Wedgerock Pty Ltd

ABN: 15 099 038 123

Preliminary Environmental Assessment

for

Kiely's Karuah Quarry

October 2017

Prepared by:

R.W. CORKERY & CO. PTY. LIMITED

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Prepared for:

Wedgerock Pty Ltd
ABN: 15 099 038 123
PO Box 59
NORTH KARUAH NSW 2324

Telephone: (02) 4997 5583
Email: wedgerock@aapt.net.au

Prepared by:

R.W. Corkery & Co. Pty. Limited
Geological & Environmental Consultants
ABN: 31 002 033 712

Brooklyn Office:
1st Floor, 12 Dangar Road
PO Box 239
BROOKLYN NSW 2083

Telephone: (02) 9985 8511
Facsimile: (02) 6361 3622
Email: brooklyn@rwcorkery.com

Orange Office:
62 Hill Street
ORANGE NSW 2800

Telephone: (02) 6362 5411
Facsimile: (02) 6361 3622
Email: orange@rwcorkery.com

Brisbane Office:
Suite 5, Building 3
Pine Rivers Office Park
205 Leitchs Road
BRENDALE QLD 4500

Telephone: (07) 3205 5400
Facsimile: (02) 6361 3622
Email: brisbane@rwcorkery.com

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1. INTRODUCTION

Wedgerock Pty Ltd (the "Applicant") proposes to develop and operate Kiely's Karuah Quarry ("the Project") on an 18ha area of land ("the Project Site") located 4 kilometres (km) northeast of Karuah and approximately 40km north of Newcastle. The Project Site is located immediately south of the Karuah Hard Rock Quarry, operated by Hunter Quarries Pty Ltd (hereafter referred to as "Hunter Quarries") and southwest of a second Hunter Quarries operation, the Karuah East Quarry, for which approval was granted to Hunter Quarries by the Minister for Planning in July 2014. **Figure 1.1** presents a locality plan showing the locations of the existing and proposed quarries near Karuah.

The Project would involve extraction and processing of the known hard rock resource (rhyodacitic ignimbrite) of the Karuah area to produce aggregates and other construction materials for use in the Hunter and Greater Sydney Metropolitan Regions.

The Project would be located on the southern section of Lot 11 DP 1024564, land owned by the Applicant. The Karuah Hard Rock Quarry operations are presently conducted on the central section of Lot 11 DP 1024564 under a licence agreement with the Applicant and sections of Lot 21 DP 1024564 owned by Hunter Quarries. The licence agreement between the Applicant and Hunter Quarries is due to expire in 2021, however, Hunter Quarries has nominated that "although the production rate at the site will likely decrease after 2017, the site will still remain operational for campaign based extraction" (Source: Table 9, Hunter Quarries AEMR 2016). Hunter Quarries has already commenced site establishment and construction activities for the Karuah East Quarry and it is anticipated that production from this quarry will increase as the production in the Karuah Hard Rock Quarry decreases.

The Project is classified as a State Significant Development in accordance with Clause 7 (1)(a) of Schedule 1 of *State Environmental Planning Policy (State and Regional Development) 2011* (State and Regional Development SEPP) because the planned maximum annual production level of 600 000 tonnes per annum (tpa) exceeds the minimum threshold level for this classification. This document has been prepared in support of a request for Secretary's Environmental Assessment Requirements (SEARs) for the EIS to accompany the application to develop and operate the proposed quarry.

The information presented in this document will ultimately be incorporated into, and expanded upon within a comprehensive *Environmental Impact Statement*, to be prepared in accordance with the provisions of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and the SEARs to be provided. An important component of the EIS will be the assessment of cumulative impacts of the Project with the Hunter Quarries' operations.

This document has been prepared for circulation to the Department of Planning and Environment, other relevant State government agencies, the MidCoast Council and the local and wider communities.

Figure 1.1
LOCALITY PLAN

2. PROJECT SUMMARY

The Applicant is proposing to develop and operate a hard rock quarry located approximately 4km northeast of Karuah (see **Figure 1.1**) to extract and process hard rock with the products used in construction and infrastructure projects within the Hunter and Greater Sydney Metropolitan Regions. **Table 2.1** presents a summary of the indicative key Project components.

Table 2.1
Indicative Key Project Components

Project Component	**Summary Description**
Extraction Method	Drill and blast in a single extraction area covering up to approximately 9ha.
Resource	Igneous rock (rhyodacitic ignimbrite) at least 80m thick.
Disturbance Area	Disturbance of approximately 12ha.
Total Recoverable Resource	Approximately 6 million tonnes of material.
Annual Production	Up to 600 000 tonnes per year of quarry products.
Project Life	Construction stage: approximately 6 months and extraction / processing for up to 15 years.
Processing	Crushing and screening.
Waste Management	Minimal waste materials are anticipated to be generated.
Workforce	Construction: approximately 20 persons (10 full time equivalent). Operational: approximately 25 persons (Quarry personnel, contractors and transport sub-contractors).
Hours of Operation	Extraction and processing operations 7:00am – 6:00pm Monday to Friday, 7:00am – 1:00pm Saturday. Blasting 10:00am – 5:00pm Monday to Friday, Transport operations 5:00am – 6:00pm Monday to Friday, 5:00am – 1:00pm Saturday. Maintenance operations 24hrs Monday to Sunday
Key Environmental Issues	Noise; air quality; visibility; terrestrial ecology; and traffic.
Capital Investment Value	$15 million.

3. PROJECT DESCRIPTION

3.1 INTRODUCTION

This section provides an overview of the Project in sufficient detail to enable the reader to understand the type and scale of activities proposed. A more detailed description of the Project will be included in the EIS. It is noted that during the preparation of the EIS, further design work is proposed which will assist in the identification of the preferred design of specific components. This may result in minor modifications to the indicative layout and project components presented throughout this document.

3.2 THE INDICATIVE APPLICATION AREA

The Project Site for the proposed development application is located on land described as part Lot 11 DP 1024564.

3.3 DEVELOPMENT DESCRIPTION

The proposed quarry would utilise conventional drill and blast, load and haul and processing methods to produce up to 600 000tpa of quarry products. A processing plant would be positioned immediately south of the resource area. Quarry products would be despatched by road using the existing road network.

The Project comprises six principal components, namely:

- an extraction area covering approximately 9ha;
- an internal haul road from the extraction area to the processing area;
- mobile processing plant and related infrastructure located immediately south of the extraction area;
- a workshop area located south of the processing area;
- a product stockpiling area located east of the processing area; and
- range of ancillary components including a weighbridge, office and staff amenities.

The definition of the footprints for the proposed extraction area, processing plant and related infrastructure is sufficiently advanced based upon a range of technical and practical factors with **Figure 3.1** showing the indicative Project component locations. However, further investigations centring principally upon technical, environmental and operational issues will be conducted during the preparation of the EIS so that the most suitable location for the processing, maintenance, stockpiling and ancillary Project components are selected. In this regard, emphasis will be placed upon locating the Project components in a manner that minimises noise, air and visual impacts as well as minimising encroachment upon identified endangered ecological communities (EECs).

