



Grounded in Quality

A proud member of the Hunter Construction Group

Karuah Hard Rock Quarry

Environmental Monitoring Report:

January 2021



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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 11569* (the EPL) (see Table 1) and *Development Consent 265-10-2004* (the Consent) (see Table 2) for the Karuah Hard Rock Quarry (the Quarry).

Table 1 Environmental Protection Licence 11569 information

Environmental Protection Licence Number	11569
Licensee's Name	Hunter Quarries Pty Limited
Licensee's Address	Licensee Postal Address: PO Box 3284 Thornton NSW 2322. Premises Address: Karuah Quarry, Corner of Andesite Road and The Branch Lane, Karuah NSW 2324.
Link to Full Licence on the EPA Website	https://apps.epa.nsw.gov.au/prpoeoapp/

Table 2 Development Consent 265-10-2004 information

Development Application	DA 265-10-2004
Applicant	Hunter Quarries Pty Limited
Consent Authority	Minister for Infrastructure, Planning and Natural Resources
Land	https://mpweb.planningportal.nsw.gov.au/major-projects/project/27181

A summary of the environmental monitoring data for January 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 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 14* of the Consent (see Table 3, Table 4 and Table 5). Deposited dust and TSP/PM₁₀ monitoring is undertaken at the locations listed in Table 6.

Table 3 DA 265-10-2004 Long Term Assessment Criteria for Deposited Dust

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

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

Table 4 DA 265-10-2004 Long Term Impact Assessment Criteria for Particulate Matter

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

Table 5 DA 265-10-2004 Short Term impact Assessment Criterion for Particulate Matter

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

Table 6 Air quality monitoring locations

Site ID	Location	Address	GPS Coordinates
DDG 1 (South)	South of the Karuah Quarry	5760 Pacific Hwy, Karuah NSW 2324	32°38'04"S 151°59'58"E
DDG 2 (South-East)	South of the Karuah Quarry	5770 Pacific Hwy, Karuah NSW 2324	32°38'02"S 152°00'09"E
DDG 3 (South-West)	South-West of the Karuah Quarry	DP 1024341, Karuah	32°37'57"S 151°59'41"E
DDG 4 (East)	East of the Karuah Quarry	21 Halloran Rd North Arm Cove NSW 2324	32° 37' 30.87"S 152°01'10.18"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 January 2021 and the year to date (YTD) from the Consent anniversary (16 January) are shown in Table 7.

Table 7 Deposited dust monitoring results

Date On	Date Off	DDG 1	DDG 2	DDG 3	DDG 4
13/02/2020	12/03/2020	1.7	1.5	0.7	0.9
12/03/2020	09/04/2020	0.8	0.8	0.5	0.1
09/04/2020	07/05/2020	1.2	0.9	1.0	-
07/05/2020	04/06/2020	0.2	0.3	0.3	0.7
04/06/2020	02/07/2020	0.1	0.2	0.3	0.3
02/07/2020	31/07/2020	0.2	<0.1	0.2	0.6
31/07/2020	01/08/2020	0.4	0.2	0.4	1
01/09/2020	01/10/2020	0.6	0.5	0.4	1.0
01/10/2020	02/11/2020	0.2	<0.1	1.3	0.7
02/11/2020	03/12/2020	3.2	2.3	0.8	0.7
03/12/2020	04/01/2021	0.3	0.5	<0.1	0.4
04/01/2021	04/02/2021	1.5	0.9	0.7	0.3
YTD average		0.8	0.6	0.6	0.5

Note¹: DDG4 was not able to be analysed for period 9/4/2020 to 7/05/2020 due to sample jar breaking during collection and transportation to the laboratory.

Monitoring results indicate that for the period 4 January 2021 to 4 February 2021 the insoluble solid levels recorded at DDG 1 to DDG 4 monitoring locations were below the project criterion of 4 g/m²/month.

2.2 HIGH VOLUME AIR SAMPLING

The TSP and PM₁₀ results for January 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/m³) results

Run Date	HVAS TSP (µg/m ³)	HVAS PM ₁₀ (µg/m ³)
3/01/2021	10	10
9/01/2021	8	8
15/01/2021	35	23
21/01/2021	22	11
27/01/2021	16	10
24hr Average Criteria¹	N/A	50
Annual Average Criteria¹	90	30
Progressive Annual Average²	22.9	12.4

Note: ¹ Criteria as specified in DA 265-10-2004.

² The progressive annual average is from 01/01/2020 to 27/01/2021, this is not a measure of compliance.

All HVAS monitoring results, to the end of January 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).

