Bradfield Development Authority

# Building Two Advanced Manufacturing Research Facility

## Section 4.55 Modification Report
## Appendix F – Environmental Noise Assessment

21 November 2025

Friday, 21 November 2025

Project number: S220854
Reference: S220854LT10

Basil Richardson
Architectus
L 18 MLC Centre
19 Martin Place, Sydney NSW 2000

Dear Basil,

**AMRFB2**
**S4.55 Environmental Noise Assessment for Stage One**

# 1 Introduction

AMRFB2 (Project) will be delivered in a staged arrangement, with research zones and the manufacturing area delivered under Stage One and the remainder of the project under Stage Two. This document presents our assessment of Stage One on sensitive receivers and whether additional noise mitigation is required for the Project. The assessment will be based on documentation up to 21 November 2025. All previous assessments relating to the full building assessment and the State Significant Development Application (SSDA) can be found in S220854RP2A issued by Resonate Consultants.

The following require an acoustic review as they have been deemed to be modifications from the SSDA Noise and Vibration Impact Assessment:

- Additional and relocated external building services plant required to maintain functionality of Stage One and,
- Changes to the overarching building envelope that will impact acoustic shielding elements to nearby sensitive receivers

# 2 Methodology

The assessment conducted in this amendment letter utilises the same methodology that was applied in the SSDA Noise and Vibration Impact Assessment.

## 2.1 Location and sensitive receivers

We present a summary of the key sensitive receivers, the project site, and previous noise and vibration measurements in Figure 1.

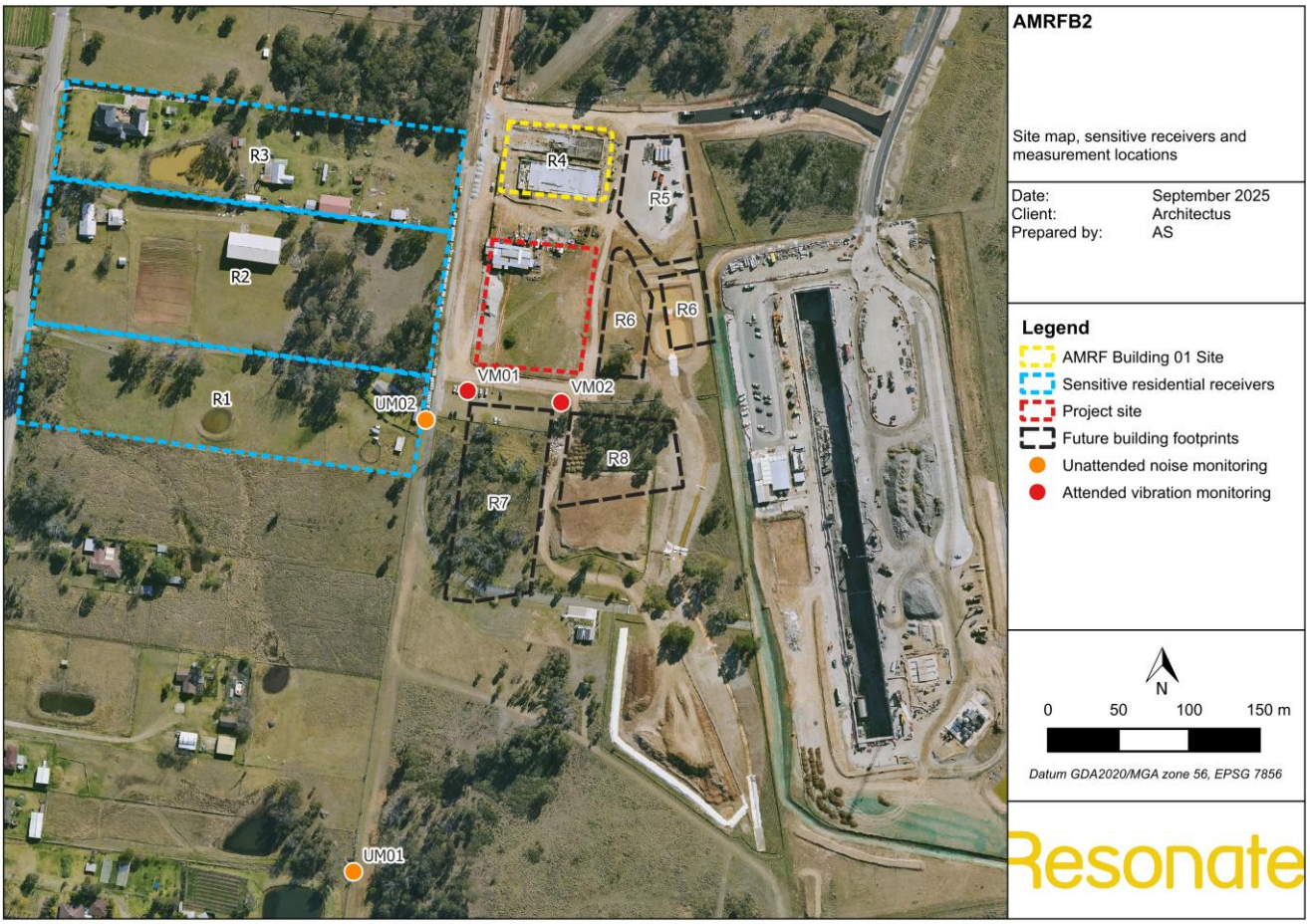


**Figure 1 AMRFB2, sensitive receivers and previous measurement locations**

Table 1 presents the current and future nearby receiver locations reviewed as part of the assessment.

