

# South Coast Concrete Crushing and Recycling Pty Ltd

ABN: 76 095 243 584



Environmental Assessment  
for the

Continuation and Expansion of Extractive  
Operations at the  
Nowra Brickworks Quarry, South Nowra

Prepared by:



**R.W. CORKERY & CO. PTY. LIMITED**

and





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## Continuation and Expansion of Extractive Operations at the Nowra Brickworks Quarry, South Nowra

Lot 1, Deposited Plan 1126288

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# Executive Summary

## INTRODUCTION

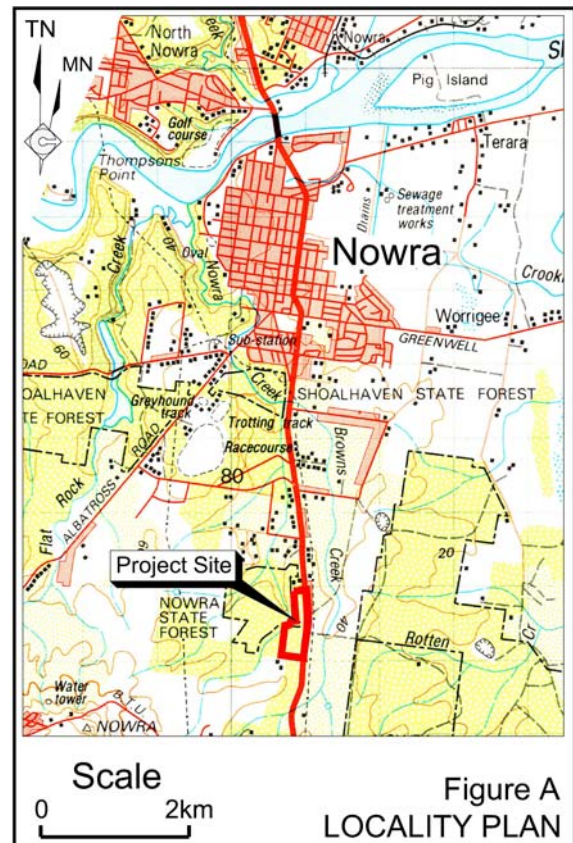
This *Environmental Assessment* has been prepared by R.W. Corkery & Co. Pty. Limited and City Plan Services Pty Ltd to support an application for project approval by South Coast Concrete Crushing & Recycling Pty Ltd (“the Proponent”) to expand extractive operations at the Nowra Brickworks Quarry, South Nowra (“the Project”). The Project includes the following activities.

- Expansion of shale extraction, processing, blending, recycling and product despatch-related activities at the Nowra Brickworks Quarry.
- Importation and placement of Virgin Excavated Natural Material (“VENM”) to create a final landform that would mimic the pre-extraction landform.
- Progressive rehabilitation of areas no longer required for extraction or VENM placement-related activities.

For the purposes of this application, the Project Site comprises Mining Leases (MLs) 5087 and 6322 and is located approximately 5km south of the Nowra central business district (**Figure A**).

## THE PROPONENT

The Proponent is an Australian private company that has operated the Nowra Brickworks Quarry (“the quarry”) since the



Mining Leases were acquired by Abib Pty Ltd (a company related to the Proponent) from the previous holder in 2002. The Proponent operates the quarry under an agreement with Abib Pty Ltd.

The Proponent’s sole activities are the operation of the Nowra Brickworks Quarry and transportation of a proportion of quarry’s products to the Proponent’s customers.

## PLANNING CONTEXT

The Project is classified as a “Major Project” under Clause 7 of Schedule 1 of *State Environmental Planning Policy (Major Projects) (2005)*. As a result, the Project is to be assessed under Part 3A of the *Environmental Planning and Assessment Act 1979* and the Minister for Planning is the approval authority. This *Environmental Assessment* has been prepared in accordance with the requirements of Section 75H of that Act.

## PROJECT BACKGROUND

ML 5087 was originally granted on 8 January 1948 in accordance with the *Mining Act 1906* and has subsequently been renewed until 8 January 2019 in accordance with the *Mining Act 1992*. No further approvals were required under any other Act at that time to enable extraction operations to commence.

ML 6322 was granted on 8 March 1972, also in accordance with the *Mining Act 1906*, following the granting of approval for the extraction of clay and shale by the State Planning Authority and has been subsequently renewed until 8 March 2020 in accordance with the *Mining Act 1992*.

Abib Pty Ltd acquired the two leases on 20 December 2002 and extraction operations since that date have been undertaken by the Proponent. Throughout that period, the Proponent has paid royalties to the NSW Government for the extraction of shale material within the leases.

In October 2005, proceedings were brought in the Land and Environment Court of New South Wales by three of the Proponent’s competitors, namely Normans Plant Hire, Tomerong Quarry and South Coast Resources Pty Ltd. The Court held that extraction operations within ML 5087 benefit from existing use rights under the *Environmental Planning and Assessment Act 1979* and were as a result lawful. However, the Court held that the development consent for extraction operations within ML 6322 granted on 24 September 1971 had lapsed prior to the commencement of the *Mining Act 1973*. As a result, extraction operations within ML 6322 were recognised not to have the required approval under the *Environmental Planning and Assessment Act 1979* and were discontinued.

## EXISTING OPERATIONS

Existing operations within ML 5087 include the following.

- Extraction and direct loading or stockpiling of approximately 7 000t per year of weathered shale material (“rip shale material”) using an excavator.
- Extraction of approximately 80 500t per year of unweathered shale material (“extracted materials”) using drill and blast techniques.
- Importation of approximately 2 500t per year of selected construction, concrete and waste bitumen material (“recycling material”) for crushing and recycling.



- Importation of approximately 35 000t per year of quarry products from other quarries (“blending materials”) for blending operations.
- Crushing, screening and blending of extracted, recycling and blending materials to produce general and specialised quarry products.
- Stockpiling, loading and despatch of approximately 125 000t per year of quarry products.
- Progressive rehabilitation of areas no longer required for extraction-related purposes.

## THE PROJECT SITE

The Project Site lies within part of Lot 464, DP1058778. The State of New South Wales is the registered owner of this land, with the Department of Lands administering the land for the Crown.

