Woolgoolga to Ballina

Pacific Highway Upgrade

Temporary Intensification of Operations at Moonimba Borrow Site

Environmental Impact Assessment Modification Report

August 2017

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Report Approved By

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Revision History

Revision	Date	Description	Approval
0	05/07/17	Initial draft for internal and RMS review	Andrea Zambolt
1	25/07/17	Draft for adequacy	Hugh Madden
2	23/08/17	Final	Andréa Zambolt

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GLOSSARY / ABBREVIATIONS

ABS	Australian Bureau of Statistics
AFG	Aboriginal Focus Group
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management Systems
Approved Project, the	Woolgoolga to Ballina Pacific Highway Upgrade - *project which has been approved by the Minister for Planning*
AQIA	Air Quality Impact Assessment
CO	Carbon monoxide
CAQMP	Construction Air Quality Management Plan
CCEMP	Contractor's Construction Environmental Management Plan
CCLMP	Construction Contaminated Land Management Plan
CEMP	Construction Environmental Management Plan
CFFMP	Construction Flora and Fauna Management Plan
CHA	Cultural Heritage Assessment
CSWMP	Construction Soil and Water Management Plan
CTAMP	Construction Traffic and Access Management Plan
CWREMP	Construction Waste, Resource and Energy Management Plan
DA127/95	The current development application for the existing quarry located at the Moonimba Borrow Site.
DA2015.0069	A recent development application that was approved for the expansion of the existing quarry at the Moonimba Borrow Site that was not activated at the time this modification report was prepared.
dB	decibel
DP&E	Department of Planning and Environment
DoE	Department of Environment
DPI	Department of Primary Industries
EEC	Endangered Ecological Communities
EIS	Environmental Impact Statement
EMS	Environmental Management Systems
ENM	Excavated Natural Material
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPA	Environment Protection Authority
EPBC Act	*Environmental Protection and Biodiversity Conservation Act 1999*
EPL	Environment Protection Licence
ER	Environmental Representative: *A suitably qualified and experienced person independent of project design and construction personnel employed for the duration of construction. The principal point of advice in relation to all questions and complaints concerning environmental performance. Equates to Environmental Management Representative under Ballina Bypass project Ministerial conditions of approval.*
ERG	Environment Review Group. A group of relevant government agencies, Roads and Maritime, Pacific Complete and Contractor staff members who meet monthly to discuss environmental matters on the Approved Project.
EWMS	Environmental work method statements
FCNSW	Forestry Corporation of NSW
GDE	Groundwater dependent ecosystem
ha	Hectares
km	Kilometres

LAeq	Describes the sound level that is representative over a certain period of time that is prescribed
LALC	Local Aboriginal Land Council
LEP	Local environmental plans
L	Litres
m^3	Cubic metres
MCoA	NSW Minister for Planning Conditions of Approval
Minister, the	Minister for Planning
Moonimba Borrow Site	Previously known as the Moonimba Quarry, the subject of this modification assessment
NIA	Noise Impact Assessment
NOx	Nitrogen oxides
OEH	Office of Environment and Heritage
OPM	Operational Plan of Management
PACHCI	Procedure for Aboriginal Cultural Heritage Consultation and Investigation
PC	Pacific Complete: *entity composed of Laing O'Rourke and Parsons Brinckerhoff/WSP appointed by Roads and Maritime as Delivery Partner for the project*
PoEO	*Protection of the Environment Operations Act 1997*
Project, the	The Woolgoolga to Ballina Pacific Highway Upgrade Project (Sections 3 to 11)
RBL	Rating background level
RL	Relative level
RMS, Roads and Maritime	Roads and Maritime Services
RTA	Roads and Traffic Authority. Previous name for Roads and Maritime Services
Secretary	Secretary of the Department of Planning and Environment
SEPP	State environmental planning policy
SO_2	Sulphur dioxide
SPIR	Submission / Preferred Infrastructure Report
SSI 4963	State Significant Infrastructure
TEC	Threatened Ecological Community
TIA	Traffic impact assessment
TMP	Traffic management plan
TSP	Total suspended particulate
TTIA	Traffic and transport impact assessment
TSC Act	*Threatened Species Conservation Act 1995*
VENM	Virgin Excavated Natural Material
VIS	Vegetation Information System
VOC	Volatile Organic Compound
W2B	Woolgoolga to Ballina Pacific Highway Upgrade project

EXECUTIVE SUMMARY

A modification of the Woolgoolga to Ballina Pacific Highway Upgrade project (the Approved Project) is being sought by NSW Roads and Maritime Services (Roads and Maritime) for the use and temporary intensification of operations at the Moonimba Quarry in Bungawalbin, NSW, referred to in this report as the Moonimba Borrow Site. The proposed modification would allow for the extraction and supply of one million tonnes of material per annum (equivalent to 400,000 cubic metres) for a period of two years or until the material demand for the project ceases. This would provide two million tonnes of material in total which would meet the deficit of material in demand for the delivery of the Approved Project.

The current earthworks balance for the Approved Project identifies a large deficit of material, therefore the required material cannot be sourced from within the project boundary. Material would therefore be required to be imported from external quarries or other borrow sites near the project. The Woolgoolga to Ballina Pacific Highway Upgrade Environmental Impact Statement (W2B EIS) outlines the potential to develop additional borrow sites near the project if there are any shortfalls of material.

The approval to temporarily increase the extraction rate at the Moonimba Borrow Site would alleviate the deficit in material and allow the delivery of the project in accordance with the current programming and staging required to meet Roads and Maritime proposed completion dates of the project. The proposed modification involves the increased extraction of material at an existing quarry site, therefore it is anticipated that the impacts would be less than those associated with the establishment of a new borrow site. A range of other benefits would result from the use of the Moonimba Borrow Site including (but not limited to);

- Sourcing material from one central location, thereby allowing for the more stringent control of one haulage route for the safety for local residents and project efficiency
- Reducing the total distance haulage vehicles travel along the local road network
- Reducing the unit cost of material, providing public value for money for a project that is funded by the NSW and Australian Governments
- Reducing dependence on smaller local quarries that could result in the reduction of available material and increased price of material for other local projects and independent buyers in the region.

This modification report identifies and assesses the potential environmental impacts from the proposed modification. Section 4 of the report provides a detailed assessment of each potential environmental impact. An Environmental Impact Statement (EIS) was prepared in 2014 for the expansion of the existing Moonimba Quarry, referred to in this report as the Moonimba Quarry EIS. Information in the Moonimba Quarry EIS was used in the preparation of this Modification Report.

The Moonimba Quarry currently operates under Development Application (DA127/95). Another Development Application was given consent by Richmond Valley Council in 2015 (DA2015.0069) for the expansion of the excavation areas, however this consent has not yet been activated.

The Moonimba Borrow Site is located within the footprint assessed and approved under DA2015.0069. The proposed Moonimba Borrow Site would consist of:

- Two excavation areas, known as the eastern pit (13 hectares) and the western pit (8 hectares)
- An access track leading from Boggy Creek Road to the two excavation areas
- Associated infrastructure including a site office and staff amenities located adjacent to the access track to the north of the two excavation areas.

The Moonimba Borrow Site is located approximately 15 kilometres from the Approved Project. The extracted material would be hauled along Boggy Creek Road, Reardons Lane and Woodburn-Coraki Road. Vehicles would proceed east along Woodburn-Coraki Road to the intersection with the Pacific Highway where they would then travel north or south along the Pacific Highway before entering the Approved Project boundary for stockpiling or immediate use.

At peak, the Moonimba Borrow Site would generate an estimated 300 truck movements per day that would use the local road network to deliver material to the Approved Project. A traffic impact assessment determined that the local roads that would be used for the haulage of material would provide adequate capacity for the proposed haulage rate. A right-turn treatment would be required on the Pacific Highway, for vehicles to safely and efficiently access Woodburn-Coraki Road. A traffic management plan (TMP) would also be prepared to ensure the safe management of traffic at this intersection. GPS tracking of haulage vehicles would be investigated to monitor the location of haulage trucks during the morning and afternoon school peak traffic times so as to ensure impacts on school bus operations are minimised.

A noise impact assessment determined that sensitive receivers located in the area surrounding the site would experience noise impacts during the operation of the borrow site. This is a result of low background (existing) noise levels and the proposed machinery and equipment to be used at the site. Noise impacts are also predicted for a number of sensitive receivers located adjacent to the haulage route. Existing management measures for the Approved Project would be implemented to minimise the predicted noise impacts. A regular noise monitoring program would also be established to monitor noise levels during the operation of the borrow site and determine the effectiveness of mitigation measures.

Clearing of approximately 9.5 hectares of vegetation would be required within the footprint of the excavation areas . This clearing has been previously approved under DA2015.0069. The clearing would result in the loss of 103 habitat trees that may provide habitat for a range of threatened species. A biodiversity review of existing information and a site inspection confirmed that the proposal is unlikely to lead to a significant impact on threatened species, populations, ecological communities or their habitats. Existing management measures for the Approved Project would be implemented to minimise impacts to flora and fauna. In addition, speed limits would be reduced along the internal access track and targeted surveys for the Powerful and Masked Owl will be undertaken prior to clearing to determine whether nesting is occurring within or near the proposed clearing footprint. A Habitat Offset arrangement would also be established in accordance with DA2015.0069.

Operation of the borrow site has the potential to cause an impact through the increase of sediment laden runoff, which may carry pollutants. The main source of sediment would be via erosion of stockpiles, earth barriers, work areas, haul roads and other disturbed areas. Existing management measures for the Approved Project would be implemented to manage sediment and erosion during the operation of the borrow site.

A range of environmental requirements and control measures have been previously prescribed for the Approved Project including mitigation measures listed within in the Submission / Preferred Infrastructure Report (November 2013)(S/PIR), the Conditions of Approval, relevant Roads and Maritime documents and the approved Woolgoolga to Ballina (sections 3-11) Construction Environment Management Plan (W2B CEMP) and associated sub-plans. The proposed modification would be established, operated and maintained in accordance with the requirements included in the W2B CEMP and associated sub-plans. Additional control measures are outlined in Section 6 of this modification report.

HOW YOU CAN COMMENT

Anyone can make a written submission about the Modification Application during the exhibition period from **Monday 11 September 2017** until **Monday 25 September 2017**.

Your submission must reach the Department of Planning and Environment by Monday 25 September 2017. Before making your submission, please read the Privacy Statement at www.planning.nsw.gov.au/privacy/ or telephone 1300 305 695 for a copy. The Department of Planning and Environment will publish your submission on its website in accordance with its Privacy Statement.

To make a submission, use the online form if possible. This is available at www.majorprojects.planning.nsw.gov.au/page/on-exhibition/

If you cannot lodge online, you can write to:

Planning Services, Department of Planning and Environment, GPO Box 39 SYDNEY NSW 2001

(Your submission should be marked, Attention: Director, Transport Assessments and quote project number SSI 13-4963)

1 INTRODUCTION

1.1 BACKGROUND

On behalf of the Australian and NSW governments, NSW Roads and Maritime Services (Roads and Maritime) is progressively upgrading the Pacific Highway to dual carriageway between the Hunter and NSW/Queensland border.

The Woolgoolga to Ballina Pacific Highway Upgrade, (the Approved Project), involves upgrading approximately 155 kilometres (km) of highway to four-lane dual-carriageway road between Woolgoolga (north of Coffs Harbour) and Ballina on the NSW north coast (refer Figure 1-1). The project bypasses the towns of Grafton, South Grafton, Ulmarra, Woodburn, Broadwater and Wardell. The project will include road duplication, alignment modification and new road sections. Once complete, the project will create a four-lane divided road, with two lanes in each direction. It would also allow for the road's upgrade in the future to a six-lane divided highway.

The Approved Project was declared critical State significant infrastructure under Part 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Before approving the application, the Woolgoolga to Ballina Pacific Highway Upgrade Environmental Impact Statement (RMS, 2012), was publically displayed for 60 days between December 2012 and February 2013, inclusively. The exhibition generated 145 submissions, which were responded to in the Woolgoolga to Ballina Pacific Highway Upgrade Submissions / Preferred Infrastructure Report, issued in November 2013 (RMS, 2013). The project was approved by the Minister for Planning on 24 June 2014.

The Approved Project has also been subject to approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The Woolgoolga to Ballina Project was declared by the Commonwealth Minister for Sustainability, Environment, Water, Populations and Communities (now the Department of the Environment and Energy) to be a controlled action under this Act on 20 June 2012. Approval was granted by the Commonwealth Government on 14 August 2014.

Roads and Maritime Services has engaged Pacific Complete (comprising Laing O'Rourke and WSP Parsons Brinckerhoff) to partner with the Pacific Highway Office to deliver the 155 km Woolgoolga to Ballina Pacific Highway upgrade.

1.2 THE APPROVED PROJECT

The Approved Project consists of the upgrade of the Pacific Highway between Woolgoolga to Ballina to a four-lane standard highway (known as a class M highway). This section of the highway is approximately 155 kilometres long (refer to Figure 1-1).

The construction of the Approved Project will be staged to include both arterial sections (known as class A) and motorway standard sections (known as class M). For sections of the project initially upgraded to arterial standard, the design allows for these sections to be upgraded to motorway standard in the future.

At its southern end, the Approved Project will tie in to the northern extent of the Sapphire to Woolgoolga upgrade (about five kilometres north of Woolgoolga). At its northern end, the Approved Project will tie in to the southern extent of the recently opened Ballina bypass. This is about six kilometres to the south-west of Ballina.

The Approved Project excludes the highway upgrades at Glenugie and Devils Pulpit, located between Woolgoolga and Ballina as both projects have been approved and are already built. The Approved Project also does not include the upgrade of the existing dual carriageway located at Halfway Creek. The project will provide a service road along the length of this section only.

The W2B EIS identifies the key sources of material for the project as major cuttings or borrow sites along the project alignment. A number of borrow sites were identified in the W2B EIS and/or the W2B SPIR to provide material for the construction of the project. The potential to develop other borrow sites near the project is discussed in the W2B EIS in the circumstance where there is a shortfall of material for the construction of the project.

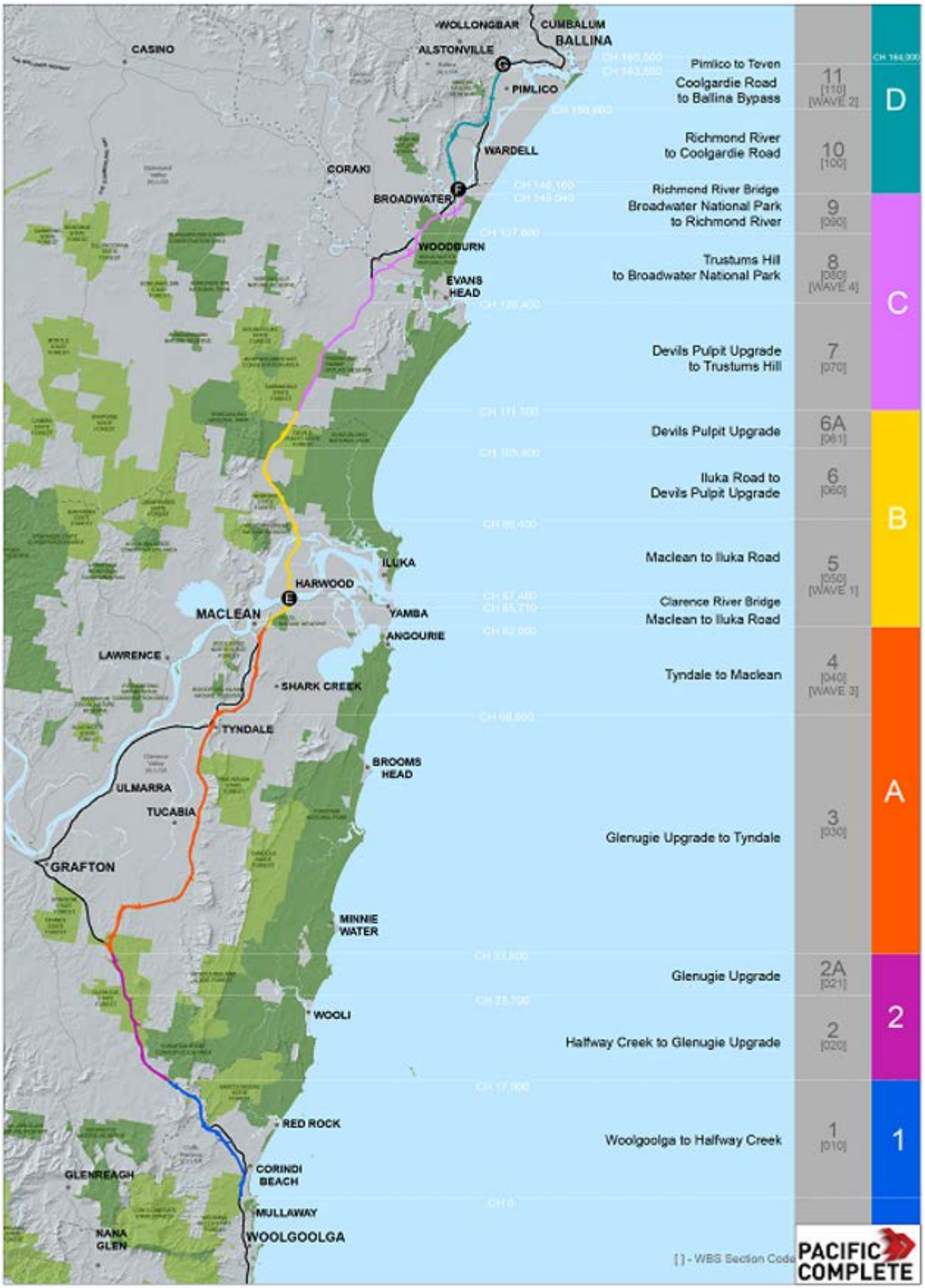


Figure 1-1 Pacific Highway Upgrade Woolgoolga to Ballina Approved Project

1.3 PURPOSE OF THIS REPORT

A modification of the Project Approval is being sought for the use of the Moonimba Borrow Site (previously known as the Moonimba Quarry), for the supply of material for the construction of the Woolgoolga to Ballina Pacific Highway Upgrade.

The environmental assessment for the modification will be submitted to the Secretary of the NSW Department of Planning and Environment in order to request planning approval as part of a Modification of Minister's Approval under Section 115ZI of the EP&A Act.

Subject to the Minister's approval of the modification, the operation of the site would proceed in accordance with the approval conditions.

This environmental assessment for the modification provides an overview of:

- A description of the proposed modification
- An assessment of the potential impacts of the proposed modification and
- The measures proposed to mitigate or manage the potential impacts.

This builds upon the work already undertaken in the W2B EIS and the W2B SPIR.

This modification to the Approved Project seeks planning approval for the use of the Moonimba Borrow Site, for the supply of material for the construction of the Woolgoolga to Ballina Pacific Highway Upgrade Project.

1.4 PROJECT OBJECTIVES

Specific project objectives were developed for the Woolgoolga to Ballina Pacific Highway Upgrade within Section 3.2 of the W2B EIS which align with the overarching Pacific Highway Upgrade program objectives. The project objectives that are relevant to the proposed modification are:

- Integrate environmental, social and economic considerations into project planning and assessment
- Provide the best outcomes, taking into account the balance of environmental, social and economic factors
- Provide a strategy for staging the delivery of the project in accordance with upgrade need and availability of funding

2 DESCRIPTION OF THE PROPOSED MODIFICATION

This modification to the Approved Project seeks planning approval for the temporary use of the Moonimba Borrow Site to extract and supply one million tonnes of material per annum (approximately 400,000 cubic metres) for the construction of the Woolgoolga to Ballina Pacific Highway over approximately two years or until the material demand for the project ceases. This would provide two million tonnes of material in total which would meet the deficit of material in demand for the delivery of the Approved Project.

2.1 LOCALITY AND ENVIRONMENT

The Moonimba Borrow Site is positioned north-west of the township of Woodburn within the Richmond Valley Council local government area, located approximately 15 kilometres from the approved Woolgoolga to Ballina Pacific Highway upgrade (Portion C), refer to Figure 2-1. The site is accessed through the use of local roads including Woodburn-Coraki Road, Reardons Lane and Boggy Creek Road. The borrow site is located within the existing Moonimba Quarry on Lot 193 DP755603. The surrounding areas located on the lower slopes of the Moonimba Ridge are comprised primarily of rural agricultural land and rural residential properties. The closest residential sensitive receiver is located more than 600 metres from the excavation area.

The borrow site is located on the top of the Moonimba Ridge, a prominent landform in the area consisting of Kangaroo Creek Sandstone formed during the Cretaceous Period. The Moonimba Ridge is heavily vegetated and is characterised by a rising elevation from north to south and from west to east with steep slopes on the south-eastern sides (Moonimba Quarry EIS, 2014). The land on which the borrow site is located (Lot 193 DP755603) occupies a large portion of the Moonimba Ridge, excluding the steeper eastern and southern slopes and the ridge's lower elevations. The elevated position of the borrow site and densely vegetated surrounds act as natural buffers which provide a visual screen to the operations within the site (Moonimba Quarry EIS, 2014). The surrounding floodplains to the east, north and north-west of the site have been cleared for approximately 100 to 130 years and are currently used for a range of commercial agricultural businesses. Cattle grazing is a common agricultural use in the area as well as the farming of a number of crops including sugar cane, soy beans and melaleuca shrubs that produce tea-tree oil (Moonimba Quarry EIS, 2014).

2.2 PROPOSED MODIFICATION

The proposed Moonimba Borrow Site consists of:

- Two excavation areas, known as the eastern pit (13 hectares (ha)) and the western pit (8 ha)
- An access track leading from Boggy Creek Road to the two excavation areas
- Associated infrastructure including a site office and staff amenities located adjacent to the access track to the north of the two excavation areas
- Clearing of approximately 9.5 ha of vegetation within the footprint of the excavation areas .