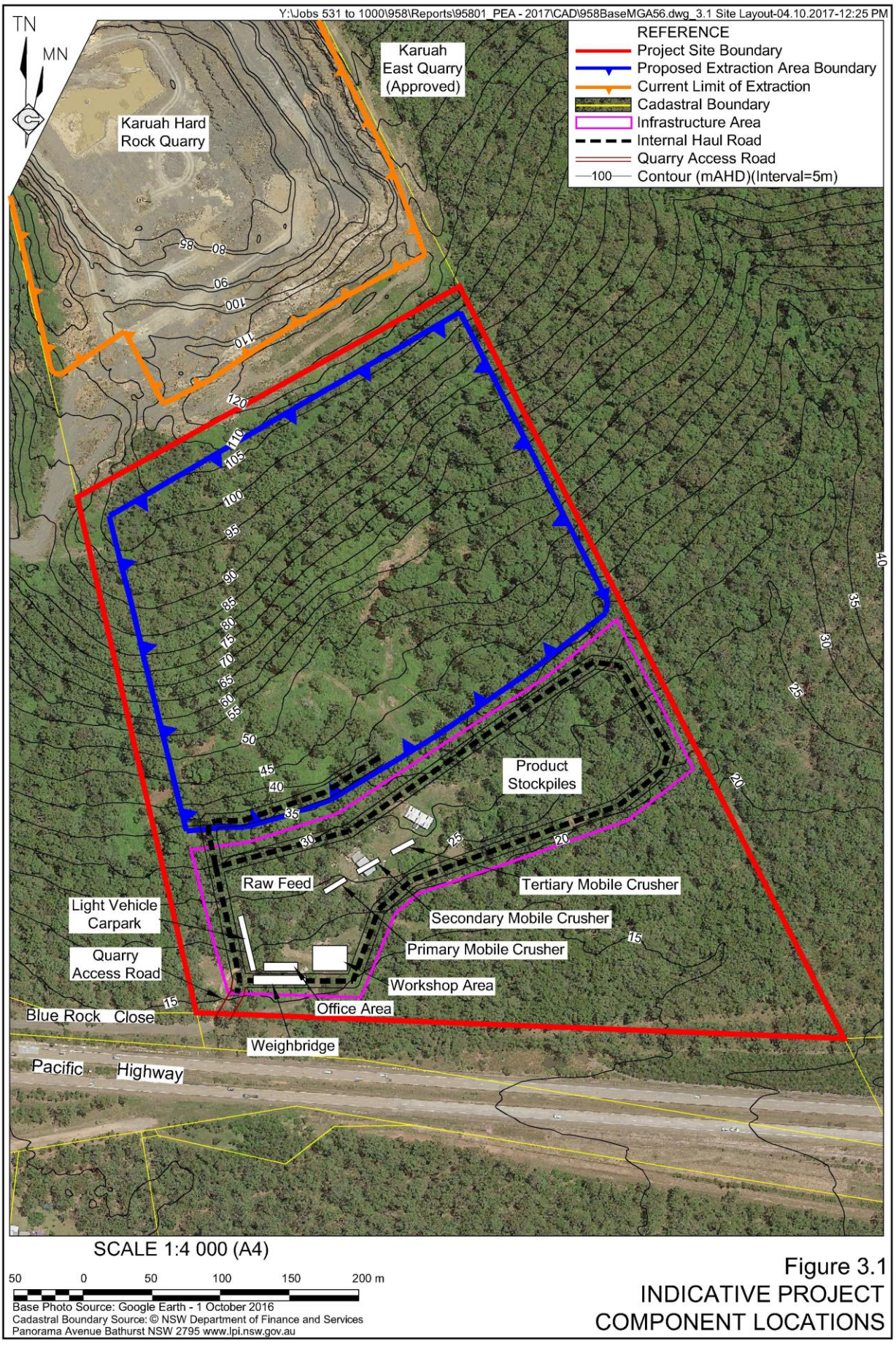


Figure 3.1
INDICATIVE PROJECT COMPONENT LOCATIONS

3.4 ANCILLARY COMPONENTS EXTERNAL TO THE PROJECT SITE

As the Project and its principal components would be located adjacent to the existing electricity distribution network as well as the local and state road network, no additional ancillary components are proposed to facilitate the provision of access and services to the Project Site.

3.5 DEVELOPMENT SCHEDULE

The Project would require a six month site establishment and construction period during which crushing and screening equipment plant for processing would be installed together with all related infrastructure.

3.6 MANAGEMENT COMMITMENTS

The indicative post-approval management commitments that the Applicant proposes to adopt to manage any adverse impacts upon the various components of the environment within and surrounding the Project Site are set out in Section 6 of this document.

3.7 MAPPING REQUIREMENTS

The design of the Project will be undertaken through the preparation of a series of plans displaying the key stages of development. These development stages would provide the basis for the operational scenarios used to assess potential noise, air quality and visual impacts.

4. STRATEGIC CONTEXT

4.1 TARGET RESOURCE

4.1.1 Geological Setting

The rhyodacitic ignimbrite to be extracted from the proposed extraction area occurs within a geological unit referred to as the Nerong Volcanics, a sequence of Carboniferous[1] volcanics (ignimbrite) interbedded with tuffaceous sandstone and conglomerate that generally dips to the west (see **Figure 4.1**).

The Nerong Volcanics, the principal geological unit in the area, forms part of the western Myall Block, a subdivision of the Tamworth Belt which in turn forms part of the southern New England Fold Belt. The rhyodacitic ignimbrite resource within and surrounding the Project Site is comparatively homogenous and broadly tabular in shape, consistent with the mode of formation – arealy extensive, blanket type, ignimbrite eruption emanating from a nearby volcano or volcanoes.

The rhyodacitic ignimbrite within the proposed extraction area is an extension of the same unit that is the target resource of Hunter Quarries' existing and future extraction operations at both the Karuah Hard Rock and Karuah East Quarries that presently provide aggregates and construction materials for use in the construction industry.

4.1.2 Resources and Reserves

The estimated target resource within the proposed extraction area is approximately 6 million tonnes. This estimate has been based on information provided by Ausrocks Pty Ltd using an analysis of the historical resource drilling investigations, adjacent quarry faces and the existing geometry of the landform within the proposed extraction area.

The estimated target resource was defined based on an extraction area with the following indicative attributes.

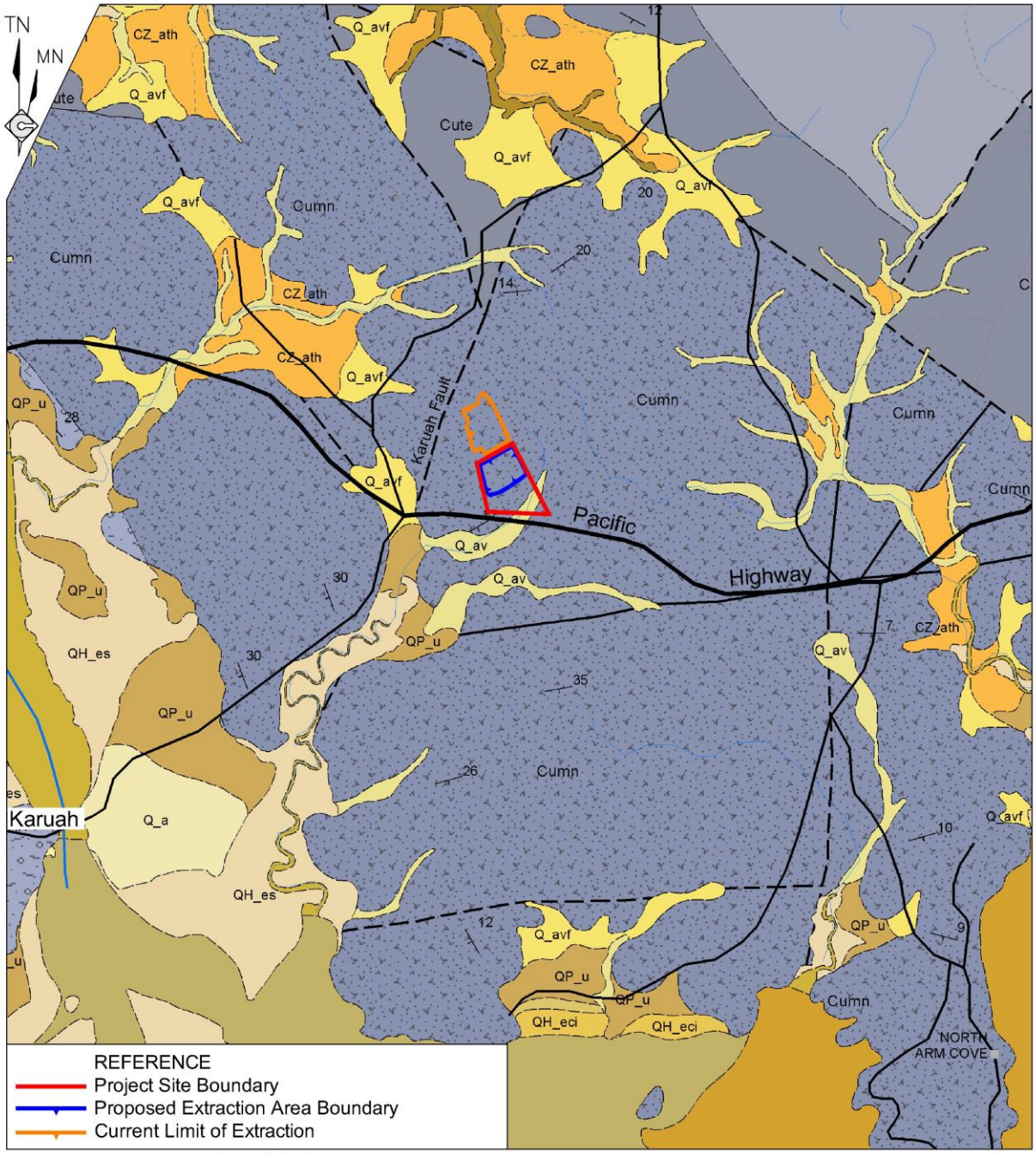
- Proposed excavation floor level: 20m AHD.
- Proposed southern limit: generally follows the 35m AHD contour.
- Proposed northern limit: offset distance of approximately 30m from the southern extent of the current limit of extraction within the Karuah Hard Rock Quarry.
- Proposed eastern and western extraction limits: generally follows the property boundary of Lot 11 DP 1024564 with an offset distance of 10m.

