

Karuah East Quarry Project
Air Quality and Greenhouse Gas Management Plan

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Karuah East Quarry Project

Air Quality and Greenhouse Gas Management Plan

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DOCUMENT CONTROL

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1 INTRODUCTION

SLR Consulting Australia Pt Ltd (SLR) has been engaged by Karuah East Quarry Pty Ltd (Karuah East) to prepare an *Air Quality Management Plan (AQMP)* 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 AQMP 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).
- *Proposed Karuah East Quarry Project, Pacify Highway, Karuah – Air Quality Impact Assessment and Greenhouse Gas Assessment* prepared by SLR dated 24 July 2013 (hereafter referred to as the AQIA).¹
- Project Approval 09_0175.
- Environment Protection Licence (EPL) 20611.
- *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (EPA 2005).

1.1 Consultation for this Management Plan

This AQMP has been prepared as per Schedule 3 Condition 16 of the Project Approval which required the Plan to be prepared in consultation with the Environment Protection Authority (EPA) and Great Lakes Council. The AQMP (Draft for Consultation) was sent to the EPA and Great Lakes Council on 15 September 2015.

Great Lakes Council provided comments to Karuah East on the Biodiversity Offset Strategy, Biodiversity Offset Area Management Plan and Landscape and Rehabilitation Management Plan. There were no comments from Great Lakes Council regarding the AQMP.

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 an EPL for the Project.

The AQMP was submitted to the DP&E for review on 16 October 2015. The AQMP has been updated to incorporate all comments received. The DP&E's review is attached as **Appendix A2**.

¹ The AQIA was prepared to address commentary received from the NSW Environment Protection Authority (EPA) during the exhibition period. This report superseded the previous Air Quality Impact Assessment and Greenhouse Gas Assessment dated 7 November 2012 that was submitted as part of the EA dated 31 January 2013.

2 STATUTORY REQUIREMENTS

2.1 Project Approval Requirements

The AQMP 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 15 of the PA and as summarised in **Table 1**.

Table 1 Air Quality Operating Conditions

Condition	Requirement	Relevant Section
Schedule 3 – Environmental Performance Conditions		
Operating Conditions		
15	The Proponent shall:	
15(a)	Implement best practice to minimise dust emissions by the project;	Section 7
15(b)	Regularly assess air quality monitoring data and relocate, modify, and/or stop operations on site as may be required to ensure compliance with the air quality criteria in this approval;	Section 7 and 8
15(c)	Minimise the air quality impacts of the project during adverse meteorological conditions and extraordinary events; and	Section 7
15(d)	Minimise surface disturbance of the site, other than as permitted under this approval.	Section 7

Requirements of the AQMP are provided in Schedule 3, Condition 16 and Schedule 5, Condition 3 of the PA. These are reproduced in **Table 2** together with the relevant section(s) of the AQMP where the requirements have been addressed.

Table 2 Air Quality Management Plan Requirements

Condition	Requirement	Relevant Section
Schedule 3 – Environmental Performance Conditions		
Air Quality Management Plan		
16	The Proponent shall prepare and implement an Air Quality Management Plan for the project to the satisfaction of the Secretary. This plan must:	Whole document
16(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
16(b)	Be prepared in consultation with Council and EPA, and submitted to the Secretary for approval prior to the commencement of construction activities;	This document was sent to Council and EPA for comment on 15 September 2015 (see Section 1.1)
16(c)	Describe the measures that would be implemented to ensure: <ul style="list-style-type: none"> Compliance with the relevant air quality conditions of this approval; Best management practice is employed; and The air quality impacts of the project are minimised during adverse meteorological conditions and extraordinary events. 	Section 7
16(d)	Describe the proposed air quality management system; and	Whole document
16(e)	Include a monitoring program that: <ul style="list-style-type: none"> Is capable of evaluating the performance of the project; Includes a protocol for determining any exceedances of the relevant 	Section 8

