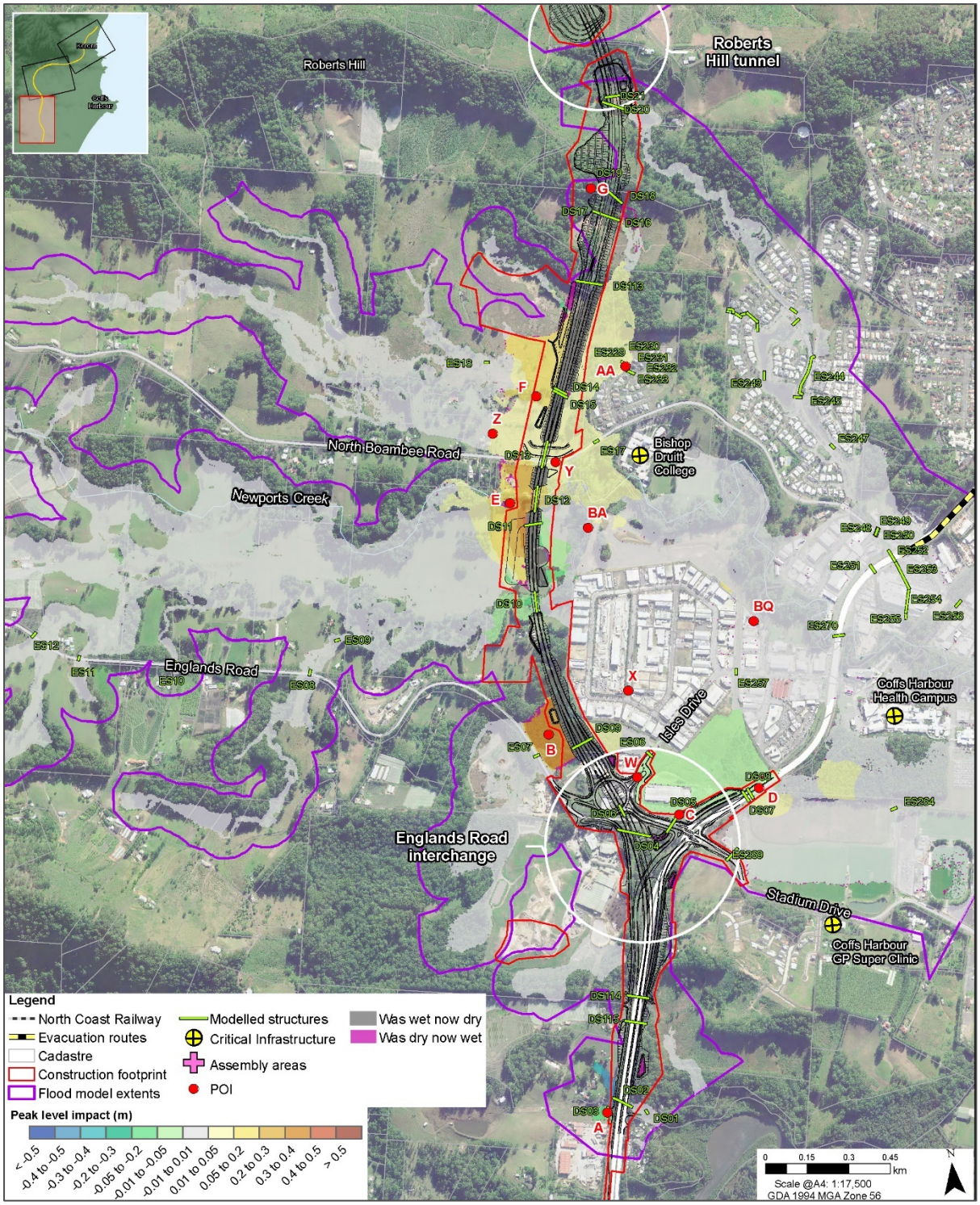

Figure 24 | North Boambee Valley 1 % AEP peak flood level difference (Source: Amendment Report)

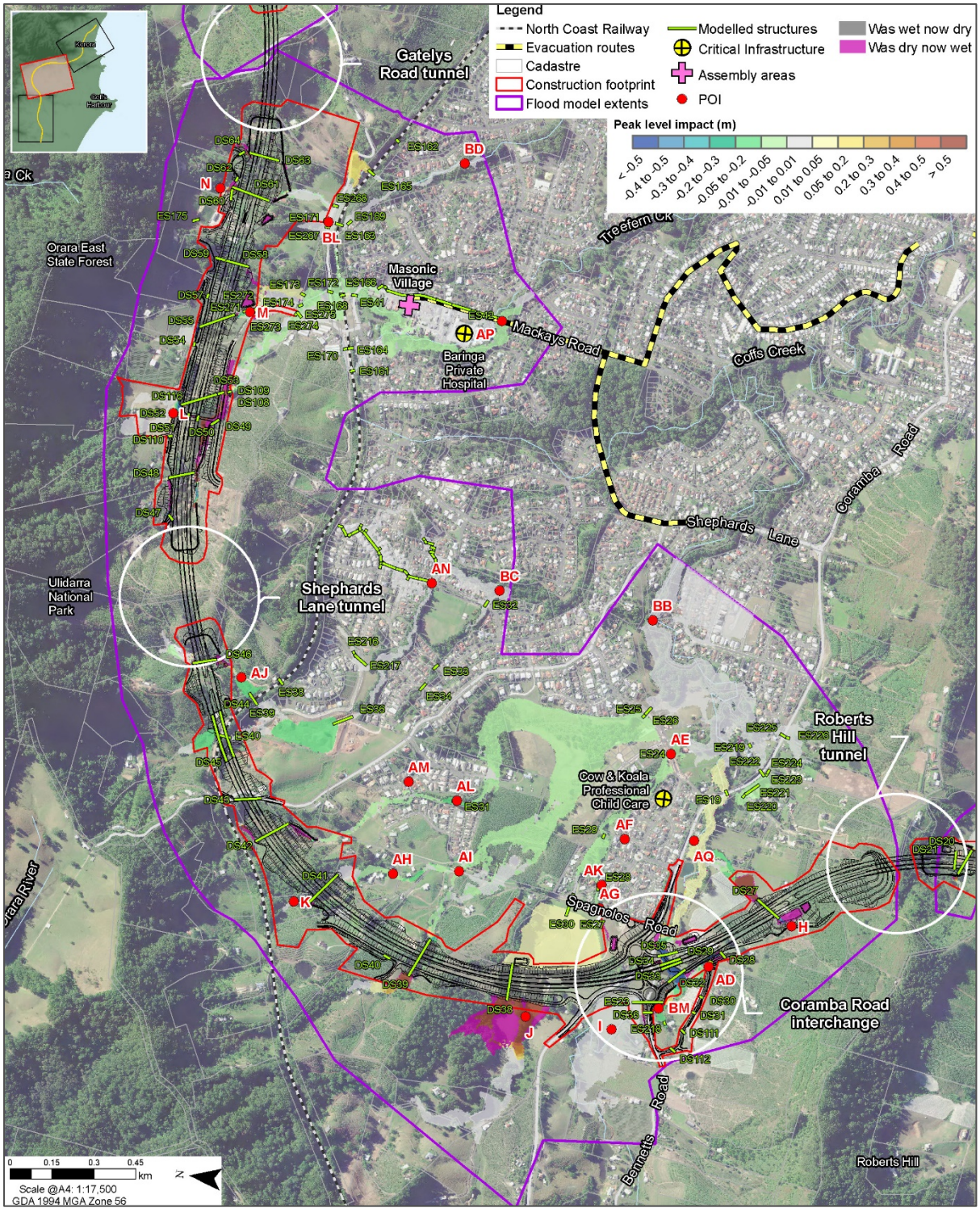

Figure 25 | Coffs Creek 1 % AEP peak flood level difference (Source: Amendment Report)

The project acts as a dam that will hold back flood waters in the Coffs Creek Catchment

The project partly affects Council's Spagnolos Road detention basin, resulting in a decrease of storage volume and attenuation effectiveness. Although the flood storage capacity is reduced, the project will act as a barrier holding floodwaters upstream on heavily vegetated land (point of interest J, **Figure 25**) owned by the Proponent. This improves flooding conditions downstream in the Roselands Estate, which would otherwise be subject to increased flood afflux and velocity in Coffs Creek. As the highway acts as a barrier holding large volumes of water upstream, it could be a Declared Dam under

the *Dam Safety Act 2015* (currently, Spagnolos Basin is a Declared Dam under that Act). The Proponent will be required to consult with the Dam Safety NSW on these changes to ensure associated compliance requirements are met.

To address the formalisation of flood waters at point of interest J, Council and EESG have requested additional larger culverts to be provided to allow flood waters to flow downstream while the culverts in dry periods can act as fauna connectivity structures. This approach is supported in principle; however, flood modelling indicates that larger culverts would have a greater downstream impact and that smaller culverts are preferred to manage the conveyance of flood waters. The Proponent has committed to investigating larger culverts during the detailed design process.

As part of the amended design, modification works to Bennetts Basin are not required as additional flood storage will be provided at point of interest H. Within this area, the existing farm dam will be excavated to provide additional downstream flood storage, while a new detention basin will be provided upstream (**Figure 26**). The updated flood modelling indicates the proposed flood mitigation works within this area will result in improved benefits compared to excavating Bennetts Basin as proposed in the EIS.

A whole of government approach to flooding can be pursued through detailed design

The Proponent is proposing to work with Council and EESG to address existing flooding within the North Boambee Valley by implementing catchment wide mitigation measures identified in the Boambee Newports Floodplain Risk Management Study and Plan (GHD, 2016). These mitigation measures include a large detention basin upstream of the project and downstream channel works within Newports Creek. This approach is supported by all parties as bringing forward these measures will provide catchment wide improvements.

Though these works do not specifically form part of this project, the Proponent is willing to assist Council in progressing these measures with EESG. If an agreement is made before detailed design commences, the project could be redesigned to reduce some aspects of its engineering design. These amendments could include:

- reduced costs by removing bridges/culverts;
- reduced capacity requirements for transverse drainage;
- minimised need for excavation of areas required to provide further mitigation of flood conveyance loss and compensatory flood storage; and
- opportunities for the beneficial reuse of any surplus materials from the project e.g. rock/earth fill.

This approach is the Proponents' preferred method of addressing flooding issues, with potential catchment wide benefits and reduced financial and engineering costs. Further, the implementation of this approach will assist Council in facilitating future development west of the project within the North Boambee Valley. Accordingly, recommended conditions allow for either a whole of Government approach or project specific measures to be implemented, contingent on the project's afflux flooding objectives being met.

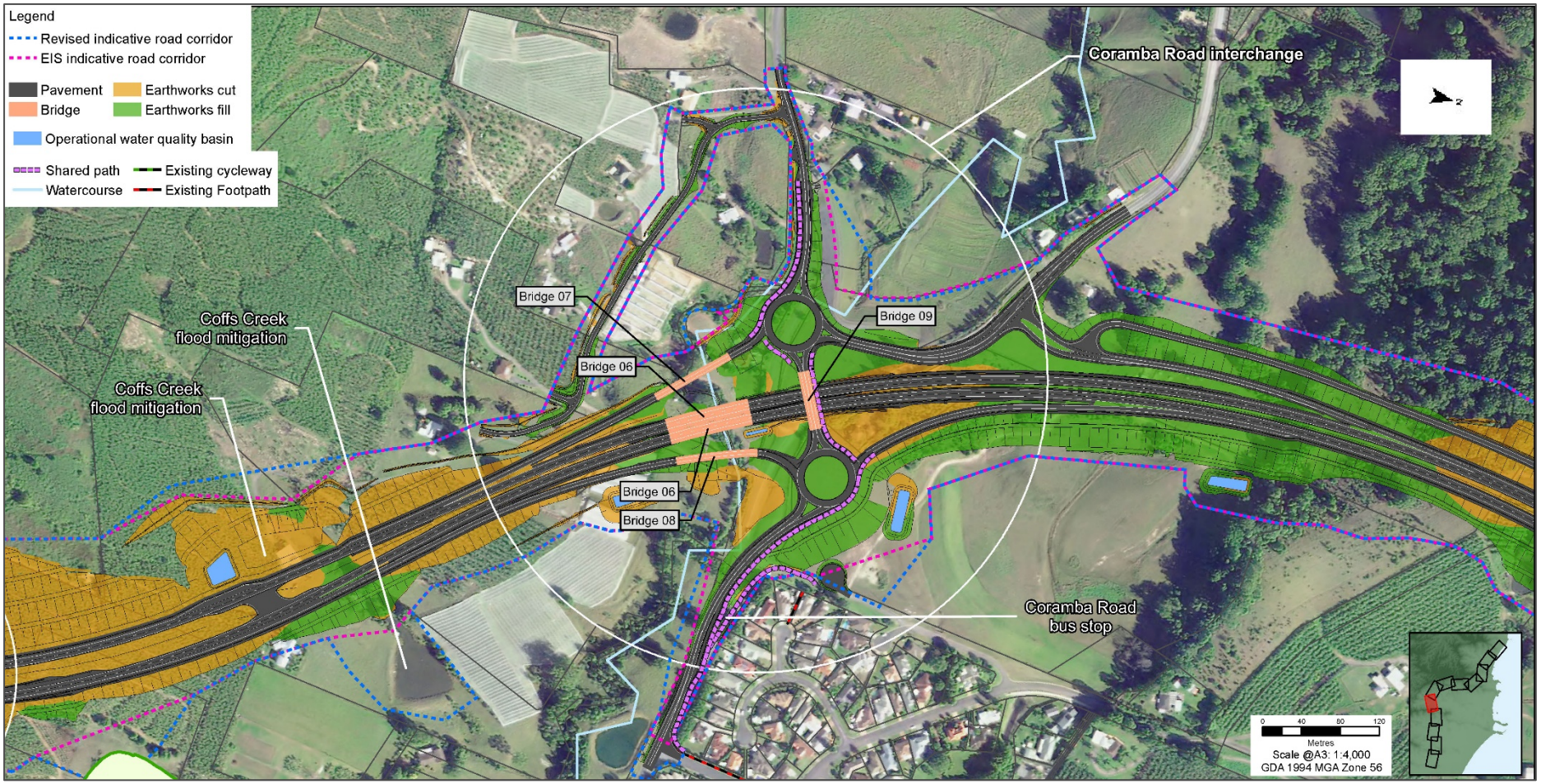

Figure 26 | location of additional flood storage (Source: Amendment Report)

6.5 Biodiversity

Note: *References to sections of the EIS, Amendment Report and the recommended conditions of approval have been included in this section to satisfy the Commonwealth's assessment requirements.*

The project will result in impacts to the biodiversity values of the project area. The Proponent has identified direct impacts to threatened ecological communities under the *Biodiversity Conservation Act 2016* (BC Act) and threatened species under the BC Act and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) within and adjoining the road alignment.

The project has avoided impacts to biodiversity where possible, however, impacts could be further reduced during the detailed design of the project. Impacts to biodiversity values will be offset under the *NSW Biodiversity Offsets Policy for Major Projects*, including the acquisition and retirement of ecological and species credits through biodiversity stewardship agreements, and management of land added to the National Parks estate.

Mitigation measures include the provision of connectivity across the alignment for terrestrial and arboreal fauna, revegetation of disturbed land and the translocation of a threatened flora species. The Department has recommended conditions which specify the total area of plant community types that can be directly impacted, identify the ecosystem and species credits required for the project, require impacts to koala habitat to be reduced and the implementation of a Biodiversity Management Sub-plan to manage impacts on biodiversity during the construction of the project.

Issue

The project area is located within the Coffs Coast and Escarpment sub-region of the North Coast Interim Biogeographic Regionalisation for Australia (IBRA) bioregion, which extends along the east coast of NSW from north of Newcastle to just inside the Queensland border. Remnant native vegetation occurs throughout the study area, interspersed with non-native pasture and exotic weeds.

On 25 August 2017, the *Biodiversity Conservation Act 2016* (the BC Act) repealed the *Threatened Species Conservation Act 1995* (TSC Act). The project is a pending planning application under the *Biodiversity Conservation (Savings and Transitional) Regulation 2017.* Clause 28 of this Regulation states that the former planning provisions continue to apply (and Part 7 of the BC Act does not apply) to the determination of a pending or interim planning application. As all threatened species, communities and their habitats are now listed under the BC Act, the biodiversity assessment and report for the project makes reference to these listings, however, the assessment has been undertaken as per the requirements of the Secretary's Environmental Assessment Requirements (SEARs), which references the TSC Act.

In accordance with the TSC Act, the biodiversity values of the study area have been assessed in accordance with the Framework for Biodiversity Assessment (FBA). A Biodiversity Assessment Report (BAR) of the concept design, updated for the amended project, accompanied the Amendment Report.

The project is a controlled action under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Bilateral Agreement and Framework for Biodiversity Assessment

The then Bilateral Agreement between the Commonwealth and the State of NSW for the assessment of environmental approvals under the EPBC Act endorsed the *Framework for Biodiversity Assessment* (OEH, 2014) and *NSW Biodiversity Offsets Policy for Major Projects* as providing a basis for the assessment of biodiversity values under the EPBC Act. The BAR includes an assessment of the impacts of the project to Matters of National Environmental Significance (MNES).

The Proponent has addressed the Commonwealth requirements and assessed the impacts on MNES. Sections of the EIS relevant to MNES include:

- Chapter 4 – Project development and alternatives;
- Chapter 7 – Consultation;
- Chapter 10 – Biodiversity;
- Chapter 25 – Cumulative Impacts;
- Chapter 26 – Summary of Environmental Management Measures;
- Chapter 28 – Project Justification and conclusion;
- Appendix H – Biodiversity Assessment Report; and
- Appendix I – Threatened Species Management Plan.

Sections of the Amendment Report relevant to MNES include:

- Chapter 2 – Design changes;
- Chapter 5.4 – Additional assessment - Biodiversity;
- Chapter 6 – Revised environmental management measures;
- Appendix C – Updated biodiversity assessment report; and
- Appendix D – Updated Threatened Species Management Plan.

Commonwealth listed species and communities to be impacted

The Commonwealth Department of the Environment and Energy (now Department of Agriculture, Water and the Environment (DAWE)) found in its assessment of the referral documentation (EPBC 2017/8005) that the proposed action is likely to have a significant impact on the following controlling provisions of the EPBC Act:

- Listed threatened species and communities (section 18 and section 18A).

The proposed action is also likely to have a significant impact on MNES, being the:

- Koala (*Phascolarctos cinereus)* (combined populations of Queensland, NSW and ACT) – vulnerable;
- Giant Barred Frog (*Mixophyes iterates*) – endangered; and
- Spotted-tail Quoll (*Dasyurus maculatus*) (SE mainland population) – vulnerable.