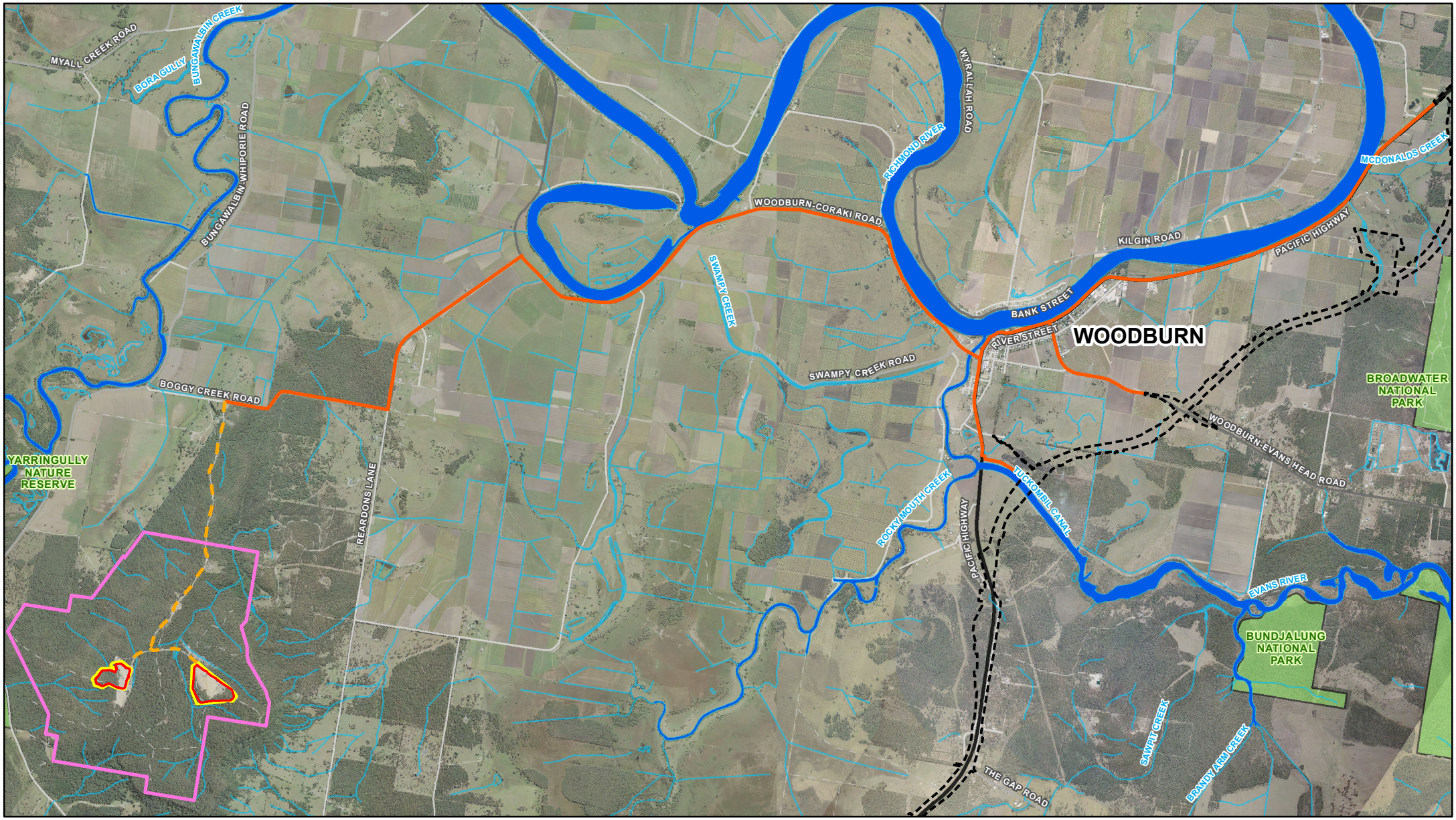
Figure 2-2 provides an indicative layout of the Moonimba Borrow Site.

The material to be extracted from the site is predominantly Kangaroo Sandstone which would be processed within the excavation areas and subsequently transported to the Approved Project. Materials extracted from the site would be used primarily for the construction of Portion C (Sections 7, 8 & 9) of the Approved Project (and other nearby portions if required, however the materials would not be used for any other projects) and would generally consist of:

- Earth fill
- Material for abutments
- Backfilling material, bedding
- Material for pipe laying

- Scour rock used for the protection of sediments around bridge abutments and piers, and
- Select and verge material for road base.

Pacific Complete would appoint and manage a contractor to operate the Moonimba Borrow Site proposed under this modification. All material extracted under this modification would be supplied to the Woolgoolga to Ballina Pacific Highway Upgrade Project only and not to any other project. Prior to any works occurring at the site the contractor would be required to prepare a Contractor's Construction Environmental Management Plan (CCEMP) in accordance with the approved Woolgoolga to Ballina Pacific Highway Upgrade (sections 3 to 11) Construction Environmental Management Plan (W2B CEMP).



PACIFIC COMPLETE

PACIFIC HIGHWAY UPGRADE

Woolgoolga to Ballina

Moonimba Borrow Site Location

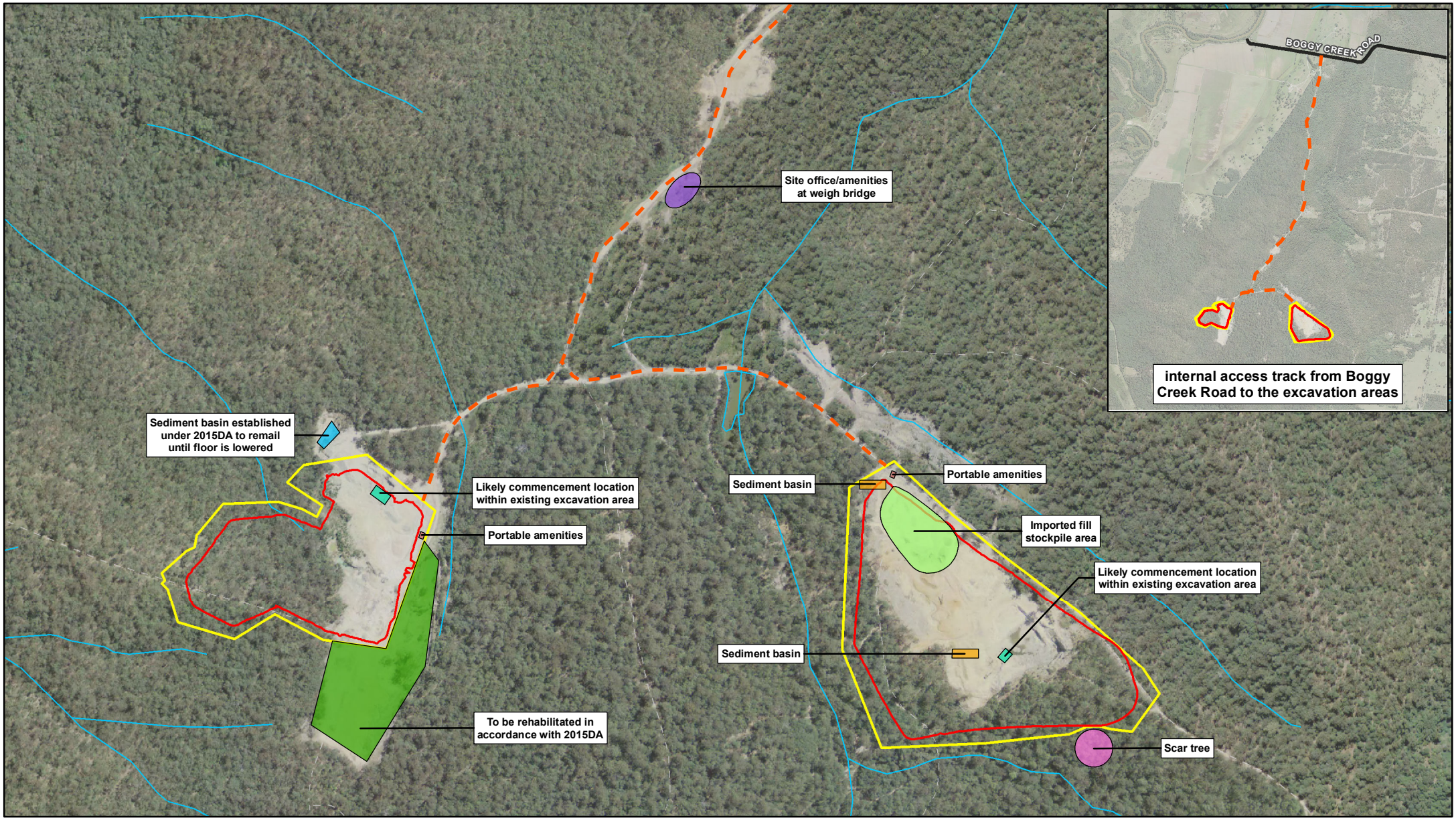
Figure 2-1

- Haulage route
- Internal access track
- Proposed excavation area
- Footprint defined in previous EIS (Novoplan, 2014)
- Borrow site property boundary
- Approved Project Boundary Version 11 (June 2016)
- PrimaryRoad
- ArterialRoad
- SubArterialRoad
- LocalRoad
- Track-Vehicular
- Drainage
- Richmond River
- National Park

1:55,000 at A4

0 350 700 1,400 2,100 Metres

Print Date:	22/05/2017
Author:	GOGANOVSKIM



PACIFIC COMPLETE

PACIFIC HIGHWAY UPGRADE

Woolgoolga to Ballina

Moonimba Borrow Site Layout

Figure 2-2

- Internal access track
- Proposed excavation area
- Footprint defined in previous EIS (Novoplan, 2014)
- Imported fill stockpile area
- Indicative site office/amenities at weigh bridge
- Portable amenities
- Scar tree
- Likely commencement location within existing excavation area
- Sediment basin
- Sediment basin established under 2015DA to remail until floor is lowered
- To be rehabed in accordance with 2015DA prior to use of site
- Track-Vehicular
- Drainage

Note - the location of offices/amenities, sediment basins and starting locations are indicative and may be subject to change

1:8,000 at A4

0 50 100 200 300 Metres

Print Date:	22/05/2017
Author:	GOGANOVSKIM

2.2.1 STAGING

Works associated with the proposed modification would be undertaken in stages visually represented in Figure 2-3. The first stage of works ('enabling works') would be undertaken by the landowner/current operator, whilst Stages 2, 3 and 4 would be undertaken by Pacific Complete and the appointed contractor.

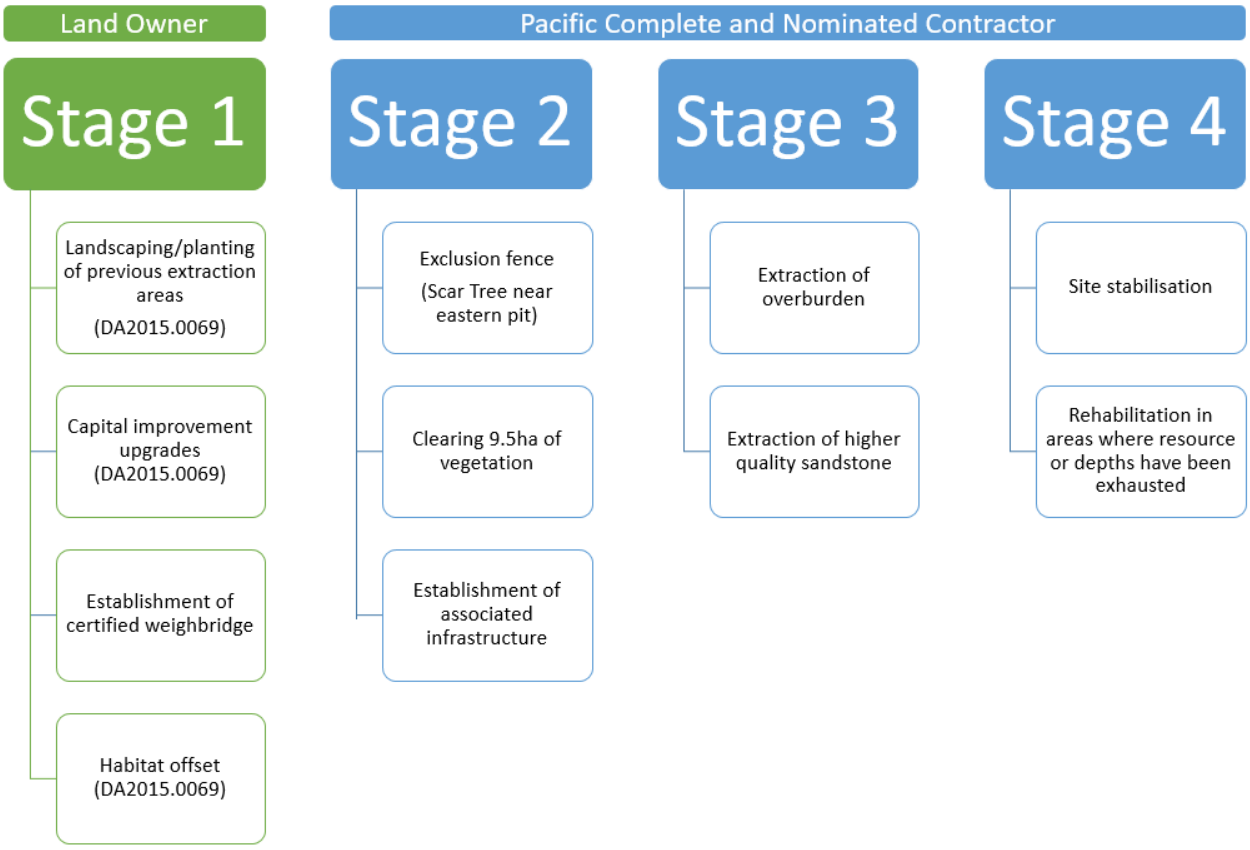


Figure 2-3 Stages of the proposed modification

STAGE 1 – ENABLING WORKS

Works listed within Stage 1 consist primarily of the capital improvement upgrades listed within Development Application No. 2015.0069 (DA2015.0069) (refer to Appendix A) and would be undertaken in accordance with the consent conditions for DA2015.0069 and in consultation with Richmond Valley Council. Capital improvements include road and intersection upgrades to Boggy Creek Road and Reardons Lane, and a noise wall for nearby receiver. It is anticipated that the works within Stage 1 would be completed by the landowner prior to the commencement of site possession by Pacific Complete and the appointed contractor.

In order to prepare the site for operation under the proposed modification, the following works would be undertaken by the landowner prior to site establishment:

- Landscaping and planting of previous extraction areas as shown in Figure 2-2
- Capital improvement upgrades required under DA2015.0069 (refer to Appendix A) including road and intersection upgrades and the installation of a noise wall for a nearby receiver
- Establishment of a certified weighbridge for weighing and recording tonnage of all quarried material
- Habitat offset requirements for proposed clearing, including a legally binding mechanism for the protection in perpetuity of the habitat offset (refer to Section 4.3.5).

STAGE 2 – SITE ESTABLISHMENT AND VEGETATION CLEARING

Prior to the commencement of operations within the site, the following works would be undertaken:

- Establishment of exclusion fencing around the scar tree to the south east of the eastern pit
- Clearing of approximately 9.5 ha of vegetation within the footprint of the excavation areas and within previously approved DA clearing limits
- Establishment of associated infrastructure including a site office and staff amenities located adjacent to the access track to the north of the two excavation areas.

The property boundary is currently accessible via the existing paved access road from Boggy Creek Road, through approximately 1.6 kilometres of unnamed roadway which has been dedicated to the Richmond Valley Council. From the property boundary, an unpaved access road extends for approximately 1.4 kilometres. The access road then forks into two, one leads south-west for approximately 300 metres towards the western pit and the other leads south-east for approximately 600 metres towards the eastern pit. This access route is considered adequate for the increase in haulage vehicle movements therefore no widening would be undertaken.

A temporary site compound and staff amenities would be established adjacent to the access road to the north of the two excavation areas (refer to Figure 2-2). The site compound and staff amenities would be located within a previously cleared area which was identified as a parking area within DA2015.0069. Additional portable amenities (such as ablution blocks or equivalent, etc.) would also be established within both excavation areas. No upgrades to existing utilities (i.e. sewage, power mains, etc) are included under the proposed modification. Indicative locations for these amenities are shown in Figure 2-2.

Clearing would occur within the boundary identified in the Moonimba Quarry Expansion Bungawalbin NSW Environmental Impact Statement (Newman's Quarry & Landscape Supplies, 2014), here on in referred to as the Moonimba Quarry EIS. Clearing works would be undertaken in accordance with the approved Woolgoolga to Ballina Pacific Highway Upgrade (sections 3 to 11) Construction Flora and Fauna Management Plan (CFFMP, Appendix B2 CEMP). Clearing and grubbing may be staged to suit the project's demand for materials. Clearing boundaries would be clearly demarcated prior to the commencement of clearing and grubbing works.

Other site establishment works would include but not be limited to:

- Construction and/or installation of erosion and sediment controls
- Construction and/or installation of sediment basins
- Construction of clean water diversion drains to direct clean water around the site
- Installation of plant and equipment necessary for operations.

STAGE 3 – OPERATION OF THE BORROW SITE

The proposed excavation areas (the eastern and the western pits) would be situated within the same footprint as outlined in the Moonimba Quarry EIS that accompanied DA2015.0069.

The demand for different types of material within the Approved Project would determine the initial excavation location and progression of excavation works. Machinery and equipment would be progressively relocated as excavation works progress within the two excavation areas. Conventional extraction methods would be used within the borrow site which would include (but are not limited to) overburden removal with excavators as well as dozer ripping, hammering, drilling and blasting to fragment the higher strength material. Topsoil, as well as any overburden not required for the Approved Project, would be stripped and stockpiled on the boundary of the excavation areas and used during rehabilitation works.

Depending on the material demands of the project, excavations within the two pits may commence as follows:

- Western pit – In the north-west area of the existing excavation area and continue behind the quarry face towards the west and to the south
- Eastern pit – In the south-east area of the existing excavation area in the existing blast hole.

The proposed final floor level for the western pit. would be approximately 75 metres AHD with sediment basins constructed at approximately 73 metres AHD (maximum). The Proposed final floor level for the eastern pit would be approximately 100 metres AHD with sediment basins constructed at approximately 98 metres AHD (maximum).

It is anticipated that activities within the first year of operation would focus primarily on the removal of overburden and lower strength material that would be used for general fill material. Minimal crushing and screening would be required during this time. The second year would consist of the removal of higher strength sandstone that would require processing (crushing and screening). The second year of operation is therefore anticipated to be the most noise intensive due to the use of crushing and screening plant.

In addition to the extraction of material, excess spoil material from the Approved Project classified as excavated natural material (ENM) or virgin excavated natural material (VENM) may also be imported and stockpiled at the site. As shown in Figure 2-2 the northern portion of the eastern pit would be designated as the stockpile location for imported fill material. This material would be stockpiled and utilised during the rehabilitation of the site where suitable. It is estimated that up to 30,000 cubic metres of material would be imported to the site per annum from the Approved Project. The importation of fill material would utilise the same access route as the excavated material.

STAGE 4 – DECOMMISSIONING AND REHABILITATION

Once the material required for the Approved Project has been extracted, the site would be stabilised and surrendered to the landowner in a similar or better condition as described at commencement of the lease agreement which would be facilitated by a pre-construction land condition assessment. The site rehabilitation would be agreed/ approved by the owner and relevant agencies. The site compound and staff amenities would be decommissioned and removed from the site along with plant and equipment used for material extraction.

Sections of the site would be rehabilitated if the resource has been exhausted or excavation depth has been reached, in consultation with the landowner. If the resource has not been exhausted, the excavation areas (including the floor of the excavation areas) would remain exposed for future extraction activities by the landowner. Exposed areas (including, but not limited to batters) would be stabilised and sediment basins would remain at the site to ensure no impacts would occur to the surrounding environment.

Any rehabilitation works at the site would generally follow the approach outlined under the Moonimba Quarry EIS and the associated Operation Plan of Management (Greg Alderson & Associates, 2014) to keep the rehabilitation works at the site consistent.

2.2.2 MATERIAL HAULAGE

The proposed haulage route used to transport material to the Approved Project is shown in Figure 2-1. The extracted material would be hauled along the internal haulage route to the intersection with Boggy Creek Road. Haulage vehicles would then travel east along Boggy Creek Road, then north along Reardons Lane to the intersection with Woodburn-Coraki Road. Vehicles would then travel east along Woodburn-Coraki Road to the intersection with the Pacific Highway where vehicles would then travel north or south along the Pacific Highway before entering the Approved Project boundary for stockpiling or immediate use. A more detailed explanation of the material haulage route, the predicted traffic to be generated from the site and the associated impacts to the local road network is outlined in Section 4.1.

2.2.3 LENGTH OF OPERATION AND PROPOSED HOURS OF OPERATION

It is proposed to operate the Moonimba Borrow Site for approximately two years to extract two million tonnes of material required to meet the material deficit within Sections 7, 8 and 9 of the Approved Project.

The borrow site would operate under the construction hours outlined in conditions B15 and B16 of the Minister's Conditions of Approval for the Approved Project (SSI-4963). In accordance with condition B15, construction activities associated with the SSI shall be undertaken during the following standard construction hours:

- Monday to Friday: 7am to 6pm
- Saturday: 8am to 5pm
- At no times on Sunday and Public Holidays.

In accordance with condition B16 (d), activities and works may also be carried out between Monday to Friday: 6am to 7am and 6pm to 7pm in sparsely populated areas.

Work within the site would not be undertaken outside of the Approved Project construction hours unless required as listed under B16 or where an out of hours works permit has been approved by the Environmental Representative.

In accordance with condition B21, blasting activities associated with the Approved Project shall only be undertaken during the following hours:

- 9:00am to 5:00pm, Monday to Friday, inclusive
- 9:00am to 1:00pm on Saturdays
- At no time on Sunday or public holidays.

Blasting may occur outside the above hours and in accordance with the standard construction hours where:

- No sensitive receivers in sparsely populated areas would be impacted by blasting
- An agreement has been made with receivers within 200 metres of the blast zone to permit blasting in accordance with the standard construction hours.

This condition does not apply in the event of a direction from the NSW Police Force or other relevant authority for safety or emergency reasons to avoid loss of life, property loss and/or to prevent environmental harm.

2.3 HISTORICAL OPERATIONS OF THE SITE

Mining Leases have previously existed on the Moonimba Borrow Site, dating to as far back as 1891 according to 1914 Parish maps (Moonimba Quarry EIS, 2014). A Statement of Environmental Effects (SEE) prepared in support of Development Application No. 127/95 indicated that extraction of material commenced at the borrow site in 1960, with the main users from that time being the Department of Main Roads, Woodburn Shire Council and the local community. The SEE estimated that approximately 20,000 m^3 were extracted from Robinson's Quarry between 1960 and 1994.

The mining operations commenced before the first planning controls were introduced on the land under Interim Development Order (IDO) No. 1 - Shire of Woodburn on 13 February 1970.

According to the above-mentioned SEE, Robinson's Quarry, a previous name of the Moonimba Borrow Site, was registered under SEPP 37 (repealed) soon after the SEPP commenced in June 1993, with an extraction limit of 3,000 m3 annually.

2.4 PREVIOUS DEVELOPMENT CONSENT

2.4.1 DEVELOPMENT APPLICATION NO. 127/95 (DA127/95)

Initial development consent to operate a gravel, sand and sandstone extractive industry within Lot 193, DP 755603, Bungawalbin-Whiporie Road, Bungawalbin, Parish of Bungawalbin was granted by Richmond River Shire Council on 19th February 1997 (DA 127/95). The conditions of the development consent are presented in Appendix B.

DA127/95 granted consent for the extraction of a maximum of 30,000m^3 per year. The consent contained 27 conditions of approval for the development including a limitation on the maximum extraction rate of 30,000 m^3 per annum, and did not allow fill importation without further consent. Other key conditions included (but were not limited to):

- Requirement for a formalised access to be constructed and dedicated to Council to provide access from Boggy Creek Road through Crown land to Lot 193 and the quarry operation. The access would facilitate transport of equipment and materials to and from the quarry. The road was to be constructed and maintained at the cost of the applicant and was to be built to Council standard
- Requirements for other road and intersection works to be carried out on Boggy Creek Road, Readons Lane, Whiporie Road, and Woodburn-Coraki Road.
- The applicant/operator was required to pay an annual road improvement and maintenance levy based on the amount (in tonnes) of material hauled from the site

2.4.2 DEVELOPMENT APPLICATION NO. 2015.0069 (DA2015.0069)

Development Application No. 2015.0069 (DA2015.0069) and the accompanying *Moonimba Quarry Expansion Bungawalbin NSW Environmental Impact Statement* (Newman's Quarry & Landscape Supplies, 2014) (Moonimba Quarry EIS) were submitted to Richmond Valley Council for consideration in September 2014. The application was referred to the Northern Joint Regional Planning Panel pursuant to Clause 8(a) Schedule 4A of the *Environmental Planning and Assessment Act 1979*. The development was classified as Designated Development being an Extractive Industry that obtains or processes for sale more than 30,000 m^3 per annum, or that will disturb a significant area greater than two hectares pursuant to Clause 19, Schedule 3 of the *Environmental Planning and Assessment Regulation 2000*.