Condition	Requirement	Relevant Section
	conditions of approval; <ul style="list-style-type: none"> Effectively supports the air quality management system; and Evaluates and reports on the adequacy of the air quality management system. 	
Schedule 5 – Environmental Management, Reporting and Auditing		
Management Plan Requirements		
3	The Proponent shall ensure that the Management Plans required under this approval are prepared in accordance with any relevant guidelines, and include:	Whole of document
3(a)	Detailed baseline data	Section 6
3(b)	A description of: <ul style="list-style-type: none"> The relevant statutory requirements (including any relevant approval, licence or lease conditions); Any relevant limits or performance measures/criteria; and 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; 	Section 2 Section 5
3(c)	A description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;	Section 7
3(d)	A program to monitor and report on the: <ul style="list-style-type: none"> Impacts and environmental performance of the project; and Effectiveness of any management measures (see (c) above); 	Section 8
3(e)	A contingency plan to manage any unpredicted impacts and their consequences;	Section 7
3(f)	A program to investigate and implement ways to improve the environmental performance of the project over time;	Section 11.3
3(g)	A protocol for managing and reporting any: <ul style="list-style-type: none"> Incidents; Complaints; Non-compliances with statutory requirements; and Exceedances of the impact assessment criteria and/or performance criteria; and 	Section 9
3(h)	A protocol for periodic review of the plan.	Section 10

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 air quality or greenhouse gas emissions or their 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 air quality management in the EPL which have been addressed in this AQMP. Specific EPL conditions are summarised in **Table 3** together with the relevant sections of the AQMP indicating where the requirements have been addressed.

Table 3 Environment Protection Licence Requirements

Condition	Summary of Condition	Relevant Section
P1.1	Air emissions monitoring points	Section 8
L6	Hours of operations	Section 3
O3	Dust operating conditions	Section 7
M2	Air Monitoring Requirements	Section 8

2.4 Statement of Commitments

Commitment 2.0 of the Statement of Commitments states that an Air Quality Monitoring Plan will be prepared prior to the commencement of construction works. In addition, Commitment 7.0 provides a number of air quality and greenhouse gas mitigation and management measures for the project, these are summarised in **Section 7**. The requirement to prepare the Air Quality Monitoring Plan has been covered by this *AQMP*.

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 Consent 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

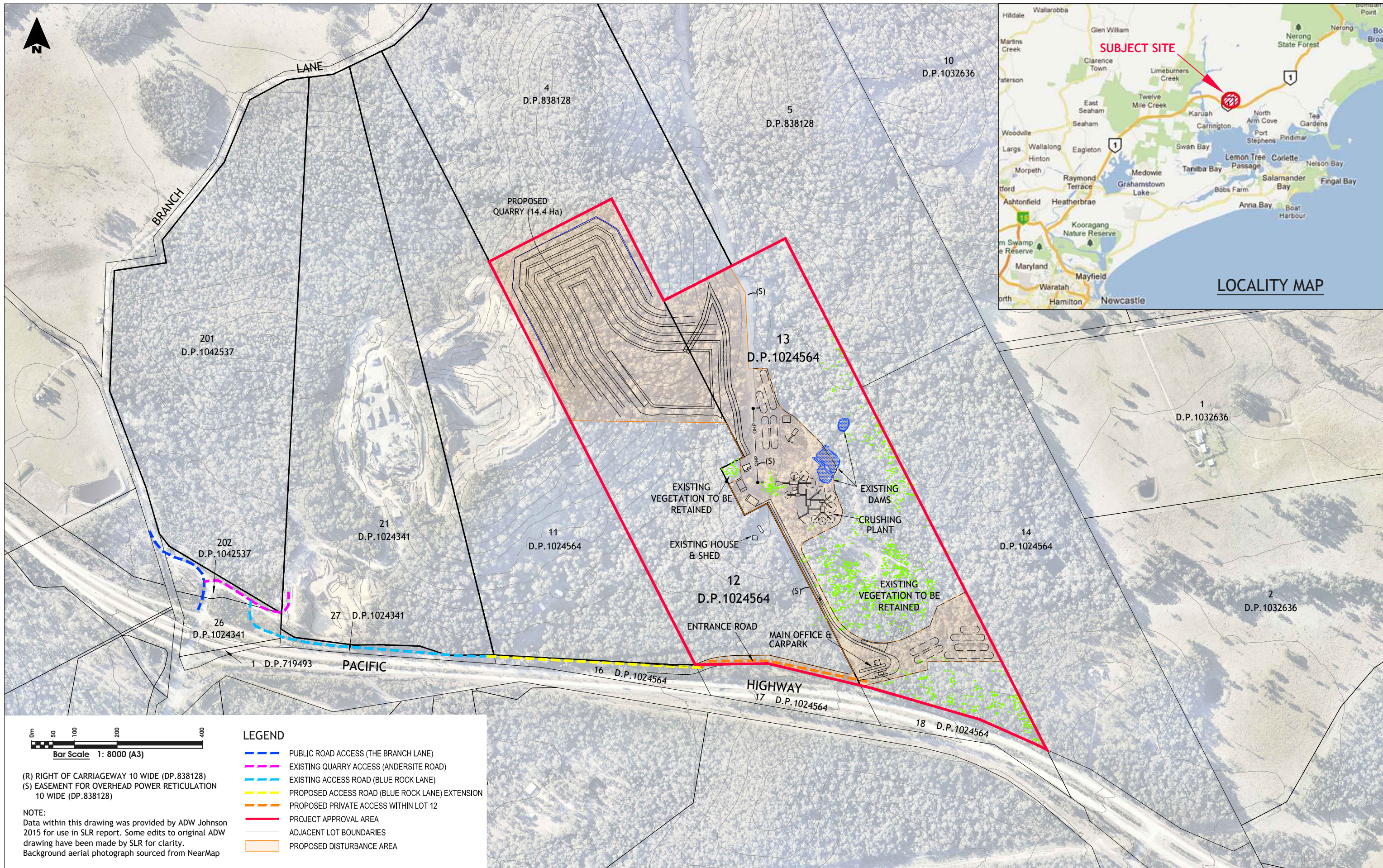
The Project site is located on Lots 12 and 13 DP 1024564, off the Pacific Highway, approximately 3 km north of Karuah NSW.