[1] Carboniferous is a term referring to geological age – which is in the order of 300 - 360 million years old.

Y:\Jobs 531 to 1000\958\Reports\95801_PEA - 2017\CAD\958BaseMGA56.dwg_4.1 Geological Settings-27.09.2017-2:37 PM

	Description
CZ_ath	High-level terrace deposits of sand and gravel
Q_a	Unconsolidated grey to brown to beige humic (??)micaceous silty clay, quartz-(??)lithic silt, fine- to medium-grained quartz-rich to quartz-lithic sand, polymictic pebble to cobble gravel (as sporadic lenses); sporadic palaeosol horizons
Q_ab	Organic-rich mud, peat, silt, clay
Q_av	Silt, clay, (fluvially deposited) lithic to quartz-lithic sand, gravel
Q_avf	Fluvially-deposited quartz-lithic sand, silt, gravel, clay
QH_af	Silt, very fine- to medium-grained lithic to quartz-rich sand, clay
QH_ebw	Clay, silt, shell, very fine- to fine-grained lithic-quartz (?? carbonate) sand (fluvially- and/or marine-deposited)
QH_eci	Fine- to medium-grained lithic-carbonate-quartz sand (marine-deposited), silt, clay, shell, gravel
QH_ecw	Fine- to medium-grained lithic-carbonate-quartz sand (marine-deposited), silt, clay, shell, gravel
QH_er	Fine- to medium-grained lithic-quartz sand (fluvially deposited), very fine- to fine-grained lithic-carbonate-quartz sand (marine deposited), ploymictic gravel, silt, clay, shell material

	Description
QH_ed	Very fine- to fine-grained (sporadically medium-grained) lithic-quartz sand (fluvially-deposited), silt, clay, shell material
QH_edw	Very fine- to fine-grained (sporadically medium-grained) lithic-quartz sand (fluvially-deposited), silt, clay, shell material
QH_es	Organic-rich mud, peat, clay, silt, very fine- to fine-grained sand (marine-deposited), fine- to medium-grained sand (fluvially deposited)
QP_u	Clay, silt, fluvial and marine sand
Cumh	Polymictic conglomerate and lithic arenite; boulder conglomerate, pebbly sandstone and mudstone; schlieren of heavy minerals
Cumn	Ignimbrite interbedded with tuffaceous sandstone and conglomerate; dominant rhyodacitic ignimbrite
Cumo	Thin bedded brown-grey, barren mudstone and siltstone with interbeds of lithic sandstone (mostly turbiditic) and conglomerate in lower parts; upper parts with fossiliferous grey to brown mudstone, thinner bedded lithic sandstone and oolitic limestone
Cute	Grey to brown, fine- to coarse-grained lithic arenite beds up to 6m thick; interbedded lenticular boulder conglomerate, mudstone and thin andesitic to rhyodacitic ignimbrite layers



SCALE 1:50 000 (A4)

0.5 0 0.5 1.0 1.5 2.0 2.5 km

Source: NSW Seamless Geology Zone 56 - Geoscience

Figure 4.1
REGIONAL GEOLOGY

4.1.3 Constraints on Resource Recovery and Resource Development

Due to the high quality of the target resource, material has historically been extracted from the adjacent Karuah Hard Rock Quarry since 2000. The Quarry Site is located adjacent to existing and future quarry operations and therefore, the recovery of the target resource is not constrained by impacts to sensitive areas. The nature of the local topography has been considered during the design of the extraction area to manage the impacts of resource recovery on the visual amenity of the surrounding area.

Whilst the development of the Project would have no implications for the continued operation of the existing Karuah Hard Rock Quarry and the future Karuah East Quarry, due to its location alongside a major transport corridor (the Pacific Highway) the Project represents an opportunity to provide greater access to a reliable and cost-effective resource for use in construction and infrastructure projects in the Hunter and Greater Sydney Metropolitan Regions.

4.2 REGIONAL AND LOCAL CONTEXT

A summary of the principal local and regional sensitivities / constraints is provided as follows. A full review of the local and regional context and constraints will be provided in the EIS.

Land Use Constraints

- Within the Project Site boundary, due to the comparatively steep nature of the topography, the land has not undergone significant clearing, however, selective logging has historically occurred.
- Whilst the Project Site is surrounded by rural land uses, no specific sensitive land uses have been identified to date that are likely to pose a constraint.
- Given the proximity of a small number of privately-owned residences within 2km of the Project Site, potential constraints include noise, air quality and visibility although it is noted that the major transport corridor of the Pacific Highway is situated between the Project Site and most of the nearby privately-owned residences.
- The only known industry within the vicinity of the Project Site is the extractive industry of Hunter Quarries' existing or future quarry operation. This does not represent a conflict with respect to land resources.
- The Project Site is not located within a defined drinking water storage area or town water supply.
- Further assessment of surface water environments including storage, and usage will be undertaken as part of the EIS, however, due to the presence of significant linear infrastructure downstream of the Project (Pacific Highway), there are currently no significant practical water constraints identified.

Biophysical, Environmental, and Heritage Constraints

- Preliminary ecological surveys completed to date have identified the presence of Lowland rainforest in the NSW North Coast and Sydney Basin Bioregion, an endangered ecological community (EEC) listed under the *Biodiversity Conservation Act 2016*. This EEC is restricted to the Plant Community Type (PCT) 1527, located as a small remnant in the centre of the proposed extraction area (see **Figure 4.2**). PCT 1527 corresponds with the Critically Endangered Ecological Community (CEEC) listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) as Lowland Rainforest of Subtropical Australia.
- No threatened species were identified during the preliminary ecological survey. However, the presence of Koala scats or possible Koala scat was noted at one location in the northern section of the proposed extraction area. Koalas have also been observed on the land immediately east of the Project Site.
- The Applicant plans to commission further ecological surveys to facilitate quantifying offset requirements under the relevant biodiversity assessment guidelines and will also submit a referral to the Commonwealth Department of the Environment and Energy specifically with respect to the identified CEEC.
- Whilst Aboriginal heritage sites are known in the locality, previous heritage surveys undertaken within or near the Project Site have not identified any Aboriginal heritage sites. Irrespective of this, Aboriginal community consultation and field surveys are planned to occur as part of the EIS. Should the consultation and field survey program identify any sites of Aboriginal cultural heritage significance, the management of these sites will be addressed in the EIS.