**Table 1 Nearby noise sensitive receivers disturbance noise criteria**

| Reference and name | Description |
|---|---|
| **Residential land uses** | |
| R1 - 145 Badgerys Creek Road, Bradfield | Residential land uses approximately 40 m to the south-west of the Project site. |
| R2 - 155 Badgerys Creek Road, Bradfield | Residential land uses approximately 40 m to the west of the Project site. |
| R3 - 175 Badgerys Creek Road, Bradfield | Residential land uses approximately 40 m to the north-west of the Project site. |
| **Commercial land uses** | |
| R4 - AMRF Building 01 | Commercial land use located approximately 35 m to the north of the Project site. |
| R5 - AMRF Lot 4 | Commercial land use located approximately 30 m to the north-east of the Project site. |
| R6 - AMRF Lot 5A, 5B | Commercial land uses located approximately 50 and 12 m respectively to the east of the Project site. |
| R7 - CSIRO | Commercial land use located approximately 30 m to the south of the Project site. |
| R8 - Illumination Hall | Commercial land use located approximately 30 m to the south-east of the Project site. |

## 2.2 Planning requirements

The development is to comply with the following planning requirements and details within the Noise and Vibration Impact assessment indicate how the development is to comply with the below criteria:

- Planning Secretary's Environmental Assessment Requirements (SEARs),
- Western Sydney Aerotropolis Development Control Plan (DCP) (2022).

The criteria in this section indicate the project performance requirements. The nominated Contractor is to comply with the following sections. The project performance requirements are to be verified by the nominated Contractor

### 2.2.1 Unattended noise monitoring

To characterise the existing acoustical environment of the area, unattended noise monitoring was conducted between the dates of 21 August 2023 and 30 August 2023 in accordance with Fact Sheet A and B of the NSW Environmental Protection Agency's (EPA) *Noise Policy for Industry* (NPfI), 2017. The unattended noise monitoring was conducted at the two locations presented in Figure 1 to determine the existing acoustic environment at the reasonably most-affected residences. Weather data was obtained from the Bureau of Meteorology (BOM) weather observation station ID 67108 at Badgerys Creek, were used to perform this filtering.

Noise data has been excluded from the processed results if:

- Rain was observed during a measurement period, and/or

- Wind speed exceeded 5 m/s (18 km/h) at the measurement height of 1.5 m above ground. Wind data obtained from the BOM is presented as the value at 10 m above ground.

### 2.2.2 Results of unattended noise monitoring

A representative noise level for each day, evening, and night of the monitoring period for the $L_{A90}$ background noise levels and the $L_{Aeq}$ ambient noise levels are presented in Table 2 in accordance with the methods described in the NPfI. The NPfI notes that the representative noise level (for the background noise levels) is known as the assessment background level (ABL).

The Rating Background Noise Levels (RBL) and overall ambient noise levels representing the day, evening and night assessment periods over the entire monitoring period have been determined with the methods described in the NPfI.

**Table 2 Summary of unattended noise monitoring results**

| Logger Location | Measurement Descriptor | Measured Noise Level – dB | | |
|---|---|---|---|---|
| | | Day 7:00 am – 6:00 pm | Evening 6:00 pm – 10:00 pm | Night 10:00 pm – 7:00 am |
| Logger 1 (UM01) | Ambient noise level $L_{Aeq}$(1) | 54 | 45 | 46 |
| | RBL $L_{A90}$(2) | 41 | 35 | 34 |
| Logger 2 (UM02) | Ambient noise level $L_{Aeq}$(1) | 50 | 50 | 49 |
| | RBL $L_{A90}$(2) | 38 | 45 | 40 |

(1) The overall ambient noise level was determined by taking the logarithmic average value of the corresponding day/evening/night daily ambient noise levels.

(2) The RBL was determined by taking the median value of the corresponding day/evening/night ABLs.

### 2.2.3 Derivation of noise emission criteria

Both intrusiveness and amenity criteria are derived from the ambient noise survey and the NPI. They are then compared with each other and the lowest and most stringent noise level is adopted to represent the project specific noise criterion for the relevant time period, day, evening and night time as shown in Table 3 and Table 4 below for sensitive and commercial receivers respectively.

