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Attn: Gilda Barakat

Milton Hospital - Cancer Care and CT Imaging - Environmental Noise Emission Assessment

1 INTRODUCTION

Acoustic Logic Pty Ltd (Acoustic Logic) has been engaged by Johnstaff on behalf of Health Infrastructure to provide acoustic consultancy services in relation to the proposed Cancer Care Centre and CT-Imaging improvements at Milton Hospital, NSW.

The following provides an assessment of noise emission from external mechanical plant proposed to be installed as part of the works.

2 SITE DESCRIPTION AND THE PROPOSAL

The project site is located at Milton Ulladulla Hospital, 106 Princes Highway, Milton NSW and consists of:

- Cancer Care House Upgrades
 - Internal refurbishment comprising:
 - Consult rooms
 - Reception
 - Cleaners room
 - Waiting areas
 - Extension of building comprising
 - One bed room with associated ensuite

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- Upgrade of mechanical services including installation of new fan coil unit(s) and associated outdoor condenser unit(s)
- CT Imaging Works
 - Internal refurbishment comprising:
 - CT imaging and general X-ray room
 - CT imaging control room
 - Shower
 - Stores
 - Upgrade of mechanical services including installation of new fan coil unit(s) and associated outdoor condenser unit(s)
- Main Switchboard Works
 - Internal refurbishment comprising:
 - Main switchboard room
 - Upgrade of mechanical services including installation of new fan coil unit(s) and associated outdoor condenser unit(s)
- It is proposed that the regular operation of the Cancer Centre will be limited to the day (7:00 am to 6:00 pm) only with mechanical plant serving the Cancer Centre only operational during this time.

The project site and nearby sensitive receivers are identified in Figure 1.

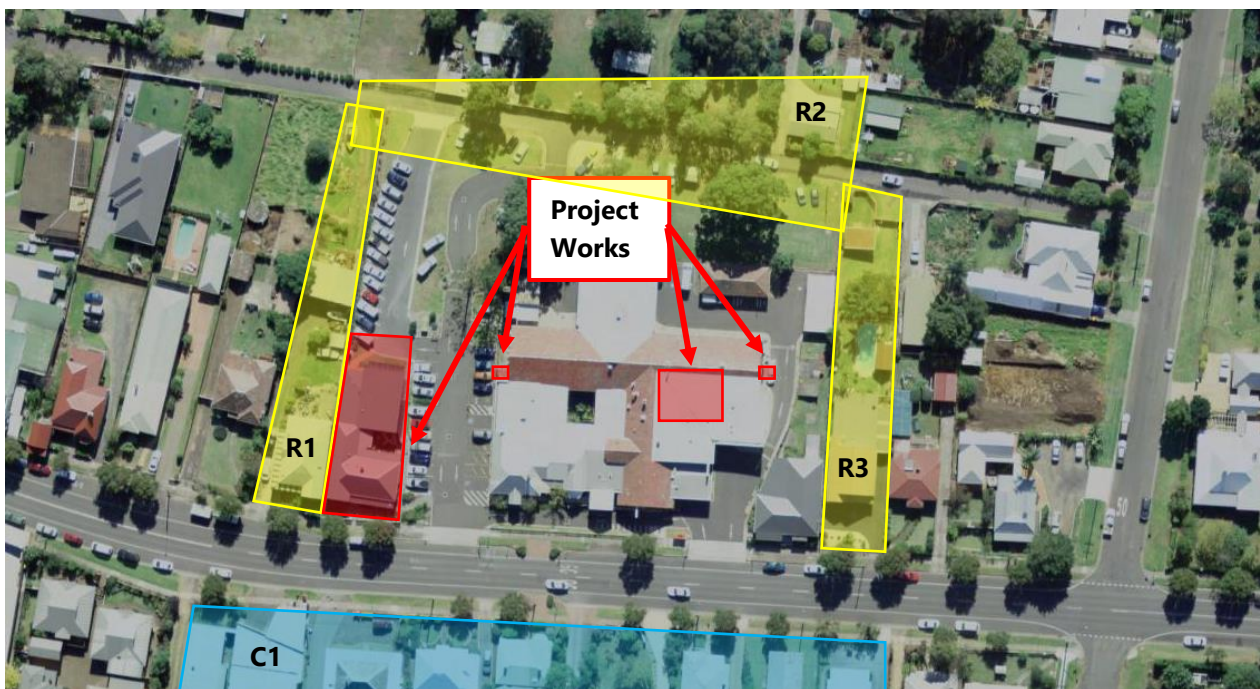


Figure 1 – Project Site

2.1 SENSITIVE RECEIVERS

The nearest/potentially most impacted sensitive receivers surrounding the site representative of noise catchments have been identified and as summarised in the following table. An aerial photo of the site indicating nearby noise sensitive receivers and the catchment areas, is presented in Figure 1.

