

FIVE DOCK PARK

NOISE ASSESSMENT OF PROPOSED MODIFICATIONS

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PREPARED FOR

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GLOSSARY OF ACOUSTIC TERMS

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph below, are here defined.

Maximum Noise Level (L_{Amax}) – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

L_{A1} – The L_{A1} level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time.

L_{A10} – The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

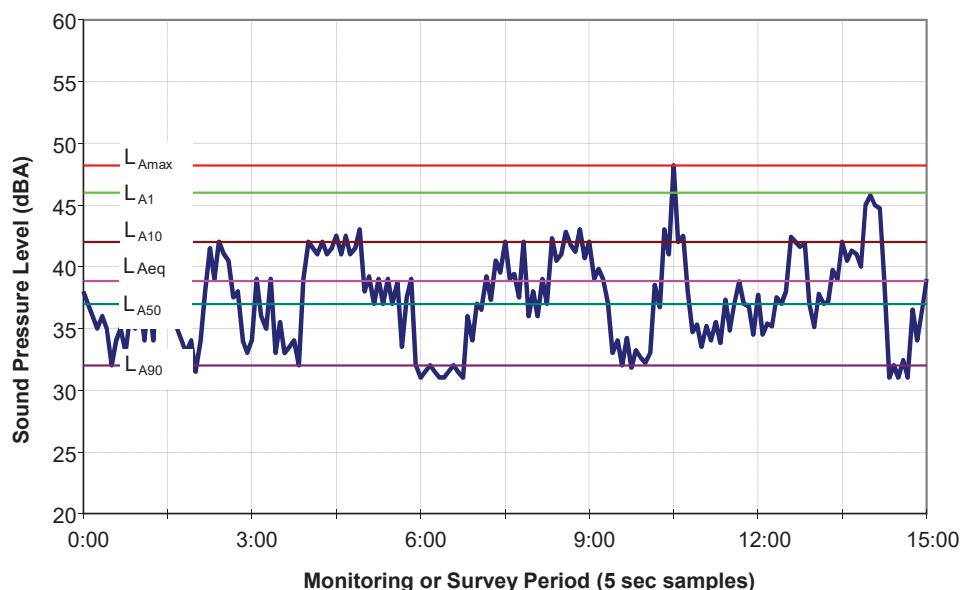
L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

L_{Aeq} – The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

ABL – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the 10th percentile (lowest 10th percent) background level (L_{A90}) for each period.

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night time.

Typical Graph of Sound Pressure Level vs Time



1 INTRODUCTION

The City of Canada Bay Council currently own and lease Five Dock Park, Barnstaple Road, Five Dock as shown in Figure 1-1. Council propose to modify the sporting facility by improving the existing lighting.

This report addresses the potential noise impacts associated with the possible increased use of the playing field as a result of the improved floodlights. The assessment focuses on noise generated by sporting activities.

Figure 1-1 Site Location



Aerial image courtesy of © 2016 nearmap

2 SITE DESCRIPTION, EXISTING & PROPOSED SPORTING ACTIVITIES

Five Dock Park is bounded by Barnstaple Road to the north, First Avenue to the south, Ingham Avenue to the east and Park Road to the west. The surrounding area is residential with Domremy College located on the southern side of First Avenue. Five Dock Bowling Club and Five Dock Tennis Club are located at the northern end of the park with access off Barnstaple Road. The football oval, cricket pitch and spectator stand are located on the northern half of the park. A rotunda is located at the southern end of the oval and a skate-park is located in the southeast corner of the park near the intersection of First Avenue and Ingham Avenue.

Typical distances to residences from the centre and edge of playing field are summarised in Table 2-1.

Table 2-1 Residential Receiver Distances, metres

General Receiver Areas	Five Dock Oval	
	Centre	Edge
Barnstaple Road	100	30
Park Road	100	50
Ingham Avenue	190	150
First Avenue	250	180

The current and proposed usage of the sporting facility is summarised in Table 2-2.

Table 2-2 Current and Proposed Sporting Field Usage

Field	Existing Use & Leasing	Existing Hours of Operation	Proposed Modifications	Future Use & Leasing	Proposed Hours of Operation
Five Dock Oval	AFL, Rugby League and cricket. Drummoyne Power AFL, Five Dock RSL Junior Rugby League, Inner Western Suburbs Cricket Association. Training weekdays and matches on weekends.	Sat & Sun and Tue, Wed, Thu evenings Lighting hours are weekdays 5pm-9.15pm	Removal of existing light poles; Installation of two new light poles	AFL, Rugby League and cricket. Drummoyne Power AFL, Five Dock RSL Junior Rugby League, Inner Western Suburbs Cricket Association. Training weekdays and matches on weekends.	Sat & Sun 7am-6pm and Mon-Fri 5pm-9.15pm

3 AMBIENT NOISE ENVIRONMENT

Unattended long-term monitoring has previously been conducted within the Canada Bay Council area, around the nearby St Lukes sporting facilities at Concord. The area is of similar nature, being generally residential, with one main arterial roadway and other local roads. The survey results are shown in Table 3-1 below. Only the Day and Evening periods are presented as these are the periods relevant for the operation of the sporting facilities.