Clearing of native vegetation will impact threatened ecological communities

The project would impact approximately 48.17 ha of native vegetation across ten separate Plant Community Types (PCT). **Table 8** provides details of the PCTs general condition, conservation status, regional extent cleared, and area impacted by the project.

Table 8 | Impacts to native vegetation (Source: Amendment Report)

Plant Community Type (PCT)	Condition	TEC under the BC Act	TEC under the EPBC Act	Percent cleared in CMA	Area (ha)
670 – Black Booyong – Rosewood – Yellow Carabeen subtropical rainforest of the NSW North Coast Bioregion	Moderate/ Good	Yes, Lowland Rainforest in NSW North Coast and Sydney Basin Bioregion	No	75%	0.51
692 – Blackbutt – Tallowwood moist ferny open forest of the coastal ranges of the NSW North Coast Bioregion	Moderate/ Good	No	No	15%	17.33
695 – Blackbutt – Turpentine – Tallowwood shrubby open forest of the coastal foothills of the NSW North Coast Bioregion	Moderate/ Good	No	No	5%	10.41
747 – Brush Box – Tallowwood Sydney Blue Gum tall moist forest of the coastal ranges of the NSW North Coast Bioregion	Moderate/ Good	No	No	30%	6.99
780 - Coastal floodplain sedgelands, rushlands, and forblands of the North Coast	Moderate/ Good	Yes, Freshwater Wetlands (0.28 ha)*	No	80%	0.33
1064 – Paperbark swamp forest of the coastal lowlands of the NSW North Coast Bioregion and Sydney Basin Bioregion	Moderate/ Good	Yes, Swamp Sclerophyll Forest	No	75%	4.41
1244 – Sydney Blue Gum open forest on coastal foothills and escarpment of the North Coast	Moderate/ Good	No	No	60%	1.18
1262 Tallowwood – Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast	Moderate/ Good	No	No	30%	1.60
1285 – Turpentine moist open forest of the coastal foothills and ranges of the NSW North Coast Bioregion	Moderate/ Good	No	No	55%	3.50

1302 – White Booyong – Fig subtropical rainforest of the NSW North Coast Bioregion	Moderate/ Good	Yes, Lowland Rainforest in NSW North Coast and Sydney Basin Bioregion	No	75%	1.91
Total					**48.17**

***note:** 0.05 ha of PCT 780 occurs within a small dam (20 m x 20 m with an 8 m x 4m island/mound in the centre). The patch of vegetation does not meet the listing criteria under the BC Act as it is man-made being circular in shape and located over 50 m from the nearest watercourse.*

Four PCTs impacted by the project meet the description of a threatened ecological community (TEC) under the BC Act. Two of these PCTs (PCT 670 and PCT 1302) were also considered to be potential TECs under the EPBC Act. The updated BAR undertook an assessment of these PCTs to determine whether they satisfy the listing criteria under the EPBC Act, in particular the *Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions* TEC. The assessment concluded these PCTs did not meet the condition class or key diagnostic requirements of the Lowland Rainforest TEC under the EPBC Act.

The direct impact of native vegetation would result in the loss of fauna habitat for locally occurring threatened fauna species. This includes the loss of potential breeding habitat (hollow bearing trees, riparian and dense forest vegetation and swamps) and foraging habitat. The fauna surveys identified 98 hollow-bearing trees within the construction footprint. Hollows would provide a variety of fauna with habitat, with the large and extra-large hollows in wet forest gullies providing threatened owls with nesting or roosting habitat. The smaller hollows may provide threatened gliders and microbats with roosting habitat.

In addition, the project directly impacts 81.10 ha of native/exotic vegetation that may provide habitat for common fauna species.

The Proponent has committed to provide ecosystem credits for direct impacts to 48.17 ha of native vegetation in accordance with the *NSW Biodiversity Offsets Policy for Major Projects*. Hollows directly impacted by the clearing of hollow-bearing trees would be replaced with nest boxes and the re-instatement of salvaged hollows.

Threatened flora species to be impacted

Field surveys undertaken for the EIS recorded two threatened flora species: Southern Swamp Orchid (*Phaius* australis) and Rusty Plum (*Niemeyera* whitei). The Southern Swamp Orchid is listed as endangered under both the BC Act and the EPBC Act, and Rusty Plum is listed as vulnerable under the BC Act.

One individual Southern Swamp orchid was recorded within a small patch of remnant vegetation consistent with PCT 695 in the North Boambee Valley and 57 Rusty Plum individuals were located in the northern section of the project area, predominantly in gullies and depressions of the Pine Brush Creek and Jordans Creek riparian corridors, with the species occurring across seven PCTs.

The Proponent undertook additional targeted surveys in Summer 2019-2020 for the threatened flora species Scrub Turpentine (*Rhodamnia rubescens*) and Native Guava (*Rhodomyrtus psidioides*), which were listed in February 2019 as Critically Endangered under the BC Act. The surveys recorded 14 Scrub Turpentine individuals and an additional 17 Rusty Plums (total 74 individuals) and confirmed

the Southern Swamp Orchid recorded during the initial surveys was the non-threatened Christmas Orchid (*Calanthe triplicate*). The BAR confirmed that the Southern Swamp Orchid does not occur in the road alignment and no Southern Swamp orchid individuals would be impacted. No Native Guavas were recorded during the targeted surveys; therefore, the project does not impact this threatened species.

Impacts to the identified threatened flora species would be offset in accordance with the *NSW Biodiversity Offsets Policy for Major Projects*.

Impacts to threatened fauna species

The field surveys recorded 13 threatened fauna species and four migratory species within the study area. The threatened fauna species are:

- Coastal Petaltail (Endangered BC Act);
- Giant Barred Frog (Endangered BC Act, Endangered EPBC Act);
- Koala (Vulnerable BC Act, Vulnerable EPBC Act);
- Pale-vented Bush Hen (Vulnerable BC Act);
- Southern Myotis (Vulnerable BC Act);
- Eastern False Pipistrelle (Vulnerable BC Act);
- Eastern Freetail-bat (Vulnerable BC Act);
- Greater Broad-nosed Bat (Vulnerable BC Act);
- Grey-headed flying-fox (Vulnerable BC Act, Vulnerable EPBC Act);
- Little Bent-winged Bat (Vulnerable BC Act);
- Olive Whistler (Vulnerable BC Act);
- Square-tailed Kite (Vulnerable BC Act); and
- White-bellied Sea-eagle (Vulnerable BC Act).

Four migratory species listed under the EPBC Act were recorded during the targeted surveys:

- Black-faced Monarch;
- Rufous Fantail;
- Spectacled Monarch; and
- Wanderer Butterfly.

The Commonwealth controlled action decision considered the project would likely have a significant impact on the Spotted-tail Quoll, however, field surveys did not record this species. The Proponent considered the loss of habitat relevant for this species.

The BAR assessed that species credits would be required for six threatened fauna species and these would be provided in accordance with the *NSW Biodiversity Offsets Policy for Major Projects*. The provision of ecosystem credits would address the loss of potential foraging, breeding and roosting habitat for the other threatened fauna species and migratory species recorded in the project area.

Minor impacts to aquatic flora and fauna

The project intersects a number of perennial and non-perennial watercourses and tributaries within the Bellinger River catchment. These watercourses flow directly to the coast instead of the Bellinger River. Four of the six watercourses (Pine Brush Creek, Jordans Creek, Treefern Creek and Coffs Creek) flow into the Habitat Protection Zone of the Solitary Island Marine Park. Newports Creek and Boambee Creek flow to the coast to the south of the Coffs Harbour airport.

The Solitary Island Marine Park extends from the mean high water mark to three nautical miles offshore, from north of Coffs Harbour to Sandon River (about 75 km of coastline). The Solitary Island Marine Park (in Commonwealth Waters) adjoins the State marine park and extends to the 50 metre depth contour, approximately 50 kilometres offshore. The Proponent considers the project is unlikely to affect the State and Commonwealth Marine Parks as the quality of water discharged from construction activities associated with the realignment of Pine Brush Creek and its northern tributary (Williams Creek) would be in accordance with the *Protection of the Environment Operations Act 1997.* In addition, sediment basins in the Marine Park's catchment would be designed to contain the five-day 90th percentile rainfall event.

There are no mapped Key Fish Habitats in the study area. Two threatened aquatic species were identified as potentially occurring in the study area, the Oxleyan Pygmy Perch (*Nannoperca* oxleyana) and Purple Spotted Gudgeon (*Mogurnda adspersa*). These species are listed as endangered under the *Fisheries Management Act 1994.* Targeted surveys of the watercourses did not record the presence of these species however, six native and one exotic species were recorded.

Ramsar listed wetlands will not be impacted

No Ramsar wetlands or Nationally Important Wetlands are in the study area. The nearest Ramsar wetland, Myall Lakes, is located approximately 300 kilometres south of Coffs Harbour.

A number of wetlands mapped by EESG occur to the east, west and south of the study area, including Pine Brush Creek, Boambee Creek and Cordwells Creek, however the project does not impact these wetlands.

A wetland previously mapped under State Environmental Planning Policy (SEPP) No.14 Coastal Wetlands (now Coastal Management SEPP 2018) occurs approximately 100 m east of the southern extent of the project (Boambee Creek). The project does not impact the wetland as no project works occurs within the wetland or its 50 m wetland buffer area.

Minor impacts to groundwater dependent ecosystems

One area of high potential groundwater dependent ecosystem (GDE), which is reliant on subsurface groundwater (from regional studies as per the Australian Government's Bureau of Meteorology Groundwater Dependent Ecosystems Atlas 2018 (GDE Atlas)) occurs within the study area. The remainder of the vegetation is considered by the GDE Atlas to be low potential GDE. The project will result in direct impacts to 3.58 ha of high potential GDE and 44.59 ha of low potential GDE.

The lowering of groundwater levels caused by the excavation of cuttings and tunnels which intercept and drain groundwater from the fractured bedrock aquifer, has the potential to impact GDEs. However, most GDEs are likely to draw groundwater from alluvial aquifers and perched water which generally occur within a few metres of the surface. It is unlikely that GDEs are dependent on groundwater from the fractured bedrock aquifer.

No moderate or high potential GDEs are expected to be within the zone of drawdown from Type A cuttings (those that extend below the water table) and drained tunnels, and similarly there are no mapped Coastal Management SEPP wetlands within the expected zone of drawdown. The Proponent has committed to manage potential impacts on GDEs through the implementation of a Groundwater Management Plan.

Submissions

Community submissions

Submissions from the community raised concerns regarding the provision of fauna crossings and monitoring of their usage, impacts on the biodiversity of the area, use of local native species for landscaping and revegetation works, and fauna corridors and connectivity.

Government agency and Council submissions

EESG identified issues and omissions within the BAR and provided requirements for additional information and amendments to ensure the assessment complied with the FBA. These included the assessment of landscape features, native vegetation mapping on the development site, identification of PCTs and ecological communities, survey and assessment of threatened flora and fauna species, assessment and offsetting of unavoidable impacts, and the biodiversity offset strategy. EESG noted the MNES assessment may need to be amended once its comments and requirements were addressed.

The Department and EESG are satisfied with the survey and assessment methodology, including the additional survey and assessment undertaken for the Amendment Report. EESG considers the revised and additional assessment in the updated BAR has addressed State and Commonwealth biodiversity matters.

Council acknowledged improved fauna connectivity outcomes from the three tunnels; however, recommended vegetation rehabilitation on Roberts Hills to improve connectivity for Koalas. Council requested the Proponent maintain fauna fencing and connectivity structures in perpetuity and artificial hollows for a minimum of 15 years, protect fauna during construction, and protection of a remnant rainforest patch in West Coffs Harbour.

Department's Consideration

The assessment adequately considers Matters of National Environmental Significance (MNES)

The desktop analysis of MNES considered listed threatened communities, species and migratory species that were known or potentially occurred in the project area. Although the project impacts the BC Act listed *Lowland Rainforest in NSW North Coast and Sydney Basin Bioregion* TEC, the BAR assessed the EPBC Act listed TEC *Lowland Rainforest of Subtropical Australia* and concluded it did not occur in the project area.

The MNES assessment in the BAR considered the project would have a potential impact on the MNES listed in **Table 9** from the direct loss of known and/or potential habitat.

The assessment concluded the project is likely to have a significant impact on the Giant Barred Frog and the Koala. The Proponent has committed to secure offsets to address residual impacts to these species and their habitat, through the FBA and the *Biodiversity Offset Policy for Major Projects.* The proposed mitigation measures for connectivity structures and fauna fencing reduces impacts to the Koala from the operation of the project. The proposal for bridges to cross Giant Barred Frog habitat and the provision of frog fencing, and connectivity structures would ensure that impacts from the construction and operation of the project are reduced.

Table 9 | MNES and Habitat Loss (Source: Amendment Report)

Fauna Species	Habitat (ha)
Giant Barred Frog	4.79 (known and potential)
Koala	47.84 (known and potential)
Grey-headed Flying-Fox	47.84 (known and potential foraging)
Regent Honeyeater	4.41 (potential foraging)
Spotted-tail Quoll	47.84 (potential)

The BAR noted that no Spotted-tail Quoll dens were recorded in the targeted surveys and no Grey-headed Flying-fox camps were located in the project area. Although the project directly impacts known and potential Grey-headed Flying-fox habitat, the Department notes that the vegetation is highly fragmented and not considered to be important for this species, given that known foraging resources are in the Boambee State Forest about 3 km to the west. The Department considers that the project does not significantly impact the Grey-headed Flying-fox and species credits are therefore not required.

In relation to the Spotted-tail Quoll, the Department considers that the proposed tunnel crossings of the ridgelines instead of cuttings, and the provision of connectivity structures to address connectivity and fragmentation of habitat, reduces the impacts of the project on this species (although no individuals were recorded in the targeted surveys). The Department therefore considers the project does not significantly impact the Spotted-tail Quoll and species credits are not required. The Proponent's proposal to secure ecosystem credits for impacts to PCTs would also addresses impacts to known and potential foraging habitats for these species.

The project directly impacts 4.41 ha of potential foraging habitat of the Regent Honeyeater, however, there are no known breeding or foraging habitat impacted by the project. The project area is located approximately 100 km east of areas identified by the National Recovery Plan for the Regent Honeyeater as key breeding areas, and there is approximately 175 ha of potential foraging habitat within 10 km of the project. The Department considers that the project does not significantly impact the Regent Honeyeater therefore species credits are not required.

In relation to the migratory species recorded in the project area, the BAR considered that these species may occur in the project area whilst moving through their large home range but are not expected to rely on the project area for their important life cycle stages, and the loss of 47.84 ha of potential habitat is considered to have a low impact for these species.

The Department is satisfied with the BAR's conclusions on impacts to MNES, in particular the significant impacts to the Koala and Giant Barred Frog, and recommends that DAWE considers:

1. the Department's assessment of MNES in this report;
2. **Appendix H** which assesses impacts to threatened communities and threatened species;
3. **Appendix I** which sets out the additional EPBC Act considerations, including the Commonwealth's international obligations and the consideration of relevant approved conservation advices, recovery plans, and threat abatement plans.

The Department recommends that DAWE, in determining the controlled action under the EPBC Act, adopts Conditions identified in **Appendix J** of this report.

Impacts to threatened communities and species cannot be avoided

The Department acknowledges that the Proponent through its design process has avoided and minimised potential impacts of the project to threatened species habitats. However, the construction of the project will require the clearing of native vegetation, loss of hollow bearing trees and removal of dead wood and dead trees from within the construction footprint. There will also be unavoidable indirect impacts to biodiversity present outside the construction footprint. The Proponent states that during detailed design, impacts to native vegetation would be minimised further where feasible and reasonable.

The Proponent has committed to address potential construction impacts on threatened communities species through a range of mitigation measures, which include pre-clearing surveys prior to vegetation clearing, reducing impacts to riparian vegetation by the placement of bridge piers and abutments, implementing unexpected species finds procedures, and delineation of sensitive areas and retained vegetation.

To address impacts on threatened species a Threatened Species Management Plan would be developed for the Koala and Giant Barred Frog. Relevant mitigation measures include fauna connectivity across the project area, rehabilitation of disturbed areas within the road corridor with habitat vegetation and providing hollows and nest boxes to replace hollow bearing trees removed by the project.

The project will directly impact approximately 74 Rusty Plum individuals. The Proponent has committed to develop a translocation plan for the Rusty Plum, which would detail the preparation of the re-establishment and receival sites, plant movement, pre- and post-translocation care, monitoring procedures and contingency plans. The Department notes translocation of threatened flora species is an established mitigation measure for other Pacific Highway Upgrade projects to the north and south of Coffs Harbour. The Department accepts the translocation of the critically endangered Scrub Turpentine is not appropriate given the risks of spreading myrtle rust pathogen to unaffected populations of the species.

The Department has reinforced the Proponent's commitments to manage impacts on threatened communities and species by including these as recommended conditions of approval:

- Development of a threatened species management plan which addresses management and mitigation measures such as connectivity, exclusion fencing, nest boxes and habitat rehabilitation;
- Rusty Plum salvage and re-establishment for the translocation of the threatened species; and
- Development of a Biodiversity Management Sub-plan to manage construction impacts on the biodiversity values of the project area.

Biodiversity offsets will be required

The direct impacts to threatened communities and threatened species habitats will require offsetting, through the securing of ecosystem credits to address impacts to plant community types and species credits for impacts to threatened species. In addition to impacts to the Koala and Giant Barred Frog, the updated BAR identified that species credits for the Coastal Petaltail, Common Planigale, Pale-vented Bush-hen and Southern Myotis was also required.

The Proponent has determined that a total of 2,911 ecosystem credits and 3,254 species credits are required to offset the biodiversity impacts of the project. The required ecosystem and species credits are outlined in **Table 10** and **Table 11**, respectively. Species credits are applied to known rather than known and potential habitat.

