

Champions Quarry Expansion Environmental Assessment Report

Volume 1 Final Report

for Reavill Farm Pty Ltd and Tucki Hills Pty Ltd

February 2010

0098287

www.erm.com



Champions Quarry 1586 Wyrallah Road Tuckurimba NSW

Environmental Assessment

February 2010

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FINAL REPORT

Tucki Hills Pty Ltd and Reavill Farm Pty Ltd

Champions Quarry 1586 Wyrallah Road Tuckurimba NSW

Environmental Assessment

February 2010

Reference: 0098287

| For and on behalf of Environmental Resources Management Australia | | |
|---|------------------|--|
| Approved by: Murray Curtis | | |
| Signed: | Mg At: | |
| Position: | Managing Partner | |
| Date: | 24 February 2010 | |

This report has been prepared in accordance with the scope of services described in the contract or agreement between Environmental Resources Management Australia Pty Ltd ACN 002 773 248 (ERM) and Reavill Farm Pty Ltd and Tucki Hills Pty Ltd. The report relies upon data, surveys, measurements and results taken at or under the particular times and conditions specified herein. Any findings, conclusions or recommendations only apply to the aforementioned circumstances and no greater reliance should be assumed or drawn by the Reavill Farm Pty Ltd and Tucki Hills Pty Ltd. Furthermore, the report has been prepared solely for use by Reavill Farm Pty Ltd and Tucki Hills Pty Ltd and ERM accepts no responsibility for its use by other parties

prepared under Part 3A of the Environmental Planning and Assessment Act 1979 **EA PREPARED BY** Names: Toby Nugent Murray Curtis BNR (Hons) BURP Qualifications: **B.**Engineering (Hons) Address: Suite 3, 146 to 148 Gordon Street Port Macquarie NSW 2444 **PROJECT PLAN APPLICATION** Reavill Farm Pty Ltd and Tucki Hills Pty Ltd Applicant name: PO Box 5261 Applicant address: East Lismore NSW 2480 Property description of land to be developed is contained in the Land to be developed: EA. Proposed development: *Project approval is sought for the expansion of the existing Champions* Quarry and to allow for access to 6.25 million tonnes of sandstone at the rate of 250,000 tonnes/annum over a 25 year quarry life at Tuckurimba, New South Wales. The Proposal is described in Chapter 2 of the EA **ENVIRONMENTAL** ASSESSMENT ☑ An EA is attached which addresses all matters listed under Part 3A of the Environmental Planning and Assessment Act 1979. **CERTIFICATE** I certify that I have prepared the contents of this EA and to the best of my knowledge: it contains all available information that is relevant to • the environmental assessment of the development to which the EA relates: and it is true in all material particulars and does not, by its presentation or omission of information, materially mislead. Signature: T.). ht Name: Toby Nugent Murray Curtis 24 February 2010 24 February 2010 Date:

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Executive Summary

EXECUTIVE SUMMARY

OUTLINE OF THE PROPOSAL

Introduction

Reavill Farm Pty Ltd and Tucki Hills Pty Ltd propose to expand their existing quarrying operations at Champions Quarry to supply the Far North Coast region of New South Wales markets with a high quality and wide range of sand products for construction materials.

The existing quarry on the site presently has an approval in place allowing for extraction of up to 29,000m³ (64,000 tonnes) per annum from a total approved resource of 130,000m³. The sandstone extracted is capable of being utilised for a range of products, including:

- *washed sand for concrete and bitumen markets;*
- select and engineered fill;
- blended road base;
- bricklayers sand;
- aggregates;
- landscaping topsoil and sandy loam; and
- *dimensioned stone and rock.*

A significant resource of approximately 12 million tonnes has been identified on land owned by the proponents, of which is it proposed to extract 6.25 million tonnes at the rate of 250,000 tonnes per year over a 25 year period. It is also proposed to expand the materials processing capacity of the quarry to accommodate for this increased extraction rate. This increased expansion will primarily occur in a new extraction area to the south of the existing quarry. The existing quarry pit will become a processing area to allow for a sand washing plant and the establishment of materials storage and processing facilities, plant storage and maintenance facilities and a building containing an office and staff amenities.