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 m³ 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 4**.

Table 4 Operating Hours

Activity	Operating Hours
Quarrying Operations	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)LAeq(15minute) 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.

4 SENSITIVE RECEIVERS

A number of non-project related residential dwellings are situated in the area surrounding the Project site. These receivers are presented in **Table 5** and **Figure 2**.

Table 5 Sensitive Receiver Locations

Receiver ID	Details	Location (m, UTM)	
		Easting	Northing
A	Lot 100 DP 785172	406,646	6,388,693
B	Lot 3 DP 785172	406,414	6,388,846
C	Lot 2 DP 785172	406,147	6,388,807
D	Lot 22 DP 1024341	405,607	6,388,906
E	Lot 250 DP 1092111	405,569	6,388,563
F	Lot 50 DP 1036893	405,632	6,389,787
G	Lot 1 DP 1032636	408,204	6,389,511
Other Structures			
Lot 11 ¹	Lot 11 DP1024564	406,683	6,389,132

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

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5 IMPACT ASSESSMENT CRITERIA

5.1 Air Quality

Air quality impact assessment criteria relevant to the Project are provided in Schedule 3 Condition 13 and Tables 3 to 5 of the PA and have been reproduced in **Table 6**, **Table 7**, and **Table 8** of this AQMP. The criteria are prescribed by the NSW EPA in their document, *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (2005)* (Approved Methods).

All reasonable and feasible avoidance and mitigation measures are to be employed so that particulate matter emissions generated by the project do not exceed the criteria in **Table 6** to **Table 8** at any residence on privately owned land.

Table 6 Long-term impact assessment criteria for particulate matter

Pollutant	Averaging Period	^d Criterion
Total suspended particulate (TSP) matter	Annual	^a 90 µg/m ³
Particulate matter < 10 µm (PM ₁₀)	Annual	^a 30 µg/m ³

Table 7 Short-term impact assessment criteria for particulate matter

Pollutant	Averaging Period	^d Criterion
Particulate matter < 10 µm (PM ₁₀)	24 hour	^a 50 µg/m ³

Table 8 Long-term impact assessment criteria for deposited dust

Pollutant	Averaging Period	Maximum increase in deposited dust level	Maximum total deposited dust level
^c Deposited dust	Annual	^b 2 g/m ² /month	^a 4 g/m ² /month

Notes to **Table 6** to **Table 8** above:

- Total impact (i.e. incremental increase in concentrations due to the project plus background concentrations due to all other sources).
- Incremental impacts (i.e. incremental increase in concentrations due to the project on its own).
- Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003 Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter - Deposited Matter - Gravimetric Method.
- Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed by the Director-General in consultation with EPA.

No specific limit conditions are specified for air quality emissions in the EPL.