Economic Constraints and Opportunities

- It is recognised that approved quarrying operations for Hunter Quarries are currently and soon to be, producing quarry product. However, due to the Project's proximity to a major transport corridor connecting the Project Site to the largest regional economy in Australia (Hunter) and the largest metropolitan market in Australia (Greater Sydney), no significant competition or price impact is anticipated due to the high level of infrastructure projects planned and / or underway in both regions.
- The Project would provide expanded employment opportunities for the local community that would be consistent with the *Hunter Regional Plan* (DPE, 2016) that (amongst others) seeks opportunities to promote growth industries that generate leverage from the accessibility presented by the Pacific Highway and to further economic diversity within the MidCoast and Port Stephens local government areas.

These potential constraints will be further considered within the EIS which will outline appropriate management and mitigation measures to avoid or minimise the potential for impacts.

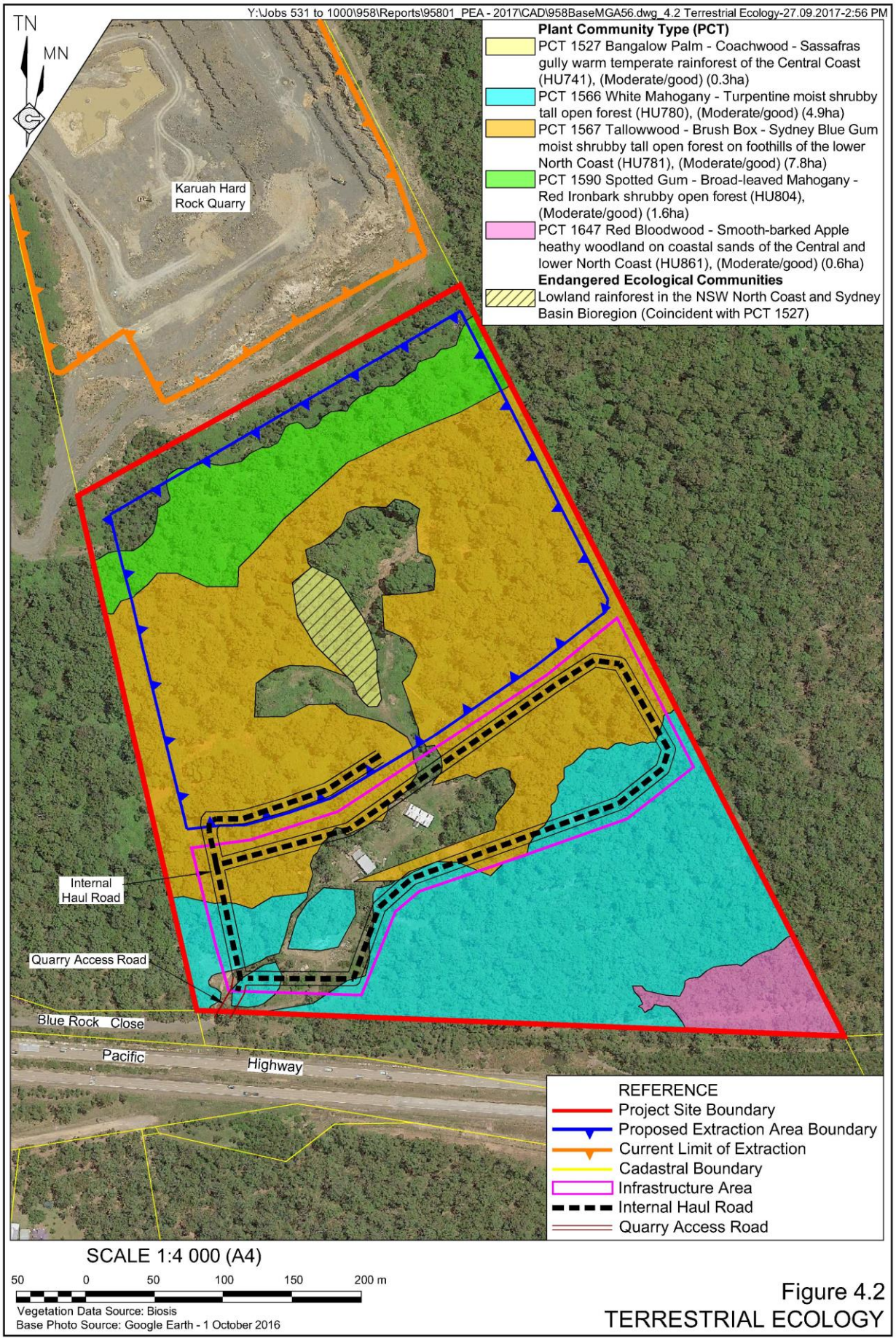


Figure 4.2
TERRESTRIAL ECOLOGY

4.3 PERMISSIBILITY AND STRATEGIC PLANNING

4.3.1 Permissibility

Within the *Great Lakes Local Environmental Plan* (LEP) *2014*, the extraction area is located within Zone RU2 – Rural Landscape with 'extractive industries' identified as permissible with consent within this zone (see **Figure 4.3**).

The Project is also permissible under Part 2 of the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007*. Clause 7(3)(a) of the policy identifies that extractive industry may be carried out on land where development for the purposes of agriculture or industry may be carried out. Within Zone RU2, 'agriculture' is permitted without consent.

4.3.2 State Planning Matters

A range of State legislation, regulation and policies apply to the Project. The principal State planning matters relevant to the Project are as follows.

State Environmental Planning Policy (State and Regional Development) 2011

This SEPP was gazetted on 28 September 2011 and applies to all projects for which their applications satisfy nominated criteria made following that date. The purpose of this SEPP is to define those projects of State Significance requiring Ministerial approval under the provisions of the EP&A Act 1979.

The Project exceeds the annual production threshold of 0.5Mtpa of extractive materials as nominated in Clause 7(1)(a) within Schedule 1 of the SEPP and the 5 million tonne resource quantity nominated in Clause 7(1)(b) of Schedule 1 in the SEPP. Therefore, the Project is a State significant development to which Part 4, Division 4.1 of the EP&A Act 1979 applies.

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

This SEPP was gazetted on 17 February 2007 in recognition of the importance to NSW of mining, petroleum production and extractive industries.

The SEPP specifies matters that need to be considered in the assessment of any State significant extractive industry developments including:

- compatibility of the proposed extractive industry with other land uses;
- compatibility of the proposed extractive industry with other extractive industries;
- natural resource management and environmental management;
- resource recovery;
- transportation; and
- rehabilitation.

