

To:	Rio Tinto – Winu Project	From:	Matt Moyle
Attention:	Matthew Devlin	Date:	23 September 2025
Email:	Matthew.Devlin@riotinto.com	Pages:	3 + Appendix A
Our Ref:	24129771-04 Memo Rimfire		
Re:	Winu Project: Rimfire Bore Field Noise Assessment		

Lloyd George Acoustics was engaged to prepare a desktop assessment of plant noise due to the proposed Rimfire Bore Field at Rio Tinto, Winu Project. The main plant items at each bore field location are generators and pumps, however the latter are submersible and installed down-hole and do not emit significant noise above the surface. As such, this assessment focuses primarily on noise from the generators. Previously, a noise assessment was completed for the mine proposal which did not include the borefield plant (LGA Ref: 24129771-03).

This supplementary study has been undertaken using methodology in accordance with *Environmental Protection (Noise) Regulations 1997* (other than for aircraft). Noise modelling software, *SoundPlan Noise 9.0* has been utilised to graphically represent the noise levels from worst-case plant at both the proposed bore field and the mining site operations (cumulatively assessed).

The study of Rimfire Bore field, the mine operations, and power plant noise has also been considered along with the noise impacts from the Airfield (Previously modelled in LGA report 24129771-02). Note that this study considers all noise predicted as an L_{Amax} level as this is the appropriate criteria when considering aircraft flights.

1. METHODOLOGY

1.1. Rimfire Bore Fields, L_{10}

The following conditions were assumed for the Bore field noise model:

- All Mining and Power plant sources in operation, as modelled previously;
- All Bore field generator noise sources (10 Total) are assumed to be running simultaneously and at full capacity, modelled at 2m above ground level;
- While the precise make/model of each generator is not finalised, conservative noise levels were selected for each generator, these were modelled with the noise data as outlined in *Table 1*.
- The Noise levels are equivalent to manufacturer's specifications of 68 dB(A) at 7-metres for the Bore Field Generators, and 77 dB(A) at 7-metres for the larger capacity Water Collection Station Generator.

Table 1: Source Sound Power Levels used in the Noise Model, dB

Description	Octave Band Centre Frequency (Hz)								Overall dB(A)
	63	125	250	500	1k	2k	4k	8k	
Bore Field Generators	92	109	98	99	96	91	85	75	98
Water Collection Station Generator	102	119	108	109	106	101	95	85	108

The plant noise is assumed to be at this level of noise for at least 10% of the time and therefore the L_{A10} assigned level becomes the critical parameter for determining compliance for this noise. Aircraft noise is not present for 10% of the time and therefore does not affect the L_{A10} predicted levels.

1.2. Cumulative Impact with Air field, L_{Max}

In LGA report 24129771-02, noise modelling was undertaken to graphically reproduce the aircraft noise calculations in accordance with Australian Standard 2021:2015 *Aircraft noise intrusion - Building siting and construction* based on the proposed project airfield. Since aircraft passes are considered to be intermittent and infrequent, the Standard predicts noise as an L_{Amax} level. In this case, aircraft noise is not present for 10% of the time and therefore there is no L_{10} noise level from aircraft flights.

When considering noise impacts from the aircraft cumulatively with other site operations, the L_{Amax} levels of these sources should be included. The approach in this project was to assume the modelled L_{A10} values are the same as the L_{Amax} values and these can then be combined with aircraft L_{Amax} .

2. RESULTS

Modelled results were overlayed with aerial photography and provided drawings of the proposal including key infrastructure such as Camps, Process Plant and the ROM pad. In addition, each result also includes the surveyed Night Parrot Habitats.