Table 10 | Ecosystem Credits Required (Source: Amendment Report)

Ecosystem Credits		
Plant Community Type (PCT) ID and name	Management zone area (ha)	Number of Credits
NR120 Blackbutt - Tallowwood moist ferny open forest of the coastal ranges of the NSW North Coast Bioregion	17.33	1023
NR122 Blackbutt - Turpentine - Tallowwood shrubby open forest of the coastal foothills of the central NSW North Coast Bioregion	10.41	615
NR138 Brush Box - Tallowwood - Sydney Blue Gum tall moist forest of the ranges of the central NSW North Coast Bioregion	6.99	432
NR149 Coastal floodplain sedgelands, rushlands, and forblands of the North Coast	0.33	8
NR217 Paperbark swamp forest of the coastal lowlands of the NSW North Coast Bioregion and Sydney Basin Bioregion	4.41	300
NR258 Sydney Blue Gum open forest on coastal foothills and escarpment of the North Coast	1.18	80
NR263 Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast	1.6	99
NR274 Turpentine moist open forest of the coastal hills and ranges of the NSW North Coast Bioregion	3.5	212
NR280 White Booyong - Fig subtropical rainforest of the NSW North Coast Bioregion	2.42	142
TOTAL ECOSYSTEM CREDITS	**48.17**	**2911**

Table 11 | Species Credits Required (Source: Amendment Report)

Species	**Loss of habitat or individuals**	**Number of Credits**
Rusty Plum, Plum Boxwood (Niemeyera whitei)	74 individuals	1110
Coastal Petaltail (Petalura litorea)	3.05 ha	235
Common Planigale (Planigale maculata)	7.94 ha	206

Giant Barred Frog (Mixophyes iteratus)	3.56 ha	274
Koala (Phascolarctos cinereus)	39.71 ha	1032
Pale-vented Bush-hen (Amaurornis moluccana)	4.86 ha	63
Southern Myotis (Myotis macropus)	15.19 ha	334
TOTAL SPECIES CREDITS		**3254**

To encourage the Proponent to reduce impacts on biodiversity during detailed design and construction, recommended conditions allow the Proponent to review and update the ecosystem and species credit requirements to reflect the final impact zone. The exception to this is species credits for the koala which requires a minimum of 1,032, based on impacts to 39.71 ha of known koala habitat. Notwithstanding, the Proponent has reduced impacts to koala habitat through design changes (changing from cuttings to tunnels resulted in saving of 3.49 ha and redesign of the Englands Road and Korora Hill interchanges resulted in a further 2.45 ha reduction). The Department considers that due to pressures on koala habitat from development, the Proponent should be required to reduce impacts to koala habitat within the project area and secure a minimum amount of species offset credits. The recommended conditions require the Proponent to reduce the area of koala habitat impacted by the project.

The project directly impacts 3.56 ha of known Giant Barred Frog Habitat in two areas within the study area. The BAR considers the impact to be significant and species credits will be obtained for the species.

The Department's recommended conditions require the Proponent to secure and retire all biodiversity credits within 12 months of construction commencing. The retirement of credits must be consistent with the *NSW Biodiversity Offsets Policy for Major Projects*, and can include:

- retiring credits under the BC Act; and/or
- making payments into the Biodiversity Conservation Fund; and/or
- providing supplementary measures.

The Proponent has prepared a Biodiversity Offset Strategy which identified four sites, three in the Coffs Coast and Escarpment IBRA sub-region (CHB1, CHB2 and CHB4) and one in the adjoining Yuraygir IBRA sub-region (CHB5), to meet the project's offset requirements. Biodiversity Stewardship Agreements under the BC Act would be entered into for CHB1, CHB2 and CHB4. The fourth property has been jointly acquired with NPWS and would be transferred to the Yuraygir National Park. The Proponent will fund the ongoing management of the site. The proposed offset sites have habitats for both the Koala and Giant Barred Frog that is equal to or in better conditions than the habitat being impacted by the project. The Proponent states that the proposed offset sites also provide habitat for a number of MNES not significantly impacted by the project.

The project impacts 14 Scrub Turpentine individuals listed as a threatened species in 2019 following introduction of the BC Act. As there are no equivalent offset requirements for this species under the FBA, offsetting of impacts can only be achieved through direct offsets or the provision of supplementary measures, rather than securing biodiversity credits. As the myrtle rust pathogen is

widespread in the eastern seaboard of the State, provision of supplementary measures which target research in combating the spread of the pathogen and potentially treating infected plants is preferable over a direct offset. EESG is supportive of this approach and has recommended that the Proponent make a payment into its “Saving Our Species *Rhodamnia rubescens* Conservation Strategy”. The Department has included a condition requiring payment to EESG prior to commencing work that impacts the Scrub Turpentine.

The Department is satisfied that the project does not have a significant impact on the Grey-headed Flying-fox (with the nearest camp at Coffs Creek approximately 1.7 km distant) and the Spotted-tail Quoll (no individuals or dens were identified during the surveys). The securing of ecosystem credits for impacts to native vegetation would satisfactorily address impacts to the habitat of these threatened species.

No significant impacts on riparian vegetation and aquatic fauna

The key impacts to waterways and aquatic fauna are associated with the construction of permanent waterway crossings. The Proponent has identified potential impacts to waterways from temporary crossings and diversion of channels, piers and bridge abutments impacting riparian vegetation and realignment of waterways (Newports Creek, Treefern Creek and Pine Brush Creek). These construction works will result in the loss of riparian and aquatic habitat, including the removal and/or relocation of snags.

The targeted surveys did not identify any threatened aquatic species, populations or communities in the waterways impacted by the project, nor were they expected to occur. Construction impacts to aquatic communities and species would be addressed in the Biodiversity Management Sub-plan. The construction of appropriately designed fish friendly crossing structures, and the implementation of standard construction mitigation measures such as erosion and sediment control, will minimise the potential for adverse impacts to watercourses and/or aquatic species.

Fauna connectivity across the alignment is maintained

The project is likely to result in increased fragmentation of habitat to the east (coastal floodplains) and west (escarpment) of the alignment. The assessment identified a number of regionally significant and local area biodiversity links along waterways and escarpment foothills that cross the project area. These include koala habitat corridors where native vegetation links habitat to the east and west. Most of these biodiversity links would be impacted by the loss of habitat, physical fragmentation of habitats to the east and west, and isolation of vegetation and habitats.

The Proponent has refined the concept design of the project to avoid and minimise impacts to biodiversity, including tunnelling instead of cuttings at the Roberts Hill, Shephards Lane and Gatelys Road ridgelines to maintain existing biodiversity links, bridge crossings of watercourses, and reinstatement of minor creeks using natural channel design principles and revegetation to restore riparian and aquatic habitat. In addition, mitigation measures would be implemented to reduce the impacts of fragmentation of habitat and severance of biodiversity links. These include:

- two dedicated fauna underpasses;
- three combined fauna and drainage underpasses; and
- bridges crossings of waterways (four), roads (three) and rail (one) with fauna passage at ground level.

The target species for these connectivity measures are the Koala, Spotted-tail Quoll, Pale-vented Bush Hen, Common Planigale and Giant Barred Frog. Fish passage is also provided in the combined fauna and drainage culverts.

The Proponent considers that these measures would mitigate the project's direct impacts on koalas and other threatened fauna species. Other measures to benefit koalas include fauna fencing along the highway to ensure that animals are not able to access the highway, rehabilitation and revegetation and protection of retained habitat within the road corridor and monitoring the use of connectivity structures. The Department notes these are proven mitigation measures adopted for other Pacific Highway Upgrade projects and ongoing monitoring of connectivity structures has demonstrated their use by koalas (and other threatened fauna species).

The Department notes that the retention of the escarpment ridgelines maintains existing biodiversity links and is a key design feature which avoids connectivity impacts to the Koala and Spotted-tail Quoll. The Roberts Hill and Gatelys Road ridgelines are key regional and local koala corridors. The Department has recommended a condition of approval which requires the Proponent to undertake restoration of koala habitat on land within the road alignment above the Roberts Hill and Gatelys Road tunnels and adjacent land owned by the Proponent that are within the regionally and locally significant koala corridors on the Roberts Hill and Gatelys Road ridgelines. Should the Proponent sell any residual land not required for the project, the koala habitat must be protected in-perpetuity through a mechanism developed with EESG and approved by the Planning Secretary. The Department considers that the restoration of koala habitat on key koala corridors is an important mitigation measure to reduce impacts on the koala. The Department notes that Council advised it is coordinating a number of grants around the Roberts Hill area and the requirement for the Proponent to undertake habitat restoration works above the Roberts Hill tunnel would complement council's initiative to improve fauna connectivity on a key koala corridor.

Ongoing monitoring of fauna connectivity structures on Pacific Highway Upgrade projects to the north and south of Coffs Harbour have shown they have been successfully used by koalas and other threatened species. Such structures maintain access to habitat which would otherwise be severed by the highway. The Department has therefore included a condition to require the preparation and implementation of a threatened species management plan to outline the measures for connectivity, monitoring of connectivity measures and revegetation of habitat.

Biosecurity risks need to be managed

The Proponent has identified risks to biodiversity from the management of diseases, pathogens and weeds during the construction of the project. In particular:

- Phytophthora cinnamomic – risk to vegetation through movement of people, machinery and vehicles;
- Myrtle rust (observed in Scrub Turpentine vegetation) – through movement of people, machinery and vehicles;
- Chytrid fungus – risk to amphibians from the movement of people, machinery and vehicles.

The Proponent has committed to develop protocols to manage risks from these diseases and pathogens.

The Department notes that the Proponent is required to manage weeds in accordance with the *Biosecurity Act 2015* during the construction and operation of the project. To minimise the risks of

transmitting weeds (such as lantana and camphor laurel), disease and pathogens, the Department has recommended the Proponent implement weed management measures and hygiene protocols as part of the Biodiversity Management Sub-plan. This would ensure that the transfer of weeds (and seeds), disease and pathogens is not spread through the movement of construction machinery and vehicles.

6.6 Surface and Groundwater

The construction and operation of the project is likely to generate potential impacts on water quality as the alignment traverses watercourses which flow from the Great Dividing Range to the coast. Due to the proximity of environmentally sensitive areas including the Solitary Islands Marine Park, the Proponent is required to implement construction measures to manage water quality risks. With such measures in place, the Department considers that the sensitive receiving environments can be appropriately protected.

Groundwater impacts are relatively minor and localised and can generally be managed to meet relevant flow and drawdown levels. The Proponent will implement mitigation measures to capture and treat construction and operational water, return intercepted groundwater to the aquifer during operation and ensure that water supply bores affected by the project are reinstated.

Issue

The project traverses three sub-catchments in the Bellinger River and Coffs Harbour Catchment:

- Boambee Creek (Boambee Creek and Newports Creek);
- Coffs Creek (Coffs Creek and Treefern Creek);
- Korora Basin (Pine Brush Creek and Jordans Creek).

The latter two sub-catchments are within the Solitary Islands Marine Park catchment. The waterways within the construction footprint and downstream are all classified as affected by urban development (NSW Water Quality and River Flow Objectives) and disturbed by agricultural uses which results in moderate to poor water quality. The sub-catchments and Solitary Islands Marine Park are shown in **Figure 27**.

During operation, surface runoff from hard surfaces will potentially lead to an increase in erosion and sedimentation and the mobilisation of pollutants. Stormwater runoff generated by the project will be managed through water quality control structures, such as grass swales. The EIS water quality modelling indicates that these measures would be effective in reducing the impact of runoff on the quality of receiving water bodies. The change of water quality in the sensitive receiving environments is likely to be negligible, with a marginal reduction or increase of the primary pollutants.

Groundwater inflow in tunnels and seepage from cuts could affect groundwater levels in water supply bores within the zone of drawdown. However, these impacts would reduce over time and modelling indicates that the groundwater take is minimal (0.2%) in the context of the long-term average annual extraction limit of the new England Fold Belt Coastal Groundwater Source.

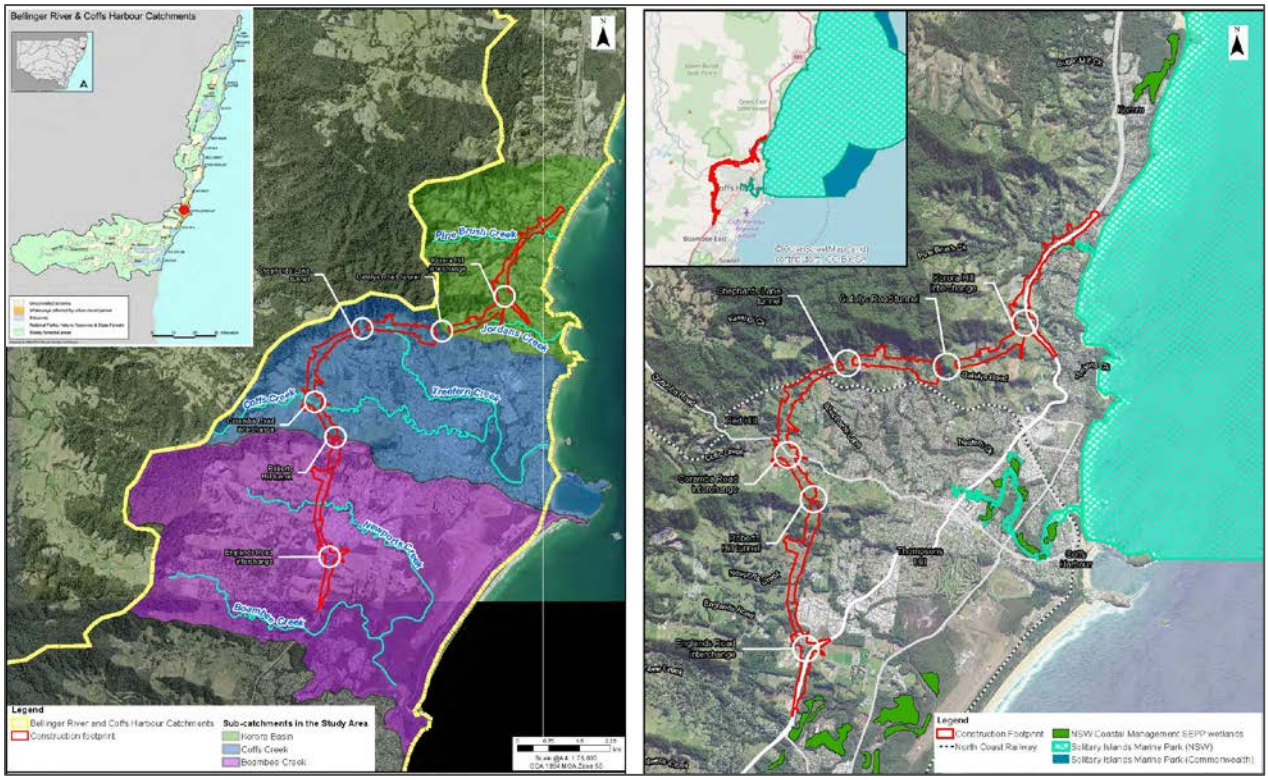

Figure 27 | Catchments, waterways, wetlands and Marine Park (Source: EIS)

Submissions

Community and special interest group submissions

The issues were mainly focused on maintaining and improving the health of waterways that flow into the Solitary Islands Marine Park and impacts of tunnelling on groundwater bores and the water table.

Government agency and Council submissions

The **EPA** raised the following issues:

- The loss of sediments into waterways from temporary waterway crossings, in terms of the lengthy duration of such crossings and the high rainfall of the region;
- The design of sediment basins is inconsistent with *Managing Urban Stormwater, Soils and Construction Vol. 2D Main Road Construction* (DECC, 2008), which should use the five-day 95th/90th percentile rainfall events where catchments are disturbed for greater than three years;
- The water quality modelling of construction discharge is inconsistent with the SEARs. The modelling did not account for changes near the point of discharge, consider all pollutants and was not fully commensurate with pollution risks in the different receiving environments;
- More general environmental management measures or guidelines are needed when managing issues of tannin leachates, works within or adjacent to waterways, and root balls reuse; and
- Concerns about groundwater intercepted during construction and the quality of the water discharged to the environment.

DPI – Fisheries did not support the abstraction of water from watercourses in the construction footprint for construction purposes.

Water Group advised that works on waterfront land should be designed in accordance with the *Guidelines for Controlled Activities on Waterfront Land* (2012) and that further consultation is required

on the long term discharge from the Gatelys Road tunnel, which is modelled at greater than 1L/sec per kilometre and there is no proposal to line the tunnel.

Council raised concern that litter can block the efficient operation of gross pollutant traps (GPTs), particularly those that target pollutants such as heavy metals and hydrocarbons.

Department's Considerations

Construction and operational water impacts can be managed by the adoption of standard construction water and sediment control measures

The primary risk to downstream water quality during construction would be through the transport of sediment during vegetation clearing and earthworks and works in watercourses (temporary crossings and diversions and the realignment of waterways). Uncontrolled discharge of sediments and pollutants into the watercourses, particularly those that flow into sensitive receiving environments, could also impact water quality.

Works in watercourses include the construction of temporary crossings and diversion of watercourses to construct culverts, and the permanent realignment or adjustment of watercourses. The Proponent considers these works would result in the release of Total Suspended Solids (TSS) and increased turbidity, however these impacts are temporary during construction. In designing the realignment of watercourses, features to minimise impacts to water quality would be included by incorporating natural channel design principles such as meanders and riparian vegetation cover.

The project has minimal impact on Coastal Management SEPP wetlands in Boambee Creek downstream of the project (approximately 100 m) and the Solitary Islands Marine Park (both State and Commonwealth listed marine parks). The Proponent has committed to implement mitigation measures to manage the discharge of surface water, including construction of sediment basins in sensitive environments to accommodate 5 day 90th percentile rainfall events, and undertake water quality monitoring.

The Department is satisfied that water quality impacts can be addressed through the implementation of the proposed mitigation measures. The EPA was concerned that the catchment wide assessment of water quality was too broad, and that modelling should focus on discharge points within the road corridor. The Department has included a condition requiring the Proponent to undertake modelling of the construction water quality discharge points based on the detailed design of the project. Other water quality conditions include the implementation of a Soil and Water Management Plan, consideration of the *Guidelines for controlled activities on waterfront land Riparian corridors* (Department of Industry, 2018) when carrying out work within 40 metres of a watercourse and the provision of enhanced erosion sediment controls in catchments that flow to the Solitary Islands Marine Park.

Groundwater impacts are minor and can be managed to meet flow criteria

Cuttings and drained tunnels have the potential to impact groundwater levels where they extend below the existing groundwater surface. Where groundwater seeps into excavations during construction, and into permanent drainage systems during operation, groundwater levels in the surrounding area would be lowered (known as drawdown). The project involves the excavation of 24 cuttings and three tunnels, of which seven cuttings and the tunnels would extend below the existing groundwater table. The other seventeen cuttings are either Type B where the design level is within 5 m of the groundwater table and Type C cuttings where the groundwater table is greater than 5 m

below the design cut level. Type B and C cuttings have low to negligible impact and no impact on groundwater levels, respectively.

Type A cuttings and the tunnels have a moderate to high impact on groundwater levels and modelling was undertaken to determine the construction and operational impacts. A conceptual hydrogeological model of Type A cuttings and tunnels are shown in **Figure 28** and **Figure 29**.