**Table 3 Derivation of noise emission criteria at sensitive receivers**

| Measurement / descriptor | Noise level (dB re 20 µPa) during Period, Residential receiver | | |
|---|---|---|---|
| | Day 7:00 am – 6:00 pm | Evening 6:00 pm – 10:00 pm | Night 10:00 pm – 7:00 am |
| Lowest Rating Background Level (RBL), $L_{A90}$ | 38 | 35 | 34 |
| Intrusive criterion assessment (RBL + 5 dB), $L_{eq\ (15minute)}$ | 43 | 40 | 39 |

| Measurement / descriptor | Noise level (dB re 20 µPa) during Period, Residential receiver | | |
|---|---|---|---|
| | **Day 7:00 am – 6:00 pm** | **Evening 6:00 pm – 10:00 pm** | **Night 10:00 pm – 7:00 am** |
| NPI amenity Level (Suburban[1]) | 55 | 45 | 40 |
| Amenity Criterion (NPI amenity level – 5 dB + 3 dB) , $L_{eq\ (15minute)}$ | 53 | 43 | 38 |
| Intrusive / Amenity criterion (onerous outcome) | 43 / 53 (43) | 40 / 43 (40) | 39 / 38 (38) |
| **NPI Project specific criteria for residential land uses[2], $L_{eq\ (15minute)}$** | **43** | **40** | **38** |

(1) A Suburban classification has been adopted for the site.

(2) The project-specific criteria are the lowest of the Intrusive criterion and the Amenity criterion for new sources for each time period.

Given the commercial receiver is less critical, the amenity criterion is used instead of both the amenity and intrusiveness criterion as shown below.

**Table 4 Derivation of noise emission criteria at commercial receivers**

| Measurement / descriptor | Noise level (dB re 20 µPa) during Period, Commercial receiver |
|---|---|
| | **When in use** |
| Rating Background Level (RBL), $L_{A90}$ | Not assessed |
| NPI amenity Level (Suburban[1]) | 65 |
| Amenity Criterion (NPI amenity level – 5 dB + 3 dB), $L_{eq\ (15minute)}$ | 63 |
| **NPI Project specific criteria for residential land uses[2], $L_{eq\ (15minute)}$** | **63** |

(1) A Suburban classification has been adopted for the site.

(2) The project-specific criteria are the lowest of the Intrusive criterion and the Amenity criterion for new sources for each time period.

### 2.2.4 Maximum noise level event assessment and criteria

In addition to the above, the NPfI provides an assessment procedure for assessing the potential for sleep disturbances from maximum noise level events generated at the development during the evening (i.e. between 6:00pm and 10:00pm) and night time period (i.e. between 10:00 pm and 7:00 am) . The term “sleep disturbance” is

considered to be both awakenings and disturbance to sleep stages. This includes emergency systems/maintenance of plant systems depending on the operation periods which is provided in Section 2.2.5.

As recommended in Section 2.5 of the NPfI, to assess the potential for sleep disturbances two-stages are recommended to be carried out:

- Step 1 – Where the subject development/premises night-time noise levels at a residential location do not exceed the following then no mitigation is required to prevent sleep disturbances from the project:
  - $L_{eq\ (15\ minute)}$ 40 dB(A) or the prevailing night-time RBL plus 5 dB, whichever is the greater, and/or
  - $L_{Fmax}$ 52 dB(A) or the prevailing night-time RBL plus 15 dB, whichever is greater,

From the above the average and maximum noise trigger levels have been determined for the Project and are presented in Table 5 If the noise trigger levels are exceeded, then 'Step 2' which involves a detailed maximum noise level event assessment would be required.

**Table 5 Maximum noise level event – project screening criteria**

| Receiver Type | $L_{eq\ (15minute)}$ dB(A) | $L_{Fmax}$ dB(A) |
|---|---|---|
| Surrounding residential receivers | 40 | 52 |

- Step 2 – A detailed maximum noise level event assessment is to be undertaken when the average/maximum noise trigger levels are exceeded and should cover the maximum noise level, the extent the maximum noise levels exceeds the RBL, and the number of occurrences during the night-time period. As is recommended in the explanatory notes of the NPfI, this more detailed sleep disturbance assessment is conducted using the current sleep disturbance research detailed in the EPA Road Noise Policy (RNP). The RNP sleep disturbance research concludes that:
  - Maximum internal noise levels below 50-55dB(A) are unlikely to awaken people from sleep
  - One to two noise events per night with maximum internal noise levels of 60-75dB(A) are not likely to affect health and wellbeing significantly.

### 2.2.5 Derivation of emergency systems noise criteria and maintenance

Designing emergency plant to comply with the NPfI criteria is likely to put unnecessary constraints and associated costs on the project to address limited and infrequent noise emission scenarios. Less stringent criteria are considered appropriate for these testing operations than daily operations, based on the infrequency of such conditions.

Guidelines for the assessment of noise from emergency or standby generators on nearby residential receivers are specified in the NSW EPA's *Environmental Noise Control Manual* (ENCM) Chapter 151. Whilst the ENCM has largely been superseded, the issue of emergency or standby generators is not addressed elsewhere. The recommended limit for emergency or standby generators in accordance to the ENCM is background plus 10 dB(A) to residential receivers.

The project specific noise criteria for proposed generator at nearby receivers, based on the ENCM and the unattended noise monitoring results, are presented in Table 6.