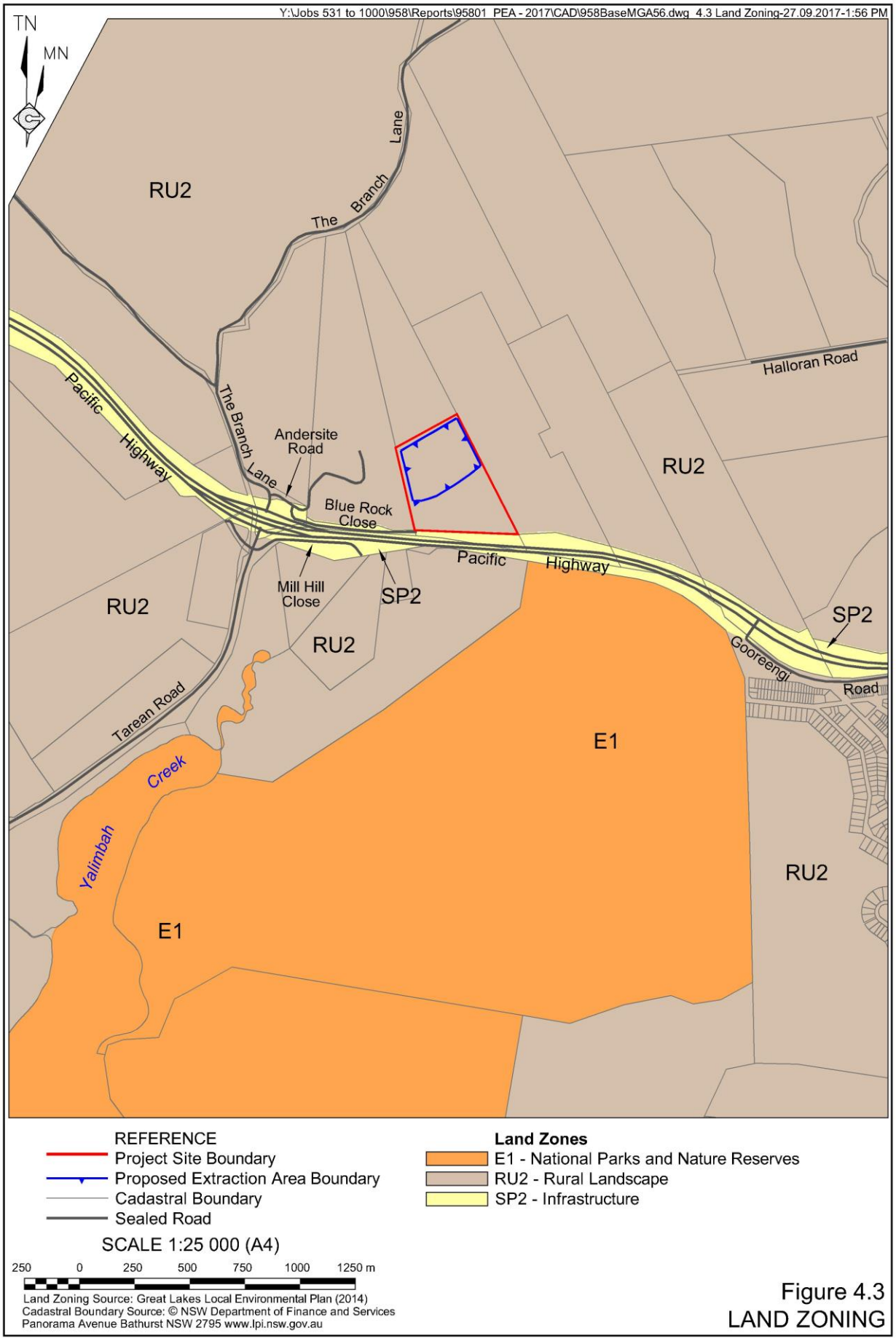


Figure 4.3
LAND ZONING

Whilst these matters have been considered during the preliminary assessment stages, the EIS will provide a full assessment of all relevant matters identified under the SEPP, including those identified in Parts 1, 3 and 4AA of the SEPP.

Other State legislation to be addressed in the EIS includes the following.

- *Protection of the Environment Operations Act 1997*.
- *Roads Act 1993*.
- *Heritage Act 1977*.
- *Biodiversity Conservation Act 2016*.
- State Environmental Planning Policy (No. 44) – Koala Habitat Protection

4.3.3 Commonwealth Planning Matters

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) covers 'matters of national environmental significance', which among other things, includes listed threatened species and communities. Ecological surveys completed to date indicate that the ecological community, Lowland Rainforest of Subtropical Australia, listed as a Critically Endangered Ecological Community is present within the Project Site boundary and therefore a matter of national environmental significance. The Applicant plans to commission further ecological surveys and assessment of the potential impacts of the Project on this community. The Applicant plans to commission further ecological surveys to facilitate a referral to the Commonwealth Department of the Environment and Energy specifically with respect to the identified CEEC.

5. PROJECT RATIONALE

5.1 INTRODUCTION

Planning for the development of the Project focussed initially upon identifying the extent of the target resource that could be extracted and processed to provide the high quality aggregates and construction materials for supply to the market.

It is proposed to develop the extraction area commencing at the southwestern margin and progressively advance northwards and eastwards throughout the life of the Project. The exact timing for this activity will be presented in the EIS.

With the knowledge of the limits of the resource, as defined by the geological investigation and the ecological and local planning instruments, the planning for the remainder of the Project focused on the other three main components namely, the processing plant, stockpiling area and ancillary quarry components area.

The rationale behind the planning for each of these components is as follows.

5.2 PROCESSING PLANT

The processing plant which is likely to be fixed over the operational life of the Project would be located sufficiently close to the initial extraction area. During initial Project planning, it was identified that locating the processing plant in this area would lower the transportation costs, fuel consumption, vehicle emissions and the overall disturbance footprint of the Quarry.

5.3 STOCKPILING AREA

The Applicant proposes to utilise the area located southwest of the processing area for stockpiling quarry products for despatch. This area would limit any potential interaction between quarry internal haul road operations. In addition, the topography of this area renders it suitable for the redirection, capture and management of sediment-laden runoff that may be generated from the stockpiles.

5.4 ANCILLARY QUARRY COMPONENTS AREA

The Applicant proposes to utilise an area south of the stockpiling area for situating ancillary quarry components. These components would include:

- quarry access road
- quarry office;
- weighbridge;
- staff amenities; and
- parking.

This area would be configured in a manner that would limit any potential interaction between quarry internal haul road operations, expedite product transport operations and separate light and heavy vehicle traffic. This would be achieved by situating the ancillary quarry components south of the stockpiling area and adjacent to the quarry access road in the southwestern section of the quarry. The quarry access road would provide access to the quarry from Blue Rock Close via the existing vehicular access for Lot 11 DP 1024564.

