

THREE KINGS QUARRY
Noise Compliance Assessment - Quarry Activity
Rp 007 2011528A

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Project: **THREE KINGS QUARRY**

Prepared for: **Winstone Aggregates
PO Box 17195
Greenlane
Auckland 1546**

Attention: **Elyse LaFace**

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1.0 INTRODUCTION

Marshall Day Acoustics (MDA) has carried out an environmental noise survey at monitoring positions adjacent to Three Kings Quarry, Mt Eden on 3 December 2014. Winstone Aggregates is required to undertake two noise surveys per year, at two identified monitoring positions, as part of the Environmental Management Plan for the quarry, in order to determine compliance with the noise rules for the site.

“Fill” operations are also taking place at the northern end of the quarry. Sound generated from these activities must comply with the conditions in Environment Court Decision No. [2011] NZEnvC 214.

2.0 NOISE PERFORMANCE STANDARDS

The quarry is zoned *Business 7* in the City of Auckland District Plan Isthmus Section – Operative 1999. The closest dwellings are located immediately to the west of the quarry in Fyvie Avenue. The noise rule for operations within the quarry is:

“Noise Control at the Residential Interface

The L_{10} noise level and maximum level (L_{max}) arising from any activity measured at or within the boundary of any residential zoned property shall not exceed the following limits:

<i>Monday to Saturday</i>	<i>7.00 am – 10.00 pm</i>	<i>L_{10} 55 dBA</i>
<i>Sunday and Public Holidays</i>	<i>9.00 am – 6.00 pm</i>	
<i>At all other times</i>		<i>L_{10} 45 dBA</i>
		<i>L_{max} 75 dBA, or background (L_{95}), plus 30 dBA whichever is the lower</i>

The above noise levels shall be measured and assessed in accordance with the requirements of the NZS 6801:1991 “Measurement of Sound” and NZS 6802:1991 “Assessment of Environmental Sound” or their replacement.”

3.0 MEASUREMENTS

3.1 General

Measurements were completed at each of the two measurement positions on 3 December 2014. The first was at the Fyvie Avenue position between 11:08 am and 11:42 am and the second was at the Grahame Breed Drive position between 12:00 pm and 12:36 pm. The measurement positions are the same as in all previous compliance measurements of this type and are shown on the figure in Appendix A.

Sound level measurements were carried out using a Brüel & Kjaer 2250 sound level meter, which satisfies the requirements for a Type 1 sound level meter according to IEC 651. Measurements were carried out and assessed generally in accordance with the relevant New Zealand Standards.

The weather was fine with 1 okta cloud cover and a light breeze from the SSW. These conditions are considered acceptable for environmental noise surveys.

3.2 Operations and Equipment

The following equipment was operating in the quarry during the survey. These operations were confirmed by the quarry supervisor following completion of the survey.

Quarry Activity:

- 1 x CAT 966G Wheel loader moving aggregate, spreading water (dust control) and loading trucks with aggregate
- Arrival and departure of trucks collecting aggregate from the stockpiles

Fill Operations Activity (at northern end of quarry):

- 1 x Hyundai 290LC Excavator spreading fill
- 1 x CAT D6R Bulldozer spreading and compacting fill
- Arrival and departure of trucks delivering fill materials

3.3 Results

The measured sound levels are presented in Table 1 below.

Table 1 – Measured Sound Levels

Measurement Position	Duration	dB L _{A10}	Noise Sources ⁽¹⁾
Fyvie Avenue	20 minutes	51	<p><u>Hyundai 290LC excavator spreading fill including excavator bucket sounds</u>, arrival and departure of trucks (collecting aggregate and depositing fill), CAT 966G wheel loader moving around the quarry, truck air brakes ⁽²⁾ CAT D6R bulldozer not operating.</p> <p><i>Non-quarry sound:</i> Bird sounds, distant helicopter and dog sounds, occasional wind in trees</p>
Grahame Breed Drive	15 minutes	48	<p>Hyundai 290LC excavator spreading fill including excavator bucket sounds, arrival and departure of trucks (collecting aggregate and depositing fill), CAT 966G wheel loader moving around the quarry ⁽²⁾</p> <p><i>Non-quarry sound:</i> Distant traffic on Mt Albert Road, occasional bird sounds and wind in trees</p>

Notes to Table 1:

- (1) Controlling sound source(s) underlined
- (2) CAT D6R bulldozer not operating during measurement

3.4 Discussion

3.4.1 Fyvie Avenue

The Terex Pegson crushing plant was not operating during the survey. Therefore associated activities including extraction of rock from the quarry face and scoria load-out of dump truck did not occur.

