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### MUSIC NOISE AND THE EPA'S DRAFT GUIDELINES

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#### ABSTRACT

Acoustic measurements were taken at several existing entertainment venues to compare the noise levels with the draft guidelines suggested by the South Australian Environment Protection Authority. It is shown that the noise levels measured at the entertainment venues in the absence of music noise can exceed the criteria in the guidelines. The practicalities of the guidelines are discussed from a planning and design view point and also from a consultant's view point.

#### 1.0 INTRODUCTION

In Australia, environmental noise regulations are each State's responsibility and in South Australia (SA) they are issued by the Environment Protection Authority (EPA)[1]. The current regulations[2], while based on AS 1055, specify fifteen minute  $L_{eq}$ 's against a background noise level provided by the  $L_{90}$ . The officers of the EPA have, at times, referred to the  $L_{90}$  of the  $L_{90}$ 's ! Various planning zones have specified maximum noise levels for sources, *eg* in Residential Areas the maximum source noise level is 45dBA between 10pm and 7am and 50dBA otherwise. However if a place of entertainment is present these levels increase to 50 and 58 dBA.

While there are many contentious issues about general community noise, one area of major concern are the noise levels generated by music venues, either public or private. The SA EPA has released draft guidelines [3] to assist planning authorities with the assessment of proposed entertainment venues. Modern music noise contains a pronounced bass beat which can be heard as an annoying noise, yet still comply with an overall noise limit.

## 1.1 EPA Draft Guidelines

The EPA (draft) guidelines recommend that a “competent acoustic consultant” should be used to measure the linear (unweighted) octave band noise statistics  $L_{10}$  when the venue is to be operating, and the  $L_{90}$  when the venue is not operating, over a 15 minute period. The acceptable criteria which was selected was that for each octave band measurement, the  $L_{10}$  value shall not be greater than the  $L_{90}$  value, by more than 8 dB for any 15 minute period.

Even though these guidelines are intended as a design tool (for competent acoustic consultants”, in the event of dispute or litigation, they must be verifiable with measurements.

This paper presents noise measurements at typical music venues and the consequences of applying the (draft) guidelines to existing premises.

## 1.2 Annoyance

There has been much written about what constitutes “annoying” noise. Measurements in octave bands at various times of the day are used as quantifiers of the noise and various set levels and adjustments for “tones”, intermittency and impulsiveness are applied to qualify the sound levels as either acceptable, satisfactory or annoying. In relation to music noise the most generally accepted view is that the boom-boom drum beat provides the essence of annoyance. Quantification of the boom-boom drum beat is difficult, but it is generally identifiable in the 63 and 125 Hz octave bands, especially as a modulation of the instantaneous level.

## 2.0 MEASURED VALUES

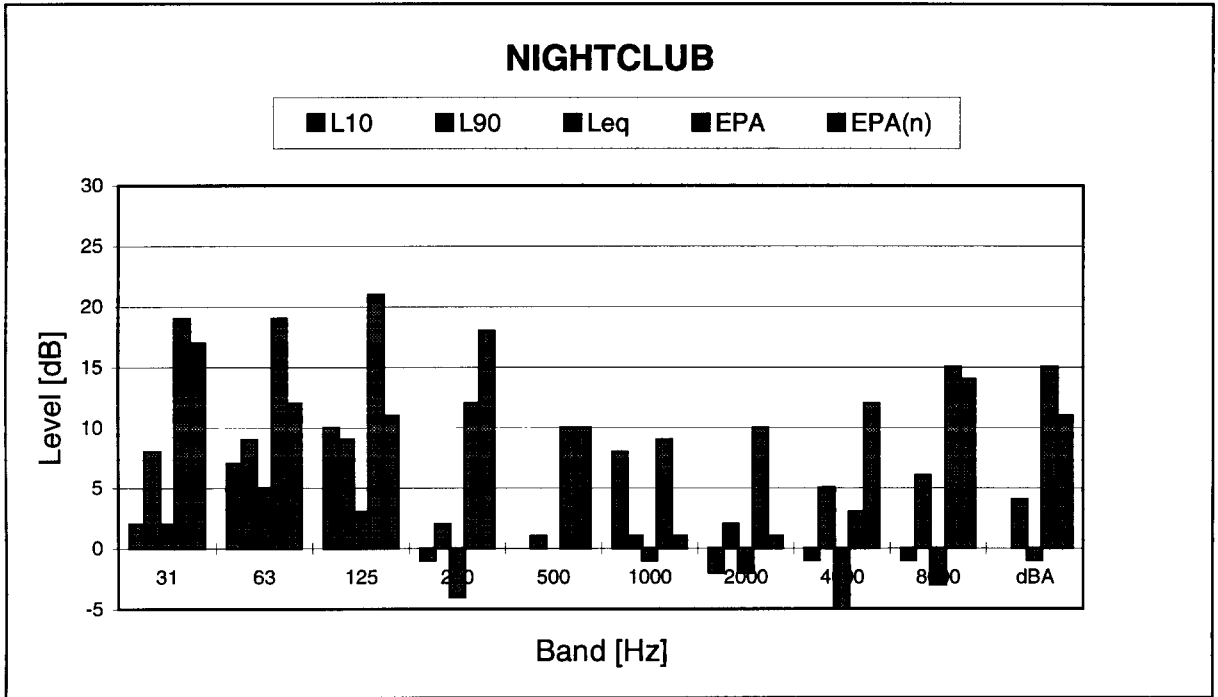
Acoustic measurements were taken at two existing entertainment venues in Adelaide, which are described by the EPA (and local residents) as emitting annoying noise. Measurements were taken when the venues were operating and at a similar time, when the venues were not operating. All measurements included traffic noise.

