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# Karuah East Quarry Project Noise Management Plan

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Karuah East Quarry Pty Limited  
PO Box 3284  
Thornton NSW 2322

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# Karuah East Quarry Project

## Noise Management Plan

### PREPARED BY:

SLR Consulting Australia Pty Ltd  
ABN 29 001 584 612  
10 Kings Road  
New Lambton NSW 2305 Australia  
(PO Box 447 New Lambton NSW 2305 Australia)  
T: +61 2 4037 3200 F: +61 2 4037 3201  
newcastleau@slrconsulting.com www.slrconsulting.com

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### DOCUMENT CONTROL

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## 1 INTRODUCTION

SLR Consulting Australia Pty Ltd (SLR) has been engaged by Karuah East Quarry Pty Ltd (Karuah East, the Proponent) to prepare a *Noise Management Plan* (NMP) to satisfy the requirements of the Project Approval (PA 09\_0175) granted on 17 June 2014 for the Karuah East Quarry Project (the Project).

The NMP has been prepared with reference to the following documents:

- *Environmental Assessment Report – Proposed Karuah East Hard Rock Quarry* prepared by ADW Johnson Pty Ltd dated 31 January 2013 (hereafter referred to as the EA);
- *Preferred Project Report – Proposed Karuah East Quarry* prepared by ADW Johnson Pty Ltd dated 30 July 2013 (hereafter referred to as the PPR);
- *Noise and Blasting Impact Assessment – Karuah East Quarry Project, Pacific Highway, Karuah* prepared by SLR dated 2 November 2012 (hereafter referred to as the NIA);
- Project Approval (PA) 09\_0175;
- Environment Protection Licence (EPL) 20611;
- *NSW Industrial Noise Policy (INP)* (EPA 2000); and
- *NSW Interim Construction Noise Guideline (IGNG)* (DECC 2009).

### 1.1 Consultation for this Management Plan

This NMP has been prepared as per Schedule 3 Condition 7 of the Project Approval (PA) which required this plan to be prepared in consultation with the EPA.

The EPA (Karen Marler) responded to Karuah East by email on 14 October 2015 stating that they do not approve management plans. They responded that:

*The EPA encourages the development of such plans to ensure that proponents have determined how they will meet their statutory obligations and designated environmental objectives. However, the EPA does not review these documents as our role is to set environmental objectives for environmental management, not to be directly involved in the development of strategies to achieve those objectives.*

A full copy of this response from EPA is attached as **Appendix A1**.

Karuah East consulted with the EPA during the application for the EPL for the Project.

Karuah East sought advice from the DP&E regarding whether noise criteria applied to Lot 11 DP 1024564 for the Karuah East Project. A letter was sent from Karuah East on 18 August 2015, and Colin Phillips from the DP&E responded on 25 September 2015. The following is an excerpt from this email:

*It is my understanding that the existing structure on Lot 11 is not a Council approved residence and accordingly there is no current residence on Lot 11 to which the noise impacts of the KEQP are to be assessed against the criterion in Table 2.*

*Therefore, at this time and unless and until a Council approved dwelling exists on Lot 11, attended monitoring (or other approved monitoring methods) on Lot 11 is not needed to assess whether compliance against the criterion in Table 2 is achieved.*

A full copy of this response from DP&E is attached as **Appendix A2**.

The NMP was submitted to the DP&E for review on 16 October 2015. The NMP has been updated to incorporate all comments received. The DP&E's review is attached as **Appendix A3**.

## 2 STATUTORY REQUIREMENTS

### 2.1 Project Approval Requirements

The NMP forms part of the Environmental Management Strategy (EMS) for the project and has been prepared in accordance with the operating conditions provided in Schedule 3 Condition 6 of the PA and as summarised in **Table 1**.

**Table 1 Operating Conditions**

Condition	Requirement	Relevant Section
<b>Schedule 3 – Environmental Performance Conditions</b>		
<b>Operating Conditions</b>		
6	The Proponent shall:	-
6(a)	Implement best practice to minimise the construction, operational and traffic noise of the project;	<b>Section 6</b>
6(b)	Minimise the noise impacts of the project during meteorological conditions when the noise limits in this approval do not apply;	<b>Section 6 and 7</b>
6(c)	Regularly assess noise monitoring data and relocate, modify, and/or stop operations on site as may be required to ensure compliance with the relevant conditions of this approval;	<b>Section 8.1</b>
6(d)	Apply and enforce a speed limit of 40 km/hour for all project-related vehicles on site; and	<b>Section 6</b>
6(e)	Ensure that project-related trucks slowing to use the intersection of Branch Lane and Andesite Road do not use engine or compression breaking systems,	<b>Section 6.2</b>
	To the satisfaction of the Secretary.	-

Requirements of the NMP are provided in Schedule 3, Condition 7 and Schedule 5, Condition 3 of the PA. These are reproduced in **Table 2** together with the relevant section(s) of the NMP where the requirements have been addressed.

**Table 2 Noise Management Plan Requirements**

Condition	Requirement	Relevant Section
<b>Schedule 3 – Environmental Performance Conditions</b>		
<b>Noise Management Plan</b>		
7	The Proponent shall prepare and implement a Noise Management Plan for the project to the satisfaction of the Secretary. This plan must:	Whole document
7(a)	Be prepared by a suitably qualified expert whose appointment has been approved by the Secretary;	Letter from DP&E approving SLR on 22/7/2015
7(b)	Be prepared in consultation with EPA, and submitted to the Secretary for approval prior to the commencement of construction activities;	<b>Section 1.1</b>
7(c)	Describe the measures that would be implemented to ensure compliance with the noise criteria and operating conditions in this approval;	<b>Section 6</b>
7(d)	Describe the proposed noise management system in detail; and	Whole document
7(e)	Include a monitoring program that: <ul style="list-style-type: none"> <li>• Uses attended and unattended monitoring to evaluate the compliance of the</li> </ul>	<b>Section 8</b> <b>Section 9</b>

