



Department of Planning

MAJOR PROJECT ASSESSMENT: Rockley Falls Quarry

Director-General's
Environmental Assessment Report
Section 75I of the
Environmental Planning and Assessment Act 1979

May 2008



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Published May 2008
NSW Department of Planning
www.planning.nsw.gov.au

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Cover photograph of Rockley Falls quarry site courtesy of Blueprint Planning

EXECUTIVE SUMMARY

Abigroup Contractors Pty Ltd proposes to develop a quarry on the *Rockley Falls* property, approximately four kilometres north east of Holbrook. The initial purpose of the quarry is to provide hard rock for roadworks to be utilised for the Hume Highway duplication between Tarcutta and Table Top. For the initial four years which coincide with highway duplication, the proposal will deliver up to 700,000 tonnes of quarry materials per annum. Approval is sought to produce up to 100,000 tonnes per annum for the remaining 16 years of the quarry life.

The proposal will occupy approximately 17 hectares of which 10 hectares will be quarried. The remainder of the site will be used for processing, stockpiles and ancillary purposes and a 2.3 kilometre access road. Geological survey has confirmed that approximately five million tonnes of high-strength rock is available for extraction. The granite based rock has been tested and confirmed to meet relevant specifications for use in roadworks.

After removing topsoil and overburden, averaging five metres depth across the quarry, the underlying rock will be loosened by blasting and then loaded to off road haul trucks for delivery to the processing area. Three stage crushing plant with screens and classifier will produce various products to be stockpiled on site prior to despatch. A sand component from the crushing plant will be washed on site.

Water for processing and dust suppression will be obtained from collected runoff on the site supplemented by fresh water trucked to the quarry from a standpipe in Holbrook.

Measures to mitigate environmental impacts include constructing a six-metre-high acoustic barrier, sealing the access road, reconstructing the intersection with the Hume Highway, rehabilitating the site following completion and providing an offset package to compensate for vegetation removal. The offset package provides for reserving and managing more than 243 hectares of land within the Rockley Falls property.

The proposal constitutes a 'major project' under Part 3A of the *Environmental Planning and Assessment Act 1979* and consequently the Minister is the approval authority for the project. Following public exhibition, the Department received five submissions on the project, all from public authorities. There were no submissions from private individuals or organisations. None of the submissions objected to the project.

The Department has assessed the project application with accompanying environmental assessment, submissions received and Abigroup's response to submissions and is satisfied that there is sufficient information available to determine the application.

The key issues considered during the assessment include noise, rehabilitation and the flora and fauna offset package. Abigroup has undertaken to introduce additional noise control measures to achieve goals at surrounding residences. To ensure that rehabilitation objectives can be achieved, Abigroup will utilise most of the quarry overburden in blended material to be despatched from the site. The cleared section of the flora and fauna offset areas will be revegetated to a standard recommended by DECC with annual monitoring to confirm performance.

The Department recommends approval of the project, subject to recommended conditions which address quarrying operations, on-going environmental monitoring and management, rehabilitation, compliance mechanisms, independent reviews and performance audits.

1 BACKGROUND

Abigroup Contractors Pty Ltd proposes to establish a hard rock quarry on a rural property known as *Rockley Falls*, located approximately four kilometres north east of Holbrook in southern New South Wales (see Figure 1). The quarry will be accessed from the Hume Highway along an access road approximately 2.3 kilometres in length. In its early years the quarry will provide hard rock for roadworks to complete the duplication of the Hume Highway between the Sturt Highway intersection near Tarcutta and Table Top, north of Albury.

Rockley Falls is a sheep and cattle grazing property. The access road will traverse land on the Rockley Falls property and a travelling stock reserve being Crown Land managed by the Hume Rural Lands Protection Board. The proposed development will occupy approximately 17 hectares, comprising approximately five per cent of the area of Rockley Falls.

A smaller “materials testing quarry” was approved on the same site by Greater Hume Shire Council in November 2007. This approval is limited to a site area of less than two hectares and provides that no extracted material be hauled from the quarry except via product sample bags for testing in a laboratory. This testing quarry will be subsumed in the larger production quarry now proposed.

Another quarry, known as the Lubke quarry, is located on an adjoining property to the north of the proposal. At the closest point the work area of the Lubke quarry is approximately 300 metres from the work area of the Rockley Falls quarry. An expansion of the Lubke quarry was approved by Greater Hume Shire Council in November 2007.

Apart from the Lubke quarry, the surrounding land is predominantly used for rural purposes. The proposed quarry is located on sloping grassland near the base of a ridge system. The Hume Highway is located about two kilometres to the west traversing predominantly cleared alluvial plains with several scattered rural residences in that area. To the east of the quarry site the land continues to rise in more heavily timbered terrain. Morgans Ridge rises to 630 metres above sea level and extends for about 2 kilometres in a north-south direction.



Figure 1: Location Map

2 PROPOSED PROJECT

The principal purpose of the Rockley Falls quarry is to supply hard rock products to the Hume Highway duplication project. The quarry is expected to produce up to 700,000 tonnes of quarry material per annum for the first four years and up to 100,000 tonnes per annum for the remaining 16 years of its 20 year life.

Exploratory drilling and subsequent laboratory testing have revealed a fine grained granite trending to a more medium to course grained granite. Material testing indicates the resource will meet all relevant hard rock specifications including RTA construction specifications. Based on geological survey it is estimated the site contains approximately five million tonnes of high-strength rock available for extraction.

The key components of the proposal are set out in Table 1 and shown in Figures 2 and 3 below.

Table 1: Key Components of the Project

Proposed Components	Description
Summary	Development and operation of a hard rock quarry to extract up to 700,000 tonnes per annum. Rock to be loosened by blasting and processed (crushed) on site. The product will be sized using screens and stockpiled for loading delivery. The sand component (crusher dust) will be washed on site. A sealed access road and earthen acoustic barrier will be constructed as part of site development. The site will be rehabilitated following cessation of extraction.
<i>Reserves</i>	Approximately five million tonnes of extractable reserves are present. Extraction will be at a rate of up to 700,000 tonnes per annum for four years and up to 100,000 tpa for the remaining 16 years of a 20 year life.
<i>Access</i>	A sealed road approximately 2.3 km in length will be constructed from the Hume Highway to the quarry site. The road will traverse private property and Crown land following the route of the existing farm access track. The road will be seven metres wide, constructed to accommodate two-way heavy vehicle movements. The point of connection to the Hume Highway will remain unchanged, with appropriate modification when the highway is duplicated.
<i>Layout</i>	The quarry is located on the west facing slope of a ridge system with the access road approaching from the west over flatter country. Of the 17 ha site, approximately half is occupied by the quarry work area and half by ancillary services including topsoil and product stockpile areas, crushing plant, sand washing area, weighbridge, internal roadways, transportable office and amenities, staff car park, sediment control structures and storage and maintenance areas.
<i>Preparation</i>	After installation of erosion and sediment controls vegetation, topsoil and overburden will be stripped using excavator, front end loader and dump truck. Separate stockpile areas are delineated for topsoil and overburden. Overburden averages five metres thick, with most being banded with other material for sale. A noise bund will be constructed to reduce transmission of noise from the crushing plant.
<i>Quarrying</i>	Rock is to be loosened by drilling and blasting and then loaded to a dump truck for delivery to the processing plant. A rotary percussion drill will be contracted to attend the site and prepare each blast when required. It is expected there will be approximately two blasts per week for the initial four years declining to one blast every three to six months thereafter. Explosives will be brought to site by contractors for each blast. The working face will be sufficiently wide to allow rock to be removed from one section while preparatory drilling is proceeding in another. A maximum instantaneous charge of 150 kg is proposed.
<i>Processing</i>	Extracted rock will be delivered to the three stage processing plant. The feedstock will be screened prior to being admitted to each crushing stage to remove finer material that does not require crushing. Products will be classified according to size and stockpiled on site. The finest product will be a manufactured sand. During the first four years of intensive quarrying for the Hume Highway duplication it is proposed to wash the sand prior to stockpiling.
<i>Loading and Transport</i>	Quarry products will be loaded to haulage trucks using a front end loader. Trucks will be weighed when leaving the site. It is expected that haul trucks will be semi trailers and truck and dog combinations with an average load of 33 tonnes or 22 cubic metres. Approximately 85 outbound trucks per day are anticipated during the initial four years, reducing to 18 outbound trucks for the remaining 16 years of life.

