

RSA ACOUSTICS
Acoustic Consultants

**-NOISE ASSESSMENT-
RELOCATION OF KLEKIES PTY LTD
TO CHRISTIE STREET
ST MARYS**

REPORT NO 2207

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Prepared for
KLEKIES PTY LTD

81 – 85 Christie Street, St Marys

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INTRODUCTION

Klekies Pty Ltd is relocating its current operations from Daintree Place, West Gosford to new premises at 81-85 Christie Street St Marys. RSA Acoustics Pty Ltd was requested by Klekies Pty Ltd to carry out a Noise Impact Assessment for the new premises.

The purpose of the assessment is to advise on the likely acoustical impacts on neighbouring properties at the new site from all plant, equipment and operations.

DESCRIPTION OF PROPOSED DEVELOPMENT SITE

The proposed site at Christie Street is an existing industrial zoned block within an established industrial area in St Marys. Christie Street is an established industrial area populated with medium to large industries from north through east to the south. To the north east is golf course. Directly to the south on the same site are two warehouses. Directly across Christie Street to the south at a distance of approximately 120 metres is Sims car crushing plant. Christie Street is a major road carrying a mixture of vehicle types including (>10%) heavy vehicles. The closest residential property is in Reid Street to the south west at a distance of greater than 800 metres.



CRITERIA

Noise criteria are provided by the Environment Protection Authority, NSW (EPA) that are generally in line with criteria given in other states of Australia and many countries of the world.

This includes the EPA Environmental Noise Control Manual (1994) and the Industrial Noise Policy (2000) which cover noise in the urban, suburban and rural areas. Although specific local conditions can affect the criteria, convincing justification must be given for any variation to EPA guidelines.

The Environment Protection Authority, NSW (EPA) in their Industrial Noise Policy (2000) states that:-

‘The intrusiveness of an industrial noise source may generally be considered acceptable if the equivalent continuous (energy-average) A-weighted level of noise from the source (represented by the L_{Aeq} descriptor) measured over a 15 minute period, does not exceed the background noise level measured in the absence of the source by more than 5 dB.’

Thus, when considering the environmental consequence of noise from a specific source, any increase above the background sound pressure level, which exceeds 5 dB, may be offensive.

The perception of noise and its level of offensiveness depends greatly on the broader situation within which it occurs. Noise that might intrude into a resting or sleeping place may be found offensive whereas the same noise occurring in a market place or noisy working area may pass unnoticed. The concept of ‘background + 5 dB’ derives from this consideration.

In the EPA’s Industrial Noise Policy it is stated that ‘To limit continuing increases in noise levels, the maximum ambient noise level within an area from industrial noise sources should not normally exceed the acceptable noise levels specified in Table 2.1.’

The relevant parts of the EPA recommended levels are given in Table 1 below:-

Table 1 - Recommended Noise Levels from Industrial Noise Sources.

Type of Receiver	Indicative Noise Amenity Area	Time of Day	Recommended L_{Aeq} Noise Level (dBA)	
			Acceptable	Extreme
Residence	Rural	Day	50	55
		Evening	45	50
		Night	40	45
Residence	Suburban	Day	55	60
		Evening	45	50
		Night	40	45
Residence	Urban	Day	60	65
		Evening	50	55
		Night	45	50
Residence	Urban Industrial Interface existing situations only	Day	65	70
		Evening	55	60
		Night	50	55
Commercial premises	All	When in use	65	70
Industrial premises	All	When in use	70	75

Hence the acceptable daytime noise level (L_{Aeq}) for existing industrial interface areas is 70 dB(A) with an extreme limit at 75 dB(A). Daytime is defined as 07:00 hours to 22:00 hours Monday to Saturday and 08:00 hours to 22:00 hours Sundays and Public Holidays. Klekies Pty Ltd will continue to operate only in daytime hours.

NOISE MEASUREMENT RESULTS

Instrumentation used for the noise measuring, the measurement procedure and results are as follows.

Instrumentation

The instrumentation used during the noise survey consisted of:-

- Sound level meter SdB1, serial number 988224;
- Pre-amplifier models SV01, serial numbers 981227;
- Pre-amplifier 12N, serial number 1264;
- Microphone MCE220, serial number 980473.

The meter conforms to Australian Standard 1259 'Acoustics - Sound Level Meters', (1982) as a type 1 precision sound level meter with an accuracy suitable for field use. The calibration was checked before and after the measurement period with a Brüel and Kjær acoustical calibrator model 4230. No significant system drift occurred over the measurement periods.