The site location and proposed site layout are shown on Figure E1.1 and Figure E1.2 below.



| | | | | Figure E1.1 |
|---------------|----------------------------|---------------|----|--|
| Client: | Champions Quarry | | | Project Locality Plan |
| Project: | Champions Quarry Expansion | | | |
| Drawing No: | o: 0098287pm_01_FE1.1 | | | |
| Date: | 12/08/09 | Drawing size: | A4 | |
| Drawn by: | AM | Reviewed by: | WW | Environmental Resources Management Australia Pty I |
| Source: | Department of Lands | | | PO Box 5711 3/146 Gordon Street |
| Scale: | Refer to Scale Bar | | | Port Macquarie NSW 2444 Telephone +61 2 6584 7155 |
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ERM



Legend

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Temporary Stockpile Holding Area

Water Management Dam

Extent of Quarry Extraction and Operations

(Project Area)

Washing Plant

Processing Plant

Service Area and

Central Section

Southern Section

Water Management (Non-quarrying area)



Figure E1.2

Proposed Layout of Project Area

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Champions Quarry is located approximately 16km south of Lismore on Wyrallah Road and is located on the proponent's landholdings (the Project Site) which have a total area of 187ha.

The land surrounding the quarry is used primarily for agricultural and rural purposes including cattle grazing, pasture production and some cropping. There are also a small number of rural dwellings on smaller allotments within close proximity to the quarry.

Project Description

The proposed expansion of Champions Quarry includes the staged lateral and vertical extraction within limited areas of the existing quarry (Central Section) as well as a larger expansion into an area immediately to the south (Southern Section). The ultimate area of disturbance is in the order of 16 hectares (the Project Area).

The Proponent

Reavill Farm Pty Ltd was formed by Jeff and Diana Champion as a family company in 1979, and along with Tucki Hills Pty Ltd (another family owned company) forms part of the Champion Family Group of Companies. Reavill Farm Pty Ltd has established and operated a number of rural and regional businesses, including quarrying, firstly within the Hawkesbury Valley and, since 1983, in the Lismore/Ballina Region. Two generations of the family are now involved in the day to day running of the businesses.

Tucki Hills Pty Ltd acts as trustee for four family trusts involving three generations of the Champion family. The company and trusts were formed to purchase land for the ongoing development and expansion of its rural and quarry interests in the Tucki Tucki area.

The Champion Group has a continued commitment to sustainable development principles in relation to businesses in general, and to agriculture and quarrying in particular. This commitment has also extended to non profit environmental projects over many years. The quarry operations, which trade as Champions Quarry, has planned expansion based on industry best practice with a significant environmental commitment, as confirmed by the Champions Quarry logo "Working with the Environment".

The success of the Champion Family Group of Companies over the past 40 years and their faith in the future can be summarised by its motto "Vision, Passion and Commitment".

ENVIRONMENTAL ASSESSMENT STRUCTURE

Legislative Framework

This Environment Assessment report (EA) has been undertaken by Environmental Resources Management Australia Pty Ltd (ERM) to assess the significance of potential environmental, social and economic impacts resulting from the intensification and expansion of extraction and processing at Champions Quarry. The EA has been undertaken pursuant to the relevant provisions of the Environmental Planning and Assessment Act 1979 (EP&A Act) and the Environmental Planning and Assessment Regulations 2000 (EP&A Regs).

The expansion of Champions Quarry has been identified as being a 'Major Project' in accordance with Section 75(b), Part 3A of the EP&A Act. This EA has been prepared in accordance with the requirements of State Environmental Planning Policy (Major Development) 2005, the Director General of the Department of Planning's Environmental Assessment Requirements (EARs) and issues raised by relevant government agencies and the community.

Environmental Assessment Approach

As the proposed quarry limits and operations are readily able to be defined, this assessment has been undertaken based on these limits. The EA has been prepared using conservative scenarios for assessments to develop a range of acceptable environmental and social parameters within which the quarry will operate. The minimization of impacts is therefore dependant upon the quarry being operated in the manner put forward in the EA and the implementation of all proposed mitigation measures.

Consultation

A community consultation plan has been developed and implemented as required by the EARs issued on 22 June 2009. The object of this was to gain highly individualized input from nearby residents such that the impact assessment could be undertaken in a manner that addresses specific matters of concern. This has included:

- Champions Quarry Expansion Community Information Newsletter May 2009 delivered to residents within a 3km radius of the quarry. This newsletter invited residents to contact ERM on a freecall 1800 number or by mail to arrange for face to face meetings if required to discuss matters of concern;
- A general media release was distributed in local media outlets in May 2009; and
- Following distribution of the newsletter, and follow up of correspondence received (four letters) face to face meetings were held with two nearby residences in August 2009.

Additionally, a request was received from the Tucki Community Against the Mega Quarry Inc. to hold an open public meeting. This offer was declined by ERM and the Proponent in a letter dated 6 August 2009.

Issues raised by the local community have been considered as part of the assessment process and were used to guide the impact assessment process and subsequently developed statement of commitments.

Aboriginal consultation was undertaken in accordance with the 'Interim Community Consultation Requirements Guideline' (2005) with the outcomes of this used to direct the Aboriginal cultural heritage assessment.

