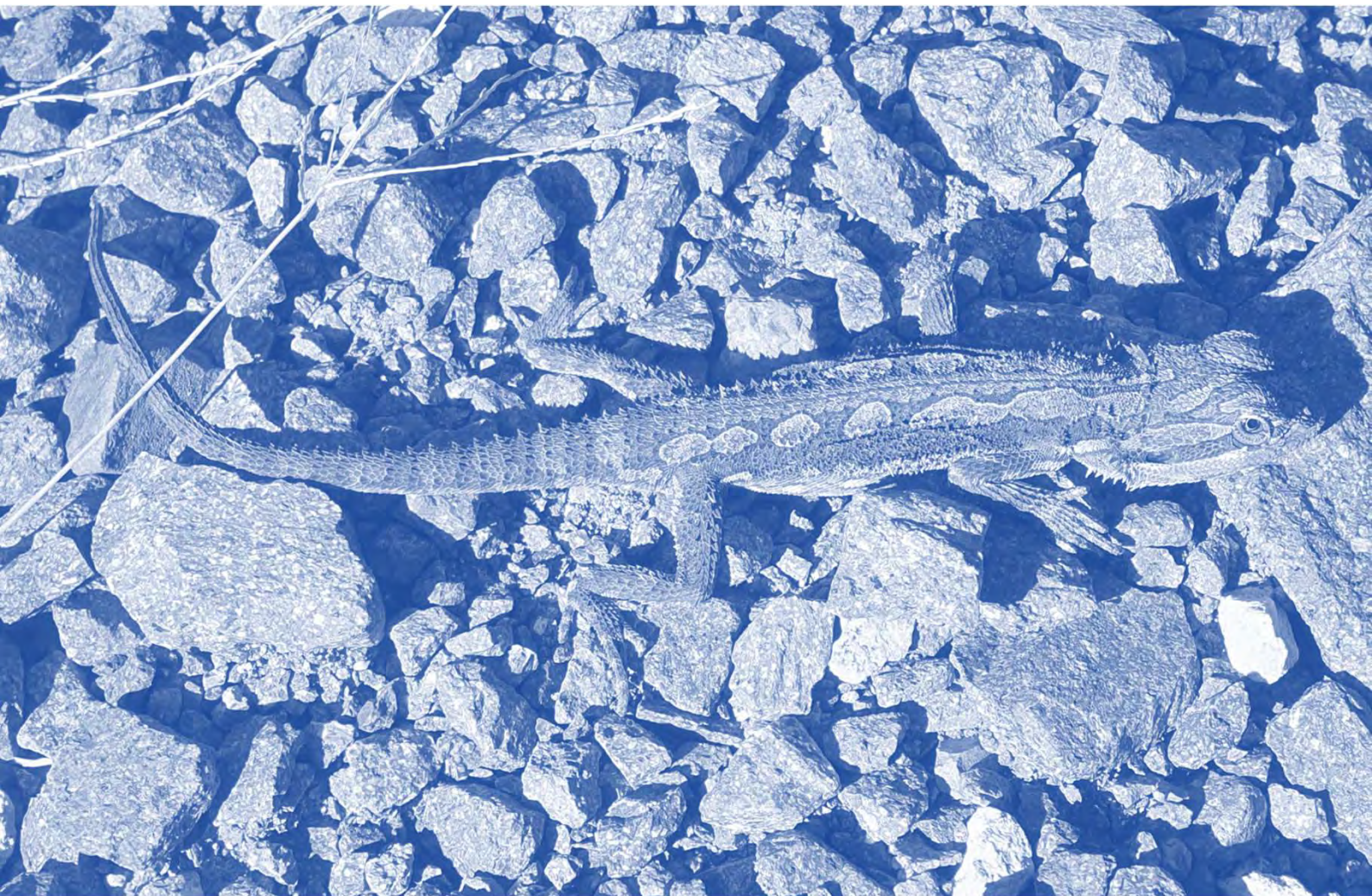




# Environmental Monitoring Report

## August 2021



# Table of Contents

1	Introduction .....	2
2	Air Quality Monitoring .....	3
2.1	Deposited Dust Monitoring .....	3
2.2	High Volume Air Sampling .....	4
3	Blast Monitoring .....	6
4	Noise Monitoring .....	8
4.1	Attended Monitoring .....	8
4.2	Unattended Noise Monitoring .....	8
4.3	Noise Monitoring Summary .....	8
5	Surface Water Monitoring .....	10
5.1	.....	10
5.2	Discharge Monitoring .....	13
5.2.1	Dam 3 (LDP3) .....	13
6	Reporting .....	14
6.1	Incident .....	14
6.2	Non-Compliance .....	14
6.3	Complaints .....	14
	Table 1 Environmental Protection Licence 20611 information .....	2
	Table 2 Project Approval 09_0175 information .....	2
	Table 3 PA 09_0175 Long Term Assessment Criteria for Deposited Dust .....	3
	Table 4 PA 09_0175 Long Term Impact Assessment Criteria for Particulate Matter .....	3
	Table 5 PA 09_0175 Short Term impact Assessment Criterion for Particulate Matter .....	3
	Table 6 Air quality monitoring locations .....	3
	Table 7 Deposited dust monitoring results .....	4
	Table 8 High Volume Air Sampling ( $\mu\text{g}/\text{m}^3$ ) results .....	4
	Table 9 EPL 20611 Condition M7.1 Blasting .....	6
	Table 10 Blast monitoring results .....	6
	Table 11 Operational Noise Criteria (dB(A) $\text{LA}_{\text{eq}(15\text{min})}$ ) .....	8
	Table 12 Noise monitoring locations .....	8
	Table 13 Attended noise monitoring results (extracted from quarterly noise monitoring report prepared by EMM September, 2021) .....	9
	Table 14 Water monitoring results .....	11
	Table 15 EPL20611 - Pollutant concentration limits .....	13

# 1 INTRODUCTION

---