Proposed Components	Description
<i>Staging</i>	Initial quarry development will be staged, with three working faces progressively established across the width of the quarry. The first two working faces will be fully developed at approximately six monthly intervals. The third stage will then commence and progress to extract the remainder of the site. The excavation will create a void with a series of stepped benches with a maximum height of 10 metres and a minimum width of five metres.
<i>Hours of Working</i>	<ul style="list-style-type: none"> • Construction 7 am to 6 pm Monday to Friday; 8 am to 1 pm Saturdays • Plant maintenance 7 am to 6 pm Monday to Saturday: • Blasting 10 am to 3 pm Monday to Friday • Quarrying and processing 7 am to 6 pm Monday to Saturday • Loading and hauling 7 am to 6 pm Monday to Friday <p>There will be no work on Sundays and public holidays</p>
<i>Employment</i>	<ul style="list-style-type: none"> • Years 1 to 4 3 full time personnel; up to 10 personnel when crushing contractors as required (blasting, maintenance) • Years 5 to 20 no full time personnel; up to 3 personnel when quarrying/crushing contractors as required (blasting, maintenance)
<i>Erosion and Sediment Control</i>	The application includes a concept erosion and sediment control plan indicating structures for clean water diversion, dirty water collection and sediment collection. Sediment basins are nominated to also have a role in water storage. The erosion and sediment control plan does not include temporary controls to be installed during construction of the quarry facilities and access road, nor does it specify basin size and management protocol for storage and sediment control. These additional matters will be requested in the detailed erosion and sediment control plan.
<i>Final Void</i>	At the completion of quarrying a void will remain in the side of the hillslope. The excavated area will be generally rectangular in plan with asymmetrical bevels at the four corners. The maximum length and width are approximately 430 metres and 250 metres. The finished floor will be approximately level and some 65 metres below natural ground level at the deepest point on the uphill side and 37.5 metres below natural ground level at the shallowest point. The final void will not be free draining.
<i>Rehabilitation</i>	The rehabilitation objective is to stabilise the final quarry void and return the ancillary work areas to a grassed or rocky outcrop finish similar to the character of the existing landscape in the area. Within the quarry, bench surfaces will be initially covered with scattered rock and later graded with overburden. Waste material and remaining overburden will in part be returned to the quarry floor with some to be spread over the surface work areas to a depth of about 1.2 m. The ancillary work area will be topsoiled and sown with pasture seed and native species. Sediment dams, drainage structures and the quarry fence will remain in place.
<i>Offset Strategy</i>	Abigroup has proposed an offset strategy for the purpose of compensating for the removal of native vegetation. The offset areas are intended to protect and improve the biodiversity values of the site and will be managed by the landowner for this purpose. Approximately 243 hectares of the Rockley Falls property have been nominated as offset areas, surrounding and adjoining the quarry site. Parts of the offset areas are to be revegetated within the first two years of quarrying. The boundary of the offset areas is to be fenced to prevent stock entry. Felled timber from the quarry preparation will be placed in the offset areas to provide additional habitat. The landowner is required to control weeds and feral animals in the offset areas.
<i>Operator</i>	The exhibited environmental assessment indicates that Abigroup, Abigroup, will vacate the site after 2012, transferring responsibility for ongoing operation and rehabilitation to the landowner. However Abigroup has subsequently advised that Abigroup will continue to operate the quarry until the end of its life.
<i>Services</i>	Electricity will be provided by diesel generator sets. Communications will be available via a mobile phone network. Water for workforce consumption will be collected in a tank from the office roof. Dust suppression water will be drawn from sediment basins that will be large enough to store water as well as having capacity to receive storm flows. Whenever insufficient water is available on site tankers will deliver water from a metered standpipe in Holbrook.