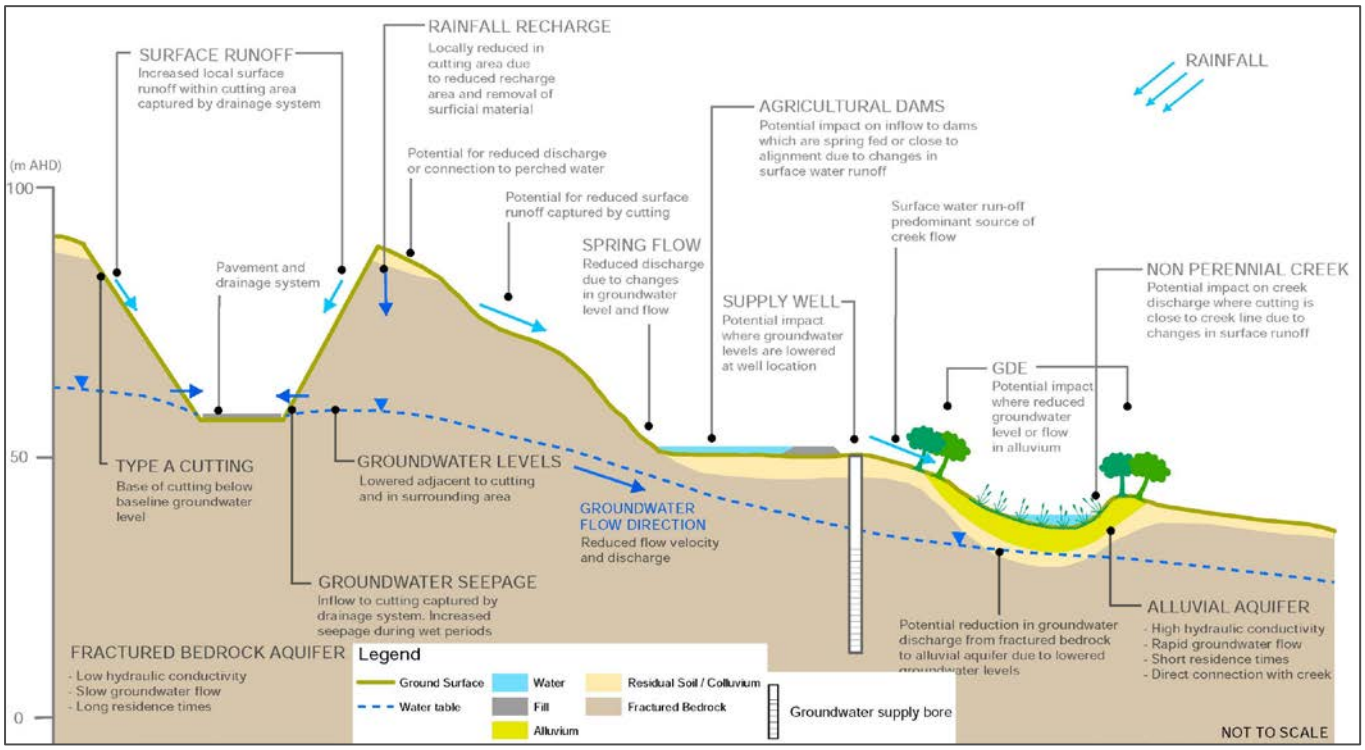

Figure 28 | Conceptual Hydrogeological Model (Type A Cutting) (Source: EIS)

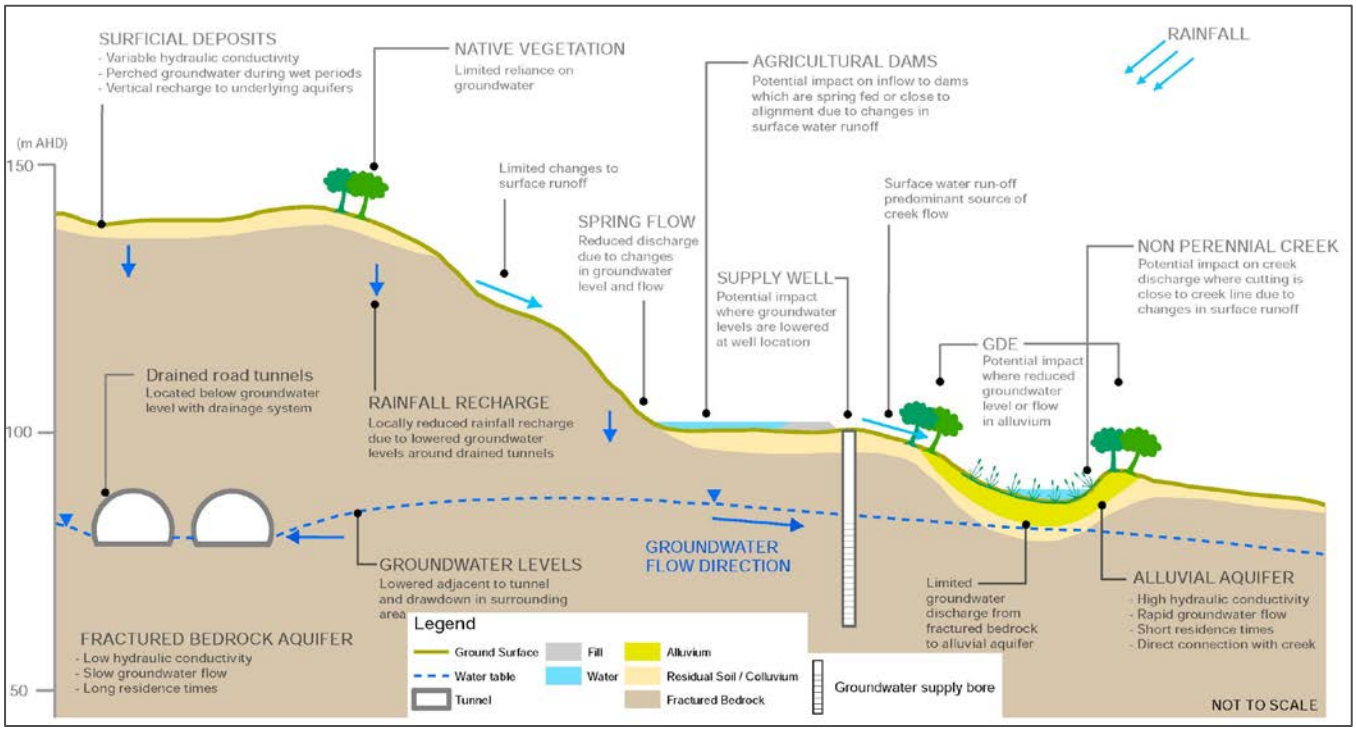

Figure 29 | Conceptual Hydrogeological Model (Tunnels) (Source: EIS)

Groundwater is present in three distinct layers in the project area, these are:

- Shallow surficial deposits or perched groundwater – often unsaturated with groundwater present following rainfall. The perched groundwater is expected to infiltrate to underlying aquifers or downgradient to watercourses.
- Alluvial aquifers – often occurs along drainage lines with recharge from rainfall and surface water within the creek lines.
- Fractured bedrock aquifer – groundwater storage and flows generally occurs in defects and in the weathered zones. Groundwater levels within the aquifer range from 11 m AHD to 117 m AHD below ground level.

The predicted groundwater inflows to the tunnels are shown in **Table 12**. The largest groundwater flow rate is predicted to occur at the Gatelys Road tunnel, with a steady state inflow rate of approximately 55.3 kL per day or 0.15L/sec per 100 metres. The initial construction inflow rate of 305 kL/day is only maintained for a short period of weeks and inflows would reduce to approximately twice the steady state inflow rate within 100 days. The time taken to reach steady state conditions is 3-4 years.

Table 12 | Predicted tunnel groundwater inflow (Source: EIS)

Tunnel*	Groundwater inflow (kL/day)	Length (m)	Groundwater inflow (L/s/100 m)
Roberts Hill	7.8	170	0.053
Shephards Lane	18.9	305	0.07
Gatelys Road	55.3	420	0.15

***Note**: * Excludes the eastern and western portals*

The cutting predicted to have the largest construction inflow rate is Cut 8 (northern side of Roberts Hill) with predicted maximum groundwater inflow of 86.7 and 60.3 kL/day for Cut 8-1 and Cut 8-2, respectively, with a maximum steady state inflow rate of 17.3 and 12.1 kL/day, respectively. Inflows to Cut 8, and the Shephards Lane and Gatelys Road tunnels account for approximately 70% of the predicted groundwater inflow across the project.

Groundwater inflow to the tunnels would be captured and treated in temporary construction water treatment plants and discharged in accordance with EPL requirements. Groundwater intercepted in cuttings would flow to sediment basins prior to discharge. The Proponent has committed to recharge captured groundwater into the underlying aquifer or creeks within the same sub-catchment. Similarly, during the operation of the project intercepted groundwater would be collected and discharged into the same catchment where it was collected.

The Water Group advised that for the assessment of groundwater inflow into road tunnels, it has established with the Proponent a threshold of 1L/s/km of tunnel to trigger a consideration that the tunnel be lined or subject to further assessment that considers other preventative or remedial solutions. The Water Group noted that the Gatelys Road tunnel is predicted to discharge 1.415 L/s per km (0.6366 L/s over 450 m) which is greater than the threshold rate. Notwithstanding the predicted rate of inflow, there has been no proposal to line the tunnel. In response, the Proponent

advised that during detailed design additional hydrogeological and geotechnical investigations would be carried out and that based on this information further groundwater modelling would be undertaken. If groundwater inflows exceed 1L/s/km then the Proponent would consider measures such as grouting around the tunnel to limit ingress of groundwater. The Department is satisfied with the assessment of groundwater inflows and has recommended a condition of approval to require operational groundwater inflow to the tunnels to not exceed 1L/s/km.

Groundwater drawdown and settlement is minimal

The *NSW Aquifer Interference Policy* (AIP) uses a two metre drawdown as the basis for the identification of impacts to groundwater users. The predicted steady state drawdown distances at the tunnels and cuts with the largest rate of inflow are shown in **Table 13**.

Table 13 | Predicated Drawdown (Source: EIS)

Cut / Tunnel	Maximum predicted distance to 1 m drawdown (upgradient)	Maximum predicted distance to 1 m drawdown (downgradient)
Roberts Hill	143	50
Cut 8-1	99	37
Cut 8-2	100	203
Shephards Lane	197	197
Gatelys Road	355	355

The assessment identified twelve water supply bores within the predicted zone of drawdown, of these:

- Eight are predicted to have a drawdown of less than one metre;
- Three are predicted to have a drawdown of between one and two metres;
- One is predicted to have a drawdown of 4.3 m, which exceeds the AIP requirement of no more than two metre drawdown.

The Proponent has committed to undertake further investigation of the groundwater bore with a 4.3 m drawdown during detailed design to determine whether its viability would be compromised by the project, and consideration of whether mitigation or remediation measures are required.

The lowering of groundwater levels in soils and rocks can lead to ground settlement and changes in the stresses of the material. The zone of drawdown along the construction boundary is principally within the fractured bedrock aquifer. The stiffness of bedrock is very high although it is reduced in the presence of geological features. The extent and magnitude of settlement occurring within the rock mass surrounding cuttings and tunnels due to groundwater drawdown is predicted to be small given the high stiffness of the underlying bedrock.

The Department considers that groundwater drawdown resulting in ground settlement is expected to be low and that one water supply bore is likely to be impacted with a reduction in water levels of more than 4 m. Recommended conditions require the Proponent to implement ‘make good’ provisions where the project has affected existing groundwater users.

Minimal impact to groundwater dependent ecosystems

The GDE Atlas identified Paperbark swamp forest vegetation, in the vicinity of the Newports Creek floodplain to the south of Englands Road, as the only area of high probability GDE within the project area. The alignment intercepts several low potential GDEs which may be intermittently groundwater dependent. The predicted zone of drawdown from the Type A cuttings and tunnels also extends to areas of low potential GDEs however no moderate or high potential GDEs are within the drawdown area.

The project is expected to have minimal impact on the perched aquifer and the alluvial aquifers, with groundwater intercepted by the project being from the fractured bedrock aquifer. The potential impact on GDEs is expected to be minimal as it is likely that the vegetation is reliant on groundwater from the perched groundwater or alluvial aquifers.

The Proponent has committed to prepare a groundwater management plan and undertake monitoring of groundwater to inform any residual impacts to groundwater within the zone of drawdown.

6.7 Agriculture

The Department recognises the importance of agriculture to the Coffs Harbour community and economy. It is considered that the Proponent has avoided and/or reduced impacts on agricultural land use where practicable and is committed to implementing mitigation measures to manage impacts to farming operations.

Panama disease is a significant risk to banana growers in the region, and its potential spread during construction will be controlled in accordance with current standards and in consultation with banana growers.

The loss of six banana farms is not considered to have a detrimental effect on the local agricultural industry due to the large number of farms in operation within the region, and the overall production of bananas over recent years has seen a transition to blueberry farming. No blueberry farms are expected to cease operation as a result of the project.

Issue

The project will intersect 24 farms, covering a total area of about 240 ha. The agricultural properties impacted include:

- 12 banana farms, with an additional five properties growing bananas with other crop/s;
- 6 blueberry farms, and another three properties growing blueberries with other crop/s;
- 1 farm growing cucumbers as its sole crop;
- 2 avocado growers, in conjunction with other crops; and
- 1 custard apple grower in conjunction with other crops.

An agricultural assessment of farms impacted by the project was made against criteria which included direct land take, crop impact (direct physical impact to crops), structures, type of acquisition (subsurface, strip, fragmentation), access, irrigation water and dust. **Table 14** provides a summary of the agricultural impacts which concluded that six farms will likely cease to operate in the future.

The spread of Panama disease (soil-borne fungal disease that kills banana plants) was also identified as a potential risk during the construction stages of the project. Currently there are three known properties that have Panama disease near the project. Large-scale bulk earthworks and movement of construction equipment may have the potential to spread Panama disease into uncontaminated areas, resulting in banana plant deaths and potentially risking the viability of banana plantations.

Table 14 | Summary of direct impact on farms within the construction footprint (Source: EIS)

Impact Level	Number of farms corresponding to impact level							
	Banana	Blueberry	Banana and blueberry	Banana, blueberry and cucumber	Banana, avocado and cucumber	Banana, avocado and custard apple	Protected cropping*	**Total**
Minor: farm would continue in its current capacity	**1**	**2**	**1**	**-**	**-**	**1**	**1**	**6**
Moderate: farming can continue operating with some alterations and management measures being implemented.	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**6**
Serious: Farming viability is likely to be seriously compromised unless extensive mitigation measures are implemented.	**3**	**1**	**-**	**1**	**1**	**-**	**-**	**6**
Critical: Farm is likely to cease operation in its current capacity.	**6**	**-**	**-**	**-**	**-**	**-**	**-**	**6**

***Note**: * Protected cropping structures (greenhouses) generally grow cucumbers and has been assumed for the purposes of the assessment*

Submissions

Community and special interest group submissions

Key issues raised in community submissions on agriculture included:

- Viability of farms;
- Contamination of blueberries from pollution and dust generated by passing vehicles and heavy machinery;
- Uncertainty surrounding cost and continuation of blueberry farming operations resulting from impacts to water supply due to construction water take and acquisition that encompasses a bore; and
- Concerns over the spread of Panama disease from construction and employing best practice/appropriate management protocols.

Government agency and Council submissions

DPI – Agriculture supports the proposed mitigation and management measures. The agency raised concerns over the susceptibility of blueberry crops to dust, the 'make good' provisions to impacted farms, the spread of panama disease, particularly through the movement of contaminated soil, and impacts to the operation and potential expansion of the Oz Group Packhouse facility.

Council identified the impact to agricultural businesses through closure or relocation. Council further acknowledged agriculture as one of the key sectors for economic health and that there is a limit to the amount of agricultural land that is available in the LGA.

Consideration

Acquisition and agricultural management practice impacts are relatively minor and will be subject to compensation and specialist review

The assessment concluded that six banana farms would likely cease operations, of which three require total acquisition and the remaining three properties subject to partial acquisition. The partially acquired properties were likely to cease operating because of the nature of acquisition (mainly fragmentation) as well as experiencing a serious to critical direct impact to crops.

The Department recognises that the critically impacted properties that would cease operating are relatively small in size (ranging from 1.4 ha to 5.6 ha) compared to the average across the project footprint (10 ha), and accepts that the Proponent has reasonably reduced the level of direct impact to agricultural properties along the alignment where practicable. The Department notes that the Coffs Harbour LGA has 111 banana farms covering 508ha.

Farms that are seriously impacted would need to adjust management practices in order to continue operation. Measures would also need to be implemented for farming to remain viable at these properties, including the reinstatement of infrastructure, maintaining water supply and alteration of internal access tracks. Where a seriously or critically impacted property is not subject to a total acquisition, the Proponent has committed to implementing mitigation measures such as engaging a specialist agricultural consultant and 'make good' provisions on impacted farm infrastructure, access and water.

The Department considers the Proponent's mitigation measures for agricultural property impacts to be appropriate and has reinforced these in the recommended conditions. Further, it is recognised that the land acquisition process under the *Land Acquisition (Just Terms Compensation) Act 1991* provides additional avenues for affected property owners to resolve issues.

Panama disease will be managed in accordance with current standards and in consultation with the banana grower's community

Panama disease is a serious threat to the local banana industry. To address this matter, the Proponent has committed to developing a Panama Disease Control Management Plan in consultation DPI - Agriculture and the Banana Growers Association of Coffs Harbour & District. The management plan will detail biosecurity measures in accordance with the most relevant current Australian guidelines. This approach is supported as there is no known cure, so preventing and controlling the movement of at-risk material is the only way to deal with the disease. Given the seriousness of the disease and potential ramifications, a condition has been recommended that further reinforces the development of a Panama Disease Management Plan.

The Proponent has also advised it has developed a *Working on Banana Plantations Panama Disease Procedure* for the field investigation works such as geotechnical works (test pits, drilling and seismic), potholing and survey works. The Procedure was developed with DPI Agriculture and the Australian Bananas Growers Council. The Department considers that this is appropriate for managing risks of Panama disease for low impact works and utility relocations.

6.8 Socio-economic, Property and Land use

Social and economic impacts from the project are relatively minor with some impacts on community cohesion, access or economic activities. This low level of impact is primarily a result of the early identification of the road corridor, as well as the design and refinement of the concept design largely within the established road corridor reservation.

The Department accepts that some local economic impacts are inevitable, but also notes the benefits provided by the new highway, which would include the removal of the majority of heavy vehicles from the existing Pacific Highway leading to increased road safety and amenity, and economic growth in the region due to increased freight efficiency, travel times, and level of service.

Issue

Property and land use

The project is predominantly contained within a road corridor zoned SP2 Infrastructure under the Coffs Harbour Local Environment Plan (LEP) 2013, with an alignment that bisects and adjoins a range of land uses including residential, rural residential, commercial, industrial, agriculture, infrastructure, community uses, recreation and conservation.

The project would directly impact 151 properties (in part or in full) and 11 easements that provide access for vehicles and essential services. 59 properties are owned by the Proponent.

The construction phase of the project would also involve the adjustment and/or relocation of utilities including electrical, sewer, water and telecommunications.

