Karuah East Quarry Project
Submission Regarding Part 3A Application 09_0175

Boral Property Group| 19 April 2013

Planning + Environment + Acoustics

Submission Regarding Part 3A Application 09_0175

Karuah East Quarry Project

Prepared for Boral Property Group | 19 April 2013

Ground Floor, Suite 01, 20 Chandos Street
St Leonards, NSW, 2065

T +61 2 9493 9500
F +61 2 9493 9599
E info@emgamm.com

emgamm.com

Submission Regarding Part 3A Application 09_0175

Final

Report J13031RP1 | Prepared for Boral Property Group | 19 April 2013

Prepared by	**Rob Janssen**	Approved by	**Brett McLennan**
Position	Associate Environmental Scientist	Position	Director
Signature		Signature	
Date	19 April 2013	Date	19 April 2013

Document Control

Version	Date	Prepared by	Reviewed by
Draft A	16 May 2013	R. Janssen	B. McLennan
Draft B	17 May 2013	R. Janssen	R. Bestic (Boral)
Final	18 May 2013	R. Janssen	B. McLennan

EMM
EMGA Mitchell McLennan

T +61 (0)2 9493 9500 | F +61 (0)2 9493 9599

Ground Floor | Suite 01 | 20 Chandos Street | St Leonards | New South Wales | 2065 | Australia

emgamm.com

Table of Contents

Table of Contents *(Cont'd)*

Appendices

Figures

1 Introduction

This submission, in response to the proposed Karuah East Quarry Project (KEQ Project), application number 09_0175, has been prepared by EMGA Mitchell McLennan (EMM) on behalf of the Boral Property Group (Boral).

The preliminary environmental assessment and major project application for the KEQ Project were lodged in 2009 and Director-General's requirements (DGRs) were issued in 2009. An amended preliminary environmental assessment was submitted in 2010 and amended DGRs were issued in 2010 with the current environmental assessment (EA) report lodged in 2013. The exhibition period is advertised to end 19 April 2013.

The KEQ Project includes the development of a hard rock quarry and crushing plant on Lots 12 and 13 DP 1024564, immediately adjacent to the proponent's existing quarry and crushing plant on Lot 11 DP 1024564 and Lot 21 DP 1024341.

The application has been submitted for assessment under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The EA states that while Part 3A of the EP&A Act has been repealed it continues to apply to the KEQ Project on the basis of transitional arrangements. As such, an assessment of the application will be prepared by the Department of Planning and Infrastructure (DP&I), followed by final determination by the Minister for Planning and Infrastructure, or his delegate.

This submission identifies issues with the adequacy of the EA.

2 Traffic

The traffic impact assessment report for the KEQ Project has been reviewed in terms of:

- compliance with the specific requirements of the DGR's which require a "detailed" assessment of the traffic safety and traffic efficiency impacts of the KEQ Project;

- compliance of the report methodology and the assumptions of the analysis with accepted practice as outlined in the Roads and Traffic Authority (RTA) now Roads and Maritime Services (RMS) *Guide to Traffic Generating Developments*. This requires assessment of the likely impacts on access to the Pacific Highway at the "Branch Lane and Old Pacific Highway" interchange during both the morning and afternoon weekday peak hour traffic periods and consideration of the traffic impacts on the length and operation of the existing intersection turning lanes;

- the adequacy of the proposed access design for access to and from the Pacific Highway by large trucks (including B-Doubles) including deficiencies in the proposed concept design for the extension of the access road from Andersite Road and Blue Rock Lane (through RMS land within the existing road reservation of the Pacific Highway);

- any proposal to ensure the adequate funding of future road maintenance for the quarry access road route (via Andersite Road and Blue Rock Lane), once it is dedicated as a public road, under the care and control of the Great Lakes Council; and

- the likely future traffic safety impacts of the quarry product truck transport operation, including any likely traffic accident and related road transport externality costs and the safety management of the proposed KEQ Project vehicle fleet.

The EA for the KEQ Project includes a separate traffic assessment report, prepared by TPK and Associates in June 2011. The traffic assessment report represents the primary information relating to the KEQ Project traffic which has been reviewed by EMM. The main EA document includes substantial extracts and summaries from the traffic assessment report.

The traffic assessment report includes an afternoon peak hour intersection traffic count which was undertaken between 3.30 to 4.30 pm (on a date which is unspecified but which was presumably a weekday in 2011) at the "Branch Lane and Old Pacific Highway" interchange on The Pacific Highway, approximately 4 km north east of Karuah. This intersection will be the primary point of access for all the KEQ Project traffic to the major road network, including the quarry product truck traffic which will be travelling to and from regional destinations via the Pacific Highway.

No corresponding morning peak hour intersection traffic count was undertaken. This is a significant deficiency of the KEQ Project traffic impact assessment, as a development of this type will normally generate its highest traffic movements during a weekday morning peak hour such as 6.00 to 7.00 am or 7.00 to 8.00 am. As a result of this omission, the actual weekday peak hour traffic impacts of the KEQ Project in the locality have not been adequately documented or assessed.

Additionally, there is no location specific or quantifiable assessment of the future traffic safety impacts of the KEQ Project, which is another significant deficiency of the KEQ Project traffic impact assessment.

2.1 Director-General's requirements

The DGRs for the EA were issued in October 2010 and include the following requirements in regard to transport issues.

- "accurate predictions of the project's road traffic and a detailed assessment of the potential impacts of project related traffic on the safety and efficiency of the road networks"; and

- "a detailed description of the measures that would be implemented to upgrade and/or maintain these networks over the life of the project".

The DGRs for the KEQ Project also refer to the *Guide to Traffic Generating Developments*, which contains an extensive checklist on pages 2.3 to 2.7 (which is reproduced as Appendix A to this document). This checklist documents the range of issues which should be considered in a traffic impact study for a project.

The DGR requirements call for a detailed assessment of the potential traffic and safety impacts of the KEQ Project, although no specific road locations or intersections are identified at which these traffic and safety impacts should be assessed.

A detailed assessment of a quarry project's traffic impacts would normally include intersection capacity analysis by means of a program such as SIDRA and assessment of the adequacy of intersection turning lanes in accordance with the current Austroads 2010 *Design Standards for rural intersection turning lanes*. These analyses are required to confirm that the design standard and lengths of existing turning lanes at intersections will be adequate for the proposed KEQ Project traffic usage, or if intersection turning lane improvements are required.

The traffic assessment report provides some discussion of other Austroads intersection capacity standards which compare uninterrupted traffic flow conditions at an intersection of two rural roads, which is generally at a simple T-intersection. The report does not include any formal analysis of the existing intersection turning lane lengths and operation at the "Branch Lane and Old Pacific Highway" interchange on the Pacific Highway.

Although constructed relatively recently, the intersection right turning lanes on the "Old Pacific Highway-Branch Lane" roadway, which are located on the lower level of the interchange, directly underneath the two bridges of the Pacific Highway overpass, have only been constructed to a very basic design standard with minimal vehicle storage lengths of 20 m approximately for right turning vehicles accommodated "end to end in a single central lane". These short right turning lanes are adequate for only minimal right turning traffic movements onto the Pacific Highway from both the Old Pacific Highway and the Branch Lane directions.

It is unlikely that these short intersection turning lanes will have sufficient length to accommodate the likely magnitude of the right turning truck traffic volumes which will be generated by the proposed production of 1.5 Mtpa of quarry product, in particular if B-Double trucks are proposed to be used. One B-Double truck alone would exceed the existing storage lane length of either right turning lane.

By failing to specifically assess the lengths of these existing intersection right turning lanes for the proposed quarry truck traffic usage, the traffic analysis has not satisfactorily confirmed the acceptability of the KEQ Project traffic impacts at this intersection.

Additionally, the correspondence from the RMS in relation to the proposed quarry access road via Andesite Road and Blue Rock Lane, operating by means of an extension to the existing alignment of Blue Rock Lane within the RMS Pacific Highway road easement, assumes that the future access road will be

dedicated as a public road under the care and control of the Great Lakes Council. Notwithstanding that, there are a number of design issues for the proposed future access road which are yet to be resolved to the satisfaction of the RMS, there is no funding proposal specified in either the traffic assessment report, or the main EA report, for the KEQ Project proponent to provide adequate funding to ensure that the road will be adequately maintained.

2.2 Compliance of the traffic impacts analysis with accepted practice

In traffic impact assessments for resource and extractive industry and related projects, it is the normally accepted practice to assess both the typical (average day) and the potential maximum (busy day) truck traffic generation. This variance is required because of the likely high variability in the site vehicular traffic generation from day to day, such that for most developments of this type, the potential maximum generated daily and peak hour truck traffic movements should be assessed as being approximately double the average daily and peak hour vehicular traffic movements. It is a significant deficiency of the traffic assessment report that only the average and not the potential maximum daily and peak hour site truck traffic movements have been assessed for the future site operations.

As mentioned in the introduction, there is no documentation or assessment of the morning peak hour traffic conditions either for the existing traffic in the locality or the KEQ Project traffic.