5.2 Greenhouse Gas

No specific criteria are specified for greenhouse gas emissions from the site; however, Schedule 3 Condition 14 states that:

The proponent shall implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site.

6 BASELINE AIR QUALITY DATA

6.1 Baseline Monitoring Results

As part of the operating conditions for the existing Karuah Quarry, an air quality monitoring network has been maintained in the vicinity of the site in order to ensure compliance with the relevant air quality assessment criteria as outlined in **Section 5.1**. Pollutants that are, or have historically been monitored at the Project site are PM₁₀, TSP and dust deposition. **Figure 2** presents the locations of the Karuah Quarry air quality monitoring sites.

6.1.1 Dust Deposition Monitoring Results

Dust deposition monitoring has been performed at locations DDG1, DDG2 and DDG3 since October 2006 and DDG4 since January 2012 and is ongoing. **Table 9** presents a summary of the dust deposition monitoring results from January 2007 to December 2014 as presented in the Annual Environmental Management Reports (AEMRs).

Table 9 Dust Deposition Monitoring Summary – January 2007 to December 2014

Date	Annual Average Dust Deposition (g/m ² /month)			
	DDG1	DDG2	DDG3	DDG4
2007	1.8	1.1	1.2	Not previously monitored
2008	1.5	1.4	1.0	
2009	1.4	2.0	1.3	
2010	1.2	0.9	1.3	
2011	1.6	1.2	1.9	0.5
2012	1.2	1.3	0.7	
2013	1.7	1.0	1.0	
2014	1.2	0.9	0.8	
Average	1.5	1.2	1.2	1.2

6.1.2 TSP and PM₁₀ Monitoring Results

TSP and PM₁₀ monitoring was undertaken adjacent to the existing Karuah Quarry by High Volume Air Sampler (HVAS) from October 2006 to December 2008.

Table 10 2006-2008 TSP Karuah Quarry Monitoring Results (including TSP/PM₁₀ Ratio)

TSP Concentration	Karuah Quarry
Annual average TSP	24.2 µg/m ³
Annual Average PM ₁₀	12.7 µg/m ³
TSP:PM ₁₀ Ratio	1.9:1

As presented in **Table 10**, measured TSP and PM₁₀ concentrations were compliant with the air quality criteria detailed in **Section 5.1**. TSP and PM₁₀ monitoring was ceased at the request of Hunter Quarries, and in consultation with the then DECC, due continued compliance with the air quality criteria for TSP and PM₁₀.

6.2 Dispersion Modelling Results

The AQIA prepared by SLR provides the results of a dispersion modelling assessment undertaken for the project as part of the EA and considers the detailed baseline monitoring data (prior to 2010) and an analysis of the meteorology and topography of the local area.

The findings of the dispersion modelling exercise indicates that pollutant concentrations and dust deposition levels are predicted to meet the criteria levels outlined in **Section 5.1** at all nearby sensitive receptors.

Reference should be made to the AQIA for further details.

7 AIR QUALITY AND GREENHOUSE GAS MITIGATION MEASURES

7.1 Air Quality

7.1.1 Best Management Practice

An assessment of the best practice was conducted during the preparation of the AQIA (SLR 2013) which analysed the major emissions sources and assessed the best practice management measures that should be incorporated into the project.

The assessment indicated that the cumulative impact of the proposed Karuah East Quarry Project and the existing Karuah Quarry will comply with the relevant air quality criteria and may operate without significant impact upon the surrounding environment, subject to implementation of the identified best management practice measures.

The identified best management practices have been committed to by Karuah East as follows.

7.1.2 Statement of Commitments

In accordance with the Statement of Commitments, the following air quality control measures will be implemented:

- Air quality monitoring will be undertaken in accordance with conditions of consent by a suitably qualified air quality expert. The monitoring will consider the performance of the quarry in relation to the criteria outlined in the SLR Air Quality Impact Assessment (dated July 2013) and conditions of consent;
- Haul roads from the site to the Pacific Highway will be sealed;
- Watering of any unsealed roads will be performed at a rate of 2 litres/m²/hour (equivalent to "Level 1 watering");
- The crusher and screens will be enclosed; and
- Stockpiles will be subject to water spraying and wind breaks will be installed.