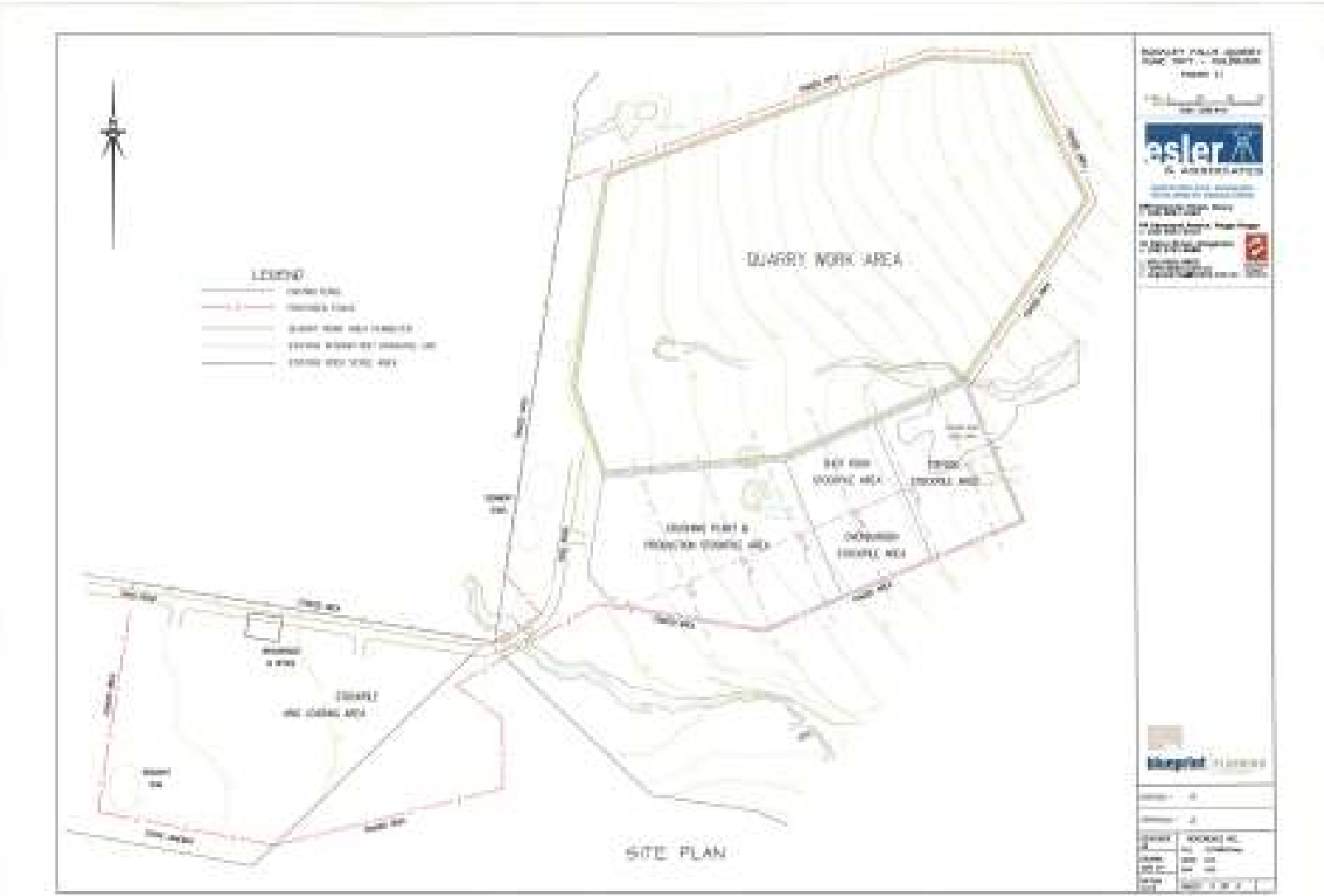


Figure 2: Proposed Layout



Figure 3: Aerial Photograph

3 STATUTORY CONTEXT

3.1 Major Project

The proposal is classified as a major project under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act), because it meets the criteria in clause 7(1)(a) of Schedule 1 of *State Environmental Planning Policy (Major Projects) 2005*, being development for the purpose of an extractive industry that extracts more than 200,000 tonnes of extractive material per year.

Consequently, the Minister for Planning is the approval authority for the project.

3.2 Permissibility

The project is located in an area zoned partly Non-urban 1(a) and partly Non-urban 1(b) under *Holbrook Interim Development Order No 1, 1970*. The 1(b) zoning extends 400 metres from the Hume Highway and encompasses part of the access road. The proposal is wholly permissible with development consent in these zones and consequently may be approved by the Minister as a major project under Part 3A.

3.3 Exhibition

Under section 75H(3) of the EP&A Act, the Director-General is required to make the environmental assessment (EA) of a project publicly available for at least 30 days.

After accepting the EA for the project, the Department:

- made it publicly available from Monday 3 March 2008 until Friday 4 April 2008:
 - via a link on the Department's website;
 - at the Department's Information Centre in Sydney;
 - at Greater Hume Shire Council, Holbrook;
 - at the Holbrook Library; and
 - at the Nature Conservation Council in Sydney;
- notified relevant public authorities and Greater Hume Shire Council by letter; and
- advertised the exhibition of the EA in the Henty Eastern Riverina Chronicle and the Albury Wodonga Border Mail.

This satisfies the requirements in section 75H(3) of the EP&A Act.

3.4 Objects of the EP&A Act

The Minister's consideration and determination of the application must be consistent with the relevant provisions of the EP&A Act, including the objects set out in section 5 of the Act. The objects of most relevance to the Minister's decision on whether or not to approve the project are found in section 5(a)(i), (ii), (vi) & (vii). They are:

"The objects of this Act are:

(a) to encourage:

- (i) the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,*
- (ii) the promotion and co-ordination of the orderly and economic use and development of land,*
- (vi) the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and*
- (vii) ecologically sustainable development"*

The Department has fully considered the objects of the EP&A Act, including the encouragement of Ecologically Sustainable Development (ESD), in its assessment of the project. The assessment integrates all significant economic and environmental considerations and seeks to avoid any potential

serious or irreversible damage to the social environment, based on an assessment of risk-weighted consequences. Abigroup has also considered a number of alternatives to the proposed development, including the alternative of not proceeding, and considered the proposal in the light of the ESD principles.

3.5 Environmental Planning Instruments

Under section 75I of the EP&A Act, the Director-General's report is required to include a copy of, or reference to, the provisions of any State Environmental Planning Policy (SEPP) that substantially governs the carrying out of the project.

The Department has considered the proposal against the relevant provisions of SEPPs 33, 44 and 55 and is satisfied that none of these SEPPs substantially govern the carrying out of this project (see Appendix C).

3.6 Statement of Compliance

Under section 75I of the EP&A Act, the Director-General's report is required to include a statement relating to compliance with the environmental assessment requirements established for the project's EA. The Department is satisfied that the environmental assessment requirements have been complied with.

4 ISSUES RAISED IN SUBMISSIONS

During the exhibition period, the Department received five submissions on the project – all from public authorities. None of these submissions objected to the project.

The key issues raised by the authorities are summarised below.

Department of Primary Industries (DPI) requested that the approval require the operator to provide annual production data to the Department. Sediment laden runoff should not be permitted to leave the site as downstream habitat supports Southern Pygmy Perch, which is a threatened species.

Department of Environment and Climate Change (DECC) advised that it will be able to issue a licence for the facility and attached the proposed conditions. The DECC identified a discrepancy in the size of Offset Area 4 and proposed a condition to address the issue. Further conditions are proposed to ensure restrictive and positive covenants are placed on the title of the land to ensure the offset areas are maintained in perpetuity and that Government agency staff have access for monitoring purposes. The DECC believes that the proposed planting densities are too low and that fencing of the offset areas and hazard reduction grazing are not sufficiently well defined. Draft conditions are proposed to address these issues.

Department of Water and Energy (DWE) requested that the groundwater monitoring plan nominate trigger levels to protect groundwater dependent ecosystems (GDEs) and monitoring protocols for GDEs and that a copy of the plan be provided to DWE for endorsement. Additional modelling of groundwater will be required if quarry inflow exceeds one litre per second. An application for a water licence will be required to be approved by DWE during stage 1 of the quarry.

The Roads and Traffic Authority (RTA) specified requirements for the intersection of the site access road with the Hume Highway and other requirements for the site access road and operations relating to roadworks and vehicle movements.

Department of Lands (DoL) advised that the access road would traverse a Crown Public Road and a Travelling Stock Reserve. DoL proposes to grant a licence to construct and use the access road and recommended 21 conditions relating to the use of the access road.

Abigroup has agreed to meet the public authorities requirements (see Submissions Report in Appendix D).

5 ASSESSMENT

5.1 Noise and Blasting

The EA examined the existing acoustic environment and the potential for noise emissions (during construction and operation) and the effects of blasting on the closest residences. There are seven residences within 2,500 metres of the quarry and processing area site, four of which are within two kilometres (see Figure 4). The EA also assessed transport noise impacts which are primarily an issue in Holbrook.