In addition to this deficiency, the traffic impact assessment in the traffic assessment report has assessed only the average daily and peak hour and not the potential maximum (busy day) peak hour and daily truck traffic movements for the KEQ Project. These will normally be approximately double the average daily truck traffic movements.

This deficiency is further compounded in the traffic assessment report when assessing the proposed future directional traffic distribution from the site operations. The report assumed a 50:50 directional traffic split for the site traffic northbound and southbound on the Pacific Highway at all times, while in reality this directional traffic distribution could vary on any specific day between either 100% northbound or 100% southbound. The consequence of these combined deficiencies in the traffic impacts assessment is that the traffic assessment report has potentially underestimated, by a factor of four approximately, the traffic capacity impacts for the future peak KEQ Project truck traffic travelling in either the northbound or the southbound directions on The Pacific Highway.

In addition to this failure, the failure of the traffic assessment report to document or assess the morning peak hour traffic conditions for the KEQ Project traffic and the failure to assess the adequacy of existing intersection turn lane lengths for the two intersection right turn lanes which are currently provided at the Pacific Highway interchange for traffic from the Old Pacific Highway and Branch Lane directions, there are two other significant omissions in the methodology of the KEQ Project traffic impact assessment report, namely:

- no measures are proposed to control potential future KEQ Project truck traffic usage of the route to the north via “The Branch Lane” which connects to Booral Road and the route to Gloucester via “The Bucketts Way”. This route is clearly unsuitable for extractive industry and related heavy truck traffic usage and formal measures should be specified in the KEQ Project application documents to prohibit this traffic usage; and

- there is no consideration of the KEQ Project construction stage traffic impacts, as is specified on page 2.7 of the RTA *Guide to Traffic Generating Developments*. The KEQ Project construction stage traffic impacts assessment should document and assess the proposed workforce traffic and truck movements associated with the site employment at the peak stage of the KEQ Project construction and the delivery of construction equipment and materials to the site and the removal of waste.

2.3 Acceptability of the proposed road design

In addition to the deficiencies and omissions in the KEQ Project traffic capacity impact assessment, which have been identified and summarised in the foregoing sections of this document, a review of the proposed design recommendations for the extension of Blue Rock Lane has identified two potentially serious and significant deficiencies with the proposed design.

Although the RMS have given their concurrence as landowner to the submission of the development application, their letter confirms that a number of key design issue remain to be addressed for this road extension, including the management of headlight glare for vehicles which will be travelling in a contra flow direction along what will effectively be a service road running directly alongside the existing northbound carriageway section of the Pacific Highway.

Also if B-Double truck usage is proposed a minimum sealed width of 8 m is required for this access road.

Notwithstanding these deficiencies in the proposed future access road design, which are yet to be resolved to the satisfaction of the RMS, there is no funding proposal specified in either the traffic assessment report, or the main EA report, for the proponent to provide adequate future funding to ensure that the access road will be adequately maintained.

2.4 Assessment of traffic safety impacts

In addition to the deficiencies and omissions in the KEQ Project traffic capacity impact assessment and the proposed KEQ Project road design, which have been identified and summarised in the foregoing sections of this document, this review has also identified there has been no assessment of the KEQ Project traffic safety impacts for either the general KEQ Project traffic safety or vehicle fleet safety management.

There is a failure in the traffic assessment report to either quantify or assess the KEQ Project traffic safety impacts, by reference to either the existing accident history of roads or any other potential traffic safety concerns. The proposed increase in the longer distance road transport of quarry product from the Karuah area with an additional 1 Mtpa of quarry product potentially being transported to destinations in the Newcastle and Lake Macquarie areas will have associated externality costs for road traffic accidents in these areas.

An additional potential traffic safety concern for the KEQ Project, as noted on page 36 of the traffic assessment report, is the KEQ Project will utilise only a small proportion of directly employed truck drivers for the KEQ Project, with the further contracting of “some ten haulage companies” to undertake the proposed quarry product transport task. The use of such a large and diverse vehicle fleet, not under the direct control of the KEQ Project proponent, will make it difficult for the KEQ Project proponent to adequately monitor and maintain the safe operations of the proposed quarry product transport vehicle fleet.

2.5 Conclusion

Following EMM’s review of the traffic and parking assessment report, it is considered that there are a number of serious deficiencies in the assessment of the proposed traffic capacity and safety impacts generated by the KEQ Project. These include:

- the failure of the traffic assessment report to either document or assess the existing or likely future morning peak hour traffic conditions for the KEQ Project traffic at the relevant major road access intersection with The Pacific Highway;

- the failure of the traffic assessment report to assess the adequacy of existing intersection turn lane lengths for the two intersection right turn lanes which are currently provided for existing traffic from the Old Pacific Highway and Branch Lane directions directly underneath the new overbridges of the Pacific Highway overpass. These right turning lanes have only very limited length and traffic storage capacity currently;

- the traffic impact assessment in the traffic assessment report has used only the average daily and not the potential maximum daily site traffic movements (which are normally double the average daily traffic movements) when assessing the proposed future traffic impacts from the site operations. Also the traffic directional assessment has assumed a 50%/50% split of the site traffic northbound and southbound on the Pacific Highway at all times, while in reality this directional distribution could vary on any specific day between 100% northbound or 100% southbound. As such, the traffic assessment report has significantly underestimated, by a factor of four approximately, the KEQ Project traffic capacity impacts for peak daily or peak hour truck traffic travelling in either the northbound or the southbound directions on The Pacific Highway;

- no measures are proposed to control potential future KEQ Project truck traffic usage of the route to the north via "Branch Lane" which connects to Booral Road and the route to Gloucester via "The Bucketts Way". This route is clearly unsuitable for extractive industry and related heavy truck traffic usage and formal measures should be specified in the KEQ Project application documents to prohibit this traffic usage;

- there are significant key design issues outstanding for the design of the proposed road extension to Blue Rock Lane. Although the RMS have given their concurrence as landowner to the submission of the development application key design issue which remain to be addressed for this road extension are the management of headlight glare for vehicle travelling in a contra flow direction along what will effectively be a service road running directly alongside the new northbound carriageway of the Pacific Highway. Also if B-Double truck usage is proposed a minimum sealed width of 8 m is required for this access road;

- there is no consideration of the KEQ Project construction stage traffic impacts, as specified on page 2.7 of the RTA *Guide to Traffic Generating Developments*. The KEQ Project construction stage traffic impacts assessment should as a minimum document and assess the proposed workforce traffic and truck movements associated with the delivery of construction equipment and materials to the site and the removal of waste;

- there is a failure to quantify or assess the KEQ Project traffic safety impacts, by reference to either the existing accident history or other potential traffic safety concerns. The proposed increase in longer distance road transport, potentially to and from destinations in the Newcastle and Lake Macquarie areas, for an additional 1 Mtpa of quarry product from the Karuah area, will have associated externality costs for road accidents, traffic congestion, traffic noise, air quality and greenhouse gas emissions; and

- an additional potential traffic safety concern for the KEQ Project, as noted on page 36 of the traffic assessment report, is the KEQ Project to utilise only a small proportion of directly employed truck drivers for the KEQ Project, with further contracting of "some ten haulage companies" to undertake the proposed quarry product transport task. The use of such a large and diverse vehicle fleet, not under the direct control of the KEQ Project proponent, will make it difficult for the KEQ Project proponent to monitor and maintain the safe operations of the proposed quarry product transport vehicle fleet.

- Notwithstanding these deficiencies in the traffic impact assessment report, the proposed means of access for the KEQ Project traffic to and from the Pacific Highway is inadequate as the short existing intersection turn lane lengths for the right turn lanes for existing traffic from the Old Pacific Highway and Branch Lane directions, directly underneath the new overbridges of the Pacific Highway overpass, will not be adequate to accommodate either additional semi trailer or B-Double truck traffic movements. These right turning lanes have only very limited length and traffic storage capacity currently for one semi trailer truck in either direction.

- Additionally, there is no funding proposal specified in either the traffic assessment report, or the main EA report, for the KEQ Project proponent to provide adequate future funding to ensure that the proposed access road will be adequately maintained as a public road under the care and control of Great Lakes Council.

On this basis, we believe that no properly informed decision can be made in regard to the KEQ Project until the deficiencies identified above are addressed and an accurate assessment of the proposed traffic impacts, which are likely to be significantly greater than reported, are provided.

3 Aboriginal heritage

The Aboriginal cultural heritage assessment has been reviewed in terms of compliance with the DGRs and the *Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (the ACH Guidelines, DEC 2005). The report methodology and consultation with Aboriginal stakeholders has been reviewed for compliance with archaeological best practice.

3.1 Director-General's Requirements

The DGRs state that the Aboriginal cultural heritage assessment must be completed in accordance with the ACH Guidelines and the *Aboriginal Cultural Heritage Standards and Guidelines Kit* (DEC 1997). There are a number of deficiencies with the assessment when viewed in light of these guidelines.