Table 1 – Sensitive Receivers

Receiver (Refer Figure 1)	Receiver Type	Comment
R1	Residential	Single level residence
R2	Residential	Single level residences
R3	Residential	Single level residence
C1	Commercial / Retail	Farm shop, various medical practices and pathology, legal offices. All single storey

3 NSW EPA NOISE POLICY FOR INDUSTRY REQUIREMENTS

The NSW EPA Noise Policy for Industry (NPfI) 2017, has two criteria which need to be satisfied: namely the Intrusiveness noise level criteria and the Project Amenity noise level criteria. The Project Noise Trigger Levels are then established based on the lower of the intrusiveness and project amenity levels.

Noise levels are to be assessed at the property boundary or nearby dwelling, or at the balcony or façade of an apartment.

3.1 BACKGROUND NOISE LEVELS

Background noise levels that adopted for this assessment have been obtained from Australian Standard AS 1055.2:1997 *Acoustics – Description and measurement of environmental noise Part 2: Application to specific situations*.

Table 2 – Adopted Background Noise Levels

Noise Category Area	Measured Assessment Background Noise Level dB(A) L ₉₀		
	Day	Evening	Night
Areas with low density transportation	45	40	35

Notes:

1. Time of day is defined as:
 - Day: the period from 7 am to 6 pm Monday to Saturday or 8 am to 6 pm Sundays and public holidays
 - Evening: the period from 6 pm to 10 pm Monday to Sunday and public holidays
 - Night: the remaining periods

3.2 PROJECT INTRUSIVENESS NOISE LEVEL

The guideline is intended to limit the audibility of noise emissions at residential receivers and requires that noise emissions measured using the L_{eq} descriptor do not exceed the background noise level by more than 5dB(A). Where applicable, the intrusive noise level should be penalised (increased) to account for any annoying characteristics such as tonality.

Background noise levels adopted are presented in Section 3.1. Noise emissions from the site should comply with the noise levels presented below when measured at nearby property boundary.

Table 3 – Project Intrusiveness Noise Levels

Receiver	Period/Time	Project Intrusiveness Noise Levels dB(A) $L_{Aeq}(15min)$
R1, R2 & R3	Day	50
	Evening	45
	Night	40

3.3 PROJECT AMENITY NOISE LEVEL

The guideline is intended to limit the absolute noise level from all noise sources to a level that is consistent with the general environment.

The NSW EPA Noise Policy for Industry sets out acceptable noise levels for various localities. Table 2.2 on page 11 of the policy indicates 3 categories to distinguish different residential areas. They are rural, suburban, urban. This site is categorised by suburban receivers.

The project amenity noise level is calculated by taking the recommended amenity noise level (as presented in table 2.2 of the policy), subtracting 5dB(A).

To standardise the periods for intrusiveness and amenity noise levels, 3dB(A) is then added to convert from $L_{Aeq, period}$ to a $L_{Aeq, 15min}$ descriptor. The project amenity noise level criteria are presented in the table below.

Table 4 – Project Amenity Noise Levels

Location	Period/Time	Amenity Noise Levels dB(A) $L_{Aeq}(period)$	Project Amenity Noise Levels dB(A) $L_{Aeq}(15min)$
R1, R2 & R3 Suburban	Day	55	53
	Evening	45	43
	Night	40	38
C1	When in use	65	63

3.4 PROJECT NOISE TRIGGER LEVELS

The project noise trigger level (as outlined in section 2.1 of the policy) is the lower of the intrusiveness and project amenity noise levels. The project noise trigger levels are presented in the table below.

Table 5 – Project Noise Trigger Levels (NPfI)

Receiver(s)	Time Period	Project Intrusiveness Level dB(A) $L_{eq}(15min)$	Project Amenity Level dB(A) $L_{eq}(15min)$	Project Trigger Noise Level dB(A) $L_{eq}(15min)$
R1, R2 & R3	Day	50	53	50
	Evening	45	43	43
	Night	40	38	38