Measurement Procedure

All measurements were taken at a height of approximately 1.2 metres and 1 metre away from the machine. The results are necessarily a snapshot of the noise levels on the particular day of the survey.

Because environmental noise levels vary with time, it is not adequate to use a single number to describe the acoustic environment. The preferred and now generally accepted method of recording and presenting noise measurements is based upon a statistical approach.

The L_{10} noise level is the level exceeded for 10% of the time, and is approximately the average maximum noise level. The L_{90} level is the level that is exceeded for 90% of the time, and is considered to be approximately the average of the minimum noise level recorded. This level is often referred to as the 'background' noise level. The L_{eq} level represents the average noise energy during the measurement period.

Noise measurements of existing plant and equipment were carried out at the current Klekies Pty Ltd site in Daintree Place, West Gosford on Monday 31st July 2006.

The $L_{Aeq,15\text{minute}}$ level represents the average noise energy during the 15 minute measurement period. This is the noise emission parameter cited in the Environment Protection Authority's Industrial Noise Policy.

The noise level of the individual items of equipment was measured under normal operating conditions measurements were taken while all equipment was operating simultaneously. This is considered to be normal operating conditions.

Leq Operating Sound Pressure Levels @ 1 metre.								
Octave Band Centre Frequencies in Hz								
63	125	250	500	1000	2000	4000	8000	(A)
Measured Linear Sound Pressure Levels Plus Overall dB(A)								
Truck Engine								
73	75	77	76	77	74	69	65	75
Truck Pump								
66	68	66	61	70	71	64	66	67
Oil Transfer Pump								
51	52	55	51	58	52	51	51	53

Calculations were carried out using plans supplied by Klekies Pty Ltd with the plant and equipment layout proposed for the operations at the new site.

Noise Predictions

The source noise has been modelled using the International Standard ISO 9613-2 (1996(E)) '*Acoustic – Attenuation of sound during propagation outdoors Part 2 General method of calculation*'. This Standard specifies methods for the description of noise outdoors in community environments. The method described in the Standard is general in the sense that it may be applied to a wide variety of noise sources, and covers the major mechanism of sound attenuation.

The equivalent continuous downwind sound pressure level (L_{Aeq}) at the main receiver points has been calculated for each industrial boundary using the equation below:-

$$L_{Aeq} = L_w + D_c - A$$

Where:

- L_w is the sound power level of the noise source;
- D_c is directivity correction; and
- A is the attenuation that occurs during the propagation from source to receiver.

The attenuation term A in the equation above is given by:-

$$A = A_{div} + A_{atm} + A_{gr} + A_{bar} + A_{misc}.$$

Where:

- A_{div} is the attenuation due to geometric divergence;
- A_{atm} is the attenuation due to atmospheric absorption;
- A_{gr} is the attenuation due to the ground effects;
- A_{bar} is the attenuation due to a barrier; and
- A_{misc} is the attenuation due to miscellaneous other effects.

The last term (A_{misc}) generally refers to miscellaneous propagation through foliage, industrial sites and areas of houses. Due to the distance of the site to the neighbouring dwellings the attenuation due to atmospheric absorption, ground effects and other miscellaneous effects are nil.

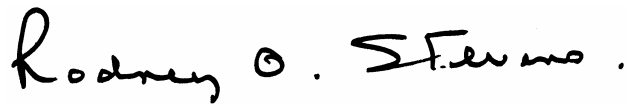
Predicted Noise Levels from the Operations of Klekies Pty Ltd at the nearest Industrial Boundary.

Noise Source	Average Sound Power Level (L_{Aeq}) (dBA)	Calculated Sound Pressure Level dBA at the Industrial Boundary	
		(L_{Aeq})	(L_{A10})
Truck Engine	75	51	46
Truck Pump	67	40	38
Oil Transfer Pump	53	39	33

Current background levels (L_{90}) on site range between 62 dB and 77 dB (L_{eq} 71 dB) with the main contributors to these levels being traffic along Christie Street and Sims.

CONCLUSIONS

A Noise Impact Assessment for the proposed relocation of Klekies Pty Ltd to 81-85 Christie Street, St Marys, has been undertaken. The predicted noise levels have been compared with current DEC requirements. The operation of Klekies Pty Ltd will not adversely affect the acoustic amenity of any surrounding premises at any time. Any noise that the Klekies Pty Ltd operation contributes the current levels of noise will be totally inaudible at the closest residence in Reid Street, over 800 metres away.

A handwritten signature in black ink that reads "Rodney O. Stevens". The signature is written in a cursive, flowing style.

Rodney Stevens MAAS
Principal Consultant
RSA Acoustics