ENVIRONMENTAL INTERACTIONS

Traffic and Transport

A traffic impact assessment was undertaken and included an assessment of the capacity of three primary haulage routes to accommodate the increase in trucks leaving the quarry from an average of 11 trucks per day to an average of 30 trucks per day. These haulage routes are:

- North to Lismore via Wyrallah Road, Wyrallah Ferry Road and Coraki Road to the Bruxner Highway, a distance of approximately 12.7km;
- Along Wyrallah Road south to the Pacific Highway at Woodburn, a distance of approximately 15.8km; and
- South to Broadwater via Wyrallah Road and Broadwater Road, a distance of approximately 17.3km.

It is concluded that provided the following recommendations are implemented that the increase in traffic resulting from the proposed expansion of Champions Quarry will not have adverse impacts on traffic flow or safety along the nominated haulage routes:

- the primary route to and from Lismore to be via the Bruxner Highway, Coraki Road, Wyrallah Ferry Road and Wyrallah Road;
- the preferred route to and from the Pacific Highway to be Wyrallah Road or via Broadwater Road;
- the intersection of Wyrallah Road and Wyrallah Ferry Road is currently substandard and will require upgrading in the form of widening for the left turn in for heavy vehicles from Wyrallah Road;

- Coraki Road and Wyrallah Ferry Road meet at a T-intersection. This intersection is currently substandard and will require upgrading in the form of widening for the left turn in to cater for heavy vehicles from Coraki Road. The proposed design will require 90m² of pavement widening in conjunction with a two coat seal;
- That Champions Quarry make a contribution towards intersection works described above in accordance with previous negotiations with Lismore City Council;
- payment of road contributions to Lismore City Council in accordance the calculations provided within the Traffic Impact Assessment;
- reduction in the speed limit on Wyrallah Road from 100km/hr to 80km/hr from Wyrallah to the Tuckurimba intersection;
- vegetation be cleared that obscures the T-junction warning sign on Wyrallah Ferry Road on the approach to the Bridge;
- a '200m' distance plate be added to the warning sign on Wyrallah Ferry Road on the approach to the Bridge; and
- when the quarry has increased truck volumes forecast for a particular period, this information to be forwarded onto the local bus companies.

Flora and Fauna

An ecological impact assessment was undertaken to assess the impacts of the proposed expansion of Champions Quarry on endangered flora, fauna and their habitats.

Four vegetation communities were identified in and contiguous with the Project Area:

- Dry Rainforest;
- Wet Sclerophyll Forest;
- Regenerating Pink Bloodwood/Forest Oak Woodland; and
- Grassland.

During field investigations a total of 67 species of flora and fauna were identified of which 18 were exotic. No threatened flora species as listed under the Threatened Species Conservation Act 1995 (TSC Act) or the Environmental Protection and Biodiversity Conservation Act 1999 were recorded in the Project Area and contiguous vegetation communities.

The rainforest communities identified are considered to be representative of the Lowland Rainforest on the NSW North Coast and Sydney Basin Endangered Ecological Community. Whilst this rainforest community is largely external to the proposed area to be disturbed, two small areas will be disturbed in areas adjoining the Central and Southern Sections. An assessment of this community has been undertaken in accordance with the TSC Act. The remainder of the Rainforest community outside of the Project Area will be managed and enhanced within a comprehensive biodiversity offset strategy and Vegetation Management Plan.

Measures to minimise direct impacts associated with the clearance of vegetation and habitats within the quarry footprint include:

- Further assessment to confirm the species of Microbat identified in Area 2 (suspected to be Myotis macropus) and to consider the potential for Nurus atlas (Atlas Rainforest Ground-beetle) to be inhabiting the Dry Rainforest areas adjoining the Project Area. These works will be undertaken in accordance with the methods described in the DECCW (2004) Draft Threatened Biodiversity Survey and Assessment Guidelines;
- pre-clearance inspection of each 'work cell' prior to the commencement of clearing works to identify potential fauna habitat (e.g. fallen hollow logs, and hollow-bearing trees) and identify appropriate measures. Measures to minimise impact on fauna during clearing operations would include modified clearance of hollow-bearing trees by clearing up to the tree, nudging the tree then leaving the tree to be cleared at a later period to allow any resident fauna to relocate;
- where potential fauna habitat identified a suitably qualified wildlife handler would be present during clearing operations to supervise clearance and rescue any individuals where required;
- pre-clearance inspection of trees to be felled for Koalas; and
- *relocation of any fallen logs to adjoining areas and or rehabilitation areas.*

Measures to minimise impact of traffic movement on fauna includes:

- *limiting traffic movement to daylight hours;*
- *limiting the speed of haul trucks to 30km/h;*
- selection of shrub species and/or tree species that do not provide a foraging resource for Koalas in visual screening proposed along the haul road; and
- providing a break in the screening planting near the junction of the haul road and Wyrallah Road to discourage directing terrestrial fauna on to the road.

