Your reference:
Our reference: DOC13/8827; NSR13/240; LIC08/1088-03
Contact Michael Howat; (02) 4908 6819

Department of Planning and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Attn: Ms Sophie Butcher

Dear Ms Butcher

Karuah East Hard Rock Quarry (MP 09_0175)
Part 3A of the *Environmental Planning and Assessment Act 1979*
Lot 12 and Lot 13 DP 1024564, Pacific Highway, Karuah

Reference is made to the report titled "*Environmental Assessment Report: Proposed Karuah East Hard Rock Quarry – 31 January 2013*" (EA) and accompanying information provided for the proposed Karuah East Hard Rock Quarry (MP09_0175) received by the Environment Protection Authority (EPA) on 11 March 2013.

The EPA understands that the proposal includes the following:

- Extraction of up to 1.5 million tonnes of hard rock (andesite) annually for 20 years;
- Construction of infrastructure such as offices, weighbridge, crushing and screening facilities;
- Transport of material off-site by road involving up to 216 truck loads per day; and
- Drilling and blasting activities.

The EPA has reviewed the proposal as described in the EA and provides the comments shown in **Attachment 1** in relation to some aspects of the proposal. If the project is approved, the EPA recommends that the conditions provided in Attachment 1 are incorporated into the consent.

In assessing the proposal the EPA has also however identified concerns in relation to the air quality impact assessment undertaken for the proposal and EPA can find no assessment in the EA relating to on-site effluent management for the proposed 28 staff. As you'll note in Attachment 1 the EPA has provided recommended conditions in relation to noise, solid waste and surface water, however based on issues with the air assessment and an apparent lack of wastewater assessment the EPA is unable to provide recommended conditions for air quality and wastewater matters. The EPA's concerns in relation to the air quality assessment and wastewater have been provided as **Attachment 2** and need to be adequately assessed prior to EPA being able to recommend all conditions of approval. The Department will also notice that EPA does not accept the sizing of the surface water dams as acceptable and although we have provided recommended conditions of consent in relation to surface waters, prior to consent being granted EPA requires a reassessment of dam sizes in recognition of the sensitivity of the receiving environment and the principles of the "Bluebook".

PO Box 488G Newcastle NSW 2300

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Tel: (02) 4908 6800 Fax: (02) 4908 6810

It is noted that the project will require a licence under the *Protection of the Environment Operations Act 1997* to commence construction activities and to operate. The proponent will need to make a separate application to the EPA to obtain this licence if project approval is granted.

If you have any questions, or wish to discuss this matter further please contact Michael Howat on 4908 6819.

Yours sincerely

P Jamieson 19-4-13

PETER JAMIESON
Head Regional Operations Unit – Hunter
Environment Protection Authority

Encl: **Attachment 1** – Karuah East Hard Rock Quarry: Recommended Conditions of Approval
Attachment 2 – Karuah East Hard Rock Quarry: Detailed Review of Air Quality Impact Assessment

ATTACHMENT 1

KARUAH EASY HARD ROCK QUARRY (MP09_0175)
RECOMMENDED CONDITIONS OF APPROVAL

General

1. Except as provided by these conditions of approval below, the works and activities must be undertaken in accordance with *"Environmental Assessment Report: Proposed Karuah East Hard Rock Quarry"* (EA) dated 31 January 2013.

Noise and Blasting

The EA and *Noise & Blasting Impact Assessment – Karuah East Quarry Project* (the "NBIA", SLR Consulting Australia Pty Ltd, dated 2012) appear to assess the proposal generally in accordance with the *New South Wales Industrial Noise Policy* (EPA 2000) and *NSW Road Noise Policy* (DECCW 2011). The EPA considers that it is able to licence the predicted noise impacts and proposes noise conditions which are attached. Please note that the proposed conditions do not include evening or night time limits, as the EA states that the proposal will operate only during daytime hours. The EPA expects that the Department of Planning and Infrastructure will include operational hours as a condition of consent.

The EPA notes the advice in the EA and NBIA that "structures on Lot 4 DP 828128 (to the north of the site) and Lot 10 DP 1032636 (to the east of the site) are a chicken shed and caravan respectively" and that there does not appear to be a residence on Lot 11 DP1024564. The EPA has therefore not included noise limits for these premises in the proposed conditions. However, if these lots are lawfully occupied by long-term residents, the noise impact of the proposal on those residential receivers would need to be assessed and appropriate limits derived.