7.1.3 Additional Air Quality Control Measures

The following best practice air quality control measures will also be implemented during the construction and operational phases of the quarry:

- Disturb only the minimum area necessary for on-site activities;
- Exposed areas are rehabilitated as soon as practicable with inert material and revegetated;
- Perform regular inspections of weather conditions to identify conditions which would be unfavourable in terms of dust levels at nearest sensitive locations blowing in the direction of sensitive receptors) and implement remedial measures if required;
- All trafficable areas and vehicle manoeuvring areas in or on the premises will be maintained, at all times, in a condition that will minimise the emission of dust to the air, or emission from the premises of wind-blown or traffic generated dust;
- Trucks entering and leaving the premises that are carrying loads of dust generating materials will have their loads covered at all times, except during loading and unloading; and
- All plant and equipment to be installed at the site to be maintained and operated in a proper and efficient condition, in accordance with manufacturer's instructions and POEO Act and Regulations.

7.1.4 Contingency Plan

Where dust or particulate levels repeatedly exceed the relevant air quality criteria at monitoring locations representative of sensitive receptor locations OR prolonged dust events occur (i.e. prolonged visual dust can be observed in a particular area), air quality mitigation measures for excessive dust events will be implemented as follows:

- Deployment of additional water carts;
- Relocation of dust-generating sources or activities where possible; and,
- Temporary halting of activities and resuming once weather conditions have improved.

In addition, further air quality control measures will be investigated and site activities moderated until air quality levels return to an acceptable level and/or the source of the exceedances can be determined and managed appropriately. Mitigation measures for managing non compliances are outlined in **Section 9.2**.

7.2 Greenhouse Gas

In accordance with the Statement of Commitments, the following practices will be adopted to assist in the reduction of Greenhouse Gas emissions from operations at the project site:

Relating to diesel / petroleum consumption:

- Emissions from transport vehicles and on site machinery will comply with the relevant Australian Standards;
- All vehicles and machinery will be regularly maintained to ensure proper and efficient working order and therefore minimise emissions;
- Optimum vehicle / equipment tire pressures will be maintained;
- The finished site topography will ensure that no excessive engine use is required; and
- Optimisation of incline / decline of roads within the construction area on the project site will be considered to reduce transport distances for vehicles entering / exiting the project site.

Relating to electricity consumption:

- Use of efficient construction equipment technology;
- Use of efficient crushing and processing plant technology; and
- Continued monitoring of site electricity usage and review of techniques to reduce usage (if possible).

8 AIR QUALITY AND GREENHOUSE GAS MONITORING PROGRAM

8.1 Air Quality Monitoring

The monitoring program is designed to ensure that air quality is measured at locations in the vicinity of the Project site. Data from the monitoring program will be used to determine the impact of Project site operations on the surrounding air environment and at private properties in the vicinity of the Project site and the compliance status of the quarry operations in relation to the PA conditions.

8.1.1 General Requirements of the Air Quality Monitoring Program

The Air Quality Monitoring Program is required to monitor dust deposition, PM₁₀, TSP and meteorological conditions. Data from this monitoring will help determine the compliance status of the Project.

To meet the PA conditions, all monitoring must be conducted in accordance with the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* (2005) (Approved Methods for Sampling).

All monitoring locations must conform to the requirements of AS 3580.1.1:2007 *Methods for sampling and analysis of ambient air – Guide to siting air monitoring equipment*, subject to local site constraints. Any deviations from the standard must be noted in the siting documentation.

Air quality monitoring will be undertaken by a suitably qualified person. The air quality monitoring procedures employed throughout the monitoring programme will be guided by the requirements of the relevant Australian Standards, as listed below:

- AS/NZS 3580.10.1:2003 *Method 10.1: Determination of particulate matter – Deposited matter – Gravimetric method*.
- AS 3580.14-2011 *Method for sampling and analysis of ambient air - Meteorological monitoring for ambient air quality monitoring applications*.
- AS 3580.9.6-2003 *“Particulate Matter-PM₁₀- high volume sampler with size selective inlet”*.
- AS 2724.3-1984 *“Particulate Matter – Determination of total suspended particulates (TSP) - High volume sampler gravimetric method”*.

All air quality monitoring equipment and meteorological instrumentation employed throughout the monitoring program will carry current NATA or manufacturer calibration certificates. All air quality monitoring samples will be analysed at a NATA accredited laboratory and results interpreted and reported by a suitably qualified air quality consultant.

8.1.2 Dust Deposition Gauges

Dust Deposition Gauges (DDGs) record dust fallout, which can be derived from site activities, and are a useful measure of changing air quality.