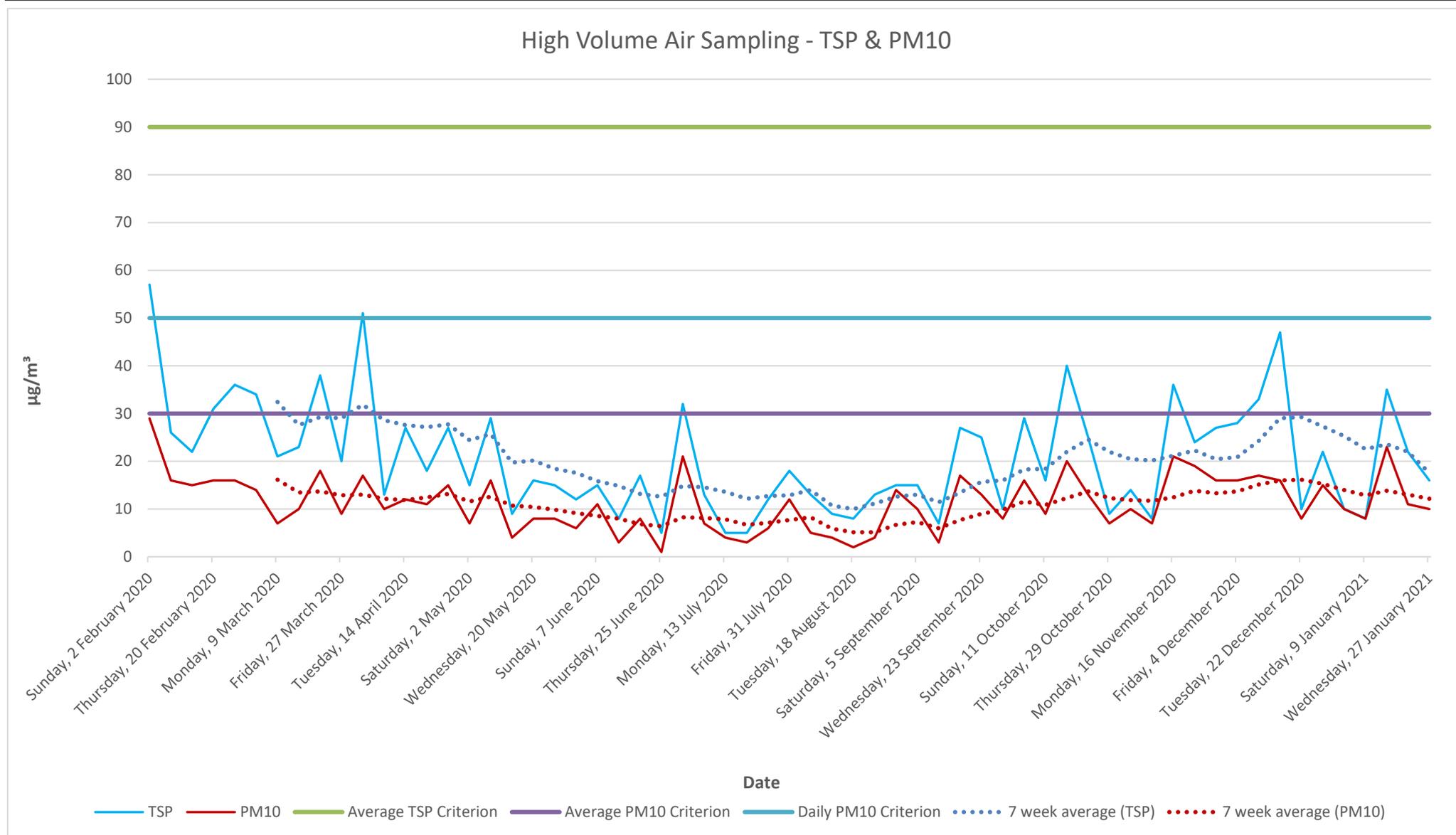


Figure 1 High Volume Air Sampling: Year-to-date results

3 BLAST MONITORING

Blasting must only be carried out between the hours of 9:00 AM and 4:00 PM Monday to Friday. No blasting is permitted on Saturday, Sundays or Public Holidays. Blasting outside of the hours specified by the EPL/Consent, can only take place with the written approval of relevant regulatory authorities.

KEQ conduct monitoring at the nearest residential location (EPL 11569 EPA identification no. 11) to ensure that airblast overpressure level and ground vibration peak particle velocity do not exceed the EPL and Consent criteria (see **Error! Reference source not found.**).

Table 9 EPL 11569 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 were no blasts conducted in January 2021.