Additionally the construction hours proposed in Condition 2 below differ to those proposed in the EA. The EA states the proposed construction hours of 7am to 1pm Saturdays, however the EPA recommends that construction hours commence no earlier than 8am on Saturdays, consistent with the *Interim Construction Noise Guidelines* (DECC, 2009).

Construction Noise

2. All construction work at the premises must be conducted between 7am to 6pm Monday to Friday and between 8am to 1pm Saturdays and at no time on Sundays and public holidays. This condition does not apply in the event of a direction from police or other relevant authority for safety or emergency reasons.

   Note: 'safety or emergency reasons' refers to emergency works which may need to be undertaken to avoid loss of life, property loss and/or to prevent environmental harm.

Operational Noise

3. All quarrying operations, including extraction, processing and loadings / transport must be conducted between 7am to 6pm Monday to Friday and 7am to 1pm Saturdays and at no time on Sundays and public holidays.
4. Noise generated at the premises must not exceed the noise limits in the table below. The locations referred to in the table below are indicated in Table 3 and Figure 10 of the document entitled *Environmental Assessment Report – Proposed Karuah East Quarry* (ADW Johnson Pty Limited 2013)

Locality	Location	NOISE LIMITS dB(A)			
		Day	Evening	Night	
		$L_{Aeq\ (15\ minute)}$	$L_{Aeq\ (15\ minute)}$	$L_{Aeq\ (15\ minute)}$	$L_{A1\ (1\ minute)}$
A	The residence on Lot 100 DP785172	40	N/A	N/A	N/A
B	The residence on Lot 3 DP785172	37	N/A	N/A	N/A
G	The residence on Lot 1 DP1032636	38	N/A	N/A	N/A
Any other residence	Any other sensitive receiver not subject to a private negotiated agreement	35	N/A	N/A	N/A

For the purpose of the table above:

- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sunday and Public Holidays.
- Evening is defined as the period 6pm to 10pm.
- Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and Public Holidays.

5. The noise limits set out in the table above apply under all meteorological conditions except for the following:
   a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or
   b) Stability category F temperature inversion conditions and wind speeds greater than 2 metres/second at 10 metres above ground level; or
   c) Stability category G temperature inversion conditions.

6. For the purposes of measuring the meteorological conditions specified above:

   a) The proponent must install or utilise an existing meteorological station which has been approved in writing by the EPA. Data recorded by the meteorological station approved by the EPA must be used to determine meteorological conditions ; and
   b) Temperature inversion conditions (stability category) are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW Industrial Noise Policy.

7. To determine compliance:
   a) with the $L_{eq(15\ minute)}$ noise limits specified above, the noise measurement equipment must be located:
      - approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or
      - within 30 metres of a dwelling façade, but not closer than 3m, where any dwelling on the property is situated more than 30 metres from the property boundary closest to the premises; or, where applicable
      - within approximately 50 metres of the boundary of a National Park or a Nature Reserve.

b) with the $L_{A1(1\ minute)}$ noise limits specified above, the noise measurement equipment must be located within 1 metre of a dwelling façade.

c) with the noise limits specified above, the noise measurement equipment must be located:
   - at the most affected point at a location where there is no dwelling at the location; or
   - at the most affected point within an area at a location prescribed by sections (a) or (b) of this conditions.

8. A non-compliance of the noise limits specified above will still occur where noise generated from the premises in excess of the appropriate limit is measured:

   - at a location other than an area prescribed by condition 7 (a) and 6(b) above; and/or
   - at a point other than the most affected point at a location.

9. For the purposes of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.

Blasting and Vibration

10. Blasting activities at the premises may only be conducted under the following conditions:
    - Between the hours of 9am to 5pm Monday to Friday. No blasting is permitted Saturdays, Sundays or public holidays;
    - Blasting is not permitted simultaneous with adjacent quarry(s); and
    - Blasting outside of the hours specified above can only take place with the written approval of the EPA.

11. The airblast overpressure level from blasting operations at the premises must not exceed 120dB (Lin Peak) at any time at any noise sensitive locations. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

12. The airblast overpressure level from blasting operations at the premises must not exceed 115dB (Lin Peak) at any noise sensitive locations for more than five per cent of the total number of blasts over each reporting period. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

13. Ground vibration peak particle velocity from the blasting operations at the premises must not exceed 10mm/sec at any time at any noise sensitive locations. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

14. Ground vibration peak particle velocity from the blasting operations at the premises must not exceed 5mm/sec at any noise sensitive locations for more than five per cent of the total number of blasts over each reporting period. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

15. The airblast overpressure and ground vibration levels in the conditions above do not apply at noise sensitive locations that are owned by the licensee or subject to a private agreement, relating to airblast overpressure and ground vibration levels, between the licensee and land owner.