Socio-economic

The social impact assessment noted that the Coffs Harbour community values its lifestyle, proximity to the coastline, natural environment and ability to travel easily through the local area. The extent of the works required for the project has the potential to affect the local community and these values, both socially and economically, through changes to property access, noise and vibration, air quality (dust and emissions), landscape and visual impacts, changes to traffic and transportation, the connectivity of the area, amenity and privacy (disruption to lifestyle), as well as community safety and health impacts. Assessment of amenity related issues has been undertaken in other sections of this report. This section focusses on the key socio-economic implications of the project on the community, businesses and social infrastructure.

Socio-demographic profile and housing affordability

Any large-scale construction project in a regional area has the potential to influence the socio-demographic profile of the area for the duration of the project's construction. The project is expected to create around 500 direct construction jobs and up to 2000 indirect jobs at peak construction. Issues associated with the inflow and/or relocation of an external workforce can include an increase in

population, difficulty in accessing accommodation and services, anti-social behaviour, adequate transport of workers, and lack of locally sourced employment. Housing a non-resident workforce has the potential to increase demand and competition for accommodation in affected areas, with related impacts to affordability.

Passing trade and tourism

A number of businesses have a level of dependence on passing trade from the existing Pacific Highway. Once the project is operational, the traffic volumes along this stretch of road are expected to decrease by about 10,000 to 12,600 vehicles per day in 2024. This may lower the overall volume of prospective customers for businesses heavily reliant on the current through town route, as drivers would need to make a conscious decision to exit the highway and travel into Coffs Harbour for fuel, food, lodgings or tourist attractions. Consequently, a reduction in the volume of traffic may result in economic losses for businesses that have a high reliance on passing trade.

During construction, direct access to the Pacific Highway north of Bruxner Park Road/James Small Drive would cease, with access provided via new local access roads where required. This would result in access changes to some accommodation facilities which could impact on business activities and trade.

Additionally, some businesses reliant on passing trade that are located around construction sites, tie-ins, and haulage routes may experience a reduction in trade from the project due to amenity impacts. Conversely, some accommodation and food and beverage businesses may experience increased trade resulting from the construction workforce.

Submissions

Community and special interest group submissions

Submissions from organisations (businesses, service providers, social infrastructure agencies and community groups) and the public raised concerns in relation to:

- Property access and associated features such as convenience, adequacy, design and construction, materials etc;
- Impact to services provided by the Englands Road Waste Management Facility;
- Property acquisition (requests, additional details and considerations);
- Property adjustments and impact on utilities (water, power, drainage, mail);
- Reduction in property values resulting from access, noise, vegetation clearing, and general amenity impacts;
- Consequences to commercial interests, development potential, investments and financial security due to the project's impact on private property;
- Effect on potential growth of Coffs Harbour including the value and desirability of real estate;
- Compensation for indirectly affected properties, lost rental income from construction impacts, reduced amenity as well as health and wellbeing impacts;
- Social impact of directly and indirectly affected residents;
- Socio-economic impacts have not been quantified;
- Justification in measuring the benefits of the project versus socio-economic cost;
- Refining the design to reduce general land use and amenity impacts on Coachmans Close, Fernleigh Avenue and Pine Brush Crescent residents;
- Loss of amenity (public and private) and reduction in quality of life;

- Health and lifestyle of residents from construction impacts;
- Impacts on visitors, tourism and passing trade; and
- Removal of a rainforest patch that is part of local family heritage.

Government agency and Council submissions

Council raised concerns regarding the following:

- Study area of the Socio-economic Impact Assessment and exclusion of certain communities;
- Impacts on housing during construction including availability, affordability and pressure on various lower socio-economic communities;
- Anti-social behaviour;
- Road safety associated with increased number of vehicles;
- Impacts on social, health and education infrastructure such as libraries, cultural facilities, sporting and recreational facilities, lifeguard services, medical facilities, hospitals and schools;
- Economic and tourism impacts;
- Social and economic impacts to community from disruption, relocation and potential closure of businesses and industries;
- Property, operational and business impacts to the Waste Management Facilities on Englands Road; and
- Coffs Harbour Chamber of Commerce be added as key consultation stakeholders in the Community Consultation Framework.

Crown Lands identified potential impacts to Crown Estate and advised that any Crown Land required for the bypass should be formally acquired.

DPI – Agriculture outlined the requirement for consultation with OzGroup to consider how the project will impact existing operations, development approval consent conditions and any potential expansion to their packing facility.

School Infrastructure NSW expressed their general support for the project and acknowledged its benefits. However, they raised concerns that several aspects may potentially impact the Kororo Public School and/or the school community. These included the relocation of the Kororo Public School bus interchange, demolition/replacement of Luke Bowen footbridge, closure of Korora School Road and construction of a new service road plus parking, changes to local traffic conditions during the construction and associated safety concerns, construction noise and disruption, and air quality during the construction phase.

Consideration

Land use and property impacts have been minimised due to early identification of a road corridor

A bypass of the Coffs Harbour urban area has been under consideration and development for some time, including the reservation of the corridor in Council's LEP. This has provided sufficient time for community awareness of the project and for development within the region to be planned accordingly. Notwithstanding, the project is indicated to directly impact 151 properties (in part or in full) and 11 easements that provide access for vehicles and essential services. The most substantial impacts to property would occur where land is required for the construction of the project.

The Proponent has committed to several land use and property measures, most importantly carrying out acquisitions/adjustments in accordance with the Land Acquisition Information Guide (Roads and

Maritime, 2014b), Fact sheet: Property acquisition of subsurface lands (Roads and Maritime, 2015) and the *Land Acquisition (Just Terms Compensation) Act 1991*. Based on the above, the Department is satisfied with these measures.

Positive socio-economic impacts are expected for the broader community

Broader social and economic impacts from the project are considered by the Department to be relatively minor with minimal impacts on community cohesion, access or economic activities. This is primarily a result of the early identification of the road corridor, and design and refinement of the project largely within an established road corridor reservation. The Department accepts that there would be economic benefits experienced as a result of construction activities. Once the project is in operation, it is anticipated that road efficiency gains would improve freight and commuter transit times delivering operational economic benefits to the region and the State. The proposed project, in addition to its broader objectives, also provides local and regional economic benefits associated with improved amenity along the Pacific Highway.

The Department notes that Coffs Harbour is a large regional centre with government and administrative services, commercial, retail, medical and education, and tourism and recreation being important sectors. Given its regional status and its proximity to large infrastructure projects (Pacific Highway upgrades to the north and south), redevelopment of the Coffs Harbour Health Campus and residential development, Coffs Harbour will likely be able to absorb and cater for the additional workforce with minimal social and economic impacts.

The loss of passing trade is relatively minor given Coffs Harbour's population, the range of services it offers and its reputation as a destination

The Department acknowledges the potential for adverse impacts on the local economy of Coffs Harbour at both the construction and operation stages of the project. The project diverts traffic away from the city and therefore a reduction in highway related business, particularly for the identified service stations, takeaway food outlets, accommodation providers and tourist attractions located along the existing Pacific Highway. This is an unavoidable impact associated with most town bypass road projects. This would be partially offset by other benefits brought about by the upgrade, such as improved safety, better local access and permeability, easier parking, reduced traffic congestion and associated enhancements in amenity. Positive environmental effects also provide an opportunity for Council to consider renewal and revitalisation of the area.

To partly address this impact, the Proponent has committed to develop a Directional Signage Plan, in consultation with stakeholders, to ensure effective and appropriate signposting for key locations along the project. The plan would identify the range of services that Coffs Harbour provides and assist in promoting departure from the highway and continued patronage of local business by Pacific Highway motorists.

Additionally, given Coffs Harbour's substantial population, the range of services it offers and its reputation as a destination, it is considered that the overall impact from the bypass would be temporary, eventually finding equilibrium, and is not considered to be significant. Furthermore, it is recognised that the construction of the project may also generate opportunities for a number of local businesses and industries through locally sourced materials and labour, provision of accommodation and food services, opportunities for retail and wholesale trade, as well as the provision of vehicles, plant, maintenance and fuel for the construction workforce.

6.9 Design and Landscape

An Urban Design and Landscape Character Strategy has informed key engineering aspects of the project. This Strategy incorporates design objectives with supporting principles that reflect the visual context of the area, noting that the project's significant engineering works will result in visual impacts as identified in the Proponent's visual and landscape impact assessment.

The Department is satisfied that the assessment has clearly identified the landscape characteristics of the locale and has been conservative in its identification of both visual and landscape impacts. Whilst a project of this scale will have initial visual impacts, the Department considers these impacts can be managed during construction and will diminish over time as landscaping matures and more effectively screens infrastructure associated with the project.

Issue

The project will result in moderate visual impacts from the bypass and noise walls

A landscape character assessment was undertaken which considered the contrast between the existing rural landscape and the introduction of a road corridor that results in adverse landscape impacts, with the impacts becoming greater where the project diverges from the natural typography. The impacts on landscape character during construction varies from moderate-low to high within three Landscape Character Zones (LCZ). Construction within the existing rural landscape would be evident; however, it is noted that these impacts are temporary and would apply for the duration of construction of the bypass.

Five areas scored '*high*' in terms of sensitivity and would be impacted during operation of the project, with the majority of these impacted areas located at LCZ 3, the Korora Basin and Foothills sector of the project. The landscape character assessment during operation has been summarised in **Table 15.**

Table 15 | Landscape character assessment - operation (Source: EIS and Amendment Report)

Landscape Character Zone	Sensitivity	Magnitude	Impact
1A: Englands Road	Low	Moderate	Moderate-Low
1B: Boambee Basin	Moderate	High	Moderate-High
1C: Boambee and Roberts Hill foothills	High	High	High
2A: Robert Hill northern foothills	High	High	High
2B: The Bowl	Moderate	High	High-Moderate
2C: End Peak + Mackay Road Valley	High	Moderate	High-Moderate
2D: Gatelys Road Valley	High	Moderate	Moderate-High
3A: Korora basin and Foothills	High	High	High
3B: Korora Basin Edge	Moderate	Moderate	Moderate

The visual impact assessment identified 23 project viewpoints to demonstrate the areas from which the project would be visible in the landscape. The viewpoints were categorised in terms of impact against sensitivity, magnitude, day-time operational impact, night-time operational impact and construction impact. During construction, six of the 23 viewpoints scored a *moderate-high* impact and five viewpoints scored a *high* impact, while during operation, four viewpoints scored a *moderate-high* impact and five viewpoints scored a *high* impact. The Bennetts Road (viewpoint 12) and Spagnolos Road residential (viewpoint 13) scored *high* across all five categories.

Submissions

Community and special interest group submissions

Key issues raised in submissions from the community and interest groups include:

- Request to include urban design principles as a condition of approval;
- Consult with Council's Bush Regeneration team on landscape design;
- Extend length of tunnels by 20 to 25 metres to achieve better design outcome;
- Consider planting and maintenance of suitable species and mitigate introduction of invasive species;
- Additional landscaping required to reinstate visual amenity; and
- Visual impacts from bypass and noise wall.

Council and agency submissions

Council provided the following comments:

- Request to be involved in the design of the noise walls;
- Recommended species to be used in landscaping;
- Recommended landscape design;
- Concerns regarding visual impact representation; and
- Visual representation of the proposed Luke Bowen footbridge.

The **EPA** recommended the re-use of mulch produced from vegetation clearing onsite.

Consideration

Design review, noise walls and soft landscaping treatments will minimise visual impacts

The Proponent has committed to retaining and protecting existing trees not required to be cleared for the project, restoring disturbed areas in consultation with landowners, using temporary hoarding and minimising light glare during construction. Clearing vegetated areas for the project will have an impact on indigenous plant species and the Department notes the Proponent's commitment to undertake landscape and revegetation works in accordance with the Place Design and Landscape Plan. A condition has been recommended to ensure that rehabilitation and revegetation is undertaken using local Indigenous plant species.

The Department notes that the Proponent has assessed the potential operational impacts, identified indicative mitigation measures and undertaken further design development considerations to manage the landscape and visual impacts associated with the project. Further investigations will be undertaken by the Proponent during detailed design, to refine the design of the proposed noise walls identified in the Place Design and Landscape Assessment. To manage the process of detailed design, the Department has recommended a condition requiring the Proponent to finalise its Place

Design and Landscape Strategy in consultation with Council, the community, affected landowners and businesses, and the Kororo Public School (in relation to the Korora bus interchange).

An overshadowing assessment was undertaken based on the winter solstice and considered impacts from noise walls, earthworks and structures such as bridges and retaining walls. Most overshadowing from the introduction of additional retaining walls would not extend beyond the construction footprint, and most additional overshadowing is expected to extend to an area of existing vegetation. Generally, by 3pm, the existing topography overshadows the project corridor, particularly at the Sunset Ridge residential subdivision. As such, the proposed viaduct bridge crossing over the North Coast Railway between Shephards Lane and the Shephards Lane tunnel would not create additional overshadowing to the residential subdivision. The Proponent has committed to further refining the design of noise wall panels, including the reduction of the height of noise walls and using transparent noise walls to reduce overshadowing. Potential glare impacts on motorists as a result of transparent noise wall panels would also be investigated during detailed design.

Provision of enhanced vegetation buffers at Coachmans Close for visual screening

Following the Proponent's Submissions Report, several residents along Coachmans Close raised issues with the Department about noise and visual impacts due to the removal of an existing noise wall along the existing road corridor. Residents requested the portion of the project parallel to Coachmans Close be shifted further to the west, to provide a visual and spatial buffer from traffic using the project. The Proponent advised it has investigated the residents' proposal, however, shifting the project further to the west would require substantial changes to the project alignment, increasing environmental impacts, requiring additional property acquisition and increasing the project scope and cost.

In addressing the resident's concerns, the Proponent has committed to providing at-property noise treatment for those identified in the operational noise assessment as requiring noise mitigation. Further, the project alignment height has been raised and moved further west as a result of design refinements. The existing noise wall would be replaced and located between the motorway and Solitary Islands Way (service road). The Proponent considers that the replacement noise wall and lower speed limit on Solitary Islands Way will improve noise outcomes for residents in Coachmans Close. The Proponent has also committed to provide additional vegetation screening between Solitary Islands Way and Coachmans Close to mitigate visual impacts from headlights and streetlights. The Department acknowledges the Proponent's effort to address these concerns and supports the additional vegetation screening proposed. A condition has been recommended to ensure that additional vegetative screening between Coachmans Close and Solitary Islands Way is provided.

The use of shotcrete will be minimised

In a submission from the community, it was requested that the use of shotcrete be avoided. In response, the Proponent outlined a number of design responses that have been developed in the urban design strategy to reduce the potential use of shotcrete. The Department notes that the Proponent has included a shotcrete avoidance and mitigation strategy as part of its management measure. This avoidance measure and its outcomes will be addressed in the Place Design and Landscape Plan.

6.10 Other issues

Issue	Findings	Recommendations
Non-Aboriginal heritage	The project will not impact on any national, State or local heritage items. Six unlisted items of potential local heritage significance occur within the study area, of which three items would be directly impacted: • Coffs Harbour Banana Plantation Landscape would be subject to direct physical and visual impacts by the cut and fill activities; and • Former Coffs Heights Post Office and Marked tree stumps would be wholly removed. Three unlisted items of potential local heritage significance would be indirectly impacted: • North Coast Railway – a highway bridge over the railway would result in indirect visual impacts on views to and from the railway; and • Old Coast Road Bridge Nos.1 & 2 – no physical impacts, however they may be subject to indirect impacts associated with construction activities.	The impacts to potential local heritage significance items are unavoidable as they are in the project footprint and it is not practicable to change the project alignment to avoid them. The Department considers that the Proponent's commitment to undertake archival recordings of all six items, and identify the three items that would be indirectly impacted on the sensitive area maps as "no go" areas, is commensurate with the unlisted and potential heritage status of these items. The Proponent will be required to prepare and implement a Construction Heritage Management Plan and prepare a Non-Aboriginal Heritage report which documents all archival recordings.
Waste	The major source of waste expected to be generated is excess spoil from cut surplus (174,000m^3) and green waste from the removal of vegetation (54,000 tonnes). Management of excess spoil would follow the waste hierarchy approach of avoidance and re-use before disposal procedures are implemented. However, feasibility of re-use should consider risk of contaminated soil. The risk of Panama Disease from soil contamination and the pathogens Myrtle Rust and Phytophthora cinnamomi limits the opportunity for beneficial reuse of green waste for landscaping/mulch use (see agricultural measures).	Recommended conditions for handling, reuse and disposal of waste.
Sustainability	The Proponent has committed to achieving a target rating of "excellent" 'Design' and 'As built' under the Infrastructure Sustainability Council of Australia (ISCA) Infrastructure Sustainability Rating Tool.	The Department recommends conditions to implement and follow a Sustainability Strategy to ensure that the ISCA rating of "excellent" is achieved.

Hazard and Risk	Parts of the project are located in bushfire prone area. Construction works may increase the risk of bushfires from accidental ignition from construction equipment, fuels and chemicals. However, operational bushfire risk is reduced due to the buffer that the highway creates between bushfire prone areas. Storage and handling of hazardous materials and dangerous goods during construction has the potential to impact the environment in the event of a spill or leak. The risk of subsidence associated with the construction of the three tunnels has been assessed. The EIS considered that the project is unlikely to have any noticeable impact on ground subsidence. Council and the community have requested that vehicles carrying dangerous goods be permitted to use the tunnels. The transportation of dangerous goods through tunnels is currently prohibited. TfNSW has advised it will consult with the EPA, SafeWork NSW and FRNSW to determine the possibility of allowing dangerous goods through tunnels.	The transportation of dangerous goods through tunnels is a matter outside the scope of the project and would need to be resolved in consultation with the relevant government agencies that regulate dangerous goods transportation. The Proponent must engage with the emergency services, EPA and SafeWork NSW in the preparation of an Emergency Response Plan. Should dangerous goods be permitted in the future, the Emergency Response Plan would be updated to reflect the change in the type and classification of goods and material being transported by vehicles using the tunnels.
Air Quality	During construction there will be localised dust impacts from activities, particularly during vegetation clearing, grubbing and removal, earthworks (stripping and stockpiling and cuttings), the excavation, placement and compaction of road base, rock crushing and screening, and concrete and asphalt batching and the movement of construction vehicles and equipment along the alignment. Dust generation from these activities is common with large linear infrastructure projects and can be managed through standard measures such as the use of water carts or soil binders, covering truck loads and early rehabilitation of disturbed areas. Given the short length of the tunnels, ventilation facilities are not required for the project. Therefore, an assessment of emissions from portals was undertaken rather than the assessment of in-tunnel air quality. The largest increases in emissions are expected to be at the portal exits due to more concentrated emissions as traffic exits each tunnel. There are no predicted exceedances of	To ensure that construction air quality impacts are effectively mitigated and managed, the Department has recommended a condition of approval requiring the Proponent to prepare and implement a Construction Air Quality Management Sub-plan.

the air quality criteria at any sensitive receptors for any of the modelled scenarios.