The following figures and outcomes were generated for the following scenarios:

- *Figure A1 – Mining Operations and Rimfire Bore field plant, L_{A10} :*
 - Rimfire Bore field levels do not significantly contribute to the overall L_{A10} noise levels of the proposal.
 - Scale of contours is from 30 to 50 dB L_{A10} .
- *Figure A2 – Rimfire Bore field area only, L_{A10} :*
 - Night Parrot Habitats not significantly impacted by Bore field plant.
 - Scale of contours is from 30 to 50 dB L_{A10} .
- *Figure A3 - Mining Operations, Rimfire Bore field and Aircraft events (Fokker 100), L_{Amax} :*
 - This figure includes previously modelled Aircraft L_{Amax} noise countours.
 - Night Parrot Roosting and Foraging locations are expected to lie within 55-72 dB L_{Amax} aircraft noise areas on eastward departures.
 - In the locations of Night Parrot foraging and roosting, the L_{Amax} noise levels from the Air field are unchanged when considering the addition of noise from Mining operations and Rimfire Bore field plant.
 - Scale of contours is from 55 dB to 75 dB L_{Amax} .

3. DISCUSSION OF TERMS

The air field noise assessment is limited to the L_{Amax} parameter, as it is based on the Australian Standard 2021:2015 which provides calculated single aircraft L_{Amax} noise levels for landing and take-off scenarios depending on the proximity to the runway. These levels are not present in the L_{A10} level as an aircraft event is not present for more than 10% of a given representative measurement period. In other words, the event is not frequently occurring or of a long enough duration. The terms relevant to this study are defined as:

- L_{Amax}

An L_{Amax} level is the maximum A-weighted noise level during a particular measurement.

- L_{A10}

The L_{A10} level is the A-weighted noise level exceeded for 10 percent of the measurement period and is considered to represent the “intrusive” noise level.

Figure 1A

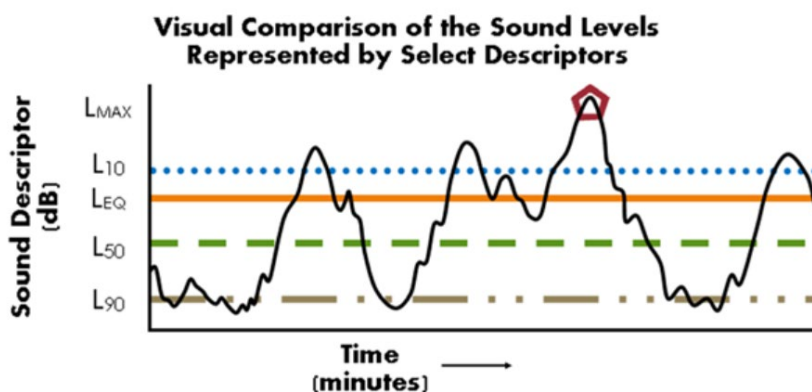
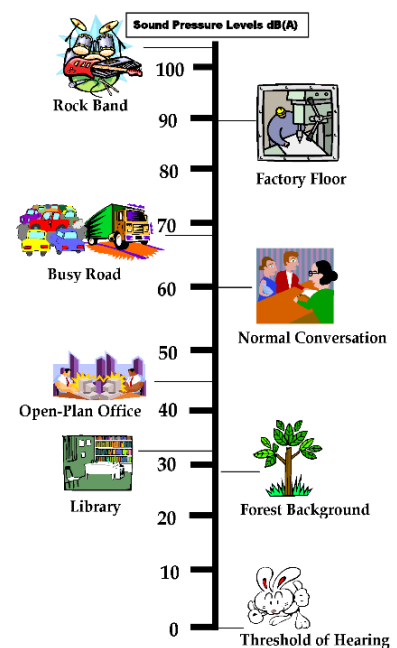