This report has been completed to meet the requirements of Section 66(6) of the *Protection of the Environment Operations Act 1997* and the NSW Environmental Protection Authority's (EPA) *Requirements for Publishing Pollution Monitoring Data* (EPA, 2013). This report summarises the required monitoring data under *Environmental Protection Licence 20611* (the EPL) (see Table 1) and *Project Approval 09\_0175* (the Consent) (see Table 2) for Karuah East Quarry (the Quarry).

**Table 1 Environmental Protection Licence 20611 information**

<b>Environmental Protection Licence Number</b>	20611
<b>Licensee's Name</b>	Karuah East Quarry Pty Limited
<b>Licensee's Address</b>	Licensee Postal Address: PO Box 3284 Thornton NSW 2322.  Premises Address: Karuah East Quarry, Blue Rock Close, Karuah NSW 2324.
<b>Link to Full Licence on the EPA Website</b>	<a href="#">EPL 20611</a>

**Table 2 Project Approval 09\_0175 information**

<b>Development Application</b>	PA 09_0175
<b>Applicant</b>	Karuah East Quarry Pty Limited
<b>Approval Authority</b>	Minister for Planning
<b>Land</b>	Lot 12 DP 1024564; Lot 13 DP 1024564; Lot 202 DP 1042537; Lot 26 DP1024341; Lot 27 DP 1024341; Lot 16 DP 1024564; Lot 17 DP 1024564

A summary of the environmental monitoring data for August 2021 is covered in this report.

Tables throughout this report provide key monitoring information from the EPL and the Consent, such as:

- location of monitoring;
- pollutant;
- unit of measurement; and
- monitoring frequency required.

Monitoring locations are identified in Appendix 1.



## 2 AIR QUALITY MONITORING

Dust emissions generated by the Quarry operation must not cause additional exceedances of ambient air quality criterion outlined in *Schedule 3, Condition 13* of the Consent (see Table 3, Table 4 and Table 5). Deposited dust and TSP/PM<sub>10</sub> monitoring is undertaken at the locations listed in Table 6.