### 2.1 City Nightclub

The first venue was a nightclub in the city of Adelaide. Measurements were taken adjacent to the local resident’s apartment, some 50 meters from the street entrance to the venue. The 15 minute  $L_{eq}$  reached 67 dBA while the venue was operating and 68 dBA while not operating.

Figure 2.1 shows the differences between the three most common static measures of noise,  $L_{10}$ ,  $L_{90}$ ,  $L_{eq}$  with and without music present, the proposed guideline (EPA) the  $L_{10}$  (with music) -  $L_{90}$  (without music), and similarly  $L_{10}$  -  $L_{90}$  without music present (EPAn). Because most monitoring programs are conducted by unmanned (or unpersoned !!) instrumentation the measurements included traffic and patron noise.

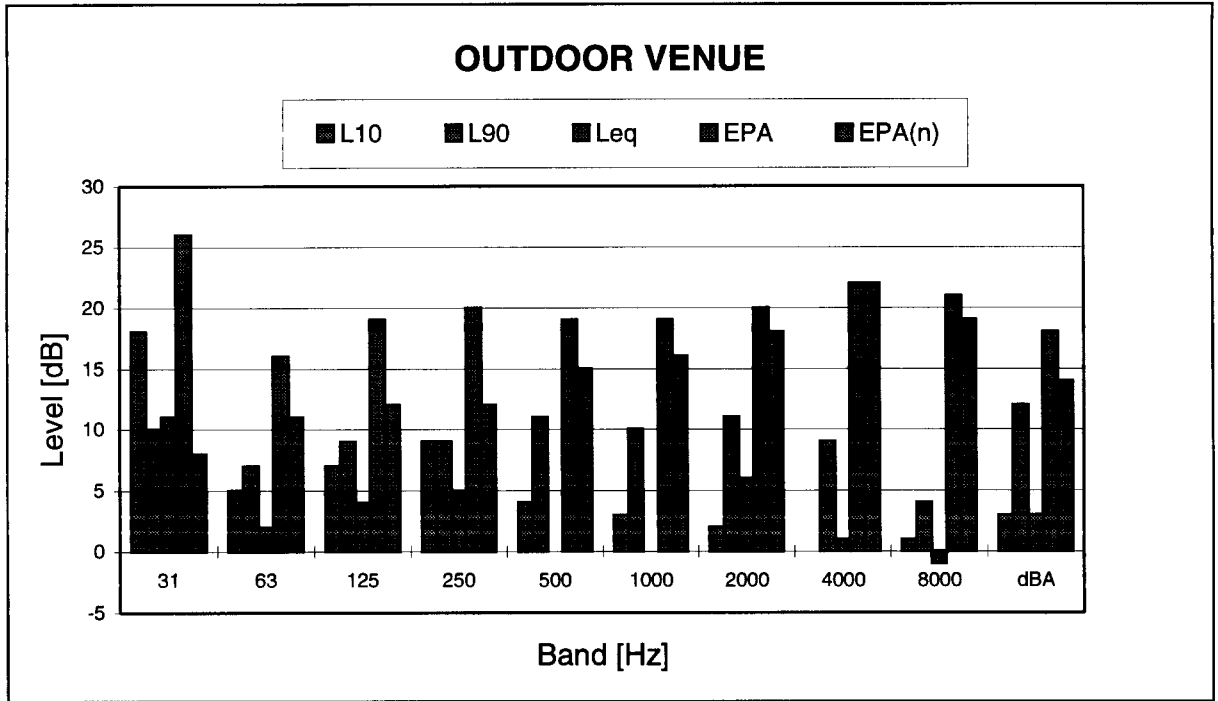
The data shows that even when there is no music playing (EPAn), the noise exceeds the EPA’s recommended criteria in some octave bands, as does the guideline criteria. This problem occurs because one is comparing two different types of noise statistics. In all the parameters chosen, the noise levels with music exceed those without by 8 dB in some octave bands. In the 63 and 125 Hz bands, the  $L_{10}$  and  $L_{90}$ , differences exceed 8 dB, whereas the overall (dBA) level differences are less than 5 dB.



**Figure 2.1 : Difference in noise level adjacent to a city nightclub.**

### 2.2 Outdoor Rock Concert

The other entertainment venue was an outdoor rock concert played at the university, which was caused local residents to complain. Measurements were taken adjacent to the resident's townhouse which was some 300 meters across open parkland from the venue.



## **Figure 2.2 : Difference in noise level measured at a residence and produced by an outdoor concert..**

The overall 15 minute  $L_{eq}$  was typically 63 dBA with the concert running and 60 dBA a fortnight later at similar times but without the concert. These measurements do include traffic noise.

Again the data shows a similar result to Figure 2.1 in that the EPA's guidelines are not met when the venue is closed, in all but the 31 Hz band.. That is, it is possible to prejudice an entertainment venue for emitting too much noise, when the normal background noise levels would also exceed the EPA's guidelines.

## **5.0 CONCLUSIONS**

We suggest that the (draft) criteria should be changed to consider before and after differences in like statistics,  $L_{10}$ ,  $L_{90}$  and  $L_{eq}$ . In which case for the  $L_{10}$  differences, the nightclub octave band differences reach 10 dB (125 Hz) and for the outdoor concert reach 18 dB (31 Hz).

The EPA's criteria in the current form can prejudice a proposed entertainment venue because the criteria is exceeded for normal background noise including traffic noise.

## **REFERENCES**

1. Burgess M & Macalpine S, Approaches to Environmental Policy in Australia, *Acoustics Australia*, Vol.24(1996) No.3, 87-90
2. South Australian Government, Regulations under the Noise Control Act, 1976-1977.
3. South Australian EPA, Assessment of proposals for developments where music may be played (Draft), Version 2, issued 12 November, 1996.