The proposal included (but was not limited to):

- An increase of the approved annual extraction maximum of sandstone material from 30,000 to 90,000 cubic metres (equivalent by weight to approximately 193,000 tonnes)
- Extraction that would occur within two areas called the western pit (8 hectares) and eastern pit (13 hectares). Together the sites cover a surface area of 21 hectares with depths of extraction extending to approximately 100 metres AHD for the eastern pit and 75 metres AHD for the western pit and sediment basins extending an additional two metres below the proposed finished floor levels
- Volume of the total resource under the application is calculated as 2.4 million cubic metres or 4.92 million tonnes over a 25 year life span (based on 2.1 tonnes per cubic metre for sandstone and 1.6 tonnes per cubic metre for sand)
- Importation of fill at a maximum rate of 30,000 cubic metres per annum for use in site rehabilitation. Fill availability and import activities would cease on completion of the Pacific Highway Upgrade project.

Development consent was granted in May 2015, with 34 conditions of approval, however this consent has not been activated and therefore, works have not commenced under this consent.

2.5 JUSTIFICATION

The W2B EIS discusses the earthworks balance for the overall project and identifies that the key sources of material would be major cuttings or borrow sites along the project alignment. Four borrow sites were identified in the W2B EIS and/or the Submissions/Preferred Infrastructure Report (SPIR) to provide material for the construction of the project. These sites include Lang Hill, Lumleys Hill, Gibsons and Eatons. Three of the four sites (Lumleys Hill, Gibsons and Eatons) are unable to provide material to Portion C as the Richmond River Bridge would not be constructed prior to when the material is required. Lumleys Hill and Gibsons Borrow Sites have also been identified to supply material to Portion D of the Approved Project.

The W2B EIS outlines the potential to develop additional borrow sites near the project if there are any shortfalls of material.

> *"…the priority would be to obtain material from nearby road projects and licensed quarries.. If nearby road projects and quarries are not able to supply the material within the timeframe, or have the quantity required, other material sources near the project would be investigated. Any material source areas would need to be:*
>
> - *More than 40 metres from waterways*
> - *Of low ecological and heritage value*
> - *Greater than 100 metres from the closest receiver (unless a negotiated agreement is in place.)"*

The borrow sites identified in the W2B EIS and SPIR have been included in the overall earthworks balance for the project. The current earthworks balance for the project identifies a large deficit of material in Portion C, therefore the required material cannot be sourced from within the project boundary and would be required to be imported from external quarries or other borrow sites near the project.

Section 6.4.1 of the W2B EIS outlines local quarries that could supply material to the project. The quarry at Moonimba Borrow Site was identified as a potential source of material under the name of Robinsons Pit, a previous name of the quarry property.

Roads and Maritime has entered into a lease agreement with the landowner to extract the required material for the project. The approval to temporarily increase the extraction rate to one million tonnes of material per annum would alleviate the deficit in material and allow for the delivery of the project in line with the current programming and staging required to meet Roads and Maritime proposed completion dates of the project. The proposed modification involves the increased extraction of material at an existing quarry site, therefore it is anticipated that the impacts would be less than those associated with the establishment of a new borrow site.

As the project is publicly funded, Roads and Maritime is committed to providing public value for money for the design, construction and operation of the Woolgoolga to Ballina Pacific Highway Upgrade. Increasing the extraction rate at the site would allow for the reduced unit cost of material due to economies of scale.

Other local quarries within the area have been identified as potential alternative sources of material for the project, however they are located further from the project alignment and do not possess the types and quantities of material necessary to fill the deficit of material in Portion C. Sourcing the required material from the Moonimba Borrow Site would reduce the distance travelled by haulage vehicles travelling to and from the alignment which would decrease the potential impacts to the wider local road network, increase safety for local residents, and provide project efficiency.

Sourcing the required material from Moonimba Borrow Site could also reduce the project's dependence on smaller quarries whose resources and/or annual extraction limits could be depleted by providing material to the project. This would reduce the amount of available material for other local projects and independent buyers in the region. Additionally, this could inadvertently encourage quarries to exceed their extraction limits in order to meet the demands of the project and their other clients.

Sourcing material from one central location also allows for a number of additional benefits including:

- Localising the impacts of haulage movements to a singular haulage route whilst reducing the number of local roads required to haul material to the project corridor
- Allowing for the more stringent control of one haulage route, increasing safety along local roads affected by the project
- Allowing for the borrow site and haulage route to be operated under the Woolgoolga to Ballina Pacific Highway Upgrade project approval and the approved Woolgoolga to Ballina Pacific Highway Upgrade (sections 3 - 11) Construction Environmental Management Plan (CEMP).

Without the proposed modification, the project could result in a number of impacts including (but not limited to):

- The need to source material from further distances, increasing congestion and the likelihood of vehicle accidents on the local road network
- Impacts to the wider local road network resulting in additional impacts to townships/villages
- An increased cost for sourcing material, resulting in an increase in capital expenditure for the project
- Additional strain could be placed on smaller local quarries impacting the supply of available material for local projects.

3 LEGISLATIVE AND PLANNING FRAMEWORK

3.1 NSW *ENVIRONMENTAL PLANNING & ASSESSMENT ACT 1979* (EP&A ACT)

3.1.1 APPROVED PROJECT CONTEXT

An environmental impact statement was required for the project when Roads and Maritime Services formed the opinion that the project would be likely to significantly impact on biodiversity, Aboriginal heritage and hydrology. An application was made to the Minister for Planning and Infrastructure for the project to be approved under Part 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Subsequently the project was declared as critical State Significant Infrastructure under section 115V of the EP&A Act, by virtue of clause 16 and Schedule 5, clause 1(c) of State Environmental Planning Policy (State and Regional Development) 2011, as it is considered to be essential for the State for economic, environmental or social reasons.

In accordance with clause 16 of State Environmental Planning Policy (State and Regional Development) 2011, the project is also State Significant Infrastructure under section 115U of the EP&A Act and is permissible without consent under Part 4 of the EP&A Act. The project was therefore assessed under Part 5.1 of the EP&A Act.

On 23 November 2011, the Director-General of the Department of Planning and Infrastructure notified Roads and Maritime Services of the environmental assessment requirements for preparation of an environmental impact statement (EIS) by (or on behalf of) Roads and Maritime Services. The Director-General of the Department of Planning and Infrastructure issued supplementary environmental assessment requirements from the Commonwealth Department of Sustainability, Environment, Water, Population (now the Department of the Environment and Energy) on 11 July 2012 following consultation.

The W2B EIS was publically displayed for 60 days between December 2012 and February 2013, inclusively. The exhibition generated 145 submissions which were responded to in the Pacific Highway Upgrade: Woolgoolga to Ballina Submissions / Preferred Infrastructure Report (SPIR) issued in November 2013. The Woolgoolga to Ballina Pacific Highway Upgrade Project (excluding the proposed modification) was approved on 24 June 2014 by the Minister for Planning subject to the Minister's conditions of approval (MCoA). Any refinements to the project which are not consistent with the Approved Project must be approved by the Minister under Section 115ZI(2) of the EP&A Act.

Two modifications to the conditions of approval have been requested and approved and included the following:

1. Modification of Conditions of Approval 15 January 2015 – SSI 4963 Modification 1: Minor amendment to the definition of construction and updating of the public authority references
2. Modification of Conditions of Approval 7 October 2015 - SSI 4963 Modification 2: Amendment to capture additional works outside the project boundary that may impact on heritage items to require archaeological investigations and conditions of approval.

A third modification has been submitted to the Department of Planning and Environment for consideration for works near Glenugie, in Portion A of the project.

3.1.2 PROPOSED MODIFICATION

Roads and Maritime considers that the proposed modification outlined in this environmental assessment is not consistent with the approval for the Woolgoolga to Ballina Pacific Highway Upgrade Project. Accordingly, Roads and Maritime seeks a modification of the Minister's approval under Section 115ZI of the EP&A Act.

This modification to the Approved Project has been prepared for the purposes of seeking approval for the use of the Moonimba Borrow Site as a modification to the Woolgoolga to Ballina Pacific Highway Upgrade Project.

3.2 COMMONWEALTH *ENVIRONMENTAL PROTECTION AND BIODIVERSITY CONSERVATION ACT 1997* (EPBC ACT)

The Woolgoolga to Ballina Project was referred to the Commonwealth Minister for the Environment in accordance with the requirements of the *Environmental Protection and Biodiversity Conservation Act 1997* (EPBC Act). The Minister's decision (2012/6394) was received on 14 August 2014 subject to a number of conditions being met. There have been no modifications of the approval since the decision was received.

An Ecological survey has been undertaken within the proposed Moonimba Borrow Site which has confirmed the vegetation types and habitat potential for fauna and did not identify the presence of an EPBC listed community or species, refer to Section 4.3. An additional referral under the EPBC Act is therefore not necessary for the proposed modification.

3.3 ENVIRONMENTAL PLANNING INSTRUMENTS

Under section 115ZF(2), Part 5.1 of the EP&A Act, environmental planning instruments do not apply to State significant infrastructure except for the declaration of infrastructure as State significant infrastructure or as critical State significant infrastructure. Therefore, the following State environmental planning policies (SEPPs) and local environmental plans (LEPs), which may have otherwise applied, do not apply to the Approved Project and, subsequently, this modification:

- SEPP No. 14 – Coastal Wetlands
- SEPP No. 26 – Littoral Rainforests
- SEPP No. 44 – Koala Habitat Protection
- SEPP No. 55 – Remediation of Land
- SEPP No. 71 – Coastal Protection
- North Coast Regional Environmental Plan (a deemed SEPP)
- Richmond Valley LEP 2012

Each of these instruments and their purposes is provided below.

SEPP No. 14 – Coastal Wetlands

State Environmental Planning Policy No. 14 – Coastal Wetlands aims to ensure that coastal wetlands are preserved and protected in environmental and economic interests of the state

There are no previously identified SEPP No. 14 – Coastal Wetlands or nationally important wetlands in the vicinity of the proposed Modification.

SEPP No. 26 – Littoral Rainforests

SEPP Environmental Planning Policy No. 26 – Littoral Rainforests provides a mechanism for the consideration of applications for development that are likely to damage or destroy littoral rainforest areas with a view to the preservation of those areas in their natural state. The SEPP also applies to land within 100 metres of the boundary of a SEPP 14 wetland.

There are no previously identified littoral rainforests identified in the vicinity of the proposed Modification.

SEPP No. 44 – Koala Habitat Protection

State Environmental Planning Policy No. 44 – Koala Habitat Protection aims to encourage the proper conservation and management of natural Koala habitat to ensure that there is a permanent free-living population throughout their present range and to reverse the current trend of population decline. SEPP No. 44 does not apply to the Project, however Roads and Maritime has adopted a similar approach to assessing koala habitat as described under SEPP No. 44.

There are no areas of previously assessed koala habitat within the footprint of or in the immediate vicinity of the proposed Modification.

SEPP No. 55 – Remediation of Land

The aims and objectives of State Environmental Planning Policy No. 55 – Remediation of Land are to provide a state-wide planning approach to contaminated land remediation. It also promotes the remediation of contaminated land.

Richmond Valley LEP 2012

The Richmond Valley Local Environment Plan 2012 was gazetted in March 2012. The provisions of the new Local Environment Plan commenced on 21 April 2012. The Richmond River plan aims to ensure adequate land is available in suitable locations for the needs of a range of beneficial and appropriate land uses.

3.4 OTHER ENVIRONMENTAL LEGISLATION

A number of approvals that generally apply under other NSW legislation are not required for State significant infrastructure approved under Part 5.1 of the EP&A Act (EP&A Act s.115ZG). A full list of exemptions is presented in Section 2.3 of Chapter 2 – Assessment Process within the Woolgoolga to Ballina Pacific Highway Upgrade Environmental Impact Statement (RMS, 2012).

- Exemptions potentially relevant to the proposed modification include:
- An approval under Part 4, or an excavation permit under section 139, of the *Heritage Act 1977*
- Part 6 (division 8) of the *Heritage Act 1977*, does not apply to, prevent, or interfere with the carrying out of approved State significant infrastructure
- An Aboriginal heritage impact permit under section 90 of the *National Parks and Wildlife Act 1974*
- An authorisation referred to in section 12 of the *Native Vegetation Act 2003* (or under any Act repealed by that Act) to clear native vegetation or State protected land
- A bushfire safety authority under section 100B of the *Rural Fires Act 1997*
- A water use approval under section 89, a water management work approval under section 90 of an activity approval (other than an aquifer interference approval) under section 91 of the *Water Management Act 2000*.

Approvals under other NSW legislation may apply to the project including:

- An environmental protection licence for road construction under Chapter 3 of the *Protection of the Environment Operations Act 1997*. In accordance with section 115ZH of the EP&A Act, such a licence cannot be refused for an Approved Project and is substantially consistent with the Part 5.1 approval.
- An approval under the *Crown Lands Act 1989* to grant a relevant interest (i.e. licence, permit, easement or right of way) over a Crown Reserve.

Other legislation may apply to the proposed modification including:

- *Native Title (New South Wales) Act 1994*: This applies to the project on land affected by native title claim in NSW. The Act requires notification to native title claimants affected by the project alignment

- *Native Title Act* (Commonwealth): The main objective of the Act is to recognise and protect native title claim in NSW. The Act requires notification to native title claimants affected by the project alignment.
- *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (Commonwealth): The main objective of this Act is to protect and preserve places, areas and objects of Aboriginal cultural significance. In situations where traditional Aboriginal cultural heritage may be at risk, the Aboriginal community has the right to ask to ask the Minister to intervene. The Minister may make declarations which can override approvals and stop activities.

Due to the Approved Project (and therefore the proposed modification) being declared critical State significant infrastructure, the following directions, orders or notices cannot be made so as to prevent or interfere with the carrying out of the approved critical State significant infrastructure (EP&A Act s. 115ZG(3)):

- An interim protection order (within the meaning of the *National Parks and Wildlife Act 1974* or the *Threatened Species Conservation Act 1995*)
- An order under Division 1 (Stop work orders) of Part 6A of the *National Parks and Wildlife Act 1974*, Division 1 (Stop work orders) of Park 7 of the *Threatened Species Conservation Act 1995* or Division 7 (Stop work orders) of Part 7A of the *Fisheries Management Act 1994*
- A remediation direction under Division 3 of Part 6A of the *National Parks and Wildlife Act 1974*
- An environmental protection notice under Chapter 4 of the *Protection of the Environment Operations Act 1997*
- An order under section 124 of the *Local Government Act 1993*.

In addition, certain third party appeal provisions do not apply (EP&A Act s.115ZK).

4 ENVIRONMENTAL ASSESSMENT

4.1 TRAFFIC, TRANSPORTATION AND ACCESS

4.1.1 INTRODUCTION

This section considers the potential traffic and transport impacts that may result from the Moonimba Borrow Site. Impacts to traffic and transport for the Approved Project were discussed in Chapter 14 of the Woolgoolga to Ballina Pacific Highway Upgrade Environmental Impact Statement (W2B EIS) (RMS, December 2012) and Section 5.6 of the Moonimba Quarry Expansion Environmental Impact Statement (Moonimba Quarry EIS, 2014).

By reviewing and utilising the Transport and Traffic Impact Assessment prepared by Greg Alderson & Associates (2014) for the Moonimba Quarry EIS, Pacific Complete has prepared a traffic impact assessment (TIA) as part of the proposed modification, refer to Appendix C.

4.1.2 METHODOLOGY

A Traffic Impact Assessment (TIA) was prepared to explore the implications of increasing haulage and heavy vehicle activity associated with the proposed modification with respect to road performance, general traffic operation, school bus routes and land uses both current and future. The proposed modification is anticipated to affect local road network performance within Woodburn and Bungawalbin.

As part of the Moonimba Quarry EIS, associated with DA2015.0069, a Traffic and Transport Impact Assessment (Moonimba Quarry TTIA) was prepared by Greg Alderson & Associates in 2014. The Moonimba Quarry TTIA has been utilised in preparing this TIA for the proposed modification.

For the purpose of this TIA, the following assumptions were made:

- Traffic volumes calculated within the TTIA (Greg Alderson & Associates, 2014) would be utilised and conservatively grown at 2% per annum, to account for future traffic volumes within Woodburn. Despite the anticipated drop in vehicles using the Pacific Highway following the completion of the W2B upgrade, this growth would ensure a worst-cast scenario analysis.
- The Pacific Highway is capable of servicing increases in the proportion of heavy vehicles.
- As stipulated within Richmond Valley Council's approval (DA 2015/0069), upgrades and maintenance of the haulage route are to be carried out by the owner of the borrow site prior to Pacific Complete occupation of the borrow site.
- Increased traffic volumes have been assumed to be split through the network; based on land usage, points of interest and dominant directions of traffic flow.
- The results and future impacts from the TTIA (Greg Alderson and Associates, 2014) would be used as the basis for further mitigation measures and strategies.
- A Road Safety Audit (RSA) would not be performed as the results from the RSA undertaken for the TTIA (Greg Alderson and Associates, 2014) remain relevant and applicable to the haulage route for the proposed modification.
- Potential upgrades to the haulage route have been considered by Richmond Valley Council. It has been acknowledged that the severe storm events within the region warrant adequate maintenance and upgrade of the haulage route, particularly Woodburn-Coraki Road.
- This TIA focuses on the impacts generated by traffic associated with the proposed modification.

4.1.3 EXISTING ENVIRONMENT

STUDY AREA

The Moonimba Borrow Site is situated approximately 16 kilometres south-west of Woodburn, NSW. The borrow site is currently accessed by Boggy Creek Road which joins with Reardons Lane approximately 3 kilometres east of the site and adjacent to a residential property (Lot 2 DP 805371). The first 300 metres of the borrow site access road is sealed so as to minimise potential noise and dust impacts to residents.

The existing haulage route passes through eight intersections on the approach to the Pacific Highway at Woodburn. The major intersections that have been examined for the purpose of the assessment include:

- Pacific Highway (River Street) and Woodburn-Coraki Road
- Reardons Lane and Woodburn-Coraki Road
- Site access road and Boggy Creek Road.

Land uses surrounding the borrow site consist predominantly of agricultural and rural residential land. Within the Bungawalbin region, the main land use activity is agriculture and nature reserves. The TTIA (Greg Alderson & Associates, 2014 for DA2015.0069) forecasted that an additional 84 residential lots are to be released/developed by 2024.

SCHOOLS AND SCHOOL BUS ROUTES

The following schools are located within the Woodburn-Coraki-Broadwater area:

- St Joseph's Woodburn Primary School
- St Joseph's Coraki Primary School
- Woodburn Public School
- Evans River K-12 School
- Coraki Public School
- Broadwater Public School.

Year to year bus routes are susceptible to change, depending on student enrolments and the proximity of schools to residents. As such, bus routes or graphical representations of the bus corridors are not available. However, bus routes and timetables are publicly available. Table 4-1 summarises the number of buses operating along the haulage corridor, during the morning and afternoon school peaks which are defined as 7.00 am to 9.00 am and 2.55 pm and 5.00 pm respectively.

Table 4-1 Over-lapping haulage and bus routes

Bus routes	Suburb	Street	Number of buses (pm)	Number of buses (pm)
Locality	Bungawalbin	Boggy Creek Road	8	7
		Reardons Lane	10	7
	Woodburn	Woodburn-Coraki Road	7	7
		Pacific Highway	20	20

Following a high level assessment, bus routes and roads used in the local area were identified as follows:

- Local roads:
  - Boggy Creek Road, Reardons Lane and Woodburn-Coraki Road support approximately 4-5 buses per hour during the morning and afternoon school peaks
- Pacific Highway services:
  - Buses transport students to schools north and south of the study area
  - Bus frequency is about 10 buses per hour during the morning and afternoon school peaks.

RESIDENCES AND BUSINESSES

The current haulage route used by the existing operation overlaps most of Woodburn's residential access along the Pacific Highway. The Woodburn-Coraki Road and Pacific Highway intersection is the focal point within the study area servicing schools, residents and businesses.

ROAD CAPACITY AND TRAFFIC COUNTS

At the time that the TIA was prepared, existing road quality and capacity are assumed to be as presented in Table 4-2. Provisions in the DA2015.0069 require upgrades to haulage routes and intersections which would be undertaken prior to the commencement of any haulage for the modification – refer section 4.1.5 for further details of this mitigation.

Table 4-2 Average traffic volumes (2014)

Location	Daily traffic (Vehicles per day - vpd)	Peak hourly volumes (Vehicles per hour - vph)
Reardons Lane	220	25
Woodburn-Coraki Road	1,397	133
Boggy Creek Road	132	<10
Site Access Road	30	

Source: Greg Alderson and Associates (2014)

HAULAGE OPERATIONS AND SITE ACCESS

The existing entrance for the Moonimba Borrow Site is located on Boggy Creek Road approximately two kilometres west of the intersection with Reardons Lane. It is noted that the first 300 metres of the site access road has been sealed. The TTIA (2014) indicated that the site access road incurs 30 truckloads per day. Following the DA2015.0069 approval (for 90,000 cubic metres per annum), it was forecasted that 40 trucks movements per day, plus an additional 14 backfill trucks per day would meet the yearly demand, thus resulting in 54 movements per day.

In conjunction with the Moonimba Borrow Site operation, Coraki Quarry and Champions Quarry are operating within the study area. The Coraki Quarry currently has approval to dispatch 21 trucks per hour between 7.00 am and 6.00 pm. It should be noted that Coraki Quarry has recently applied for approval to dispatch 31 truckloads per hour in order to facilitate the supply of material to the upgrade of the Pacific Highway. Furthermore, there is an additional 'private' quarry known as 'Petersons Quarry' within the Coraki complex, which generates minor traffic movements along the Coraki Quarry haulage route. The haulage route for Coraki Quarry is along Woodburn-Coraki Road towards the Pacific Highway. There is approximately six kilometres of Woodburn-Coraki Road where haulage vehicles from Coraki/Petersons Quarry and Moonimba Quarry overlap. For this assessment, these volumes have been considered as a cumulative impact with the Moonimba Borrow Site.

Champions Quarry, which is situated in Tuckarimba, north-west of Woodburn, contributes 11 to 30 trucks per day, with restrictions to operate between 7.00 am and 5.30 pm. The identified haulage route for this site, is via the Bruxner Highway for deliveries to Lismore, with the preferred access to the Pacific Highway via

Wyrallah Road. The indicative traffic impacts of haulage operations from Champions quarry, are wholly restricted to Wyrallah Road and the Pacific Highway. Therefore the Moonimba Borrow Site haulage route does not incur any cumulative impacts from the operation of Champions Quarry.

Figure 4-1 illustrates the location of Peters/Coraki Quarries and Champions Quarry and their respective haulage routes.

4.1.4 IMPACT ASSESSMENT

PROPOSED HAULAGE OPERATIONS

It is proposed to increase the maximum annual extraction rate of the Moonimba Borrow Site to one million tonnes per annum. The borrow site is proposed to operate six days per week (7 am to 6 pm weekdays and 8 am to 5 pm on Saturdays). The TIA undertaken to support the proposed modification identified an operational threshold of 300 truck movements per day or 33 movements per hour (16 vehicles per hour) and has been considered to account for increases in construction demands. The average number of heavy vehicle movements per day would range between 230 and 250.