A network of four (4) DDGs (DDG1 to DDG4) are currently maintained around the Project site to assess deposited matter on a continuous basis with EPL conditions as presented in **Figure 2**. These monitoring locations will continue to be utilised for the Karuah East quarry operations. An additional DDG (DDG5) will be installed at the front gate of Lot 11 for the Karuah East Project.

DDGs are exposed for 30 days (± 2 days) and analysed for Insoluble Solids and Ash Residue. Equipment and methods comply with AS 3580.10.1-2003 *“Particulates – deposited matter – gravimetric method”* (EPA Approved Method 19 [AM19]). Where rain events occur, dust deposition flasks will be changed over to prevent over-filling and therefore loss of sample, with the results of the analyses summed to provide a total dust deposition rate for the monitoring period.

8.1.3 High Volume Air Sampler

Particulate monitoring will also be conducted using a High Volume Air Sampler (HVAS) at the same location (Receiver A) that TSP and PM₁₀ monitoring was previously undertaken for the existing Karuah Quarry (refer **Section 6.1.2** and **Figure 2**). The HVAS will be used to gather additional data on the effectiveness of dust suppression controls. TSP and PM₁₀ sampling will be conducted for 12 months per year.

Monitoring of PM₁₀ will be undertaken in accordance with AS 3580.9.6-2003 "*Particulate Matter-PM₁₀-high volume sampler with size selective inlet*" (EPA Approved Method 18 [AM-18]). This involves the implementation of a one-day-in-six cycle using a HVAS fitted with size selective inlet for PM₁₀.

Monitoring of TSP will be undertaken in accordance with AS2724.3-1984 "*Particulate Matter – Determination of total suspended particulates (TSP) - High volume sampler gravimetric method*" (EPA Approved Method 15 [AM-15]). This also involves the implementation of a one-day-in-six cycle.

In accordance with Schedule 3, Condition 15(b), results of HVAS monitoring will be regularly assessed following Project commencement to ensure ongoing compliance with the air quality criteria is achieved.

8.1.4 Summary of Air Quality Monitoring

Table 11 presents a summary of the air quality monitoring requirements of this AQMP.

Table 11 Air Quality Monitoring Summary

Monitoring Focus/Parameter	Monitoring site (refer Figure 2)	Location	Unit of Measurement	Sampling Method	Frequency	Criteria	Responsibility
Depositional dust	DDG1	5760 Pacific Hwy, Karuah (Receiver C)	Grams per square metre per month (g/m ² /month)	AM-19	Monthly for depositional dust.	Refer Table 8	Quarry Manager Air quality Specialist
	DDG2	5770 Pacific Hwy, Karuah (Receiver B)					
	DDG3	DP 1024341, Karuah					
	DDG4	21 Halloran Rd, North Arm Cove					
	DDG5	Front gate to Lot 11					
	DDG6	5772 Pacific Highway, Karuah (Receiver A)					
TSP	HVAS	5772 Pacific Highway, Karuah	Micrograms per cubic metre	AM-15	Every 6 Days	Refer Table 6, Table 7	
PM ₁₀			(µg/m ³)	AM-18			

8.2 Meteorological Monitoring

Schedule 3, Condition 17 of the PA requires that:

"For the life of the project, the Proponent shall ensure that there is a suitable meteorological station operating in the vicinity of the site that complies with the requirements in the Approved Methods for Sampling of Air Pollutants in New South Wales guideline."

In accordance with the above, meteorological data will be obtained from a site representative Automatic Weather Station (AWS) within the vicinity of the Project site to assist in operational monitoring and real-time response

Real-time meteorological data from the AWS will be made available to the Quarry Manager to assist in operational monitoring and real time response.

The station will be installed and situated in compliance with AS 3580.14-2011 *Method for sampling and analysis of ambient air - Meteorological monitoring for ambient air quality monitoring applications*.

Parameters to be measured by the on-site meteorological station will comprise at minimum:

- Wind Speed;
- Wind Direction;
- Temperature;
- Precipitation;
- Pressure; and
- Relative Humidity.

8.3 Reporting

Monitoring results will be made available to the public on the Karuah East website on a monthly basis through the Monthly Environmental Monitoring Report as required by the EPL and *Guidelines for Publishing Pollution Monitoring Data (EPA)*.