The Project Site covers a total area of approximately 21.5ha, incorporates all areas of proposed disturbance and would include the following principal components (**Figure B**).

- An existing extraction area covering approximately 2.0ha.
- An expanded extraction area covering approximately 15ha.
- A water storage facility
- An office, two weighbridges and visitor’s carpark area.

- A site access road.
- A perimeter amenity bund.

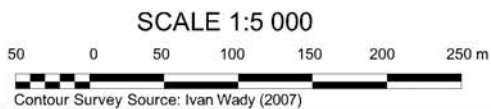
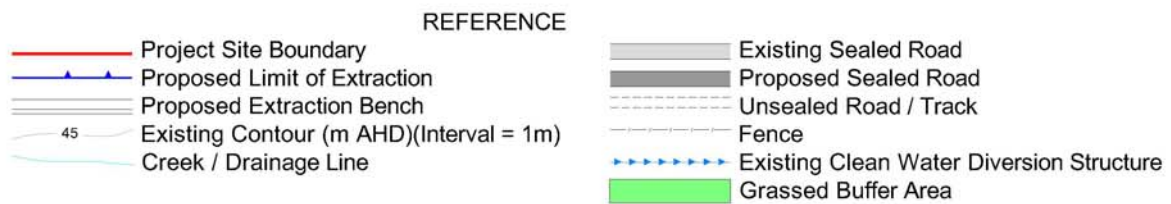
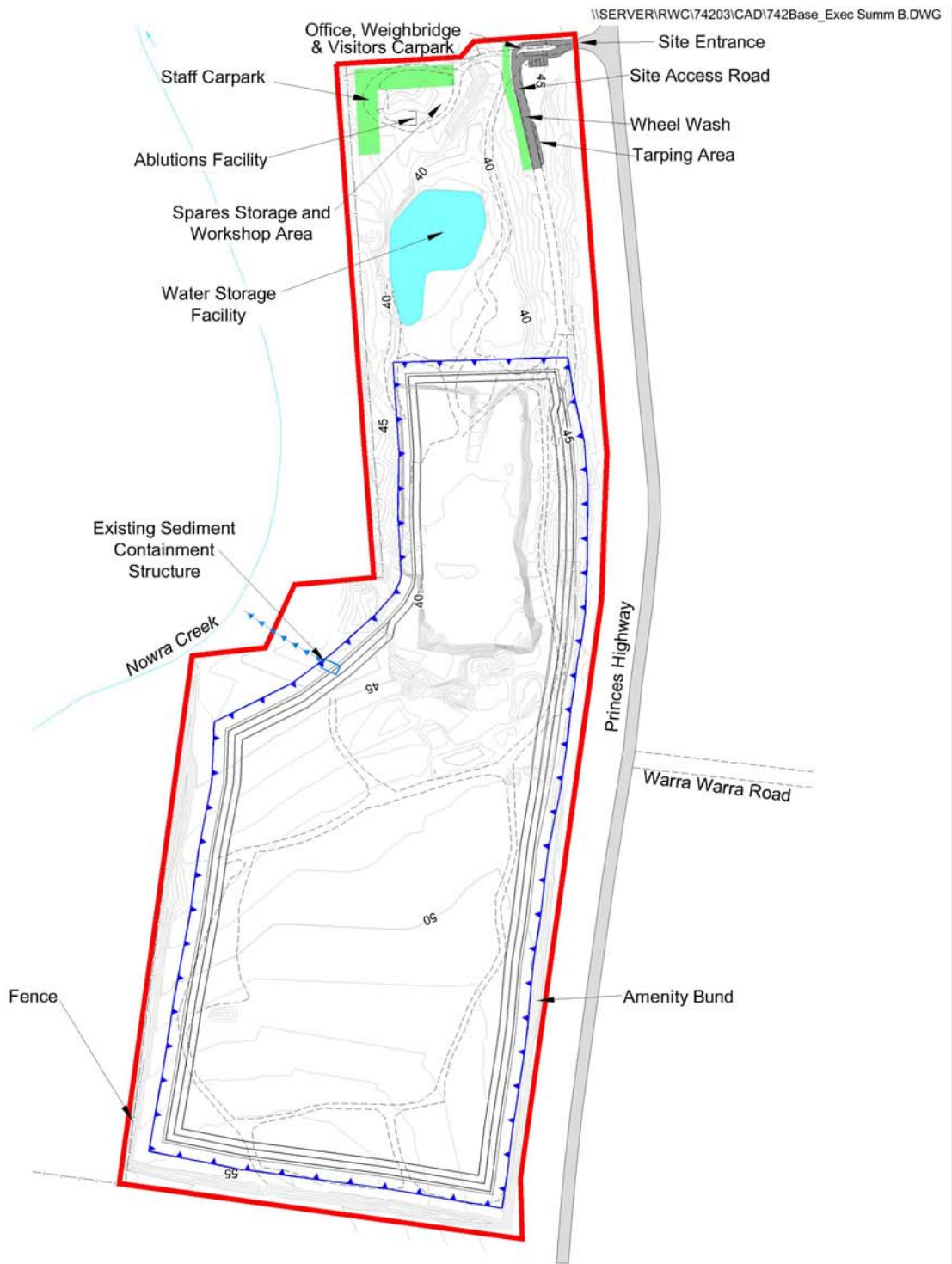
Approximately 8.0ha, or 37%, of the Project Site is currently disturbed.

## PROJECT DESCRIPTION

### Introduction

The Project would involve the following activities, the locations of which are displayed on **Figure B**.

- Realignment and sealing of the section of the site access road from the site entrance from the Princes Highway for a distance of 150m.
- Construction of a wheel wash facility, dual weighbridge and office and a sealed visitor’s carpark.
- Staged extraction of up to 14 000t per year of weathered shale material using an excavator for direct sale to the Proponent’s customers or stockpiling for later sale without processing.
- Staged extraction of up to 350 000t per year of unweathered shale material (“extracted material”) using drill and blast methods.
- Importation and stockpiling of up to approximately 50 000t per year of recycling materials.
- Importation and stockpiling of up to approximately 125 000t per year of blending materials.