The proposed quarry expansion will clear less than 1.5 ha vegetation including Dry Rainforest buffer zones and Wet Sclerophyll Forest, and including minor scattered stands of vegetation. The areas to be cleared have been minimised by the design of the quarry footprint, however these remnant and regenerating vegetation stands will not be avoided by the proposal. The loss of this relatively small amount vegetation will be offset through the management and protection of existing areas, and revegetated areas of the same communities and habitat attributes in the immediate area to provide a net improvement in ecological values.

Identification of a suitable offset area was guided by consideration of DECCW offsetting principles that an offset must:

- consider the structure, function and compositional elements of biodiversity including threatened species;
- enhance biodiversity;
- consider the conservation status of ecological communities; and
- *ensure the long-term viability and functionality of biodiversity.*

The offset areas should preferably be located on-site or in the locality, contain the same or equivalent vegetation communities and be in equivalent or better condition to provide for an offset of 'like for like'. Further, preference was given in identifying suitable offset areas, to areas that provide offset strategies through implementation of measures such as habitat enhancement and securing land for conservation as opposed to reconstruction of communities. The latter option is not preferred as it involves high risk and uncertainties for biodiversity outcomes in the short term and long term. It is noted, however, that significant areas of the existing habitat, which will be enhanced by the proposed offsets, are also to be locked-up and managed as part of the overall offset strategy.

To ensure long term security and implementation of management measures, the offset area should be located on land owned by, or which can be purchased by the proponent. The proponent will commit to the protection and management of the offset areas through legal enforcement of the offset strategy.

Areas proposed to be identified and managed as biodiversity offset areas for the loss of the remnant and regenerating habitat in the Project Area are shown on Figure 7.2.

The offset areas will be managed in perpetuity. A vegetation management plan will be prepared for the offset areas. The management plan would include but not be limited to the following consideration:

- baseline assessment of the community and habitat values of the offset area;
- *identification of environmental weeds to be targeted in the weed management plan;*
- *any fencing reconfiguration requirements;*
- safety issues for revegetation and weed management works on the steeper slopes; and
- ongoing monitoring program.

The identified biodiversity offset areas are all within the proponents ownership. In addition, the proponent will commit to the protection and management of the offset areas secured through legal enforcement of the offset strategy via a voluntary conservation agreement under the National Parks and Wildlife Act 1974 or Section 88B-E covenant of the Conveyancing Act 1919 to be negotiated by the proponent and the DoP and DECCW.

The biodiversity offset areas are proposed as a means of ensuring that the proposal maintains or improves biodiversity in the local area. The biodiversity offset areas will support similar vegetation community and habitat structure within the immediate area of the proposal and provides for long term protection, management and conservation of an area of at least 10ha of woodland. The proposed offset will improve biodiversity values within the area through enhancing habitat connectivity.

The existing quarry has a Rehabilitation and Final Landscape Plan. The principals of this plan will be applied to the expanded quarry operation. Work cells will be progressively rehabilitated. A large part of the proposed quarry will be rehabilitated with pasture species to grazing land as currently characterises the Project Area. The benches would be shaped and rehabilitated with locally occurring native species. The rehabilitation will be monitored monthly to assess establishment of vegetation and progress documented by the Environmental Officer.

Surface Water

A water management plan for the quarry was developed to:

- ensure adequate water supplies under most climatic conditions, and
- safeguard the integrity of downstream watercourses and lowlands.

Runoff from undisturbed areas will be diverted around areas disturbed or affected by quarry activities. This will reduce the potential for clean runoff to be polluted by quarry activities. Diversion of clean water will be affected by diversion drains, contour drains and, where necessary, bunds, and pipe culverts designed in accordance with the Managing Urban Stormwater - Soils and Construction 'Blue Book' (Landcom, NSW 2004). A conceptual drainage plan has been developed and verification modelling has been undertaken to confirm the adequacy of the proposed water management system.

As far as possible, all water runoff within the pit, including any minor seepage or groundwater inflow, will be directed to sediment basins to be constructed in the bottom of each active quarry pit.

All settling ponds will be required to be regularly de-silted to ensure that they are operating effectively. It is also recommended that an additional small settling pond be constructed at upslope side of the main clean water ponds.

Long-term material stockpiles (i.e. topsoil and overburden) will be stabilised by seeding with seasonal grasses. All shorter term material stockpiles will be bunded to reduce run-on and to capture runoff. Appropriate sediment control measures (i.e. silt fencing, check dams etc.) will be established in accordance with Managing Urban Stormwater - Soils and Construction 'Blue Book' (Landcom, NSW 2004) where necessary to reduce the potential for sediment run-off.