**Table 3 PA 09\_0175 Long Term Assessment Criteria for Deposited Dust**

Pollutant	Averaging Period	Maximum Increase in Deposited Dust Level <sup>1</sup>	Maximum Total Deposited Dust Level <sup>1</sup>
Deposited dust	Annual	2 g/m <sup>2</sup> /month	4 g/m <sup>2</sup> /month

**Note 1:** Deposited dust is assessed as insoluble solids as defined by AS 3580.10.1-2003.

**Table 4 PA 09\_0175 Long Term Impact Assessment Criteria for Particulate Matter**

Pollutant	Average period	Criterion
Total suspended particulate (TSP) matter	Annual	90 µg/m <sup>3</sup>
Particulate matter <10 µm (PM <sub>10</sub> )	Annual	30 µg/m <sup>3</sup>

**Table 5 PA 09\_0175 Short Term impact Assessment Criterion for Particulate Matter**

Pollutant	Averaging period	Criterion
Particulate matter <10 µm (PM <sub>10</sub> )	24 hour	50 µg/m <sup>3</sup>

**Table 6 Air quality monitoring locations**

Site ID	EPL ID	Location	Address	GPS Coordinates
DDG 1	MP 4	South-West of Karuah East Quarry	5760 Pacific Hwy, Karuah NSW 2324	32°38'04"S 151°59'58"E
DDG 2	MP 5	South-West of Karuah East Quarry	5770 Pacific Hwy, Karuah NSW 2324	32°38'02"S 152°00'09"E
DDG 3	MP 6	South-West of Karuah East Quarry	DP 1024341, Karuah	32°37'57"S 151°59'41"E
DDG 4	MP 7	East of Karuah East Quarry	21 Halloran Rd North Arm Cove NSW 2324	32° 37' 30.87"S 152°01'10.18"E
DDG 5	MP 8	South-West of Karuah East Quarry	Lot 21 DP 1024341 Karuah NSW 2324	32° 37' 55.33"S 152°00'2.74"E
HVAS (TSP/PM <sub>10</sub> )	MP 9	South-West of Karuah East Quarry	5770 Pacific Hwy, Karuah NSW 2324	32°38'03"S 152°00'09"E

All dust monitoring is undertaken in accordance with the *Approved Methods of Sampling and Analysis of Air Pollutants in NSW* (EPA, 2007).

### 2.1 DEPOSITED DUST MONITORING

Deposited dust results for the twelve months prior to and including August 2021 are shown in Table 7.

**Table 7 Deposited dust monitoring results**

Date On	Date Off	DDG 1	DDG 2	DDG 3	DDG 4	DDG 5
01/09/2020	01/10/2020	0.6	0.5	0.4	1.0	1.0
01/10/2020	02/11/2020	0.2	<0.1	1.3	0.7	0.6
02/11/2020	03/12/2020	3.2	2.3	0.8	0.7	<b>4.7</b>
03/12/2020	04/01/2021	0.3	0.5	<0.1	0.4	1.5
04/01/2021	04/02/2021	1.5	0.9	0.7	0.3	1.2
04/02/2021	05/03/2021	0.4	0.4	0.7	0.2	1.6
05/03/2021	06/04/2021	0.8	1.3	0.5	0.7	0.7
06/04/2021	06/05/2021	0.7	1.4	2.2	3.7	1.9
06/05/2021	03/06/2021	0.3	0.3	0.3	0.4	0.6
03/06/2021	05/07/2021	0.2	0.4	0.2	0.2	-
05/07/2021	05/08/2021	0.5	0.4	0.5	1.0	0.2
05/08/2021	06/09/2021	2.3	0.8	1.4	0.6	1.2
<b>YTD average</b>		0.9	0.8	0.8	0.8	1.4

**Note** <sup>1</sup>: DDG5 was not able to be analysed for period 03/06/2021 to 05/07/2021 due to sample jar breaking the laboratory during analysis.

Monitoring results indicate that for the period 5 August 2021 to 6 September 2021 the insoluble solid levels recorded at DDG 1 to DDG 5 monitoring locations were below the project criterion of 4 g/m<sup>2</sup>/month over an annual averaging period.