Construction Noise Assessment

Construction noise will occur during construction of the access road, weighbridge and erosion and sediment controls, during topsoil and overburden removal and any rock drilling associated with these activities. In its submissions report Abigroup has confirmed that construction work will occur for less than 4 weeks, hence the construction noise goal in the EA for short term noise of 50 dB(A) is appropriate. Rock drilling is nominated as being potentially the noisiest activity, but is considered unlikely to be required during construction except possibly for site establishment in the quarry pit area. The noise level from rock drilling at the nearest residential property is predicted to be 45 dB(A). Noise from road construction at the nearest residential property is predicted to be 43 dB(A). If rock drilling is occurring at the same time as road construction a combined noise level of 47 dB(A) is predicted, complying with the construction noise goal.

The Department is satisfied with the construction noise assessment.

Operational Noise Assessment

Background noise surveys were conducted over 10-day periods using unattended noise loggers at three surrounding residences, *Cromer*, *Quambatook* and *Tumbarook*.

The calculated daytime rating background noise level (L_{A90}) ranged from 29 to 36 dB(A) for the three residences. These figures were used to assess intrusive noise goals for the three residences in accordance with DECC's Industrial Noise Policy (INP), which ranged from 35 to 41 dB(A). Noise goals were set in consideration of future noise to be generated by the expanded operation of the Lubke quarry on an adjacent property.

Abigroup developed an acoustic model to simulate noise emissions from the various sources within the quarry site. The model also considered meteorological effects, surrounding terrain and distance from source to receiver. Sound pressure measurements of quarry equipment were recorded at a quarry in Glenrowan, Victoria which the EA states utilises similar equipment to that proposed at Rockley Falls.

The noise assessment predicts that during continuous operation for the first four years of the quarry, when output will be up to 700,000 tonnes per annum, noise goals will be met or marginally exceeded by 1 to 2 dB at all neighbouring residences under moderate wind and ground based temperature inversions. No prediction is made for high wind conditions as they do not occur for more than 30 per cent of the time in any single direction. Noise predictions for the subsequent 16 years of quarry life when output is to be limited to 100,000 tonnes per year are 1 to 2 dB lower than for the first four years and will remain within noise goals. The above predictions do not include rock drilling.

An acoustic barrier in the form of a six metre high earthen mound is to be constructed within 10 metres of the crushing plant to prevent line-of-sight noise transmission in the direction of the three closest residences to the west and south-west. The noise barrier is expected to result in a reduction of noise at the relevant residences of approximately 5 dB. The Department considers that the noise levels from the operations modelled in the EA will be acceptable, noting that intensive operations will be limited to four years, and that noise mitigating measures will be implemented.



Figure 4 – Location of Nearest Residences

However, the Department then asked Abigroup to undertake additional noise assessment to consider noise from rock drilling as part of normal operations because during the first four years of quarry operations, when two blasts per week are planned, it is anticipated that rock drilling will be a frequent, if not continuous, activity taking place close to the surface. Abigroup responded that the cumulative effect of all plant on site including the rock drill would exceed the noise goals by 5 dB to 9 dB, depending on the relative location of source and receptor.

To control noise from the rock drill to within project noise goals Abigroup has proposed further safeguards in its Submissions Report:

- source an air track drill with a sound power level of 112 dB(A) or less (previously proposed 122 dB(A)); and/or
- use a portable sound barrier with the air track drill and diesel power supply standing at least 1 m higher and 1 m wider than the diesel power supply when viewed from the direction of any residence within 1700 metres.

The DECC in its submission has recommended noise limits for nearby residences based on noise levels predicted by Abigroup's modelling, with the exception of the *Cromer* residence where a higher limit of 45 dB(A) is recommended. The *Cromer* residence is located on the property of the adjoining Lubke quarry.

The Department is satisfied that the limits recommended by DECC will require Abigroup to control the noise from the project at residences on properties not associated with quarrying. A condition has been included to require Abigroup to prepare a Noise Monitoring Program to assess compliance with noise criteria and validate noise modelling predictions. The program would also detail specific actions for responding to exceedances of criteria and complaints should they occur.

Road Noise Assessment

The DECC publication *Environmental Criteria for Road Traffic Noise* provides standards for road traffic noise associated with the proposed quarry:

- Local Roads $L_{Aeq(1 \text{ hour})}$ 55 dB(A) for 7:00 am to 10:00 pm; and
- Freeways/arterial roads $L_{Aeq(1 \text{ hour})}$ 60 dB(A) for 7:00 am to 10:00 pm.

In cases where the criteria are already exceeded, the traffic arising from the quarry should not lead to an increase in existing noise levels of more than 2 dB.

The EA assesses noise impacts from quarry traffic using both the UK CoRTN method and separate calculations based on the sound exposure level for one truck. During the first four years a maximum of 170 truck movements per day is anticipated (85 inbound and 85 outbound) and a maximum of 20 movements per hour with 90 per cent travelling to/from the south. For the purposes of assessment, the average hourly flow was doubled to cover a possible worst case.

Within the quarry site truck traffic noise at the nearest residence to the quarry, *Cromer*, is predicted to be 34 dB(A), in compliance with DECC guidelines. The nearest residence to the access road, *Beenly*, is already affected by Hume Highway noise above guideline levels. In this location site traffic noise is predicted not to exceed 2 dB above existing day time conditions, which also complies with DECC guidelines.

Beyond the quarry it is assumed that 90 per cent of the truck traffic will pass through the town of Holbrook. Background noise monitoring was carried out at two locations in Holbrook beside the Hume Highway. Both locations were found to already exceed the DECC preferred traffic noise goal of 60 dB(A). The site specific day time noise goal for traffic in the town was determined to be 66 dB(A), being 2 dB above the measured background at the quietest site.

The noise level from quarry trucks passing through Holbrook is predicted to be 65 dB(A) at 15 metres. This exceeds the DECC preferred day time goal for road traffic noise by 5 dB, but meets the site-specific day time goal.

Abigroup has proposed that a driver's code of conduct be prepared specifically relating to haulage of material along Albury Street, Holbrook.

The Department considers that road noise has been satisfactorily addressed by Abigroup, that the proposed mitigation strategies are appropriate and that no additional conditions are necessary.

Blasting

The criteria adopted for blasting impact at dwellings for blasts undertaken within the proposed hours of blasting at the quarry are as follows:

- Overpressure goal 115 dB (linear peak) measured at 3 metres from any dwelling, may be exceeded up to 5% of the total number of blasts over a period of 12 months, but should not exceed 120 dB (linear peak) at any time;
- Vibration goal a site-specific goal of 2 mm/s peak particle velocity measured at the foundation of any dwelling

Based on a maximum instantaneous charge (MIC) of 150 kg, it is predicted the vibration criterion will be met for 95% of blasts at approximately 700 metres from the blast site. The nearest residence, *Cromer*, is some 1210 metres to the north, well outside this perimeter.

Again based on an MIC of 150 kg the overpressure criterion of 115 dB is predicted to be met for 95% of blasts at line of sight distances of 1100 metres from the blast site. The EA states that natural topography will shield residences to the north and that the closest residence with line of sight to the blasting area is *Beenly*, some 1740 metres to the west. Consequently the EA predicts that no residences are likely to be exposed to overpressure levels exceeding the goal of 115 dB (linear peak) for 95% of blasts or the 120 dB limit at any time.