6. PRELIMINARY ENVIRONMENTAL IMPACT ASSESSMENT

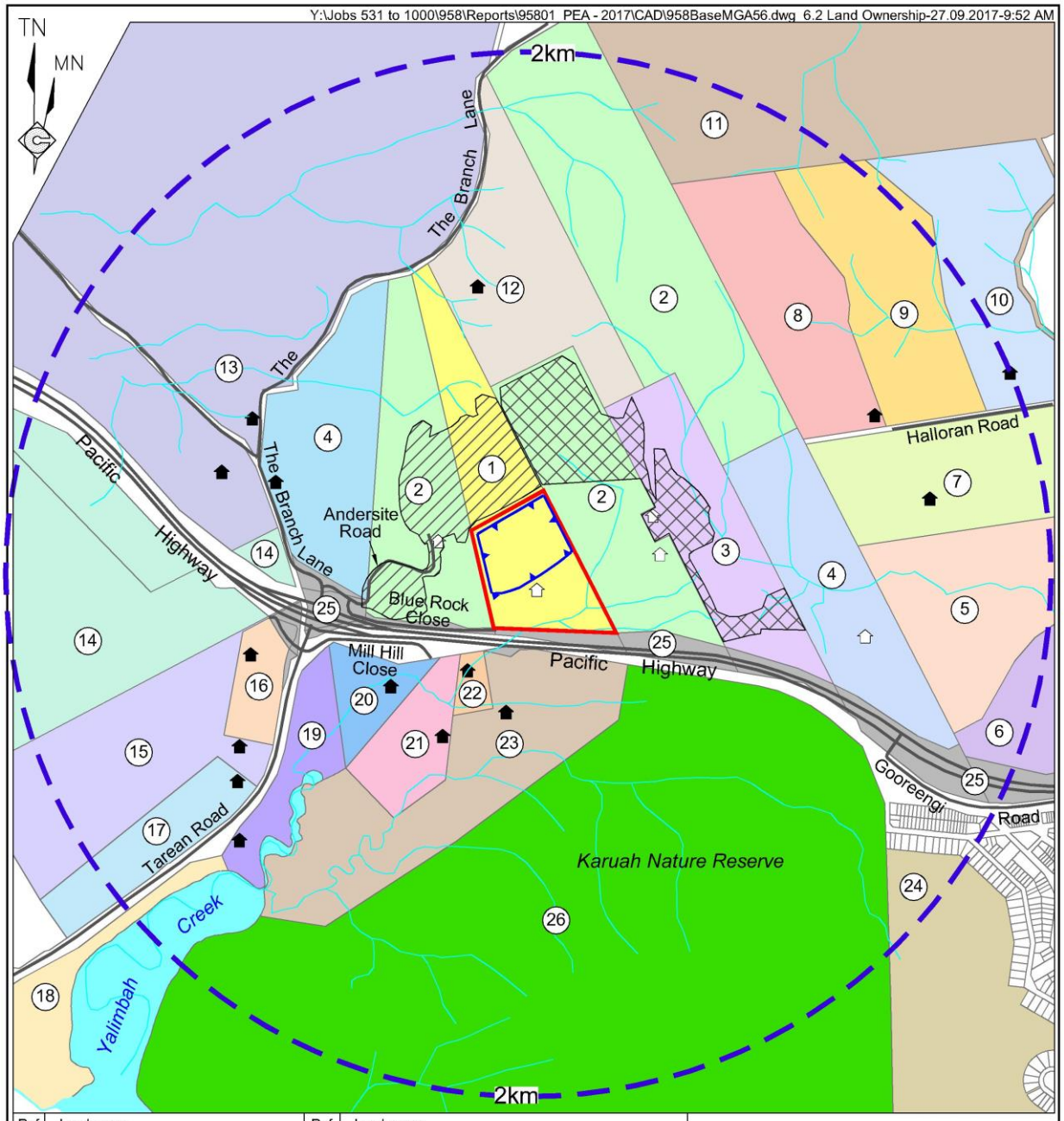
Figure 6.1 displays an aerial photograph of the Project Site, Hunter Quarries' Karuah Hard Rock Quarry within its local setting, including the nearest privately-owned residences and the Pacific Highway. Reference data relied upon for the environmental impact assessment for the Project includes details of surrounding land ownership (**Figure 6.2**). **Figure 6.2** also presents the extents of disturbance over local landholdings as a result of approved and proposed quarrying activities. Local topography, watercourses and contributing catchments are presented on **Figure 6.3**. It is noted that surface watercourses in the vicinity of the Project Site invariably discharge into the tidally influenced Karuah River / Port Stephens system.

Table 6.1 presents a summary of the existing environment within and surrounding the Project Site, potential impacts management commitments that would be implemented, together with the proposed assessment approach to be presented in the EIS.

An understanding of the existing environment has been developed via a number of studies commissioned by the Applicant and data assembled by Hunter Quarries on the adjoining land titles. Further data will be collected to facilitate and inform further studies and assessments throughout the preparation of the EIS.

It is recognised that each of the environmental assessments addressing both the Applicant's proposed operations and the cumulative impacts of both Hunter Quarries operations would be undertaken.

Figure 6.1
LOCAL SETTING



Ref	Landowner	Ref	Landowner
1	MJ Kiely	14	RN Pickford,RF Pickford, KL Pickford
2	Branch Land Pty Ltd	15	DB Clarke
3	HR Grugeon, BC Grugeon	16	PR Wood
4	HR Grugeon, GA Chevalley, RA Badior	17	WE Cameron, D Taylor
5	J Vallas, M Vallas	18	AF Percy
6	Tea Garden Farms Pty Ltd	19	S Emanuel
7	Bao Lin Pty Ltd	20	GA Norbury
8	WB Hestelow, TA Hestelow	21	WR Plover
9	AW Woodfield, JA Woodfield	22	RJ Trotter
10	J Tonna	23	GB Myers, DL Myers
11	Firstcomp Pty Ltd	24	Walker North Arm Cove Developments Pty Limited
12	G J Mis, S Mis	25	Roads and Traffic Authority of New South Wales
13	Upper Wantagong Station Pty Ltd	26	Minister Administering The National Parks and Wildlife

REFERENCE
- Project Site Boundary
- Proposed Extraction Area Boundary
- Sealed Road
- Cadastral Boundary
- (1) Landowner Reference
- Privately-owned Residence
- Resource Company-owned Residence
- Karuah Hard Rock Quarry
- Karuah East Quarry (Approved)

SCALE 1:25 000 (A4)

250 0 250 500 750 1000 1250 m

Landowner Source: Department of Lands Online Search - May 2017
Cadastral Boundary Source: © NSW Department of Finance and Services
Panorama Avenue Bathurst NSW 2795 www.lpi.nsw.gov.au