The report provides little social or cultural information about the study area as required in Step 2 of the ACH Guidelines. There is no evidence that research has been conducted to undertake cultural mapping and/or oral history recording with Aboriginal community representatives. If cultural information has been received from Aboriginal stakeholders it is not discussed within the report.

The assessment of the landscape of the study area as required by Step 2 of the ACH Guidelines is limited as it does not contain a number of important aspects. There is no information regarding the landscape units of the study area and no maps of these landscapes have been provided. Maps of landscape features, places and natural resources of interest to Aboriginal people should also have been identified in greater detail than provided in Section 3 of the report.

Documentation of the survey strategy and survey units has not included a map that shows the boundaries of the survey within the eight survey units. There is also little information on survey transect widths. These elements are stipulated in the ACH Guidelines and are required to calculate effective survey coverage. An effective survey coverage table is a requirement of the ACH Guidelines but is not included. Additionally the calculation of effective survey coverage for the survey has not been completed.

Due to these issues it is considered that the report does not represent a detailed cultural heritage impact assessment.

3.2 Consultation

This assessment is also deficient in its consultation with the Aboriginal community. The ACH Guidelines state that the *Interim Community Consultation Requirements for Applicants* (ICCRs, DEC 2005) must be followed during the consultation process. In Stage 1 of the ICCRs a letter is required to be sent to a number of organisations including the Native Title Services to seek to identify stakeholder groups wishing to be consulted about the KEQ Project. No evidence of a letter being sent to the Native Title Service is presented. Additionally, no responses from any organisations have been included in Appendix 2 and it is not clear if these organisations replied in Section 1.5 of the report.

Stage 2 requires that the proposed methodology for the cultural and archaeological assessment be provided to the registered Aboriginal stakeholders and that they are provided with at least 21 days to respond. The one listed registered Aboriginal stakeholder in the process, the Karuah Local Aboriginal Land Council, was given only three days to review the assessment methodology (letter sent on 3 March 2010 and a response requested by 5 March 2010). This is not considered to be a reasonable time for the registered stakeholder to respond.

Stage 2 also requires information on the cultural significance of the area to be collected and the opportunity provided to Aboriginal people who hold cultural knowledge to contribute to the assessment process. No express request is made during Stage 2 or at any other time during the consultation process for cultural heritage information and no information is given in the report of any discussions regarding the cultural heritage of the area. As such it is unclear if the Aboriginal community has been given sufficient time and opportunity to provide information on the cultural significance of the study area.

During the consultation and report writing process there was a 16 month gap between the first survey completed on 30 March 2010 and a request for further survey made on the 14 July 2011. It is not clear if any contact between the Aboriginal stakeholders and the KEQ Project team occurred during this time. No reason for this gap is provided. This is a considerable length of time without contact with stakeholders and does not represent appropriate or continuous consultation. As a comparison, in their publication *Applying for an Aboriginal Heritage Impact Permit: Guide for applicants* (DECCW 2010), the NSW Office of Environment and Heritage (OEH) notes that gaps in communication of six months or more do not constitute a continuous consultation process. Should a gap of six or more months occur without consultation, OEH requires that the Aboriginal community consultation process restart. Using this as a guide it is clear that the lapse in consultation of 16 months which occurred during this EA does not constitute any sort of continuous or regular consultation and the consultation process should have been started again. Aboriginal parties were not regularly informed of progress in the KEQ Project.

Additionally, the assessment has not followed the best practice Aboriginal heritage consultation guidelines available. The assessment began in early 2010 under the ICCRs however at the same time the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010) were released by OEH to replace the ICCRs. While they are not specifically required under the DGRs since their release in early 2010 it has been best archaeological heritage management practice to use the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010). These requirements have been widely used in assessments of comparable Part 3A projects and clearly represent current best practice.

The report acknowledges that these guidelines are in existence but that the ICCRs are being followed and that this is permitted by the transitional arrangements in place. However, considering the gap of 16 months between stages of the consultation process it would be considered best practice to restart the consultation under the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010).

Due to these considerable deficiencies in the consultation process it is unclear if appropriate consultation with Aboriginal stakeholders has taken place.

3.3 Conclusion

The review of the Aboriginal cultural heritage assessment has identified a number of significant deficiencies in the reporting of Aboriginal cultural heritage for the KEQ Project. These include:

- the absence of information regarding the social and cultural significance of the study area particularly that which required the participation of the Aboriginal community;
- insufficient information regarding the landscape of the study area and the documentation of the survey strategy; and
- an inadequate consultation process which did not allow enough time for Aboriginal stakeholders to consider the assessment methodology, left a gap of 16 months in the consultation process with no contact with stakeholders and which did not follow best practice consultation methods.

On this basis, we believe that no properly informed decision can be made in regard to the KEQ Project until these identified deficiencies are addressed and it is clear that a detailed report has been prepared which includes comprehensive consultation with the Aboriginal community.

4 Ecology

Alison Hunt & Associates was commissioned by EMM to review the ecological assessment done for the KEQ Project.

The information reviewed included:

- the DGRs;
- the Terrestrial Ecology Survey and Assessment Report by RPS Australia East; and
- Identifying Offsets for Karuah East Quarry by Eco Logical Australia.

The review was based on a desk top assessment of the above mentioned information and did not involve a site visit.

4.1 Background to the assessment

The Terrestrial Ecology Survey and Assessment Report (RPS 2013) supersedes an earlier assessment (RPS 2011) which accompanied a previous Part 3A application to the DP&I for the KEQ Project. The 'updated' report incorporated additional flora survey work on the subject site carried out in 2012 by RPS, as well as a revised flora and fauna assessment in response to local and state government issues with respect to the KEQ Project. The superseded version of the Terrestrial Ecology Survey and Assessment Report prepared by RPS (2011) was not available for review so the basis for the additional work is unknown.

Contained at the rear of the Terrestrial Ecology Survey and Assessment Report (RPS 2013) is a letter from Eco Logical Australia (Our ref: 12SYDENV-0002) addressed to Karuah East Quarry Pty Limited and dated 4 March 2013, which summarises the progress on finding and securing offsets for the KEQ Project.

4.2 Study area

The subject land lies approximately 40 km to the north-east of Newcastle and approximately 5 km north-east of Karuah on the NSW lower North Coast. The majority of these lands are comprised of bushland. The area of investigation included (Figure 2, RPS 2013):

- Subject Site - part of Lots 12 and 13 DP 1024564 form the development footprint (quarry and associated infrastructure) and is referred to as the Subject Site. The Subject Site has an area of approximately 74.31 ha;
- Study Area - comprised of parts of Lots 12 and 13 DP 1024564 and all of Lot 14 DP 1024564 which is located to the east; and
- Study Locality - a 5 km radius around the boundary of the subject site is referred to as the Study Locality.

The 5 km radius around the boundary of the subject site falls below the generally accepted range for investigation. The industry standard is 10 km radius for assessments undertaken on the eastern side of the Great Dividing Range.

An existing Andesite quarry is located on adjacent Lots 11 DP 1024564 and Lot 21 DP 1024341. Part of Lot 12 has at some time in the past been set aside as Conservation Offset Lands. This area was excluded from surveys except for targeted surveys for *Asperula asthenes*.

The EA reports notes "the proposal will involve upgrade and extension works to Blue Rock Lane, realignment of the Andesite Road and Blue Rock Lane intersection and adjustment of road markings at Branch Lane and Andesite Road intersection". However, these areas have not been included in the assessment.

4.3 Contents of the report

Of particular importance is Appendix 6 where the statutory assessment under the EP&A Act and the NSW *Threatened Species Conservation Act 1995* (TSC Act) is set out. It was noted that the report does not provide a similar appendix containing a statutory assessment under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act).

4.4 Method

RPS (2013) has aimed the effort and extent of their surveys to meet the industry standard, Draft DEC 2004 *Threatened Biodiversity Survey and Assessment Guidelines*.

Rare or Threatened Australian Plants (RoTAPs) were omitted from searches and analyses and these should have been included.

Fauna surveys are considered inadequate as:

- these have not specifically addressed the *Survey Guidelines of Nationally Listed Threatened Species* produced by Commonwealth of Australia (DEWHA (2010) SEWPaC (2011));
- there was limited spatial and temporal replication for a project of this type and Part 3A assessment. For example survey was not done in the Dry Rainforest vegetation community and seasonal surveys were not done to identify such matters as seasonal migrants (eg Regent Honeyeater), winter-flowering feeders (eg Grey-headed Flying-fox) and fauna responding to changes in rain and/or temperature patterns (eg amphibians); and
- no attempt was made to quantify hollow-bearing trees and tree hollows (density and size) across the site. Such data provide important input in determining likely impacts on hollow-dependent fauna and fauna with specific hollow requirements (eg Yellow-bellied Glider and Glossy Black-Cockatoo).