Monitoring

16. The meteorological weather station must be maintained so as to be capable of continuously monitoring the parameters specified in the condition below.

17. For each monitoring point specified in the table below the licensee must monitor (by sampling and obtaining results by analysis) the parameters specified in Column 1. The licensee must use the sampling method, units of measure, averaging period and sample at the frequency, specified opposite in the other columns.

Point <insert point number as listed in table P1.1>

Parameter	Units of Measure	Frequency	Averaging Period	Sampling Method
Air temperature	°C	Continuous	1 hour	AM-4
Wind direction	°	Continuous	15 minute	AM-2 & AM-4
Wind speed	m/s	Continuous	15 minute	AM-2 & AM-4
Sigma theta	°	Continuous	15 minute	AM-2 & AM-4
Rainfall	mm	Continuous	15 minute	AM-4
Relative humidity	%	Continuous	1 hour	AM-4

Note: the sampling methods referred to in the table above are described in the document *Approved Methods for Modelling and Assessment of Air Pollutants in New South Wales*

18. To assess compliance with the noise limits for this premises attended noise monitoring must be undertaken in accordance with condition 7 above and:
    a) at each one of the locations listed in condition 4;
    b) occur annually each reporting period at the time of year generally associated with maximum noise transmission (ie generally winter conditions);
    c) occur during each day period as defined in the NSW Industrial Noise Policy for a minimum of 1.5 hours.

    Note: the frequency of this noise monitoring may be varied at the discretion of the EPA.

19. The proponent must monitor all blasts carried out in or on the premises at or near the nearest residence or noise sensitive location (such as a school or hospital) that is likely to be most affected by the blast and that is not owned by the licensee or subject of a private agreement between the owner of the residence or noise sensitive location and the licensee relating to alternative blasting limits.

Reporting Conditions

20. Noise Monitoring Report:
    A noise compliance assessment report must be submitted to the EPA within 30 days of the completion of the annual monitoring. The assessment must be prepared by a suitably qualified and experienced acoustical consultant and include:

    a) an assessment of compliance with noise limits presented in condition 4; and
    b) an outline of any management actions taken within the monitoring period to address any exceedences of the limits contained in condition 4.

21. The proponent must report any exceedence of the blasting limits to the regional office of the EPA as soon as practicable after the exceedence becomes known to the licensee or to one of the licensee's employees or agents.

22. The proponent must supply annually a Blast Monitoring Report with the EPA licence Annual Return, which must include the following information relating to each blast carried out within the premises during the respective reporting period:

    a) the date and time of the blast;
    b) the location of the blast on the premises;
    c) the blast monitoring results at each blast monitoring station; and
    d) an explanation for any missing blast monitoring results.

Waste

23. The licensee must not cause, permit or allow any waste generated outside the premises to be received at the premises for storage, treatment, processing, reprocessing or disposal or any waste generated at the premises to be disposed of at the premises, except as expressly permitted by a licence.

24. The condition above only applies to the storage, treatment, processing, reprocessing or disposal of waste at the premises if those activities require an environment protection licence.

Water

The EPA notes the primary water bodies surrounding the Karuah East Quarry flow to either Bulga Creek to the east of the proposed site and Yalimbah Creek to the west. Both of these creek systems flow to the Port Stephens estuary and through State Environmental Planning Policy (SEPP) 14 Wetlands. The EPA considers the Port Stephens estuary a sensitive receiving environment.

As detailed in the EA, if approved, site operations would result in two potential discharge points from the premises. These discharge points are proposed from Dam 1 and Dam 2 as shown in Figure 15 of the EA. The EPA notes the dam capacities are allegedly designed in accordance with the *Soils and Construction: Managing Urban Stormwater 2004* (Bluebook) 5-day 95th percentile rainfall event for the locality, although Dam 1 will have increased capacity above the Bluebook calculation as it is proposed to receive additional volumes from the in-pit sump as required.

In addition to the above the EA states that the water management plan for the site is directed at reducing discharges from Dam 2 due to the close proximity of the Dam 2 outlet point to SEPP 14 wetlands. The EPA understands that pumping between the in-pit sump, Dam 1 and Dam 2 will be designed to ensure discharges are predominantly from Dam 1 wherever possible, and the EA states that discharges from Dam 2 are only anticipated during extreme wet weather events.