## 2.2 HIGH VOLUME AIR SAMPLING

The TSP and PM<sub>10</sub> results for August 2021, the report average and a rolling annual average are shown in are shown in Table 8. Figure 1 illustrates the year-to-date results for HVAS monitoring.

**Table 8 High Volume Air Sampling (µg/m<sup>3</sup>) results**

Run Date	HVAS TSP (µg/m <sup>3</sup> )	HVAS PM <sub>10</sub> (µg/m <sup>3</sup> )
1/08/2021	15	8
7/08/2021	9	4
13/08/2021	15	9
19/08/2021	25	12
25/08/2021	6	2
31/08/2021	40	24
<b>24hr Average Criteria<sup>1</sup></b>	<b>N/A</b>	<b>50</b>
<b>Annual Average Criteria<sup>1</sup></b>	<b>90</b>	<b>30</b>
<b>Progressive Annual Average<sup>2</sup></b>	20.9	11.6

**Note:** <sup>1</sup> Criteria as specified in PA 09\_0175.

<sup>2</sup> The progressive annual average is from 01/01/2020 to 31/08/2021, this is not a measure of compliance.

All HVAS monitoring results for the period to and including August 2021 were compliant with the long term and short term impact assessment criteria outlined in *Schedule 3 Condition 13* of the Consent (see Table 3, Table 4 and Table 5).