4.5 Results

There are omissions of information that should have been gleaned as a part of the literature review as well as a lack of analyses of survey data to a level expected for this type of report, all of which are essential in the consideration of impacts. These are explained below:

- there is limited analysis of landscape context (eg bioregions, Mitchell landscapes, catchment management area, biodiversity values of the area including Great Lakes local government area, nearby conservation and forested areas);

- previous vegetation mapping undertaken within the locality, catchment management area, local government area and/or regionally significant vegetation communities have not been included in the report;

- there is limited detail relating to the flora species recorded (eg species recorded in each vegetation community/weeds recorded in each community/spatial extent of weed species versus native species);

- noxious weeds are not addressed;

- no mention or analyses of the occurrence of Matters of National Environment Significance (MNES) listed under the EPBC Act (ie world heritage areas, Ramsar wetlands, threatened ecological communities, threatened species, migratory species and commonwealth lands) within the locality as would be expected;

- endangered ecological communities and endangered populations listed under the TSC Act and which occur within the Great Lakes Local Government Area (LGA) and Hunter – Central Rivers Catchment Management Authority were not included in analyses; and

- RoTAPs have been omitted from the analysis.

4.6 Impact assessment

There has been no quantitative assessment of the proposed loss of vegetation in a landscape context. The author notes that there are no reliable datasets for Nerong Volcanics vegetation communities for the Great Lakes LGA which is a valid point and such an argument could be used for many areas across NSW. It is still up to the Author to make a scientifically valid analysis of the impact of loss of this vegetation, even if it is just within the Great Lakes LGA. The assessment does not allow the reader to know if the loss of vegetation associated with this proposal is large compared to remaining vegetation within the area or relatively minor given the extent of vegetation within the LGA.

There have been no analyses done on the potential impacts of blasting, noise or lights on fauna.

There have been no analyses of the cumulative impacts on the biodiversity of the Subject Area and Locality as a consequence of this latest proposal, including impacts on the adjacent conservation lands across the southern area of Lot 12 DP 1024564.

The statutory assessment under the EPBC Act is considered inadequate. Assessments under this Act have been confined to *Tetratheca juncea* and *Grevillea parviflora* subsp. *parviflora*. There has been no assessment of the level of impact associated with the KEQ Project on the other eight species deemed to be subject species (Appendix A). Migratory, endangered population and threatened ecological communities have not been mentioned nor addressed.

The statutory assessment under the TSC Act is potentially an incomplete assessment under this Act due to the omission of endangered populations.

4.7 Mitigation measures

Mitigation measures have been confined to vegetation clearing management, fauna management and threatened plant populations. Mitigation measures for threatened plant populations include the proposed salvage and reintroduction of *Tetratheca juncea* and *Grevillea parviflora* subsp. *parviflora*. It is

considered extremely unlikely that OEH would sanction or support the translocation of either of these species.

4.8 Offsets

This report prepared by Eco Logical Australia (2013) is based on a review of options for additional offsets, data collected for assessment of the KEQ Project and a brief site visit to two potential offset sites by a senior botanist. They note that biometric data required for a biobanking assessment to be undertaken were not collected for the impact site by RPS (2013).

At the time of the report, suitable biobanking credits were not available to purchase for offsetting impacts of a proposal which could not be mitigated. Instead the KEQ Project has proposed the provision of off-site private land for conservation, including two parcels of 56 ha of land: Karuah offset (partial Lot 14 adjacent to the impact site) and Tahlee offset (adjacent to the Karuah Nature Reserve).

Eco Logical Australia (2013) concluded that there would be a 'like for like' outcome regarding vegetation communities and habitat for threatened species and that an offset ratio of 3.7:1 would be achieved. The ecological assessment of the KEQ Project does not include a biobanking credit report for the proposed development site or biobanking agreement credit reports. Therefore, the complete applicability of the proposed offset sites remains unknown. The provision of adequate 'species credits' for *Tetratheca juncea* and *Grevillea parviflora* subsp. *parviflora* on these proposed offset lands may be difficult to achieve. This would require further analyses.

It is also noted that no mention of the potential for offsets which may be required by SEWPaC for the loss of *Tetratheca juncea* and *Grevillea parviflora* subsp. *parviflora*.

4.9 Conclusion

The review of the ecology assessment has identified a number of significant deficiencies in the assessment and reporting of ecological impacts for the KEQ Project. These include:

- the 5 km radius around the boundary of the subject site falls below the generally accepted range for investigation. The industry standard is 10 km radius for assessments undertaken on the eastern side of the Great Dividing Range;
- the area set aside as Conservation Offset Lands and the area of road extension and upgrade works should have been included in the assessment;
- additional fauna survey work is required to achieve spatial and temporal variation to identify the presence of seasonal migrants, winter flowering feeders and fauna responding to changes in weather patterns. These surveys should also attempt to quantify hollow-bearing trees and tree hollows (density and size) across the site;
- the reporting of the literature review and analysis of survey data should be revised to include landscape context, vegetation mapping, flora species context, description of weeds and an analysis of the occurrence of MNES listed under the EPBC Act, endangered ecological communities and endangered populations listed under the TSC Act and RoTAPS;
- further impact assessment is required to quantify the proposed loss of vegetation, indirect impacts and cumulative impacts. Statutory impact assessment under the EPBC Act and the TSC Act is also required; and

- biometric data needs to be collected for the impact site and the offset sites to determine the appropriateness of the offsets proposal outlined in the EA.

On this basis, we believe that no properly informed decision can be made in regard to the KEQ Project until these identified deficiencies are addressed and it is clear that an accurate assessment of the KEQ Project on ecological values and quantified justification for proposed offsets is provided.

5 Air quality

ENVIRON Australia was commissioned by EMM to review the air quality assessment for the KEQ Project by SLR Consulting (SLR) in November 2012, titled *Proposed Karuah East Quarry Project Pacific Highway Karuah Air Quality and Greenhouse Gas Assessment* (the AQGGA report).

5.1 Assessment method

The overall approach to the air quality assessment was generally in accordance with the NSW Environment Protection Agency (EPA, then DEC) *Approved Methods for Modelling and Assessment of Air Pollutants* (the Approved Methods for Modelling, DEC 2005). However, the following issues were identified:

- incomplete assessment of cumulative impacts from the existing Karuah Quarry; and
- inconsistencies in some of the emission factors used in compiling the emissions inventory for the KEQ Project.

5.1.1 Cumulative impact assessment

In order to account for cumulative impacts of emissions from the proposed Karuah East Quarry, proposed Kiely's Quarry and the existing Karuah Quarry, the following approach was undertaken:

- concentrations attributable to the proposed Karuah East Quarry and Kiely's Quarry were calculated through atmospheric dispersion modelling; and
- concentrations attributable to the existing Karuah Quarry were accounted for through ambient air quality monitoring data.

Local monitoring data, collected to the south of the existing Karuah Quarry by high volume air sampler (HVAS) between October 2006 and December 2008, was compared with concurrent data recorded at the NSW EPA monitoring station at Wallsend, approximately 43 km southwest of the Karuah Quarry HVAS. For concurrent measurements between 2006 and 2008, the maximum and mean recorded concentrations at Wallsend were shown to be higher than those recorded by the Karuah Quarry HVAS.

On the basis of this comparison, SLR considered the Wallsend EPA dataset a more conservative estimation of baseline concentrations at the Karuah East Quarry site, accounting for the contribution of the existing Karuah Quarry. To meet the requirements of the NSW EPA (as specified in Section 5 of the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW*) with regards to the use of continuous background datasets, the assessment adopted the Wallsend EPA dataset for 2008 to account for concentrations from the existing Karuah Quarry in the assessment of cumulative impacts with the KEQ.

The *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* states that the location at which the adopted background dataset was recorded should "resemble the existing sources at the Proposal Site". The Wallsend is situated in an urbanised area in the outer suburbs of Newcastle. The dominant land use is residential dwellings and parklands. While there is a small industrial estate located approximately 500 m to the north and a number of significant industrial and extractive operations in the surrounding 10 km, there are no notable extractive operations within 1 km of the Wallsend EPA station.

Figure 5 of the AQGGA report presents concurrent PM_{10} concentrations recorded at the Wallsend EPA and Karuah Quarry HVAS locations. Despite the spatial distance between the two locations, the two datasets show reasonable agreement on a day-to-day basis. It is considered that this is likely attributable to regional concentrations. To further illustrate this point, the 24-hour average PM_{10} concentrations recorded at the three NSW EPA Lower Hunter air quality monitoring stations (Wallsend, Newcastle and Beresfield) between October 2006 and October 2008 were collated and reviewed.

A scatter plot of the 24-hour average PM_{10} concentrations recorded at Wallsend paired with the coincident concentrations at Newcastle and Beresfield is presented in Figure 5.1. The scatter plot highlights that, while the concentrations experienced at Newcastle and Beresfield are typically higher, there is a strong agreement with the concentrations recorded at Wallsend, despite the spatial distance between the monitoring sites. Further the calculated correlation coefficient, a measure of the strength of relationship between two datasets, between the Wallsend and Newcastle and Wallsend and Beresfield datasets is 0.88 and 0.86 respectively (a value of 1 implies a strong relationship).