Condition	Requirement	Relevant Section
	project against the noise criteria in this approval;	<b>Section 9.2</b>
	<ul style="list-style-type: none"> <li>Evaluates and reports on: <ul style="list-style-type: none"> <li>The effectiveness of the on-site noise management system; and</li> <li>Compliance against the noise operating conditions; and</li> </ul> </li> <li>Defines what constitutes a noise incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any noise incidents.</li> </ul>	
<b>Schedule 5 – Environmental Management, Reporting and Auditing</b>		
<b>Management Plan Requirements</b>		
3	The Proponent shall ensure that the Management Plans required under this approval are prepared in accordance with any relevant guidelines, and include:	Whole document
3(a)	Detailed baseline data;	<b>Section 4</b>
3(b)	A description of: <ul style="list-style-type: none"> <li>The relevant statutory requirements (including any relevant approval, licence or lease conditions);</li> <li>Any relevant limits or performance measures/criteria; and</li> <li>The specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures;</li> </ul>	<b>Section 2</b>
3(c)	A description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;	<b>Section 6</b>
3(d)	A program to monitor and report on the: <ul style="list-style-type: none"> <li>Impacts and environmental performance of the project; and</li> <li>Effectiveness of any management measures (see (c) above);</li> </ul>	<b>Section 6</b> <b>Section 8</b>
3(e)	A contingency plan to manage any unpredicted impacts and their consequences;	<b>Section 10</b>
3(f)	A program to investigate and implement ways to improve the environmental performance of the project over time;	<b>Section 12.3</b>
3(g)	A protocol for managing and reporting any: <ul style="list-style-type: none"> <li>Incidents;</li> <li>Complaints;</li> <li>Non-compliances with statutory requirements; and</li> <li>Exceedances of the impact assessment criteria and/or performance criteria; and</li> </ul>	<b>Section 10</b>
3(h)	A protocol for periodic review of the plan.	<b>Section 11</b>

Noise impact assessment criteria for the Project are contained within Schedule 3 Conditions 3 to 5 of the PA and are outlined in **Section 4**.

## 2.2 Federal Approval

Federal Approval (EPBC 2014/7282) was granted for the site under the Environment Protection and Biodiversity Conservation Act (EPBC Act 1999) on 20 March 2015.

The Federal Approval contains no conditions with regard to noise emissions or noise management.

## 2.3 Environment Protection Licence Requirements

The Environment Protection Authority (EPA) regulates the operations conducted at the Project site through an Environment Protection Licence (EPL 20611) issued under the Protection of the Environment Operations Act 1997 (POEO Act).

There are several conditions relating to noise management in the EPL which have been addressed in this NMP. Specific EPL conditions are summarised in **Table 3** together with the relevant sections of the NMP indicating where the requirements have been addressed.

**Table 3 Environment Protection Licence Requirements**

Condition	Summary of Condition	Relevant Section
L4	Noise limits	<b>Section 5.2.2</b>
L6	Hours of operations	<b>Section 3.3</b>
O7.1	Noise and Blast Management	<b>Section 6.2</b>
M8	Noise Monitoring	<b>Section 8</b>
R4.3	Noise Monitoring Report	<b>Section 9.1</b>

## 2.4 Statement of Commitments

Commitment 2.0 of the Statement of Commitments states that a Noise Monitoring Plan will be prepared prior to the commencement of construction works. The relevant commitments relating to noise are included in Commitment 5.0 of the Statement of Commitments and are reproduced in **Table 4** below. The requirement to prepare the Noise Monitoring Plan has been covered by this NMP.

**Table 4 Statement of Commitments**

Condition	Commitment	Timing	Relevant Section
<b>Noise, Blasting and Vibration<sup>1</sup></b>			
5	Four (4) metre noise barriers will be included around stockpile and stacker locations to reduce noise emissions from mobile plant items in these areas.	Prior to operations	<b>Section 6</b>
	Noise compliance monitoring will be undertaken in accordance with conditions of consent by a suitably qualified acoustic expert. The monitoring will consider the performance of the quarry in relation to the project specific noise, vibration and blast criteria established in the SLR Noise and Blasting Impact Assessment (dated 2 November 2012).	During operations as per this NMP.	<b>Section 8</b>

1 – Blast management requirements are presented separately in the Karuah East Blast Management Plan dated August 2015.

## 3 PROJECT DESCRIPTION

### 3.1 Overview

Hunter Quarries currently extract hard black andesite material from its existing quarry operation on adjoining lands. Approval was granted for this designated development on the adjoining land (Lot 21 DP 1024341, Lot 11 DP 1024564 and Lot 12 DP 1024564) by the Minister as State Significant Development on 3rd June 2005 (DA265/10/2004).

The existing Karuah Quarry currently operates under development approval DA 265/2004 and is approved to extract up to 500,000 tonnes per annum (tpa) of 'andesite' basalt material suitable for use as road base, construction aggregate and concrete batching, among various other applications.



Following exploratory works adjacent to the existing approved quarry, additional resource has been identified to the east on land owned by the Proponent (Project site). On 17 June 2014, the approval (09\_0175) was granted by the Planning Assessment Commission on behalf of the Minister for Planning and Environment for the extraction of this additional resource through the development of Karuah East, a stand-alone operation to the existing quarry. Federal Approval (EPBC 2014/7282) was granted for Karuah East under the Environment Protection and Biodiversity Conservation Act (EPBC Act 1999) on 20 March 2015.

