

**THREE KINGS QUARRY**  
**Noise Compliance Assessment – Quarry Activity**  
**Rp 006 2011528A**

**1 August 2014**



Project: **THREE KINGS QUARRY**  
**Noise Compliance Assessment – Quarry Activity**

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## TABLE OF CONTENTS

1.0	INTRODUCTION .....	4
2.0	NOISE PERFORMANCE STANDARDS .....	4
3.0	MEASUREMENTS.....	4
3.1	General.....	4
3.2	Operations and Equipment .....	5
3.3	Results .....	5
3.4	Discussion .....	5
3.4.1	Fyvie Avenue.....	5
3.4.2	Grahame Breed Drive .....	6
4.0	CONCLUSIONS .....	7

## APPENDIX A MEASUREMENT POSITIONS

## 1.0 INTRODUCTION

Marshall Day Acoustics has carried out an environmental noise survey at monitoring positions adjacent to Three Kings Quarry, Mt Eden on 29 July 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><math>L_{10}</math> 55 dBA</i>
<i>Sunday and Public Holidays</i>	<i>9.00 am – 6.00 pm</i>	
<i>At all other times</i>		<i><math>L_{10}</math> 45 dBA</i>
		<i><math>L_{max}</math> 75 dBA, or background (<math>L_{95}</math>), 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 the Fyvie Avenue measurement position on 29 July 2014 between 7.00am - 8.00 am and 12.00 pm - 1.00 pm. Measurements at the Grahame Breed Drive position were carried out between 11.30 am and 12.00 pm on the same day.

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 little cloud cover and a light breeze from the north-east. 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:

- General loader operation
- Arrival and departure of trucks collecting aggregate from the stockpiles

#### Fill Operations Activity (at northern end of quarry):

- 1 x Hyundai 290 Excavator digging out from the trench and stockpiling
- 1 x CAT D6 Swamp Track 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	Start Time	Duration	dB L <sub>A10</sub>	Noise Sources <sup>(1)</sup>
Fyvie Avenue	07.07am	10 minutes	54	Loader starting up and driving down from main gate; arrival of trucks collecting and depositing aggregate <i>Non-quarry sound: <u>Birds</u> and <u>traffic</u></i>
Fyvie Avenue	07.31am	10 minutes	52	Loader moving around site; arrival and departure of trucks collecting aggregate; fill ops noise incl. trucks and excavator <sup>(2)</sup> <i>Non-quarry sound: <u>Birds</u> and <u>traffic</u></i>
Fyvie Avenue	12.12pm	20 minutes	53	Insignificant quarry ops noise. Fill ops noise incl. trucks, excavator and <u>bulldozer</u> <sup>(3)</sup> <i>Non-quarry sound: <u>construction noise</u></i>
Grahame Breed Drive	11.42am	20 minutes	49	Loader moving around site; arrival and departure of trucks collecting aggregate; fill ops noise incl. trucks, excavator and bulldozer <sup>(2)(3)</sup> <i>Non-quarry sound: Birds and traffic</i>

#### Notes to Table 1:

- (1) Controlling sound source(s) underlined
- (2) Fill ops noise included as site as a whole was generating less than 55 dB L<sub>A10</sub>
- (3) Excavator and bulldozer operated consecutively

### 3.4 Discussion

#### 3.4.1 Fyvie Avenue

Early morning start-up noise was measured at this location and included the warm-up and movement of the loader from the front gate down to the quarry floor. Sound from quarry activities (excluding scoria extraction and crushing) was audible at the Fyvie Avenue measurement position.

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.

Ambient sound sources (i.e. not associated with quarry operations) including birds and traffic on local roads were considered to be the controlling sources of sound. One of the measurements at this location included building noise from a nearby house. Fill operations noise was included in the measurements as the site as a whole was operating inside the noise limit.

Levels of between 52-54 dB  $L_{A10}$  were measured at this location although sound contribution from quarry operations was considered to be less than 50 dB  $L_{A10}$  and therefore readily compliant with the noise limit.