All water used as part of the quarry and sand washing operations is to be diverted via catch drains to a series of linked settling ponds. Sediment control devices will be installed between the sediment ponds in the form of rock filters. This will allow the removal of sediment from the catch drains, adjacent to each rock filter as part of routine site maintenance.

Sediment control devices in the form of rock filters will be installed at regular intervals between the settlement ponds. These rock filters will be designed and installed to allow regular desilting maintenance to ensure that they are operating effectively. Additional sediment control devices including plant filter strips and smaller settling ponds, designed as a pond-riffle flow system are to be installed upslope of the Water Reuse Dam. The 40ML Water Reuse Dam will operate with a minimum of 6ML of freeboard for the collection and treatment of all active Project Area runoff prior to reuse, land application or discharge.

An operational surface water monitoring program will be designed and implemented as part of the quarry environmental management procedures. Water quality monitoring is proposed to be undertaken as outlined below on an ongoing basis. This monitoring will be refined where necessary based on the results of previous monitoring and ongoing quarry operations.

The proposed conservatively designed Surface Water Management System is considered to be adequate, as it not only accounts for site operational water needs, but provides for conservative design measures for the detaining and treatment of Project Area runoff and washing plant reuse water.

Groundwater

Geological investigations undertaken encountered groundwater in six boreholes advanced across the site (Coffey Geotechnics, 2007). Relatively high standing water levels were recorded, following a significant rainfall event in excess of 500mm, in the four boreholes that were converted to monitoring wells.

Hydraulic conductivity analysis results indicate very low recharge rates and low calculated conductivity ($K = E^{-7}m/s$ to $E^{-8}m/s$) in the four monitoring bores. This suggests that the groundwater encountered is likely to represent shallow perched seepage water in the sandstone.

In the absence of information on groundwater flow data for the site, it can be reasonably assumed that shallow perched groundwater will generally follow the landform and flow in an east to north easterly direction towards the low lying flood plain.

The pH of shallow perched groundwater across the site is slightly to mildly acidic and contains low levels of nutrients and non-organics.

As the quarry expands laterally and vertically it is not expected to intercept the groundwater table. Based on the hydrogeological properties encountered during site investigations, shallow perched groundwater identified within the extraction zones is not

expected to result in significant levels of seepage into the quarry pits. This is further supported by the conditions experienced in the existing quarry pit where significant seepage is not encountered. It is considered likely that the extraction of the sandstone resource will result in a lowering of the perched water table profile, with any minor seepage from quarry walls likely to be lost via evaporation.

Groundwater quality monitoring will comprise water level gauging along with sample collection and testing by a National Association of Testing Authorities (NATA) registered laboratory and will provide a mechanism to:

- ensure the quarry is operating as anticipated with respect to groundwater quality protection;
- to gauge the impact (if any) of the groundwater level across the site;;
- *identify any unforseen impacts from the quarry operations;*
- *implement measures to prevent any as yet unforseen impacts from the scheme; and*
- *verify that the quarry is achieving its environmental objectives.*

Acid Mine Drainage

There exists what is expected to be minor potential for AMD at the site. The identified veins containing pyrite at the site are considered very minor (to insignificant) due to their thickness in relation to the total sandstone resource. In addition, they were only identified in one of the four drilling cores located in the proposed Southern Section extraction area (at BH5 to the west). It is noted that heavy metals are not a feature of the sandstone resource and as such are not expected to present a significant issue with regard to mobilisation of same.

As all operational site runoff is to be contained within the Project Area, the Water Reuse Dam will provide a means for capturing and treating (if required) any AMD. In order to prevent the generation of AMD, where possible material from the very thin veins containing pyrite will be separated, excavated and stockpiled for treatment. Given the inconsistency and thinness of these veins, this may not always be practical, however the simple extraction methods utilised at the quarry does allow for this management strategy to be implemented where possible.

Where pyrite material can be separated it will be stored with the Project Area (and hence within the Water Management System) and be immediately covered with clay overburden sourced from the Project Area. This will limit the potential for oxidation and aim to prevent the production of AMD. The storage area, to be contained with the quarry pit, will be monitored and where AMD is detected Aglime (or equivalent) will be used to neutralise the materials.

In addition to the above, the Water Reuse Dam will be regularly monitored for pH to ensure AMD is not creating acidic conditions. If the pH of the Water Reuse Dam is

outside relevant discharge criteria, Aglime (CaCO3) (or equivalent) will need to be broadcast over the dam in order to raise the pH. Monitoring of the Water Reuse Dam is discussed further in Section 8.4. To retain design capacity, options for discharge from the Water Reuse Dam include on-site irrigation over the wider Project Site, and/or discharge downstream once monitoring confirms dam water is shown to meet DECCW discharge criteria.