**Figure B**  
**PROJECT SITE LAYOUT**



- Processing and blending of extracted, recycling and blending material to produce general and specialised products using a mobile processing plant.
- Stockpiling of quarry products.
- Loading, sale and despatch of an average of approximately 300 000t per year, to a maximum of approximately 500 000t per year, of quarry products using road registered heavy vehicles.
- Importation and placement of up to 200 000t per year of VENM. A small proportion of this material may be processed and blended with other materials to produce saleable products. The remainder would be placed within completed sections of the extraction area to establish a final landform that mimics the pre-extraction landform within the Project Site.
- Progressive rehabilitation of areas no longer required for extraction or VENM placement-related activities.

### Site Construction

The Proponent would progressively increase the rate of product despatch from the present rate of 125 000t per year. The following construction-related activities would be completed prior to despatch of quarry products exceeding 250 000t per year.

- Widening of the site entrance to 11m.
- Construction and sealing of the site access road.

- Construction and installation of a wheel wash and shake down facility.
- Extension of the existing tarping area.
- Erection of a transportable office, second weighbridge and ablutions facility.
- Construction and sealing of the visitor's carpark.
- Construction of a bio-infiltration facility adjacent to the water storage facility.

### Land Preparation

Land preparation would involve the removal of vegetation and soil from undisturbed sections of the Project Site to allow the expansion of the extraction area. The following procedures would be employed during vegetation removal operations.

- Vegetation would be cleared during the late spring to early autumn.
- All hollow-bearing trees would be identified, marked and inspected for fauna.
- Once the absence of native fauna is confirmed, large trees would be removed using a bulldozer. The cleared vegetation would be cut or broken into manageable lengths or coarsely mulched, and either placed on areas undergoing progressive rehabilitation or stockpiled for later use during rehabilitation.
- Smaller vegetation and groundcover would be removed during soil stripping operations.

Soil would be removed in two layers. Between 180mm and 250mm of topsoil and 175mm and 500mm of subsoil would be stripped and either placed immediately on areas undergoing progressive rehabilitation or used stockpiled for later use.

### **Extraction Operations**

Weathered shale material would be extracted from below the base of the subsoil to a depth where the material becomes too hard to be extracted using an excavator, generally between 3m and 5m below the natural surface. The weathered shale material would continue to be loaded directly into road registered trucks for transportation to the Proponent's customers, stockpiled for subsequent sale and despatch, or used for rehabilitation-related purposes within the Project Site.

Once the hardness of the shale becomes too great to be ripped, ie. progression to unweathered shale material, drill and blast techniques would be direct loaded into the processing plant using an excavator.

All drilling and blasting-related activities would be supervised by a suitably qualified and experienced blasting engineer or shot firer. Drilling activities would continue to be undertaken using a hydraulic drill rig. Up to 13 blasts would be initiated each year and each blast would typically continue to break between 12 000 bank cubic metres (bcm) and 15 000bcm of shale material. Blasting would continue to be conducted between the hours of 9:00am and 4:00pm Monday to Friday and only one blast would be initiated on any given day. No explosives would be stored within the Project Site.

### **Recycling Operations**

Recycling materials would be sourced from construction and demolition sites, primarily within the Shoalhaven and Illawarra areas, with some material sources from the Southern Highlands, Southern Sydney and South Coast areas. Procedures would be implemented to ensure that no material unsuitable for recycling into quarry products is received at the Project Site. Any such material that is received would be disposed of at an appropriate disposal facility.

Materials to be recycled would continue to be placed within a designated area within or adjacent to the extraction area. Non-recyclable materials, such as plastic linings and timber would continue to be removed and disposed of appropriately. Concrete material containing steel reinforcing would be broken using pulverising jaws on an excavator and the steel material would be removed and sold to a steel merchant.

### **Blending Operations**

The Proponent would continue to import blending material from a number of quarries. Blending material would be transported to the Project Site primarily as part of a back loading operation, ie. utilising trucks returning to the Project Site that would otherwise be empty. The amount and timing of materials imported would depend on the demand for particular quarry products, the availability of trucks to back load the material to the Project Site and the quality and price of material produced at each of the quarries.



## Processing Operations

All processing operations, as far as practicable, would be undertaken within the extraction area.

The mobile processing plant would be located immediately adjacent to the active extraction area to allow an excavator to directly load extracted, recycling and blending material in appropriate proportions into one or more primary jaw crushers. A proportion of the crushed material would not require any further processing and would be stockpiled for use as select fill or other purposes. The remaining crushed material would be transferred to the secondary cone crusher for further crushing and shaping and then a screening plant for final sizing.

Each component of the mobile crushing plant would continue to be equipped with dust and noise suppression equipment to limit the generation of airborne dust and reduce the potential for adverse noise impacts on the surrounding community.

## VENM Placement Operations

The Proponent would import up to 200 000t of VENM per year, primarily from construction sites/projects from an area from Batemans Bay to the south, Wollongong to the north and the Southern Highlands to the west of the Project Site. In addition, depending on the availability of trucks for back loading, the Proponent may import limited VENM from southern Sydney.

The Proponent would implement procedures to ensure that all VENM received at the Project Site is free from contamination and that a record of the source, type and placement location of all material is maintained. If any contaminated material is received, it would be disposed of at an appropriate facility.

VENM would be placed in horizontal lifts approximately 3m high. Each lift would be levelled and compacted prior to construction of the next lift. When backfilling operations reach a point approximately 3.5m below the final landform, a single, uncompacted 3.0m high lift would be constructed. This final lift would preferentially include weathered shale material in the upper 0.5m of the lift to provide suitable growth medium for vegetation. Finally, approximately 0.45m of topsoil and subsoil would be placed on the final landform.

## Transportation Operations

The site access road would be the primary access for heavy and light vehicles entering or leaving the Project Site. The site access road would continue to permit access for light and heavy vehicles to the extraction area and southern sections of the Project Site.

Quarry products would be transported from the Project Site via the Princes Highway to the following destinations in approximately the following proportions.

- Urban areas within Nowra to the south of the Shoalhaven River – 25%.