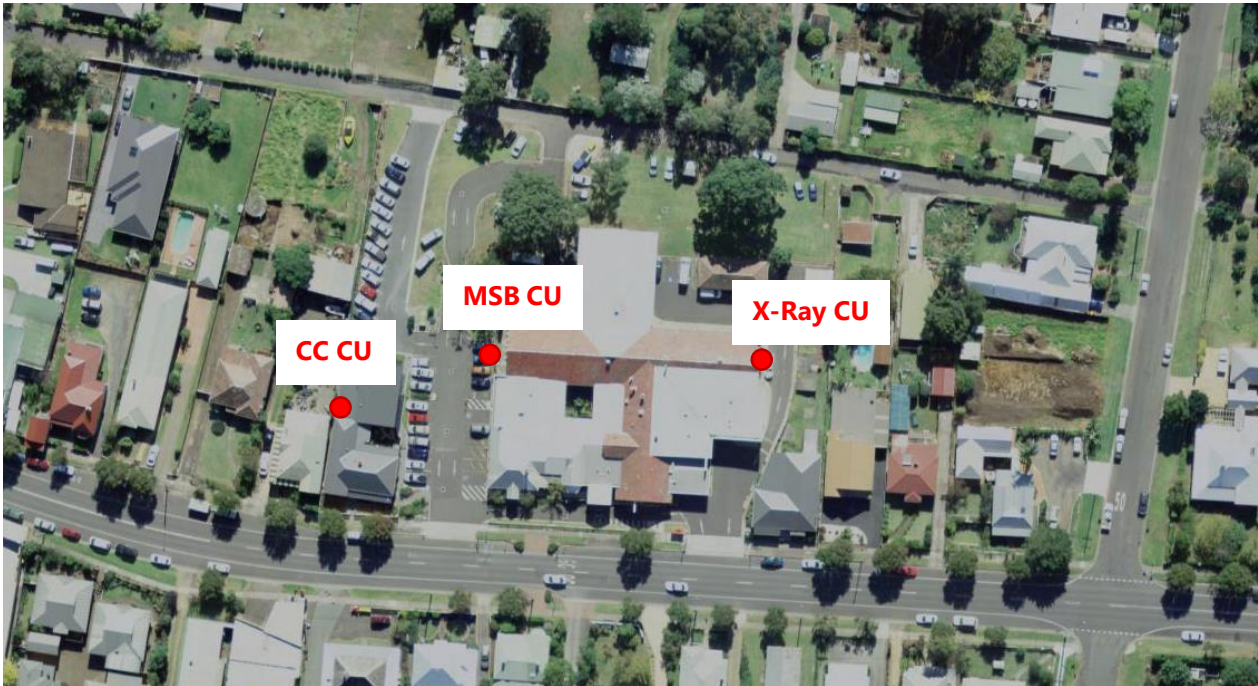
C1	When in use	-	63	63
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4 COMPLIANCE ASSESSMENT

4.1 LOCATIONS OF MECHANICAL PLANT

The locations of the new external plant are presented in the figure below.

Figure 2 – External Mechanical Plant Locations



4.2 MECHANICAL PLANT SELECTIONS

The mechanical plant selections and associated noise levels are presented in the table below.

Table 6 – External Mechanical Plant Selections

Plant Item	Selection	Sound Power Level, SWL, dB(A)
New Plant		
Cancer Centre Condenser Unit	Mitsubishi FDC90KXZEN1-W	66
MSB Condenser Unit	Mitsubishi SRC80ZRA-W	68
X-Ray Condenser Unit	Mitsubishi FDC224KXZPE1	73
Existing Plant – Cancer Centre		
Condenser Unit 1	Fujitsu AOT90TPC3L	69
Condenser Unit 2	Fujitsu AOT90TPC3L	69
Condenser Unit 3	Fujitsu AOTR12LCC	50
Condenser Unit 4	Mitsubishi MUZ-AP42VG	65

4.3 PREDICTED NOISE EMISSION

The predicted noise emission from the new external plant and the existing cancer centre plant is presented in the tables below.

Table 7 – Predicted Noise Emission – 100 Princes Highway

Receiver	Time of Day	Project Trigger Noise Level dB(A) $L_{eq}(15min)$	Predicted Noise Emission dB(A) $L_{eq}(15min)$
Existing Cancer Centre Plant Only			
100 Princes Highway, Milton	Day	50	59
	Evening	43	_1
	Night	38	_1
New Plant Only			
100 Princes Highway, Milton	Day	50	52
	Evening	43	29 ²
	Night	38	29 ²
New Plant and Existing Cancer Centre Plant Combined			
100 Princes Highway, Milton	Day	50	60
	Evening	43	29 ²
	Night	38	29 ²

Notes:

1. Cancer Centre plant not operable during the evening and night periods
2. Predicted noise emission from new plant servicing MSB and X-ray

Table 8 – Predicted Noise Emission – 114 Princes Highway

Receiver	Time of Day	Project Trigger Noise Level dB(A) $L_{eq}(15min)$	Predicted Noise Emission dB(A) $L_{eq}(15min)$
114 Princes Highway, Milton	Day	50	40
	Evening	43	
	Night	38	

4.4 DISCUSSION

It is noted that the predicted day time noise emission from new plant to 100 Princes Highway exceeds the established project noise trigger levels. However, the predicted noise levels at this receiver from existing plant already significantly exceed the project noise trigger levels. The predicted increase in noise levels from

external plant at this receiver is 1 dB. An increase of up to 2 dB is generally considered to be imperceptible to the human ear.

Predicted noise emissions to 114 Princes Highway from installation of the mechanical plant comply with the day and evening project noise trigger level, however exceeds by 2 dB during the night-time period. It is noted that the location of the condenser unit causing this exceedance is intended to be located amongst other pre-existing condenser units shown in the figure below. Data is not available for these pre-existing units, however, it is expected that, similarly to the units located at the Cancer Centre, the installation of a single new unit will have a negligible effect on the overall noise emission from the hospital to this receiver.

Figure 3 – External Mechanical Plant Locations



5 CONCLUSION

We trust this information is satisfactory. Please contact us should you have any further queries.

Yours faithfully,

Acoustic Logic Pty Ltd
Laura Keen