In relation to operational air quality, the project will create a new source location for vehicle emissions. Though a new source will be created, the existing road network will see an improvement in air quality as vehicles will be redistributed onto the new motorway.

7 Evaluation

The Department considers the project is in the public interest and should be approved, subject to conditions. The Department's assessment has considered all relevant matters and objects of the *Environmental Planning and Assessment Act 1979*, the principles of ecological sustainable development, and Matters of National Environmental Significance under the *Environment Protection and Biodiversity Conservation Act 1999* as required by the bilateral agreement between the Commonwealth and NSW Government.

The Project is consistent with Commonwealth and NSW strategic planning policies and frameworks including:

- *NSW State Infrastructure Strategy (Infrastructure NSW 2018)*
- *Making it Happen in the Regions: Regional Development Framework (DPI 2017)*
- *Future Transport Strategy 2056*
- *National Road Safety Strategy 2011 – 2020 (Australian Transport Council 2011)*
- *North Coast Regional Plan 2036*
- *Coffs Harbour 2030 Plan (CHCC 2009a)*
- *Coffs Harbour City Council Bike Plan 2014 – 2019 (CHCC 2014)*
- *NSW Freight and Ports Plan 2018-2023.*

Key benefits provided by the project include:

- provision of free-flowing dual carriageway conditions between Hexham and the Queensland border;
- improved reliability of journey times, particularly during peak travel periods;
- improved road safety by removing through traffic and some local traffic from the existing road network;
- provision of increased road capacity to cater for increasing traffic volumes; and
- improved accessibility and amenity along the existing Pacific Highway.

In its assessment, the Department reviewed the Environmental Impact Statement, Response to Submissions and Amendment Report, and assessed the key issues arising from the construction and operation of the project. This was undertaken with advice provided by the Proponent, other public agencies and Council, and in consideration of key strategic government policies and plans.

The Proponent identified a range of environmental mitigation measures which it has committed to applying to the project. Based on its assessment described in this report, the Department has also recommended further conditions of approval to reinforce these commitments and address outstanding or residual impacts. The Department is satisfied that issues raised in submissions have been appropriately considered. Impacts can be mitigated, managed or offset through the implementation of the recommended conditions and the Proponent's commitments.

8 Recommendation

It is recommended that the Minister for Planning and Public Spaces:

- **considers** the findings and recommendations of this report;
- **accepts and adopts** the findings and recommendations in this report as the reasons for making the decision to approval to the application;
- **considers** any advice provided by the Minister having portfolio responsibility for the project;
- **agrees** with the key reasons for approval listed in the notice of decision;
- **grants approval** for the application in respect of SSI 7666 as amended, subject to the conditions in the attached development consent / project approval; and
- **signs** the attached project approval and recommended conditions of approval.

Recommended by:

Daniel Gorgioski
Senior Planner
Transport Assessments

Recommended by:

Glenn Snow
Director
Transport Assessments

9 Determination

The recommendation is **Adopted** / ~~**Not adopted**~~ by:

The Hon. Rob Stokes MP
Minister for Planning and Public Spaces

Appendices

Appendix A – List of referenced documents

NSW State Infrastructure Strategy (Infrastructure NSW 2018)

Making it Happen in the Regions: Regional Development Framework (DPI 2017)

Future Transport Strategy 2056

National Road Safety Strategy 2011 – 2020 (Australian Transport Council 2011)

North Coast Regional Plan 2036 (DPE, 2017)

Coffs Harbour 2030 Plan (CHCC 2009a)

Coffs Harbour City Council Bike Plan 2014 – 2019 (CHCC 2014)

NSW Freight and Ports Plan 2018-2023 (TfNSW 2018)

Coffs Harbour Bypass Environmental Impact Statement Volume 1A – 10, (TfNSW, September 2019)

Coffs Harbour Bypass Submissions Report Volume 1 – 3 (TfNSW, June 2020)

Coffs Harbour Bypass Amendment Report Volumes 1 – 6 (TfNSW, June 2020)

Appendix B – Environmental Impact Statement

https://www.planningportal.nsw.gov.au/major-projects/project/10461

Appendix C – Submissions

https://www.planningportal.nsw.gov.au/major-projects/project/10461

Appendix D – Submissions Report

https://www.planningportal.nsw.gov.au/major-projects/project/10461

Appendix E – Amendment Report

https://www.planningportal.nsw.gov.au/major-projects/project/10461

Appendix F – Community Views for Draft Notice of Decision

The key issues raised by the community (including in submissions) and considered in the Planning Secretary's Assessment Report and by the decision maker include construction and operational noise impacts (including noise modelling and heavy vehicle noise impacts), Aboriginal cultural heritage, traffic and access, including dangerous goods vehicles in tunnels, biodiversity and project design. Other issues raised are addressed in detail in the Planning Secretary's Assessment Report.

Issue	Consideration
Operational Traffic Noise • The project will introduce a new and increased source of noise to western Coffs Harbour. • Additional noise mitigation required to address high noise levels. • Further assessment and consideration of truck noise during the night-time.	*Assessment* • Residential properties in some sections of the project experience low levels of noise associated with their rural or suburban setting and others are exposed to high levels of noise due to their proximity to the existing highway (which generally exceed the relevant operational noise goals or experience acute noise levels (equal to or greater than 60 dB(A))). Depending on their location, receivers in these areas may experience an increase or decrease in noise levels or would be exposed to new noise levels associated with the construction and operation of the project. • To mitigate and manage traffic noise impacts, the Proponent has proposed noise mitigation measures, including low noise pavement, noise barriers and at-property architectural treatment. *Recommended Conditions/Response* • A two-stage approach is recommended to address operational noise impacts, with the submission of a review of the mitigation measures based on an updated noise model of the detailed design within six months of the commencement of construction, and a review of operational noise compliance within twelve months and ten years of the commencement of operation. • The operational noise review would assess compliance with the predicted noise levels and any additional mitigation measures that may be required to address non-compliance with the operational noise criteria in the *NSW Road Noise Policy* (2011, EPA).

Construction Noise Impacts • Construction noise impacts including impacts from blasting causing structural damage to properties.	*Assessment* • Construction noise and vibration impacts are consistent with projects of this scale and will be managed through standard practices and the early application of operational noise mitigation. • The construction noise assessment predicted exceedances of the noise management levels at sensitive receivers adjacent to the alignment. The closest receivers are predicted to exceed the Interim Construction Noise Guideline's highly noise affected noise management level (equal to or greater than 75 dB(A)). The Proponent has committed to manage noise and vibration impacts through the implementation of a Construction Noise and Vibration Management Sub-plan. • Excavation of tunnels is proposed to be undertaken 24 hours a day, seven days a week under controlled drilling and blasting methods. Daytime activities will include blasting and spoil removal, while blast preparation, ground support and tunnel fit out will occur during the night time period. *Recommended Conditions/Response* • Preparation of a Noise and Vibration Management Sub-plan to detail how construction noise and vibration impacts will be minimised and managed. • Preparation of a Blast Management Strategy to manage impacts associated with the excavation of cuttings and tunnels by blasting. • 24/7 works can only occur within tunnels and enclosed acoustic sheds at the tunnel portals. • Haulage of material and deliveries is not permitted during the night-time period. • Provision of operational noise treatments within six months of the commencement of construction in the vicinity of the impacted receiver(s), to minimise construction noise impacts. • Condition survey of buildings and structures at risk of damage to be undertaken before and after construction, and damage caused by the project to be rectified.

Aboriginal cultural heritage impacts

- Registered Aboriginal Parties (RAP) requested more involvement in future site investigations to record previously unidentified potential archaeological deposits (PADs) and in determining the cultural values of impacted sites.
- RAPs requested to review relevant construction management documentation.
- RAPs recommended that all Aboriginal artefacts within the construction footprint be salvaged.
- RAPs also requested the ongoing engagement, or employment of Aboriginal Cultural Compliance Safety Officers, additional surveys, monitoring and salvage.
- RAPs noted the potential for burial sites along the project corridor.

Assessment

- The project will directly impact Aboriginal archaeological sites and sites with intangible cultural significance within the project corridor. Whilst the revised design of the project has minimised these impacts, particularly in relation to cultural pathways, residual impacts are required to be managed in collaboration with the Aboriginal community.
- Four of the five cultural sites are located partially within the construction footprint and would be impacted to varying extents. The archaeological sites (with potential archaeological deposits (PAD)) assessed as having moderate heritage significance will be subject to archaeological salvage.
- Impacts to cultural sites have been reduced with the use of tunnels and the Proponent has committed to minimising the extent of impact through detailed design and managing residual impacts by the salvage of items and artefacts, archival recording and providing interpretive signage.

Recommended Conditions/Response

- Preparation of a Heritage Management Sub-plan and requirement that the Proponent offer RAPs the opportunity to inspect the project corridor and determine which areas should be subject to cultural salvage.
- Allow the RAPs to undertake cultural salvage at sites they have identified and be given the custody of salvaged cultural artefacts and relics.
- Inclusion in the Heritage Management Sub-plan of procedures that would be implemented should unexpected human remains be discovered during the construction of the project.

Biodiversity • Concerns were raised regarding the provision of fauna crossings and monitoring of their usage, impacts on the biodiversity of the area, use of local native species for landscaping and revegetation works, and fauna corridors and connectivity.	*Assessment* • The project will result in impacts to the biodiversity values of the project area. The Proponent has identified direct impacts to threatened ecological communities under the *Biodiversity Conservation Act 2016* (BC Act) and threatened species under the BC Act and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) within and adjoining the road alignment. • The project has avoided impacts to biodiversity where possible, however, impacts could be further reduced during the detailed design of the project. • Impacts to biodiversity values will be offset under the *NSW Biodiversity Offsets Policy for Major Projects*, including the acquisition and retirement of ecological and species credits through biodiversity stewardship agreements, and management of land added to the National Parks estate. • The Proponent has committed to manage construction impacts through a Biodiversity Management Sub-plan and prepare a threatened species management plan to manage the project's impacts on the Koala and Giant Barred Frog. *Recommended Conditions/Response* • The preparation of a Biodiversity Management Sub-plan to manage impacts on biodiversity during the construction of the project. • Requirement to retire ecological and species credits to offset impacts to biodiversity values. The offsets must be retired in accordance with the *NSW Biodiversity Offsets Policy for Major Projects*, and may include biodiversity stewardship agreements, management of land added to the National Parks estate and supplementary measures. • Restoration of Koala habitat within the regional Koala corridors on top of the Roberts Hill and Gatelys Road tunnels is required on remnant land not required for the project, including mechanisms for in perpetuity protection and maintenance. • Re-use of root balls and Lowland rainforest plant material for habitat and Landcare restoration works.

Traffic and Transport

- Request for a redesign of the Coramba Road Interchange.
- The project alignment should be further west.
- Request for improved cyclist connection to the bypass and along the bypass.
- A new service road should be provided between Sawtell Road Interchange and Englands Road interchange.
- Increased traffic on local roads.
- All Dangerous Goods vehicles must be permitted to use the bypass / tunnels.

Assessment

- Local roads are required to provide access to the construction area. While construction activities will increase daily traffic volumes on local roads, potentially causing delays and disruptions to the local road network, these impacts are considered relatively minor. Construction traffic impacts are considered acceptable and will be managed proactively through the implementation of traffic management measures.
- Community submissions on the Coramba Road interchange requested that it be redesigned to reduce its overall footprint and noise impact on the Roselands Estate. Council requested the project include improvements to the Sawtell Road on-ramp and additional access to the Stadium precinct.
- The transportation of dangerous goods through tunnels is a matter outside the scope of the project and would need to be resolved in consultation with the relevant government agencies that regulate dangerous goods transportation. The Proponent states that it will consult with regulatory authorities (Fire and Rescue NSW, EPA and SafeWork NSW) on the transportation of dangerous goods through the tunnels.

Recommended Conditions/Response

- Overall, the project will provide benefits across the road network, particularly through the removal of through traffic along the existing Pacific Highway and local intersections. The project has been designed in consideration of surrounding residents and schools and it will provide a safer road for motorists, cyclists and pedestrians.
- Construction traffic impacts are considered acceptable and will be managed proactively through the implementation of traffic management measures.
- Coramba Road interchange was designed to minimise impacts on the Bennetts Road and Spagnolos Road detention basins. In response to the community's concerns, the Proponent has advised that alternative designs would be further investigated during the detailed design stage, a commitment which is supported by the Department.
- The key constraints in providing a new service road between Sawtell Road Interchange and Englands Road Interchange includes the need to reconfigure existing property accesses and change to the interchange arrangements at Sawtell Road, safety issues with entry and exit ramps spaced closely together, and potential impacts on koala habitats and existing koala corridors on both sides of the Pacific Highway. Though

	these constraints are noted, the Proponent has committed to work with Council to deliver this service road in the future. • The project will provide additional active transport networks along the shoulders of the projects, around the Englands Road and Korora Hill interchanges, extension of the Solitary Islands Way cyclist path to James Small Drive and a new Luke Bowen footbridge. • The proponent must engage with emergency services, EPA and SafeWork NSW to prepare an Emergency Response Plan, should dangerous goods be permitted to use the project.
Residents preferred option is tunnels over the provision of cutting through major ridge lines	*Assessment* • Residents are opposed to a design and construction contract. Residents prefer a construct only contract in fear of tunnels being changed to cuttings following project approval. *Recommended Conditions/Response* • The current proposal is for three tunnels through ridges, ranging from 190 metres to 450 metres in length. Should the Proponent wish to proceed with an inconsistent proposal, a modification request will be required to be assessed under the EP&A Act. • It is noted that the tunnel design does provide benefits compared to a cutting design, including lowering the vertical alignment of the main carriageways to help reduce noise and visual impacts and reduced biodiversity and Aboriginal cultural heritage impacts.

Appendix G – Bilateral Assessment

Assessment of EPBC Act listed threatened species and communities using the NSW Framework for Biodiversity Assessment

1. Identifying MNES

(a) ***Confirm*** *whether all the EPBC Act-listed threatened species and communities that occur on the project site, or in the vicinity are identified in the EIS. Note which species and/or communities have not been identified.*

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed threatened species and communities that are likely to be affected by the construction and operation of the Coffs Harbour Bypass as generated from the Environmental Reporting Tool (ERT) have been identified in the Environmental Impact Statement (EIS) and the Biodiversity Assessment Report. The following MNES were determined as having potential to be impacted by the bypass project:

- Lowland Rainforest of Subtropical Australia
- Clear Milkvine (*Marsdenia longiloba*)
- Hairy Jointgrass (*Arthraxon hispidus*)
- Orara Boronia (*Boronia umbellata*)
- Semadera sp. Moonee Creek
- Southern Swamp Orchid (*Phaius australis*)
- Cryptic Forest Twiner (*Tylophora woolsii*)
- Giant Barred Frog (*Mixophyes iteratus*)
- Koala (*Phascolarctos cinereus*)
- Grey-headed Flying-fox (*Pteropus poliocephalus*)
- Long-nosed Potoroo (*Potorus tridactylus*)
- Regent honeyeater (*Anthochaera phrygia)*
- Spotted-tailed quoll (*Dasyurus maculatus*)
- Swift Parrot (*Lathamus discolour*).

An assessment of significance has been prepared for each of these entities and documented at Appendix F of the BAR.

The two entities are considered likely to be significantly impacted by the proposal:

- Giant Barred Frog (*Mixophyes iteratus*)
- Koala (*Phascolarctos cinereus*) combined populations of Qld, NSW and the ACT.

(b) ***Comment*** *on whether the Framework for Biodiversity Assessment (FBA) has been applied to all EPBC Act-listed threatened species and communities that occur on the project site or in the vicinity.*

The FBA was appropriately applied to all relevant EPBC Act entities.
The following EPBC listed threatened species are likely to be affected by the proposal:

- Giant Barred Frog (4.79 hectares of known and potential habitat).
- Koala (47.84 hectares of known and potential habitat).
- Grey-headed Flying-fox (47.84 hectares of known and potential foraging habitat).
- Regent Honeyeater (foraging) (4.41 hectares of potential foraging habitat).
- Spotted-tail Quoll (47.84 hectares of potential habitat).

(c) In the circumstance where there are EPBC Act-listed species that are not addressed by the FBA (i.e. migratory species) ***comment*** *on whether these species have been assessed in accordance with the SEARs and provide references to where the assessment information is detailed in the EIS.*

Four EPBC Act listed migratory species were recorded within the subject site and appropriately assessed within the BAR:

- Black-faced Monarch (*Monarcha melanopsis*)
- Rufous Fantail (*Rhipidura rufifrons*)
- Spectacled Monarch (*Symposiachrus trivirgatus*)
- Wanderer Butterfly (*Danaus plexippus*).

It is stated in Section 8.3 of the BAR that '*These species may occur within the study area on occasion, whilst moving through their large home ranges, but are not expected to rely on the study area for important life cycle stages, and as such the potential for impacts to these species as a result of the Project is considered low*.'

(d) ***Verify*** *that the proponent has expressed a statement about the potential impact i.e. likely significant, low risk of impact, not occurring, for each listed threatened species and community protected by the EPBC Act referred to in 1(a). Note which species and/or communities have not been addressed in this manner.*

The following summarises the likely significance of the project on each of the EPBC Act MNES entities addressed via the FBA:

1. Lowland Rainforest of Subtropical Australia.

Lowland Rainforest of Subtropical Australia was assessed as not occurring within the study area. Based on the above assessment, Lowland Rainforest of Subtropical Australia is unlikely to be significantly impacted by the Project and as such offsetting in accordance with the EPBC Act Environmental Offsets Policy (Commonwealth of Australia 2012) and the EPBC Act is not required.

2. Clear Milkvine (*Marsdenia longiloba*)

Approximately 41.83 hectares of potential habitat for Clear Milkvine occurs within the study area. The species was not recorded within the study area during targeted flora transect surveys undertaken in accordance with the NSW Guide to Surveying Threatened Plants (OEH 2016). Based on the above assessment, Clear Milkvine is unlikely to be significantly impacted by the Project and as such offsetting in accordance with the EPBC Act Environmental Offsets Policy (Commonwealth of Australia 2012) and the EPBC Act is not required.

3. Hairy Joint-grass (*Arthraxon hispidus*)

Approximately 40.85 hectares of potential habitat for Hairy Joint-grass occurs within the study area. The species was not recorded within the study area during targeted flora transect surveys undertaken in accordance with the NSW Guide to Surveying Threatened Plants (OEH 2016). Based on the above assessment, Hairy Joint-grass is unlikely to be significantly impacted by the Project and as such offsetting in accordance with the EPBC Act Environmental Offsets Policy (Commonwealth of Australia 2012) and the EPBC Act is not required.