- Urban areas within Nowra, north of the Shoalhaven River and areas to the northwest of Nowra – 25%.
- Areas to the north of Nowra – 30%.
- Areas to the south of the Project Site – 20%.

Materials imported to or from the Project Site would be transported using road-registered rigid trucks, truck and dog trailers, semi-trailer tippers or B-Double trucks. The majority of materials transported to the Project Site would continue to be transported as back loads.

## **PROJECT DEVELOPMENT SEQUENCE**

The Project Site would be developed in six stages (**Figure C**). In summary, extraction operations would progress generally from north to south, with extraction of unweathered shale material and establishment of final quarry faces completed within each stage of the development prior to commencement of the next stage of development.

## **HOURS OF OPERATION AND PROJECT LIFE**

The proposed hours of operation would be 7:00am to 6:00pm, Monday to Friday and 7:00am to 4:00pm, Saturday with the following exceptions.

- Up to three unladen trucks would arrive at the Project Site after between 6:00am and 7:00am Monday to Saturday and a further three may return to the Project Site

between 6:00pm and 8:00pm, Monday to Saturday and 4:00pm and 6:00pm on Saturday.

- Maintenance activities may be undertaken until 6pm on Saturday.

The quarry would not operate on Sundays or Public Holidays.

The Proponent is seeking project approval for a period of 30 years.

## **EMPLOYMENT AND ECONOMIC CONTRIBUTION**

At a rate of 300 000t per year of products despatched, the Project would directly and indirectly employ approximately 20 and 7 full-time equivalent employees respectively. At a rate of 500 000t per year of products despatched, the Project would directly and indirectly employ approximately 25 and 12 full-time equivalent employees respectively.

The Proponent anticipates that at an annual rate of product despatch of 300 000t, the Project would contribute approximately \$7.7 and \$2.5 million per year to the local/regional, and the wider State and National economies respectively. At an annual rate of product despatch of 500 000t, the Project is estimated to contribute approximately \$11.3 and \$4.1 million to the local/regional, and the wider State and National economies respectively.





## **SAFETY AND SECURITY**

The Proponent would ensure that the existing 1.8m high site security fence is maintained and the site entrance gate is locked when the Project is not operating. In addition, all employees and visitors to the Project Site would be required to undergo a Project Site induction which would include training in safe working procedures.

## **REHABILITATION OPERATIONS**

The Proponent would progressively rehabilitate the Project Site following completion of extraction and processing-related operations. The short-term objectives of the Project Site rehabilitation program would be to stabilise all earthworks, drainage lines and disturbed areas in order to minimise the risk of erosion, sedimentation and air quality impacts on the environment surrounding the Project Site, as quickly as possible.

The longer term objectives of the rehabilitation program would be to provide a low maintenance, stable and safe landform that mimics the pre-extraction landform and provides for the establishment of vegetation communities similar to communities in undisturbed areas adjacent to and surrounding the Project Site.

The final landform would include:

- a gently sloped re-created landform within the extraction area that mimics the pre-extraction landform;
- a fenced water storage facility;

- an access track to allow vehicular access to the water storage facility; and
- the retention of the existing perimeter amenity bund.

The Proponent would initially revegetate and stabilise disturbed sections of the Project Site using a non-regenerating cover crop. Final revegetation would be undertaken using species representative of the Spotted Gum forest within and adjacent to the Project Site.

Progressive rehabilitation would include the following activities.

- Following completion of placement activities, subsoil and topsoil would be placed over the final landform.
- Where required, surface water management structures would be constructed.
- Coarsely mulched or broken vegetation would be spread over the placed topsoil
- Revegetation with a temporary, non-regenerating cover crop to stabilise the area to be rehabilitated in the short-term.
- Species used during final revegetation would be a mixture of lower, mid and upper storey species, sourced from seed collected within or adjacent to the Project Site.
- The area to be rehabilitated would be fenced and signs erected to restrict access to the area.



Areas undergoing rehabilitation would be regularly inspected and assessed against the short- and long-term rehabilitation objectives and remedial action undertaken, where appropriate.

## BIODIVERSITY OFFSET STRATEGY

In order to compensate for the removal of approximately 7.4ha of Spotted Gum Forest, the Proponent proposes to protect the following two areas of Spotted Gum Forest within and surrounding the Project Site (**Figure D**).

- Approximately 3.0ha within the Northern Biodiversity Offset Area.
- Approximately 17ha within the Southern Biodiversity Offset Area.

The aim of the proposed biodiversity offset strategy would be to maintain or improve the cumulative biodiversity values of the land within and surrounding the Project Site for the life of the anticipated impacts.