**Table 6 Derivation of emergency plant and general maintenance criteria.**

| Location | Receiver type | Period | Noise criteria dB $L_{Aeq\ (15\ minute)}$ |
|---|---|---|---|
| Residential receivers | Residential | Day (07:00 – 18:00) | 48 |
| | | Evening (18:00 – 22:00) | 45 |

| Location | Receiver type | Period | Noise criteria dB $L_{Aeq\ (15\ minute)}$ |
|---|---|---|---|
| | | Night (22:00 – 07:00) | 44 |

# 3 Assessment

## 3.1 Rooftop plant

The mechanical plant noise data has been made available for the AHU units only. For this assessment assumptions have been made to determine the maximum sound power for the units located on the southern and western plant areas of the Project. The allowable maximum sound power for these mechanical plant units has been determined for the daytime, evening and night-time periods and will encompass the total noise produced by all the mechanical equipment relating to the Project. The maximum sound power levels emanated by each type of plant item for this assessment are presented in Table 7.

**Table 7 Mechanical plant sound power level during the night-time**

| Plant item | Plant area | Design sound power level, dB(A) |
|---|---|---|
| AHUs ducted | L2, L4, L5 | 82 |
| AHUs outside air | L4 | 89 |
| GEF-04-01 and GEF-04-02 or fans generally | L4 | 82 (with 5m lining on exhaust) |
| Cooling towers | L4 | 87 |
| Heat pumps | L4 | 94 |
| 1200 kW chillers | L2 | 95 (1) |
| 250 kW chillers | L1 | 88 (1) |

(1) L1 and L2 plant rooms to feature absorption of NRC 0.9 to soffit and minimum one full wall in conjunction with acoustic louvres providing attenuation of 14 dB(A).

If the proposed combined sound power levels for individual plant items in Table 7 are exceeded, then appropriate additional noise mitigation measures are to be adopted to ensure compliance with the requirements of the NPfI. Such measures would include noise barriers and operational controls.

## 3.2 Predicted noise levels

Potential operational noise impacts from the Project at surrounding receptors have been modelled using the ISO 9613-2 1996 propagation model within SoundPLAN v9.1. This method is commonly used and accepted by regulatory agencies in NSW. The site and surrounding environment were digitised to create a 3-dimensional model of the Project area using the input data presented in Table 8.

As required by the NPfI, the maximum operational noise levels are assessed at the reasonably most affected point on or within the residential property boundary or, if that is more than 30 metres from the residence, at the reasonably most affected point within 30 metres of the residence. The worst-case scenario, with all plant items operating 24/7 at full capacity has been adopted.

**Table 8 Operational noise modelling parameters**

| Parameter | Input data |
|---|---|
| Receiver locations | As identified in Figure 1 |
| Terrain | 5 metre ground contours from ELVIS elevation and depth |

| Parameter | Input data |
|---|---|
| Ground surface/absorption | The land surrounding the site has been modelled with a ground cover factor of 0.6, which is considered indicative of grassland and paddocks |
| Source heights | Mechanical plant set at 1 m above the relevant building floor height |
| Receiver heights | Receivers have been placed at an elevation of 1.5 m |
| SoundPLAN module | ISO 9613-2 1996 propagation model |
| Met condition | Neutral meteorological condition has been modelled. |

Noise emissions from the site were predicted using a 3D model and the noise data is provided in the SSDA with predicted noise levels are summarised in Table 9.