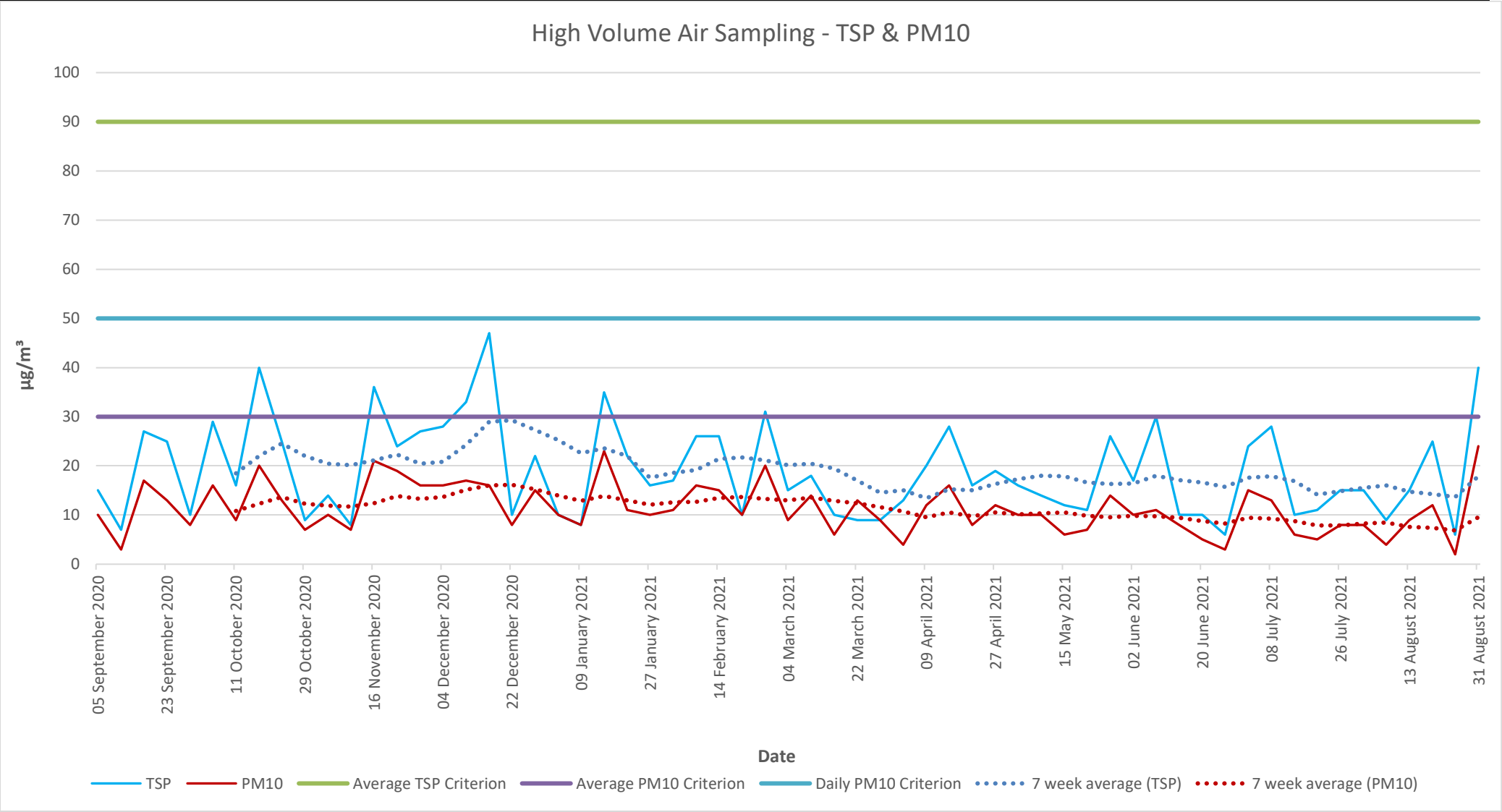


Figure 1 High Volume Air Sampling: Year-to-date results

### 3 BLAST MONITORING

The following conditions from the EPL refer to blast management:

*L5.1 Blasting in or on the premises must only be carried out between the hours of 9:00 am and 4:00 pm Monday to Friday. No blasting is permitted on Saturdays, Sundays or public holidays. Blasting outside of the hours specified in this condition can only take place with the written approval of the EPA.*

*L5.2 Blasting is not permitted simultaneously with adjacent quarry(s).*

*L5.3 The airblast overpressure level from blasting operations in or on the premises must not exceed:*  
*a) 115 dB (Lin Peak) for more than 5% of the total number of blasts during each reporting period; and*  
*b) 120 dB (Lin Peak) at any time,*  
*at monitoring point 11 detailed in Condition P1.4.*

*L5.4 The ground vibration peak particle velocity from blasting operations carried out in or on the premises must not exceed:*  
*a) 5 mm/second for more than 5% of the total number of blasts during each reporting period; and*  
*b) 10 mm/second at any time,*  
*at monitoring point 11 detailed in Condition P1.4.*

*L5.5 Error margins associated with any monitoring equipment used to measure airblast overpressure or peak particle velocity are not to be taken into account in determining whether or not the limit has been exceeded.*

*L5.6 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.*

*L5.7 Offensive blast fume must not be emitted from the premises.*

*M7.1 To determine compliance with Blast Limit conditions of this licence:*  
*a) Airblast overpressure and ground vibration levels must be measured and electronically recorded for monitoring point 11 for the parameters specified in Column 1 of the table below; and*  
*b) The licensee must use the units of measure, sampling method, and sample at the frequency specified opposite in the other columns.*

**Table 9 EPL 20611 Condition M7.1 Blasting**

Parameter	Units of Measure	Frequency	Sampling Method
Airblast Overpressure	Decibels (Linear Peak)	All blasts	Australian Standard AS 2187.2-2006
Ground Vibration Peak Particle Velocity	Millimetres/second	All blasts	Australian Standard AS 2187.2-2006

There was othree blasts conducted in August 2021, see Table 10 for monitoring results.

**Table 10 Blast monitoring results**

Date	Time	Overpressure (dB(L))	Vibration (mm/s)
Wednesday, August 4 2021	1:32 PM	Nil Trigger	Nil Trigger
Friday, 13 August 2021	12:56 PM	Nil Trigger	Nil Trigger
Monday, 16 August 2021	2:22 PM	Nil Trigger	Nil Trigger

The monitoring results demonstrate compliance with blasting criteria of the Consent and the EPL.



## 4 NOISE MONITORING

Noise monitoring is undertaken in accordance with the approved *Noise Management Plan*, the Consent (*Schedule 3, condition 3 to 7*) and the EPL (*conditions L4 and M8*).

As the Quarry is operational with no construction activities being completed, construction noise is not being considered. Table 11 summarises the operational noise criteria.