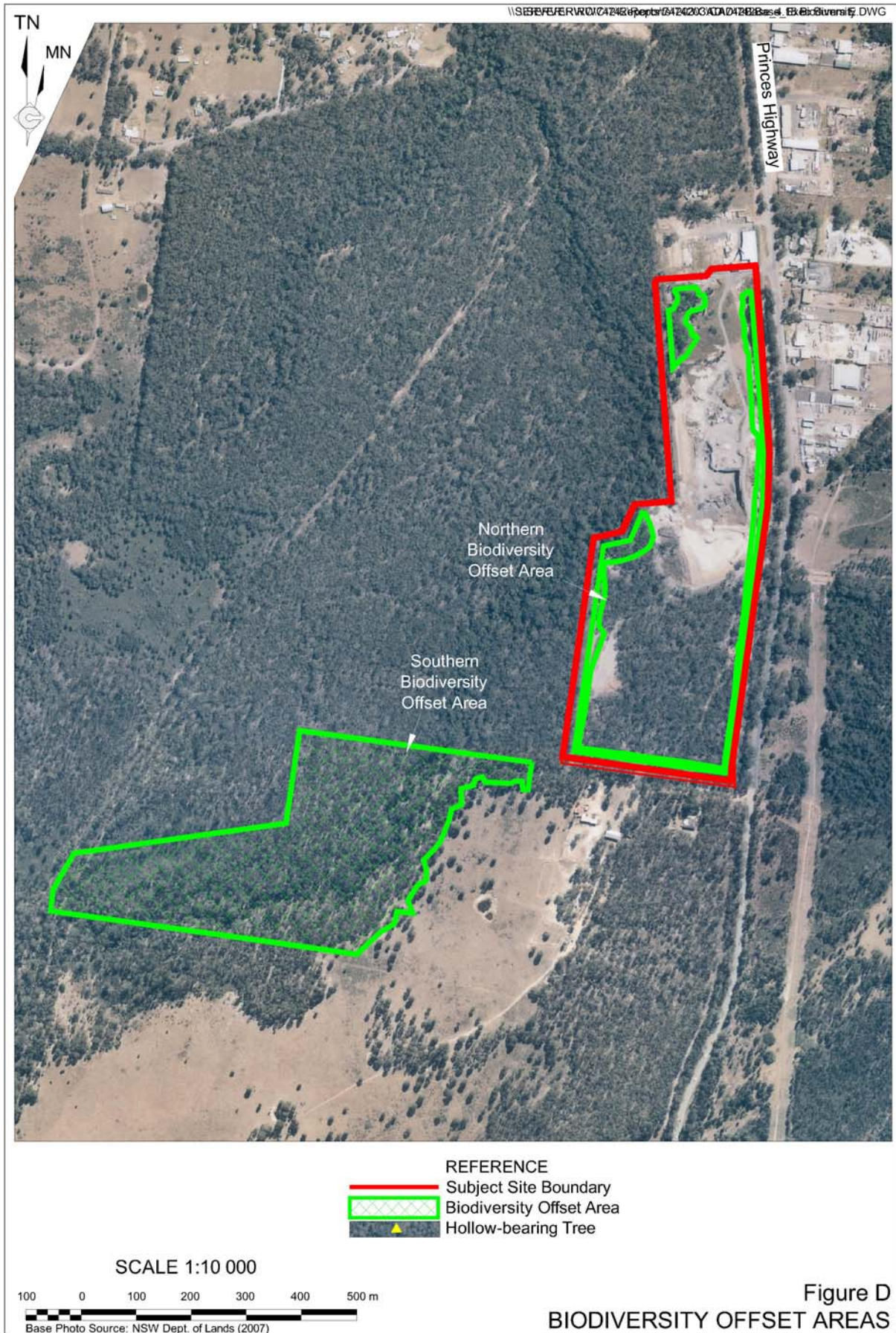
The Northern Biodiversity Offset Area incorporates part of Lot 464, DP1058778. The State of New South Wales is the registered owner of this land. The Proponent holds Mining Leases 5087 and 6322 over this land and retains access to that land through those leases. The Proponent or its successors in title would manage the Northern Biodiversity Offset Area in accordance with the management measures described below while ever the mining leases remain in force. In the event that the leases are relinquished or cancelled, the Proponent would provide sufficient resources for the on-going management of the Northern Biodiversity Offset Areas for the life of the offset strategy.

The Southern Biodiversity Offset Area comprises part of Lots 228 and 229 DP 755952. The land is owned by Mrs J. Goodsell and the Proponent has agreed with her to acquire a lease over the land for the term of the offset strategy, subject to the granting of project approval. The lease would include terms that would prevent the lease from being terminated by the lessor or subsequent owners of the land. The Proponent would secure the Southern Biodiversity Offset Area through a covenant or restriction on the use of the land to the satisfaction of the Department of Environment and Climate Change.

The following biodiversity management measures would be implemented during the life of the biodiversity offset strategy.

- Stock would removed and would continue to be excluded.
- Boundary fences would be erected or maintained.
- Appropriate fences would be erected to restrict wildlife from entering areas of active mining and rehabilitation-related operations. These fences would be removed once extraction and rehabilitation-related activities have ceased.
- Pest and weed control programs would be implemented and regular monitoring would be undertaken.

The life of the biodiversity offset strategy would be between 80 and 120 years.



## ISSUE IDENTIFICATION AND PRIORITISATION

In order to undertake a comprehensive environmental assessment of the Project, the Proponent undertook the following steps to identify and prioritise potential environmental impacts associated with the Project.

- Consultation with residents and other land users in the vicinity of the Project Site.
- Consultation with government agencies through a planning focus meeting.
- Review of relevant State Environmental Planning Policies.

This process identified 12 potential environmental issues as follows. These issues have been prioritised as follows based on potential environmental impacts and the frequency that each issue was identified during consultation with the community and relevant government agencies.

- Hydrology (groundwater and surface water).
- Ecology.
- Traffic and Transportation.
- Air Quality.
- Noise and Blasting.
- Aboriginal Heritage.
- Soils and Land Capability.
- Strategic Planning.
- Visual Amenity.
- Bushfire.
- European Heritage.
- Socio-economic impacts.

## ENVIRONMENTAL SAFEGUARDS AND RESIDUAL IMPACTS

The components and features of the existing environment within and in the vicinity of the Project Site have been studied in detail and the Project designed to avoid or minimise impacts on the environment. A brief overview of the main components of the surrounding environment, the proposed safeguards and the residual impacts are set out below.

### Hydrology

Potential Project-related surface water and groundwater impacts include adverse impacts on the quality and quantity of water within Nowra Creek (**Figure B**) and aquifers within and in the vicinity of the Project Site. In order to minimise the potential for such impacts, the Proponent would implement the following.

- Maintain and progressively relocate the existing and future surface water diversion structures to divert all surface water flows from undisturbed sections of the Project Site and areas where initial rehabilitation has been completed.
- Construct, maintain and relocate, as required, surface water diversion structures to ensure that all surface water flows within disturbed sections of the Project Site are directed to the extraction area or the water storage facility. The maximum area of this catchment would be 5.9ha.