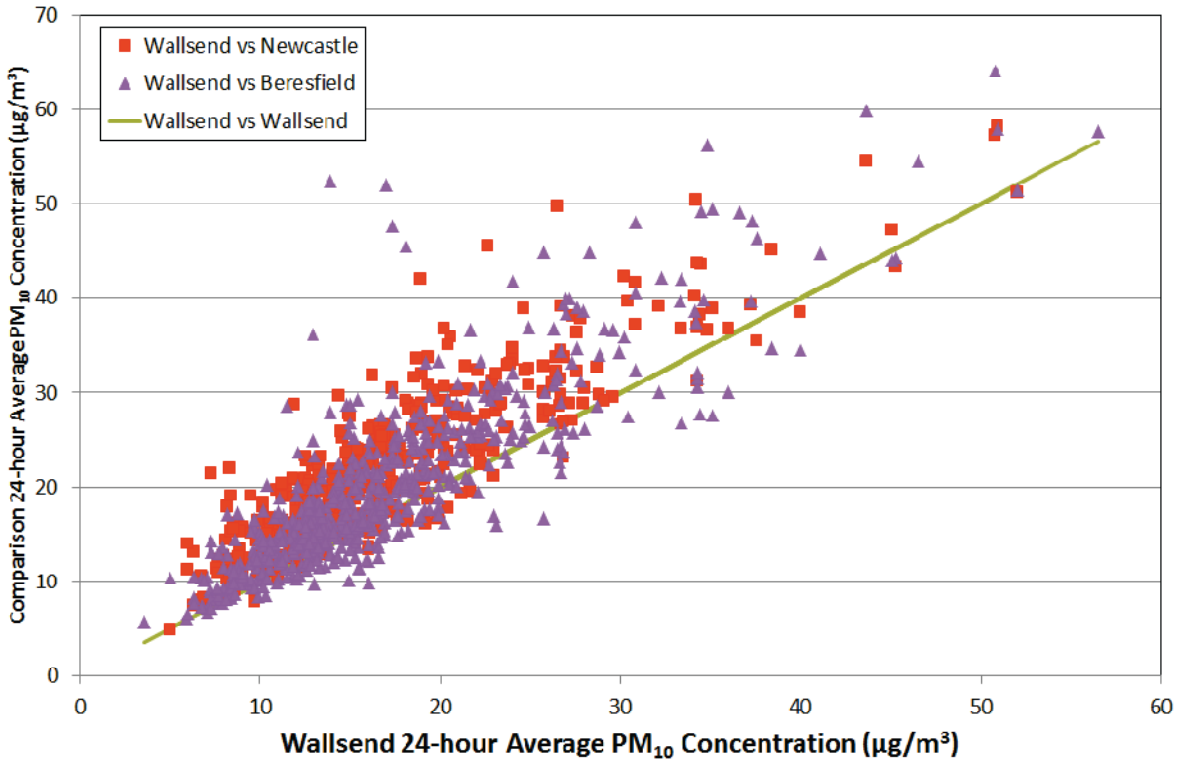

Figure 5.1 Comparison of 24-hour PM_{10} concentration in lower Hunter (2006 – 2008)

It is therefore considered that, due to the similarity in concentrations with other monitoring datasets in the Lower Hunter region, the Wallsend dataset provides a good measure of regional particulate matter concentrations. It is considered that the use of the Wallsend dataset in representing background PM_{10} concentrations attributable to regional sources is valid.

However, it is less certain that the contribution of the existing Karuah Quarry, in particular peak localised concentration events, have been accounted for.

The annual wind rose predicted for the Karuah East Quarry site (Figure 11 in the AQGGA report) is presented in Figure 5.2, overlayed on an aerial photo of the site. Also marked are the seven sensitive

receptor locations, the HVAS location where TSP and PM_{10} concentrations were recorded and the critical wind direction range where the HVAS is downwind of the existing Karuah Quarry.

Figure 5.2 Wind rose data used for assessment compared against the Karuah Quarry HVAS wind direction data

It can be seen from Figure 5.2 that the HVAS monitoring location is downwind of the existing Karuah Quarry when winds are from the north-west to north. Based on the predicted annual wind rose for the site presented in Figure 11 of the AQGGA report, winds from this direction occur approximately 11% of the year.

As described in the AQGGA report, winds at the site are predominantly from the west (12%) and southeast through to northeast (33% combined). It is therefore considered that the HVAS location is not located in the most optimal location to ensure that the majority of air quality impacts from the existing Karuah Quarry are recorded.

5.1.2 Emissions inventory

The details regarding the emissions inventory presented within the air quality assessment have been reviewed to determine the accuracy of emission calculations. The following issues were raised:

- The emission equation for "Excavator/Front End Loader on Product" listed in Table 24 of the assessment report could not be found with the provided reference (NPI, 2012). This equation should be clarified and emissions recalculated and remodelled as required.

- The use of the rainfall adjustment factor in the calculation of unpaved haul road emissions is not appropriate for the estimation of peak 24-hour average emissions. The use of this adjustment factor would reduce the calculated emissions from unpaved roads.

- A control factor of 100% was applied to the sealing of the unpaved roads used to transport product offsite. However, no emissions were accounted for the movement of vehicles along paved roads, nor were details regarding the control of emissions from such movements discussed. Onsite paved road surfaces have the potential to generate particulate emissions due to road surface silt loading.

- The source of the adopted values for silt and moisture content for unpaved roads, 1.5% and 5% respectively, is unknown. The silt content value in particular appears very low. The US-EPA *AP-42 Emission Factor Database*, Chapter 13.2.2, *Unpaved Roads* presents typical silt values for a range of industries. For Stone Quarrying and Processing, the US-EPA specifies in Table 13.2.2-1 that a mean silt content of 8.3% is applicable for "Haul road to/from pit". The use of 8.3% in place of 1.5% would drastically alter the emission factor for unpaved road emissions.

5.2 Conclusion

A technical review of the AQGGA report has been completed by ENVIRON. While the air quality impact assessment was generally in accordance with the NSW EPA *Approved Methods for Modelling*, the review highlighted the following issues:

- incomplete assessment of cumulative impacts from the existing Karuah Quarry; and

- inconsistencies within some emissions factors used in compiling the emissions inventory for the KEQ Project.

On this basis, we believe that no properly informed decision can be made in regard to the KEQ Project until these identified deficiencies are addressed and it is clear that there has been a complete assessment of cumulative impacts and the identified inconsistencies with some emissions factors has been resolved.

6 Noise and blasting

The EA for the KEQ Project includes a separate noise and blasting impact assessment report (NBIAR) (630.02482-R1), prepared by SLR Consulting Australia in November 2012. The NBIAR represents the primary information relating to the KEQ Project which has been reviewed by EMM.

The NBIAR for the KEQ Project has been reviewed in terms of:

- compliance with the specific requirements of the DGRs;
- compliance of the report methodology and the assumptions of the analysis with accepted practice, policies and guidelines pertaining to noise and vibration; and
- potential deficiencies in the assessment with respect to non compliance.

6.1 Director-General's requirements

The DGRs include the following requirements in regard to noise and vibration:

- "Noise and vibration – including construction noise, operational noise and off-site road noise impacts; and
- Cumulative impacts – including: noise and dust emissions".

The DGR requirements call for a "detailed" description of the existing environment, using sufficient baseline data.

6.2 Findings

The noise and vibration assessment was completed in general accordance with the *Industrial Noise Policy*, however some discrepancies within the assessment were identified that may influence the assessment outcomes. These include:

- ambient noise monitoring to quantify the KEQ Project specific noise levels (PSNL) were performed with the inclusion of quarrying activities (NM1 and NM2);
- logging data appears to not exclude unsuitable meteorological periods (for NM1 and NM2) and the meteorological conditions considered in the assessment are based on data obtained in an earlier assessment process, which arguably should be updated; and
- several minor discrepancies with regards to contemporary Australian Standards and noise policy references.

6.3 Ambient noise monitoring

Section 3 of the INP states: "for the assessment of modifications to an existing development, the noise from the existing development should be excluded from background noise measurements".

A review of ambient noise monitoring results has been completed. It is evident from Table 7 and Table 8 of the NBIAR that the quarry was operating concurrently to ambient noise measurements. It is understood that ambient road traffic is a significant contributor to noise levels, however, operator

attended surveys identify quarry noise contributions that influence the L_{90} metric that are used to derive the PSNL's. Therefore, the data was not assessed in accordance with the INP and is 'not suitable baseline data' as per the DGRs. The expected outcome is that the noise criteria should be lowered to account for the quarry noise contribution to NM1 and NM2 derived criteria. It is noted that NM1 is owned by the quarry, however the data from this location has been used to derive criteria for surrounding receivers.

It is clear from the noise logger charts that some quarry influence occurs to ambient levels at the time of the quarry start up (7 am), see Figure 1 reproduced from Appendix C of NBIAR. In Figure 6.1 it is evident that some 'morning shoulder' traffic noise from the highway is present (representative of the L_{eq} metric), however the L_{90} metric increases by approximately 17 dB(A) in the hour from 6 am to 7am, clarification is sought to demonstrate that the quarry was not influencing the ambient levels that were used to determine the PSNL as per the INP.