Noise

An acoustic assessment was undertaken and included modelling of all major quarrying equipment for representative operational scenarios. This assessment considered the following:

- potential noise impacts at sensitive receptors from proposed operational noise from the quarry (including processing and extraction); and
- potential noise impact at sensitive receptors due to increased traffic flows to and from the quarry expansion.

Six operation noise model scenarios were created for the assessment. These included:

- Central Section extraction;
- Central Section processing operation;
- Southern Section processing;
- Southern Section overburden stripping;
- Southern Section operational; and
- processing and extraction, being a combination of extraction in Southern Section and processing in the Central Section.

In addition to the above scenarios the use of a rock hammer or rock saw was also included separately in the model for the final Southern Section scenario.

Initial modelling of the scenarios indicated predicted noise levels greater than the Project Specific Noise Criteria without the implementation of any mitigation measures. A model was developed which included a number of physical noise mitigation measures such as strategically placed earthen bunds. This showed compliance with the Project Specific Noise Criteria for all scenarios, at all dwellings except for one sensitive receptor which showed a 1dBA exceedance for the processing and extraction scenario.

In order to minimize all acoustic impacts associated with the expansion of Champions Quarry, the following measures are to be put in place:

• the operating hours of the quarry are restricted from 7am to 5.30pm Monday to Friday and 7.30 to 3.00pm on Saturdays.. This time restriction prevents noise emissions *during the evening and night periods, at which time background noise levels are lower. It also avoids potential sleep disturbance to the residents;*

- road traffic noise created by the haul trucks accessing the site is ameliorated by imposing a speed limit of 30km/h and prohibiting haul trucks from using compression braking on-site;
- effective placement and stockpiling of product so that where possible, plant equipment can be working behind stockpiles;
- a 4m earth bund adjacent to plant that is not shielded by permanent bunding;
- modern, well maintained industrial equipment will be used;
- plant operations personnel will undergo induction training into best practice quarry operations (i.e. lean manufacturing training), the benefits of which help to minimise unnecessary noise emissions from plant equipment;
- for compliance purposes, attended noise monitoring (at established permanent noise assessment locations) and plant equipment audits will be undertaken on an annual basis; and
- sealing of the main access road from the site entrance intersection to the Central Section pit
- *no other on-site plant is to be operational when the rock saw or rock hammer is in use;*
- use of the rock hammer to be limited to between 9:00am to 12.00pm and 2.00pm to 4.00pm; and
- *in-situ noise monitoring of the operational rock hammer to take place to verify results of the model and to determine success of mitigation measures to be implemented*

Noise experienced at sensitive receivers is expected to be progressively reduced as the quarry expansion proceeds, through implementation of the following measures:

- plant is to be progressively moved in-pit where the pit walls will act to shield receiver locations from noise generated;
- plant will be relocated to greater pit depths throughout the life of the quarry to further reduce noise at receiver locations;
- the earth bund adjacent to the existing pit will be progressively increased in height and consequently increase shielding to the residences nearest to the quarry; and
- *no additional noise producing activities, plant or equipment will be introduced at the site without further assessment.*

Air Quality

A Level 2 air quality impact assessment, as described by the NSW DECCW (DECC, 2005) was carried out to determine potential impacts from the quarry expansion. This was

undertaken utilising a computer based dispersion model to predict ground level dust concentrations and deposition levels in the vicinity of the quarry.

The air quality impact assessment demonstrates that the proposed expansion and operations can be undertaken in compliance with NSW DECCW air quality impact criteria for PM10 and TSP short and long term averages and dust deposition. Additionally, the concentration contours produced demonstrate that the predicted concentration are localized around the site and decrease rapidly with distance.

The expansion of Champions Quarry is not anticipated to have negative air quality impacts on the surrounding environment. A number of mitigation measures have been developed for implementation to aid in the minimization of the potential for operations to generate dust.

Visual Amenity

Given the alteration in the landscape that can occur as the result of extractive industries, a visual impact assessment was undertaken to provide a description of the likely range of landscape and visual impacts of the proposed quarry and subsequent rehabilitation work.

Nine viewpoints were identified, including four rural dwellings (this excludes any dwellings owned by the Proponent). Photographs were taken from publically accessible locations within the view shed. As such, they provide a reasonable range of views on which to evaluate the likely visual impacts. With regard to the dwellings, photographs were taken and views assessed from publically accessible locations adjoining the identified dwelling, considered best representative of the dwellings views over the site.