- Construct a suitably sized sump within the active extraction area to collect all surface water runoff and groundwater inflows to the extraction area.
- Preferentially use water within the extraction area sump for dust suppression-related activities. Surplus water within the extraction area sump would be pumped to the water storage facility.
- Preferentially use water within the water storage facility for rehabilitation-related activities or for irrigation within the irrigation area (see below).
- Construct and relocate as required, an irrigation area of at least 4ha in the southern section of the Project Site (**Figure C**). The irrigation area would be irrigated preferentially using water from the water storage facility.
- Construct 'grassed buffer areas' adjacent to the site access road and other sealed sections of the Project Site as indicated on **Figure B**.
- Water that would be permitted to flow to Nowra Creek from the areas identified above would have Nitrogen, Phosphorous and suspended sediment concentrations of less than the concentrations currently within Nowra Creek.
- The Project would result in a decrease in the height of flood events within Nowra Creek of between 0.03m and 0.06m.
- The Project Site does not encroach upon flood liable land.
- The Project would result in a drawdown of the piezometric surface in the vicinity of the Project Site of a maximum of 18m. The 1m drawdown contour is anticipated to occur approximately 1 425m from the boundary of the extraction area.
- As the closest registered bore to the Project Site is 3.9km to the northeast, the anticipated drawdown of the piezometric surface would not impact on registered bores in the vicinity of the Project Site. In addition, the economic value of groundwater is likely to be low due to its saline nature.

The hydrology assessment concluded the following.

- No water would be required to be discharged from the water storage facility to Nowra Creek.
- Surface waters from undisturbed sections of the Project Site, areas of completed rehabilitation/stabilisation operations and the grassed buffer areas adjacent to the site access road and other sealed sections of the Project Site would continue to flow to Nowra Creek.
- As the existing piezometric surface is 9m below the invert of Nowra Creek, the anticipated drawdown of the surface would be unlikely to have an impact of Nowra Creek.
- There are no anticipated impacts to groundwater dependent ecosystems in the vicinity of the Project Site.



- The anticipated salt concentration of water that would be permitted to flow to Nowra Creek would be from undisturbed, rehabilitated or impervious sections of the Project Site would be approximately 220mg/L.

The median concentration of dissolved solids used for irrigation within the irrigation area would be approximately 760mg/L. The 85<sup>th</sup> percentile concentration of dissolved solids would be approximately 335mg/L. Martens (2009) state that this water may be used for irrigation purposes without any significant detrimental effect on plants or soils within the Project Site.

As a result, the Project is not anticipated to have a significant adverse impact on the quality and quantity of water within Nowra Creek or groundwater resources within and in the vicinity of the Project Site.

## Ecology

Eleven fauna species and three flora species listed on the schedules of the *Threatened Species Conservation Act 1995* (TSC Act) were recorded as occurring within 5km of the Project Site.

Vegetation within the Project Site comprises previously logged Spotted Gum forest, of which approximately 7.4ha would be disturbed by the Project. Eighty one species of plants were identified within the Project Site, including thirty species of exotic weeds. Approximately 49 hollow-bearing trees have been identified within the Project Site, of which approximately 37 would be disturbed by the Project. No Endangered Ecological Communities or

species listed under the *Threatened Species Conservation Act 1995* were observed within the Project Site.

Sixty three species of fauna were observed within or surrounding the Project Site. One, the Square-tailed Kite, was observed adjacent to the Project Site.

The Proponent would implement the following measures to limit the risk of adverse Project-related impacts on flora and fauna.

- Limit the removal of native vegetation to those areas required for operational purposes during the subsequent 12 months.
- Mark all hollow-bearing trees to ensure they are readily identifiable.
- Clearly mark the boundaries of areas of native vegetation to be cleared. No clearing would occur outside these boundaries. Only the area required for extraction-related operations during the next 12 months would be disturbed.
- Set cage traps in the vicinity of hollow-bearing trees for three consecutive nights prior to clearing of native vegetation.
- Clear non-hollow bearing trees first, where practicable, to allow any remaining nesting or roosting to animals to leave the area to be disturbed prior to removing hollow-bearing trees.
- Ensure a qualified fauna consultant observes operations when hollow-bearing trees are being removed to rescue any remaining nesting or roosting fauna.

- Break or cut into manageable sections cleared vegetation to be placed on areas undergoing rehabilitation or within other areas of native vegetation surrounding the Project Site.
- Control noxious weeds within the Project Site.

The Ecology assessment concluded that no threatened species listed under the TSC Act or under the *Environment Protection and Biodiversity Conservation Act 1999* would be significantly impacted by the Project.

### **Traffic and Transportation**

Potential Project-related impacts include increasing traffic levels on the Princes Highway and poor performance of the intersection between the site access road and highway. In order to minimise the potential for such impacts, the Proponent would implement the following.

- Transportation operations would adhere to the approved hours of operation.
- All speed limits would be strictly adhered to.
- All entering and exiting laden trucks would pass over the weighbridge.
- The Proponent would seal a 150m section of the site access road and construct a wheel wash facility prior to the amount of quarry products despatched from the Project Site exceeding 250 000t per year.

- The Proponent would ensure all loads are covered.
- The Proponent would require all truck drivers to sign a Driver's Code of Conduct.

The anticipated additional Project-related traffic would increase traffic levels on the Princes Highway by 0.1% or less. The operations of the existing site entrance would be good to satisfactory.

### **Air Quality**

Potential air quality impacts include the dispersion of particulate material in the atmosphere. In order to reduce the generation of airborne dust, the Proponent would implement the following.

- Utilise a chemical dust-lift off suppression system along unsealed roads, tracks and working areas, as well as within the processing plant(s) during the life of the Project.
- Utilise efficient mist sprays and wind sheltering equipment on processing equipment.
- Maintain a maximum speed limit within the Project Site of 10km/h.
- Install a wheel wash on the site access road.
- Utilise dust aprons, dust extraction systems and/or water injection or sprays during drilling operations, as required.



- Adequately stem all blast holes with aggregates.
- Commence rehabilitation as soon as practicable once an area is no longer required for extraction or placement-related operations.