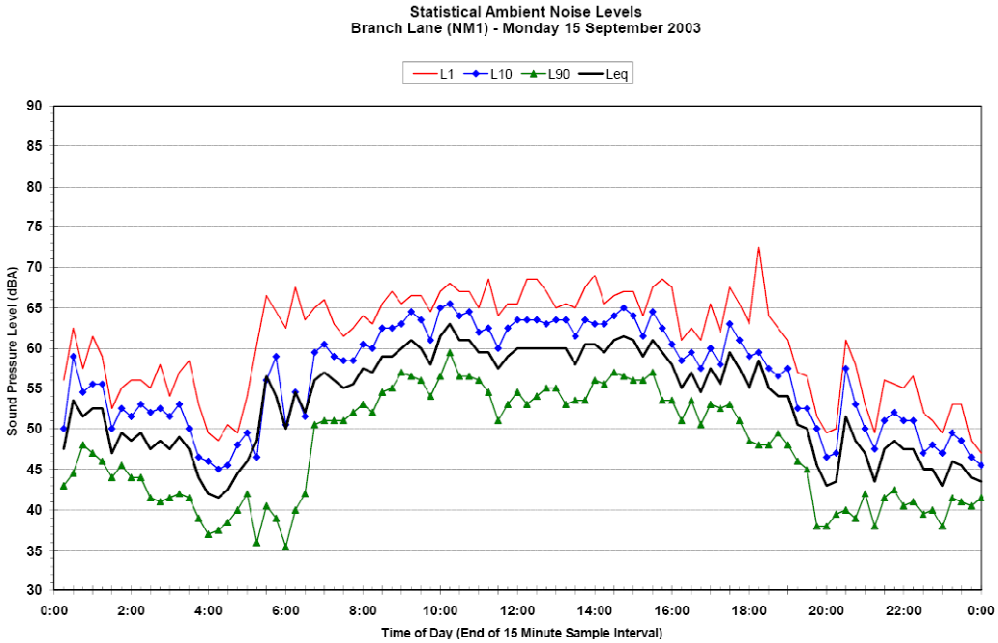

Figure 6.1 NM1, Monday 15 September 2003

Additionally, it is arguable that ambient levels for the area are outdated (more than 10 years old) and do not reflect the current noise environment.

6.4 Meteorological data

It is considered that ambient data for NM1 and NM2 are on occasion affected by winds above 5 m/s and rain (see Figure 6.2 and Figure 6.3). Clarification is sought regarding the exclusion of these periods from derivation of the rating background levels (RBL). If not, the PSNLs have not been assessed in accordance with the INP. Furthermore, it is unclear to the reviewer the age of the meteorological data used in the assessment. If the data was from 2003, it is arguable that the data is no longer representative of the subject site (ie not suitable baseline data) as per the DGR's.

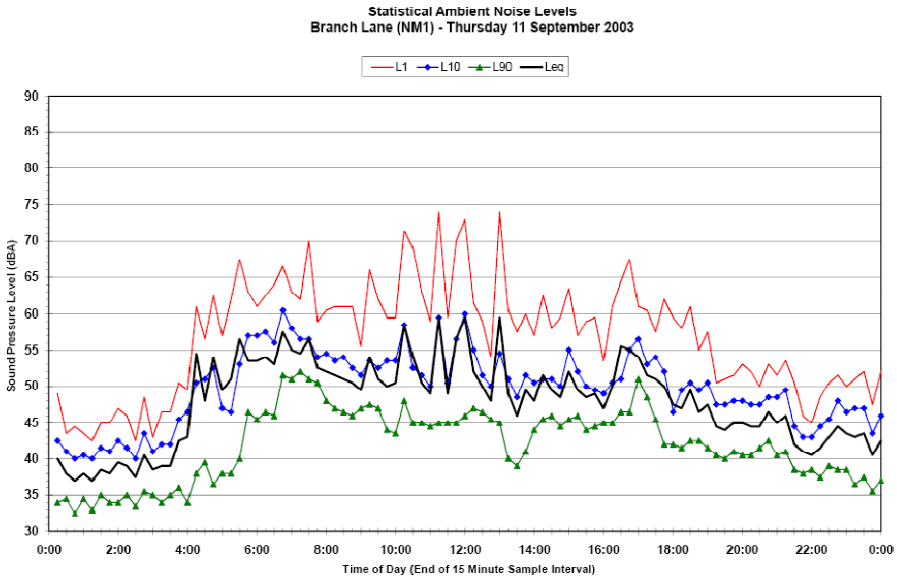

Figure 6.2 NM1, Thursday 11 September 2003

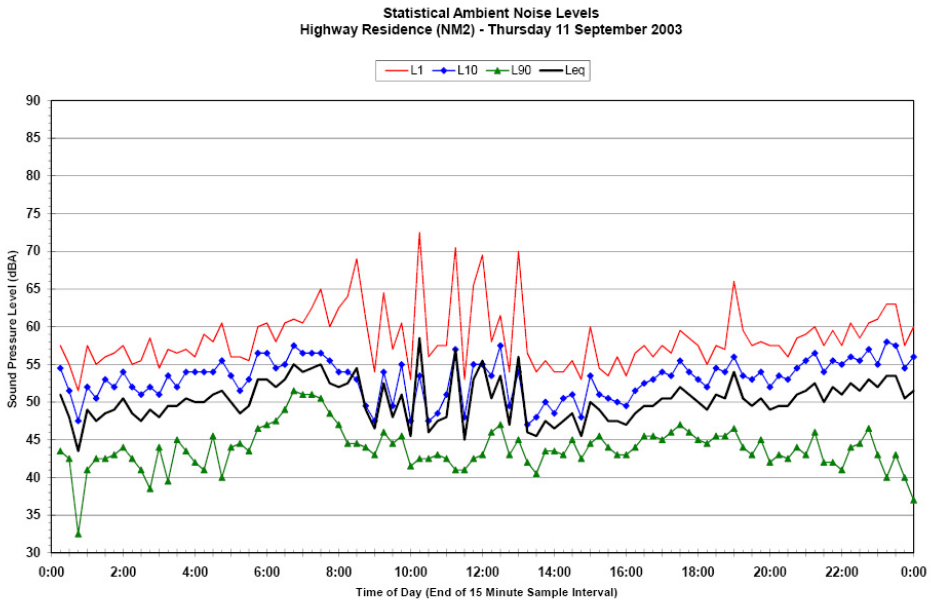

Figure 6.3 NM2, Thursday 11 September 2003

6.5 Noise standards and policy references

It is noted that the NBIAR made several incorrect references to Australian standard and relevant noise policy, these include:

- AS 2187.2-1993 is superseded and is now AS2187.2-2006; and
- Reference to the *Environmental Criteria for Road Traffic Noise* (ECRTN) which has been replaced by the *Road Noise Policy* (RNP, 2011).

It is noted that these references are minor and inconsequential to assessment outcomes and/or adopted criteria in the NBIAR.

6.6 Conclusion

Following EMM's review of the NBIAR, it is considered that there are a number of discrepancies that potentially affect the validity of the assessment in accordance with the INP and DGRs. These include:

- the failure to exclude the quarry noise from ambient assessment in accordance with Section 3 of the INP;
- the potential inclusion of wind and rain affected data when deriving the RBLs; and
- limited contemporary background data for both ambient noise and meteorological conditions.

On this basis, we believe that no properly informed decision can be made in regard to the KEQ Project until these identified deficiencies are addressed and it is clear that suitable baseline data is used for the assessment.

7 Justification and economics

Gillespie Economics was commissioned by EMM to review the justification and economic assessment for the KEQ Project.

The legislative requirement for economic analysis of the KEQ Project arises from the definition of the environment in the EP&A Act, the objects of the Act, the specification of the content of EISs/EAs provided in the Environmental Planning and Assessment Regulation 2000 (EP&A Regulation), DGRs and relevant policies and guidelines.

7.1 Legislative requirements

Section 4 of the EP&A Act provides the definition of environment as including "all aspects of the surroundings of humans, whether affecting any human as an individual or in his or her social groupings".

This broad definition of the environment includes the social and economic environment, as well as the biophysical environment. It is also anthropocentric in nature consistent with the welfare foundations of benefit cost analysis (BCA).

Section 5 (a) of the EP&A Act states that 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..".

In economics, welfare has specific meaning related to wellbeing of society and BCA is the main technique used to examine if projects are welfare improving.

Clause 7 (1) (f) of Schedule 2 of the EP&A Regulation requires that an EIS/EA includes "the reasons justifying the carrying out of the development, activity or infrastructure in the manner proposed, having regard to biophysical, economic and social considerations including the principles of ecologically sustainable development".

Justification of an investment project in economic terms requires more than providing disparate information on employment, taxes, and revenue. It requires a consideration of all costs and benefits and demonstration that the benefits to society exceed the costs.