### 3.4.2 Grahame Breed Drive

In terms of activity from the quarry, the most audible sound sources at this position were the loader moving around the site and depositing loads of aggregate into waiting trucks, as well as trucks entering and exiting the site. Fill operations 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.

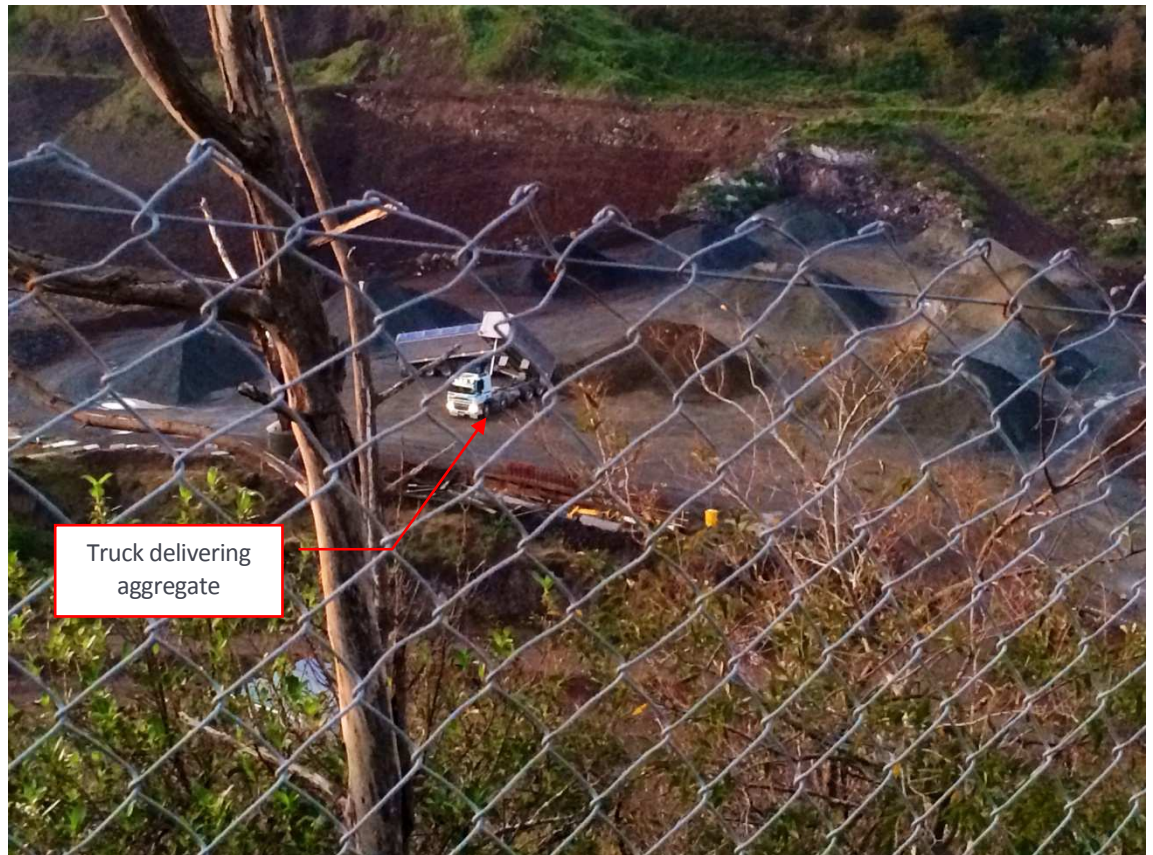
The measured sound level of 49 dB  $L_{A10}$  readily complies with the noise limit of 55 dB  $L_{A10}$ .

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



**Photo 1: Northern End of Quarry**





*Photo 2: Southern End 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.