### 3.2 Project Site

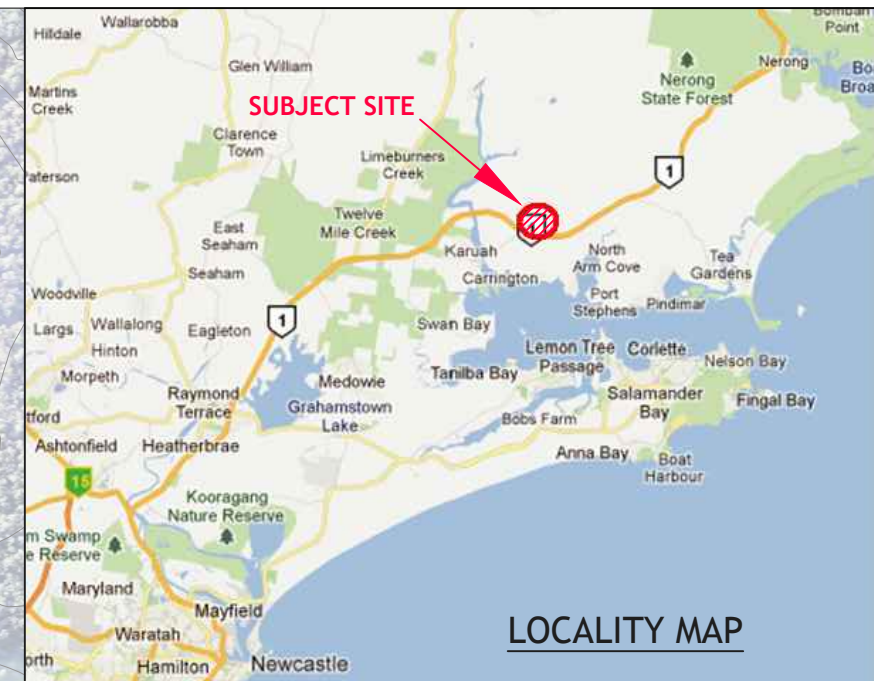
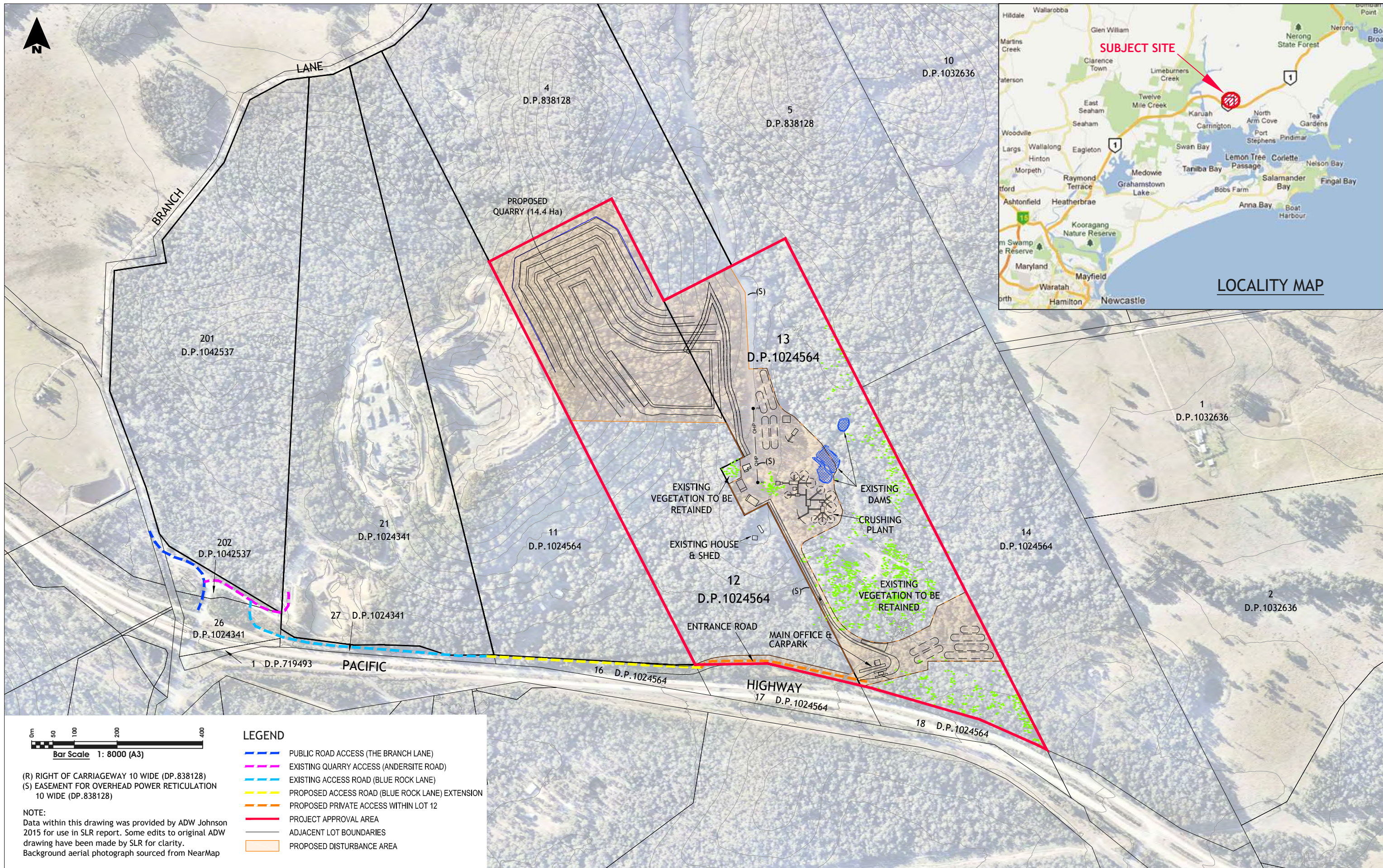
The Project site is located on Lots 12 and 13 DP 1024564, off the Pacific Highway, approximately 3 km north of Karuah NSW.

The approved Project includes the following key elements:

- Staged extraction of approximately 29 million tonnes of “andesite” over a 20 year timeframe;
- Extraction of up to 1.5 million tonnes of andesite material per year;
- Removal and stockpiling of an estimated 380,000 m<sup>3</sup> of overburden (approximately 750,000 tonnes) from the quarry extraction area in accordance with the Rehabilitation Plan prepared for the EIS. Removal of overburden is not included in the proposed extraction rate of 1.5 million tonnes of andesite annually;
- Haulage of up to 1.5 million tonnes of andesite per year from the site to market by 25 to 30 tonne haul trucks via the Pacific Highway;
- Up to 216 truck loads per day (at maximum production);
- Implementation of water management and erosion and sediment control works to ensure no loss of sediment, dust minimisation and to control discharges from the site to ensure that all discharges are within acceptable volumetric and water quality criteria;
- Roadworks to secure access to the site including upgrade & extension of Blue Rock Lane, realignment of Andesite Road & Blue Rock Lane intersection and adjust road markings at Branch Lane & Andesite Road intersection;
- Employment of 28 on-site staff;
- Construction of new haul road and access through adjoining RMS land;
- Staged clearing;
- Drilling and blasting activities;
- Loading and hauling of extracted material;
- Crushing and screening of extracted material;
- Stockpiling of material on-site; and
- Location of plant on Lot 13 comprised of office buildings, workshops, parking areas, crushing plant, wash plant, weigh bridge and product storage areas.

**Figure 1** presents the Project site plan and layout.





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### 3.3 Operating Hours

In accordance with Schedule 2, Condition 7 of the PA and Condition L6 of the EPL, the Project is approved to operate during the hours presented in **Table 5**.

**Table 5 Operating Hours**

Activity	Operating Hours
Quarrying operations including extraction, processing and loadings / transport	7.00 am to 6.00 pm, Monday to Friday; and 7.00 am to 1.00 pm, Saturdays. No quarrying operations on Sundays or Public Holidays
Construction activities	7.00 am to 6.00 pm, Monday to Friday; and 8.00 am to 1.00 pm, Saturdays. Unless noise from the activities does not exceed 35 dB(A) <sub>L<sub>Aeq</sub>(15minute)</sub> at any privately-owned residence.
Maintenance activities	24 hours a day, 7 days per week, providing maintenance activities are inaudible at any privately-owned residence.