**Figure 2 3D view of noise model from above AHUs in middle of Manufacturing Hall roof**

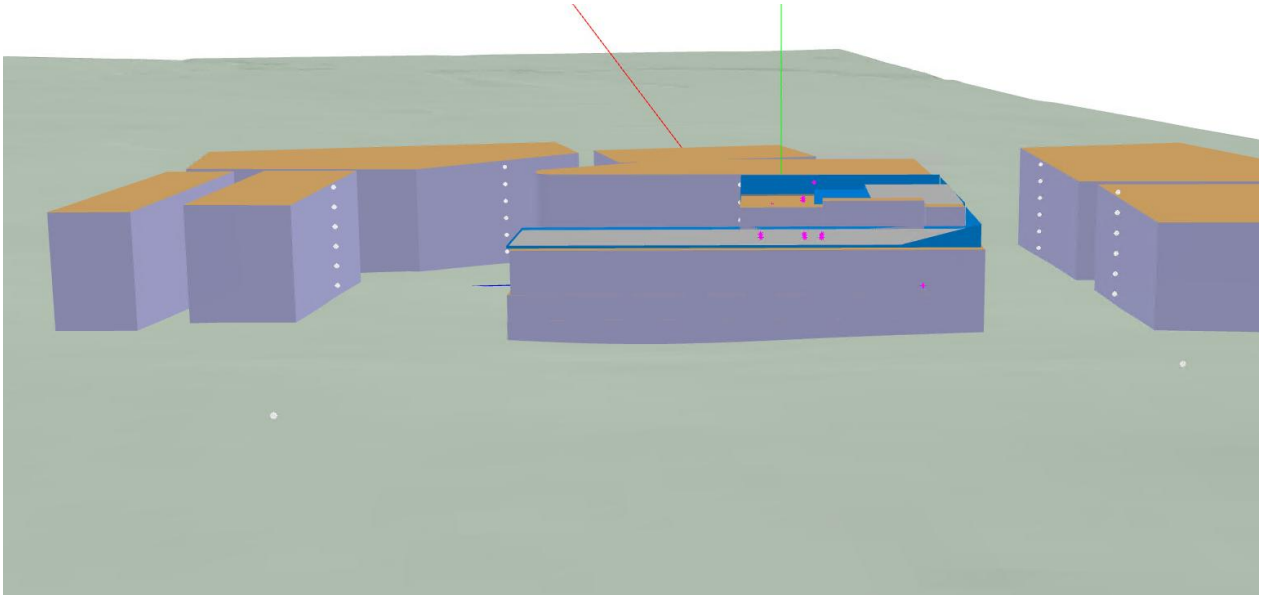

**Figure 3 3D view of noise model from West AHUs in middle of Manufacturing Hall roof**

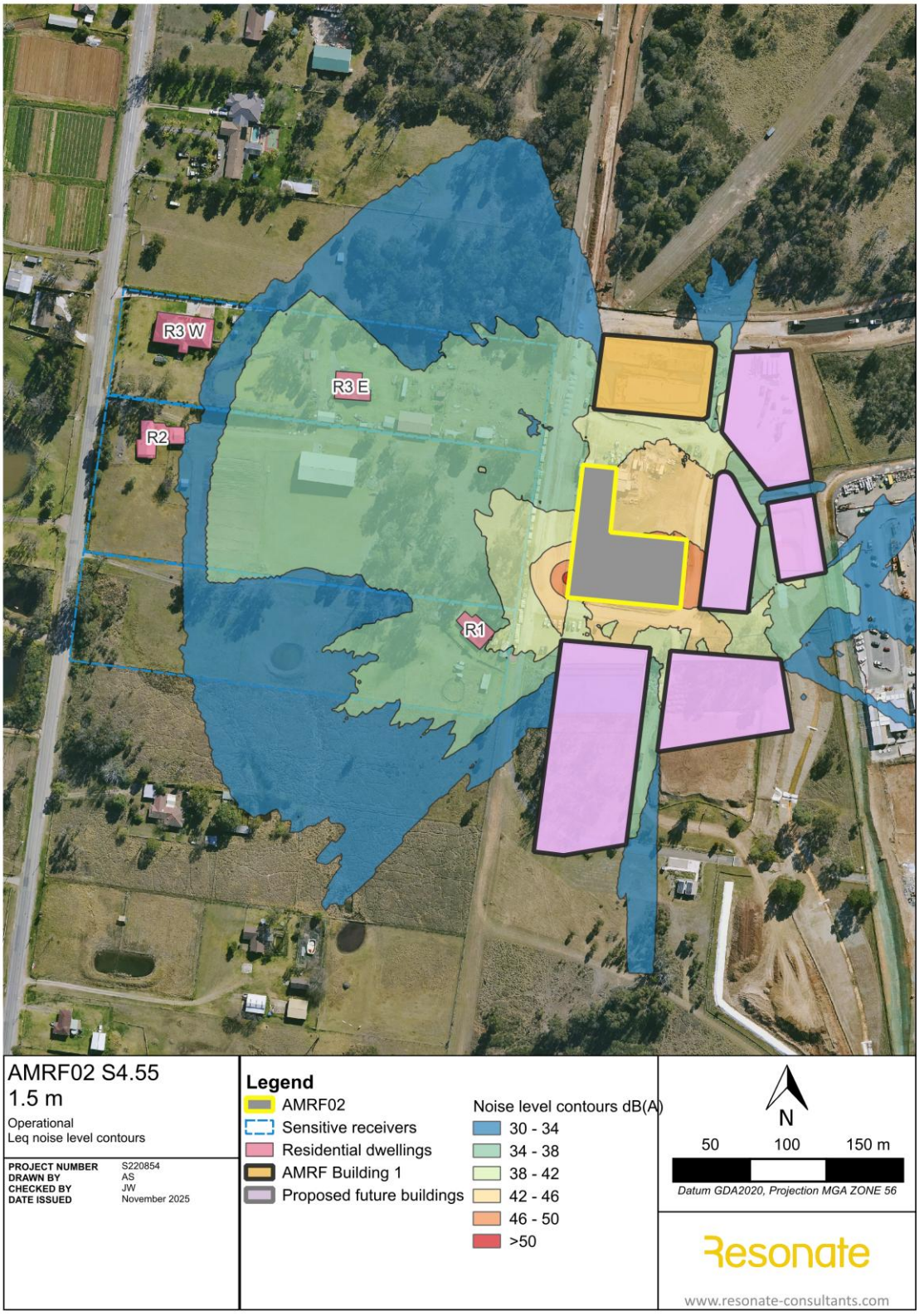


**Figure 4 Indicative noise contours at height of 1.5 m**

**Table 9 Predicted operational noise levels from the Project**

| Receiver (Address) | Predicted $L_{Aeq}$ operational noise level[1] – dB(A) Day/Evening/Night[(1)] | Noise criteria, dB(A) Day/Evening/Night | Exceedance, dB(A) Day/Evening/Night | Compliance Day/Evening/Night |
|---|---|---|---|---|
| R1 – 145 Badgerys Creek Road, Bradfield (assessed at the boundary) | 40 / 40 / 38 | 43 / 40 / 38 | - / - / - | Yes / Yes / Yes[(2)] |
| R2 – 155 Badgerys Creek Road, Bradfield (30 m from residence) | 37 / 37 / 35 | 43 / 40 / 38 | - / - / - | Yes / Yes /Yes |
| R3 – 175 Badgerys Creek Road, Bradfield (30 m from residence) | 38 / 38 / 36 | 43 / 40 / 38 | - / - / - | Yes / Yes / Yes |
| R4 – AMRF Building 01 | 46 / 46 / 46 | 63 / 63 / 63 | - / - / - | Yes / Yes / Yes |
| R5 – AMRF Lot 4 | 46 / 46 / 46 | 63 / 63 / 63 | - / - / - | Yes / Yes / Yes |
| R6 – AMRF Lot 5/5A | 47 / 47 / 47 | 63 / 63 / 63 | - / - / - | Yes / Yes / Yes |
| R7 - CSIRO | 52 / 52 / 52 | 63 / 63 / 63 | - / - / - | Yes / Yes / Yes |
| R8 - Illumination Hall | 50/ 50 / 50 | 63 / 63 / 63 | - / - / - | Yes / Yes / Yes |

(1) For commercial receivers the noise level shown relates to the top floor centre of the building at 1.5m from the facade.

(2) Compliance for night-time period will require additional operational controls for times after 10pm. See the maximum permitted noise levels in Table 13. We expect that this performance is only possible with silences and reduced load during the night period.

Based on the predicted operational noise levels presented in Table 9, the Project is predicted to comply with the requirements of the NPfI during day and evening periods.

## 3.3 Maximum noise level event assessment

The potential for sleep disturbances during the night-time period (i.e. between 10:00 pm and 7:00 am) from the operational noise level events generated at the Project have been assessed in this section. The mechanical plant is expected to be the only noise source operating during the night-time period. It is noted that the mechanical plant noise source is constant and therefore the predicted $L_{Aeq\ (15\ minute)}$ noise level would likely be equal to the $L_{AFmax}$ noise level. Based on this, the night-time predicted noise level presented in Table 9 were compared with the project screening criteria determined in