4 NOISE MONITORING

Noise generated by the Quarry operation must not exceed the criteria specified in *Schedule 3, Condition 14* of the Consent (see Table 10) at the locations identified in Table 11.

Table 10 Noise impact assessment criteria

Time Period	Noise Limit (dBA) LAeq(15minute)
Day 7:00am to 6:00pm Monday to Friday 7:00am to 1:00pm Saturday	48
Evening 6:00pm to 10:00pm Monday to Friday	47
At All Other Times	46

Table 11 Noise monitoring locations

Noise Monitoring Location	Property Name	Distance from Karuah Quarry
NM1	Lot 3 DP785172 5772 Pacific Hwy, Karuah	317 metres South of the Karuah Quarry
NM2	Lot 2 DP 785172 5760 Pacific Hwy, Karuah	200 metres South of the Karuah Quarry

4.1 ATTENDED MONITORING

Attended noise monitoring is required to be undertaken at the two nearest residence (NM1 and NM2) biannually.

The most recent attended noise monitoring was undertaken during November, see monitoring results in Table 12.

Table 12 Attended noise monitoring results

Location	Date/Start Time/ Weather	Primary Noise Descriptor (dBA re 20 µPa)					Description of Noise Emissions and Typical Maximum Noise Levels (dBA)
		LA _{max}	LA1	LA10	LA90	LA _{eq}	
NM1	4/11/2020 1:20 PM Calm	66	62	55	41	49	Pacific Highway 50-55 Karuah Quarry Inaudible
NM2	4/11/2020 11:35 AM Calm	75	70	66	57	63	Pacific Highway 55 - 65 Birds 40-45 Karuah Quarry Inaudible

The results of the attended monitoring (Table 12) show ambient noise levels include noise sources such as traffic from the nearby Pacific Highway and wildlife such as birds. The Quarry operation was inaudible at location NM1 and NM2.

4.2 UNATTENDED NOISE MONITORING

Unattended noise monitoring is required to be undertaken at the two nearest residence (NM1 and NM2) biannually.

The most recent unattended noise monitoring was undertaken during November, see monitoring results for NM1 in Table 13 and NM2 in Table 14.

Table 13 NM1 - Unattended noise monitoring results

INP Period	L _{A1}	L _{A10}	L _{A90}	L _{AEQ}
Day	64	60	51	57
Evening	66	62	49	59
All other times	66	63	47	58

Table 14 NM2 - Unattended noise monitoring results

INP Period	L _{A1}	L _{A10}	L _{A90}	L _{AEQ}
Day	70	67	54	63
Evening	71	66	52	63
All other times	71	66	47	62

The attended noise monitoring conducted during November 2020 identified that the Quarry was not audible at location NM1 or NM2.

5 SURFACE WATER MONITORING

Condition L2 of the EPL outlines the requirement to monitor surface water discharges from the Quarry via the licensed discharge point (LDP001), see Table 15.

Table 15 EPL 11569 - 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	50

There were no controlled discharges from LDP001 during the month of January 2021.

6 WEATHER MONITORING

Karuah Quarry has a permanent meteorological station to monitor various weather parameters. Figure 2 shows the recorded results for the local weather during January 2021. Weather data is significant from an environmental perspective, especially when regarding the total rainfall in the area as this effects multiple variables particularly erosion and sediment control as well as water quality management.

A wind rose is a graphic tool used to depict the average direction and speed of the wind over a recorded period. Figure 3 shows the wind rose generated from data gathered during January 2021.