Four roads have been identified within the proposed haulage route including Reardon's Lane, Boggy Creek Road, Woodburn-Coraki Road and the existing Pacific Highway. The existing Pacific Highway was identified within the W2B EIS as a haulage route to be used throughout the duration of construction. The other three roads were not identified within the W2B EIS as haulage routes. However, the haulage route proposed is similar to the existing haulage route being used by the existing Moonimba Quarry, as well as the nearby Coraki Quarry. Once on the Pacific Highway, haulage vehicles are anticipated to access the construction corridor via a number of local roads including: Watsons Lane and Alfred Street (that lead into Wagner Street and then onto Woodburn-Evans Head Road). These roads were identified in Section 6.6.1 of the W2B EIS as local roads that could potentially be used for construction access or haulage routes. The impacts to these local roads have not been considered as part of this modification as they have already been addressed within the W2B EIS for the delivery of material to the construction corridor.

The proposed haulage route is inconsistent with the haulage routes identified within the W2B EIS and would result in additional impacts to Reardon's Lane, Boggy Creek Road and Woodburn-Coraki Road throughout the duration of the proposed increase in annual extraction from the Moonimba Borrow Site.

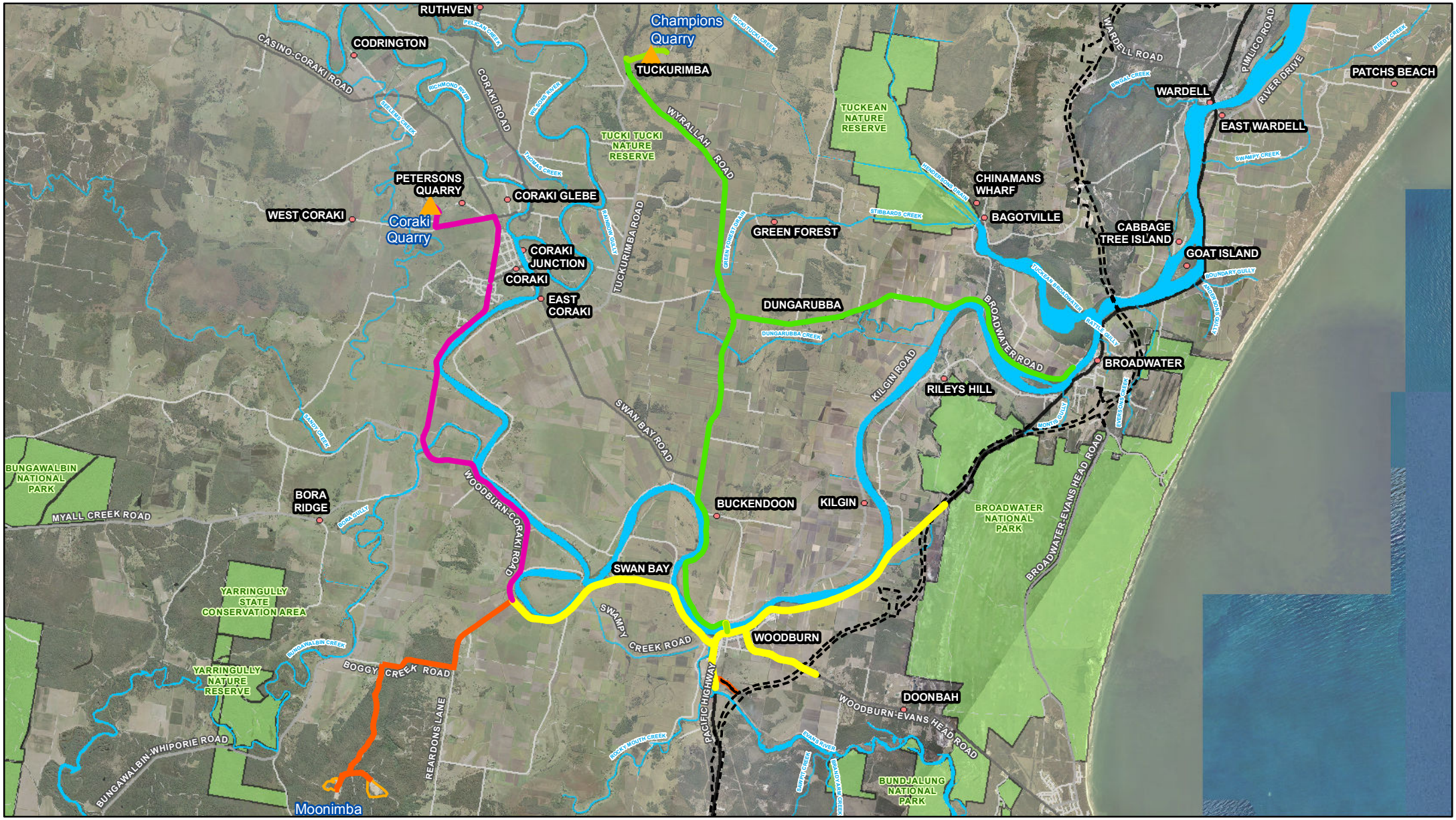
INTERSECTION IMPACTS

Three intersections have been identified within the TIA which would be impacted throughout the duration of operations under the proposed modification including:

- Site Access / Boggy Creek Road,
- Reardon's Lane / Woodburn – Coraki Road, and
- Woodburn – Coraki Road / Pacific Highway.

Based on the assumption that the road upgrades specified by approved DA2015.0069 have been completed prior to commencement of haulage for the modification, Boggy Creek Road, Reardons Lane and the borrow site access road would provide adequate capacity to service the one million tonnes per annum (400,000 m^3 per annum) extraction and associated backfill vehicle movements.

Of the three intersections identified, the intersection between Woodburn-Coraki Road and the Pacific Highway is the most critical. The resulting increase in traffic associated with the proposed increase in extraction of material from the borrow site would necessitate a right-turn treatment on the Pacific Highway, for vehicles to safely and efficiently access Woodburn-Coraki Road. The appropriate treatment is a channelised right-turn bay on the Pacific Highway, southbound, as shown in Figure 4-2.



PACIFIC COMPLETE

PACIFIC HIGHWAY UPGRADE

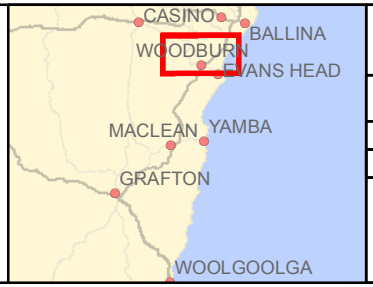
Woolgoolga to Ballina

Moonimba, Coraki & Champions Quarry Haulage Routes

Figure 4-1

- AOI Quarries (Excluding Moorinmba)
- Coraki Haulage Route
- Shared Haulage Route
- Champions Haulage Route
- Moonimba Haulage route
- Footprint defined in previous EIS (Novoplan, 2014)
- Approved Project Boundary Version 11 (June 2016)

- PrimaryRoad
- ArterialRoad
- SubArterialRoad
- LocalRoad
- Track-Vehicular
- Drainage
- Richmond River
- National Park



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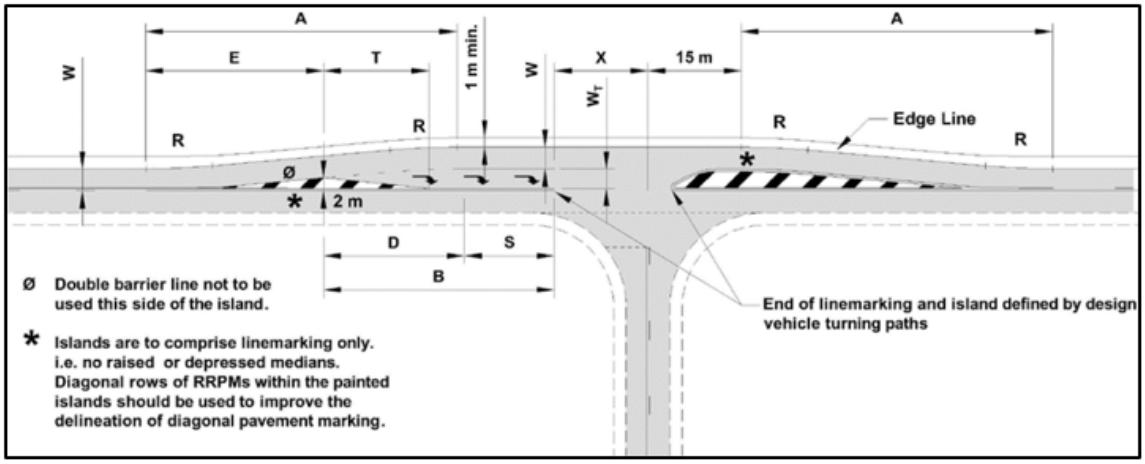


Figure 4-2 Channelised Right Turn Bay on the Pacific Highway

Due to the locality of St Joseph's Primary School (immediately west of the intersection of Woodburn-Coraki Road and Pacific Highway), the morning and afternoon peaks incur greater bus and light vehicle volumes accessing Woodburn-Coraki Road. The introduction of a channelised lane would improve the safety and manoeuvrability of construction and local vehicles. This treatment would require the reconfiguration of the intersection's layout and realignment of the existing line marking.

Due to fluctuations in project demands, there would be circumstances where the frequency of haulage operations would increase or decrease. An alternative to line marking amendments, would be the introduction of a traffic management plan (TMP). Traffic controllers, variable message signs and adequate tapering, would be provided to manage this intersection during peaks in construction haulage activities. Already operating at 50 kilometres per hourand within a school zone, the slowing down of traffic typically takes place at this location. Therefore, to accommodate the number of turning vehicles accessing (entering and exiting) Woodburn-Coraki Road, a TMP would be applied.

TMPs would be prepared in accordance with the approved Woolgoolga to Ballina Pacific Highway Upgrade (Sections 3 to 11) Construction Traffic and Access Management Plan (CTAMP), Appendix B1 of the Construction Environmental Management Plan. Pacific Complete construction staff and their contractor will liaise with the Pacific Complete logistics team so as to ascertain details of other construction activities, such as, concrete and precast unit deliveries to ensure proposed TMPs account for project specific traffic movements.

In addition, the implementation of GPS tracking of haulage vehicles would be investigated to monitor the location and speed of haulage trucks during the morning and afternoon school peak traffic times so as to ensure impacts of school bus operations are minimised.

CONSISTENCY WITH THE APPROVED PROJECT

Traffic and transport is considered to generally be consistent with the approved project. In particular, haulage numbers would generally be consistent with those predicted for the Pacific Highway for the Approved Project. The haulage route from Moonimba Borrow Site has been assessed in the TIA for this modification and found that there would be a large increases of haulage vehicles on this route. However, the assessment has determined that Boggy Creek Road, Reardons Lane and the borrow site access road would provide adequate capacity to service the predicted vehicle numbers. Additionally, it has been assessed that where intersection treatments and upgrades to the route are undertaken, Woodburn-Coraki Road and the Pacific Highway intersection would also have adequate capacity to service the increased haulage.

4.1.5 MITIGATION / MANAGEMENT MEASURES

Construction traffic impacts associated with the proposed modification would be managed in accordance with the Woolgoolga to Ballina Pacific Highway Upgrade (Sections 3 to 11) Construction Traffic and Access Management Plan (CTAMP), Appendix B1 of the Construction Environmental Management Plan. In addition, the following mitigation/management measures identified by the TIA would be implemented:

- Road upgrades specified by approved DA2015.0069 would be completed prior to the commencement of increased haulage of extracted material from the borrow site.
- Right-turn treatment on the Pacific Highway, for vehicles to safely and efficiently access Woodburn-Coraki Road with the appropriate treatment being a channelised right turn bay on the Pacific Highway, southbound would be installed to provide a right-turn treatment on the Pacific Highway for vehicles to safely and efficiently access Woodburn-Coraki Road. This treatment require the reconfiguration of the intersection's layout and realignment of the existing line marking.
- A traffic management plan (TMP) would be prepared in accordance with the W2B CTAMP (Appendix B1 of the CEMP). This would include traffic controllers, variable message signs and adequate tapering, which would be provided to manage this intersection during peaks in construction haulage activities.
- The implementation of GPS tracking of haulage vehicles would be investigated to monitor the location of haulage trucks during the morning and afternoon school peak traffic times so as to ensure impacts of school bus operations are minimised.

4.3 NOISE AND VIBRATION

4.3.1 INTRODUCTION

This section considers potential noise and vibration impacts that may result from the Moonimba Borrow Site. Noise and vibration impacts were discussed in Chapter 15 of the Woolgoolga to Ballina Pacific Highway Upgrade Environmental Impact Statement (W2B EIS) (RMS, December 2012) and section 5.7 of the Moonimba Quarry Expansion Bungawalbin NSW Environmental Impact Statement (Newman's Quarry & Landscape Supplies, 2014) (Moonimba Quarry EIS).

4.3.2 METHODOLOGY

A Noise Impact Assessment (NIA) was prepared to assess the impacts of the proposed modification to the borrow site's extraction rate, refer to Appendix D. The objectives of the NIA were to assess the following matters:

- Clearing of approximately 9.5 hectares of vegetation within the footprint of the excavation areas (in addition to the clearing limits specified in SSI-4963 (MCoA B1)
- Airborne noise from extraction processes on the site according to the NSW Industrial Noise Policy (EPA, 2000)
- Airborne noise impacts from haulage vehicles travelling on the public road network according to the NSW Road Noise Policy (EPA, 2011).
- Specifically, the following were included in the assessment as required by these policies:
    - Identification of noise sensitive receiver locations
    - Description of existing acoustic environment around the borrow site and the haulage route
    - Establishment of the appropriate noise assessment criteria for extractive processes and road traffic noise
    - Predictive worst case noise modelling for extractive processes
    - Prediction of impacts from additional heavy vehicle movements travelling on public roads generated by the increased site operations
    - Assessment of impacts and recommendations for mitigation and management measures.

The noise modelling predicted noise levels at the nearest noise sensitive receivers surrounding the borrow site from extraction process scenarios located in the western pit and eastern pit. The predicted noise levels for each scenario were compared with the criteria derived from the Industrial Noise Policy to assess impacts.

The assessment also undertook a desktop study to predict the potential impact from the increase in road haulage movements generated by the increased extraction rate. The assessment considered impacts on Boggy Creek Road, Reardons Lane and Woodburn-Coraki Road until the route meets the Pacific Highway. It considered the potential impacts at receivers adjacent to these public roads that access the borrow site. The increase in road traffic noise levels was predicted and compared with the assessment criteria in the Road Noise Policy.

The noise impact assessment does not address overpressure or vibration from blasting operations, which are managed via the W2B CEMP Appendix B3 Construction Noise and Vibration Management Plan (CNVMP).

4.3.3 EXISTING ENVIRONMENT

EXISTING APPROVALS

The borrow site's current extraction processes were approved in the 1997 Development Application No. 127/95 (DA 127/95). The conditions did not nominate specific noise, vibration or blasting limits other than with reference to the EPA requirements. The approval also required noise emission must not be offensive and operational hours were limited to:

- 7am to 8 pm Monday to Friday
- 8 am to 12 noon Saturdays.

The Moonimba Quarry EIS assessed the noise and blasting impacts from the expanded extraction processes. An NIA was conducted for the EIS in 2014 by Greg Alderson and Associates, (Moonimba Quarry NIA), to assess the increased extraction rate proposed in 2015. The Moonimba Quarry NIA predicted no exceedance above the Industrial Noise Policy criteria from extractive processes. It identified several exceedances of the Road Noise Policy criteria and recommended speed limits for heavy vehicles on the haulage route.

The DA2015.0069 approval contained specific measures for the control of noise and blasting from the site, in addition to road traffic noise. At the time of this report, the application has not been activated and the approval conditions are not in effect.

EXISTING ACOUSTIC ENVIRONMENT

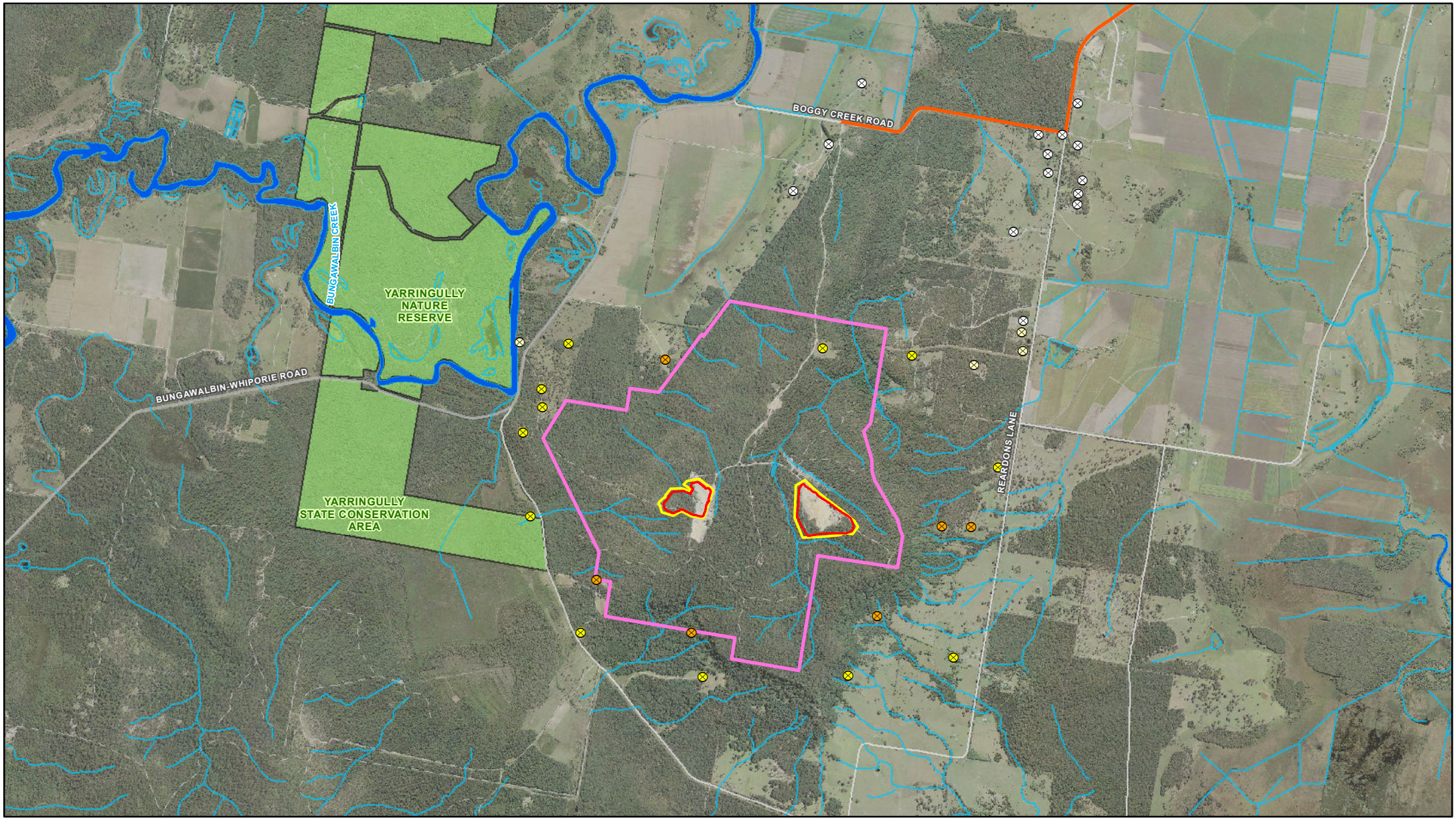
The borrow site is situated in a rural environment surrounded by isolated rural residential properties, farming land and nature reserves. Thirty-six noise sensitive receivers were identified in the vicinity of the borrow site, with one receiver located inside the site boundary (being the landowner of the quarry), refer to Figure 4-3.

The existing acoustic environment was defined using measurements undertaken in 2014 for the Moonimba Quarry EIS. These measurements showed that the existing background noise levels were close to or below 30 dB(A) for the nearest sensitive receivers. As a result, the rating background level (RBL) for the assessment was set to 30 dB(A), which is the minimum permissible according to the Industrial Noise Policy.

The existing road traffic noise level on the haulage route was defined using road traffic noise measurements carried out for the Moonimba Quarry EIS on Boggy Creek Road and Reardons Lane. The haulage route from the borrow site potentially affects the following existing roads:

- Public areas of the Quarry Access Road
- Boggy Creek Road (east of access road)
- Reardons Lane (north of Boggy Creek Road)
- Woodburn-Coraki Road (east of Reardons Lane).

Woodburn-Coraki Road is an arterial road which carries vehicles between Casino and the Pacific Highway at North Woodburn. Heavy vehicles from Coraki and other quarries and developments in the area would also use the route and therefore noise generated from heavy vehicle movements would not be attributed solely to the borrow site.



PACIFIC COMPLETE

PACIFIC HIGHWAY UPGRADE

Woolgoolga to Ballina

Moonimba Borrow Site Sensitive Receivers

Figure 4-3

Sensitive Receivers
- 500 - 1000m
- 1000 - 1500m
- 1500 - 2000m
- 2000m >
- Haulage route
- Proposed excavation area
- Footprint defined in previous EIS (Novoplan, 2014)
- Borrow site property boundary
- SubArterialRoad
- LocalRoad
- Track-Vehicular
- Drainage
- Richmond River
- National Park

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The Moonimba Quarry EIS identified the above sections of roads as a 'principal haulage route' defined by Richmond Valley Council. Therefore they are considered as sub-arterial/arterial type road for the purposes of noise assessment due to their specific purpose. The daytime road traffic noise levels were defined at 10 metres from the road as:

- Boggy Creek Road 57 dB(A) Leq,15hr
- Reardons Lane was 61 dB(A) Leq,15hr.

The existing traffic volume on Woodburn-Coraki Road is considered to be 1397 vehicles per day, with 30 percent categorised as being heavy vehicles.

4.3.4 IMPACT ASSESSMENT

ON-SITE OPERATIONAL NOISE EMISSIONS

The assessment of extractive processes was undertaken using three dimensional predictive noise modelling. The modelling considered the effect of weather conditions on noise emissions. Neutral conditions with no effect from weather and an enhanced condition that considered the wind blowing from noise source to receiver were included. The borrow site would not operate during the night and was therefore only assessed for operations during the day.

Three operational scenarios were considered as follows:

- Scenario 1 - Site establishment
- Scenario 2 - Extraction, crushing and loading operations in the existing excavation area (typical relative level (RL) of 90 metres western pit and RL 120 metres eastern pit)
- Scenario 3 - Extraction, crushing and loading operations in the worst case highest works elevation (typical RL 109 metres western pit and RL 145 meters eastern pit).

The noise emitting equipment assessed included:

- Transportation vehicles, semi-trailers and delivery trucks
- Small mobile cranes
- Graders and rollers
- Excavators, front end loaders and dozers
- Impact crusher screen, Jaw crusher and reclaimer screen
- Watercart and light vehicles.

The noise emissions for the equipment were assessed for modifying factors as defined in the Industrial Noise Policy, including tonal, intermittent, impulsive and low frequency noise. The NIA found that no modifying factors were applicable.

Based on the rating background level derived from onsite noise measurements, the operational noise criteria was established as 35 dB(A) Leq,15min in accordance with the procedure in the Industrial Noise Policy.

The assessment identified exceedances under both neutral and enhanced weather conditions, with the enhanced conditions representing the highest impact. Table 4-3 presents the predicted exceedances for receivers.

Table 4-3 Summary of predicted exceedances under enhanced weather conditions

Scenario	Number of receivers exceeding criteria within range			
	1-5 dB	6-10 dB	11-20 dB	> 20dB
Site establishment	1	0	0	0
Operations in existing excavation area	1	7	1	0
Operations in the worst-case location	3	2	7	0

For the site establishment scenario, only one receiver was predicted to experience noise levels above the criteria.