Table 5. The maximum noise level event assessment is summarised in Table 10.

**Table 10 Night-time maximum noise level events**

| Receiver | Predicted screening criteria, dB(A) | | Predicted noise levels, dB(A)(1) | Compliance |
|---|---|---|---|---|
| | $L_{eq\ (15\ minute)}$ | $L_{Fmax}$ | | |
| R1 - 145 Badgerys Creek Road, Bradfield | 40 | 52 | 40 | Yes |
| R2 - 155 Badgerys Creek Road, Bradfield | 40 | 52 | 37 | Yes |
| R3 - 175 Badgerys Creek Road, Bradfield | 40 | 52 | 36 | Yes |

(1) The predicted noise levels represent the $L_{eq\ (15\ minute)}$ and $L_{Fmax}$ noise parameters.

The results in Table 10 show that nearby residential receivers are not anticipated to have sleep disturbances from the operational noise of the Project.

## 3.4 External noise assessment

The following plant items listed in Table 11 are to be relocated since the previous iteration of the project noise modelling. AHUs previously to be situated to the north of the development on the Level 5 plant area are now to be located on the roof of the manufacturing hall. For exhaust fans servicing end of trip spaces have also been added to this location.

**Table 11 relocation of plant items for Stage One design**

| Plant item | Previous location | New location |
|---|---|---|
| AHU-AMF-MANH-01 | Level 5 plant area | Northern or middle zone of manufacturing hall roof |
| AHU-AMF-MANH-02 | Level 5 plant area | Northern or middle zone of manufacturing hall roof |
| Additional Fans to support end-of-trip and ancillary spaces. Assumed noise levels of GEF as noted in Table 7. | New to the support function of stage works | Middle zone of the manufacturing hall roof |

### 3.4.1 Unit-specific maximum sound power levels

Table 12 presents the maximum allowable sound power levels for external plant for the Project. Extents of treatment required for each unit is based on the sound power.

**Table 12 AHU maximum sound power levels**

| Unit designation | Maximum sound power level (dB) Octave Band Centre Frequency (Hz) | | | | | | | | dBA |
|---|---|---|---|---|---|---|---|---|---|
| | 63Hz | 125Hz | 250Hz | 500Hz | 1kHz | 2kHz | 4kHz | 8kHz | Total |
| AHU-AMF-MANH-01 | 106 | 109 | 108 | 108 | 106 | 98 | 95 | 87 | 110 |