Monthly Weather Summary



Site: Karuah Quarry
 Month: January 2021

Date	Day	Temperature @ 2m			Temperature @ 10m			Winds			Solar Radiation		Rain ² mm
		Max ¹ °C	Min ² °C	Ave ¹ °C	Max ¹ °C	Min ² °C	Ave ¹ °C	Max Gust ¹ km/h	Ave Speed ¹ km/h	Dir Ave ¹ deg	Max ¹ W/m ²	Ave ¹ W/m ²	
1	Fri	20.7	19.5	18.9	20.9	19.4	18.8	30.8	5.9	160	330.8	50.7	6.4
2	Sat	23.1	18.1	20.3	22.5	18.1	20.2	21.3	3.3	149	449.9	104.9	41.8
3	Sun	27.2	18.8	21.9	25.7	19.1	21.6	21.3	3.7	169	859.9	158.4	13.8
4	Mon	30.8	18.0	21.8	29.2	18.1	21.5	40.2	3.3	182	900.7	143.2	4.4
5	Tue	32.3	17.0	25.3	31.1	17.4	24.8	28.4	6.0	200	1034.1	296.4	25.4
6	Wed	25.5	19.6	21.6	23.6	20.4	21.3	33.1	9.2	160	860.8	116.5	0.2
7	Thu	26.1	17.6	19.6	23.6	17.8	19.5	33.1	7.2	153	1369.9	164.9	2.0
8	Fri	21.8	16.2	17.9	21.3	17.0	17.9	33.1	5.5	170	476.6	107.6	7.2
9	Sat	25.3	15.1	19.1	23.1	15.1	18.7	27.2	5.0	187	1204.0	229.5	16.4
10	Sun	27.7	14.2	20.5	24.6	14.5	20.1	28.4	5.0	157	1215.0	294.6	8.6
11	Mon	29.4	13.8	22.7	27.0	14.2	22.4	31.9	5.5	128	1229.9	301.1	0.2
12	Tue	32.9	15.4	24.2	30.2	16.3	23.8	23.7	4.8	128	1053.2	291.2	
13	Wed	31.2	17.2	24.2	28.6	18.5	23.5	34.3	5.8	125	1246.7	296.9	
14	Thu	36.1	17.8	26.4	34.9	18.1	25.9	22.5	4.9	160	1078.3	256.5	
15	Fri	30.0	20.6	23.3	27.2	20.7	23.0	35.5	5.7	185	1151.6	238.9	2.2
16	Sat	28.0	16.7	19.6	24.8	17.8	18.9	35.5	5.1	181	986.7	331.0	
17	Sun	28.2	10.8	20.6	25.1	11.3	19.6	27.2	4.2	188	999.2	290.1	
18	Mon	32.1	14.4	23.1	29.6	14.7	22.7	22.5	4.0	183	1074.1	252.0	
19	Tue	26.5	16.6	20.1	24.8	17.3	19.9	35.5	6.8	156	1250.0	100.6	
20	Wed	24.6	16.7	18.4	22.1	17.3	18.0	23.7	3.8	171	1123.2	165.9	9.8
21	Thu	27.7	12.7	21.6	25.1	13.3	21.1	30.8	5.6	133	1179.2	302.9	0.2
22	Fri	34.8	14.9	25.6	32.1	15.6	25.3	23.7	4.3	142	915.8	300.0	
23	Sat	36.2	17.9	26.2	33.5	18.9	26.4	26.0	3.9	148	922.5	290.4	
24	Sun	37.2	15.8	26.3	34.8	17.2	25.7	26.0	5.9	134	935.7	307.6	
25	Mon	36.2	17.4	26.5	33.0	18.0	25.8	30.8	5.2	134	935.0	309.2	
26	Tue	39.7	19.0	29.4	37.0	19.6	28.7	31.9	5.5	141	952.5	286.1	
27	Wed	24.5	22.0	21.5	24.0	22.5	21.3	40.2	11.0	182	160.0	35.3	
28	Thu	21.4	20.0	20.3	21.1	19.8	20.2	39.0	13.1	149	257.5	57.3	23.2
29	Fri	24.7	19.5	21.7	24.2	19.6	21.6	27.2	5.5	142	519.2	96.9	59.8
30	Sat	31.9	20.4	22.7	29.1	20.3	22.3	37.9	3.5	161	1270.7	164.7	11.6
31	Sun	28.3	18.1	23.2	25.9	18.4	22.5	33.1	4.0	171	1159.2	183.8	8.6
Ave or Total		29.1	17.2	22.4	27.1	17.6	22.0	30.2	5.6	158.9	938.8	210.5	241.8
High		39.7	22.0	29.4	37.0	22.5	28.7	40.2	13.1		1369.9	331.0	59.8
Low		20.7	10.8	17.9	20.9	11.3	17.9	21.3	3.3		160.0	35.3	
												No. rain days >1mm:	15

Notes: 1. Values are for the 24 hour period from 9am to 9am next day.