Note: This condition does not apply in the event of a direction from police or other relevant authority for safety or emergency reasons regarding works which may need to be undertaken to avoid loss of life, property loss and/or to prevent environmental harm.

### 3.4 Noise Sensitive Receivers

A number of noise sensitive receivers are located in the area surrounding the Project site. These receivers were assessed in the EA and are presented in **Table 6** and **Figure 2**.

**Table 6 Noise Sensitive Receivers**

Receiver ID	Details
<b>Existing Approved Dwellings</b>	
A	Lot 100 DP 785172
B	Lot 3 DP 785172
C	Lot 2 DP 785172
D	Lot 22 DP 1024341
E	Lot 250 DP 1092111
F	Lot 50 DP 1036893
G	Lot 1 DP 1032636
<b>Other Structures</b>	
Lot 11 <sup>1</sup>	Lot 11 DP1024564

Note 1 - No currently approved residential dwelling exists on Lot 11.

Proposed noise monitoring locations are also presented in **Figure 2** and are discussed in **Section 8**.



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## 4 BASELINE DATA

Ambient noise levels in the vicinity of the project were monitored for the purpose of the NIA prepared for the EA. Noise monitoring locations and monitored noise levels are representative of the acoustic environment at the nearest approved residential locations in the absence of noise emissions from Karuah East and the existing Karuah Quarry. Noise monitoring locations are presented in **Figure 2**. These have been reported in detail in the NIA (SLR, 2012) and are summarised in **Table 7**.

**Table 7 Summary of Existing Ambient Noise Levels**

Location	Description	Background LA90 Noise Level	Measured Existing LAeq Noise Level	Existing LAeq Industrial Contribution
		Rating Background Level (RBL)		
NM1 (Representative of location F)	Day	44 dB(A)	54 dB(A)	43 dB(A)
NM2 (Representative of Locations A to E and Structure on Lot 11)	Day	44 dB(A)	53 dB(A)	< 49 dB(A)
NM3 (Representative of Location G)	Day	34 dB(A)	51 dB(A)	< 44 dB(A)

Note: Daytime 7.00 am to 6.00 pm; Evening 6.00 pm to 10.00 pm; Night-time 10.00 pm to 7.00 am, Monday to Saturday. The LA90 represents the level exceeded for 90% of the interval period and is referred to as the average minimum or background noise level. LAeq - The equivalent continuous noise level is defined as the level of noise equivalent to the energy average of noise levels occurring over a measurement period.

Ambient noise level data has also been recorded during bi-annual compliance monitoring for the existing Karuah Quarry operations and has been reported in the Annual Environmental Management Reports (AEMRs). The ambient noise level data has shown that noise levels have typically increased over time due to greater road traffic volumes on the Pacific Highway.

## 5 NOISE IMPACT ASSESSMENT CRITERIA

### 5.1 Construction Noise Goals

The PA and EPL do not provide specific construction noise criteria for the Project. The NSW EPA Interim Construction Noise Guideline (ICNG) sets out noise criteria applicable to construction site noise for the purpose of defining intrusive noise impacts. **Table 8** sets out the noise management levels and how they are to be applied. The approach is intended to provide respite for residents exposed to excessive construction noise outside the recommended standard hours whilst allowing construction during the recommended standard hours without undue constraints.

**Table 8 IGNG Construction Noise Management Levels**

Time of Day	Management Level	How to apply
Recommended standard hours : Monday to Friday 7:00am to 6:00pm Saturday 8:00am to 1:00pm No work on Sundays or public holidays	Noise affected RBL + 10 dBA	The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured LAeq,(15mins) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to minimise noise. The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75 dBA	The highly affected noise level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the proponent should consider very carefully if there is any other feasible and reasonable way to reduce noise below this level. If no quieter work method is feasible and reasonable, and the works proceed, the proponent should communicate with the impacted residents by clearly explaining the duration and noise levels of the works, and by describing any respite periods that will be provided.
Outside recommended standard hours	Noise affected RBL + 5 dBA	A strong justification would typically be required for works outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable practices have been applied and noise is more than 5 dBA above the noise affected level, the proponent should negotiate with the community.

In accordance with the ICNG, **Table 9** presents the adopted construction noise goals for the project.

**Table 9 Project Specific Construction Noise Goals (dBA LAeq(15minute))**

Location	Adopted RBL <sup>1</sup>	Noise Management Level (dBA LAeq(15minute))	
		Noise Affected	Highly Noise Affected
Any approved Residence on Lot 11 DP 1024564 <sup>2</sup>	44	54	75
A to E	44	54	
F	44	54	
G	34	44	

Note 1 – Adopted RBL as per **Table 7**.

Note 2 – At present there is no approved residence on Lot 11.

## 5.2 Operational Noise Criteria

### 5.2.1 PA Schedule 3 Condition 3

Operational noise criteria are presented in Schedule 3 Condition 3 of the PA as follows:

*The Proponent shall ensure that the operational noise generated by the project does not exceed the criteria in **Table 10**.*

**Table 10 Operational Noise Criteria (dBA LAeq(15minute))**

Location	Criteria (day)
Residence on Lot 11 DP 1024564	43
A	40
B	37
G	38
All other residences	35

Notes:

- Receiver locations are shown in **Figure 2**.
- Noise generated by the project is to be measured in accordance with the relevant requirements, and exemptions (including certain meteorological conditions), of the NSW Industrial Noise Policy.
- **Section 5.5** sets out the meteorological conditions under which these criteria apply.

The noise criteria in **Table 10** do not apply if the Proponent has an agreement with the relevant landowner to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of the agreement.

#### 5.2.2 EPL Condition L4

The noise limits set out in condition L4.1 of the EPL are reproduced in **Table 11** are generally consistent with those contained in the PA (refer **Section 5.2.1**).

**Table 11 EPL Noise Limits (dBA LAeq(15minute))**

Location	Noise Limit dBA Day LAeq(15minute)
Residence A on Lot 100 DP 785172	40
Residence B on Lot 3 DP 785172	37
Residence G on Lot 1 DP 1032636	38
Any other residence or sensitive receiver not subject to a private negotiated agreement	35
Any approved residence on Lot 11 DP 1024564	43

#### 5.2.3 Operational Noise Limits on Lot 11

It is noted that the noise limits detailing in the EPL for Lot 11 are for “*any approved residence on Lot 11 DP 1024564*”. At this time, there is currently not an approved residence on Lot 11 and therefore it is considered that the noise limits do not currently apply at this location.