| Unit designation | Maximum sound power level (dB) Octave Band Centre Frequency (Hz) | | | | | | | | dBA |
|---|---|---|---|---|---|---|---|---|---|
| | 63Hz | 125Hz | 250Hz | 500Hz | 1kHz | 2kHz | 4kHz | 8kHz | Total |
| AHU-AMF-MANH-02 | 106 | 109 | 108 | 108 | 106 | 98 | 95 | 87 | 110 |
| AHU-LAB-VAV-CZ | 103 | 106 | 105 | 105 | 103 | 95 | 92 | 84 | 107 |
| AHU-LAB-GF-ISO5-CZ-04 | 55 | 59 | 86 | 79 | 82 | 81 | 79 | 72 | 87 |
| AHU-LAB-GF-ISO5-CZ-03 | 55 | 59 | 86 | 79 | 82 | 81 | 79 | 72 | 87 |
| AHU-LAB-GF-ISO5-CZ-02 | 55 | 59 | 86 | 79 | 82 | 81 | 79 | 72 | 87 |
| AHU-LAB-GF-ISO5-CZ-01 | 55 | 59 | 86 | 79 | 82 | 81 | 79 | 72 | 87 |
| AHU-LAB-GF-ELAB-CZ-01 | 55 | 59 | 86 | 79 | 82 | 81 | 79 | 72 | 87 |
| AHU-LAB-GF-SPEC-CZ-01 | 91 | 86 | 82 | 80 | 78 | 72 | 65 | 60 | 82 |
| AHU-LAB-L3-LABS-CZ-01 | 56 | 60 | 88 | 80 | 82 | 82 | 80 | 72 | 88 |
| AHU-LAB-VAV-EZ | 101 | 104 | 103 | 103 | 101 | 93 | 90 | 82 | 105 |
| AHU-LAB-L4-ISO5-SZ-01 | 110 | 113 | 112 | 112 | 110 | 102 | 99 | 91 | 114 |
| AHU-LAB-L4-ISO5-CZ-01 | 110 | 113 | 112 | 112 | 110 | 102 | 99 | 91 | 114 |
| AHU-LAB-OA-01 | 104 | 107 | 106 | 106 | 104 | 96 | 93 | 85 | 108 |
| AHU-LAB-OA-02 | 104 | 107 | 106 | 106 | 104 | 96 | 93 | 85 | 108 |

### 3.4.2 Heat pumps, cooling tower and water-cooled chiller

All heat pumps, cooling towers and chillers that require operation at night after 10am and before 7am must be fitted with silencers and acoustic louvres for water-cooled systems. Maximum sound power levels to achieve compliance with environmental noise criteria are listed below in Table 13.

**Table 13 Heat pump, cooling tower and chiller maximum sound power levels**

| Unit designation | Maximum sound power level (dB) Octave Band Centre Frequency (Hz) | | | | | | | | dBA |
|---|---|---|---|---|---|---|---|---|---|
| | 63Hz | 125Hz | 250Hz | 500Hz | 1kHz | 2kHz | 4kHz | 8kHz | Total |
| HX-PX (night-time requirements) | 86 | 85 | 89 | 91 | 92 | 80 | 69 | 61 | 94 |
| CT-0X | 84 | 78 | 81 | 82 | 80 | 82 | 81 | 74 | 87 |
| CH-0X (1300 kW) (night-time requirements) | 44 | 66 | 88 | 89 | 93 | 87 | 77 | 64 | 95 |

### 3.4.3 Minimum acoustic treatments

Table 14 contains a summary of the minimum acoustic requirements for achieving internal noise level targets and environmental emissions criteria. Specific units have been referenced for the AHUs however the Fan sound power levels have been estimated based on expected airflow and external pressure requirements.

**Table 14 Specific unit acoustic treatments**

| Unit | Minimum Acoustic requirements(1) |
|---|---|
| AHU-AMF-MANH-01 | Line minimum first 15m or for extent of roof plant up to first riser. |
| AHU-AMF-MANH-02 | Line minimum first 15m or for extent of roof plant up to first riser. |
| AHU-LAB-VAV-CZ | Line supply min 5m. |
| AHU-LAB-GF-ISO5-CZ-04 | Provide lining to first 8m of supply and return |
| AHU-LAB-GF-ISO5-CZ-03 | Provide lining to first 8m of supply and return |
| AHU-LAB-GF-ISO5-CZ-02 | Provide lining to first 8m of supply and return |
| AHU-LAB-GF-ISO5-CZ-01 | Provide lining to first 8m of supply and return |
| AHU-LAB-GF-ELAB-CZ-01 | Provide lining to first 8m of supply and return |
| AHU-LAB-GF-SPEC-CZ-01 | Provide lining to first 8m of supply and return |
| AHU-LNK-VAV-WZ | Line supply for min 4m.<br>Line return |
| AHU-LAB-VAV-NZ | Line supply to east until riser, line supply to west min 7m. Line return path including expansion (2300x1600). |
| AHU-LAB-L3-LABS-CZ-01 | Provide lining to first 8m of supply and return |
| AHU-LAB-VAV-EZ | Line supply for min 4m.<br>Line return |
| AHU-LAB-L4-ISO5-SZ-01 | Provide internally lined duct 50mm foil facing for entire duct run |
| AHU-LAB-L4-ISO5-CZ-01 | Provide internally lined duct 50mm foil facing for entire duct run |
| AHU-LAB-OA-01 | Line supply for extent of roof duct |
| AHU-LAB-OA-02 | Line supply for extent of roof duct |

(1) All duct lining to comprise of minimum 50 mm internal perforated foil facing.