2. Values are for the 24 hours to 9am.

Figure 2 Weather Summary January 2021

Wind Rose Report for: Karuah East - 15 Min Data
 WDIR Vector Wind Dir and VWSP Vector Wind Spd in km/h
 Period: 2021-01-01 00:00 to 2021-01-31 00:00
 Direction the Wind is Blowing To

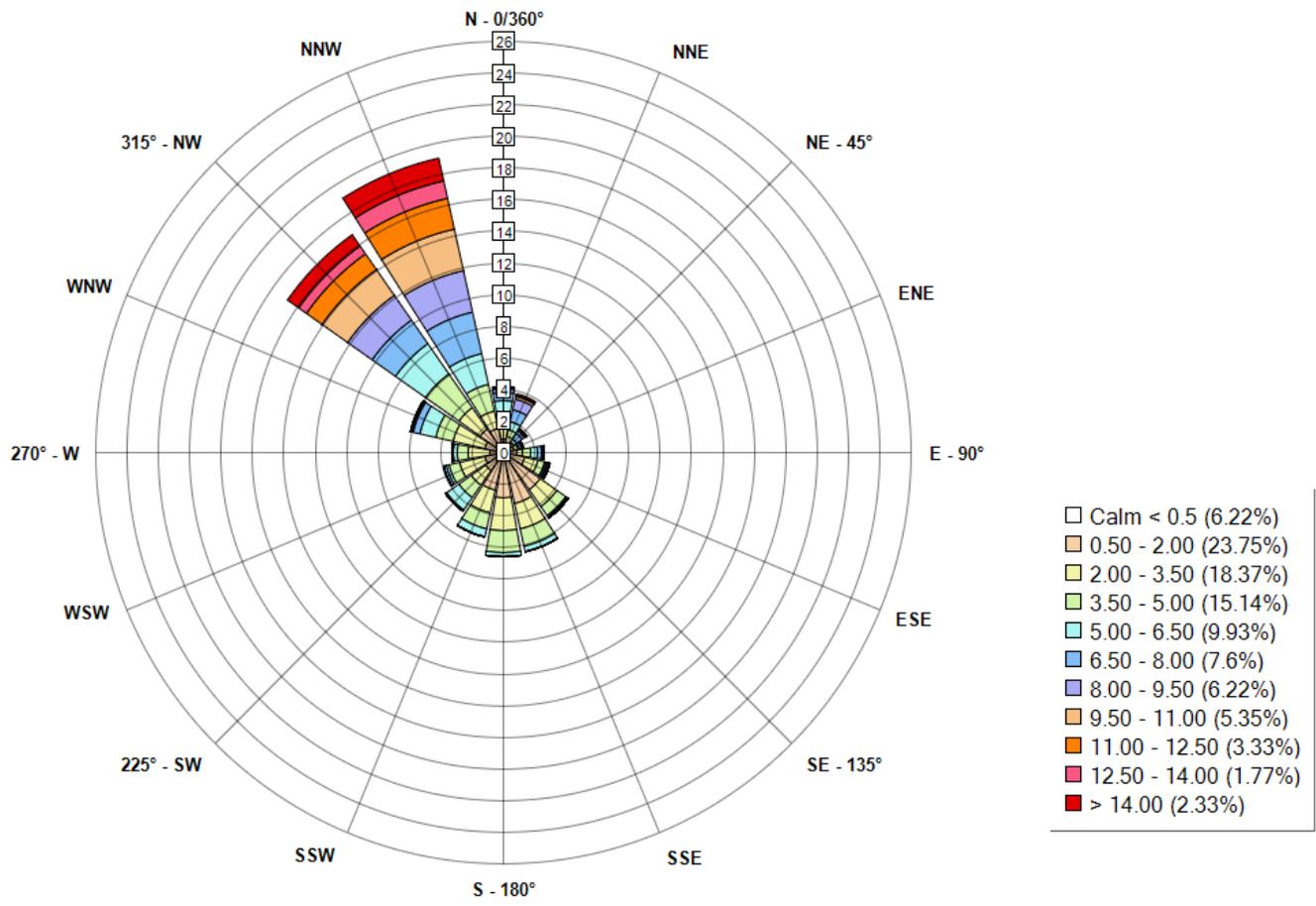


Figure 3 Wind rose January 2021

7 REPORTING

7.1 INCIDENT

There were nil environmental incidents during January 2021 to report.

7.2 NON-COMPLIANCE

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

7.3 COMPLAINTS

There were nil complaints received during January 2021.

Appendix 1 – Monitoring Locations

\\slr\slr\local\Corporate\Projects-SLR\630-Sv\NTL\630-NTL\630-30036\00000 Karuah Quarry EMS 2020 Review\06 SLR Data\01 CAD\GIS\GIS\SLR\630-30036_EIMP_Monitoring_01.mxd

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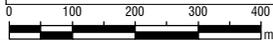
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LEGEND

-  Blast Monitoring Site
-  Air Quality Monitoring Site
-  Noise Monitoring Site
-  Water Monitoring Site
-  Watercourse
-  Lot Boundary



Scale: 1:12,000
GDA 1994 MGA Zone 56

05-Aug-2020
630.30036

Source: Nearmap (June 2020)