EPA notes from the EA that in a median year uncontrolled discharges are expected to occur up to 6 days per year for Stage 5 and this would rise to 13 uncontrolled discharges during a "wet" year. This is significantly higher than the anticipated 1-2 discharges per year detailed in the Bluebook. Given the sensitivity of the receiving environment this level of uncontrolled discharge is unacceptable. EPA requests that prior to approval the proponent increase the size of the dam(s), do additional modelling and make a submission to EPA for alternative dam designs/sizes that are more commensurate with the sensitivity of the receiving environment. This revised submission should also better document how sediment laden water will be managed from the extraction area during the early stages of development prior to an in-pit sump being developed.

The EPA notes that if approved the project will require an Environment Protection Licence (EPL) under the *Protection of the Environment Operations Act 1997*. It is the intention of the EPA to regulate discharges

from the site through an EPL including associated concentration limits, monitoring requirements and reporting conditions.

The EA does not appear to provide specific detail on the achievable water quality parameters from both controlled and uncontrolled discharges from the site. In response to this the EPA has reviewed the site operations and water management systems proposed and determined discharge quality parameters, which are included in the recommended conditions of approval provided below. These concentration limits are commensurate with the sensitivity of the receiving environment.

Sediment and erosion controls

25. The licensee must, before undertaking any earthmoving or vegetation removal works, implement erosion and sediment control measures to prevent pollution of waters in accordance with *Soils and Construction: Managing Urban Stormwater 2004* (Landcom, 2004).

26. Stormwater from the premises which has the potential to mobilise sediments and other material must be controlled and diverted through the appropriate sediment and erosion control and/or pollution control measures/structures, so as not to cause, permit or allow water pollution to occur.

27. The in-pit sump must be sized at all times to prevent a discharge to waters in the event of pump failure.

Location of monitoring/discharge points and areas

28. The following points referred to in the table below are identified for the purposes of monitoring and/or setting of limits for the emission of pollutants to water from the point.

WATER

Identification no.	Type of Monitoring Point	Type of Discharge Point	Description of Location
1	Discharge quality monitoring	Discharge to waters	The discharge point from Dam 1, as shown on Figure 15 of the Environmental Assessment Report dated 31 January 2013
2	Discharge quality monitoring	Discharge to waters	The discharge point from Dam 2, as shown on Figure 15 of the Environmental Assessment Report dated 31 January 2013

Concentration limits

29. Except as may be expressly provided by a licence under the *Protection of the Environment Operations Act 1997* in relation of the development, section 120 of the *Protection of the Environment Operations Act 1997* must be complied with in connection with the carrying out of the development.

30. For each monitoring/discharge point or utilisation area specified in the table above the concentration of a pollutant must not exceed the concentration limits specified for that pollutant in the table.

POINTS 1 & 2

Pollutant	Units of measure	100 PERCENTILE LIMIT
Suspended Solids	mg/L	40
Oil and Grease	mg/L	5 and/or none visible
pH	pH units	6.5 – 8.5

Monitoring

31. For each monitoring/discharge point or utilisation area specified below (by a point number) the concentration of each pollutant specified in Column 1 must be monitored by sampling and obtaining

results by analysis. Specified opposite in the other columns are the sampling method and units of measure to be used and the frequency with which samples are to be taken.

POINTS 1 & 2

Pollutant	Units of measure	Frequency	Sampling Method
Suspended Solids	mg/L	Special Frequency 1	Grab sample
Turbidity	ntu	Special Frequency 1	Grab sample
Oil and Grease	mg/L	Special Frequency 1	Visual
pH	pH units	Special Frequency 1	Grab sample

Note: For the purposes of the table above 'Special Frequency 1' means:
(a) within 12 hours prior to any controlled discharge; or
(b) daily during any uncontrolled discharge.

Bunding

32. All above ground tanks containing material that is likely to cause environmental harm must be bunded or have an alternative spill containment system in place.

33. Bunds must:
a) have walls and floors constructed of impervious materials;
b) be of sufficient capacity to contain 110% of the volume of the tank (or 110% volume of the largest tank where a group of tanks are installed);
c) have walls not less than 250 millimetres high;
d) have floors graded to a collection sump; and
e) not have a drain valve incorporated in the bund structure,

or be constructed and operated in a manner that achieves the same environmental outcome.