Noise generated by the Quarry operation must not exceed the criteria specified in *Schedule 3, Condition 14* of the Consent (see Table 11) at the locations identified in Table 12.

**Table 11 Operational Noise Criteria (dB(A) LA<sub>eq</sub>(15min))**

Location	Criteria (day <sup>1</sup> )
Residence on Lot 11 DP10244564	43
A	40
B	37
G	38
All other residence	35

**Note 1:** A day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sunday and Public Holidays.

In accordance with the Consent, a noise monitoring program has been implemented. A summary of this monitoring program is outlined in Table 12

**Table 12 Noise monitoring locations**

Monitoring Method	Location	Frequency	Criteria
Attended noise monitoring	A, B, F, G	Quarterly	Refer to Table 11
Unattended noise monitoring	G	Quarterly	Refer to Table 11

### 4.1 ATTENDED MONITORING

Attended noise monitoring is required to be undertaken at locations (A, B, F and G) Quarterly.

The most recent attended noise monitoring was undertaken in August 2021.

The results for attended monitoring (see Table 13) show ambient noise levels include noise sources such as wind noise, traffic from the nearby Pacific Highway and wildlife such as insects and birds. The Quarry operation was inaudible at all locations except for Location G, where engine revs and the processing plant were audible, however; compliant with noise criteria.

### 4.2 UNATTENDED NOISE MONITORING

A review of the historical unattended noise monitoring data by expert noise consultants (EMM) found no evident trends associated with Karuah East Quarry operations. As a result of this review, Karuah East Quarry has decided to cease the unattended noise monitoring component of the quarterly compliance noise monitoring program.

### 4.3 NOISE MONITORING SUMMARY

The attended noise monitoring conducted during August 2021 demonstrated that Quarry operations are compliant with the established criteria.

**Table 13 Attended noise monitoring results (extracted from quarterly noise monitoring report prepared by EMM September, 2021)**

Location	Date	Start time (Period)	Total noise levels, dB							Site contribution, dB		EPL / PA Limits, dB	Meteorological conditions <sup>2</sup> EPL limits apply (Y/N)	Exceedance, dB	Comments
			L <sub>Amin</sub>	L <sub>A90</sub>	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A1</sub>	L <sub>Amax</sub>	L <sub>Ceq</sub>	LFN mod. Factor <sup>1</sup>	L <sub>Aeq</sub>				
A	31/8	10:36	39	45	50	53	55	62	65	Nil	IA	40 / 42	1.2 m/s @ 359° A stability class Y	Nil	Karuah East Quarry inaudible. Traffic on the Pacific Highway and bird noise consistently audible.
B	31/8	10:55	42	52	61	66	69	74	70	Nil	IA	37 / 40	1.4 m/s @ 0° A stability class Y	Nil	Karuah East Quarry inaudible. Traffic on the Pacific Highway and bird noise consistently audible. Karuah Quarry occasionally audible (37 dB L <sub>Aeq,15 minute</sub> ).
F	31/8	11:13	36	41	47	49	54	70	59	Nil	IA	35 / 40	1.0 m/s @ 41° A stability class Y	Nil	Karuah East Quarry inaudible. Distant traffic on the Pacific Highway and bird noise consistently audible. Wind in foliage occasionally audible.
G	31/8	11:37	33	35	43	46	54	60	63	Nil	37	38 / 43	1.4 m/s @ 314° A stability class Y	Nil	Karuah East Quarry engine revs and processing plant consistently audible with alarms and bangs on occasion. Distant traffic on the Pacific Highway and bird noise consistently audible. Aircraft noise, dogs barking and wind in foliage occasionally audible.
Notes: 1. Modifying factor correction for LFN in accordance with Fact sheet C of the NPfI. 2. Meteorological data were taken as an average over 15 minutes from the Karuah East Quarry on-site weather station (Refer to Section 5.1). 3. IA = inaudible. 4. N/A = not applicable.															

## 5 SURFACE WATER MONITORING

---

### 5.1

Monthly water monitoring was undertaken on 5 August 2021 in accordance with the *Surface Water Monitoring Program* outlined in the *KEQ Water Management Plan (2015)*. Results are displayed in Table 14 **Error! Reference source not found.** along with the EPL discharge criterion and ANZECC (2000) Guidelines. These results do not determine compliance, they are used to analyse trends and assist with water management.