As outlined in **Section 1.1**, the DP&E agree that criteria only applies to ‘Residence on Lot 11’ if there is a council approved residence within Lot 11. As of October 2015, there is not a council approved residence on Lot 11. Karuah East is committed to undertaking noise monitoring to determine compliance at ‘approved residences’ only. Should a residence be approved by council on Lot 11, the NMP will be updated to include noise monitoring at this location.

### 5.3 Road Traffic Noise Criteria – PA Schedule 3 Condition 4

Road traffic noise criteria are presented in Schedule 3 Condition 4 of the PA as follows:

The Proponent shall take all reasonable and feasible measures to ensure that the traffic noise generated by the project does not cause additional exceedances of the criteria in **Table 12** at any residence on privately-owned land.

**Table 12 Road traffic noise criteria (dBA LAeq(period))**

Road	Criteria (day)
Pacific Highway	60
Local roads	55

### 5.4 Cumulative Noise Criteria – PA Schedule 3 Condition 5

Cumulative noise criteria are presented in Schedule 3 Condition 5 of the PA as follows:

*The Proponent shall implement all reasonable and feasible measures to ensure that the noise generated by the project combined with the noise generated by adjacent quarrying operations does not cause any exceedance of the criteria in **Table 13**.*

**Table 13 Cumulative noise criteria (dBA LAeq(period))**

Location	Criteria (day)
F	50
G	50
All other privately-owned residences, except the residence on Lot 11	55

Notes:

- Receiver locations are shown in **Figure 2**.
- The structure used as a residence on Lot 11 is excluded from **Table 13** because the other major contributor to cumulative noise totals is quarrying operations conducted on this Lot, under agreement with the Lot owner.
- Cumulative noise is to be measured in accordance with the relevant requirements, and exemptions (including certain meteorological conditions), of the NSW Industrial Noise Policy.
- **Section 7** sets out the meteorological conditions under which these criteria apply, and the requirements for evaluating compliance with these criteria.

### 5.5 Applicable Meteorological Conditions

Appendix 3 of the PA sets out the applicable meteorological conditions for the project as follows:

The noise criteria are to apply under all meteorological conditions except the following:

- during periods of rain or hail; or
- wind speeds greater than 3 m/s measured at 10 m above ground level.

In addition, the EPL details the following meteorological exclusions:

- Stability category F temperature inversion conditions and wind speeds greater than 2 metres/second at 10 metres above ground level; or
- Stability category G temperature inversion conditions.



## 6 NOISE MITIGATION AND MANAGEMENT MEASURES

In accordance with Schedule 3 Condition 6 of the PA, the quarry will implement best practise noise management, including all reasonable and feasible noise mitigation measures to minimise the construction, operational and road traffic noise generated by the Project.

### 6.1 Construction Activities and Construction Traffic

The following best practice noise control measures shall be implemented:

- Adherence to operating hours outlined in **Table 5**;
- Noise monitoring on site and within the community;
- Keep plant and equipment well maintained, regular inspection and maintenance of equipment to ensure it is good working order and operating at the lowest feasible noise level;
- Equipment not to be operated until it is maintained or repaired;
- Regularly train staff and contractors (ie toolbox talks) to use equipment in ways to minimise noise;
- Operate mobile plant in a quiet, efficient manner;
- Switching off vehicles and plant when not in use;
- A speed limit of 40 km/hour will be applied and enforced for all construction-related vehicles onsite; and
- Incorporate clear signage at the site including relevant contact numbers for community enquiries; and
- Prompt response to any community issues of concern.

### 6.2 Operational Activities and Operational Road Traffic

Noise mitigation measures to be implemented for the project have been provided in the NIA (SLR, 2012), the PA and the Statement of Commitments and are reproduced and summarised as follows:

- All crushers and screens will be enclosed;
- Four (4) metre noise barriers will be included around stockpile and stacker locations to reduce noise emissions from mobile plant items in these areas;
- Haul roads from the site to the Pacific Highway will be sealed;
- A speed limit of 40 km/hour will be applied and enforced for all project-related vehicles onsite; and
- Project related trucks slowing to use the Branch Lane and Andesite Road intersection will not use engine or compression breaking systems.

In addition, the best practice noise control measures outlined in **Section 6.1** shall continue to be implemented for operational activities.

It is noted that in accordance with Condition O7.1 of the EPL:

*All acoustic bunds necessary to achieve compliance with the noise limits specified in this licence must be constructed prior to the commencement of quarrying activities and be maintained throughout the operational life of the premises to the height and location described in the Noise Management Plan.*

As such, the four (4) metre noise barriers around the stockpile and stacker locations will be constructed prior to the commencement of quarrying activities.

## 7 METEOROLOGY

In accordance with Schedule 3 Condition 17 of the PA, a meteorological station will be installed and situated in compliance with *Approved Methods for Sampling of Air Pollutants in New South Wales* guidelines.

The weather station will be programmed to continuously record the meteorological parameters as shown in **Table 14**.

**Table 14 Meteorological Measurement Parameters**

Measured Parameter	Unit	Sample Interval
Mean wind speed	m/s	15 minute
Mean wind direction	Degrees	15 minute
Aggregate rainfall	mm	15 minute
Mean air temperature	C°	15 minute
Sigma-theta ( $\sigma_A$ )	Degrees	15 minute

This data can be accessed via a website to view to the latest hour or to download previously recorded data. Previously recorded data is validated and can be downloaded in intervals of 15 minutes.

Meteorological data will be monitored to determine noise enhancing meteorological conditions and if necessary, quarrying operations will be modified to reduce potential impacts at the nearest noise sensitive receivers under noise enhancing meteorological conditions.

## 8 NOISE MONITORING PROGRAM

The Noise Monitoring Program is designed to ensure that noise is measured at representative locations in the vicinity of the Project Site. Data from the monitoring program will be used to determine the noise impact of the Projects operations at the surrounding receivers, and the compliance status of the quarrying operations in relation to the relevant PA and EPL conditions presented in **Section 5**.

### 8.1 General Requirements of the Noise Monitoring Program

Noise measurements required in accordance with the NMP will be undertaken by a suitably qualified and experienced acoustic expert. The noise measurement procedures employed throughout the monitoring programme will be guided by the requirements of AS 1055 1997 *Acoustics - Description and Measurement of Environmental Noise*.

Noise monitoring data and reports will be reviewed by the Quarry Manager. If monitoring reports or site activities indicate noise above criteria, Karuah East will review site activities in an attempt to effectively manage noise.

