GUNGAHLIN TENNIS FACILITY

NOISE IMPACT ASSESSMENT

ACT Sport and Recreation

17 November 2022

Job Number 22071460

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DOCUMENT CONTROL

Report Version	Date	Prepared by	Reviewed by
DRAFT - 001	01/09/2022	N Hall (SoundIN)	A Todoroski
FINAL - 001	17/11/2022	P Henschke	

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1 INTRODUCTION

The ACT Government is proposing to establish the Gungahlin Tennis Facility (the Project) in the northern section of the Amaroo District Playing Fields.

Todoroski Air Sciences has been engaged to conduct a noise impact assessment for the Project. This assessment considers the potential noise impacts associated with the operation of the Project and has been prepared to address the requirements of the *Environment Protection Regulations 2005* (**ACT Parliamentary Counsel, 2022)**.

2 PROJECT SETTING AND DESCRIPTION

2.1 Project setting

The Project site is located in the northern section of the Amaroo District Playing Fields between Jorgensen Street and Horse Park Drive.

Land use to the north, east and west of the site is residential, with the aforementioned playing fields to the south. The nearest sensitive receivers are residents to the east across Horse Park Drive and to the West on Jorgensen Street.

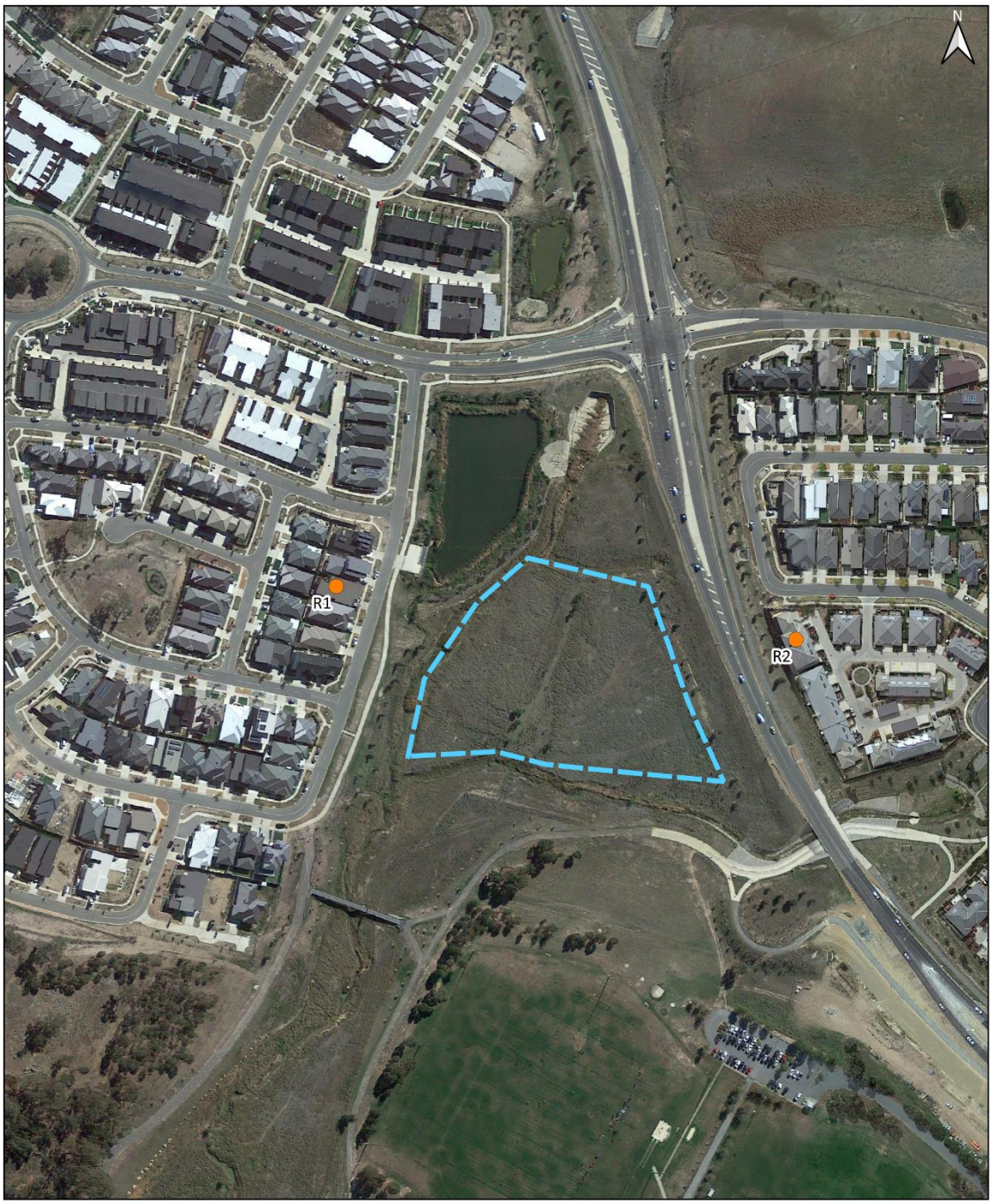
The most potentially noise affected receivers have been identified for assessment purposes as set out in **Table 2-1**.