ATTACHMENT 2

KARUAH EASY HARD ROCK QUARRY (MP09_0175)
DETAILED REVIEW OF AIR QUALITY IMPACT ASSESSMENT AND WASTEWATER ASSESSMENT

AIR QUALITY

The EPA has determined that the Air Quality Impact Assessment (AQIA) has not been conducted in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (DEC, 2005). Issues identified with the AQIA are summarised below.

1. Cumulative impacts of emissions from the Project, the existing Karuah Quarry and the proposed Kiely's Quarry have not been adequately assessed

The AQIA does not adequately justify the assumption that emissions from operations at the existing Karuah Quarry are included within the background air quality data.

The EPA notes that the Project dispersion model uses background air quality from data obtained:

- during 2009 from the Karuah Quarry air quality monitoring network for dust deposition; and
- during 2008 from the Office of Environment and Heritage Wallsend air quality monitoring site for Total Suspended Particles (using a site specific TSP/PM_{10} ratio of 1.9:1), 24-hour average PM_{10} and annual PM_{10}.

The EPA agrees that air quality at Wallsend is likely to be generally representative of regional air quality and data from this site is likely to be adequate for use in estimating air quality at the Project site due to sources affecting regional air quality (the background air quality).

However, Karuah Quarry is located adjacent to the Project site and the air quality levels measured at Wallsend (located approximately 40 km to the north east of the Project site) will not be representative of air quality levels at properties located around the Karuah Quarry – which is expected to have a significant additional contribution to air pollutant levels in the vicinity around the Project site.

The EPA request the AQIA be revised and additional information is provided to demonstrate the cumulative impacts of emissions from all existing and potential quarries have been assessed. Specifically, the impacts of emissions from the existing Karuah Quarry must be included in the assessment of cumulative impacts.

2. Meteorological data used in the dispersion model has not been demonstrated as site-representative

The AQIA does not justify or demonstrate that metrological data used in the dispersion model is site representative.

The use of site representative metrological data is particularly important due to the topography of the Project site and the location of the identified residences. Valley drainage flows are likely to move air from the Project site downhill – potentially in the general direction of impacted residences.

The Bureau of Meteorology Newcastle Nobby's and Williamtown automatic weather stations are located approximately 39 km and 24 km southwest of the Project site. The AQIA states that since both sites are

located close to the coastline, they are not representative of local meteorological conditions at the Project site. Consequently, meteorological data for the dispersion model was prepared using the The Air Pollution Model (TAPM) meteorological model.

The AQIA dispersion model uses TAPM generated metrological data based on 2008 data only. However, Section 4 of the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (Approved Methods) requires that site-representative data should be "correlated against a longer-duration site-representative meteorological database of at least five years (preferably 5 consecutive years) to be deemed acceptable". In addition, the AQIA does not justify that the year 2008 is representative of long term meteorology at this site (i.e. address the factor of inter-annual variability in meteorology).

The EPA request the AQIA be revised and additional information is provided to demonstrate and justify the meteorology data used in the dispersion model is site representative.

3. Predicted impacts may have been underestimated or are not well justified

Several issues have been identified in the AQIA which have the potential to result in an underestimation of predicted impacts:

a. Emissions inventory does not include all emission sources and the layout of the site and unit operations is unclear

AQIA Appendix E provides a summary of the emissions inventory used for the Project. The emissions inventory does not:

- include all emission sources such as drilling; or
- clearly define the likely extent or location of exposed areas.

In addition it is not clear if emplacement at dumps and stockpiles, and bulldozer operations on various overburden activities have been included in the emissions inventory.

The AQIA does not provide detailed site plans clearly showing the layout of all unit operations and the site topography, as required by Section 9 of the Approved Methods.

The EPA request the AQIA be revised and additional information is provided so that each potential emission source is clearly identified and described.

The EPA request detailed site plans clearly showing the layout of all unit operations and the site topography be provided, in accordance with the requirements of Section 9 of the EPA document *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*.

b. The emission rate equations and control factors used are not clear or justified for all sources

Section 7.4 of the AQIA states that emission controls have been applied for drilling according to the equations summarised in Table 24, however drilling is not included as an activity in this table.

Section 7.3.1 states the haul roads between the product stockpiles and the Pacific Highway for the Project and Kiely's Quarry will be paved and consequently emissions from these roads will be reduced by 100%. 100% control efficiency is not realistic where the paved road is located near unpaved areas, is used to transport material, or is not curbed. Best practice emission control measures to best maintain the condition of paved roads must include a control plan to implement and address routine cleaning of the paved road surface.