### 8.2 Instrumentation and Measurement Parameters

All acoustic instrumentation employed throughout the monitoring programme will be designed to comply with the requirements of AS IEC 61672.1 – 2004 *Electroacoustics—Sound level meters - Specifications* and carry current NATA or manufacturer calibration certificates.

Instrument calibration will be checked before and after each measurement survey, with the variation in calibrated levels not exceeding  $\pm 0.5$  dB(A).

### 8.3 Operator Attended Noise Monitoring

In accordance with the Schedule 3 Condition 7(e) and Appendix 3 of the PA, operator attended noise monitoring will be used to evaluate compliance with the noise criteria presented in **Table 9** to **Table 13**.

Operator attended noise surveys shall be conducted at locations outlined in **Section 8.3.1**, with these being potentially most affected receiver locations (approved dwellings) relevant to quarrying operations at the time of monitoring, in order to quantify noise emissions and estimate the LAeq noise contribution from the Karuah East quarry as well as the overall ambient noise level.

Each operator attended noise survey shall be a minimum duration of 15 minutes during the daytime, as defined in the INP during typical operating conditions. All noise measurements shall be accompanied by both qualitative description (including cloud cover) and quantitative measurements of prevailing local weather conditions throughout the survey period.

The operator shall obtain information regarding the relevant fixed plant and mobile equipment operating logs to be included in the noise monitoring report.

During each survey the maximum (LAmax), the energy equivalent (LAeq) and background (LA90) noise levels from ambient noise sources and Project operations shall be quantified and characterised. Digital audio recordings will be conducted to allow for additional post analysis of the Project contributed noise levels and to assist in source identification.

For the purposes of determining the noise generated by the quarry the modifying factors detailed in Section 4 of the NSW Industrial Noise Policy (INP) will be applied as appropriate to the measured noise levels.

#### 8.3.1 Monitoring Locations

Following review of the draft NMP, DP&E have requested that noise monitoring be undertaken at the following locations identified in **Figure 2**:

- Location F; and
- Location G.

At locations A and B it will be difficult to measure the LAeq noise from Karuah East due to the presence of other noise sources, in particular the Pacific Highway. As such, as advised by the DP&E noise monitoring is not required at locations A and B (refer **Appendix A3**). Notwithstanding this, noise measurements will be undertaken at an appropriate location closer to the quarry and then calculated back to the receiver locations to determine likely compliance with the noise limits in **Section 5**.

As noted in **Section 5.2.3**, there is currently no approved residence on Lot 11 and therefore noise monitoring is not currently required at this location. Should a residence be approved by council on Lot 11, the NMP will be updated to include noise monitoring representative of this location.

### **8.3.2 Monitoring Frequency**

#### **Construction Noise Monitoring**

Construction noise monitoring will be undertaken at the commencement of the following activities associated with the construction program:

- Construction of the Site Access Road; and
- Clearing of the plant/pit area.

#### **Operational Noise Monitoring**

Operational noise monitoring will be conducted initially on a quarterly basis. The frequency of monitoring will be reviewed after the first 2 years of operations in order to determine future requirements.

### **8.3.3 Plant and Equipment Observations and Log**

During the attended noise measurements, the operator shall record any significant quarry noise sources (i.e. haul trucks, dozers, etc). In addition, the operator shall obtain copies of the relevant fixed plant and mobile equipment mining operating shift logs to be included in the noise monitoring report.

### **8.3.4 Determining Compliance**

The contributed noise emissions from construction and operational activities associated with the Project, as well as cumulative quarrying noise levels, shall be evaluated and assessed against the noise levels provided in **Table 9**, **Table 10** and **Table 13** respectively. In order to determine noise generated from the Project (only) and cumulative noise levels, the following methods (or a combination of) would be used:

- Direct measurement of ambient noise levels;
- Operator estimated LAeq(15minute) contribution;
- Analysis of operator attended noise monitoring results;
- Calculation from near-field measurements;
- From post analysis of audio recordings;
- Measurement at a representative location; and
- A combination of the above.

## **8.4 Unattended Noise Monitoring**

In order to supplement the operator-attended measurements, unattended continuous noise monitoring shall be conducted at Locations G, for a minimum period of seven (7) days per quarter during operations, to quantify overall ambient noise amenity levels resulting from quarrying, road traffic and other environmental noise sources.

Data from unattended continuous noise logging will allow trends to be identified in ambient noise levels surrounding the quarry, road traffic noise levels and the assessment of cumulative noise impacts from all quarrying related noise sources in the area.

The unattended ambient noise logger data from the monitoring location, together with the weather shall be presented graphically on a daily basis and presented in the noise monitoring report.

Prior to further analysis, the ambient noise level data from each monitoring location which correlate with periods of unstable weather (ie rainfall greater than 0.5 mm or wind speed greater than 5 m/s per 15 minutes) shall be discarded.

Unattended noise monitoring will be conducted initially on a quarterly basis. The frequency of monitoring will be reviewed after the first 12 months of operations in order to determine future requirements.

## 8.5 Noise Monitoring Summary

**Table 15** presents a summary of the noise monitoring requirements of this NMP.

**Table 15 Noise Monitoring Summary**

Monitoring Focus/Parameter	Monitoring sites (refer Figure 2)	Frequency	Criteria	Responsibility
<b>Construction</b>				
Operator attended noise monitoring	Location F and G.	At the commencement of any new activities and a minimum of once per quarter	Refer <b>Table 9</b>	Quarry Manager Noise Specialist
<b>Operations</b>				
Operator attended noise monitoring	Location F and G.	Quarterly <sup>1</sup>	Refer <b>Table 10, Table 12, Table 13</b>	Quarry Manager Noise Specialist
Unattended noise monitoring	Location G.	Quarterly <sup>2</sup>		

Note 1 – Monitoring frequency will be reviewed after the first 2 years of operations.

Note 2 – Unattended monitoring frequency will be reviewed after the first 12 months of operations.

## 9 REPORTING

### 9.1 Noise Monitoring Report

All routine monitoring results will be documented and reported initially on a quarterly basis, then reviewed after the first year of operations. Noise monitoring results will be included in the Annual Review which is sent to the relevant authorities as listed in Schedule 5 Condition 4 of the PA and the Annual Return prepared in accordance with Condition R1 of the EPL.

Noise monitoring reports will consist of the following information:

- Summary of all attended and unattended noise monitoring results;
- Measured/ calculated and/or operator estimated mine LAeq(15minute) contributed noise levels for each monitoring location;
- Measured/ calculated road traffic noise;
- Statement of compliance/ non-compliance with the noise conditions contained in the PA and EPL;
- Details of any complaints relating to noise and their state of resolution; and

- An outline of any management measures taken within the monitoring period to address any exceedances of the noise criteria.