Table 3-1 *INP* Time Periods & Ambient Noise Levels

Period	Time of Day	Rating Background	
		Level (RBL) L_{A90} dB	L_{Aeq} dB
Day	0700-1800hrs	43	58
Evening	1800-2200hrs	42	53

The background and ambient noise levels shown in Table 3-1 are typical of a suburban residential receiver area and are considered an acceptable basis on which to determine assessment criteria. A series of short-term attended noise level measurements were conducted on Tuesday 27 September 2016 at three residential receiver locations surrounding the Five Dock Park as shown in Figure 1-1 . A summary of the measurements is presented in Table 3-2 below.

Table 3-2 Summary Results of Attended Measurements

Location	Time of day	RBL L_{A90} dB	$L_{Aeq,15min}$ dB
Receiver 1	1830hrs	44	58
Receiver 2	1848hrs	46	61
Receiver 3	1905hrs	50	67 (dog barking)
Receiver 1	1920hrs	42	52
Receiver 1	2125hrs	41	49

The L_{eq} noise levels for the time period shown in Table 3-2, measured during the previous unattended long-term survey ranged between 52-56 dBA. As can be seen from the attended measurement results, noise levels at the receiver locations surrounding Five Dock Park were generally around this range. The contribution from road traffic would likely be the cause of the elevated noise levels measured at Location 2 on Barnstaple Road.

Attended measurements undertaken during the Sunday morning period around the St Lukes sporting facility resulted in background L_{A90} and ambient L_{Aeq} noise levels at surrounding residential receivers ranging between 44dBA-47dBA and 49dBA-62dBA, respectively. The weekday evening and the Sunday morning levels were found to be similar around St Lukes and it is therefore likely that a similar range could be expected around Five Dock Park.

4 ASSESSMENT CRITERIA

City of Canada Bay Council has no specific criteria to address noise from sporting activities in public parks or recreation spaces. Furthermore no other applicable policies address such noise.

The EPA's *Noise Guide for Local Government* (NGLG) provides some guidance in assessing intrusive noise and relies on the *Industrial Noise Policy* (INP) which applies to the assessment of commercial and industrial noise sources but is not intended for the assessment of social or community sporting activities.

However, in the absence of any other nominated criteria we have referred to the *INP* for guidance on desirable limits of acoustic intrusiveness and amenity in the suburban context.

The *INP* aims to control industrial noise sources with respect to two criteria, firstly to address short-term intrusive noise impacts and secondly to maintain noise level amenity for an area. The intrusiveness criterion is applicable to residential receivers only. The purpose of the amenity criterion is to prevent the existing background noise level gradually increasing ("background creep") due to noise generated by successive industrial developments. Given sports fields only generate noise whilst in operation during evening training and weekend games (and any other periodic daytime usage, such as local school events), the issue of "background creep" is not relevant and the associated amenity criteria are therefore unnecessary.

The *INP* criteria for intrusive impacts are based on a background +5dB assessment. To determine the criteria for assessing the potential intrusiveness of noise from the sporting facilities, the background levels measured during the attended weekday evening monitoring (and attended and unattended monitoring previously carried out around the St Lukes facility) have been adopted. The resulting Intrusiveness Criteria are detailed in Table 4-1 below.

Table 4-1 Intrusiveness Criteria

Receiver	Time of Day	Intrusive Criteria, dB
		$L_{Aeq,15min}$
Barnstaple Road	Day	49
	Evening	48
Park Road	Day	47
	Evening	46
Ingham Avenue	Day	47
	Evening	46
First Avenue	Day	49
	Evening	48

Whilst the intrusiveness criterion is a means by which to gauge audibility, it is intended to apply to “industrial”-type noise emissions that are of a continuous nature. Noise that is more familiar in character to a receiver (and to which they are able to relate) and which is non-continuous or occurs over shorter, less frequent periods is less likely to cause disturbance or annoyance. For outdoor activity noise, a criterion of Background + 10dBA has previously been applied to assess potential impact. It is considered that this criterion is a more appropriate basis upon which to assess the potential impact of noise from the sporting field at nearby residents. A summary of the recommended limiting criteria for noise generated by the sporting activities is shown in Table 4-2.