Table 2-1: Sensitive Receivers

Receiver ID	Address
R1	18 Jorgensen Street, Moncrieff
R2	11 Starcevich Crescent, Jacka

Noise impacts associated with the operation of the Project at other nearby sensitive receivers in Moncrieff and Jacka will be similar to but less than those at the locations identified in **Table 2-1**.

Figure 2-1 presents the location of the Project with reference to the assessment locations considered in this assessment.



GUNGAHLIN TENNIS FACILITY

PROJECT SETTING AND SENSITIVE RECEIVERS

0 25 50 75 100 m

LEGEND

Site

Receivers

Note: Locations of features are indicative only and are shown solely to demonstrate features pertinent to the noise assessment.

Figure 2-1: Project setting and Sensitive Receivers

3 PROJECT DESCRIPTION

The new Gungahlin Tennis Facility, which will be located in Amaroo on Horse Park Drive, will meet the needs of the community as tennis participation continues to grow in the ACT.

Work has commenced on the design of the new facility .

Subject to funding the plan aims to include:

- 10 full sized courts
- 2 hot shot courts
- A hitting wall
- LED lighting
- Female friendly changerooms
- A pavilion
- Parking

It is assumed that the facility would operate within the hours of 8am-10pm.

Figure 3-1 provides a layout of the concept design for the Project.

Figure 3-1: Site Layout

4 NOISE CRITERIA

Operational noise criteria applicable to the Project are set out in the ACT's *Environment Protection Regulation 2005* (the Regulation) (**ACT Parliamentary Counsel, 2022)**.

The Regulation, which is made under the *Environment Protection Act 1997* (**ACT Parliamentary Counsel, 2021)**, specifies allowable noise levels (noise standards) for various land uses as set out in the *Territory Plan*. Noise standards for sensitive receivers near the Project are presented in **Table 4-1**.

Table 4-1: Noise Standards

Receiver	Noise Zone / Description	Noise Standard – L_{A10} (dBA)	
		Day	Night
R1 & R2	RZ1 - All other land, including- residential land (RZ1-5), hills, ridges and buffers	45	35

Note: Day = 7am-10pm Monday to Saturday, 8am-10pm Sunday and public holidays
Night = 10pm-7am Monday to Saturday and 10pm-8am Sunday

The noise standards are taken to apply at the 'compliance location', which is the property boundary, or the property boundary on the other side of the street if there is an intervening road.

In addition to the noise standards set out in the Regulation, the *Noise Management Manual* (**DECCEW, 2009**) specifies adjustments to be applied to noise containing certain characteristics that are likely to increase annoyance, such as tonality, impulsiveness, intermittency or excessive low frequency content.

5 NOISE ASSESSMENT

This assessment is based on a single scenario representing typical worst-case noise emissions from the Project.

5.1 Operational noise modelling methodology

Operational noise emissions from the Proposal have been modelled using SoundPLAN v8.2. The selected noise calculation method is International Standard ISO 9613-2:1996 *Acoustics – Attenuation of sound during propagation outdoors – Part 2: General Method of Calculation* (ISO 9613-2) (**ISO, 1996)**.

Factors accounted for by ISO 9613-2 are:

- Noise source sound power and locations
- Shielding from ground topography and structures
- Noise attenuation due to geometric spreading
- Ground absorption
- Atmospheric absorption
- Noise enhancing meteorology.

ISO 9613-2 is a "downwind" model, which conservatively assumes that each receiver is downwind from all noise sources.

5.2 Operational noise sources and assessment scenario

The main operational noise sources associated with the Project are those associated with tennis and carpark activities.