**Table 14 Water monitoring results**

Parameter	Units of measure	EPL 20611 concentration limit	Dam 1	Dam 2	Dam 3	SW 2	Lot 3 DP785172
Oil and grease	Milligrams per litre	5 and/or non-visible	<5	<5	<5	<5	<5
pH	pH	6.5 – 8.5	6.98	6.57	7.13	6.89	6.77
Total suspended solids	Milligrams per litre	40	188	6	9	6	12
		<b>ANZECC Guidelines<sup>1</sup></b>					
Conductivity	µS/cm	125 – 2200	599	1098	662	653	527
Total dissolved solids	mg/L	--	405	709	419	425	351
Total phosphorus	mg/L	0.025	0.12	<0.01	0.01	0.02	0.03
Ammonia	mg/L	0.2	0.05		0.04	0.05	0.02
Nitrogen (Nitrate)	mg/L	0.350	16.2	0.42	12.8	11.7	0.13
Total hardness (as CaCO <sub>3</sub> )	mg/L	--	35	435	86	85	89
Arsenic	mg/L	0.024	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium	mg/L	--	4	161	23	21	16
Chromium	mg/L	0.001	0.003	<0.001	<0.001	<0.001	<0.001
Copper	mg/L	0.0014	0.005	<0.001	<0.001	0.001	0.003
Lead	mg/L	0.0034	0.003	<0.001	<0.001	<0.001	0.001
Magnesium	mg/L	--	6	8	7	8	12
Manganese	mg/L	1.9	0.159	0.208	0.06	0.01	0.119

Nickel	mg/L	0.011	0.003	<0.001	<0.001	<0.001	0.001
Potassium	mg/L	--	1	<1	1	2	2
Sodium	mg/L	--	103	41	100	97	67
Vanadium	mg/L	--	0.01	<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	0.0312	0.03	0.007	<0.005	0.006	0.025

Note 1 – Key default trigger values presented in ANZECC 2000 for slightly disturbed upland rivers in NSW. Heavy metals based on hard water (120-179 mg CaCO<sub>3</sub>/L).

SW3 creek not running, sample taken from downstream creek – reference: Lot 3 DP785172.

## 5.2 DISCHARGE MONITORING

Condition L2 of the EPL outlines the requirement to monitor water discharges from the Quarry via the licensed discharge points (LDP1, LDP2 and LDP3), see Table 15.

**Table 15 EPL20611 - Pollutant concentration limits**

Pollutant	Units of Measure	Concentration Limit
Oil and Grease	Visible	5 &/or non-visible
pH	pH units	6.5 – 8.5
Total suspended solids	Milligrams per litre	40

### 5.2.1 Dam 3 (LDP3)

Dam 3 had a total of six days discharging during the month of August (see Table 17).

**Table 17 Discharge monitoring – LDP3**

Date	pH	Total suspended solids	Oil and grease	Controlled
04/08/2021	7.7	9	Non-visible	Yes
10/08/2021	7.8	<5	Non-visible	Yes
12/08/2021	7.7	<5	Non-visible	Yes
16/08/2021	7.7	8	Non-visible	Yes
18/08/2021	7.7	12	Non-visible	Yes
20/08/2021	7.7	17	Non-visible	Yes



## **6 REPORTING**

---

### **6.1 INCIDENT**

There were nil environmental incidents during August 2021 to report.

### **6.2 NON-COMPLIANCE**

There were nil non-compliance events during August 2021 to report.

### **6.3 COMPLAINTS**

There were nil complaints received during August 2021.

# Appendix 1 – Monitoring Locations



\\slr.slrcorp.net\Projects\SLR\630-SinWTL\630-HTL\630.30036.00000 Karuah Quarry EMS 2020 Review\06 SLR Data\01 CAD\GIS\GIS\SLR63030036\_EIMP\_Monitoring\_01.mxd



Source: Nearmap (June 2020)

Sheet Size : A4