The visual impact assessment concluded that impacts resulting from the proposed expansion of Champions Quarry will be minimal. This conclusion was reached based on the following considerations:

- *the topography of the site and surrounds is undulating;*
- the undulating topography restricts views to the site from Wyrallah Road and the surrounding area to the immediate vicinity of the site near the site boundaries;
- *the site would be visible from the following locations:*
 - Wyrallah Road near Receiver 1 described in Viewpoint 3 & 6;
 - *Receiver 3 to the east of the site described in Viewpoint 8;*
 - Wyrallah Road at the entrance gate into the site on the western boundary as described in Viewpoint 4; and
 - Viewpoint 9 adjacent to the road reserve on a rural property located at the corner of Wyrallah Road and Tuckurimba Road.
- the visual impact of the quarry from these locations can be mitigated and reduced through the construction of bunds and the planting of trees on the site to create a visual buffer between the proposed works and these locations.

Following the completion of rehabilitation works, the site is to be restored to pasture land. This landscape type will integrate with the surrounding rural landscape character. The provision of additional tree planting will provide an overall improvement in the landscape quality of the site and surrounds.

Socio Economic Considerations

The increased production within Champions Quarry will result in considerable social and economic benefits at both the local and regional level. The principle economic benefit of the proposal is related to the security of local construction materials for the northern New South Wales market and the increased production resulting in greater economies of scale and a significant saving in overall green house gas emissions. Local economic benefits include increased employment opportunities resulting from both the increase in annual production capacity and the increase in quarry life. This will have significant flow on effects to the local community.

During community consultation, a number of specific issues were raised which were subsequently subject to significant environmental assessment. The outcomes of this assessment process are presented throughout the report. These assessments have clearly demonstrated that with the provision of appropriate mitigation measures, impacts can be minimized such that the local amenity of the area will not be substantially affected. It is therefore concluded that the quarry will be able to operate without causing major disruption to local residents and should continue to be seen as a non intrusive element of the rural landscape.

Following on from the characterization of the impact of the proposal on the identified communities, an assessment of the physical demand for the product to be quarried was undertaken comprising of:

- Characterization of the resource;
- assessment of potential market types for each product type;
- estimation of demands for each major market type within the Local Government Areas of Lismore, Ballina, Byron and Richmond Valley;
- research into approved supply sources within the Local Government Areas of Lismore, Ballina, Byron and Richmond Valley;
- *identification of deficiencies between demand and supply and contribution of the quarry to rectifying any deficiency; and*
- consequences of not proceeding with the Project

It was concluded that utilization of the resource that would be produced by the expanded Champions Quarry is a vital element of the sustainable development of the Far North Coast region. It presents an opportunity to contribute considerably to the identified resource deficiency within the region, providing a highly centralised source of quality sand products and a significant saving in green house gas emissions.

Greenhouse Gases and Climate Change

A specialist greenhouse gas assessment was undertaken. The boundary for this greenhouse gas impact assessment has been defined as those emissions directly attributable to the proposed quarrying activities at the site, defined as 'the Project'.

For the Project, the largest source of Scope 1 or, direct emissions, will result from the combustion of diesel from equipment use on site during on site operations; that being, clearing, winning, processing, stockpiling and loading of materials.

Scope 2, indirect emissions, will primarily result from electricity consumption at the Sand Washing Plant.

In addition to Scope 1 and Scope 2 emissions, this assessment also considers Scope 3 emissions indirectly associated with the Project. Scope 3 emissions considered within the boundary of this assessment will result from indirect emissions associated with the haulage of product from the site to end point user destinations in the region.

This impact assessment has presented estimates of direct emissions and indirect emissions beyond the operational control of the Project.

In this assessment, total emissions over the lifetime of the Project (25 years) have been calculated as being 29,466 t CO_2 -e, representing an emissions profile of 1,179 t CO_2 -e aggregated annually.

Direct (Scope 1 and 2) emissions from diesel consumption on site (Scope 1) and electricity consumption on site (Scope 2) are calculated at 4,112.5 t CO_{2e} over the lifetime of the project, or approximately 13.9 percent of total emissions. Aggregated annually, direct emissions from the site have been estimated at 464.5t $CO_{2-}e$.

Scope 3, or indirect emissions comprise greenhouse gas emissions from road transportation of saleable product to end-point locations in the Lismore Ballina region. Indirect emissions contribute approximately 86.1 percent of all emissions from the Project.

In calculating the direct emissions profile, it is anticipated that the Project will contribute approximately 0.00008 percent of emissions to the Australian annual greenhouse gas emissions total and approximately 0.0003 percent of emissions to the NSW annual total. The greenhouse intensity of the Project equates to approximately 0.0019 tCO_{2-e}/t of sandstone material extracted.

It is anticipated that the Project will significantly increase supply of washed sand and engineered fill available from within the Lismore Ballina region. It is expected that local infrastructure projects, currently relying on materials from outside of the local region, will be able to use materials from this Project and reduce product haulage distances by more than 50%.