Figure 6.2
LAND OWNERSHIP
AND RESIDENCES

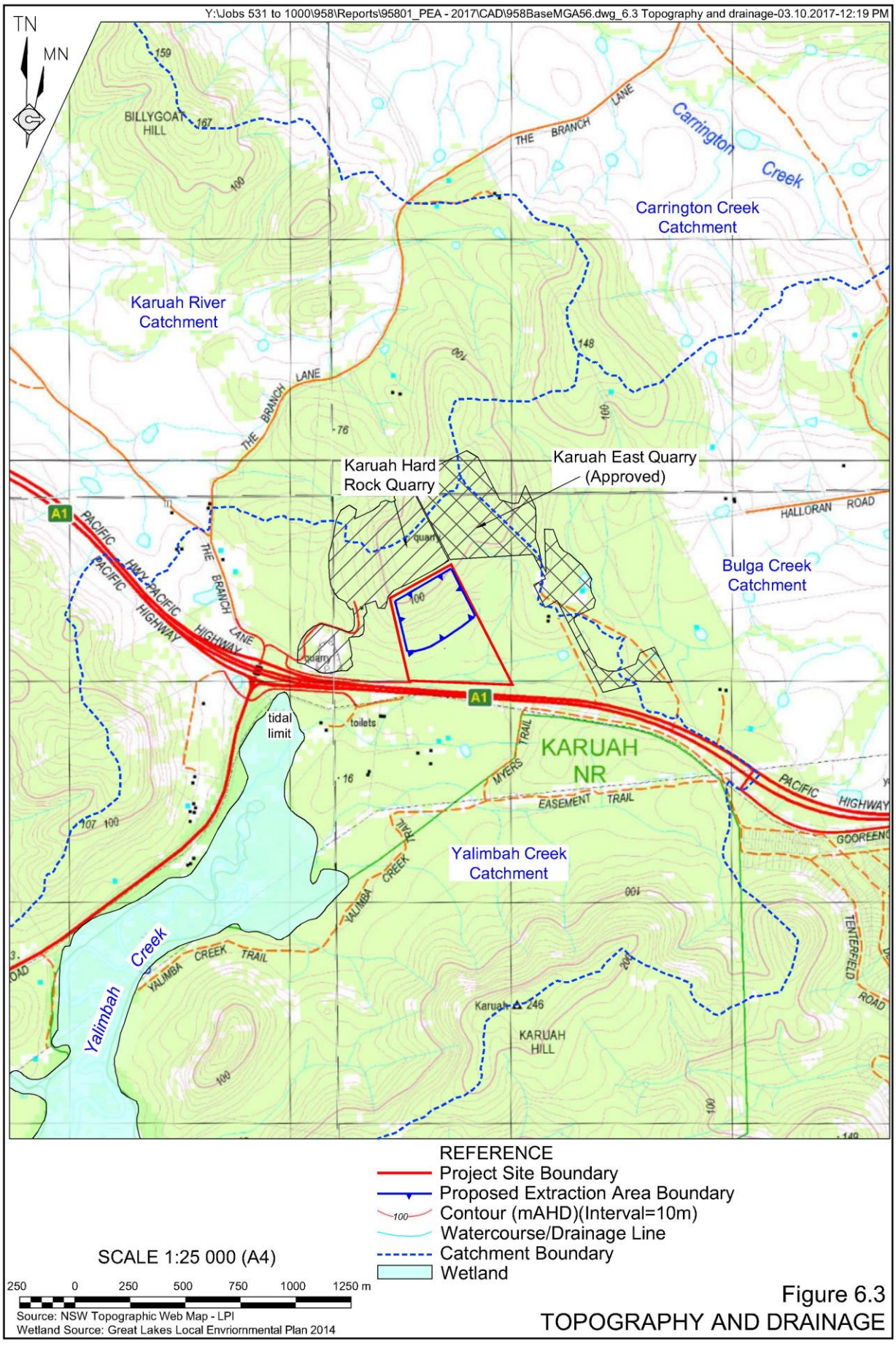


Figure 6.3
TOPOGRAPHY AND DRAINAGE

Table 6.1
Preliminary Environmental Impact Identification and Management Commitments

Issue	Existing Environment	Further Investigations	Potential Impacts	Proposed Assessment	Management Commitments (post approval)
Aboriginal Cultural and Historic Heritage	Much of the area in the vicinity of the Project Site has been the subject of previous cultural heritage surveys. The most recent survey was undertaken by Karuah Local Aboriginal Land Council in August 2012 to identify any areas of cultural significance within the Project Site boundary. Whilst Aboriginal heritage sites and artefacts are known from the locality, the most recent survey did not identify any Aboriginal heritage sites or artefacts within the Project Site.	Requirements for additional Aboriginal cultural heritage survey would be clarified following the receipt of SEARs. Consultation with Aboriginal stakeholders would be conducted following the outcomes of the survey (if required).	The approach to the management of any identified sites will be developed in consultation with the Aboriginal stakeholders.	An Aboriginal Cultural Heritage Assessment of the proposed disturbance footprint will be undertaken and an assessment of the significance of any identified objects assessed in accordance with the relevant guidelines. The approach to the salvage and curation of the artefacts within areas to be disturbed would be discussed with all registered Aboriginal stakeholders.	Ensure that the outer limit of the proposed disturbance is accurately surveyed and marked on the ground. Ensure that all surface disturbing activities are undertaken within the marked disturbance footprint or previously disturbed areas only. Arrange for the salvage of any artefacts in accordance with an approved Aboriginal Cultural Heritage Management Plan prepared in consultation with Aboriginal stakeholders.
Transportation	Entry by road to the Project Site would be via Blue Rock Close, Andersite Road, The Branch Lane / Tarean Road and the Pacific Highway from either the northbound or southbound direction. Egress from the Project Site is also via the same route. Neither Andersite Road nor Blue Rock Close provide through passage to connecting roads or properties except for the quarry operations undertaken by Hunter Quarries. The Branch Lane provides access to the Pacific Highway and Karuah for residents north of the Pacific Highway whilst Tarean Road provides access to the Pacific Highway for Karuah residents travelling northwards. Both The Branch Lane / Tarean Road and the Pacific Highway are sealed and are approved 25m B-double routes.	Levels of service and performance would be assessed at The Branch Lane / Andersite Road and Tarean Road/ Pacific Highway (southbound) intersections.	Whilst traffic volumes generated by the Project would primarily utilise existing roads used primarily by quarrying operations and the Pacific Highway, minor impacts may occur at the intersections of Andersite Road / The Branch Lane and Tarean Road / Pacific Highway (southbound).	A traffic assessment will be undertaken to document the potential impacts on the immediate surrounding road network. The cumulative impacts of traffic generated by Hunter Quarries will also be undertaken.	Develop a traffic management plan and Drivers' Code of Conduct
Noise	The noise environment surrounding the Project Site is typical of a semi-rural area that is dominated by traffic noise emanating from the Pacific Highway. Other contributing noise sources to the local noise environment include the existing quarry operations, domestic noises, rural, dogs, birds etc. and wind generated noises.	Further investigations are planned to verify noise measurements taken to date and undertake an attended noise survey to assist in quantifying the existing noise environment.	Activities within the indicative Project Site could result in increased received noise levels at surrounding residences under certain meteorological conditions.	A noise assessment will be undertaken to predict the received noise levels under different operational scenarios and under prevailing meteorological conditions. A range of design and operational safeguards will be incorporated into the Project in order to achieve compliance with applicable noise criteria. Cumulative noise impacts with the activities undertaken within the Karuah Hard Rock Quarry and the future Karuah East Quarry Operation will also be assessed.	Undertake noise monitoring during operations. Regularly service all on-site equipment. Install frequency modulated reversing alarms to all mobile equipment. Ensure truck loading activities are undertaken in a manner that limits noise generation. Ensure all truck drivers comply with a Drivers Code of Conduct which outlines procedures for reducing noise impacts during transportation on and off site. Maintain an open dialogue with the surrounding community and neighbours to address any concerns over noise are addressed. Implement additional noise mitigation measures as determined through noise modelling.

Table 6.1 (Cont'd)
Preliminary Environmental Impact Identification and Management Commitments