Table 4-2 Recommended Limiting Criteria for Sporting Activities

Receiver	Time of Day	Recommended Criteria, dB
		$L_{Aeq,15min}$
Barnstaple Road	Day	54
	Evening	53
Park Road	Day	52
	Evening	51
Ingham Avenue	Day	52
	Evening	51
First Avenue	Day	54
	Evening	53

5 ASSESSMENT OF NOISE LEVELS

The proposed modifications to Five Dock Park involve the replacement of the existing lighting which consists of two light poles with two new light poles. The field is currently used from 5pm through to 9.15pm Tuesdays, Wednesday and Thursday evenings, in addition to weekend use on Saturdays and Sundays between 7am and 6pm. Although there is typically no evening play on Mondays and Fridays, Council would like the flexibility to vary the evening usage if and when required. As such, the sports lighting (and field use) is proposed to operate between 5.00pm and 9.15pm Monday through Friday. There are no changes proposed to the activities that currently take place. The field will continue to be utilised for AFL, junior rugby league and cricket. The current on-street carparking arrangements will continue.

Noise levels generated by sport are highly variable and are influenced by the level of competition, which affects the vocal efforts of players, and the number and enthusiasm of spectators, officials and coaching staff.

Measurements of noise emissions from sporting events have established typical sound power levels ranging from 90dBA for rugby training to 95dBA for a competition game with approximately 250 spectators.

Table 5-1 summarises the range of noise levels expected at residential receivers surrounding Five Dock Park during rugby league and AFL games which are considered to represent a worst case usage scenario. Exceedances of the associated criteria are also shown.

Table 5-1 Predicted Noise Emissions from Five Dock Oval, dBA

Activity	Sound Power Level $L_{Aeq,15min}$	Predicted $L_{Aeq,15min}$ Noise Level			Exceedance		
		Distance, m		Daytime	Evening		
		Closest	Typical	L_{A90+5}	L_{A90+10}	L_{A90+5}	L_{A90+10}
<i>Barnstaple Road (North)</i>							
Training	90	52	42	3	0	4	0
Game	95	57	47	8	3	NA ¹	NA ¹
<i>First Avenue (South)</i>							
Training	90	37	34	0	0	0	0
Game	95	42	39	0	0	NA ¹	NA ¹
<i>Ingham Avenue (East)</i>							
Training	90	38	36	0	0	0	0
Game	95	43	41	0	0	NA ¹	NA ¹

Activity	Sound Power Level $L_{Aeq,15min}$	Predicted $L_{Aeq,15min}$ Noise Level		Exceedance			
		Distance, m		Daytime		Evening	
		Closest	Typical	$L_{A90}+5$	$L_{A90}+10$	$L_{A90}+5$	$L_{A90}+10$
<i>Park Road (West)</i>							
Training	90	48	42	1	0	2	0
Game	95	53	47	6	1	NA ¹	NA ¹

Note 1: Competitive games will not be held during weekday evenings.

The noise emissions currently experienced at surrounding residences generally achieve recommended background+10dBA criteria. Exceedances of 1dB and 3dB are possible at the closest receivers in Barnstaple Road and Park Road during competitive games when players are in closest proximity to these residences. The intrusiveness (Background + 5dBA) criterion may be exceeded by up to 8dBA and 6dBA at the closest receivers in Barnstaple Road and Park Road during competitive games when players are in closest proximity to these residences.

Noise associated with vehicular traffic will be unchanged.

Overall the noise emissions associated with sporting fixtures and training conducted at the oval will remain essentially unchanged with maximum noise events also unaltered. It is therefore unlikely that the proposed new lighting will result in any appreciable change to the existing noise environment of the surrounding residential community.

6 CONCLUSION

This study was conducted to assess the potential noise impacts resulting from the proposed modifications to the existing sporting facilities at Five Dock Park. The noise emissions assessed from the development include:

- Participant and spectator noise.
- Vehicular noise.

The noise impact assessment gives consideration to the following criteria and control guidelines:

- The EPA's *Industrial Noise Policy*; and
- The EPA's *Noise Guide for Local Government*.

The site benefits from several planning features in terms of limiting the impact of noise emissions:

- The site is an established sporting and recreational facility.
- Intervening roadways and landscaped buffer zones around the perimeter.

The conclusions of our assessment are as follows:

Participant and Spectator Noise

Noise emissions from participants and spectators are an integral part of sporting facilities. These facilities are a necessary and important part of any residential community and as such, noise emissions are generally tolerated by surrounding residents.

The noise levels currently received at nearby residences during training and sporting events at Five Dock Park are unlikely to undergo any significant change as a result of the proposed modifications. Maximum levels currently experienced will also remain unchanged.

Predicted noise levels from training and competitive fixtures generally comply with the recommended assessment criteria for weekend and evening operations. Possible (marginal) exceedances of the recommended criteria may occur at residences closest to the oval during competitive fixtures when play occurs near the edge of the field in closest proximity to these receivers.

Vehicular Noise

No change in existing vehicular noise emissions are expected to result from the proposed modifications.