The EPA request the AQIA be revised and additional information is provided to:

- **clarify that appropriate emission controls have been applied for each emission source; and**
- **justify the use of a control efficiency of 100% for haul road emissions between the product stockpile and the Pacific Highway.**

The EPA request detailed calculations of pollutant emission rates for each source be provided.

c. Adverse air impacts on adjacent residences are predicted if the identified "best practice" control measures are not implemented effectively or at the proposed Kiely's Quarry

Previous air assessment and determination of best management practice measures for top four emission sources.

The EPA notes that the AQIA has been amended following a review of the initial air assessment conducted in November 2011 and a supplementary assessment conducted in May 2012 (all conducted by SLR Consulting Australia (SLR)). The supplementary assessment concluded that cumulative impacts from Karuah, Karuah East and Kiely's Quarries would be likely to result in non-compliance of the air assessment criteria at existing sensitive receptors.

To address the non-compliance issue identified in the supplementary assessment, a best management practice assessment was conducted (July 2012) on the identified four largest emission sources at the proposed Karuah East and Kiely's Quarries. Based on the incorporation of the identified best practice measures for these sources, SLR states the proposed quarries may both operate without exceeding the prescribed air quality criteria.

The EPA notes that additional control measures are included in the AQIA that are not specified in the best management practice assessment. The AQIA assumes that emission management practices used at the proposed Kiely's Quarry will be the same as that identified as necessary for the Project.

The EPA notes that where the proposed control measures are not implemented effectively, or potentially at all in the case of the proposed Kiely's Quarry, air impacts are predicted to exceed EPA assessment criteria (Appendix F).

The AQIA does not state if the operators of the proposed Kiely's Quarry have committed to the use of best practice measures as identified in the AQIA. This will be necessary to ensure emissions do not have an adverse impact on adjacent residences.

The EPA request the AQIA be revised and additional information is provided to:

- **clarify that the proposed emission controls will be implemented for the Project and at the proposed Kiely's Quarry.**
- **demonstrate how the proposed emission controls will be effectively implemented.**

4. Confirmation is required that all exiting and likely residential receptor locations have been assessed

The EPA notes that a dwelling appears to be located immediately south of the proposed Kiely's Quarry (Figure 3). Air impacts at this location have not been assessed.

The EPA recommends that if necessary, the AQIA should be revised to include an assessment of impacts at the apparent residence south of the proposed Kiely's Quarry.

5. Any future residence to be located on Lot 11

The EPA notes that the likely impacts of the Project on future residential development within Lot 11 were considered in the May 2012 supplementary assessment.

The EPA notes an outcome of the supplementary assessment that a residence may be located within the northern portion of Lot 11 "provided suitable particulate management practices are adhered to at both the existing and proposed quarries".

The EPA recommends that if a residential dwelling is likely to be situated within Lot 11 a revised AQIA should consider and assess air impacts at this location.

6. Blast fume emissions have not been assessed

The AQIA has not considered blast fume emissions (NO_2) which can vary greatly depending on a range of factors including the tendency of a particular blast to generate NO_2 emissions.

The EPA recommends the AQIA be revised and additional information is provided to consider and discuss blast fume emissions.

7. The AQIA does not assess $PM_{2.5}$ emissions as "the goals related to $PM_{2.5}$ particles are reporting guidelines only at the present time and are not assessed by NSW EPA as Project criteria"

Particulate matter below 2.5 µm in aerodynamic diameter ($PM_{2.5}$) can penetrate deep into the lungs and studies show that people in cities exposed to higher levels of $PM_{2.5}$ are at greater risk of PM associated health effects such as death from cardiopulmonary disease.

Despite the $PM_{2.5}$ goals being reporting guidelines under the Ambient Air Quality NEPM, the EPA expects $PM_{2.5}$ impacts to be investigated as a part of the assessment of air impacts due to the Project.

The EPA request the AQIA be revised to include an assessment of $PM_{2.5}$ emissions.

WASTEWATER MANAGEMENT

The EPA could find no assessment of wastewater management in the EA for the 28 employees proposed to work on the site. This would appear to be a major deficiency in the EA. It is anticipated that for a workforce of 28 a package sewage treatment system involving effluent irrigation will be necessary. Prior to this project being given consideration for approval EPA requires a thorough assessment of wastewater management, including an assessment of the soils in the proposed effluent disposal area and the provision of water and nutrient budgets to demonstrate that wastewater management can be conducted in a sustainable manner on the site.

Upon provision of this documentation EPA will be in a position to determine if it can issue conditions of approval in relation to wastewater management.