Sound from quarry activities (excluding scoria extraction and crushing) was audible at the Fyvie Avenue measurement position. However the overall noise level was controlled by the Hyundai 290LC Excavator in relation to fill operations at the northern end of the quarry (Refer Photos 1 and 2 below). Trucks (both quarry and fill operations related) moving along the haul road were audible. Wheel loader activity was also audible depending on its location.

Ambient sound sources (i.e. not associated with quarry operations) included birds and distant helicopter and dog sounds. Fill operations noise was included in the measurement, and the site as a whole was operating inside the quarry operations noise limit.

A level of 51 dB L_{A10} was measured at this location although sound contribution from quarry operations was considered to be less than this and therefore readily compliant with the noise limit of 55 dB L_{A10} .

3.4.2 Grahame Breed Drive

In terms of activity from the quarry, the most audible sound sources at this position were bucket sounds from the Hyundai 290LC excavator undertaking fill operations, as well as trucks entering and exiting the site. Wheel loader noise was also audible at times.

Ambient sound sources (i.e. not associated with quarry operations activity) included distant traffic sound from the surrounding road network and birds.

The measured sound level of 48 dB L_{A10} readily complies with the noise limit of 55 dB L_{A10} .

The following photos 1 & 2 show the plant which was in the quarry during the period of the survey.

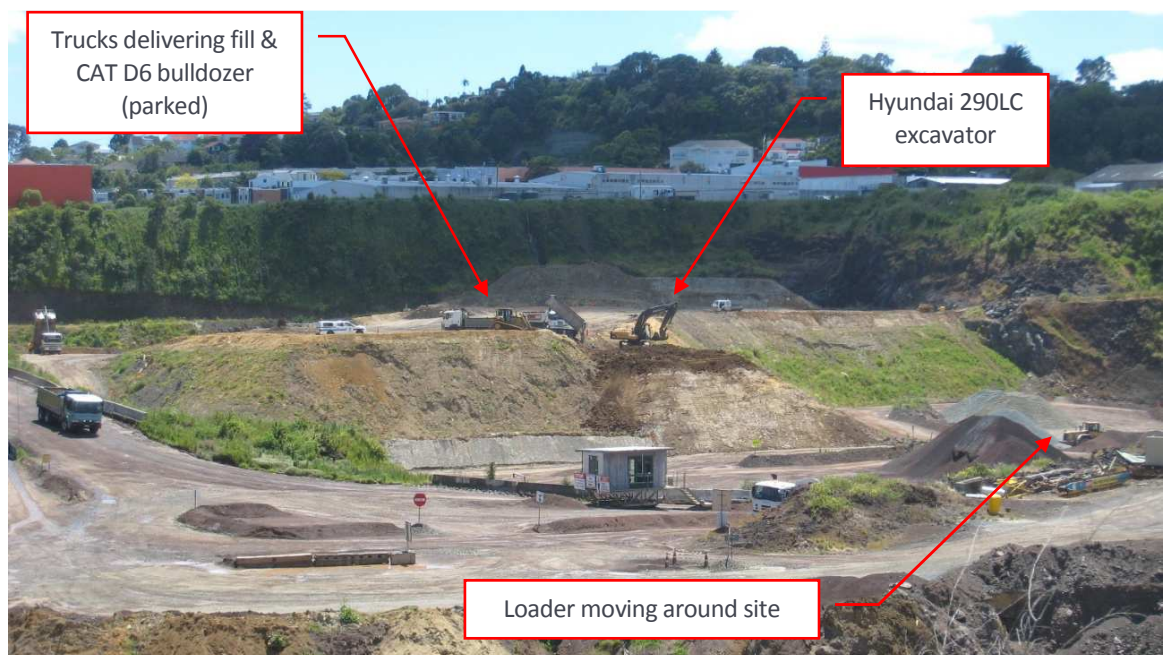


Photo 1: Northern End of Quarry



Photo 2: Middle of Quarry

4.0 CONCLUSIONS

Marshall Day Acoustics has completed noise monitoring at the two nominated monitoring positions as required by the Environmental Management Plan for the Three Kings Quarry.

Sound generating activity from the quarry during the survey period included general quarry activity and fill operations.

Fill operations were taking place at the northern end of the quarry and involved one bulldozer to spread and compact the fill material, one excavator, and trucks delivering material to the fill area.

Quarry activity included the arrival and departure of trucks collecting aggregate from the stockpiles, and general loader operation. Aggregate extraction and crushing did not occur.

The cumulative acoustic emission from quarry and fill operations resulted in sound levels which complied with the relevant noise rules for quarry operations on the site.

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