Abigroup has included mitigation measures for airblast overpressure as follows:

- wind from 3 to 5 km/hr from the north, east or north-east reduce MIC to 60 kg; and
- wind exceeding 5 km/hr from the north or north-east no blasting permitted

A weather station is to be installed on/or near the site with a communications link to the site office so that wind speeds can be confirmed before a blast is approved for firing.

To minimise potential cumulative impacts with blasting at the nearby Lubke quarry, the EA states that:

- Rockley Falls will co-ordinate its blasting program with that of Lubke to ensure they do not blast on the same day; and
- Rockley Falls will seek to develop a joint notification process with Lubke to alert residents at least 24 hours before any blast.

The Department notes that the blasting assessment is based upon calculations correlated with a test blast carried out in similar material at a quarry in Glenrowan, Victoria. The DECC has recommended comprehensive management and monitoring of blasts which have been incorporated in conditions.

The Department is satisfied that with the implementation of proposed mitigating measures, monitoring as required in the conditions and appropriate response procedures, noise and blasting impacts from the quarry will be acceptable.

5.2 Air Quality

Abigroup's air quality assessment focussed on particulates and considered emissions from both the proposed Rockley Falls quarry and the adjoining Lubke quarry to ensure that the cumulative effects were adequately assessed. Meteorological data was obtained from Wagga and Albury airports and used as inputs to a CSIRO climate model to predict local meteorology at Rockley Falls. The results predict a predominant proportion of winds from the eastern quadrant, which differs from the winds recorded at Wagga and Albury.

Abigroup assumed background particulate levels for the area based on data collected from six sites for the Hume Highway duplication. Project specific air quality criteria were determined by subtracting the assumed background data from DECC assessment criteria, resulting in the following project goals:

- TSP annual average 70 $\mu\text{g}/\text{m}^3$
- Dust deposition 2 $\text{g}/\text{m}^2/\text{month}$
- PM_{10} annual average 20 $\mu\text{g}/\text{m}^3$
- PM_{10} (24-hour) 25 $\mu\text{g}/\text{m}^3$

Abigroup has explained that the assumed air quality background data at Rockley Falls have been derived from data collected during 8 months of pre-construction background monitoring undertaken in

the region for the purpose of the Hume Highway duplication project. On this basis the Department considers the project goals for air quality to be reasonable.

The above project specific criteria apply to cumulative emissions from the Lubke and Rockley Falls quarries at any sensitive receiver.

Abigroup prepared an inventory of expected dust emissions from dust generating activities on the two sites making allowance for proposed dust controls at Rockley Falls including the sealed access road and management practices detailed in the EA. The dispersion modelling program AUSPLUME was used to create dust isopleths for the various parameters listed above considering the first four years of production when Rockley Falls quarry would produce up to 700,000 tonnes per annum, and the subsequent 16 years of production when the quarry would produce up to 100,000 tpa. Lubke quarry was assumed to produce its maximum output of 200,000 tpa throughout the 20 year period. The modelling predicted that the cumulative emissions from the two quarries would result in the project specific goals not being exceeded.

The Department notes that owing to the absence of a local meteorological station, wind data for the locality were computed by interpolating Bureau of Meteorology synoptic data and incorporating recordings at Wagga and Albury airports, being 80 km and 70 km respectively from the site. The calculated data for Rockley Falls emphasise winds from the east and south east which differ from the measured winds at Wagga and Albury. The Department is satisfied that use of these computed data is not a significant issue because the results emphasise winds towards the sensitive receivers and hence may be considered conservative.

Abigroup's air quality consultant recommended that a meteorological station be installed on the site and that a network of dust gauges be installed, one gauge at each sensitive receptor, remaining operational for the first four years of quarrying. In its Submissions Report Abigroup confirmed that such a met station would be installed on or near the site. A condition is included requiring an air quality monitoring program to be prepared to detail proposed monitoring, response to any exceedances and the process for dealing with complaints, should any be received.

Greenhouse Gas Emissions

Operating quarry machinery and haulage vehicles would release greenhouse gases entrained in the fossil fuels consumed. Clearing vegetation from an area of land would remove that land from playing a role in absorbing CO₂ from the atmosphere. Cleared vegetation would release greenhouse gases as it decays. Greenhouse gases emitted from all of these processes associated with the proposal would contribute to climate change.

Two aspects of the proposal will go some way towards offsetting its greenhouse gas emissions:

- revegetation plantings associated with the rehabilitation program, aimed at restoring vegetation cover to much of the disturbed land; and
- protecting the flora and fauna offset areas in perpetuity, thereby preventing future clearing and associated release of stored carbon from this significantly larger area of land.

The latter benefit should be qualified in that there is not necessarily likely that vegetation in the offset areas would be cleared if the quarry does not proceed, but in the absence of the quarry there would be no restraint on grazing the offset areas which is detrimental to vegetation cover.

The Department is satisfied that the need for the quarry to proceed has been established. Refusal of the project will not necessarily save greenhouse gas emissions. The principal purpose of the quarry is to supply rock for the Hume Highway duplication. If Rockley Falls quarry does not proceed the necessary rock will be obtained from another source. It is likely that such alternative source will be less favourably located than Rockley Falls resulting in greater greenhouse gas emissions owing to greater haulage distance. Hence the Department concludes there is no significant reason relating to greenhouse gas emission to withhold approval for the project.

5.3 Groundwater and Surface Water

The EA provided details of the results of groundwater investigation with boreholes to record water levels, ground permeability, presence of aquifers and groundwater quality. The investigation was carried out to provide information regarding the effect of the proposal on groundwater-dependent

ecosystems. Surface water management is based upon operation of the drainage system and sediment basins.

Surface Water

The quarry site is located on a south-west facing slope with two small ephemeral drainage lines descending over rocky beds to lower slopes and alluvial flats. A number of springs and soaks are located south-west of the quarry supporting a Tea Tree vegetation community. Potential impacts of the proposal on surface water include the effects of retaining runoff from the site and the risk to the environment should sediment laden water escape from the site.

The EA includes a concept erosion and sediment control plan that indicates the general location of surface water collection drains and three sediment basins. The sediment basins are intended to also serve as storage dams, holding water for use in processing. Indicative sizing for the basins has been provided in the EA. The Department of Primary Industries has identified that downstream waterways provide habitat for a threatened species, the Southern Pygmy Perch and expressed concern that site water management practices ensure that no sediment laden runoff impacts on downstream habitats.

Daily water consumption for the first four years is estimated to be 120,000 litres (29ML annually), dropping to 5-20,000 litres (5ML annually) for the remaining 16 years. Abigroup acknowledges that it is impractical to supply the quantity of water required from surface water harvesting or groundwater and hence will import water by tanker from Holbrook reticulation by arrangement with Greater Hume Shire Council. Imported water will supplement any water collected from rainfall runoff.

The Department is satisfied that this concept can adequately serve the water requirements of the quarry and protect the downstream environment from sediment laden runoff if properly designed and managed. This will occur if the storages are maintained with sufficient unused capacity to receive storm runoff and the water level is quickly reduced to re-establish this capacity after each significant rainfall event. To give greater certainty that water management protocols are fully documented, conditions have been included to require a water management plan to be submitted for approval with design and management details for stormwater and operational water.