Addressing the principles of ecologically sustainable development (ESD) in an EIS/EA can also be interpreted to require a consideration of economic matters since economic concepts and principles are directly relevant to ESD. In the EP&A Act the principles of ESD are identified as:

a) "the precautionary principle —namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

b) inter-generational equity—namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,

c) conservation of biological diversity and ecological integrity—namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,

d) improved valuation, pricing and incentive mechanisms—namely, that environmental factors should be included in the valuation of assets and services,..".

Improved valuation can be interpreted as a fundamental component of BCA.

7.2 Director-General's requirements

Clause 7 (2) (f) requires that an EIS/EA addresses any DGRs that are issued for a project. The DGRs issued for the KEQ Project includes a requirement for "a conclusion justifying the project on economic, social and environmental grounds,..".

As identified above, justification of a project on economic grounds requires a consideration of all costs and benefits and demonstration that the benefits to society exceed the costs.

The DGRs also identify the following key issue to be addressed: "social and economic – including an assessment of the socio-economic impacts of the project, and the demand on local infrastructure and services".

7.3 Policies and guidelines

The DGRs identify that the assessment of the key issues listed above must take into account relevant guidelines, policies, and plans. The list of guidelines includes the *Draft Economic Evaluation in Environmental Impact Assessment* (DoP 2002).

This guideline identifies that "to conduct a proper economic evaluation of the options associated with a proposed development that is likely to have significant environmental impacts it is essential to undertake a benefit-cost analysis".

The guideline also identifies that regional economic impact assessment using input-output analysis may provide additional information as an adjunct to the BCA.

7.4 Conclusion

Section 2.3.4 of the EA provides a consideration of the KEQ Project market and justification for the proposed output. The justification is considered deficient because it only considers the benefits to the proponent from developing the KEQ Project. The project justification should consider broader social impacts and the outputs of a BCA.

Section 6.12 of the EA provides a consideration of social and economic aspects of the KEQ Project.

No BCA is undertaken of the KEQ Project and hence the EA is considered to be inadequate with respect to legislative and policy requirements relating to economics. BCA of the KEQ Project would require:

- identification of the base case or without KEQ Project scenario;

- identification of the KEQ Project and its biophysical implications;
- identification and valuation of the incremental benefits and costs of the KEQ Project relative to the base case;
- consolidation of value estimates using discounting to account for temporal differences;
- application of decision criteria;
- sensitivity testing; and
- consideration of non-quantified benefits and costs.

Any BCA of the KEQ Project would need to summarise and synthesise the separate sections dealing with environmental, social and cultural impacts, and interpret these impacts in economic terms.

The economic analysis that is undertaken in the EA primarily involves consideration of the direct and indirect economic activity associated with expenditure during the construction and operation phase of the KEQ Project. As identified above, the draft guideline identifies that this type of assessment may be undertaken as an adjunct to BCA. It is not a substitute for BCA.

The EA confuses the results of the multiplier analysis, which focuses on indicators of economic activity (ie direct and indirect output (expenditure/revenue) and employment), with economic benefits that would be estimated in a BCA. The results of multiplier analysis are not economic benefits that are relevant to a BCA of the KEQ Project. Indeed, flow-on effects are normally excluded from BCA.

While multiplier analysis may be undertaken as an adjunct to BCA, the analysis undertaken in the EA is deficient. No input-output tables have been developed for the NSW or local region to assess the impacts of the KEQ Project for these areas. Instead, "the transaction tables used in this analysis are based on those developed at the national level by the ABS. This means that some value judgements and relativities have needed to be (sic) to determine relevant estimates for the state and local levels. This report leans on similar analysis for quarries across Australia. It makes judgements and calculations based on the best knowledge at the time supplied by the company". However, no references for the multipliers used are provided or any explanation of how national level multipliers were adjusted to NSW or local level.

Multipliers developed from primary input-output analysis take into account the levels of expenditure in the region as well as the extent to which purchases in the local region were also manufactured in the local region. Borrowing multipliers from other studies or making arbitrary adjustments from national multipliers is not recommended as these types of adjustments are unable to capture the intricacies of the regional and local economies they claim to represent.

On this basis, we believe that no properly informed decision can be made in regard to the KEQ Project until the above identified deficiencies are addressed and an accurate analysis of the benefits and costs of the KEQ Project are provided.

8 Other

8.1 Cumulative assessment

The EA report states that it addresses the cumulative impacts of the simultaneous operation of the existing Karuah Quarry, the proposed Karuah East Quarry and the proposed Kiely's Quarry on Lot 11 DP 1024564.

No description of the proposed Kiely's Quarry has been provided to allow accurate consideration of cumulative impacts. For example, it is not known if raw material from the proposed Kiely's Quarry will be crushed and stockpiled at the existing Karuah Quarry. This situation could mean Karuah Quarry operations on Lot 21 DP 1024341 continue for longer than five years as indicated in the EA report. In addition, it is unclear how the cumulative impacts have been considered for a number of assessments including:

- water (surface water and groundwater);
- ecology;
- traffic;
- socio-economics; and
- rehabilitation.

On this basis, we believe that no properly informed decision can be made in regard to the KEQ Project until a description of the proposed Kiely's Quarry is provided and the technical assessments for water, ecology, traffic, socio-economics and rehabilitation are updated to identify the contribution of the proposed Kiely's Quarry to cumulative impacts.

8.2 Water

The EA report states that "a baseline ecological health condition assessment of Yalimbah Creek will be undertaken prior to the commencement of operations, and monitoring of Yalimbah Creek will continue as part of the annual ecological monitoring of offset areas". Figure 14 in the EA report indicates SEPP 14 Coastal Wetlands are located on both Yalimbah Creek and Bulga Creek and are in the same catchment as the KEQ Project. Due to the conservation significance of these downstream wetland areas, the baseline assessment of Yalimbah Creek and Bulga Creek should have been done during the EA so that a properly informed assessment could be made of the potential impacts on these areas. It is also considered appropriate that the proposed ecological health condition monitoring program be extended to Bulga Creek and should include ecological health condition monitoring sites located both upstream and downstream of the KEQ Project disturbance area.

The EA report contains little description of release points for controlled and un-controlled discharges from Dam 1 and Dam 2 and there is limited baseline water quality and flow data available for the receiving waters. It is noted that there was considerable opportunity to collect this data during the EA (ie 2009-2013). Baseline water quality data and flow data for the receiving environment is required to assess the potential impact of water releases during flow events and to determine appropriate water quality and contaminant levels for release water under a variety of receiving environment flow conditions. The installation of a stream flow gauging station(s) would assist with the collection of data. In addition, no

mitigation measures are described for the management of potential impacts such as erosion of the bed and banks, or material build-up of sediment at the release points.

The proposed surface water monitoring parameters and program in Table 18 and Table 19 in the EA report is considered to be insufficient as follows:

- water quality characteristics of released water should be monitored daily during a release event. In addition, the daily quantity of released water should be measured at each release point;
- water quality release limits should consider the flow conditions in the receiving environment (ie electrical conductivity limits should be relative to the volume of flow in the receiving environment).
- no release limits have been proposed for total dissolved solids which was identified as being the key water quality parameter requiring management throughout the life of the KEQ Project. Release limits are required so that the performance of sediment and erosion control measures can be evaluated;
- turbidity should also be included in the surface water quality monitoring parameters. Measurement of turbidity in the receiving environment is required to assess ecosystem impacts and is considered important given the location of SEPP 14 Coastal Wetlands in the downstream receiving environment;
- no release contaminant trigger levels have been provided for petroleum hydrocarbons. This is considered essential given the KEQ Project includes the operation and maintenance of heavy plant and equipment, a workshop and fuel and oil storage areas;
- no downstream receiving environment monitoring points have been identified outside of the Lot boundary of the KEQ Project area; and
- no recommendation for biological monitoring in the receiving environment has been made (eg macroinvertebrates). Macroinvertebrate monitoring should be conducted at receiving environment monitoring points in accordance with the AusRivas method.

The success of the proposed water management system for the KEQ Project is in part, reliant upon the engineering design standards and construction of structures such as water management bunds, drains and dams. Applicable standards/manuals which will be used as the basis for design, hazard assessment and performance of water management structures should be specified along with the requirement for engineering certification of design plans and construction. As the performance of the water management system is integral to environmental performance at the KEQ Project site, the EA should also specify the intent of guidelines for the operation, management and monitoring/maintenance of water management structures.

8.3 Visual amenity

The EA report identifies that the visual impact of the KEQ Project was a key issue of concern raised by attendees at a public forum and representatives of the North Arm Residents Association.

The management of visual impacts relies on progressive rehabilitation of exposed surfaces post extraction to mitigate potential visual impacts. The quarry rehabilitation program discussed in the EA report identifies that revegetation will be done by re-instating topsoil and direct seeding. Some tubestock may also be introduced to increase biodiversity. While the rehabilitation approach is considered valid, it should not be underestimated how long it will take for rehabilitation to mitigate the visual impacts of the KEQ

Project. It could take many years and will be influenced by the appropriate management of topsoil and subsoil during the life of the quarry, achievement of a stable final landform (ie bank stability, control of surface inflow) and favourable climatic conditions.