Noise emissions from tennis activities include the racquet striking the ball; players, coaches and spectators talking and cheering; and, in some cases, music.

Attended noise measurements were conducted at a large outdoor tennis facility in Canberra to quantify noise emissions from typical tennis activities. These measurements included a range of tennis activities including play from both social and competitive players and coaching activities. The particular coaching activities where noise levels were measured included amplified pre-recorded music being played from a speaker.

L_{A10} sound power levels for tennis play and tennis coaching (including music) were calculated from measurements and are presented in **Table 5-1**.

Table 5-1: L_{A10} Sound Power Levels - Tennis

Source	Sound Power Level at Octave Band Centre Frequency (dBL)									Overall SWL (dBA)
	31.5	63	125	250	500	1k	2k	4k	8k	
Tennis play	93	95	90	86	83	81	76	73	66	86
Tennis coaching (with music)	95	95	95	94	94	87	83	81	84	94

The applicability of adjustments for noise characteristics per the *Noise Management Manual* have been considered. Impulsiveness is the only noise characteristic considered potentially applicable to noise from the operation of the Project.

The noise associated with a tennis racquet striking a tennis ball can be potentially be impulsive, i.e. where the difference between L_{AImax} and L_{AFmax} noise levels is in the range of 3-5 dB, a corresponding adjustment of 3-5 dB could be applied to account for this.

However, whilst the noise from striking a ball (in isolation from all other noise) may be impulsive, the measured levels in practice (which include noise from other courts crowds etc.) show that the maximum difference between L_{AImax} and L_{AFmax} noise levels corresponds to crowd noise, and is typically less than 2 dB. The measured data for existing Canberra tennis facilities indicates that in accordance with the *Noise Measurement Manual*, no adjustment is applicable.

For assessment purposes, it was assumed that half of the available courts would be used for tennis play and half of the courts would be used for coaching, including music playing on the courts used for coaching.

Car-park movements under Australian conditions can be modelled using an L_{A10} sound power level of 66 dBA for one car movement per hour (**Nicol & Johnson, 2011**). It should be noted that this noise level incorporates all vehicle associated activities including; cars starting, doors and boots closing, and people talking.

Based on the concept design for the Project, there would be approximately 45-50 car parking spaces on the site. For assessment purposes, it is assumed that the highest level of car-park activity would be the filling (or emptying) of all available parking spots in a one-hour period.

It is noted that the assessment scenario, which represents all courts in use at the same time as peak car-park activity is rather conservative, since the peaks in these activities are unlikely to occur concurrently.

5.3 Predicted noise levels

Table 5-2 presents the predicted noise modelling results at the assessed sensitive receiver locations for the typical worst-case scenario. The noise criterion in **Table 5-2** represents the noise standard for daytime.

Table 5-2: Predicted Operational L_{A10} Noise Levels at Sensitive Receivers

Receiver ID	Predicted level (dBA)	Criterion (dBA)	Complies?
R1	45	45	Yes
R2	43	45	Yes

The results indicate the predicted noise levels would be below or at the applicable criterion level, and would thus comply with the applicable criteria at the assessed most impacted receiver locations.

A contour plot is shown in **Figure 5-1**, showing that the assessed receiver locations (R1 & R2) are the most potentially affected and that operational noise levels from the Project at other sensitive receivers in Moncrieff and Jacka will be similar to but less than those at R1 and R2.