Rehabilitation and Final Land Use

The operators of Champions Quarry are committed to the rehabilitation and development of the best end use for the quarry. The present objective is the rehabilitation of the site to its pre-quarrying, agricultural state such that its agricultural carrying capacity is not permanently lost. Previous rehabilitation works adjacent to the site, by the Proponent utilising the methodology proposed, have resulted in excellent landform and pasture cover suitable for cattle grazing activities.

Given the approach taken to quarrying (utilisation of 3ha active quarry cells) the rehabilitation of disturbed areas is able to be continually undertaken during the life of the quarry. Quarry rehabilitation works will be undertaken in accordance with Mine Rehabilitation (Commonwealth Department of Industry, Tourism and Resources, 2006) and Best Practice in Landform Design for Rehabilitation (Commonwealth Department of Environment and Water Resources).

A rehabilitation plan has been developed which will ensure that works are implemented progressively to enhance the scenic and environmental quality of the site, increase habitat for wildlife and utilise suitable areas for agricultural pursuits. With regard to the progressive rehabilitation of the 3ha work cells, the following procedures will take place with a view to returning the site to its current grazing use:

- remove any felled trees and logs from work cells;
- long term stockpiles of overburden and topsoil to be revegetated with non-invasive grasses;
- remove problem weeds or prevent from spreading;
- *doze the face of the completed quarry areas to a slope of between 1:1 to 2:1;*
- *use overburden, loose quarry material and topsoil to cover the completed quarry area;*
- *rip the material on the contour to prevent erosion in the event of heavy rain;*
- *chisel plough and harrow the site on the contour to prepare a seedbed;*
- *apply organic fertilizers;*
- sow site with a mixture of native grasses and legumes; and
- *keep cattle off the area for approximately 12 months.*

This method was used by the Proponent rehabilitate a quarry that formerly existed adjacent to the Project Area and is considered to have been highly successful. This method aims to ensure that the site can withstand significant rainfall occurrences without erosion.

This methodology has been expanded upon within the Preliminary Quarry Plan of Management that has been developed. Additionally, the ongoing management of the biodiversity offset areas will continue to take place post closure in accordance with an approved Vegetation Management Plan. The proponent will commit to the protection and management of the offset areas secured through legal enforcement of the offset strategy via a voluntary conservation agreement under the National Parks and Wildlife Act 1974 or Section 88B-E covenant of the Conveyancing Act 1919 to be negotiated by the proponent and the DoP and DECCW.

CONCLUSION

This EA has assessed the potential environmental impacts associated with the proposed expansion of Champions Quarry. Initial geological investigation revealed a total resource of up to 12 million tonnes contained on land owned by the proponent. The proposal would allow for access to 6.25 million tonnes of this resource, at the rate of 250,000 tonnes per year, thus allowing quarry to take place for up to 25 years, disturbing an area of approximately 16 hectares. Excavation is proposed to commence in the existing established Central Section pit, prior to moving to the Southern Section pit.

The EA was prepared having regard to biophysical, economic and social considerations and the principles of ESD. No significant environmental impacts have been identified during the preparation of the EA that cannot be mitigated with the implementation of appropriate mitigation measures and management strategies.

The environmental assessment process has been utilized to drive the development of quarry design and ensure that operations will be sustainable and create minimal impacts to the surrounding area. Quarry operations have been designed to be self sufficient in terms of water usage, minimise traffic impacts on the local road network, minimize the visual intrusiveness of all on site elements of the quarry, as well as the elimination of any adverse noise and air quality impacts on adjoining properties. All mitigation measures and management practices identified in the EA from part of the statement of commitments for the proposal and will be incorporated into the environmental management plans for construction and quarry operations.

The proposed quarry expansion has the opportunity to provide long term security over a sandstone resource which has been demonstrated to be vital to the supply of construction materials in the Far North Coast of New South Wales. The expansion is capable of being undertaken with minimal environmental impact and is thus justifiable when considered in conjunction with the substantial economic benefits it will provide.

The wide range of sand products able to be produced from Champions Quarry will be able to be used to meet fundamental community needs for the construction of buildings and roads in the rapidly growing Far North Coast region. The lack of a similarly sized resource of sufficient quality to provide the range of products that Champions Quarry is capable of presently necessitates the importation of product from outside of the region.

The extraction and use of this material will have positive flow on effects throughout the local economy through the creation of jobs, both directly by the quarry and through associated industries.

All the potential environmental impacts of the proposed development have been considered and mitigation measures developed to minimize any impacts as detailed throughout this EA report. Control and regulation of these impacts will be the responsibility of the operators of Champions Quarry and the NSW Department of Environment, Climate Change and Water through the Environment Protection Licensing process. It is therefore concluded that the establishment of an expanded Champions Quarry is justified in terms of all environmental, social and economic considerations and, furthermore, is able to be operated and monitored throughout its life such that the predicted outcomes are fulfilled.