Groundwater

Abigroup installed six boreholes to investigate groundwater conditions on the quarry site and along the route of the access road. There are two aquifers present on the site: the granite, functioning as a fractured rock aquifer underlying the entire site; and a less extensive alluvial/colluvial aquifer, limited to minor ephemeral streams. The fractured granite material was found to be a poor groundwater source with low recorded bore yields in the range 0.01 to 2 litres per second.

At the quarry site investigations indicate the groundwater level ranges from 5 to 23 metres below ground with a flow direction generally towards the north-west. Groundwater sampled from quarry site boreholes revealed low salinity. Higher salinities occur in groundwater and surface water towards localised springs and soaks, down gradient from the quarry. This is likely to have arisen from salt concentration resulting from water ponding and evaporating at these locations.

It is anticipated that dewatering of the quarry may be required from time to time to remove intercepted groundwater. The EA suggests inflow is likely to commence after about 12 months of quarrying, but owing to the low permeability rock the quantity involved is estimated to be small (up to 2 litres per second or approximately 60 ML per year). A licence will be required from DWE for this extraction.

The closest existing groundwater bore is located 1.9 km from the proposed quarry, with 16 other bores within 5 km of the site. These bores mainly target deep aquifers within the weathered granite and were installed either for investigation or for domestic and stock watering purposes. The Department is satisfied that the likely minor interception of groundwater by the quarry would have minimal effect on the yield from other boreholes in the area.

Groundwater dependent ecosystems (GDEs) have been identified downstream of the quarry in more saline conditions. The EA suggests that impacts from the proposal on groundwater flow to down gradient springs or GDEs are likely to be minor or negligible given yield and flow estimates, distance from the quarry and evidence that the GDEs are supported by shallow water tables derived from local recharge. The Department of Water and Energy is concerned that the GDEs may be at risk and emphasises the need for groundwater monitoring to include frequent inspection of GDE condition.

The Department is satisfied that sufficient investigation has been undertaken to predict the likely effects of the quarry on groundwater. However, to give greater assurance that GDEs down gradient of the site are adequately monitored, a condition has been included to prepare a groundwater monitoring plan as proposed in the EA with the inclusion of the additional matters recommended by DWE:

- frequent visual observations of the condition of the GDEs;
- additional groundwater modelling and assessment should inflow to the quarry exceed one litre/second.

5.4 Flora and Fauna

Development of Rockley Falls quarry would remove approximately 17 ha of remnant Box-Gum woodland vegetation occupying the extraction area, the processing, stockpiling and loading areas and the access road. However, Abigroup's flora/fauna survey identified that the vegetation on the site has been extensively modified through clearing and grazing. Within the 17 ha there are only about 40 remaining scattered trees to be cleared, consisting of eucalyptus and acacia species, mainly Apple Box/Red Box and Blakely's Red Gum. The ground cover layer has also been significantly modified and is dominated by introduced grasses. There is no middle and lower storey vegetative layers.

The EA reports closely examining 34 trees to be removed revealing that trees were mainly mature and generally separated by 45-50 m, with less than 10% containing hollows. The Box Gum Woodland surrounding the quarry site is in a similar depauperate condition. The vegetation to be cleared meets the criteria for White Box-Yellow Box-Blakely's Red Gum Woodland, listed as an endangered ecological community (EEC) in the TSC Act. The EA indicates that notwithstanding its listing as an EEC, in regional terms the removal of the vegetation affected by the proposal is unlikely to be regarded as significant. However in local terms the loss of the vegetation is important because of the number of threatened species that are associated with it and its value as an EEC.

During the survey three threatened fauna species (birds) were recorded on the site or nearby:

- Diamond Firetail (*Stagonopleura guttata*);
- Hooded Robin (*Melanodryas cucullata*); and
- Brown Treecreeper (eastern subspecies) (*Climacteris picumnus victoriae*).

A further three fauna species listed under the *Threatened Species Conservation (TSC) Act* or *Environment Protection Biodiversity Conservation (EPBC) Act* are considered to potentially occur within the site. The vegetation community on the site is not considered to meet the definition of the Commonwealth listed Box Gum Grassy Woodland hence application to the Commonwealth under the EPBC Act is not required. Nonetheless the Abigroup referred the matter to the Commonwealth Department of the Environment, Water, Heritage and the Arts and received a decision that the proposal is not a controlled action.

Clearing native vegetation, loss of hollow bearing trees and removal of dead wood and dead trees are recognised as key threatening processes under the TSC Act. These practices would affect all native flora and fauna inhabiting the site. In addition there will be indirect effects on native flora and fauna extending beyond the area of land disturbance, arising from noise, dust, blasting and increased vehicle movement on the property. A total of 21 native flora species and 63 native vertebrate fauna species were recorded on the site or nearby.

Abigroup's assessment considers that the proposed activity is unlikely to remove or modify any significant native vegetation and that it is unlikely a significant portion of habitat for any species will be removed from the broader locality.

Impact Avoidance and Mitigation Measures

Abigroup's EA includes measures to minimise the effects of the proposal on flora and fauna and to compensate for effects which will unavoidably occur, including the loss of an area of EEC. A significant component of the strategy is the provision of offset areas to improve or maintain biota of the same vegetation and habitat types that exist in the area to be disturbed. The offset strategy has been developed in consultation with the landowner and DECC. Four offset areas within the *Rockley Falls* property which for the most part are not directly affected by the proposed development are to be set aside in perpetuity and managed for the enhancement of native flora and fauna. These areas, shown on Figure 5, will be recorded as covenants on the land title. Two of the offset areas will be affected to an extent by site operations. Proposed Offset Area 3 contains two of the site's three sediment basins and associated drains and is therefore likely to be accessed from time to time for operational