At the maximum rate of product despatch (500 000t per year), the anticipated rate of dust deposition from the Project alone would exceed the assessment criteria for sensitive receivers of  $2\text{g}/\text{m}^2/\text{month}$  at two non-residential sites, namely at the Nowra Brickworks site adjacent to the northern boundary of the Project Site ( $2.2\text{g}/\text{m}^2/\text{month}$ ) and at the conceptual roundabout at the intersection of Warra Warra Road and the Princes Highway ( $2.7\text{g}/\text{m}^2/\text{month}$ ) (**Figure E**). In addition, the maximum cumulative daily  $\text{PM}_{2.5}$  concentration would exceed the assessment criteria of  $25\mu\text{g}/\text{m}^3$  at one site, namely Residence A to the south of the Project Site ( $26.25\mu\text{g}/\text{m}^3$ ) (**Figure E**). The Proponent has approached the owner of Residence A with a view to negotiating an appropriate arrangement. The owner of that residence has indicated that they would prefer to postpone such negotiations at the present time. The Proponent would seek to recommence negotiations at an appropriate time.

## Noise

Existing noise levels in the vicinity of the Nowra Brickworks Quarry are influenced by a range of sources including traffic on the Princes Highway, industrial noise from industrial and commercial operations to the east and north of the Project Site, noise from the Nowra Brickworks Quarry itself and naturally occurring noise, including

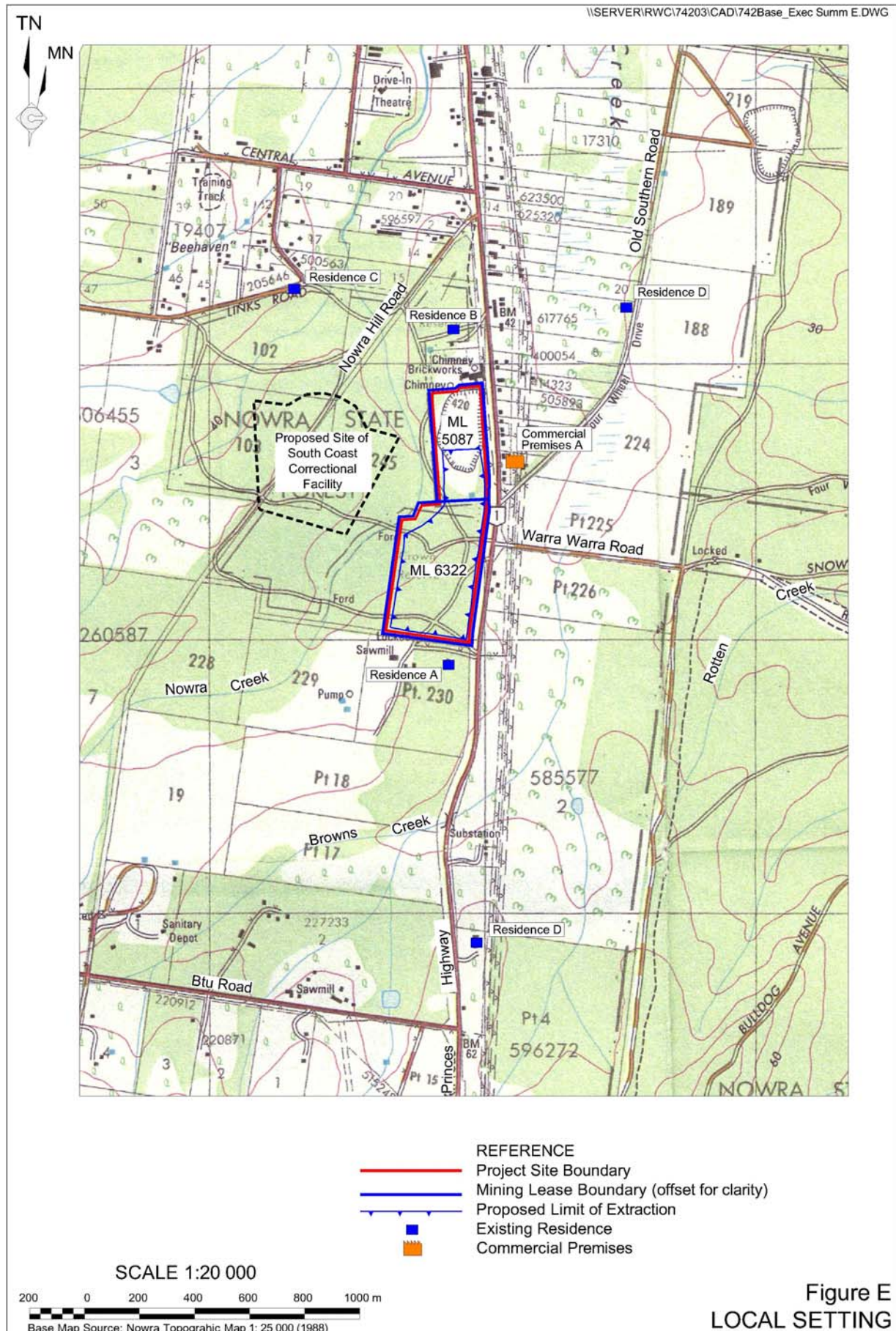
noise from wind in trees, insects and birds. Project-specific noise assessment criteria were determined for four representative residences, namely Residences A to D (**Figure E**).

In order to reduce noise emissions, the Proponent would implement the following.

- Strictly adhere to the hours of operation.
- Use noise-mitigated mobile and processing equipment.
- Undertake all processing operations within the deepest section of the quarry.
- Maintain all mobile and processing equipment in accordance with the manufacturer's specifications.
- Progressively install frequency modulated reversing alarms on mobile equipment, as equipment is renewed.
- Negotiate an appropriate arrangement with the owner of Residence A prior to the completion of Stage 1 of the Project.

With the exception of Residence A during Stage 5 of the Project where the Project-specific assessment criteria ( $51\text{dB}(\text{A})$ ) would be exceeded by  $5\text{dB}(\text{A})$ , Project-related noise emissions would be less than the Project-specific assessment criteria at all assessment locations.

Project-related road traffic noise at Residence E, the closest residence to the Princes Highway (**Figure E**), was determined to be within the relevant road noise criteria.



## Blasting

Blasting impacts primarily include ground vibration and airblast overpressure. In order to reduce blasting impacts, the Proponent would implement the following.