### 3.4.4 Plant room treatment and louvres

Acoustic treatments to control environmental noise emissions are required to plant rooms containing CH-01, CH-02 and CH-03. Suitable products are provided below, with the Fantech SBL1 providing the minimum required attenuation. Static insertion loss values for acoustic louvres are outlined in Table 15 and shown in Figure 5.

**Table 15 Static insertion loss for acoustic louvres**

| Acoustic louvres | Static Insertion Loss, centre band frequency (Hz) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz |
| Fantech SBL1 | 4 | 7 | 9 | 13 | 14 | 12 | 12 |
| Fantech SBL2 | 5 | 10 | 14 | 22 | 27 | 25 | 21 |

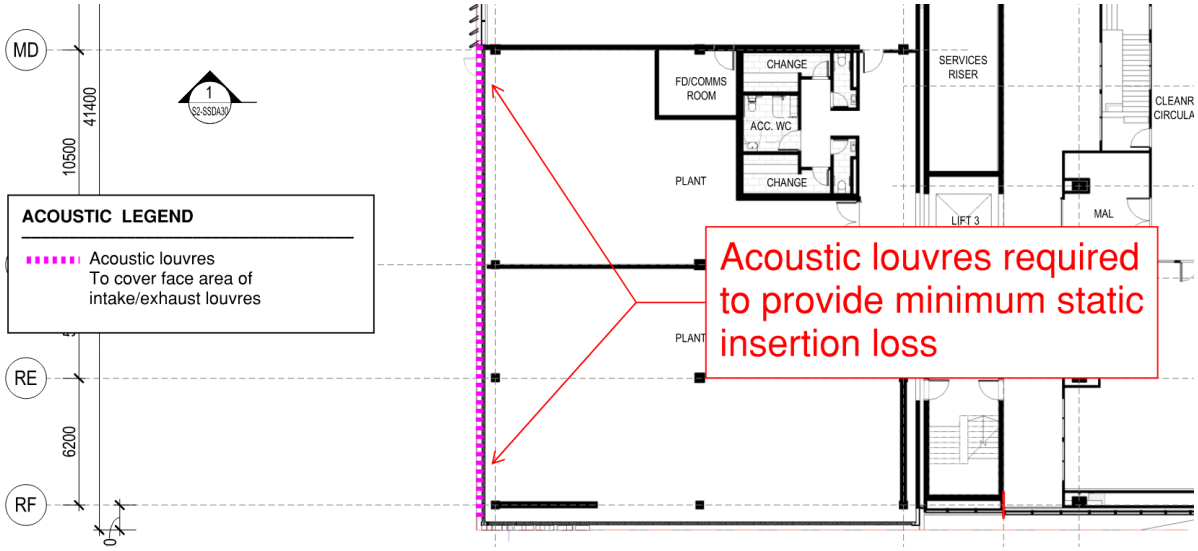


**Figure 5 AMRFB2, level 02 louvre requirements**

Suitable acoustic absorption products for different plant areas is provided in Table 16. All plant areas are required to contain a minimum NRC 0.95 insulation to the soffit.

**Table 16 Recommended absorptive treatments**

| NRC | Panel |
|---|---|
| **Internal plant rooms** | |
| 0.95 | Martini Absorb HD 50 |
| | Bradford Supertel 75 Acoustituff |
| 1.0 | Megasorber FM50 – 50 mm |
| | Martini Absorb HD 75 |
| | Bradford Supertel 75 HD Perf / Unfaced |
| **External plant areas** | |
| 0.9 | Pyrotek 50 mm Reapor |
| 1.0 | Megasorber 50 mm FM-DS (thermoset acoustic foam with water-repellent Soundmesh G8) |
| | Stratocell Whisper |

### 3.4.5 Attenuator schedule

The following mechanical plant will require an attenuator with the minimum insertion loss as listed in Table 17.

**Table 17 Attenuator schedule**

| Unit | Minimum static insertion loss required dB | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 63 (Hz) | 125 (Hz) | 250 (Hz) | 500 (Hz) | 1000 (Hz) | 2000 (Hz) | 4000 (Hz) | 8000 (Hz) |
| OAF-GF-03 | 12 | 26 | 32 | 46 | 44 | 42 | 34 | 32 |
| AHU-LAB-L4-ISO5-SZ-01 (Supply) | 5 | 10 | 11 | 15 | 14 | 17 | 12 | 11 |
| AHU-LAB-L4-ISO5-CZ-01 (Supply) | 5 | 10 | 11 | 15 | 14 | 17 | 12 | 11 |

# 4 Conclusion

The proposed Stage One works for AMRFB2 have been assessed for potential noise and vibration impacts. The sensitive receivers are not expected to be affected by the amendment, as noise levels are predicted to be below the Project criteria as required by the NPfI. This requires various attenuators, acoustic louvres, and reduced noise levels at night to ensure compliance, similar to the main body of work.

As these noise management and mitigation measures previously outlined remain unchanged and are still applicable, the proposed amendment has been assessed to result in minimal noise-related concerns to nearby sensitive receivers.

Please let me know if you have any queries or wish to discuss the above.

Yours sincerely,

Jake Werden
Principal Consultant
p +61 3 9020 3888
m +61 413 591 240
jake.werden@resonate-consultants.com