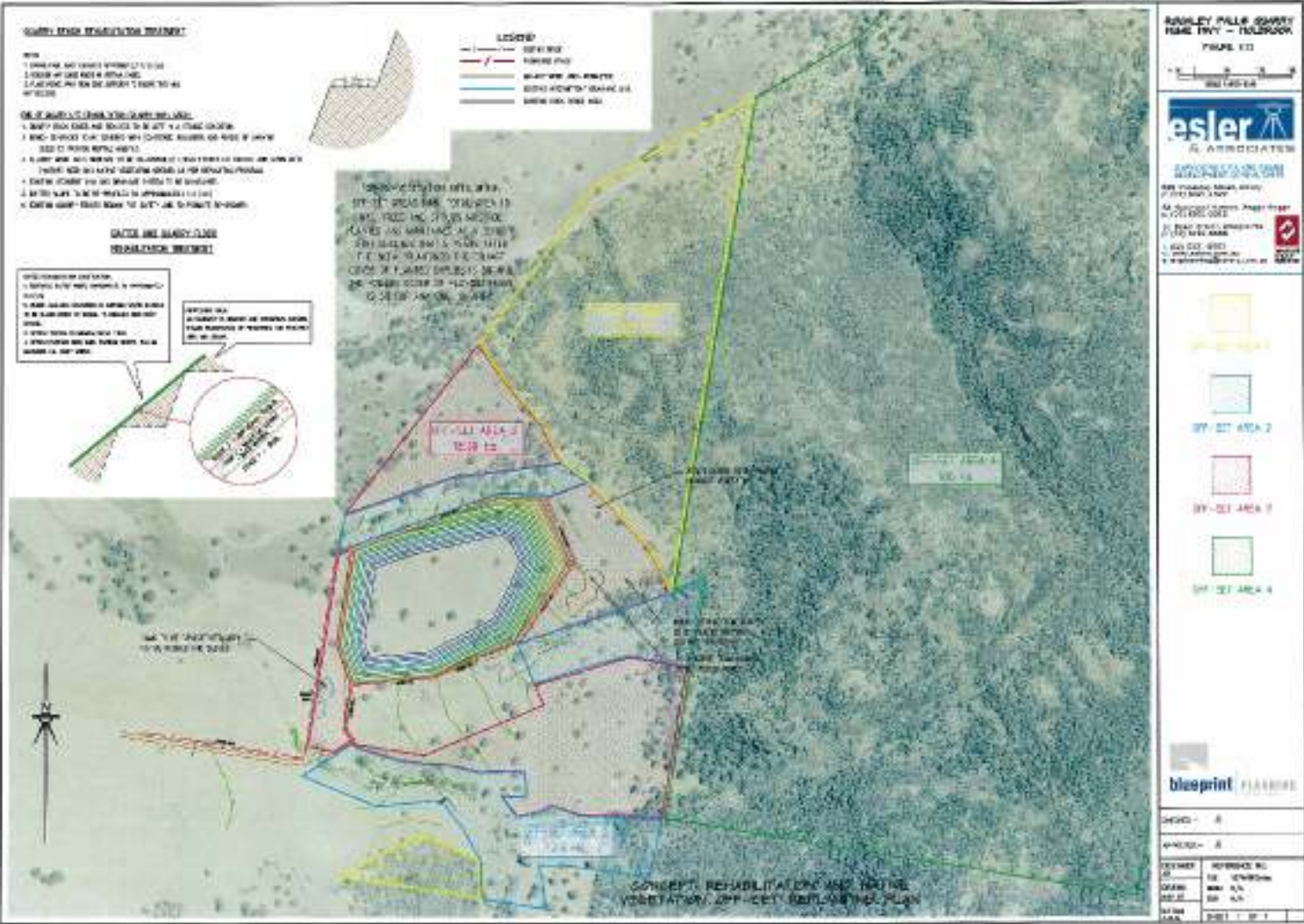


Figure 5 – Proposed Vegetation Offset Areas

purposes. One of these basins appears to receive the reject slurry from the sand washing operation. Proposed Offset Area 2 is traversed by the haul road and adjoins the crushing area. In these circumstances some further consideration of the proposed offset areas may be appropriate when detailed plans are submitted.

The proposed offset areas have a total area of at least 243 hectares and are to be fenced with fauna friendly fencing to prevent stock entry. Weed management is to occur in all of the offset areas with assisted native regeneration and active revegetation in particular sections, amounting to 15 hectares. Habitat enhancement is proposed in the offset areas by placing woody debris and rocks from the quarry clearing operation. Other impact mitigation strategies have been proposed for implementation prior to commencement, during quarry production and after quarrying have been completed on the site.

DECC raised concerns that the stated planting density for rehabilitation in the offset areas is too low and was not allied to any acceptable standard of revegetation to be achieved. Targets for vegetation coverage recommended by DECC have been incorporated into the recommended conditions.

The Department is satisfied that the flora and fauna impacts of the proposal can be adequately compensated and managed and that the proposed offset package is adequate. However, the Department believes that the various requirements for managing flora and fauna issues should be set down in detailed plans for managing the offset areas in perpetuity and managing flora and fauna within the quarry site during the period of quarry operations. These plans should incorporate:

- a Vegetation Clearance Protocol and other measures to be taken prior to commencing quarrying;
- protocols to minimise disturbance to offset areas during quarry operations;
- management methods for the offset areas, with details of proposed revegetation techniques;
- monitoring procedures for revegetation in the offset areas and GDEs downstream of the site;
- response measures to be taken if monitoring indicates objectives are not being met;
- measures to be implemented on the site during the quarry operational period;
- obligations on the property owner after quarrying is complete.

The plan should include and elaborate upon all of the recommendations of Abigroup's flora and fauna consultant contained in the EA as well as the matters raised by DECC and DWE in their submissions. The reason for preparing consolidated plans is to ensure that requirements from various sources are readily available for the operator, regulatory authorities, auditors and ultimately the landowner when he assumes responsibility for management of the site and the offset areas at the completion of quarrying.

5.5 Rehabilitation

Abigroup proposes to progressively rehabilitate disturbed areas of the site for grazing. Initially, areas available for rehabilitation will be land disturbed during preparatory works. This includes the noise bund, drainage structures, sediment basin surrounds and the shoulders of the access road. As the remainder of the disturbed land will be utilised for operational purposes there will be limited opportunity for further rehabilitation while quarry production is in progress. Temporary topsoil and overburden stockpiles will be stabilised following initial stripping of the extraction area.

Abigroup has indicated in its submissions report that the western work area, referred to as the product stockpile and loading area, will be rehabilitated at the end of the first four years of intensive quarrying. It is understood stockpiling and loading will thereafter take place at a smaller scale in the crushing area. Apart from placing some rock on quarry benches, further rehabilitation will not be practical until sections of the quarry reach full depth and access to the floor is available.

The revised rehabilitation plan submitted by Abigroup with its Submissions Report (see Appendix D) indicates that after completion of quarrying there will be no remaining overburden stockpile. Rehabilitation works will result in remaining overburden and other waste material being:

- distributed over the stockpile and crushing plant area to an approximate depth of 1.2 metres;
- returned to the quarry floor; and
- placed against the terraced walls of the quarry in sufficient quantity to create a uniform 2:1 gradient.

Abigroup has supplied further information to clarify management of overburden material during the life of the quarry. During extractive operations Abigroup considers the configuration of the site provides capacity for stockpiling up to 153,300 m³ of overburden, to a maximum depth of 10 m. The balance of the estimated 500,000 m³ of overburden to be extracted will be either utilised in site preparation (haul road, hard stand, noise bund) amounting to about 71,000 m³ or progressively blended with other quarry products to produce select materials for sale and use in the Hume Highway duplication project. During the first four years of operation when the stockpile is growing, Abigroup estimates that to prevent the stockpile exceeding its available capacity, approximately 68,000 m³ of overburden would need to be blended and despatched from the site each year. During the remaining 16 years up to 10,000 m³ would be despatched per annum, gradually reducing the stockpile. In both cases blended material would amount to approximately 20% of quarry output.

The Department is satisfied that provided the overburden material can be blended and despatched from the site as proposed by Abigroup, the final rehabilitation configuration will be achievable without substantial earthmoving operations. Conditions have been included to require Abigroup to incorporate its proposals into a Quarry Closure and Rehabilitation Management Plan showing final landforms and the manner in which these final surfaces will be achieved, rehabilitated, monitored and maintained after quarry closure. Included conditions require that Abigroup:

- obtain certification attesting the stability of final quarry batter slopes;
- monitor and annually report the quantity of stockpiled overburden on site.