- Blasts would be designed and implemented by a suitably qualified blasting engineer and experienced shot-firer.
- All blasts would be designed to adhere to the following blasting assessment criteria.
  - Residential receivers – ANZEC recommended blasting limits, namely ground vibration less than 5mm/s for 95% of blasts and less than 10mm/s for all blasts and airblast overpressure less than 115dB Linear for 95% of blasts and less than 120dB Linear for all blasts.
  - Commercial receivers and the proposed South Coast Correctional Facility – Ground vibration less than the British Standard 7385: Part 2-1993 “*Evaluation and Measurement for Vibration in Buildings Part 2*” guide for structural damage to reinforced or heavy framed buildings of 50mm/s. Airblast overpressure less than the Australian Standard AS 2187.2-2006 recommended criterion of 133dB Linear.
- All blasts would be monitored at the existing blast monitoring location, the proposed South Coast Correctional Facility and elsewhere, as required.
- Blast designs, mitigation measures and operating procedures would be modified on the basis of monitoring results, if required.
- Blasting would continue to occur between the hours of 9:00am and 4:00pm, Monday to Saturday.
- An appropriate arrangement would be negotiated with the owner of Residence A prior to the completion of Stage 1 of the Project. As indicated previously, the owners of Residence A have requested that negotiation of a suitable arrangement be postponed.
- Notify relevant government agencies and residents on the working day prior to the blast being initiated.

The blasting assessment indicates that the existing blasting parameters would result in exceedances of the blasting assessment criteria at Residence A and B and Commercial Premises A (**Figure E**). However, the blasting parameters would be modified for each blast to ensure that all blasts comply with the assessment criteria at all non-Project related residential and commercial receivers surrounding the Project Site. As a result, the Project would have no significant blasting-related impacts on surrounding residential or commercial receivers.

## Aboriginal Cultural Heritage

No sites of Aboriginal heritage significance were identified within the Project Site. As a result, the Project would have no impact on matters of Aboriginal heritage significance.

## Visual Amenity

The Proponent would implement the following to limit the potential for adverse impacts on the visual amenity of the area in the vicinity of the Project Site.

- The existing perimeter amenity bunds, vegetated buffer within the Nowra Creek riparian zone and line of mature trees adjacent to the eastern Project Site boundary would be retained and enhanced.
- The Proponent would adopt a high standard of housekeeping.

The Project would have a negligible impact on the visual amenity of the area in the vicinity of the Project Site.

## Bushfire

The Project Site is identified as bushfire prone land on the *Bushfire Prone Lands Map* published by the NSW Rural Fire Service. As a result, the Project is considered to be compliant with the requirements of Clause 46 of *Rural Fires Regulation 2002* and the document *Planning for Bushfire Protection* published by the NSW Rural Fire Service in 2006.

## European Heritage

No items of European Heritage significance were identified within the Project Site or within 4.5km of the Project Site. As a result, the Project would have no impact on matters of European heritage significance.

## Socio-economic

The Project Site is located within the Shoalhaven City Council Local Government Area (Shoalhaven LGA). The Proponent would implement the following to ensure the socio-economic benefits of the Project are maximised.

- Where ever practicable, preference would be given to suppliers of equipment, services or consumables located within the Shoalhaven LGA or Illawarra Region.
- Where ever practicable, when engaging new employees, the Proponent would hire candidates who live within the Shoalhaven LGA.
- The Proponent would continue to support community organisations.
- The Proponent would consult with the community, as required.
- The Proponent would advertise and maintain a community complaints telephone line and a Complaints Management Plan to ensure prompt response to issues identified by the public.



The Project is predicted to have the following social and economic benefits.

- Creation of 27 full-time equivalent positions at an annual rate of product despatch of 300 000t, increasing to 37 full-time equivalent positions at an annual product despatch rate of 500 000t.
- Injection of approximately \$11.3 million per year into the local and regional economy, and approximately \$4.1 million into the State and national economy at an annual product despatch rate of 500 000t. This expenditure is likely to generate additional economic activity and flow on effects, providing further employment opportunities.
- Provision of a range of competitively priced, high quality specialist and general quarry products.
- Provision of a competitively priced service to accept and recycle construction material, which may otherwise end up in regional landfills.
- Provision of a well managed facility to receive, process and place VENM at competitive prices.
- Ongoing availability of easily accessible water supplies, including pumps, for rapidly filling tankers, for use during emergencies.

The Proponent contends that any adverse socio-economic or environmental impacts, both actual and perceived, would be more than adequately countered by the positive

effect that the Project would have on employment in the vicinity of the Project Site and contribution of the Project to the local and regional economy and community.

## JUSTIFICATION AND EVALUATION

The Project has been evaluated and justified principally through consideration of its potential impacts on the environment and potential benefits to the local and wider community.

An evaluation of the Project was undertaken through consideration of the principles of ecologically sustainable development and on balance, it is concluded that the Project achieves a sustainable outcome for the local and wider environment.

The Project and associated activities have been assessed in terms of a wide range of biophysical, social and economic issues. The Project would have some minor adverse impacts, including the following.

- The short to medium-term loss of an area of Spotted Gum forest.
- More frequent blasting operations.
- A slight increase in the number of heavy vehicles using the Princes Highway.

These impacts can be justified in terms of the significant positive economic and social benefits to the local and wider community.

## CONCLUSION

The proposed continuation and expansion of extraction operations at the Nowra Brickworks Quarry has, to the extent feasible, been designed to address the issues identified by the local community, all levels of government and a range of specialist consultants. The Project provides for the extraction of shale material within the Project Site, blending of products from other quarries and recycling of waste construction materials to produce a range of specialist and general quarry products for use in building and road construction and maintenance projects, providing benefits for, and boosting the economies of the local and wider community. In addition, the Project provides for the backfilling of the extraction area and the creation of a final landform that would mimic the pre-extraction landform. The post-extraction landform would be used for nature conservation, which, together with the proposed biodiversity offset strategy, would provide medium to long-term environmental benefits.

The *Environmental Assessment*, supported by the range of specialist consultant studies, has established that if the Project proceeds, it would:

- contribute to satisfying the demand for general and specialist quarry products;
- satisfy ecological sustainable development principles;
- have an acceptable and manageable impact on the biophysical environment; and
- contribute to the continued economic activity of the local and wider community.