Monitoring results will also be reported within the EPL Annual Return and the Annual Review in accordance with relevant PA conditions.

9 PROTOCOL FOR MANAGING COMPLAINTS AND/OR EXCEEDENCES

9.1 Complaints Handling

All complaints received regarding operational air quality from the Project should be responded to within 24 hours by appropriate personnel.

Karuah East will keep a record of any complaint made to the quarry or any employee or any agent of the quarry in relation to air quality 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.

9.2 Non-Compliance Response Procedure

In the event of a measured exceedance of the relevant air quality criteria (taking into account relevant averaging periods for each criterion) or a complaint being received with regard to dust, the following actions will be undertaken:

- The situation will be investigated to determine possible emission sources including microscopic analysis of dust deposition samples and investigation into the prevailing wind conditions experienced at the time of the complaint to identify the source of the dust;
- Where the source is identified as the Project site, additional controls will be implemented or operational activities altered until a favourable outcome can be achieved;
- The appropriate Karuah East personnel will be informed of any corrective actions taken or complaint received;
- A full and complete record of the incident, actions and sign-off by an authorised person will be recorded in a log book;
- The appropriate Karuah East personnel shall notify the Secretary and any other relevant agencies as soon as practicable, after becoming aware of the incident (taking into account relevant averaging periods for the relevant air quality criteria); and
- Within 7 days of the incident, the appropriate Karuah East personnel shall provide the Secretary and any relevant agencies with a detailed report of the incident.

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.

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.

10 PERIODIC REVIEW

The AQMP 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; or
- Any modification to the conditions of the PA.

Review of the AQMP will also take place if monitoring records indicate that it is warranted or in the event of any significant change to operations or air quality 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 required all site environmental management plans will be reviewed and updated every three years.

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

11 COMMUNITY CONSULTATION AND PERFORMANCE MONITORING

11.1 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 outlined in the EMS.

11.2 Performance Monitoring

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

- Compliance with relevant air quality criteria at monitoring locations;
- Compliance with Australian Standards as required;
- The frequency and nature of complaints reported to the quarry in relation to air quality emissions;
- Achievement of energy demand and GHG emission project targets;
- Contractor and employee awareness of the company's Environmental Policy and this AQMP; and
- Compliance with this AQMP, as indicated by statutory reporting.

11.3 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 air quality 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 11.2**.

APPENDIX A1

CONSULTATION WITH EPA REGARDING MANAGEMENT PLANS

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** |

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APPENDIX A2

DP&E COMMENTS ON DRAFT AQMP

1. REVIEW

2.4 Air Quality and Greenhouse Gas Management Plan (AQMP)

Under Schedule 3, Condition 16 of the Project Approval 09_0175, KEQ is required to prepare and implement an AQMP 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
<i>The Proponent shall prepare and implement an Air Quality Management Plan for the project to the satisfaction of the Secretary. This plan must:</i>			
<i>(a) be prepared by a suitably qualified expert whose appointment has been approved by the Secretary;</i>	Section 2	Requirement has been met satisfactorily.	NFA
<i>(b) be prepared in consultation with EPA, and submitted to the Secretary for approval prior to the commencement of construction activities;</i>	N/A	Consultation with agencies to be provided in Appendix of management plan.	Please provide EPA consultation correspondence.
<i>(c) describe the measures that would be implemented to ensure:</i> <ul style="list-style-type: none"> <i>• compliance with the relevant air quality conditions of this approval;</i> <i>• best management practice is employed; and</i> <i>• the air quality impacts of the project are minimised during adverse meteorological conditions and extraordinary events;</i> 	Section 7	Requirement has been met satisfactorily.	NFA
<i>(d) describe the proposed air quality management system; and</i>	All	Requirement has been met satisfactorily.	NFA
<i>(e) include a monitoring program that:</i> <ul style="list-style-type: none"> <i>• is capable of evaluating the performance of the project;</i> <i>• includes a protocol for determining any exceedances of the relevant conditions of approval;</i> <i>• effectively supports the air quality management system; and</i> <i>• evaluates and reports on the adequacy of the air quality management system.</i> 	Section 8.1.3	Paragraph 4 suggests particulate monitoring may not occur after the first 12 months of monitoring. This is however inconsistent with Condition 15, where regular assessment of air quality monitoring data is required.	Condition 15 to be taken into account in Paragraph 4.