For operations in the existing excavation area, up to nine receivers were predicted to be impacted above the criteria by up to 14 dB(A). These receivers were located to the west of the site, closest to the western pit.

For operations in the worst-case location, 12 receivers were identified to be impacted above the criteria by up to 19 dB(A). The impacted receivers were located surrounding the western side of the borrow site.

Receivers to the east of the site were not predicted to be impacted above the criteria as the natural topography provides acoustic shielding from the works.

Noise levels were predicted to be up to 54 dB(A) LAeq,15min from the work in their worst-case locations. Noise levels were predicted to be up to 49 dB(A) LAeq,15min when the work is being carried out in the existing excavation area, meaning there is some existing shielding from the pit walls. The NIA considers this to be representative of work occurring with localised screening of plant in place.

The predicted noise levels were well above the operational criteria derived in accordance with the Industrial Noise Policy, which is designed to manage long term impacts of noise from permanent industrial operations. The proposed increase in extraction at the borrow site is limited to a short-term period of approximately two years (or until the material demand for the project ceases) as necessary to meet construction material requirements for the W2B project and would not be a permanent operation. As such, the resulting impacts are considered to be reduced due to the limited duration of the work.

Further to this, whilst the noise levels are higher relative to the background level, the absolute predicted noise level is not a particularly high noise level, in the same order of magnitude as the Industrial Noise Policy day time acceptable amenity criteria level of 50 dB(A) Leq,11hr for rural residential areas.

In comparison to the Moonimba Quarry EIS the predicted noise impacts are greater for extractive processes. This is largely due to the different equipment that is being proposed for this proposal. The equipment proposed would emit higher noise levels, especially the crushers and screens. In addition, the modelled worst case work areas would have less topographical screening to the receivers and therefore more noise would be transmitted from the work.

CUMULATIVE ASSESSMENT

A cumulative assessment was undertaken to assess noise impacts from more than one activity operating at the same time. It is anticipated that the eastern and western pit would operate with alternating activities, such that crushing and screening would take place in one pit while loading and processing would be undertaken in the other.

The cumulative assessment has predicted exceedances above background levels for a number of receivers, with the majority of exceedances in the range of 1 to 10 dBA.

It is important to note that a cumulative assessment represents a worst case scenario which includes all plant and equipment operating at 100 per cent for the total assessment duration. This situation is unlikely to occur as plant and equipment will move around within the quarry, resulting in variable noise emission levels.

Noise monitoring during operation of the quarry would be undertaken at representative receiver locations to measure the actual noise levels and ensure that noise emissions are minimised for nearby sensitive receivers. Refer to section 4.2.5 below for further migitation.

ROAD TRAFFIC NOISE EMISSIONS

In accordance with Section 2.2.2 of the Road Noise Policy criteria for Arterial/Sub-Arterial roads is set at 60 dB $L_{Aeq(15hour)}$ during daytime hours (07.00 – 22.00) and 55 dB $L_{Aeq(9hour)}$ during night time hours (10 pm to 7 am). The noise impacts from heavy vehicles travelling to and from the borrow site on the haulage route are expected to exceed the Road Noise Policy criteria at one receiver on Reardons Lane.

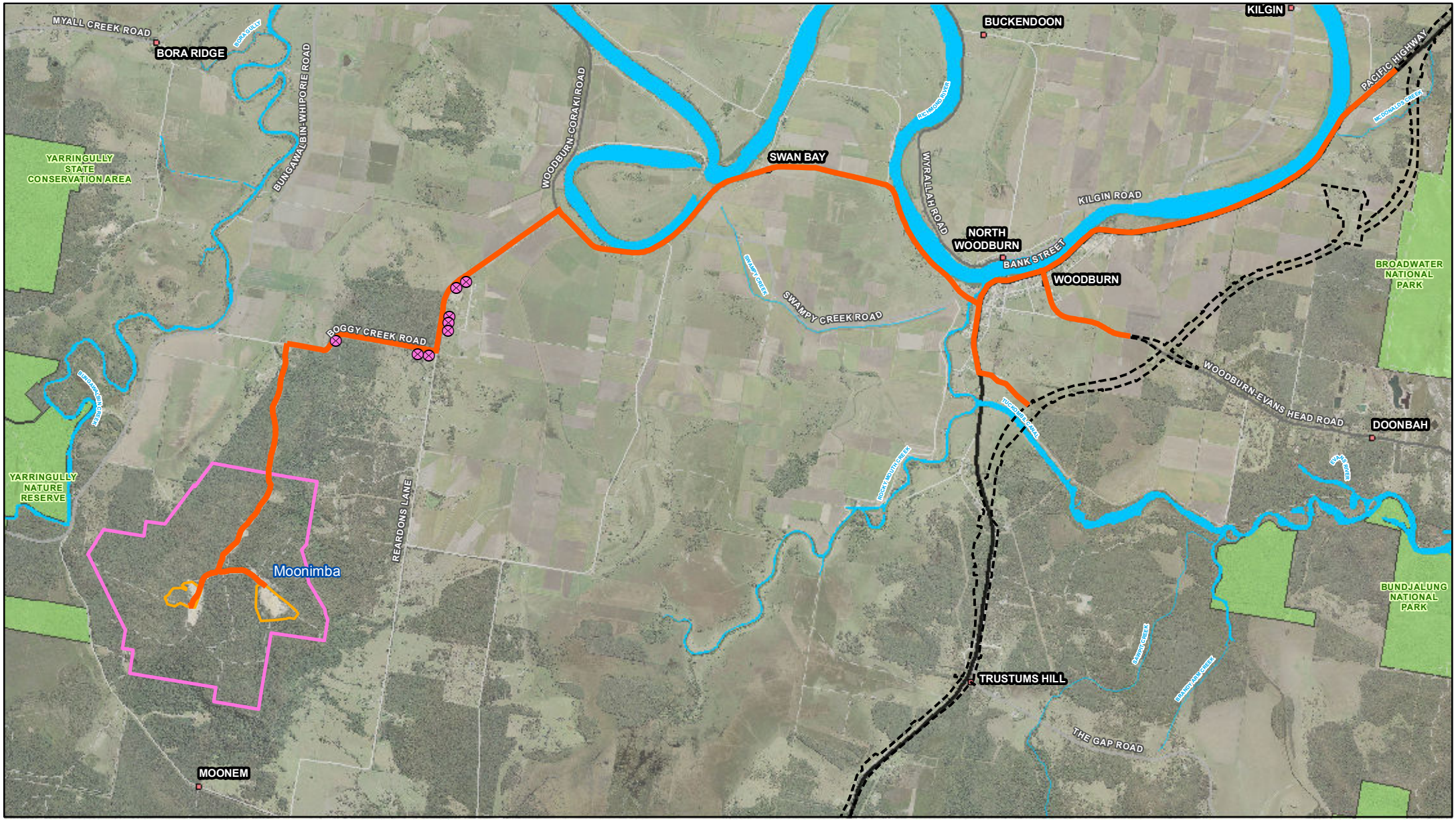
One of the objectives of the Road Noise Policy is also to consider the increase in noise level from the existing background level. An increase in traffic noise levels of more than 2 dBA may cause potential impacts. Eight sensitive receivers on Boggy Creek Road, Casuarina Drive and Reardons Lane are predicted to experience more than a 2 dBA increase in noise levels from haulage vehicles. Figure 4-4 illustrates the location of these eight sensitive receivers.

Mitigation and management measures to reduce potential noise impacts are discussed in Section 4.3.5.

CONSISTENCY WITH THE APPROVED PROJECT

The noise generated under the proposed modification would be higher than those already generated by the approved quarry operations identified in the Moonimba Quarry EIS and represent additional impacts to those identified in the W2B EIS. The W2B EIS did not specifically address noise and vibration from the extractive processes at the borrow site as, at the time, it was not expected that there would be an intensification of quarry operations and therefore a change in noise levels from this activity.

The use of local quarries and resources was always planned to supply material to the project (refer Section 2.6) and whilst the intensification of work at the quarry is expected to temporarily increase noise levels in the vicinity of the quarry and haulage route, the borrow site is not a new source of noise. The Moonimba Quarry EIS recommended a noise wall be constructed for 240 Reardons Lane which will be completed by the landowner during stage one of the proposed modification. Details of the noise wall are not currently available, however a standard noise wall would break line-of-sight with the road and would likely provide a reduction in noise of at least 5dB. Therefore this would be sufficient to ensure compliance with the applicable noise criteria. Where this measure is constructed, no additional impacts would be expected at this receiver.



PACIFIC COMPLETE

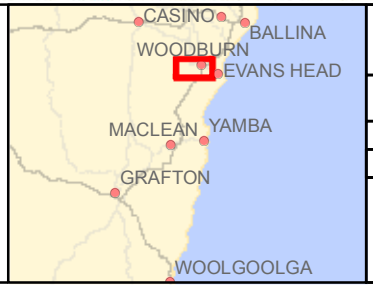
PACIFIC HIGHWAY UPGRADE

Woolgoolga to Ballina

Moonimba Borrow Site
Sensitive Receivers Impacted by Haulage Vehicles

Figure 4-4

- Sensitive receivers impacted by haulage vehicles
- Moonimba Haulage route
- Footprint defined in previous EIS (Novoplan, 2014)
- Borrow site property boundary
- Approved Project Boundary Version 11 (June 2016)
- PrimaryRoad
- ArterialRoad
- SubArterialRoad
- LocalRoad
- Track-Vehicular
- Drainage
- Richmond River
- National Park



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4.3.5 MITIGATION / MANAGEMENT MEASURES

Noise mitigation and management measures have been defined in the W2B CEMP Appendix B3 Construction Noise and Vibration Management Plan (CNVMP). The CNVMP addresses potential impacts from noise and blasting from borrow sites in addition to noise from vehicles using haulage routes to access the borrow sites.

The borrow site would be managed in accordance with relevant measures in the CNVMP.

The local community is currently being engaged with to inform them of the reasons for the short-term increase in noise from the borrow site. In addition to the consultation currently being undertaken, local residents will be provided with ongoing updates and will be provided a suitable means of contact to make enquiries during operations under the proposed modification. A site specific complaints management procedure will also be developed in the event that complaints are made with respect to noise.

Noise mitigation measures have been recommended in the NIA and would be undertaken as follows:

- Establish a program of regular noise monitoring. As a minimum, noise monitoring would be undertaken for the following:
    - The first time any new or altered operations occur at the facility to meet the increased extraction rate (with the exception of Site Establishment works)
    - Any time equipment changes are made
    - Any time operations are commenced concurrently for the first time
    - Where operations move to a new location within the approved work area
    - As a result of a valid complaint from a surrounding noise sensitive receiver.
- Where any exceedances of the criteria are measured, the operator of the facility is to implement all reasonable and feasible measures to reduce noise levels towards the criteria. Measures may include:
    - Erecting noise barriers, screening or forming bunds around activities which are found to cause exceedances of the criteria. Depending on the surrounding topography, localised screening around equipment may reduce noise emissions by up to 10-15 dB(A).
    - Performing all noise intensive activity such as crushing and/or screening at deep excavation areas in existing pits, irrespective of extraction location.
    - Managing activities that are undertaken concurrently in order to meet noise criteria. This may change dependent on the location on site due to topographical screening and distance to the surrounding receivers. In certain areas more work may be permissible concurrently than when the same work is undertaken on a different part of the site.
    - Where reversing alarm noise is identified to be a source of disturbance, the alarm noise level would be checked against the appropriate regulatory and health and safety requirements and the necessary mitigating action taken to achieve an acceptable noise reduction without compromising safety standards.
    - In line with the CNVMP, alternative methods to traditional beeper alarms may be used.
    - In the event that rumble grid noise is considered to be a source of disturbance, mitigation applied in the form of lower posted speeds at the grids or localised screening to be installed if appropriate.

In order to manage the haulage route noise impacts, the measures detailed in the CNVMP would be followed and implemented where feasible and reasonable. An inspection of the noise wall to be constructed at the

affected received on Reardons Lane would be undertaken and noise monitoring carried out to ensure sufficient noise reductions are being provided for this receiver.

A blast management plan would be prepared by the contractor prior to any blasts occurring at the site to ensure compliance with overpressure and vibration limits outlined in the Approved Project's Conditions of Approval, specifically MCoA B22 and B23.

4.5 BIODIVERSITY

4.5.1 INTRODUCTION

This section addresses the biodiversity impacts of the Moonimba Borrow Site. Biodiversity impacts associated with the borrow site were assessed in the Moonimba Quarry Expansion Bungawalbin NSW Environmental Impact Statement (Newman's Quarry & Landscape Supplies, 2014) (Moonimba Quarry EIS) and associated Flora and Fauna Assessment (Australian Wetlands Consulting Pty Ltd, 2014) located in Appendix 4 of the Moonimba Quarry EIS, herein referred to as the Moonimba Quarry Flora and Fauna Assessment. As part of the Moonimba Quarry Flora and Fauna Assessment for the Moonimba Quarry EIS the following was undertaken:

- Review of previous assessments
- Desktop searches (Atlas of NSW Wildlife and EPBC Protected Matters Search)
- Targeted site assessment over five days and five nights (30 September-5 October 2013)
- Habitat Tree Inventory (7-10 February 2014)
- Powerful Owl Survey (29 June-3 July 2014).

In order to confirm the existing site attributes, current condition, and findings of the Flora and Fauna Assessment undertaken for the Moonimba Quarry EIS, a biodiversity review was prepared to support the modification which included a site inspection undertaken on 28 February 2017, refer to Appendix E.

4.5.2 METHODOLOGY

A desktop review of the Moonimba Borrow Site was undertaken which included the following:

- Atlas of NSW Wildlife
- EPBC Protected Matters Search Tool
- Relevant reports and documents on the Moonimba Borrow Site, including previous environmental assessments of the Moonimba Quarry and Approved Project (refer to Section 4.1.1)
- Previous data and mapping

A site inspection was undertaken to confirm the findings and existing habitat condition identified in the Moonimba Quarry Flora and Fauna Assessment Fauna (Appendix 4, Moonimba Quarry EIS). The site inspection was undertaken on 28 February 2017 and was focussed around the two approved quarry cell areas referred to within this modification as western pit (8 ha) (referenced as 'Pit B' in the Flora and Fauna Assessment) and eastern pit (referenced as 'Pit C' in the Flora and Fauna Assessment) (13 ha).

4.5.3 EXISTING ENVIRONMENT

The borrow site is situated on top of the Moonimba Ridge. The property in which the borrow site is located is heavily vegetated except for the footprint of the existing quarry and access tracks that are cleared and highly disturbed. Vegetation surrounding the footprint of the existing quarry comprises dry sclerophyll forest predominately consisting of Blackbutt, with secondary species of Pink Bloodwood, Red Mahogany, Scribbly Gum and occasional Tallowwood. The Moonimba Ridge sub-regional wildlife corridor has also been identified within the property surrounding the borrow site which connects the larger vegetated landscapes adjacent to the borrow site.

MOONIMBA QUARRY FLORA AND FAUNA ASSESSMENT (MOONIMBA QUARRY EIS, 2014)

The Moonimba Quarry Flora and Fauna Assessment Fauna (Appendix 4, Moonimba Quarry EIS) focussed on a study area of approximately 522 ha which surrounds the proposed borrow site. A summary of the threatened flora and fauna species and vegetation communities identified in the Moonimba Quarry Flora and Fauna is included below.

Flora

Vegetation within the study area comprises dry sclerophyll forest predominately consisting of Blackbutt, with secondary species of Pink Bloodwood, Red Mahogany, Scribbly Gum and occasional Tallowwood. The south west of the study area comprises grassy open forest dominated by Smudgy Apple, which grades into open forest in the far west dominated by Large-leafed Spotted Gum. Wet Brush Box forest and rainforest occur in the southern escarpment and in the north east adjacent to the access track. This vegetation in the north east of the study area was identified as Lowland Rainforest in the NSW North Coast and Sydney Basin bioregion, listed as an Endangered Ecological Community (EEC) under the Threatened Species Conservation Act 1995 (TSC Act). This community is also representative of the Commonwealth listed critically endangered ecological community Lowland Rainforest of Subtropical Australia and contains Arrowhead Vine which is listed as threatened under the TSC Act. This community occurs immediately east of the access track and approximately 1.7 kilometres north of the eastern pit. Water courses and drainage lines are dominated by open emergent Broad-leaved paperbark.

The vegetation within the expanded footprint of the two borrow site pits was identified as Blackbutt/ Pink Bloodwood with the western portion of the western pit expansion footprint identified as Smudgy Apple. The vegetation occurring within the proposed borrow site footprint is not indicative of any threatened or endangered ecological community. The assessment identified 103 habitat trees within the borrow site that would require clearing. Refer to Appendix F for the vegetation plan extracted from the Flora and Fauna Assessment.

Fauna

Ten threatened species under the TSC Act were confirmed at the time of survey within the study area and are presented in Table 4-4.

Table 4-4 Threatened fauna species confirmed within the Moonimba Borrow Site footprint

Threatened Species	Status	Comment
Brush-tailed Phascogale *Phascogale tapoatafa*	Vulnerable (TSC Act)	Single animal trapped in the northern Elliott trap line in the western pit
Eastern Long-eared Bat *Nictophilus bifax*	Vulnerable (TSC Act)	Two individuals captured in the eastern harp trap
Glossy Black Cockatoo *Calyptorhynchus lathami*	Vulnerable (TSC Act)	A pair and a juvenile observed foraging in Black she-oak in the central portion of the site; chewed cones observed under several mature she-oak in this area. A pair also recorded during owl searches (July 2014 foraging in Black she-oak in the western pit.
Greater Broad-nosed Bat *Scoteanax rueppellii*	Vulnerable (TSC Act)	Recorded by Anabat in western cell and along the central track
Grey-headed Flying-fox *Petropus poliocephalus*	Vulnerable (TSC Act) Vulnerable (EPBC Act)	Six animals observed overflying the western pit
Little Bentwing-bat *Minopterus australis*	Vulnerable (TSC Act)	Recorded by Anabat in the western pit

Threatened Species	Status	Comment
Masked Owl *Tyto novaehollandiae*	Vulnerable (TSC Act)	An individual was seen and another heard between the two quarry cells during Powerful Owl surveys in 2014; a pair therefore occurs at the site. Interestingly Masked Owls were heard and seen during two of the five nights of owl survey in 2014 that coincided with calling Squirrel Gliders in the central portion of the site on these occasions. Follow up targeted investigations within and around the proposed quarry footprint found no signs of owl roosting or nesting; however it is possible that active nest/roost trees may exist elsewhere at the site
Powerful Owl *Ninox strenua*	Vulnerable (TSC Act)	An animal responded to call playback in the eastern pit on the final night of the 2013 survey, and may have been calling 200-300m from the playback point. Whether this animal occurs at the site or was attracted from adjacent habitat areas is unknown. Dedicated owl survey (active listening) in 2014 during the nesting period failed to confirm Powerful Owls at the site, despite excellent conditions. Follow up targeted investigations within and around the proposed quarry footprint found no signs of owl roosting or nesting; however it is possible that active nest/roost trees may occur elsewhere at the site.
Red-legged Pademelon *Thylogale stigmatica*	Vulnerable (TSC Act)	One animal flushed from within the northern rainforest remnant
Squirrel Glider *Petaurus norfolcensis*	Vulnerable (TSC Act)	One individual observed in the adjacent habitat around the eastern pit; gliders heard calling around the middle track between the two pits during the 2014 owl survey.

In addition, Anabat analysis identified calls which may be attributed to three threatened species including:

- Eastern Freetail-bat *Mormopterus beccarii* (Vulnerable, TSC Act),
- Eastern False Pipstrelle *Falsistrellus tasmaniensis* (Vulnerable, TSC Act), and
- Hoary Wattled Bat *Chalinolobus nigrogriseus* (Vulnerable, TSC Act).

Refer to Appendix G for locations of threatened fauna sightings during the site investigation. No signs of Koala were observed as the borrow site is relatively poor habitat due to the low incidence of preferred feed trees.

DUE DILIGENCE BIODIVERSITY REVIEW (2017)

Desktop Assessment

A desktop search of the Atlas of NSW Wildlife was undertaken on 3 February 2017, centred on the borrow site with a 10 kilometre search radius. The search identified 32 fauna species and 9 flora species within the 10 kilometre search radius listed under the *Threatened Species Conservation Act 1995* (TSC Act).

A search of the Protected Matters Search Tool was also undertaken on 3 February 2017, centred on the borrow site with a 10 kilometre search radius. The search identified one Threatened Ecological Community (TEC) – Lowland Rainforest of Subtropical Australia, 60 Threatened Species (17 flora and 43 fauna species) and 35 Migratory Species listed under the *Environment, Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Biodiversity Review

As outlined in Section 4.1.1, a biodiversity review was undertaken which involved a desktop review of the Moonimba Quarry Flora and Fauna Assessment (Appendix 4, Moonimba Quarry EIS) and a due diligence site inspection was undertaken to confirm the findings of the Flora and Fauna Assessment produced for the Moonimba Quarry EIS.

The site inspection confirmed the vegetation within and surrounding the eastern pit as Open forest (Blackbutt, Pink Bloodwood). This community corresponds to the equivalent vegetation type Blackbutt - bloodwood dry heathy open forest on sandstones of the northern North Coast identified in the Approved Project. The vegetation extent of this community was confirmed to be consistent with the area documented in the Moonimba Quarry Flora and Fauna Assessment.

The vegetation within and surrounding excavation western pit was confirmed as Open Forest (Blackbutt, Pink Bloodwood) and Open Forest (Smudgy Apple). In terms of equivalent vegetation community types, Open Forest (Blackbutt, Pink Bloodwood) corresponds to Blackbutt - bloodwood dry heathy open forest on sandstones of the northern North Coast whilst Open Forest (Smudgy Apple) does not correspond to a vegetation type identified within the Approved Project boundary. Open Forest (Smudgy Apple) is consistent with the NSW Vegetation Information System (VIS) Classification vegetation type Pink Bloodwood - Red Mahogany - Smudgy Apple shrubby open forest on sandstone of northern NSW North Coast Bioregion.

The Moonimba Quarry Flora and Fauna Assessment produced for the Moonimba Quarry EIS confirmed the presence of the following threatened species and ecological communities within the property:

- Two threatened flora species (Arrowhead Vine and Slender Milkvine) listed under the TSC Act were recorded within the study area. Slender Milkvine was referenced in the Moonimba Quarry Flora and Fauna Assessment as being previously identified at the property, however was not sighted during the associated site inspection. Habitat and specimens of these species were not recorded within the borrow site.
- The endangered ecological community, Lowland Rainforest, was recorded within the study area. This community was not recorded within the borrow site.
- Thirteen threatened fauna species listed under the TSC Act were recorded within the study area. No additional threatened species were observed during the recent site inspection.

4.5.4 IMPACT ASSESSMENT

MOONIMBA QUARRY EIS 2014

The key impacts identified in the Moonimba Quarry Flora and Fauna Assessment (Appendix 4, Moonimba Quarry EIS) include:

- Gradual clearing of an estimated 9.5 ha of existing vegetation/habitat.
- Loss of 103 habitat trees (66 within eastern pit and 37 within western pit).
- Loss of known forage and shelter/roost habitat for threatened species listed under the TSC Act including:
    - Glossy Black-cockatoo,
    - Brush-tailed Phascogale,
    - Grey-headed Flying-fox, and
    - Squirrel Glider.

- Loss of habitat trees which may be utilised by threatened species including:
    - Brush-tailed Phascogale,
    - Glossy-Black Cockatoo
    - Masked Owl,
    - Microchiropteran bat species
    - Powerful Owl, and
    - Squirrel Glider.
- Fragmentation of habitat for the Squirrel Glider and Brush-tailed Phascogale.