## **9.2 Incident Reporting**

Schedule 5 Condition 7 of the PA requires:

*The Proponent shall immediately notify the Secretary and any other relevant agencies of any incident that has caused, or threatens to cause, material harm to the environment.*

*For any other incident associated with the project, the Proponent shall notify the Secretary and any other relevant agencies as soon as practicable after the Proponent becomes aware of the incident. Within 7 days of the date of the incident, the Proponent shall provide the Secretary any relevant agencies with a detailed report on the incident, and such further reports as may be requested.*

It should be noted that it is unlikely that a noise incident would constitute material harm, therefore Karuah East would report as per the above requirement – notification as soon as practical and detailed incident report within 7 days.

The protocol for managing complaints and/or non-compliances is provided in **Section 10**.

## **9.3 Annual Review**

By the end of March each year the quarry will submit to the Secretary a report reviewing the annual environmental performance of the project. The contents of the required report are detailed in Schedule 5 Condition 4 of the PA. The Annual Review will cover the calendar year period.

# **10 PROTOCOL FOR MANAGING COMPLAINTS AND/OR NON-COMPLIANCES**

The sections below outline the contingency plan for managing noise impacts and complaints.

## **10.1 Complaints Handling**

All complaints received regarding operational noise emissions from the Project will be responded to within 24 hours by appropriate personnel.

The quarry will keep a record of any complaint made to the quarry or any employee or agent of the quarry in relation to noise from the Project site. Records will include:

- Date and time of complaint;
- Method by which the complaint was made;
- Personal details of the complainant (if provided);
- Nature of the complaint;
- Weather conditions corresponding to the time of the complaint;
- Action taken by the quarry and any follow up actions; and
- If no action was taken, the reason why no action was taken.

## 10.2 Non-Compliance Response Procedure

Incident reporting is to be undertaken as per the requirements in **Section 9.2**. In the event of a measured exceedance of the relevant noise emission criteria or a complaint being received with regard to noise, the following actions will be undertaken:

- Identify the noise source that has caused the complaint/exceedance. This would be completed through consultation with the complainant and/or by conducting a noise survey to quantify the relevant noise emissions. Additional methods such as near field monitoring, unattended noise monitoring or computer noise modelling may be utilised to investigate noise emissions in relation to noise complaints, or to determine compliance with the PA conditions where potential non-compliances have been measured or are difficult to quantify from operator-attended noise measurements.
- Reassess the noise reduction techniques employed at the site and implement any reasonable and feasible additional noise controls including relocating and/or modifying mining activities to reduce impacts.
- Conduct a further investigation, following the adoption of noise controls, to evaluate the effectiveness of the mitigation strategy.
- Report details of any non-compliance and the results of noise monitoring/investigations to relevant agencies as soon as possible.

Where a significant pollution incident occurs which causes an impact on material harm, reference will also be made to the Karuah East Pollution Incident Response Management Plan (PIRMP) for procedures relating to management of pollution incidents. It is unlikely the PIRMP would be enacted for a noise incident.

## 11 PERIODIC REVIEW

The NMP shall be reviewed and revised and/or updated, in accordance with Schedule 5 Condition 5 of the PA, within three (3) months of any of the following:

- The submission of an annual review;
- The submission of an incident report;
- The submission of an audit; and
- Any modification to the conditions of the PA.

Review of the NMP will also take place if monitoring records indicate that it is warranted or in the event of any significant change to operations or noise management procedures at the quarry. The Karuah East management team will discuss and review the status of all management plans on an annual basis, but unless otherwise required, all site environmental management plans will be reviewed and updated every three years.

Any modifications to the NMP will be undertaken in consultation with the appropriate government agencies.

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## **12 COMMUNITY CONSULTATION AND PERFORMANCE MONITORING**

### **12.1 Community Consultative Committee**

Condition 5 Schedule 6 of the PA states that the Proponent shall establish and operate a Community Consultative Committee (CCC) for the project. The CCC must be operated in general accordance with the *Guidelines for Establishing and Operating Community Consultative Committees for Mining Projects (Department of Planning, 2007)* and be established prior to commencement of construction activities, to the satisfaction of the Secretary.

The CCC is to facilitate communication, consultation and information sharing between the quarry and the local community. Further details of the CCC are provided in the EMS.

### **12.2 Performance Monitoring**

Compliance of this NMP with the PA conditions and any other relevant agency requirements will be measured according to the following performance indicators:

- Compliance with relevant noise criteria at monitoring locations.
- Compliance with Australian Standards as required.
- The frequency and nature of complaints reported to the quarry in relation to noise emissions.
- Contractor and employee awareness of the company's Environmental Policy and this NMP.
- Compliance with this NMP, as indicated by statutory reporting.

### **12.3 Continual Improvement**

Through the effective application of best practice principles to on-site activities including, where cost-effective and practicable, the adoption of best practice technologies and noise control measures, the quarry will continue to improve on the quarry's environmental performance with progress to be monitored against the performance indicators noted in **Section 12.2**.



## **APPENDIX A1**

# **CONSULTATION WITH EPA REGARDING MANAGEMENT PLANS**

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**From:** Karen Marler [mailto:Karen.Marler@epa.nsw.gov.au]  
**Sent:** Wednesday, 14 October 2015 12:53 PM  
**To:** Blake Almond  
**Cc:** Peter Jamieson; Jocelyn Karsten; EPA RSD Hunter Region Mailbox; Christopher Jones  
**Subject:** RE: Karuah East Quarry Project - Management Plans [EPA]

Hi Blake, the EPA does not approve management plans. In response to requests regarding consultation on management plans we provide the following standard response..

The Environment Protection Authority (EPA) encourages the development of such plans to ensure that proponents have determined how they will meet their statutory obligations and designated environmental objectives. However, the EPA does not review these documents as our role is to set environmental objectives for environmental management, not to be directly involved in the development of strategies to achieve those objectives.

Regards

K

**Karen Marler**

Head Regional Operations Unit - Hunter | **NSW Environment Protection Authority** |

☎: (02) 49086803 | Mobile ☎: 0409 606 368 | 📠: (02) 49086810 | ✉: [karen.marler@epa.nsw.gov.au](mailto:karen.marler@epa.nsw.gov.au)

## **APPENDIX A2**

# **CONSULTATION WITH DP&E REGARDING NOISE CRITERIA**

**From:** Colin Phillips  
**Sent:** Friday, 25 September 2015 1:20 PM  
**To:** 'gs@gwhbuild.com.au'  
**Cc:** 'kf@gwhbuild.com.au'; Thomas Watt; Swati Sharma; Gen Seed  
**Subject:** Karuah East Quarry Project - Noise Monitoring on lot 11 DP 1024564

Dear Grahame,

I refer to your letter of 18 August 2015 to Howard Reed, Director Resources Assessments, about proposed noise monitoring for the Karuah East Quarry Project (KEQP). I am replying on his behalf.