4. Orara Boronia (*Boronia umbellata*)

Approximately 13.91 hectares of potential habitat for Orara Boronia occurs within the study area. The species was not recorded within the study area during targeted flora transect surveys undertaken in accordance with the NSW Guide to Surveying Threatened Plants (OEH 2016). Based on the above assessment, Orara Boronia is unlikely to be significantly impacted by the Project and as such offsetting in accordance with the EPBC Act Environmental Offsets Policy (Commonwealth of Australia 2012) and the EPBC Act is not required.

5. Samadera sp. Moonee Creek

Approximately 15.09 hectares of potential habitat for Samadera sp. Moonee Creek occurs within the study area. The species was not recorded within the study area during targeted flora transect surveys undertaken in accordance with the NSW Guide to Surveying Threatened Plants (OEH 2016). Based on the above assessment, Samadera sp. Moonee Creek is unlikely to be significantly impacted by the Project and as such offsetting in accordance with the EPBC Act Environmental Offsets Policy (Commonwealth of Australia 2012) and the EPBC Act is not required.

6. Southern Swamp Orchid (*Phaius australis*)

Approximately 4.41 hectares of potential habitat for Southern Swamp Orchid occurs within the study area. The species was not recorded within the study area during targeted flora transect surveys undertaking in accordance with NSW Guide to Surveying Threatened Plants (OEH 2016). Based on the above assessment, Southern Swamp Orchid is unlikely to be significantly impacted by the Project and as such additional offsetting in accordance with the EPBC Act Environmental Offsets Policy (Commonwealth of Australia 2012) and the EPBC Act is not required.

7. Cryptic Forest Twiner (*Tylophora woollsii*)

Cryptic Forest Twiner was not recorded within the study area during targeted flora transect surveys undertaken in accordance with the NSW Guide to Surveying Threatened Plants (OEH 2016) (refer Section 4.2.1). Approximately 29.00 hectares of potential habitat for Cryptic Forest Twiner occurs within the study area. This is considered a small proportion of potential habitat (<0.4%) within 10 kilometres of the study area. Based on the above assessment, Cryptic Forest Twiner is unlikely to be significantly impacted by the Project and as such offsetting in accordance with the EPBC Act Environmental Offsets Policy (Commonwealth of Australia 2012) and the EPBC Act is not required.

8. Giant Barred Frog (*Mixophyes iteratus*)

The Project will result in the removal of 3.56 hectares of known and potential habitat, in two separate locations, and a further 1.23 hectares of potential habitat within the study area. This will result in the removal of 1% of commensurate potential habitat within the locality. The Project has the potential to result in disruptions to the breeding cycle of the local population of the species and fragment habitats in this, and other locations within the study area.

Indirect impacts may also occur from impacts to water flow regimes and degradation of water quality; however, hydrological flows will not be substantially altered, and mitigation measure will be implemented to manage water quality. Additional mitigation measures will be implemented including bridging on known habitat at Newports Creek and Pine Brush Creek, construction of fauna connectivity structures targeted to Giant Barred Frog, pre-clearance surveys prior to earthworks and installation of sedimentation controls and frog proof fences.

Despite these mitigation measures, the Project is considered to have the potential to result in a significant impact on the Giant Barred Frog.

9. Grey-headed Flying-fox (*Pteropus poliocephalus*)

The closest active camp is located approximately 1.7 kilometres from the study area (Coffs Creek) and comprises foraging habitat critical to the survival of the Grey-headed Flying-fox. The Project would result in the removal of 47.84 hectares (0.4%) of known and potential foraging habitat, within the project area.

However, this vegetation is fragmented and not considered important to the species, given that known spring foraging resources are located in Boambee State Forest 3 kilometres west of the study area. A further 8,683 hectares of potential foraging habitat occurs within a 10km buffer of the project area, as mapped by the Coffs Harbour LGA mapping project (OEH 2012).

Based on the above assessment, Grey-headed Flying-fox is unlikely to be significantly impacted by the Project and as such offsetting in accordance with the EPBC Act Environmental Offsets Policy (Commonwealth of Australia 2012) and the EPBC Act is not required.

10. Koala (*Phascolarctos cinereus*)

The project will remove 39.71 hectares of known koala habitat and will disrupt several local and regional koala movement corridors. As such, the Biodiversity Conservation Division (BCD) of Environment, Energy and Science Group is of the view that the project will have a significant impact on koalas.

Hence, there is potential for the Project to result in a significant impact to the Koala, particularly where the roadway is likely to interrupt movement corridors.

The Proponent will be required to compensate for the loss of koala habitat by retiring 1032 koala credits. Furthermore, while the residual impact of the Project on the Koala will be reduced using mitigation measures as detailed in Section 9 of the BAR, the BCD has recommended an additional condition of approval be included requiring the applicant to restore regionally and locally significant koala corridors:

The regionally and locally significant koala corridors at Roberts Hill and Gatelys Rd must be actively restored and protected in-perpetuity using a mechanism that is satisfactory to the BCD and the Planning Secretary. The mechanism is to ensure in-perpetuity funding for management and the protection of koala corridors. The agreed mechanism is to commence within 12 months of commencement of construction.

11. Long-nosed Potoroo (*Potorous tridactylus*)

Long-nosed Potoroo is unlikely to be significantly impacted by the Project and as such offsetting in accordance with the EPBC Act Environmental Offsets Policy (Commonwealth of Australia 2012) and the EPBC Act is not required.

12. Regent Honeyeater (*Anthochaera phrygia*)

Based on the assessment provided above, it is concluded that Regent Honeyeater is unlikely to be significantly impacted by the Project, and as such offsetting in accordance with the EPBC Act Environmental Offsets Policy (Commonwealth of Australia 2012) and the EPBC Act is not required.

13. Spotted-tailed Quoll *(Dasyurus maculatus)*

Provided suitable mitigation measures are put in place to reduce the impacts of fragmentation on the Spotted-tailed Quoll the Project is considered unlikely to result in a significant impact to this species, and as such offsetting in accordance with the EPBC Act Environmental Offsets Policy (Commonwealth of Australia 2012) and the EPBC Act is not required.

14. Swift Parrot (*Lathamus discolour*)

Based on the assessment provided above, it is concluded that Swift Parrot is unlikely to be significantly impacted by the Project, and as such offsetting in accordance with the EPBC Act Environmental Offsets Policy (Commonwealth of Australia 2012) and the EPBC Act is not required.

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*(e) I**dentify** where further information from the proponent is critical to the assessment of MNES particularly in relation to mapping Table 1 (A), analysis of impacts Table 1 (F) and Table 2 (F), avoidance, mitigation and offsetting, and 6.*

No further information is deemed necessary.

2. Assessment of the relevant impacts

All EPBC Act-listed species and/or communities that the Commonwealth consider would be significantly impacted (as noted in the referral documentation) should be assessed and offset. These are referred to as relevant impacts

*(a) **Verify** [by ticking the following boxes]:*

✓ *the nature and extent of all the relevant impacts has been described*

✓ *measures to avoid and mitigate have been described*

✓ *an appropriate offset for any residual adverse significant impact has been determined.*

The nature and extent of relevant impacts has been described in Section 8.3.2 of the BAR.

Measures to avoid and mitigate have been described in Section 8.33 and Chapter 9 of the BAR.

An offset has been determined for the residual significant adverse impacts of the proposal on Koala and Giant Barred Frog habitat.

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*(b) **Note** if information in relation to any of these boxes has not been provided for any relevant EPBC Act-listed species and communities.*

Not applicable.

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*(c) There may be listed threatened species and communities for which the proponent will claim that the impact will be **not** significant in accordance with the EPBC Act Significant Impact Guidelines. Please **provide** advice for cases where OEH disagrees with this finding.*

BCD does not disagree with the Proponent regarding the significance of impacts.

(d) Provide references to where specific lists or tables are detailed in the EIS i.e. List of EPBC Act-listed EECs Appendix J Table 4 pg 65

Refer to the BARs TOC for this information.

Table 1 Impact Summary Relevant EPBC Act – listed Ecological Communities (refer to section 3 below)

A	B	C	D	E		F	G
EPBC Act - listed EEC	**Y/N**	**PCTs**	**Y/N/ comment**	**Ha**	**Credits**	**Comment**	**Relevant page numbers in the EIS**
Not applicable as no MNES ECs are likely to be affected.							

(A) **List** the relevant EPBC Act listed ecological communities that will be significantly impacted in accordance with the referral documentation.

(B) **Verify** that there is evidence in the EIS that listed EEC and species habitat has been mapped in accordance with relevant listing guidelines (Yes/No).
Proponents are required by the SEARs to ensure that EPBC-listed communities are mapped in accordance with EPBC Act listing criteria. It is important that any derived native grassland components of an EPBC listed EEC are included in the mapping of native vegetation extent.

(C) **List** the Plant Community Types (PCTs) associated with the ecological communities in accordance with Chapter 5 of the FBA.

(D) **Confirm** that the identification of PCTs has been correct (Yes/No) and comment if not correct.

(E) **Record** the area of impact (ha) and credits required.

(F) **Comment** on the analysis of the impacts in relation to the nature and extent of the impact and whether or not the EIS includes an analysis of the direct and indirect impacts to the EEC. Note whether further information might be required.

(G) **Cite** relevant page numbers for details provided the EIS and Appendices for each EEC.

Table 2 Impact Summary Relevant EPBC Act –listed Species (refer to section 4 below)

A	B	C	D	E		F	G
Threatened species (listed under the EPBC Act)	**Credit Type (SC/EC)**	**Record PCTs associated with ecosystem credits**	**Y/N/ Comment**	**Ha (total species habitat)**	**Credits (total species habitat)**	**Comment**	**Relevant page numbers in the EIS and Appendices**
Koala	SC	N/A due to Koalas being a species credit species	Y	39.71	1032	Assessment of affected habitat and the generation of credits has been undertaken appropriately for both species.	Refer to BAR Appendix E of BAR – Biodiversity Offset Strategy
Giant Barred Frog	SC	N/A due to Giant Barred Frogs being a species credit species	Y	3.56	274		

(A) **List** the relevant threatened species that will be significantly impacted in accordance with the referral documentation.
(B) **Record** whether the relevant threatened species is classified as "species credit species" of ecosystem credit species for the purposes of the FBA.
(C) **List** the PCTs associated with the ecosystem credit species.
(D) Verify that the habitat polygons for MNES have been mapped appropriately representing the foraging and/or breeding habitat for the species that will be impacted by the development.
(E) **Record** the area of impact (ha) and credits required. For impacts associated with ecosystem credit species identify the total credit requirements associated with the cleared PCTs identified as habitat for the species.
(F) **Comment** on the adequacy of the analysis of the impacts in relation to the nature and extent of the impact and whether or not the EIS includes an analysis of the direct and indirect impacts to the species. Note if further information is required.
(G) **Cite** relevant page numbers for details provided in the EIS and Appendices for each threatened species.

3. Avoid, mitigate and offset

Comment *on whether or not the EIS identifies measures to avoid and minimise impacts on the relevant EPBC Act-listed threatened species and communities. Section 8 of the FBA requires that proponents detail these efforts and commitments in the EIS. Identify gaps in the discussion on measures to avoid and minimise impacts on Commonwealth matters. Provide references to sections and page numbers in the EIS.*

Chapter 7 of the BAR documents how impacts on biodiversity have been avoided and/or minimised in relation to all TSC Act and EPBC Act listed entities.

Comment *on the adequacy and feasibility of measures to avoid and minimise impacts. Identify inadequacies where further efforts could be made to avoid and minimise impacts on Commonwealth matters. Provide references to sections and page numbers in the EIS that discuss avoidance and mitigation measures relevant to EPBC Act-listed species and communities.*

BCD is satisfied with the avoidance and mitigation measures proposed.

4. Offsetting

(a) ***Verify*** *[by ticking the following boxes] that the offsets proposed to address impacts to EPBC-listed threatened species and communities are in accordance with the requirements under the EPBC Act.*

✓ *An appropriate offset for any residual adverse significant impact has been determined.*

✓*Proposed offsets for EECs provide a like for like outcome i.e. proponents have identified PCTs attributed to the specific threatened ecological community being impacted*

✓*Proposed offsets have been determined using the FBA*

If offsets have not been determined in accordance with the FBA, Planning is required to discuss the proposed approach with the Commonwealth as soon as possible.

5. **Comment** *on whether the information and data relied upon for the assessment have been appropriately referenced in the EIS. Comment on the validity of the sources of information and robustness of the evidence.*

The information and data used in the assessment has been appropriately referenced, and the sources of information are valid.

Table 3 Summary of Offset Requirements

A	B	C	D	E	F
Threatened species or EEC (listed under the EPBC Act)	**Credits required as calculated by the FBA**	**Credits generated from offsets in remnant vegetation**	**Credits generated from offsets proposed by other means**	**Comment on the proposed offsets.**	**Relevant page numbers in the EIS and Appendices**
Koala	1032	1031	0	TfNSW is currently pursuing the purchase/retirement of credits to satisfy the offset obligation. The BCD is confident TfNSW will retire credits at geographically appropriate offset sites. However, if this is not possible, the option exists for TfNSW to pay an amount into the Biodiversity Conservation Fund, determined by the Biodiversity Offset Payment Calculator. This amount is at least the equivalent of the value of the credit obligation.	Appendix E - Biodiversity Offset Strategy
Giant Barred Frog	356	356	0		

(A) **List** the relevant threatened species or ecological community included in the proposed offset package (these are the listed species and communities that will be significantly impacted in accordance with the *EPBC Act Significant Impact Guidelines 1.1*.). Identify any relevant species or ecological communities which have not been included in the proposed offset package.

(B) **List** the total credit requirement identified by the FBA for impacted listed threatened species and ecological community. For EECs and ecosystem credit species this is the sum of the credits generated by PCTs associated.

(C) **Identify** the total number of required credits which are proposed to be retired through conserving and managing remnant / mature vegetation.

(D) **Identify** the number of credits proposed to be met through other methods allowable under the FBA, such as rehabilitation of impacted areas or regrowth vegetation.

(E) **Comment** on the adequacy of the proposed offset in meeting requirements of the FBA and the EPBC Act. In particular is there a reasonable argument for a shortfall in credits required for MNES and/or non-compliance with like-for like? Are the offsets proposed by means other than protection of remnant vegetation adequate?

(F) **Reference** the relevant page numbers from the EIS and Appendices for each threatened species and community.

Appendix H – Matters of National Environmental Significance

In accordance with the bilateral agreement between the Commonwealth and NSW Governments, the Department provides the following additional information required by the Commonwealth Minister for the Environment (the Minister), in deciding whether or not to approve a project under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The Department considers that all threatened species and communities protected under Part 3 of the EPBC Act have been adequately assessed and documented in the Environmental Impact Statement (EIS) and Amendment Report and this assessment has been prepared based on the information contained in Chapter 10 – Biodiversity, Appendix H – Biodiversity Assessment Report, and Appendix I – Threatened Species Management Plan of the EIS; Chapter 5.4 Additional Assessment Biodiversity, Appendix C - Updated Biodiversity Assessment Report, and Appendix D – Updated Threatened Species Management Plan of the Amendment Report; any supplementary information provided during the assessment process; and advice provided by the Department's Environment, Energy and Science Group (EESG).

This Appendix is supplementary to and should be read in conjunction with the assessment included in **Section 6.5** of this report, which includes the Department's consideration of impacts to listed threatened species and communities, mitigation and offsetting measures for threatened species, including for matters of national environmental significance (MNES).

M.1 REQUIREMENTS FOR DECISIONS ABOUT THREATENED SPECIES AND ENDANGERED ECOLOGICAL COMMUNITIES

In accordance with section 136 of the EPBC Act, in deciding whether or not to approve the taking of an action and what conditions to attach to an approval, the Minister must consider matters relevant to any matter protected by a provision of Part 3 that the Minister has decided is a controlling provision for the action. These matters are addressed in Table 1 of this report on MNES.

In accordance with section 139 of the EPBC Act, in deciding whether or not to approve, for the purposes of section 18 or section 18A of the EPBC Act, the taking of an action and what conditions to attach to such an approval, the Minister must not act inconsistently with certain international environmental obligations, Recovery Plans or Threat Abatement Plans. The Minister must also have regard to relevant approved conservation advices.

Australia's International Obligations

Australia's obligations under the *Convention on Biological Diversity* (Biodiversity Convention) include the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding.

The recommendations of the Biodiversity Assessment Report (BAR) (as updated by the BAR in the Amendment Report) and this assessment report are not inconsistent with the Biodiversity Convention, which promotes environmental impact assessment (such as this process) to avoid and minimise adverse impacts on biological diversity. The recommended approval requires avoidance, mitigation and management measures, and offsetting for the listed threatened species and communities and all information related to the proposed action is required to be publicly available to ensure equitable sharing of information and improved knowledge relating to biodiversity.

Australia's obligations under the *Convention on Conservation of Nature in the South Pacific* (Apia Convention) include encouraging the creation of protected areas which together with existing protected areas will safeguard representative samples of the natural ecosystems occurring therein (particular attention being given to endangered species), as well as superlative scenery, striking geological formations and regions. Additional obligations include using their best endeavours to protect such fauna and flora (special attention being given to migratory species) to safeguard them from unwise exploitation and other threats that may lead to their extinction. The APIA Convention was suspended with effect from 13 September 2006. While this Convention has been suspended, Australia's obligations under the Convention have been taken into consideration. The recommendations are not inconsistent with the Convention which has the general aims of conservation of biodiversity.

The *Convention on International Trade in Endangered Species of Wild Flora and Faunas* (CITES) is an international agreement between governments which seeks to ensure that international trade in specimens of wild animals and plants does not threaten their survival. The recommendations are not inconsistent with CITES as the proposed action does not involve international trade in specimens of wild animals and plants.

Recovery Plans and Approved Conservation Advices

There are Approved Conservation Advice for: Koala (*Phascolarctos cinereus*) and the Giant Barred Frog (*Mixophyes iterates*), but no Recovery Plans for these species.

- **Koala (Phascolarctos cinereus)**

The Conservation Advice for the koala was approved on 30 April 2012 and applies to the combined population in Queensland, NSW and the ACT. The main threats to this species are loss and fragmentation of habitat, vehicle strike, disease, removal of movement corridors and predation by dogs.

The Conservation Advice identified research priorities to fill gaps in the knowledge of the species and develop effective conservation management measures and priority management actions to support the recovery of the koala population. The research priorities include population monitoring and abundance estimation, landscape scale population models and gene flow and connectivity.

The recommended priority management actions include measures to address habitat loss, disturbance and modification, and animal predation. The Conservation Advice recommended the development of a recovery plan under the EPBC Act. To date no EPBC Recovery Plan has been prepared for the koala, however, there is an NSW Recovery Plan (DECC 2008) which identifies threats to koalas, efforts to conserve koalas and actions to aid the recovery of the species. The objectives of the recovery plan include the conservation of koalas in their existing habitat and rehabilitating and restoring koala habitat and populations.