## APPENDIX A MEASUREMENT POSITIONS

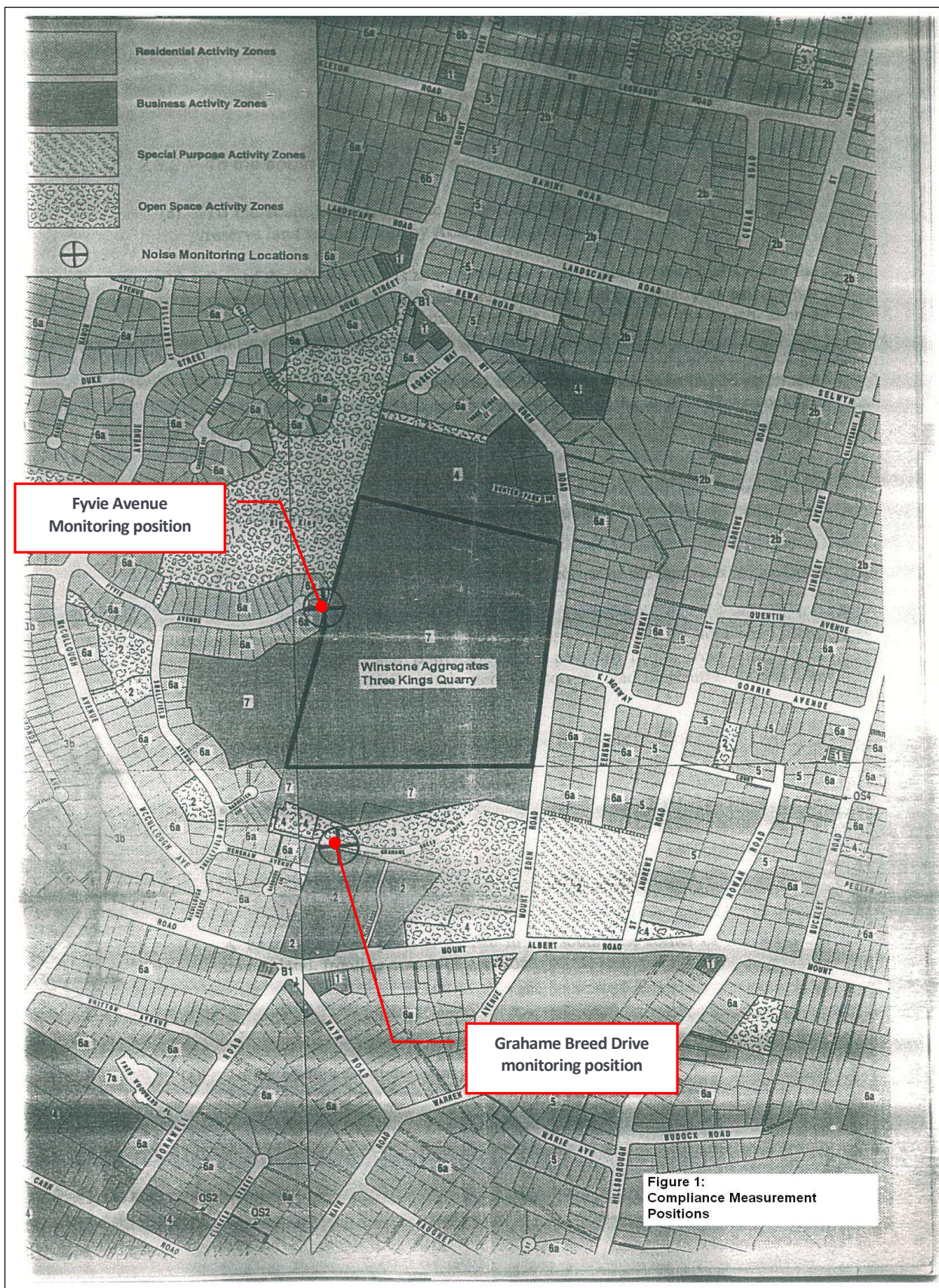


Figure 1:  
Compliance Measurement  
Positions