Issue	Existing Environment	Further Investigations	Potential Impacts	Proposed Assessment	Management Commitments (post approval)
Air Quality	The Project Site lies within a rural area with an existing quarry and the North Coast's major transport corridor nearby.	Data drawn from Hunter Quarries' publicly available deposited dust and total suspended particulate monitoring will be utilised during the preparation of the EIS.	The Project would result in an increase in received particulates and emissions in areas surrounding the Project Site. The potential impacts would relate to particulates in various size fractions.	An air quality assessment will be undertaken by a suitably qualified consultant. The assessment will include modelling of the potential for emissions of airborne particulates under a range of operational scenarios and under prevailing meteorological conditions, including a cumulative assessment with Hunter Quarries' operations.	Apply water to internal roads and trafficked areas using water trucks to minimise the generation of dust. Installing and operating water sprays on crushing equipment. Water stockpiles, as required, to maintain moisture content and minimise the generation of dust. Undertake regular monitoring of deposited dust.
Visual Amenity	The Project Site is located within visual catchments principally to the south and sections of the Project Site may be visible from residences located to the south. However, as the Project Site is located adjacent to an existing approved quarrying operation, the visual catchment in which the Project Site is located is already impacted by similar activities which present exposed quarry faces from various vantage points.	Further observations are planned to assess all potential viewing locations.	The removal of hard rock from the elevated areas within the Project Site could possibly cause local changes in view lines and view scape. The quarry product stockpiles may be visible, depending on their location.	A visual amenity assessment will be undertaken by RWC to identify the visual catchment of the Project which will be supported by photographs of the Project Site and cross-sections from key surrounding vantage points.	Paint all potentially visible items of fixed plant and equipment in a colour that would minimise the contrast within the surrounding landscape. Construct visibility barriers in strategic locations to prevent visibility of various on-site activities and vehicle headlights on site after dusk.
Surface Water	Surface runoff is largely discharged via overland flow to longitudinal and cross drainage infrastructure situated along the alignment of Blue Rock Close. This infrastructure discharges in Pacific Highway cross drainage infrastructure. Discharge of surface water south of the Pacific Highway is via indistinct drainage pathways before entering Yallimbah Creek, identified as a wetland under the Great Lakes LEP 2014 and listed as a coastal wetland under the Draft NSW Coastal Management SEPP, approximately 600m west of the Project Site.	Assessment of potential runoff volumes requiring management from additional Project related disturbance areas (e.g. stockpiling and loading areas).	Reduction in water quality of downstream watercourses as a consequence of the discharge of sediment-laden runoff. It is noted that mitigation measures would be implemented to avoid any such discharges.	A surface water assessment will be undertaken by RWC. The assessment would include the relevant design criteria of the water management infrastructure and required design and operational safeguards.	Divert clean water around the areas disturbed by the Project. The development of the proposed extraction area will require the installation of water management infrastructure to manage potentially sediment-laden runoff. Ensure that proposed water management structures are designed, constructed, managed and maintained in accordance with all design standards and hydraulic performance criteria. Implement a Water Management Plan and an Erosion and Sediment Control Plan.
Groundwater	The local groundwater system of the Project Site within the Nerong Volcanics generally mimics topography (i.e. flows from high to low elevation) with flow occurring in fractures (secondary porosity). A groundwater assessment has previously been conducted by Coffey Geotechnics Pty Ltd to support Hunter Quarries' Environmental Assessment for the Karuah East Quarry. This assessment identified that the groundwater flow predominantly occurs within fractures. This fractured rock system is primarily recharged via rainfall infiltration and disconnected from surface watercourses. No impact to local standing water levels are anticipated as a consequence of the Project. Groundwater has not been intercepted at the Karuah Hard Rock Quarry. A search of the Australian Groundwater Explorer Database, managed by the Bureau of Meteorology did not locate any registered groundwater bores within 3km of the Project Site.	No further investigations are proposed.	The low-yielding, low permeability nature of the underlying aquifer would result in a low potential for impact on groundwater resources.	The assessment conducted by Coffey Geotechnics identified that the development of the Karuah East Quarry would not lead to significant impacts to groundwater users with respect to groundwater quality or volume would occur and that no sensitive groundwater receivers would be impacted due to extraction operations. Subsequently, no further assessment is proposed.	Monitor the volumes (if any) of all water pumped from the extraction area and clarify whether any of the water removed is groundwater. Implement a Water Management Plan that includes provision for ongoing monitoring and reporting of groundwater encountered at the Project Site.

Table 6.1 (Cont'd)
Preliminary Environmental Impact Identification and Management Commitments

Issue	Existing Environment	Further Investigations	Potential Impacts	Proposed Assessment	Management Commitments (post approval)
Blasting and Vibration	Two hard rock quarrying operations are either currently located or soon to be located adjacent to the Project Site, both of which utilise drill and blast methods for the winning and extraction of material.	Further investigations are planned to verify blast measurements taken to date and calculate blasting overpressure and ground vibration levels at the nearest privately-owned residences for blasts within the Project Site.	Whilst blasts at the Project Site are likely to be heard at surrounding locations, with the implementation of appropriate blast design and management measures, compliance with applicable criteria is considered highly likely.	Assessment of potential blasting impacts will be undertaken by suitably qualified specialist consultants with respect to ground vibration, airblast overpressure and blast fume.	Strictly comply with the approved blasting hours. Ensure the burden spacing, hole spacing and stemming depth are carefully designed to be sufficient to fragment the rock to the required size and then implemented precisely.
Terrestrial Ecology	Preliminary ecological surveys completed to date by Biosis Pty Ltd have identified the presence of Lowland rainforest in the NSW North Coast and Sydney Basin Bioregion, an endangered ecological community (EEC) listed under the NSW *Biodiversity Conservation Act 2016*, and Critically Endangered Ecological Community (CEEC) listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This EEC is present within the proposed extraction area. No threatened species were identified during the preliminary ecological survey. However, the presence of Koala scats or a possible Koala scat was noted at one location in the northern section of the proposed extraction area.	The Applicant plans to commission further ecological surveys to facilitate quantifying offset requirements under the applicable NSW biodiversity assessment methodology and will also submit a referral to the Commonwealth Department of the Environment and Energy.	Impacts would principally occur as a result of clearing vegetation removing both individual plants and habitat area. The potential significance of these impacts has yet to be determined and will be presented in the EIS.	A comprehensive ecological impact assessment will be completed to identify the presence and status of the EECs and individual species within the area to be disturbed. Appropriate design and operational safeguards will also be investigated.	Throughout the life of the Project, mitigation measures to be adopted would include: • progressive clearing to provide sufficient areas for the next 12 months of operation; • implementation of pre-clearance inspections; • progressive rehabilitation (where practicable); and • ongoing weed management and control. The principal long-term management measure would be the development of a biodiversity offset strategy to secure in perpetuity areas around the Project Site with similar vegetation to that which would be cleared within the Project Site.
Soils and Land Capability	The soils of those sections of the Project Site proposed to be disturbed have been identified as being Land and Soil Capability Class 6 (low capability land) and Class 7 (very low capability land).	No further investigations are required.	Soil resources are limited within the disturbance area however, the extraction operations would involve the removal and transfer/storage of as much topsoil and selected subsoil from this area as possible.	RWC will prepare a brief land and soil assessment.	Minimise land and soil degradation through the implementation of appropriate soil management measures. Implement a Rehabilitation Management Plan that establishes timing and final land use objectives of the progressive rehabilitation activities during the operational life of the Project and post closure.
Social and Economic Appraisal	The Project would provide expanded employment opportunities for the local community that would be consistent with the *Hunter Regional Plan* (DPE, 2016) that (amongst others) seeks opportunities to promote growth industries that generate leverage from the accessibility presented by the Pacific Highway and to further economic diversity within the MidCoast and Port Stephens areas.	The Applicant will develop a Community Liaison Plan (CLP) with the objectives of establishing and maintaining the Applicant's social licence to operate through: • identifying, building and maintaining effective relationships with stakeholders; • engaging with the local community; and • communicating and consulting with identified community members and groups..	The positive potential impacts of the Project would include additional direct and indirect employment opportunities to the local and regional area that would assist in increasing current levels of economic activity and benefits to the broader community. Potential negative impacts will be identified through consultation undertaken in accordance with the CLP. Mitigation measures will be developed and communicated to potentially affected stakeholders.	With reference to the Social Impact Assessment and Economic Assessment Guidelines of the Department of Planning & Environment, RWC will undertake social and economic impact assessment of the Project.	Ensure all environmental factors re noise, air quality, blasting and visibility are appropriately managed. Utilise the existing local and regional workforce and service providers where practical. Establish a Community Consultative Committee to enable a structured approach to a range of issues raised by the local community.

7. CONSULTATION

7.1 GOVERNMENT AGENCIES

Consultation with relevant government agencies will commence with this request for Secretary's Environmental Assessment Requirements (SEARs). Further consultation is planned with relevant agencies to inform and discuss specific issues relating to the Applicant's plans for the Quarry.

7.2 LOCAL COMMUNITY

The Applicant will develop a Community Liaison Plan (CLP) with the objectives of establishing and maintaining the Applicant's social licence to operate through:

- identifying, building and maintaining effective relationships with stakeholders;
- engaging with the local community; and
- communicating and consulting with identified community members and groups.

The CLP will utilise the information gathered from the community and details stakeholder individuals and groups, and outline engagement activities, timing of consultation events and responsibilities. The CLP will be tailored to reflect the interest of the local community to the Project.

The Applicant would form a Community Consultative Committee to enable a structured approach to a range of issues raised by the local community.

The Applicant approached a total of eighteen local residents via a mail-out in late July 2017, seeking their input to those issues of interest to them that they would like to be addressed in the EIS. To date, no responses have been received.

In light of the absence of response to the mail-out, the Applicant intends to make direct contact with as many local residents as possible during the preparation of the EIS.

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