The project would result in the clearing of 47.84 hectares of known and potential koala habitat. However, in terms of species credits the Proponent is proposing to offset 39.71 hectares of known habitat providing 1032 credits in accordance with the *NSW Biodiversity Offsets Policy for Major Projects*. The Proponent proposes additional mitigation measures including connectivity structures to maintain biodiversity links across the alignment, fauna fencing to prevent koalas accessing the highway, revegetation of koala habitat above the Roberts Hill and Gatelys Road tunnels, which are key koala connectivity links. The Department has also required the Proponent to restore koala habitat on the regionally and locally significant Roberts Hill and Gatelys Road Koala corridors, and on residual land that is owned by the Proponent but not required for the project and is to be sold, with protection in-perpetuity of the restored koala habitat within the corridors. The Department considers that the

connectivity structures and restoration of habitat on key koala corridors mitigates the project's impacts on koala movement and fragmentation of habitat.

The Proponent has committed to preparing a Construction Environmental Management Plan and a Biodiversity Management Sub-plan to address impacts on biodiversity values from the construction of the project. In addition, a Threatened Species Management Plan, which addresses measures to manage connectivity, habitat revegetation and fauna fencing would also be developed to mitigate operational impacts for the Koala.

- **Giant Barred Frog (Mixophyes iterates)**

The Conservation Advice for this vulnerable species was approved on 13 July 2017. The species is known to occur from Belli Creek near Eumundi, south-east Queensland's, south to Warrimoo, mid-east New South Wales. The main threats are loss and fragmentation of habitat, clearance of riparian vegetation, reduction in water quality, alterations to flow patterns, disease and invasion of feral pigs, domestic stock and weeds. The species is known to occur along Pine Brush Creek and Newports Creek.

The project is likely to result in direct impacts to approximately 4.79 hectares of known and potential habitat. Nevertheless, the Proponent is proposing to offset 3.56 hectares of known habitat resulting in 274 credits. Species credits are only required for impacts to known habitat. Impacts to potential habitat would be addressed through the provision of ecosystem credits for impacts to plant community types.

The Proponent has committed additional mitigation measures including the construction of bridge crossings of Giant Barred Frog habitat at Newports Creek and Pine Brush Creek, frog fencing and fauna and drainage culverts to enable frogs to cross the alignment. A Biodiversity Management Sub-Plan Is proposed to address construction impacts and includes commitments to implement measures to manage the spread of chytrid fungus disease which affects amphibians. The Proponent recommends appropriate wash down procedures to prevent the spread of Chytrid fungus.

The project may have potential impacts including disruptions to the breeding cycle and fragmented habitats. Indirect impacts also include altered water flow and degradation of water quality which will be mitigated.

Threat Abatement Plans

The Threat Abatement Plans (TAP) relevant to this action are discussed below and are available at http://www.environment.gov.au/biodiversity/threatened/threat-abatement-plans/approved.

- **Threat abatement plan for the biological effects, including feral pigs (relevant to Giant Barred Frog)**

Feral pigs are found across Australia and are a threat to the Giant Barred Frog. Feral pigs are typically found within wetlands and river systems. The threat abatement plan (TAP) suggests actions and strategies to manage the impacts of feral pigs. The Conservation Advice for the Giant Barred Frog mentions monitoring damage and implementation of control measures. Feral pigs are a threat to this species by way of predation, disturbance of habitat and destruction of eggs. For the Giant Barred Frog, predation is the main threat.

The Proponent has committed to prepare a Biodiversity Management Sub-plan to manage construction impacts and a threatened species management plan for the construction and operational stages, providing measures such as connectivity, revegetation of habitat, frog fencing and monitoring.

- **Infection of amphibians resulting in chytridiomycosis (relevant to Giant Barred Frog)**

Since 1993, chytridiomycosis (a highly infectious disease) has led to sporadic deaths in some amphibian populations and extinctions in others. The disease is now established in most climatically suitable areas in Australia. The TAP provides strategies to manage the threat of the disease and potential extinction. The Conservation Advice for the Giant Barred Frog recognises there has been a substantial decline in numbers and distribution due to chytridiomycosis.

The disease can affect both tadpoles and adult frogs with the ability to wipe out entire populations. This threat is a known cause of decline in frog species. The TAP aspires to prevent amphibian populations from becoming infected and to decrease the impact of the infection on those already infected.

The Department considers that actions and strategies should be consistent with the TAP for the threats to the Giant Barred Frog. The Proponent has committed to implement measures to reduce the spread of the chytrid fungus pathogen from the movement of construction personnel, equipment and vehicles as part of the Biodiversity Management Sub-plan.

M.2 REQUIREMENTS FOR DECISIONS ABOUT WORLD HERITAGE PROPERTIES

The Commonwealth determined that the action is not a controlled action for the controlling provision of World Heritage (section 12 and section 15A of the EPBC Act) and therefore further consideration is not required.

M.3 REQUIREMENTS FOR DECISIONS ABOUT NATIONAL HERITAGE PLACES

The Commonwealth determined that the action is not a controlled action for the controlling provision of National Heritage (section 15B and section 15C of the EPBC Act) and therefore further consideration is not required.

M.4 ADDITIONAL EPBC ACT CONSIDERATIONS

Table 1 contains the additional mandatory considerations, factors to be taken into account and factors to have regard under the Act, additional to those already discussed, which the Commonwealth Minister must consider in determining the proposed action.

Table 1 | Additional considerations for the Commonwealth Minister under the EPBC Act

EPBC Act section	Considerations	Conclusion
Mandatory considerations		
136(1)(b)	Social and economic matters are discussed in **Section 6.7** of the report.	The Department considers that the project would result in a range of benefits to State and regional economy through improvements in the efficiency of the inter- and intra-state road freight network.
Factors to be taken into account		
3A, 391(2)	Principles of ecologically sustainable development (ESD), including the precautionary principle, have been taken into account, particularly: • the long-term and short-term economic, environmental, social and equitable considerations that are relevant to this decision;	The Department considers that the project, if undertaken in accordance with the recommended conditions of approval, would be consistent with the principles of ESD. **Section 4.3** of the

	• conditions that restrict environmental impacts and impose monitoring and adaptive management reduce any lack of certainty related to the potential impacts of the project; • conditions requiring the project to be delivered and operate in a sustainable way to protect the environment for future generations and conserving the relevant matters of national environmental significance; • advice provided within this report reflects the importance of conserving biological diversity and ecological integrity in relation to the controlling provisions for the project; and • mitigation measures to be implemented which minimise potential impacts of the project on biodiversity within the project area.	report addresses the project in regards ESD principles.
136(2)(e)	Other information on the relevant impacts of the proposed action. The Department is not aware of any relevant information not addressed in this assessment report.	**Section 3.3** of the report discusses the route selection process. The Proponent considers that in the development of the project route, impacts to Koala habitat have been avoided where possible in selecting the preferred route. The Department considers that all information relevant to the impacts of the project have been taken into account in this assessment. The Department's consideration on key issues is presented in **Section 6** of this report.
Factors to have regard to		
176(5)	Bioregional plans	There is no relevant bioregional plan.
Considerations on deciding on conditions		
134(4)	Must consider: • information provided by the person proposing to take the action or by the designated proponent of the action; and • the desirability of ensuring as far as practicable that the condition(s) is a cost-effective means for the Commonwealth and a person taking the action to achieve the object of the condition.	All project related documentation is available at the Department's website www.majorprojects.planning.nsw.gov.au. The Department considers that the conditions at Appendix J are a cost-effective means of achieving their purpose.

M.5 CONCLUSIONS ON CONTROLLING PROVISIONS

Threatened species (sections 18 and 18A of the Act)

For the reasons set out in **Section 6.5** of the report and this Appendix, the Department recommends that the impacts of the action on threatened species will be acceptable, subject to the implementation of the avoidance and mitigation measures described in the EIS, Amendment Report, and the requirements of the recommended conditions of approval.

M.6 OTHER PROTECTED MATTERS

The Commonwealth DAWE determined that other matters under the EPBC Act are not controlling provisions with respect to the proposed action. These include listed migratory species, RAMSAR wetlands, Commonwealth marine environment, world heritage properties, national heritage places, nuclear action, Great Barrier Reef Marine Park and a water resource associated with a large coal mining or coal seam development.

Appendix I – Recommended MNES Biodiversity Conditions

C4 The **CEMP Sub-plans** in **Table 3** must be prepared in consultation with the government agencies identified for each **CEMP Sub-plan.** The outcomes of consultation with government agencies in accordance with **Condition A5** must be provided with the relevant **CEMP Sub-plan**.

Table 3: CEMP Sub-plans

	Required CEMP Sub-plan	Relevant government agencies to be consulted for each CEMP Sub-plan
(b)	Biodiversity	EESG, DAWE, DPI Fisheries, Council

C9 The **Biodiversity Management Sub-plan** must include:

(a) procedures for pre-clearing surveys for threatened species to be undertaken by a suitably qualified and experienced ecologist, including survey and relocation methodologies and management/offset measures;
(b) measures to prevent the spread of the pathogen myrtle rust, Phytopthora cinnamomi and chytrid fungus, and non-indigenous regenerative plant material and seeds, by the movement of all tools, vehicles, machinery, soil and earth, vegetative waste and personnel;
(c) a weed management plan, including appropriate protocols to demonstrate compliance with the requirements of the *Biosecurity Act 2015* and *Biosecurity Regulation 2017*; and
(d) protocols for incidental finds of threatened species within the construction boundary, including guidance for updating biodiversity credit calculations and/or the use of supplementary measures where impacts cannot be avoided or minimised.

D6 The **Operational Monitoring Programs** in **Table 6** must be prepared in consultation with the relevant authorities identified for each Operational Monitoring Program to compare actual operational performance against predicted performance. These programs must be submitted to the Planning Secretary for information. The monitoring program must be implemented.

Table 6: Operational monitoring program

	Required Operational Monitoring Programs	Relevant authority(s) and council(s) to be consulted for each Operational Monitoring Program
(b)	Biodiversity	EESG, DAWE, Council

E2 The clearing of native vegetation must be minimised with the objective of reducing impacts to threatened ecological communities and threatened species habitat.

E3 The Proponent must meet the biodiversity offset obligations for ecosystem and species credits as set out in **Table 7** and **Table 8** within 12 months of the commencement of construction. The retirement of the biodiversity credits must be carried out in accordance with the *NSW Biodiversity Offsets Policy for Major Projects* and can be achieved by:

(a) acquiring and retiring "biodiversity credits" within the meaning of the *Biodiversity Conservation Act 2016*; and/or
(b) properties secured with the NSW National Parks and Wildlife Service (NPWS), on the basis of a draft credit report to show what the property would provide and written confirmation from NPWS that the financial contributions for acquisition and management have been received; and/or
(c) making a payment into the Biodiversity Conservation Fund; and/or
(d) a Biodiversity Offset Strategy prepared in consultation with EESG and DAWE that provides supplementary measures.

Notes 1: Following repeal of the Threatened Species Conservation Act 1995 on 25 August 2017, "biodiversity credits" created under that Act are taken to be "biodiversity credits" under the

Biodiversity Conservation Act 2016 by virtue of clause 19 of the Biodiversity Conservation (Savings and Transitional) Regulation 2017.

2: *The determination of biodiversity credits under the BC Act that are reasonably equivalent to biodiversity credits created under the TSC Act remaining to be retired must be carried out in accordance with clause 22 of the Biodiversity Conservation (Savings and Transitional) Regulation 2017.*

Table 7 Ecosystem Credits to be Retired

Ecosystem Credits		
Plant Community Type (PCT) ID and name	*Management zone area (ha)*	*Number of Credits*
NR120 Blackbutt - Tallowwood moist ferny open forest of the coastal ranges of the NSW North Coast Bioregion	17.33	1023
NR122 Blackbutt - Turpentine - Tallowwood shrubby open forest of the coastal foothills of the central NSW North Coast Bioregion	10.41	615
NR138 Brush Box - Tallowwood - Sydney Blue Gum tall moist forest of the ranges of the central NSW North Coast Bioregion	6.99	432
NR149 Coastal floodplain sedgelands, rushlands, and forblands of the North Coast	0.33	8
NR217 Paperbark swamp forest of the coastal lowlands of the NSW North Coast Bioregion and Sydney Basin Bioregion	4.41	300
NR258 Sydney Blue Gum open forest on coastal foothills and escarpment of the North Coast	1.18	80
NR263 Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast	1.6	99
NR274 Turpentine moist open forest of the coastal hills and ranges of the NSW North Coast Bioregion	3.5	212
NR280 White Booyong - Fig subtropical rainforest of the NSW North Coast Bioregion	2.42	142
TOTAL ECOSYSTEM CREDITS	**48.17**	**2911**

Note: Credits have been calculated using the Framework for Biodiversity Assessment

Table 8 Species Credits to be Retired

Species	*Loss of habitat or individuals*	*Number of Credits*
Rusty Plum, Plum Boxwood (*Niemeyera whitei*)	74 individuals	1110
Coastal Petaltail (*Petalura litorea*)	3.05 ha	235
Common Planigale (*Planigale maculata*)	7.94 ha	206
Giant Barred Frog (*Mixophyes iteratus*)	3.56 ha	274
Koala (Phascolarctos cinereus)	39.71 ha	1032
Pale-vented Bush-hen (*Amaurornis moluccana*)	4.86 ha	63
Southern Myotis (Myotis macropus)	15.19 ha	334

TOTAL SPECIES CREDITS	**3254**

Note: Credits have been calculated using the Framework for Biodiversity Assessment.

E4 The Proponent may review and update the ecosystem and species credit requirements in **Table 7** and **Table 8** or the supplementary measures outlined in **Table 9** to reflect the final construction footprint and resulting extent and type of plant community types to be cleared and the extent of threatened species habitat impacted by the construction of the CSSI. Amendments to the ecosystem and species credit requirements must be undertaken in consultation with EESG and DAWE and submitted to the Planning Secretary for approval within six (6) months of determining the final construction footprint.

E5 The review and update of credit requirements must be undertaken by:

(a) using the vegetation mapping in the *Coffs Harbour Bypass Amendment Report Volume 3 Appendix C Biodiversity Assessment Report (May 2020)*; and/or
(b) completing verification surveys to confirm the extent, type and condition of native vegetation to be impacted.

E6 Where verification surveys are required, they must be undertaken in consultation with EESG. Any additional surveys must be undertaken at the time of year when groundcover is most likely to be predominantly native. If evaluation is not possible at a time when groundcover is most likely to be native, the assumed presence of any relevant species and ecosystems may be applied to conservatively evaluate impacts and associated credit requirements.

E7 The Proponent must submit to the Planning Secretary for information:

(a) a copy of the **Credit Retirement Report**; and/or
(b) a receipt confirming payment to the Biodiversity Conservation Fund; and/or
(c) a receipt confirming payment to the EESG North East Branch for the Scrub Turpentine supplementary measures; and/or
(d) correspondence from NPWS.

for the retirement of the ecosystem and species credits required by **Condition E3** within one month of receiving the report and/or making the payments and/or receiving correspondence from NPWS.

Supplementary Measures for Scrub Turpentine

E8 Prior to the commencement of work that impacts Scrub Turpentine (*Rhodamnia rubescens*), the quantum of funds specified in **Table 9** (based on the requirements of the NSW Biodiversity Offsets Policy for Major Projects) must be transferred to the Department's EESG North East Branch for the purposes of EESG undertaking one or a combination of the supplementary measures in **Table 9** to offset the CSSI's impacts to Scrub Turpentine.

Table 9: Supplementary measures for Scrub Turpentine

Scrub Turpentine Credit Obligation	*Measures to be funded*	*Funding amount*
42	(a) Undertake genetically representative germplasma collections. Genetic material is to be collected from a minimum of eight individuals from every germplasma collection site and analysed to determine population structure and genetic representativeness of collections.	$274,000
	(b) Where possible, collect swamp turpentine seeds for depositing in the seed collection of the Australian Botanic Gardens – Mt Annan.	
	(c) Collect cuttings from appropriate field locations and propagate these cuttings in a controlled disease free environment.	
	(d) Create an "orcharding" and seed production program to grow and manage plants obtained from cuttings by botanic gardens/nurseries located in low humidity / myrtle rust free areas.	
	(e) Develop a long term management plan for the eventual management/re-establishment of wild populations of the species.	

	(f) Any other relevant conservation action identified in the EESG "Saving Our Species *Rhodamnia rubescens* Conservation Strategy" (https://www.environment.nsw.gov.au/savingourspeciesapp/project.aspx?profileid=20341	

Koala habitat

E9 The Proponent must reduce the 39.71 hectares of known koala habitat that is impacted by the CSSI, unless otherwise agreed by the Planning Secretary

E10 A report on the final construction footprint demonstrating how impacts to koala habitat have been reduced must be provided to the Planning Secretary, EESG and DAWE for information, within six (6) months of determining the final construction footprint.

E11 A minimum of 1032 species credits must be provided to offset impacts to the koala.

E12 The species offset credits required by **Condition E11** must be sourced where practicable, from:

(a) the same IBRA subregion as the impacted site, or
(b) the adjoining IBRA subregions within the same IBRA region as identified in (a).

E13 Any lands within the road alignment above the Roberts Hill and Gatelys Road tunnels as well as any directly adjacent residual lands owned by the Proponent that are within the regionally and locally significant koala corridors at Roberts Hill and Gatelys Road must be actively restored with koala habitat. Any land that is subsequently disposed of by the Proponent at these locations must have the Koala habitat protected in-perpetuity. The mechanism to protect the restored koala habitat must be developed in consultation with EESG and approved by the Planning Secretary prior to the commencement of construction. The mechanism is to ensure in-perpetuity funding for management and the protection of the koala corridors at these two locations. The restoration of the koala habitat must be undertaken within 12 months of the completion of construction.

Threatened Species Management Plan

E14 A **Threatened Species Management Plan** must be prepared to address impacts and identify management measures for the species identified in Appendix C Updated Biodiversity Assessment Report, May 2020 (Coffs Harbour Bypass Amendment Report Vol.3, June 2020) as being significantly impacted by the CSSI. The plan must be prepared by a suitably qualified and experienced ecologist in consultation with EESG, DPI Fisheries, DAWE and Council and implemented prior to work that impacts the species' habitat.

The Plan must include:

(a) details of potential impacts from the construction and operation of the CSSI on each species;
(b) details of proposed management and mitigation measures for each species, including exclusion fencing, connectivity structures, nest boxes and habitat revegetation;
(c) goals and performance indicators to measure the success of the mitigation measures;
(d) ongoing monitoring during construction and operation; and
(e) contingency measures to address impacts attributable to the construction and operation of the CSSI.

E15 The **Threatened Species Management Plan** must be submitted to the Planning Secretary for information prior to work that impacts the species' habitat.

Appendix J – Recommended Conditions

https://www.planningportal.nsw.gov.au/major-projects/project/10461