I agree that attended noise monitoring is not currently required to be conducted on Lot 11 DP 1024564 as part of the operation of the KEQP.

However do not agree *"that the criteria of 43 (dB(A) LAeq(15min)) does not apply to Lot 11 ....."*

The operational noise criteria that are set out in Table 2 of the KEQP project approval currently apply to, and continue to apply to, any "Residence on Lot 11 DP 1024564".

It is my understanding that the existing structure on Lot 11 is not a Council approved residence and accordingly there is no current residence on Lot 11 to which the noise impacts of the KEQP are to be assessed against the criterion in Table 2 .

Therefore, at this time and unless and until a Council approved dwelling exists on Lot 11, attended monitoring (or other approved monitoring methods) on Lot 11 is not needed to assess whether compliance against the criterion in Table 2 is achieved.

However, it is important for Hunter Quarries to understand that the wording in the KEQP's Environmental Protection Licence (EPL) does not alter any of the requirements of KEQP's conditions of project approval. In the case of any inconsistency between the conditions of the EPL and Project Approval, compliance with BOTH instruments would need to be achieved.

The Department will continue its review of KEQP management plans, particularly any proposed noise monitoring program, on the basis that I have set out in this email.

Please contact me if you have any questions about this matter.

Regards

**Colin Phillips**

Team Leader  
Resource Assessments  
Department of Planning & Environment  
23-33 Bridge Street | GPO Box 39 SYDNEY NSW 2001  
T 02 9228 6483 E [colin.phillips@planning.nsw.gov.au](mailto:colin.phillips@planning.nsw.gov.au)



Please consider the environment before printing this email.

## **APPENDIX A3**

### **DP&E COMMENTS ON DRAFT NMP**

#### Karuah East Quarry - Noise Management Plan (NMP)

Under Schedule 3, Condition 7 of the Project Approval 09\_0175, KEQ is required to prepare and implement a Noise Management Plan to the satisfaction of the Secretary. Refer to the table below for the applicable approval requirements, the relevant sections in the submitted MP and the Department's review comments.

09_0175 Requirement	Section	Review Comment	Further Action
The Proponent shall prepare and implement a Noise Management Plan for the project to the satisfaction of the Secretary. This plan must:			
(a) be prepared by a suitably qualified expert whose appointment has been approved by the Secretary;	Section 2	Requirement has been met satisfactorily.	NFA
(b) be prepared in consultation with EPA, and submitted to the Secretary for approval prior to the commencement of construction activities;	Section 1.1	<ul style="list-style-type: none"> <li>The Department recommends consultation with agencies to be provided in an Appendix of the management plan.</li> </ul>	<ul style="list-style-type: none"> <li>Please provide EPA consultation correspondence in Appendix 1.</li> <li>Amend Table 2</li> </ul>
	Section 2.1	<ul style="list-style-type: none"> <li>Table 2 notes that the management plan will be sent to the EPA for consultation. This can be removed if EPA has already been consulted.</li> </ul>	
(c) describe the measures that would be implemented to ensure compliance with the noise criteria and operating conditions in this approval;	Section 6	Requirement has been met satisfactorily.	NFA
(d) describe the proposed noise management system in detail; and	All	Requirement has been met satisfactorily.	NFA
(e) include a monitoring program that: <ul style="list-style-type: none"> <li>uses attended and unattended monitoring to evaluate the compliance of the project against the noise criteria in this approval;</li> <li>evaluates and reports on: <ul style="list-style-type: none"> <li>the effectiveness of the on-site noise management system; and</li> <li>compliance against the noise operating conditions; and</li> </ul> </li> <li>defines what constitutes a noise incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any noise incidents.</li> </ul>	Section 8, 9.2 & 10.2	<p>8.3.1 - Attended noise monitoring is only required at sites F &amp; G.</p> <p>8.3.2</p> <ul style="list-style-type: none"> <li>The Department's position is that attended noise monitoring should be conducted quarterly for at least two years, and then the monitoring frequency can be re-assessed.</li> <li>Construction monitoring? Or construction noise monitoring?</li> <li>It is too broad and potentially onerous to expect monitoring for <b>each</b> new activity. It is more suitable to have monitoring undertaken for the construction of the Site Access Road, and during clearing.</li> </ul> <p>8.4</p> <ul style="list-style-type: none"> <li>Unattended noise monitoring is only required site G.</li> <li>Paragraph 4 - "rainfall greater than 0.5mm" – what is the period?</li> </ul> <p>Table 15 – refer to above comments. Unattended noise monitoring can be reviewed after 12 month, whereas attended noise monitoring can be reviewed after 24 months. Amend table notes.</p> <p>In Section 8.1 and 8.2, 10.1 and 10.2, change words 'should' to 'will'. e.g. the NMP <b>will</b> be undertaken by a suitably qualified and experience acoustic expert.</p>	Amend as per comments.

09_0175 Requirement	Section	Review Comment	Further Action
Other Comments			
	Section 3.1	Paragraph 4 (pg 5) The approval (09_0175) was granted by the Planning Assessment Commission, on behalf of the Minister for Planning.	Amend text.
	Section 3.3	The Project Approval requires construction activities to occur between 8.00am – 1.00pm on Saturdays. Table 5 of the NMP specifies 7.00am.	Amend Table 5 to reflect approved construction activity hours.
	Section 5.1	The NMP has references the IGNG Construction Noise Management Levels in Table 8. The hours recommended hours for Saturday in this table (8.00am – 6.00pm) are not consistent with the construction hours in the Project approval (8.00am – 1.00pm).	Amend / note approved construction hours.
	Section 6.1	Paragraph 2 – "In addition, the best practice noise control measures outlined in Section 6.1 shall continue to be implemented" – please add "for operational activities" at the end of this sentence.	Amend text
	Section 7	Table 14 – Sigma-theta is a good inclusion for this table, but should be separate to mean air temperature.	Provide a new row for sigma-theta in Table 14.
	Section 10.2	After the word "implement", add "any reasonable and feasible".	Amend text.
	Section 11	Paragraph 2, line 4. "basic, but unless required all site environmental management plans will be reviewed and updated every three years" Add "otherwise" after "unless".	Amend text.