The Moonimba Quarry Flora and Fauna Assessment also identified a range of other potential direct and indirect impacts which may result from the approved expansion of the Moonimba Quarry including potential injury/mortality and disturbance to fauna, potential introduction and establishment of weeds, noise disturbance to local fauna and potential for sediment to enter watercourses in proximity to excavation of the eastern pit.

The expansion was considered unlikely to lead to a significant impact on threatened species, populations, ecological communities or their habitats. Key differences between the proposed modification and DA2015.0069 regarding impacts to biodiversity include:

- Clearing proposed under DA2015.0069 would be undertaken in a single event under the proposed modification (as opposed to staged clearing).

Management methods for the impacts to biodiversity are discussed in section 4.3.5.

BIODIVERSITY REVIEW 2017

The Moonimba Quarry Flora and Fauna Assessment confirmed the presence of the 15 threatened species (two flora species and 13 fauna species) and one ecological community from the study area.

Project impacts were assessed for these threatened species and other likely species as part of DA2015.0069 approval. The Moonimba Quarry was considered unlikely to lead to a significant impact on threatened species, populations, ecological communities or their habitats. However, since the 2014 Moonimba Quarry Flora and Fauna Assessment report, a number of threatened species listed under both the TSC Act and the EPBC have been updated. As a result, assessments of significance have been undertaken for species that have a moderate or higher likelihood of occurrence within the study area. Findings of the significance assessments for Moonimba Borrow Site concluded the following:

- The borrow site is unlikely to lead to a significant impact on threatened species, populations, ecological communities or their habitat listed under the TSC Act.
- A Species Impact Statement is not required for the borrow site.
- The borrow site is unlikely to have a significant impact on matters of national environmental significance
- An EPBC Act referral of the borrow site for consideration of a controlled action is not required.

As this modification is proposing to utilise the same footprint as assessed under the Moonimba Quarry Flora and Fauna Assessment within the Moonimba Quarry EIS, and the findings and outcomes of that assessment were considered to be appropriate and relevant for the Moonimba Borrow Site proposal, no additional impacts are anticipated.

CONSISTENCY WITH THE APPROVED PROJECT

Both direct and indirect biodiversity impacts associated with the Moonimba Borrow Site are consistent with the biodiversity assessment undertaken for the Approved Project. The main impacts of the borrow site are:

- Removal of 9.5 hectares of native vegetation previously approved under DA2015.0069
- Impacts on threatened species (those outlined in significance assessments)
- Removal of breeding and/or sheltering habitat for threatened fauna, in particular hollow bearing trees
- Loss of foraging resources for fauna
- Direct mortality of fauna from construction activities; and
- Potential impacts from construction to water quality and surrounding natural hydrological flows.

The area previously assessed as Commonwealth listed critically endangered ecological community Lowland Rainforest of Subtropical Australia (EPBC) occurs immediately east of the access track and approximately 1.7 kilometres north of the eastern pit (refer to Appendix F). No widening of the access track would be undertaken during operations under the proposed modification. It is considered unlikely that this area of vegetation would be impacted under the proposed modification.

The plant community type - Pink Bloodwood - Red Mahogany - Smudgy Apple shrubby open forest on sandstone of northern NSW North Coast Bioregion and one additional threatened species (Red-legged Pademelon (Thylogale stigmatica) were identified within the study area but not assessed under the Approved Project. Based on the potential associated direct and indirect impacts on these entities, mitigation measures developed for the Approved Project are considered adequate to minimise adverse effects to these matters.

4.5.5 MITIGATION / MANAGEMENT MEASURES

The borrow site would be established, operated and managed in accordance with the approved *Woolgoolga to Ballina Pacific Highway Upgrade (sections 3-11) Construction Flora and Fauna Management Plan* (CFFMP, Appendix B2, CEMP). This would include (but not limited to) implementation of approved clearing procedures and the management of weeds.

In addition to the measures outlined in the CFFMP the following would be implemented to ensure the protection of biodiversity during the establishment, operation and management of the borrow site:

- To reduce the potential for injury to resident fauna (especially macropods), speed limits along access roads and tracks would be limited to 40-50 kilometres per hour to reduce likelihood of road collision and road mortality. Warning signs along regularly used roads would be erected to warn road users of potential wildlife within the vicinity along road verges.
- While targeted surveys did not record nesting or roosting sites of the Powerful and Masked Owl within the proposed clearing footprint, pre-clearing surveys would help determine whether nesting is occurring within or near the proposed clearing footprint. In the event that a nest tree or roost tree is located and an active breeding pair are utilising the hollow, it must be clearly marked and a buffer of a minimum 50 metres radius must be applied and clearly delineated. Clearing of any identified roosting tree would be removed outside breeding season (March – September) and when individuals have vacated the nest.
- Revegetation areas required under DA2015.0069 are further examined to ensure compliance with conditions of approval and ensure DA operation is possible in a timely manner.
- A Habitat Offset arrangement of a minimum of 68 hectares with a legally binding mechanism for the protection in perpetuity of the habitat offset would be implemented in accordance with the

requirements outlined in DA2015.0069. Prior to approval of the offset a suitably qualified person would be engaged to:

- Undertake detailed assessment of the 90 hectare area to determine the location of the final 68 hectare area. The area shall provide habitat on a like for like basis proportional to the impacted vegetation communities.
- The offset shall comprise a single contiguous area incorporating logical management and/or landscape boundaries that are easily identifiable and designed to minimise edge effects.
- Investigate opportunities for securing the Habitat Offset. Preference shall be given to use of the BioBanking Scheme or alternatively a Conservation Agreement pursuant to the National Parks and Wildlife Act 1974.
- Submit for approval of Richmond Valley Council details of the investigations referred to.
- Undertake any such recommendations or requirements in association with the approved method of securing the Habitat Offset
- The offset shall remain in force in perpetuity and the final offset area and mechanism for securing the habitat offset shall be approved by Richmond Valley Council.

4.6 HYDROLOGY, WATER QUALITY AND SOIL MANAGEMENT

4.6.1 INTRODUCTION

This section addresses the hydrological, water quality and soil impacts of the borrow site. The impacts for the Approved Project were addressed in the Woolgoolga to Ballina Pacific Highway Upgrade Environmental Impact Statement (W2B EIS) (RMS, December 2012) in Chapter 8 – Hydrology and Flooding, Chapter 9 – Soils, Sediment and Water as well as Working Paper 2 – Hydrology and Flooding, Working Paper 3 – Water Quality and Working Paper 4 – Groundwater. This section evaluates the impacts and mitigation required for hydrology, water quality and erosion and sediment control.

4.6.2 METHODOLOGY

A desktop review of existing information was undertaken including a review of the Moonimba Quarry EIS, specifically:

- The Operational Plan of Management (OPM) that forms Appendix 3 of the Moonimba Quarry EIS
- The Soil and Water Management Plan that forms Appendix A of the OPM

A groundwater memo, included in Appendix H, was also prepared in June 2017 to consider the potential for local and regional impacts to the groundwater regime in the Moonimba Borrow Site area.

4.6.3 EXISTING ENVIRONMENT

The borrow site is situated within a large forested area, on a major ridgeline known as Moonimba Ridge. The ridgeline extends north south with a maximum elevation of approximately 190 metres AHD (Australian Height Datum) at the southern end. The borrow site is located along this ridgeline at an elevation of approximately 100-130 metres AHD. The borrow site generally has a northerly aspect, with drainage to the north, which eventually flows to the surrounding low lying floodplain areas.

SURFACE WATER

A small creek separates through the centre of the site and separates the two excavation areas (the eastern pit and western pit) and flows to a rainforest to the north of the excavation areas. Pumping currently occurs from this creek area for watering of haul roads, crushers and screens and stock piles at the site. In general the majority of the creeks and drainage lines are intermittent with flowing water only occurring from prolonged rainfall events. The main creek line drains to low lying, disturbed land to the north of the borrow site and continues in constructed drainage lines and connects to Bungawalbin Creek prior to discharging to the Richmond River approximately six kilometres to the north.

The borrow site is located on the top of the Moonimba Ridge, at an elevation of approximately 100-130 metres AHD and is therefore not subject to flooding.

GROUNDWATER

The Moonimba Borrow Site is located within the Clarence-Moreton Basin, an extensive sediment basin in the north east of New South Wales and southern Queensland. A number of groundwater flow systems are present at and surrounding the Moonimba Borrow Site, however they are generally limited to rainfall recharge and gradient profiles and so are not present close to the surface. The Kangaroo Creek Sandstone, the material to be quarried, is considered to be a confined aquifer or aquitard that has low hydraulic connectivity. Groundwater within the Kangaroo Creek Sandstone bedrock typically occurs as a shallow perched aquifer that is present during periods of heavy or prolonged rainfall events and has limited connectivity to deeper bedrock groundwater systems.

Three registered, and one non-registered, groundwater bores are located within two kilometres of the borrow site including:

- A licensed bore on the borrow site property, GW305748, that was constructed in 2006 and passes through sandstone and shale from a depth of 4.5 metres to 60 metres and sandstone from 60 metres to 9 metres. The groundwater level was recorded at a depth of 66 metres below ground level, equivalent to 33 metres Australia Height Datum (AHD). This bore is considered to access water from the Walloon Coal Measures.
- Two groundwater bores GW032869 and GW301828, located more than 1.5 kilometres from the borrow site, at lower elevations. Both these bores are shallow bores.
- An additional bore, GW053626, is located to the south west of the site, however the license for this bore has lapsed.

GROUNDWATER DEPENDENT ECOSYSTEMS

Groundwater dependent ecosystems (GDEs) are also beneficial users of groundwater. The GDE Atlas (BOM, 2017) categorises GDEs into three classes:

- Ecosystems that rely on the surface expression of groundwater – this includes all the surface water ecosystems which may have a groundwater component, such as rivers, wetlands and springs
- Ecosystems that rely on the subsurface presence of groundwater – this includes all vegetation ecosystems
- Subterranean ecosystems – this includes cave and aquifer ecosystems

Within a two kilometre radius of the Moonimba Borrow Site, five types of ecosystems were identified that rely on the subsurface presence of groundwater with these being Lowland Red Gum winter flowering, Paperbark, Lowlands Grey Box, Clarence Lowlands Spotted Gum and Sub-Tropical and Warm Temperate Rainforest. These GDEs have a low to high potential for groundwater interaction.

A search of the GDE atlas also identified that Bungawalbin Creek and associated floodplain wetlands rely on the surface expression of groundwater and have a low to high potential for groundwater interaction.

SOIL

The majority of the soils at the borrow site are classified as podzolic soils (weathered/ low nutrient type soils) with minor areas containing, skeletal soils and sandy podzolics. The area mapped as sandy podzolics is in the general vicinity of the eastern pit.

Within the footprint of the existing quarry, the topsoil has been removed and the sandstone parent material remains exposed. Due to the topography of the site there is anticipated to be a thin layer of topsoil beneath the vegetated areas that would be cleared for the expansion of the borrow site. Kangaroo Sandstone is the predominant material at the site. Low strength overburden material overlays the solid sandstone. The topsoil would be removed and stockpiled at the site for use in rehabilitation. Within the first year of operation it is anticipated that the overburden material would be excavated and transported for use on the project, therefore minimal to no processing would be required during the first year of operation. The second year of operation would then include the excavation and removal of the high strength sandstone, require a range of excavation and processing techniques.

4.6.4 IMPACT ASSESSMENT

Operation of the borrow site has the potential to cause an impact through the increase of sediment laden runoff, which may carry pollutants. The main source of sediment is via erosion of stockpiles, earth barriers, work areas, haul roads and other disturbed areas. Sediment basins would be the primary collection point for sediments, for the eastern pit and western pit. These are located within and/or adjacent to the excavation area in the western pit (one sediment basin identified in DA2015.0069, would remain in place until the quarry floor is lowered) and the eastern pit (two sediment basins) as shown in Figure 2-2. The location of the basins has been selected to maximise the collection of sediment-laden runoff generated from the site throughout construction.

The depth to groundwater at GW305748 (at the time of drilling) was 66 m below ground level (33 m AHD) whilst the minimum final floor depth within the eastern and west pits would be approximately 75 and 100 m AHD respectively. Since the water table in the deeper bedrock is likely to be located below the level of the proposed pit floor, it is unlikely to be intersected by the borrow site activities. As such, it is anticipated that negligible direct impact would be caused to this aquifer by the proposed activities. Groundwater bores GW032869 and GW301828, located more than 1.5 kilometres from the site, are also not anticipated to be affected by the excavation works at the borrow site.

Groundwater may occur locally as a perched aquifer within the Kangaroo Creek Sandstone after heavy or continuous rainfall and is anticipated to be a shallow system (within one to five metres below ground level) of short duration after direct rainfall recharge. However, a perched aquifer is not expected to be present at the borrow site during normal conditions.

Activities at the borrow site are not anticipated to affect surface or subsurface water bodies connected to groundwater. All GDEs that rely on surface water bodies connected to groundwater are associated Bungawalbin Creek and the floodplain areas of Bungawalbin Creek.

GDEs that rely on groundwater are expected to occur within localised water bearing zones typically characterised by localised recharge-in/recharge-out processes associated with rainfall infiltration. Small reductions to the groundwater flow to the downhill side of the site can be anticipated. Since the immediate surroundings of the borrow site area lacks any threatened/ endangered communities potentially sustained by groundwater, this constraint to groundwater recharge is not considered to pose a meaningful ecological impact. As such, and given the distance from the excavation pits, activities on site are unlikely to present a risk of adversely affecting GDEs.

The potential impacts to hydrology, water quality and soil management from the proposed borrow site are considered similar to those outlined in the Operational Plan of Management (OPM) that forms Appendix 3 of the Moonimba Quarry EIS and the Soil and Water Management Plan that forms Appendix A of the OPM.

The key difference between the proposed borrow site and DA2015.0069 regarding hydrology, water quality and soil management would be the removal of vegetation in a single clearing event leading to the exposure of larger areas of soil and rock material, increasing the likelihood of sediment laden runoff leaving the site. Section 4.4.5 outlines the mitigation and management approach for the operation of the site.

CONSISTENCY WITH THE APPROVED PROJECT

The borrow site would have similar construction and operational impacts on hydrology, water quality and soil management as described within the *Woolgoolga to Ballina Pacific Highway Upgrade Environmental Impact Statement* (EIS) (RMS, December 2012). No additional impacts to hydrology, water quality and soil management are anticipated beyond those previously assessed.

4.6.5 MITIGATION / MANAGEMENT MEASURES

Hydrology, water quality and soil would be managed in accordance with the approved *Woolgoolga to Ballina Pacific Highway Upgrade (sections 3-11) Construction Soil and Water Quality Management Plan* (CSWQMP, Appendix B4, CEMP) and Managing Urban Stormwater, Soil and Construction (Landcom, 2004) (known as the Blue Book). In particular, relevant mitigations that would be undertaken for the borrow site include, but are not necessarily limited to, the following:

- An erosion and sediment control plan (ESCP) would be prepared by the contractor to detail how the site would be managed. This would be prepared in accordance with the CSWQMP, (Appendix B4 of the W2BCEMP) and the Blue Book.
- A surface water monitoring program would be established prior to the operation of the site in order to establish baseline levels of the drainage lines near the borrow site and continue through the operation of the site. Water quality monitoring would be undertaken in accordance with the approved *Woolgoolga to Ballina (sections 3 to 11) Water Quality Monitoring Program*.
- During the decommissioning of the site, the exposed areas would be stabilised prior to the site being handed back to the landowner.
- In the unlikely event that the Moonimba Borrow Site does encounter a permanent water table in the bedrock, and penetrates this water table, to a depth in excess of 5 metres, a review of management measures shall be undertaken which would include re-evaluation of the groundwater impact and return of captured water (inflows) to local drainages after treatment in an appropriate sedimentation pond (to capture suspended solids).

4.7 ABORIGINAL HERITAGE

4.7.1 INTRODUCTION

This section considers potential impacts to Aboriginal heritage that may result from the borrow site. Aboriginal heritage impacts were discussed in Chapter 12 ('Aboriginal heritage') of the *Woolgoolga to Ballina Pacific Highway Upgrade Environmental Impact Statement* (RMS, December 2012) and section 5.5 ('Cultural Heritage Assessment') of the Moonimba Quarry Expansion Bungawalbin NSW Environmental Impact Statement (Newman's Quarry & Landscape Supplies, 2014) (Moonimba Quarry EIS).

4.7.2 METHODOLOGY

The desktop assessment for Aboriginal heritage at the Moonimba Borrow Site included:

- A search and review of the Aboriginal Heritage Information Management Systems (AHIMS) on 5 April 2017 (refer to Appendix I)
- Archaeological sensitivity of the Moonimba Borrow Site and the need for any further assessment or consultation was then determined by considering the following factors:
    - Location of the Moonimba Borrow Site
    - The proximity to known Aboriginal heritage sites
    - Review of previous cultural heritage assessment undertaken for the Moonimba Quarry EIS (Everick Heritage Consultants, 2014)
    - Review of other existing documentation of heritage items in the area.

An Aboriginal heritage assessment was completed by Everick Heritage Consultants Pty Ltd as part of the Moonimba Quarry EIS. The information provided in the Cultural Heritage Assessment (CHA) was used to provide the context and potential sensitive areas within the Moonimba Borrow Site.

A site visit by Navin Officer was also undertaken on 19 July 2017 to locate a known cave listed on the AHIMS register, refer to Appendix J.

Community consultation with the Local Aboriginal Land Council (LALC) has also been undertaken in accordance with the OEH guidelines Aboriginal Cultural Heritage Consultation Requirements for Proponents (2010). Details of consultation undertaken for the Moonimba Borrow Site is included in Chapter 5.

4.7.3 EXISTING ENVIRONMENT

The CHA undertook a review of parish maps which found that the land which hosts the current Moonimba Quarry was Crown Land under lease for mining purposes as early as 1891. Aerial imagery of the site indicates that a majority of the vegetation cover surrounding the Moonimba Ridge has been extensively cleared for agricultural activities. Logging and potential extraction activities are evident within the Moonimba Borrow Site in the 1988 aerial photography and by 1998 several large extraction pits and access tracks are clearly visible. The CHA concludes that while clearing and extraction works have dramatically altered the appearance of lands used for quarrying, the lands immediately surrounding this area have not been extensively cleared of vegetation in the past, likely due to the difficult and often inaccessible terrain.

The CHA indicates that should aboriginal cultural heritage exist within the excavation area, it would have been impacted by the clearing and quarrying activities, while the surrounding lands have been subject to minimal disturbance and maintain potential for Aboriginal heritage to be located.

4.7.4 IMPACT ASSESSMENT

No places of intangible (non-physical) cultural heritage significance were identified within the excavation areas in the literature review or within the CHA. The CHA outlines that a mythological/ceremonial site, Ngimboug Cave (AHMS Site 13-1-0034) was identified on the AHIMS register as well as the Moonimba Forbidden Place (identified on the AHIMS register as restricted (AHIMS Site 13-1-0145)). Both sites were identified to be within 400 metres of the proposed quarry expansion being assessed at the time. The CHA also discusses the identification of a scar tree during a site inspection. The scar tree is located on the ridge crest to the south east of the eastern pit, refer to Figure 2-2. This was registered on the AHIMS register as Robinsons Quarry 1 (AHIMS Site 13-1-0199).

The CHA recommended that the scarred tree (AHIMS Site 13-1-0199) should be protected. As a result the tree and the area around it have been excluded from the excavation area (refer to section 4.5.5 for proposed management measures).

The CHA undertaken to support DA2015.0069 concluded that the activities proposed were unlikely to impact on Aboriginal heritage values with appropriate mitigation measures in place to protect the scarred tree. No further assessment was recommended within the CHA.

The more recent extensive AHIMS search undertaken in April 2017 identified three items / places including the Ngimboug Cave, the Forbidden Place and the Robinsons Quarry 1 Scar Tree discussed above.

A site inspection was undertaken in July 2017 to confirm the location of the Ngimboug Cave and determine if the proposed intensification of operations at the borrow site could have any potential impact on the structural stability of the cave, for example vibrations from blasting activities. The cave was unable to be located during the site inspection due to overgrown vegetation. Further background research revealed that the cave is a natural feature embedded in the rock face, located approximately four metres from the ground level, with a diameter of approximately two to three metres (refer to Appendix J).

As the Ngimboug Cave is located approximately 400 metres from the eastern pit and imbedded in the existing rock face, it is considered unlikely that the proposed modification would have any impacts on the cave. Given the proposed modification would impact the same footprint as DA2015.0069, it is unlikely that additional impacts to Aboriginal heritage values would be generated as a result of the proposed modification.

CONSISTENCY WITH THE APPROVED PROJECT

Three Aboriginal heritage items/places were identified within 400 metres of the excavation areas, with one scarred tree identified in the immediate vicinity of the Eastern Pit. Impacts to the scarred tree were assessed within the Moonimba Quarry EIS and subsequently granted consent within DA2015.0069. In order to prevent impacts to the scarred tree, management measures would be put in place to exclude the tree and its immediate surrounds from the Eastern Pit. The operation of the proposed modification would not result in further impacts to either the Ngimboug Cave, or the Moonimba Forbidden Place, given there are no proposed activities outside the areas shown in Figure 2-2 and the distance to these items. Provided the appropriate management measures are put in place to protect the scarred tree, there are no additional anticipated impacts to Aboriginal heritage items surrounding the proposed excavation areas. The impacts to Aboriginal heritage items are therefore considered consistent with the Approved Project.

4.7.5 MITIGATION / MANAGEMENT MEASURES

Management of Aboriginal heritage will be undertaken in accordance with the approved *Woolgoolga to Ballina Pacific Highway Upgrade (sections 3-11) Construction Heritage Management Plan* (Appendix B5, CEMP) to address known and unexpected heritage sites and impacts associated with the Moonimba Borrow Site.

The following additional mitigations from the CHA will also be undertaken to ensure protection of the scar tree located near the eastern pit:

- A temporary high visibility fence to provide a buffer zone will be erected prior to commencing work in the immediate vicinity of the tree. It will be erected within a minimum of 30 m radius of the tree and remain in place until specialist advice is sought.
- The advice of a specialist, preferably an Aborist, will be sought to determine an appropriate buffer zones for the ongoing management and protection of the tree taking into account the topography of the landscape, the proposed extensive extractive works and the potential for long term damage.

4.8 NON-ABORIGINAL HERITAGE

4.8.1 INTRODUCTION

This section considers potential impacts to non-Aboriginal Heritage that may result from the borrow site. Non-Aboriginal heritage impacts were discussed in Chapter 13 ('Historical (non-Aboriginal) heritage') of the *Woolgoolga to Ballina Pacific Highway Upgrade Environmental Impact Statement* (RMS, December 2012) and section 5.5 ('Cultural Heritage Assessment') of the Moonimba Quarry Expansion Bungawalbin NSW Environmental Impact Statement (Newman's Quarry & Landscape Supplies, 2014) (Moonimba Quarry EIS).

4.8.2 METHODOLOGY

A desktop assessment for non-Aboriginal heritage was undertaken in April 2017 which included a review of publicly available information including:

- Everick Heritage Consultants, 2014, Cultural Heritage Assessment for the Moonimba Quarry – Lot 193 DP75560 Bungawalbin, NSW. Prepared for Newmans Quarry and Landscaping PTY LTD.
- Richmond Valley Local Environment Plan (2012)
- NSW State Heritage Register
- Australian Heritage Database
- National Heritage List
- Commonwealth Heritage List
- Register of the National Estate
- World Heritage List

4.8.3 EXISTING ENVIRONMENT

The *Cultural Heritage Assessment for the Moonimba Quarry* (Everick Heritage Consultants, 2014) was undertaken as part of the Moonimba Quarry EIS to support DA2015.0069. The assessment reviewed parish maps and historic data and found that the parcel of land now known as Lot 193 DP755603 was Crown Land under lease for mining purposes as early as 1891. Aerial photos from 1988 show evidence of extractive and logging activities, whilst aerial photos from 1998 show clear excavation areas and an access track within the property.