Therefore, the ability of the rehabilitation program to mitigate visual impacts identified in the EA report is considered to be overestimated (at least in the medium term).

Despite the proposed mitigation measure, the proponent still has a responsibility to prevent visual impacts from occurring. For the KEQ Project, this would include upfront mitigation measures (eg bunds, screens) that would be implemented prior to construction. This is particularly relevant for views from the Pacific Highway to the KEQ Project where there could be a traffic safety concern.

8.4 Building standards

The EA report does not identify building/infrastructure design standards and building codes applicable to the KEQ Project.

For example, the EA report does not identify the capacity of carparking areas other than to say adequate carparking will be provided. Similarly, no standards or provisions have been proposed for disabled access.

It is considered important that the EA report includes a commitment from the proponent to comply with applicable local government building codes and relevant design and construction standards.

9 Conclusion

This review of the EA for the Karuah East Quarry has identified a significant number of technical errors or inadequacies. These include:

- serious deficiencies in the assessment of the proposed traffic capacity and safety impacts generated by the KEQ Project. The proposed means of access for the KEQ Project traffic to and from the Pacific Highway is inadequate. There is no funding proposal for the KEQ Project proponent to provide adequate future funding to ensure that the proposed access road will be adequately maintained as a public road under the care and control of Great Lakes Council;

- deficiencies in consultation with Aboriginal stakeholders and the reporting of Aboriginal cultural heritage for the KEQ Project;

- significant deficiencies in the assessment and reporting of ecological impacts for the KEQ Project. Adequate assessment of the KEQ Project footprint and offsets, spatial and temporal variation of fauna surveys, reporting of relevant landscape and ecological values, impact assessment and evaluation of offsets have been identified as issues;

- issues with the air quality impact assessment including incomplete assessment of cumulative Impacts from the existing Karuah Quarry and inconsistencies within certain of the emission factors used in compiling the emissions inventory for the KEQ Project;

- discrepancies that potentially affect the validity of the noise and blasting assessment including the apparent failure to exclude the quarry noise from ambient assessment, the potential inclusion of wind and rain affected data when deriving the RBL's and limited contemporary background data for both ambient noise and meteorological conditions;

- no justification for the KEQ Project on economic grounds. Justification on economic grounds would require consideration of all costs and benefits and demonstration that the benefits to society exceed the costs;

- no description of the proposed Kiely's Quarry has been provided to allow accurate consideration of cumulative impacts. It is unclear if cumulative impact assessments considering Kiely's Quarry has been done for all of the assessments as claimed;

- limited baseline studies have been done to support the assessment of impacts in the surface water receiving environment. Deficiencies in the surface water monitoring parameters and program have been identified. The basis of engineering design of water management structures and the operation, monitoring and maintenance of these structures should also be provided;

- the ability of the rehabilitation program to mitigate visual impacts of the KEQ Project is considered to be overestimated (at least in the medium term) and pre-construction mitigation measures should be implemented; and

- no commitment from the proponent to comply with applicable local government building codes and relevant design and construction standards.

For the reasons given above the EA does not provide a sufficient basis for a properly informed decision to be made about the proposal, meaning the application cannot be determined at this time.

Appendix A

Checklist for traffic generating developments

2.3 Issues to be addressed.

A traffic impact study should follow the standard format and structure that is listed in Table 2.1. This format covers the key issues to be addressed in determining the impact on traffic of a development. Use of this format and the checklist will ensure those involved in the preparation and / or assessment of Development Applications that the most significant matters are considered.

Table 2.1
Key issues in preparing traffic impact studies

Procedures & Key Parameters	Source	Check✓
Brief description of the development		
Application and study process		
Introduction		
Background		
Scope of report		
The key issues and objectives of a traffic impact study		
General Data Collection / Existing Conditions		
Description of the Site and Proposed Activity		
Site location		
Current land use characteristics (zoning) of the proposed site and land use in the vicinity	Development Consent Authority	
Site access		
The Existing Traffic Conditions		
Road hierarchy; including the identification of the classified road network (major and minor roads) which may be affected by the development proposal	Council / RTA	
Inventory of road widths, road conditions, traffic management and parking control	Council / RTA and Survey	
Current and proposed roadworks, traffic management works and bikeways	Council / RTA	
Traffic Flows		

Procedures & Key Parameters	Source	Check✓
Selection of key streets - possibly divided into the major and the minor road network; selection of key assessment periods, chosen to cover the times at which the development would be expected to have its major impacts	Section 3	
AADT on key streets	Council / RTA and Survey	
Daily traffic flow hourly distribution, particularly in or near residential areas	Survey	
Estimate of the speed of traffic on the road to which vehicular access is proposed	Survey	
Current traffic generation of site	Survey	
Daily and peak period heavy vehicle flows and percentages	Survey	
The adaptation of appropriate computer models or techniques for assessing levels of traffic congestion and queuing conditions		
Traffic Safety		
Accident history of road network in the area	Council / RTA	
Parking Supply and Demand		
On-street parking provision	Council	
Off-street parking provision	Council / Survey	
Current parking demand, including utilisation by time of day and turnover rates	Survey	
Short term pick up and set down areas	Council / Survey	
Modal Split		
Public Transport		
Rail station locations	State Rail / Cityrail	
Bus routes and bus stop locations; Pedestrian access to bus stops; Constraints and conflicts	STA / Private Operators / Council / Survey	
Rail and bus service frequencies, ideally separated into Monday to Friday, Saturday and Sunday, for both peak and off-peak times	State Rail / Cityrail / Survey	

Procedures & Key Parameters	Source	Check✓
Commuter parking provision	State Rail / Cityrail / Survey	
Pedestrian Network		
Identify major pedestrian routes	Survey	
Pedestrian flows and potential conflicts with vehicles, particularly where such conflicts cause capacity constraint on either vehicular or pedestrian movement	Survey	
Pedestrian infrastructure	Survey	
Proposed developments in the vicinity		
Proposed Development		
The Development		
Plan reference, if plans not contained in study report		
Nature of development		
Gross floor areas of each component of development		
Projected number of employees/users/residents		
Hours and days of operations		
Staging and timing of development		
Selection of appropriate design vehicles for determining access and circulation requirements	Section 6	
Access		
Driveway location, including review of alternative locations	Sections 5, 6	
Sight distance of driveways and comparisons with stopping and desirable minimum sight distances	Section 6	
Service vehicle access	Section 6	
Analysis of projected queuing at entrances	Section 6	
Current access to site and comparison with proposed access		
Provision for access to, and by, public transport	Section 6	

Procedures & Key Parameters	Source	Check✓
Circulation		
Proposed pattern of circulation	Section 6	
Internal road widths	Section 6	
Provision for bus movements	Section 6	
Service area layout		
Parking		
Proposed supply		
Parking provision recommended by State Government policy	RTA / DUAP	
Council code and local parking policies and plans	Council	
Parking layout		
Projected peak demand, based where appropriate on similar research reports and on surveys of similar developments;	Section 5	
Parking for Service / courier vehicles and bicycles	Section 5	
Impact of Proposed Development		
Traffic generation during design periods		
Daily and seasonal factors		
Pedestrian generation and movements		
Traffic Distribution and Assignments		
Hourly distribution of trips		
Assignments of these trips to the road system based where possible on development feasibility studies or on origin/ destination surveys undertaken at similar developments in the areas		
Impact on Traffic Safety		
Assessment of Road Safety Impact		
Impact of Generated Traffic		
Daily traffic flows and composition on key streets and their expected effect on the environment particularly in residential areas		

Procedures & Key Parameters	Source	Check✓
Peak period volumes at key intersections and effect of generated traffic on congestion levels	Survey	
Impact of construction traffic during construction stages		
Other proposed developments in the vicinity their timing and likely impact, if known		
Assessment of traffic noise		
Public Transport		
Options for extensions and changes to bus routes and bus stops following discussions with the STA and or private bus operators	STA / Private Operators	
Provision for pedestrian access to bus stops		
Recommended Works		
Improvements to site access and circulation		
Improvements to roads, signals, roundabouts and other traffic management measures		
Improvements to pedestrian facilities		
Effect of recommended works on the operation of adjacent developments		
Effect of recommended works on public transport services including access to bus routes and bus stops		
Provision of LATM measures		
Funding of proposed improvement projects		
Noise attenuation measures		

EMM
EMGA Mitchell McLennan

SYDNEY
Ground floor, Suite 1, 20 Chandos Street
St Leonards, New South Wales, 2065
T 02 9493 9500 F 02 9493 9599

NEWCASTLE
Level 1, 6 Bolton Street
Newcastle, New South Wales, 2300
T 02 4927 0506 F 02 4926 1312

BRISBANE
Suite 1, Level 4, 87 Wickham Terrace
Spring Hill, Queensland, 4000
T 07 3839 1800 F 07 3839 1866