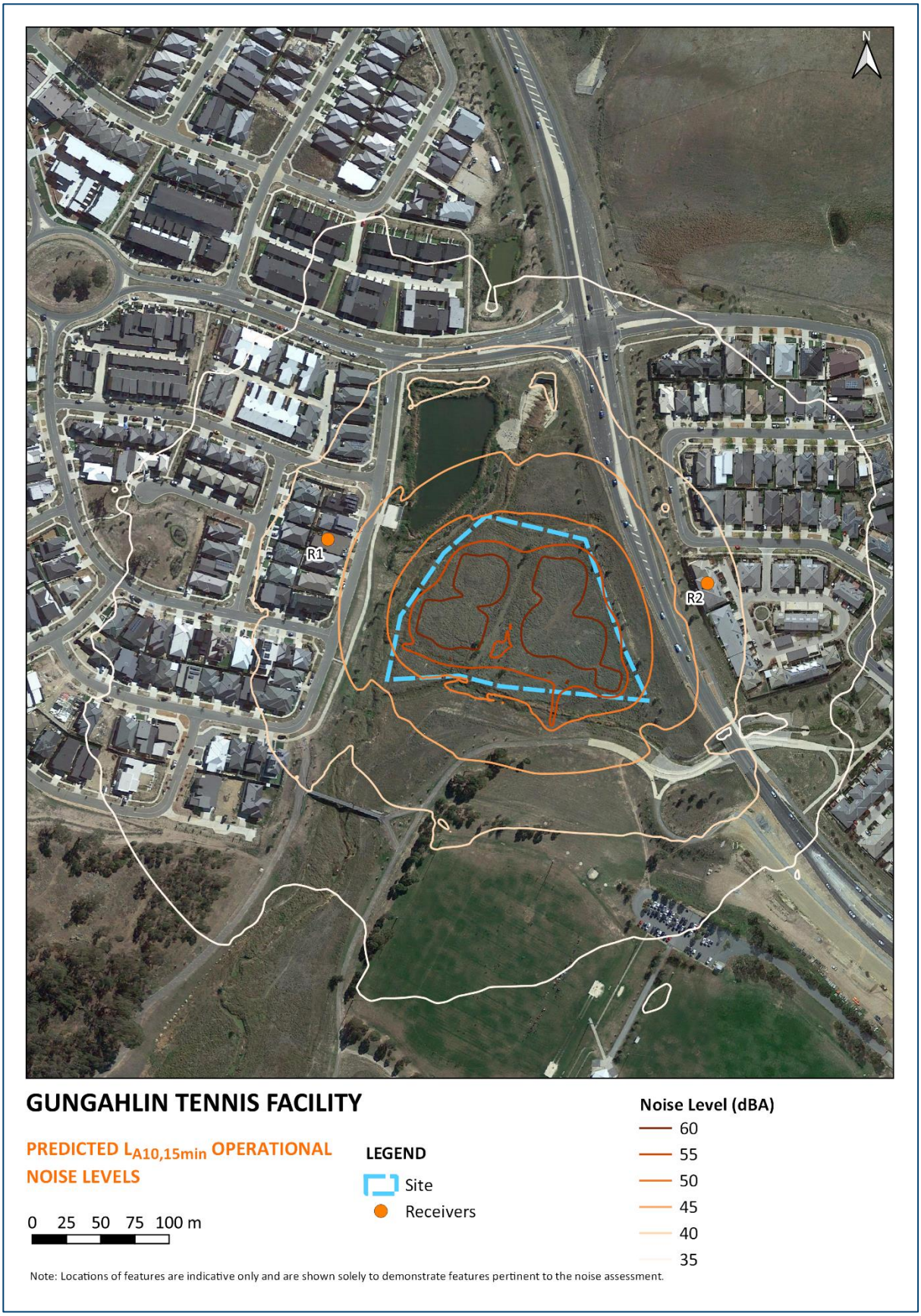


Figure 5-1: Contour Plot – Operational Noise

6 SUMMARY AND CONCLUSIONS

The ACT Government is proposing to establish the Gungahlin Tennis Facility (the Project) in the northern section of the Amaroo District Playing Fields.

Todoroski Air Sciences has been engaged to conduct a noise impact assessment for the Project.

Potential noise impacts associated with the operation of the Project have assessed against the requirements of the *Environment Protection Regulations 2005*.

Noise modelling was used to predict potential off-site noise impacts in the surrounding area due to the operation of the Project.

The modelling in this assessment assumed a potential worst-case scenario, with full use of the tennis courts and car-park occurring simultaneously at the site under noise enhancing meteorological conditions. The assumptions used in the operational noise modelling are generally conservative and in general the predicted levels are likely to somewhat overestimate the potential impact that may arise.

The results indicate that noise levels would be below or at the applicable criteria at the nearest most potentially impacted receivers. The predicted noise levels indicate the facility would be acceptable relative to the appliable criteria.

7 REFERENCES

ACT Parliamentary Counsel (2021)

""Environment Protection Act 1997", authorised by the ACT Parliamentary Counsel, republication date 11 December 2021

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"Environment Protection (Noise Management Manual) Approval 2009", Department of the Environment, Climate Change, Energy and Water (DECCEW), September 2009

ISO (1996)

"Acoustics – Attenuation of sound during propagation outdoors – Part 2: General Method of Calculation", International Organization for Standardization, 1996

Nicol & Johnson (2011)

"Prediction of parking area noise in Australian conditions", Proceedings of ACOUSTICS 2011, November 2011