A search and review of the relevant non-Aboriginal heritage registers and publicly available data (refer to section 4.6.2) did not identify non-Aboriginal heritage items within or adjacent to the borrow site. The borrow site is located approximately 550m west of an area identified as high conservation value Old Growth Forest. No areas identified as Old Growth Forest occur within either excavation areas.

4.8.4 IMPACT ASSESSMENT

No objects or places of non-Aboriginal significance were identified within the excavation areas or immediately surrounding the footprint of the site at the time of DA2015.0069 or within the desktop search undertaken in April 2017. No excavation would be undertaken outside the footprint of the site shown in Figure 2-2, reducing the risk of impact to the area of Old Growth Forest (approximately 550m east of the borrow site).

CONSISTENCY WITH THE APPROVED PROJECT

Given there are no previously identified Non-Aboriginal heritage items within or adjacent to the borrow site, the impacts to non-Aboriginal heritage are consistent with the Approved Project.

4.8.5 MITIGATION / MANAGEMENT MEASURES

The borrow site would be managed in accordance with the *Woolgoolga to Ballina Pacific Highway Upgrade (sections 3-11) Construction Heritage Management Plan* (Appendix B5, CEMP) and no additional mitigation measures are proposed.

4.9 AIR QUALITY

4.9.1 INTRODUCTION

This section considers potential air quality impacts that may result from the borrow site. Air quality impacts were discussed in Chapter 18.2 of the *Woolgoolga to Ballina Pacific Highway Ugrade Environmental Impact Statement* (RMS, December 2012) and Section 5.9 of the *Moonimba Quarry Expansion Bungawalbin NSW Environmental Impact Statement* (Newman's Quarry & Landscape Supplies, 2014) (Moonimba Quarry EIS).

4.9.2 METHODOLOGY

An air quality impact assessment (AQIA) was prepared to predict the level of impact to the surrounding environment from the operation of the Moonimba Borrow Site, refer to Appendix K. The AQIA was prepared in accordance with the NSW EPA document 'Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales' (NSW EPA, 2017), referred to as the 'Approved Methods'. The assessment involved the modelling of local meteorology and the dispersion of potential emissions from the project site to predict the level of impact that may be experienced in the surrounding environment.

- Specifically, the following requirements of the Approved Methods were addressed as part of the AQIA:
- Description of local topographic features and sensitive receptor locations
- Establishment of air quality assessment criteria
- Analysis of climate and dispersion meteorology for the region
- Description of existing air quality environment
- Compilation of a comprehensive emissions inventory for the existing and proposed activities
- Completion of atmospheric dispersion modelling and analysis of results.

The key pollutants from the operation of the borrow site are in the form of suspended particulate matter (PM) including total suspended particulate (TSP), PM_{10} and $PM_{2.5}$ as well as fugitive dust deposition. While emissions of pollutants associated with the combustion of diesel fuel, including nitrogen oxides (NOx), sulphur dioxide (SO_2), carbon monoxide (CO) and Volatile Organic Compounds (VOCs), would be generated by the current and proposed operations at the borrow site, these emissions are unlikely to compromise air quality at the closest receivers, given the nature and scale of the operation.

4.9.3 EXISTING ENVIRONMENT

The borrow site is situated in a rural environment surrounded by farming properties and nature reserves. Sensitive receivers are the same as those identified in the 2014 Moonimba Quarry Expansion Air Quality Impact Assessment, prepared by ENVIRON Australia Pty Ltd, Appendix 9 of the Moonimba Quarry EIS, (Moonimba Quarry AQIA).

As part of this AQIA, the existing air quality was assessed in order to establish background levels for the key pollutants. The assessment consisted of a review of existing sources of air emissions in the region and a review of available air quality monitoring data.

Three industrial sources of dust emissions which may potentially cause direct cumulative impacts with emissions from the borrow site were identified within a 20 kilometre radius of the borrow site. These industrial sources were:

- Coraki Quarry, 18 Petersons Quarry Road, Coraki, NSW 2471
- Cape Byron Power Broadwater, 117 Pacific Highway, Broadwater, NSW 2472
- Broadwater Sugar Mill, 117 Pacific Highway, Broadwater, NSW 2472.

There is limited information on existing air quality in the region surrounding the borrow site. No publicly available air quality monitoring data is available for the region surrounding the borrow site and no air quality monitoring has been carried out at the borrow site.

In order to establish background levels for the key pollutants (i.e. deposited dust, TSP, PM_{10} and $PM_{2.5}$), the following air quality monitoring data sets were utilised:

- Roads and Maritime monitored air quality at a site adjacent to the Pacific Highway at Korora between Korora Public School and the Korora Rural Fire Brigade, north of Coffs Harbour. This monitoring was undertaken as part of the Environmental Assessment for the Sapphire to Woolgoolga Pacific Highway Upgrade (RTA, 2007) and was conducted from October 2005 to January 2006.
- Pacific Highway Upgrade Project between Woolgoolga and Ballina. Dust deposition monitoring has been performed at several locations along this section of the Pacific Highway since July 2016. The dust deposition monitoring network for this section of the highway currently consists of seventeen dust deposition gauges, eight of which are located within a 20 kilometre radius of the borrow site.

The ambient air quality criteria adopted for the assessment are based on NSW EPA air quality goals as detailed in the Approved Methods (NSW EPA, 2017).

4.9.4 IMPACT ASSESSMENT

In order to assess the potential variation in emissions over the two years of extraction at the borrow site, two emission inventories were compiled (i.e. year 1 and year 2). Emissions from each scenario were estimated and dispersion modelling was carried out for year 2, which was found to be the year with the highest overall emissions.

- Sources of particulate emissions associated with the borrow site include:
- Topsoil and overburden removal
- Raw material extraction activities, including excavation, drilling and blasting
- Vehicle entrainment of particulate matter during the haulage of material along the sealed and unsealed roads
- Unloading of material to processing plants
- Crushing and screening of extracted material at screening plants
- Process plant operations including loading of product to stockpiles and stockpile management
- Loading of products to delivery trucks
- Unloading of imported fill to emplacement areas
- Wind erosion associated with material stockpiles, active pits and imported fill emplacement areas.

The dispersion modelling results found that the cumulative $PM_{2.5}$, PM_{10} and TSP concentrations and dust deposition rates predicted at each surrounding sensitive receiver comply with their corresponding ambient air quality criteria. Specifically, the following conclusions were drawn for the proposed intensification of extraction at the Moonimba Borrow Site:

- The modelling of $PM_{2.5}$ emissions from all identified sources associated with the operations at the borrow site showed that maximum predicted annual and 24-hour average cumulative $PM_{2.5}$concentrations at all nearby sensitive receivers would remain below the relevant ambient air quality criteria. The incremental impacts predicted by the modelling for $PM_{2.5}$ emissions are negligible.
- The modelling of PM_{10} emissions from all identified sources associated with the operations at the borrow site showed that maximum predicted annual and 24-hour average cumulative PM_{10}

concentrations at all nearby sensitive receivers would remain below the relevant ambient air quality criteria.

- The modelling of TSP emissions from identified sources associated with the operations at the borrow site showed that these emissions have no potential to give rise to ground level exceedances of ambient air quality criteria for annual average TSP concentrations and dust deposition rates.

No air quality constraints have been identified for the proposed intensification of extraction at the Moonimba Borrow Site as a result of the air quality impact assessment.

The source of particulate matter associated with the proposed Moonimba Borrow Site are considered to be similar to those that were identified in Section 5.9.5 of the Moonimba Quarry EIS. Despite the intensification of operations at the site, the proposal is unlikely to result in exceedances of the ambient air quality criteria, similarly to the outcome of the Moonimba Quarry AQIA.

CONSISTENCY WITH THE APPROVED PROJECT

The sources of particulate matter outlined in Section 4.7.4 are considered to be consistent with those that were identified and assessed for the Approved Project under the W2B EIS. A qualitative air quality impact assessment was undertaken under the W2B EIS. This assessment determined that air quality would not be a key issue for the project, and that event though fugitive dust emissions had the potential to impact on sensitive receivers, these could be avoided through appropriate mitigation. This quantitative assessment for the Moonimba Borrow Site determined that no air quality constraints are anticipated from the proposed intensification of extraction at the site, therefore no additional impacts are anticipated beyond those previously assessed.

4.9.5 MITIGATION / MANAGEMENT MEASURES

Dust emissions from the Moonimba Borrow Site would be managed in accordance with the *Woolgoolga to Ballina Pacific Highway Upgrade (sections 3-11) Construction Air Quality Management Plan* (CAQMP), Appendix B6 of the CEMP.

4.10 VISUAL AMENITY AND LANDSCAPE

4.10.1 EXISTING ENVIRONMENT

The Moonimba Ridge is a prominent landform in the area consisting of Kangaroo Creek Sandstone formed during the Cretaceous Period. The ridge is heavily vegetated and surrounded by predominantly cleared floodplain utilised for agricultural purposes.

The borrow site is located on a large property (Lot 193 DP 755603) that is situated on top of the Moonimba Ridge. A majority of the site comprises dry sclerophyll forest predominately consisting of Blackbutt, with secondary species of Pink Bloodwood, Red Mahogany, Scribbly Gum and occasional Tallowwood.

The surrounding floodplains to the east, north and north-west of the borrow site were cleared 100 to 130 years and support a range of commercial agricultural businesses. Cattle grazing is a common agricultural activity in the area as well as the farming of a number of crops including sugar cane, soy beans and melaleuca shrubs that produce ti-tree oil. The region surrounding the borrow site consists primarily of by rural residential properties which are located on the lower slopes of the Moonimba Range. The closest residential receiver is about one kilometre from the excavation area.

4.10.2 IMPACT ASSESSMENT

The borrow site is located on the peak of the ridge in the centre of a large property (greater than 500 hectares) which is densely vegetated. The dense vegetation surrounding vegetation the borrow site acts as a natural visual shield for the borrow site and assists in reducing the visual signature of the borrow site. The expansion of the existing excavation area would not impact on the natural shielding provided by the vegetation. , however some light would be produced due to the need to use security lighting within the site compound and where required for works within the eastern and western pits. A temporary increase in visual amenity impacts would be anticipated for residents and road users along Woodburn-Coraki Road due to the increase in heavy vehicle movements associated with the proposed modification. It is noted however that the temporary visual amenity impacts associated with increased heavy vehicle traffic would be short term in nature and may vary according to the needs of the Approved Project.

An assessment of visual and landscape impacts was undertaken during the preparation of the Moonimba Quarry EIS. The assessment considered key areas of potential impact including the state of the current landscape, extent of the changes proposed, areas of visibility, duration of impact and the effectiveness of the mitigations proposed. Given the proposed modification would encompass the same parcel of land assessed within the Moonimba Quarry EIS, it is considered unlikely that activities under the proposed modification would generate a significant increase in visual amenity impacts, or impacts to the landscape form.

Key differences between the proposed modification and Development Application No. 2015.0069 regarding visual amenity and landscape impacts include:

- The provision of security lighting within the site compound as well as lighting towers within both the eastern and western pits
- Additional temporary visual amenity impacts for residents and road users along Woodburn – Coraki Road due to increase in heavy vehicle movements

CONSISTENCY WITH THE APPROVED PROJECT

The visual amenity and landscape impacts generated throughout the duration of site operation under the proposed modification would be consistent with those already generated by the borrow site operations identified in the *Woolgoolga to Ballina Pacific Highway Upgrade Environmental Impact Statement* (RMS, December 2012). No additional visual amenity or landscape impacts are anticipated beyond those previously assessed.

4.10.3 MITIGATION / MANAGEMENT MEASURES

Mitigation / management measures for the Approved Project are relevant to the proposed modification. No additional mitigation measures are required.

4.11 PROPERTY AND LAND USE

4.11.1 INTRODUCTION

This section considers potential land use and property impacts that may result from the proposed modification. Impacts on planning and land use were discussed in Chapter 16 of the *Woolgoolga to Ballina Pacific Highway Upgrade Environmental Impact Statement* (W2B EIS) (RMS, December 2012) and *Working Paper Volume 8 – Traffic and Transport, Land use and property and Social and Economic.*

4.11.2 EXISTING ENVIRONMENT

Moonimbah Quarry currently operates as an approved sandstone quarry site which is wholly contained within Lot 193 DP755603. The borrow site is zoned as RU1 – Primary Production under the Richmond Valley LEP (2012), and the current land uses (extractive industry, and importation of fill) are permitted with consent under the RU1 zone. All proposed activities associated with operating the borrow site would be undertaken within the site as specified in Figure 2-2. No operational activities would be undertaken outside Lot 193 DP755603 aside from transporting materials to and from the borrow site. The access track which connects into Lot 193 DP755603 is a dedicated road maintained by Richmond Valley Council. Some of the surrounding land adjacent near Boggy Creek Road is Crown Land, however this land is not likely to be impacted during operation of the borrow site. All vehicles transporting materials to and from the site would use designated roads and would not enter private or Commonwealth property for any reason without permission from the landholder. A search of the Native Title Register revealed that there are no native title claims or determinations located within the borrow site.

4.11.3 IMPACT ASSESSMENT

Operations under the proposed modification would not alter current land uses within the site. No conservation lands would be impacted by the proposed modification, and there is no commercial forestry currently carried out within the site or proposed as a part of this modification.

No additional private properties would need to be acquired to facilitate the proposed modification. Impacts to the adjoining land uses are consistent with the land use impacts previously assessed within DA2015.0069.

Property and land use impacts associated with DA2015.0069are discussed within section 5.1 (‘Section 79C(1) of the EP&A Act’) of the Moonimba Quarry EIS. The land use and property impacts are discussed in order to address the criteria listed within Section 79C(1) of the EP&A Act which details the matters for consideration for the assessment of a development application.

The Moonimba Quarry EIS states that the development associated with DA2015.0069 would not substantially alter the use of the land or lands within the surrounding area. Similarly, the proposed modification would operate within an existing quarry and therefore would not result in any proposed change in land use. There are no notable differences between the land uses proposed within the Moonimba Quarry EIS and the proposed modification.

CONSISTENCY WITH THE APPROVED PROJECT

The quarry was identified as Robinson’s Pit and a source of material in the W2B EIS (refer Figure 6-44 in Chapter 6 of the EIS). While it was not assessed, the land uses are consistent with other borrow sites assessed by the EIS. As there are no proposed changes to land use, and the site would function in the same manner as all other borrow sites assessed within the W2B EIS, the planning and land use impacts of the proposed modification are considered consistent with the Approved Project.

4.11.4 MITIGATION / MANAGEMENT MEASURES

Mitigation / management measures for the Approved Project are relevant to the proposed modification. No additional mitigation measures are required.

4.12 SOCIAL AND ECONOMIC

4.12.1 INTRODUCTION

This section considers potential socio-economic impacts that may result from the proposed modification. Socio-economic impacts were discussed in Chapter 17 of the *Woolgoolga to Ballina Pacific Highway Upgrade Environmental Impact Statement* (RMS, December 2012) and *Working Paper Volume 8 – Traffic and Transport, Land use and property and Social and Economic*. This assessment includes the same items that were addressed in the *Woolgoolga to Ballina Pacific Highway Upgrade Environmental Impact Statement* (RMS, December 2012).

4.12.2 METHODOLOGY

A desktop review of existing information was undertaken to provide an overview of the demographic and social characteristics of the area. The review included the most recent Census data from Swan Bay and Woodburn region (2011), and the *Richmond Valley Economic and Demographic Profile Report* prepared for Richmond Valley Council by Lawrence Consulting in 2013.

4.12.3 EXISTING ENVIRONMENT

POPULATION

Bungawalbin was identified within the Swan Bay (Richmond Valley – NSW) Census (2011) region. As of the 2011 Census, the total population of Swan Bay was 286 people of these 51.0% were male and 49.0% were female (ABS, 2017). This represents 1.3% of the total number of people who resided in Richmond Valley (22,697) (Richmond Valley Council, 2017). The median age of people in Swan Bay (Richmond Valley - NSW) was 35 years. Children aged 0 - 14 years made up 26.4% of the population and people aged 65 years and over made up 10.6% of the population (ABS, 2017).

In the 2011 Census, there were 775 people in Woodburn (Richmond Valley - NSW) of these 54.1% were male and 45.9% were female. The median age of people in Woodburn (Richmond Valley - NSW) was 42 years. Children aged 0 - 14 years made up 20.1% of the population and people aged 65 years and over made up 18.7% of the population.

The region surrounding Bungawalbin primarily consists of sparsely populated regional villages, regional development (such as quarrying and other extractive industries) and agricultural lands. Given the lack of a regional centre in the area, it is considered unlikely that the township has experienced major population growth in the years following the 2011 Census, however it is noted that Richmond Valley Council has granted consent for the subdivision of several rural residential lots in the vicinity of the proposal which could result in additional rural residential developments.

EMPLOYMENT

Average weekly income in Swan Bay (Richmond Valley - NSW) was lower than the NSW average in 2011 with less people holding qualifications when compared to the state average. However, the Swan Bay (Richmond Valley-NSW) region hosted a higher rate of home ownership when compared to the state average. The unemployment rate was 4.7%, which is lower than the Northern Rivers average, the NSW average (5.9%) and the national average (5.6%).

The most commonly held occupations in Swan Bay (Richmond Valley - NSW) included Managers 19.5%, Technicians and Trades Workers 19.5%, Clerical and Administrative Workers 12.2%, Machinery Operators and Drivers 11.4%, and Professionals 10.6%. In comparison, the most common occupations in Woodburn (Richmond Valley - NSW) included Technicians and Trades Workers 17.1%, Labourers 16.1%, Community and Personal Service Workers 13.0%, Managers 12.1%, and Sales Workers 11.5%.

Woodburn (the nearest town) includes a number of restaurants, facilities and accommodation which service the wider region, including regional towns and villages such as Bungawalbin. Several businesses occur within Woodburn and hold direct access to the Pacific Highway, including a supermarket, service station, cafés, bakeries, takeaway shops and a motel. Local schools within the region include St Joseph's Primary school on Woodburn-Coraki Road and Woodburn Public school on Woodburn Street.

On the day of the 2011 Census, the majority of employed people in Swan Bay (Richmond Valley - NSW), travelled to work by car whether as the driver (69.4%) or as a passenger (2.5%). To a lesser extent, employed people in Swan Bay (Richmond Valley – NSW) walked to work (3.3%) or took a motorbike / scooter (2.5%). Similar figures were observed in Woodburn (Richmond Valley - NSW) with the majority of employed people travelling to work by car as a driver (65.9%) or as a passenger (6.6%). A larger proportion of people in this area walked to work (7.2%) whereas smaller portions of the population travelled by truck (1.6%) or motorbike/scooter (1.2%). Public transport is not provided in Woodburn and surrounding areas, however local bus providers provide a school bus service for local children. When combined, it is clear that the majority of traffic in peak times (i.e. before and after normal business hours) would be generated by a combination of motorists in addition to any truck movements generated by surrounding quarries and other extractive industries. Very few bus movements could be anticipated as the only service provided is exclusively for school children as opposed to public transportation.

4.12.4 IMPACT ASSESSMENT

The socio-economic impacts resulting from operations within the Moonimba Borrow Site are largely discussed within section 5.13 ('Economic and Social Impacts') of the Moonimba Quarry EIS prepared to support DA2015.0069. The impacts that were assessed included potential positive impacts to employment in the area and the local economy, and positive impacts to road users through the implementation of capital improvement upgrades (detailed DA2015.0069). Many of these impacts are hinged on the potential to help in the delivery of the Approved Project.

The Moonimba Borrow Site would be an important resource for the construction of the highway in the short term and to the local economy in the longer term when it resumes operation to supply local areas.

The proposed modification would not require additional property acquisition, or involve the expansion of the borrow site beyond the footprint presented in the Moonimba Quarry EIS. No impacts are anticipated to agricultural lands surrounding the Moonimba Borrow Site.

Operations under the modification would offer additional direct and indirect employment opportunities within the locality. Employment opportunities would include full-time and part-time roles within the Moonimba Borrow Site during operations, and opportunities for blasting contractors as well as transportation contractors. Operations under the modification would also provide direct and indirect benefits and jobs to local businesses in areas such as Woodburn and surrounding region through increased construction expenditure and workforce activity. This would include (but is not limited to) retail, accommodation, cafes and restaurants, and property and business services.

Temporary increases in heavy haulage trucks would be anticipated along local roads (Woodburn-Coraki Road) resulting in some amenity impacts to local residents. It is not anticipated that these increases would impact on the Pacific Highway due to existing traffic levels on the highway as described in the Traffic, Transportation and Access chapter (Section 4.2.4). In addition there would be potential impacts on road safety resulting from the increased construction traffic on haulage routes during construction and operation of the borrow site (refer to Section 4.2).

The borrow site would also generate additional noise and dust as described in Sections 4.3 and 4.7. Furthermore, additional noise and dust impacts associated with the haulage of materials and equipment during operation is anticipated (refer to Sections 4.3 and 4.7).

The social and economic impacts under the proposed modification would be similar to those described within section 5.13 of the Moonimba Quarry EIS. The increase in activity within the Moonimba Borrow Site would result in positive employment impacts, with up to three part time and up to five full time jobs created during the duration of site work. Further employment opportunities would be generated as an indirect outcome of the proposal including machinery and equipment operators, transportation contractors, and blasting contractors. Local businesses such as cafes and restaurants would also experience potential increases in business due to the increase of activity in the area. Road users would also benefit in the long-term through the capital improvement upgrades. However there are some key areas where impacts under the proposed modification would be greater than those discussed within DA2015.0069.Key differences to the proposed modification and DA2015.0069 regarding social and economic impacts include:

- Modest increase in available full time and part time employment positions during operations
- Undertaking repairs to local roads caused by hauling operations in lieu of making payments to Council for road maintenance
- Potential for short-term delays on local roads due to increase in heavy vehicle movements in the area
- Potential for short-term amenity impacts (such as noise and dust generation) due to the increase of heavy vehicle movements in the area

CONSISTENCY WITH THE APPROVED PROJECT

The anticipated social and economic impacts generated during site operation under the proposed modification would be consistent with those already generated by the borrow site operations identified in Chapter 6 ('Description of the Project – Construction) and the social and economic impacts identified in Chapter 17 ('Social and Economic') of the Woolgoolga to Ballina Pacific Highway Upgrade Environmental Impact Statement (RMS, December 2012). Chapter 6 details the types of activities which could be anticipated during the construction phase of the project which includes (but is not limited to) the use of borrow sites to supply material to the project and the haulage of that material to the construction corridor. Chapter 17 details the potential social and economic impacts of the Approved Project which includes (but is not limited to) potential for impacts from construction traffic, noise and dust, increased travel times for local and long distance road users near road works.

The impact assessment undertaken for the Approved Project assessed potential impacts to Woodburn and its immediate surrounds, but did not include social and economic impacts for towns outside the immediate vicinity of the works (such as Bungawalbin). Given the nature of the proposed modification, similar impacts to amenity and local road use would be anticipated for Bungawalbin during the operations under the proposed modification through the increase in heavy vehicles hauling material from the Moonimba Borrow Site to the Approved Project. The additional impacts to local traffic, noise and air quality are discussed in sections 4.1.4, 4.2.4 and 4.7.4 respectively. It is anticipated that the proposed modification may result in additional social amenity impacts to Bungawalbin and road users in the region due to the temporary increase in heavy vehicle movements along Woodburn-Coraki Road.