5.6 Visual Impact

The EA describes the regional landscape as semi-cleared rural land with timbered hills in the east and broad plains in the west. Four residences and two locations on the Hume Highway were nominated to have direct or partly obscured views to the site. These locations are all in the western quadrant from the site, the nearest being about 1.7 km from the quarry and the furthest being in excess of 2 km distant. Abigroup considers that the quarry workings will create a visual effect of colour contrast on a minor proportion of the observable hills to the east.

Abigroup has supplied in its submissions report photographs taken from viewing locations nominated in the EA. The photos are marked up to show the area of view predicted to be affected by the quarry site, illustrating that only a minor component of the view will be affected. The existing Lubke quarry is currently visible in these views. Abigroup considers that while the landform will be permanently changed the visual effect can be moderated by restoring the existing colour contrast. Proposed mitigation strategies include revegetation of adjoining offset areas and rehabilitation of disturbed areas.

The Department is satisfied that the proposed mitigation strategies, while taking time to be fully effective will assist to lessen the visual effect of the quarry.

5.7 Indigenous Cultural Heritage

The Abigroup arranged for the Albury and District Local Aboriginal Land Council to conduct an Aboriginal heritage survey of the site, which detected no relics or places of significance. A letter from the Land Council to this effect was included in the EA.

Subsequent to submitting the EA Abigroup has commissioned an Aboriginal cultural heritage assessment and Aboriginal archaeological heritage assessment, the reports from which have been forwarded with Abigroup's submissions report. The cultural heritage assessment identified two items (trees), three places of significance and one *area of concern*.

Both of the identified trees are along the haul road route. One is clear of the road but the other requires a minor deviation to the road to be saved from disturbance. Abigroup has agreed to deviate the road and barricade both trees as recommended to protect them from disturbance.

The places of significance are outside of the quarry site but traverse parts of the offset areas. As no work is planned in the offset areas other than conservation works which are supported by the knowledge holders, the places of significance place no constraint on the proposal.

The *area of concern* identified in the cultural heritage assessment is identical with the western quarry work area referred to as the product stockpiling and loading area. The recommendation from the

report was that an Aboriginal archaeological survey be undertaken on this site. Abigroup has implemented that recommendation resulting in the second report which discovered an artefact scatter at the eastern end of the work area. The report recommended that the work area be slightly reduced in size by relocating a fence to protect the artefact scatter. Abigroup has agreed to this recommendation.

The Department is satisfied that Abigroup's undertakings to protect the identified trees and artefact scatter will satisfactorily address Aboriginal cultural heritage issues. A condition is included to confirm requirements.

5.8 Traffic

It is estimated that during the first four years of operation when extraction of up to 700,000 tpa is proposed, an average of 85 truckloads per day or 10 outgoing trucks per hour will be required to remove crushed rock from the site. Haulage will be by standard semi-trailer and "truck and dog" combinations, having both three and four axles with an assumed maximum capacity of 33 tonnes. All exiting vehicles will travel down the sealed two-lane access road to the Hume Highway. Abigroup estimates that 90% of vehicles utilising the site access road will travel to or from the south on the Hume Highway.

By comparison, in the subsequent 16 years of the project, when extraction of up to 100,000 tpa is proposed, traffic will reduce to an average of 18 truckloads per day or 2 outgoing trucks per hour.

Abigroup has considered a worst case scenario of peak traffic generation being double the estimated average hourly truck movements (20 each way) to assess safety requirements at the intersection with the Hume Highway. Prior to commencement of haulage Abigroup proposes to modify the intersection by constructing channelised right turn/auxiliary left turn (CHR/AUL) in accordance with the RTA *Road Design Guide*. In addition the gate on the haul road will be relocated into the property to ensure a standard semi-trailer can turn completely off the highway and shoulder before having to stop in the event the gate is closed. A small number of trees will need to be removed at the intersection (scheduled to be removed for the highway duplication) to ensure that the safe intersection sight distance (SISD) can be achieved. Owing to the occurrence of fogs in the area Abigroup intends to seek RTA permission to install marker posts 225 m each side of the intersection and then instruct drivers that they are not to enter or leave the site if fog obscures the marker posts from view.

In its submission the RTA has raised no objection to the proposal subject to conditions relating to intersection design, safety, construction and operation. The Department agrees that the proposed traffic arrangements will be satisfactory. Conditions have been incorporated to reflect the RTA's requirements.

5.9 Impact on TSR

For approximately 250 metres of its 2.3 km length the access road leading to the quarry passes over Travelling Stock Reserve 16893. The road deviates from a straight line route in this area to avoid vegetation associated with a watercourse. The Department of Lands (DoL) intends to grant a licence over the TSR for the road subject to a number of conditions. DoL requires that the access road be fenced with a stock proof fence on its southern side where it traverses the reserve and that the balance of the reserve to the north of the road be revegetated by the Abigroup.

The Department is satisfied that use of the TSR is justified and that revegetation of part of the reserve will be appropriate compensation. An appropriate condition has been included to implement DoL requirements.

5.10 Other Issues

The Department has considered other issues relevant to the project and come to the view that there are no further matters of significance to be assessed and controlled in conditions of approval.

6 RECOMMENDED CONDITIONS

The Department has prepared recommended conditions of approval for the Project. These conditions are required to:

- prevent, minimise and/or offset adverse impacts of the Project;
- set standards and performance measures for acceptable environmental performance;
- ensure regular monitoring and reporting; and
- provide for the ongoing environmental management of the Project.

A summary of the conditions of approval is provided in Appendix A and a full set of the recommended conditions appears in Appendix B. Abigroup has reviewed the recommended conditions and has accepted them.

7 CONCLUSION

The Rockley Falls quarry is an important infrastructure project associated with the southern Hume Highway duplication. The proximity of the quarry to the highway will provide economic benefits in controlling the cost of delivered quarry materials upon which the duplication depends.

The Department has assessed the project application with accompanying environmental assessment, submissions received and Abigroup's response to submissions and is satisfied that there is sufficient information available to determine the application. The key issues identified in the Department's assessment and raised in submissions concern the control of noise and blasting impacts, rehabilitating the site at the completion of quarrying and protection and management strategies to mitigate impacts and offset losses to flora and fauna. Conditions have been recommended to address these issues.

A number of other issues were raised in the submissions; however Abigroup has satisfactorily addressed these in both its Environmental Assessment and Submissions Report.

An offset strategy has been proposed, which would protect over 243 ha of existing native vegetation, and enhance this area with planting and management procedures to promote native flora and fauna habitat. This offset satisfactorily meets the objects of the EP&A Act regarding biodiversity conservation and ESD principles, specifically section 5(a)(vi-vii) "the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and ecologically sustainable development".

Consequently, the Department considers the project is in the public interest and should be approved, subject to recommended conditions.

8 RECOMMENDATION

It is RECOMMENDED that the Minister:

- consider this report;
- approve the project application, subject to conditions, under section 75J of the *Environmental Planning and Assessment Act 1979*; and
- sign the attached project approval (Tagged B).

David Kitto
Director, MDA

Chris Wilson
Executive Director, MPA

Sam Haddad
Director-General