4.12.5 MITIGATION / MANAGEMENT MEASURES

Management of social amenity such as increased traffic, noise and dust are discussed in sections 4.1.5, 4.2.5, and 4.7.5 respectively. The community in the vicinity of the proposed modification would be notified and consulted with in accordance with the approved *Woolgoolga to Ballina Stakeholder Engagement Strategy*. No additional mitigation measures are proposed.

4.13 WASTE AND RESOURCE MANAGEMENT

4.13.1 INTRODUCTION

This section considers potential waste and resource impacts that may result from the borrow site. Waste and resource impacts were discussed in Chapter 18.3 of the *Woolgoolga to Ballina Pacific Highway Upgrade Environmental Impact Statement* (RMS, December 2012) and section 5.10 of the *Moonimba Quarry Expansion Bungawalbin NSW Environmental Impact Statement* (Newman's Quarry & Landscape Supplies, 2014) (Moonimba Quarry EIS).

4.13.2 EXISTING ENVIRONMENT

Conditions of consent associated with Development Application No. 127/95, do not include provisions for the importation of fill material. Hazardous materials are permitted to be stored in a manner which prevents environmental damage from spills or leaks. Where oils and lubricants are kept on site, they are required to be stored in an impermeable bunded and roofed area with holding capacity of 110% of the capacity of the largest container. All necessary licenses have been obtained from the Environment Protection Authority for the operation of the quarry and discharge of polluted wastewater from the site.

Under the consent conditions associated with Development Application No. 2015/069 and as detailed in the Operational Plan of Management (presented within Appendix 10 of the Moonimba Quarry EIS), operations permitted under do not include a permanent fuel storage within the site. All machinery would be refuelled by mobile vehicles (utilities with fuel tanks attached) which would travel to the site with fuel as a payload. Oils and lubricants would be stored in utility vehicles and brought to site by the operators as needed. Minor maintenance (such as the initial setup of machines) would be carried out on site, however major repairs and services would be carried out at the relevant depot for each machine. No servicing would be undertaken on site for any reason. No waste fuels or oils would be disposed of on site and all containers would be disposed of by individual machine operators or contractors. No unsightly materials would be held in areas which are visible to residences or public places, no rubbish would remain on site at any time and no waste storage would be provided. Fill imported to the site under the consent conditions associated with Development Application No. 2015/069 is required to be certified Virgin Extracted Natural Material (VENM). Certification would be provided to the quarry manager for all VENM imported to the site. Imported fill would be stored in designated areas only and would not be stored outside the initial area where received or designated rehabilitation areas.

No wastewater disposal facilities are currently provided on the site. Drinking water is currently supplied through sourcing of bottled water. Non-potable water is supplied by pumping sedimentation ponds using small on-site pumps. The water is currently used for dust suppression and watering of landscaped areas.

No public utilities are currently available within the site, however, an access track exists to the transmission towers in Lot 50 DP755609 and suitable access is maintained to allow continual access to the towers.

4.13.3 IMPACT ASSESSMENT

The principal wastes likely to be generated by the borrow site may include (but are not limited to):

- Classified liquid and non-liquid wastes (e.g. waste oil, hydrocarbons and containers and oil/water emulsions)
- Sewage and general waste from construction compounds
- General waste from office and compounds.(e.g. food scraps, packaging and consumables)
- Green waste.

Due to the nature of the quarrying operations, negligible waste from extraction activities is anticipated. There would not be any tailings or refuse material as all of the extracted material would be needed and thus exported from the borrow site. Should any material excavated at the site be unsuitable for the project, then it would be stockpiled at the site in accordance with the stockpiling requirements in the W2B CEMP.

Topsoil would be scraped up and stockpiled on site separately for use in rehabilitation of the site once operations are completed.

The modification would include the temporary use of a bulk fuel storage within the site. Up to 10,000L of diesel would be stored within an above-ground, self-bunded storage vessel. Mobile fuel carts would also be used to reach less mobile plant and equipment within the site. Other chemicals associated with the modification would be stored within the site including small quantities of unleaded fuel (up to 100L) and small quantities of oils and lubricants (up to 200L). Other chemicals associated with blasting (including emulsion chemicals) would also be stored within the site.

Minor maintenance would also continue to be performed on equipment and machinery within the site, however major repairs and all servicing would continue to be undertaken at a depot.

Fill imported to the site would comprise a mixture of Virgin Excavated Natural Material (VENM), and Excavated Natural Material (ENM). Imported fill would be stored within the designated areas shown in Figure 2-2.

No wastewater disposal facilities would be provided within the site, and non-potable water would be supplied to the site through de-watering of sediment basins for use in dust suppression on haulage roads and during crushing/screening operations. Sediment basins have the potential to generate large quantities of fine silt laden material, which, if not managed appropriately, has the potential of causing water pollution. Drinking water would be supplied through procurement of potable water. Ablution blocks or equivalent would be installed and maintained throughout the duration of site use. Power would likely be supplied to the site office through use of generators for the duration of site use. Access to the transmission towers in Lot 50 DP755609 would be maintained at all times.

The waste generated and resources used by operations under the proposed modification would be similar to those listed within the section 5.10.2 of the Moonimba Quarry EIS and the Operational Plan of Management presented in Appendix 10 if the Moonimba Quarry EIS.

Key differences between the proposed modification and Development Application No. 2015/069 regarding waste and resource management include:

- Importation of certified ENM in addition to VENM,
- Storage of up to 10,000L of bulk fuel on site and designated,
- Designated refuelling areas for mobile plant,
- Storage of small amounts of chemicals (including but not limited to unleaded fuel, oils, lubricants, and chemicals used for blasting such as emulsion chemicals), and
- Small amounts of waste oil and rubbish would also be stored within the site.

Management of these impacts is addressed in section 4.11.4.

CONSISTENCY WITH THE APPROVED PROJECT

The waste generated and resources used throughout the duration of site operation under the proposed modification would be consistent with those already generated by the borrow site operations identified in the *Woolgoolga to Ballina Pacific Highway Upgrade Environmental Impact Statement* (RMS, December 2012). No additional impacts to waste and resource management are anticipated beyond those previously assessed.

4.13.4 MITIGATION / MANAGEMENT MEASURES

Waste material generated on-site would be managed in accordance with the Protection of the Environment Operations Act 1997, Waste Classification Guidelines Part 1: Classifying Waste (DECCW, 2009), and approved *Woolgoolga to Ballina Pacific Highway Upgrade (sections 3 to 11) Construction Waste, Resource and Energy Management Plan* (CWREMP)(Appendix B7,CEMP).

All fill imported to the site would be recorded and managed in accordance with Excavated Natural Material Order 2014 and the Excavated Natural Material Exemption 2014, and would be stockpiled and stored in accordance with the approved *Woolgoolga to Ballina Pacific Highway Upgrade (sections 3 to 11) Construction Soil and Water Management Plan* (including the Stockpile Management Protocol).

If contaminated soil is encountered, it would be managed and disposed of in accordance with the approved *Woolgoolga to Ballina Pacific Highway Upgrade (sections 3 to 11) Construction Waste, Resource and Energy Management Plan* (CWREMP) (Appendix B7,CEMP) and the approved *Woolgoolga to Ballina Pacific Highway Upgrade (sections 3 to 11) Construction Contaminated Land Management Plan* (CCLMP)(Appendix B8, CEMP). Both plans contain protocols for the handling, stockpiling and disposal of contaminated soils and require disposal at an appropriately licensed waste facility.

Where suitable, the sediment removed from basins would be used within the borrow site for landscaping or rehabilitation purposes. Water collected in the sediment basins would be extracted and used as a dust suppressant on haul roads and during crushing/screening. The rate of application would be such as not to cause runoff to surrounding waters. It is anticipated that the water reuse would be limited to the excavation area above the sediment ponds so that any excess water would run off back into the basins.

All fuel and chemical stores, and refuelling areas would be managed in accordance with the approved *Woolgoolga to Ballina Pacific Highway Upgrade (sections 3 to 11) Construction Soil and Water Management Plan* (Appendix B4, CEMP). No additional mitigation measures would be implemented on the site beyond those outlined within the approved *Woolgoolga to Ballina Pacific Highway Upgrade (sections 3 to 11) Construction Environmental Management Plan* and associated sub-plans.

4.14 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

Under the environmental assessment provisions of the Environment Protection and Biodiversity Conservation Act 1999, the following matters of national environmental significance and impacts on Commonwealth land are required to be considered for the proposed modification.

Table 4-5 shows the Matters of National Environmental Significance and the level of impact the proposed modification is anticipated to generate.

Table 4-5 Matters of National Environmental Significance

FACTOR	IMPACT
Any impact on a World Heritage property?	No World Heritage properties would be impacted by the proposal.
Any impact on a National Heritage place?	No impact on a National Heritage Place.
Any impact on a wetland of international importance?	No wetlands of international importance would be impacted by the proposal.
Any impact on a listed threatened species or community?	No threatened species or communities listed under the EPBC Act would be impacted by the proposal.
Any impact on a listed migratory species?	No migratory species would be impacted by the proposal.
Any impact on a Commonwealth marine area?	The borrow site is not located within a Commonwealth marine area.
Does the proposal involve a nuclear action (including uranium mining)?	The proposal does not involve a nuclear action.
Additionally, any impact (direct or indirect) on Commonwealth land?	The borrow site is located on privately owned land.

5 CONSULTATION

5.1 CONSULTATION FOR THE APPROVED PROJECT

Consultation has been undertaken throughout the evolution of the Approved Project. Activities undertaken prior to project approval are detailed in Chapter 12 of the W2B EIS and Appendix D of the W2B SPIR.

Government agencies have been regularly consulted with during monthly Environment Review Group (ERG) meetings. Relevant government agency stakeholders include:

- Environment Protection Authority (EPA)
- Department of Primary Industries – Fisheries (DPI Fisheries)
- Office of Environment and Heritage (OEH)
- Forestry Corporation of NSW (FCNSW)
- Department of Planning and Environment NSW (DP&E)
- Department of Environment (DoE)
- Roads and Maritime Services (RMS)

Community consultation for the Approved Project has occurred regularly in accordance with the approved Woolgoolga to Ballina Communications and Stakeholder Engagement Strategy which has been delivered in accordance with MCoA C1. Flood focus group meetings would be undertaken to discuss hydrological impacts in accordance with MCoA B33.

In accordance with mitigation measure AH10 in Chapter 5 of the SPIR (November 2013), ongoing Aboriginal Focus Group (AFG) meetings have occurred regularly in each of the four portions of the project. The consultation with RAPs has been undertaken in accordance with the Aboriginal Cultural Heritage Requirements for Proponents (DECCW 2010) and the Roads and Maritime 'Procedure for Aboriginal Cultural Heritage Consultation and Investigation' (PACHCI).

5.2 CONSULTATION FOR DEVELOPMENT APPLICATION NO. 2015.0069

Consultation was undertaken to support DA2015.0069 in early 2014 and was summarised in the Community Consultation Regarding the Proposed Expansion of Newmans Quarry (Caroline Desmond, July 2014) presented as Appendix 10 of the Moonimba Quarry EIS. Consultation was undertaken with immediate neighbours, all residents on the proposed truck route (Boggy Creek Road and Reardons Lane from the Boggy Creek Road intersection to the T-intersection at Woodburn-Coraki Road) and residents within a one kilometre radius of the site. Consultation consisted of phone calls, emails, letters in the post, and/or personal visits. The residents were supplied with a summary of the proposal at the time of consultation and were asked whether they had any issues or concerns with current operations within the quarry, and whether they had any concerns regarding the proposed quarry expansion. In total, 42 residents were contacted during the community consultation period of which the following issues were raised:

- No concerns (17)
- Trucks – including noise, dust, bus route, safety (11)
- Hours of operation (6)
- Noise from quarry operations (5)
- Property value (4)
- Other issues (14)

5.3 CONSULTATION FOR THE PROPOSED MODIFICATION

5.3.1 AGENCY CONSULTATION

The relevant government agencies were briefed about the proposed modification during the July 2017 Environment Review Group (ERG) meeting prior to the exhibition of the Modification Report. Agencies would be notified once the Modification has been placed on public display. Any feedback received would be addressed in a submission report prepared after the public display of the modification report.

5.3.2 COMMUNITY CONSULTATION

An initial notification letter was distributed in August 2017 to potentially affected receivers and stakeholders that contained information regarding the background and scope of the proposal, traffic management, work hours and an outline of the modification approval process. See copy in Appendix L. Issues raised by the community from this information was a request for outcomes of any updated studies and specifically issues regarding traffic and noise management. These issues have been addressed in this modification report which will be made available to the community during the exhibition period.

A drop-in session is scheduled during the exhibition period at the Woodburn Visitor Information Centre. Doorknocks and one-on-one meetings will be scheduled as required.

5.3.3 REGISTERED ABORIGINAL PARTIES

The proposed modification falls within the Bogal Local Aboriginal Land Council (LALC) area. A consultation letter has been sent to Bogal LALC providing a brief description of the proposal, and information regarding the intended exhibition timeframes for the modification. Bogal LALC were also invited to provide feedback prior to exhibition of the proposed modification.

6 ADDITIONAL MANAGEMENT MEASURES

A range of environmental requirements and control measures have been previously prescribed for the Approved Project including mitigation measures listed within in the Submission / Preferred Infrastructure Report (November 2013)(S/PIR), the Conditions of Approval, relevant Roads and Maritime documents and the approved *Woolgoolga to Ballina (sections 3-11) Construction Environment Management Plan (W2B CEMP)* and associated sub-plans. The proposed modification would be established, operated and maintained in accordance with the requirements included in the W2B CEMP and associated sub-plans.

As outlined in Section 4.2.3 of the approved W2B CEMP, the contractor operating the Moonimba Borrow Site would be required to develop project specific environmental management documentation to address the operational control requirements outlined in the W2B CEMP. This includes the development of a Contractor's Construction Environmental Management Plan (CCEMP) that would be reviewed by Pacific Complete to ensure its compliance with the relevant requirements of the W2B CEMP. Additionally, an Environmental Work Method Statement (EWMS) would be developed by the contractor for the Moonimba Borrow Site. Management measures identified within this modification report would be incorporated into site or activity specific Environmental Work Method Statements (EWMS) prepared by the contractor.

The mitigation measures presented in Table 6-1 are discussed in Chapter 4 of this modification report and are in addition to mitigation measures presented in the W2B CEMP and associated sub-plans.

Table 6-1 Additional mitigation measures for the Moonimba Borrow Site

	MEASURE/REQUIREMENT	RESPONSIBILITY	TIMING/ FREQUENCY
Traffic transport and access			
MM 1	Road upgrades specified in approved DA2015.0069 would be completed prior to the commencement of increased haulage of extracted material from the borrow site.	Landowner / Pacific Complete	Preconstruction
MM 2	Right-turn treatment on the Pacific Highway, for vehicles to safely and efficiently access Woodburn-Coraki Road with the appropriate treatment being a channelised right turn bay on the Pacific Highway, southbound will be installed to provide a right-turn treatment on the Pacific Highway for vehicles to safely and efficiently access Woodburn-Coraki Road. This treatment requires the reconfiguration of the intersection's layout and realignment of the existing line marking.	Pacific Complete / Contractor	Preconstruction
MM 3	A traffic management plan (TMP) will be prepared in accordance with the W2B CTAMP (Appendix B1 of the CEMP). This will include traffic controllers, variable message signs and adequate tapering, which will be provided to manage this intersection during peaks in construction haulage activities.	Pacific Complete / Contractor	Preconstruction

	MEASURE/REQUIREMENT	RESPONSIBILITY	TIMING/ FREQUENCY
MM 4	The implementation of GPS tracking of haulage vehicles will be investigated to monitor the location of haulage trucks during the morning and afternoon school peak traffic times so as to ensure impacts of school bus operations are minimised.	Pacific Complete / Contractor	Preconstruction Construction
Noise and vibration			
MM 5	A blast management plan will be prepared by the contractor prior to any blasts occurring at the site to ensure compliance with overpressure and vibration limits outlined in the Approved Project's Conditions of Approval, specifically MCoA B22 and B23.	Pacific Complete / Contractor	Preconstruction Construction
MM 6	A program for regular noise monitoring will be established. As a minimum, noise monitoring will be undertaken for the following: • The first time any new or altered operations occur at the facility to meet the increased extraction rate (with the exception of Site Establishment works) • Any time equipment changes are made • Any time operations are commenced concurrently for the first time • Where operations move to a new location within the approved work area • As a result of a valid complaint from a surrounding noise sensitive receiver.	Pacific Complete / Contractor	Construction
MM 7	Where any exceedances of the criteria are measured, the operator of the facility is to implement all reasonable and feasible measures to reduce noise levels towards the criteria. Measures may include: • Erecting noise barriers, screening or forming bunds around activities which are found to cause exceedances of the criteria. Depending on the surrounding topography, localised screening around equipment may reduce noise emissions by up to 10-15 dB(A). • Performing all noise intensive activity such as crushing and/or screening at deep excavation areas in existing pits, irrespective of extraction location. • Managing activities that are undertaken concurrently in order to meet noise criteria. This may change dependent on the location on site due to topographical screening and distance to the surrounding receivers. In certain areas more work may be permissible concurrently than when the same work is undertaken on a different part of the site. • Where reversing alarm noise is identified to be a source of disturbance, the alarm noise level will be checked against the appropriate regulatory and health and safety requirements and the necessary mitigating action taken to achieve an acceptable noise reduction without compromising safety standards. • In line with the CEMP, alternative methods to traditional beeper alarms may be used.	Pacific Complete / Contractor	Construction

	MEASURE/REQUIREMENT	RESPONSIBILITY	TIMING/ FREQUENCY
	• In the event that rumble grid noise is considered to be a source of disturbance, mitigation applied in the form of lower posted speeds at the grids or localised screening to be installed if appropriate.		
MM 8	In order to manage the haulage route noise impacts, the measures detailed in the CNVMP will be followed and implemented where feasible and reasonable.	Pacific Complete / Contractor	Construction
MM 9	An inspection of the noise wall outlined in DA2015.0069 to be constructed at the affected received on Reardons Lane will be undertaken and noise monitoring carried out to ensure sufficient noise reductions are being provided for this receiver.	Pacific Complete / Contractor	Construction
Biodiversity			
MM 10	A Habitat Offset arrangement of a minimum of 68 hectares with a legally binding mechanism for the protection in perpetuity of the habitat offset will be implemented in accordance with the requirements outlined in DA2015.0069. Prior to approval of the offset a suitably qualified person will be engaged to: • Undertake detailed assessment of the 90 hectare area to determine the location of the final 68 hectare area. The area shall provide habitat on a like for like basis proportional to the impacted vegetation communities. • The offset shall comprise a single contiguous area incorporating logical management and/or landscape boundaries that are easily identifiable and designed to minimise edge effects. • Investigate opportunities for securing the Habitat Offset. Preference shall be given to use of the BioBanking Scheme or alternatively a Conservation Agreement pursuant to the National Parks and Wildlife Act 1974. • Submit for approval of Richmond Valley Council details of the investigations referred to. • Undertake any such recommendations or requirements in association with the approved method of securing the Habitat Offset. The offset shall remain in force in perpetuity and the final offset area and mechanism for securing the habitat offset shall be approved by Richmond Valley Council.	Landowner / Pacific Complete	Preconstruction
MM 11	Revegetation areas required under DA2015.0069 will be further examined to ensure compliance with conditions of approval and ensure DA operation is possible in a timely manner.	Landowner / Pacific Complete	Preconstruction
MM 12	During pre-clearing surveys targeted surveys for the Powerful and Masked Owl will be undertaken to determine whether nesting is occurring within or near the proposed clearing footprint. In the event that a nest tree or roost tree is located and an active breeding pair are utilising the hollow, it must be clearly marked and a buffer of a	Pacific Complete / Contractor	Construction

	MEASURE/REQUIREMENT	RESPONSIBILITY	TIMING/ FREQUENCY
	minimum 50 metre radius must be applied and clearly delineated. Clearing of identified roosting tree would be removed outside breeding season (March – September) and when individuals have vacated the nest.		
MM 13	To reduce the potential for injury to resident fauna (especially macropods), speed limits along access roads and tracks will be limited to 40-50 kilometres per hour to reduce likelihood of road collision and road mortality. Warning signs along regularly used roads will be erected to warn road users of potential wildlife within the vicinity along road verges.	Pacific Complete / Contractor	Construction
Hydrology, water quality and soil management			
MM 14	An erosion and sediment control plan (ESCP) will be prepared by the contractor to detail how the site will be managed. This will be prepared in accordance with the Woolgoolga to Ballina Construction Soil and Water Management Plan (CSWMP, Appendix B4 of the W2BCEMP) and the Blue Book.	Pacific Complete / Contractor	Preconstruction
MM 15	A surface water monitoring program will be established prior to the operation of the site in order to establish baseline levels of the drainage lines near the borrow site and continue through the operation of the site. Water quality monitoring will be undertaken in accordance with the approved Woolgoolga to Ballina (sections 3 to 11) Water Quality Monitoring Program.	Pacific Complete / Contractor	Preconstruction Construction
MM 16	In the unlikely event that the Moonimba Borrow Site does encounter a permanent water table in the bedrock, and penetrates this water table, to a depth in excess of 5 metres, a review of management measures shall be undertaken which will include re-evaluation of the groundwater impact and return of captured water (inflows) to local drainages after treatment in an appropriate sedimentation pond (to capture suspended solids).	Pacific Complete / Contractor	Construction
MM 17	During the decommissioning of the site, the exposed areas will be stabilised prior to the site being handed back to the landowner.	Pacific Complete / Contractor	Post construction
Heritage			
MM 18	A temporary high visibility fence, with a minimum 30 metre radius, will be established around the scar tree, located to the south of the eastern pit prior to the commencement of works. The advice of a specialist preferably an Arborist, will be sought to determine appropriate buffer zones for the ongoing management and protection of the tree taking into account the topography of the landscape, the proposed extensive extractive works and the potential for long term damage.	Landowner/ Pacific Complete / Contractor	Preconstruction

7 CONCLUSION

A modification of the Woolgoolga to Ballina Pacific Highway Upgrade (the Project Approval) is being sought for the use and temporary intensification of operation at the Moonimba Borrow Site (previously known as the Moonimba Quarry), for the supply of material for the construction of the Approved Project.

The proposed modification would allow for the extraction and supply of one million tonnes of material per annum (equivalent to 400,000m^3) for a period of two years or until the material demand for the project ceases. This would provide two million tonnes of material in total which would meet the deficit of material in demand for the delivery of the Approved Project.

This modification report identifies and assesses the potential environmental impacts from the proposed modification. Section 4 of the report provides a detailed assessment of each potential environmental impact. The key potential environmental impacts identified include:

- An increase in haulage vehicles using the local road network to delivery material to the Approved Project
- Noise impacts to surrounding sensitive receivers from the operations of the borrow site
- Noise impacts to sensitive receivers located along the haulage route that would be utilised by haulage vehicles delivery material to the Approved Project
- The removal of 9.5 hectares of native vegetation and potential fauna habitat (previously approved under DA2015.0069).

As outlined in Section 6, the Moonimba Borrow Site would be established, operated and maintained in accordance with the requirements included in the *Woolgoolga to Ballina (sections 3-11) Construction Environment Management Plan (W2B CEMP)* and associated sub-plans. Additional mitigations applicable to the Moonimba Borrow Site are outlined in Section 6.

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