Figure 1B



Figures 1A and 1B: Sound level descriptors and typical sound Pressure Levels

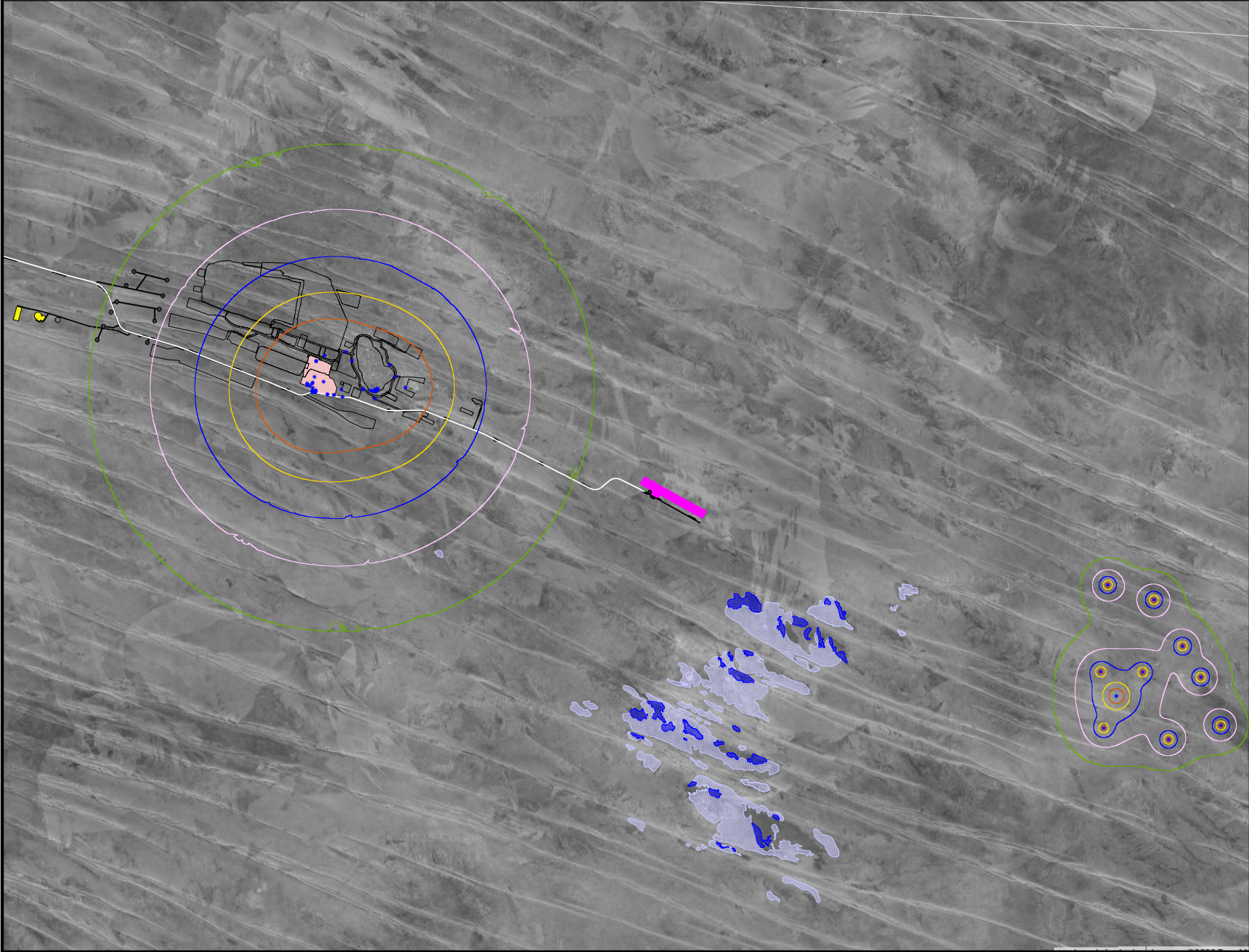
We trust the above advice is satisfactory. Should you require further information, please do not hesitate in contacting us.

Regards,

Matt Moyle

Figure A1: All Mining Operations and Rimfire Bore Field, dB LA10

Winu Project, Western Australia



Predicted Noise level

- = 30
- = 35
- = 40
- = 45
- = 50

Legend

- Plant/Mobile Source
- Access Road
- Infrastructure Areas
- Winu Camp
- ROM/Processing Plant
- Airport
- Night Parrot - Foraging
- Night Parrot - Roosting



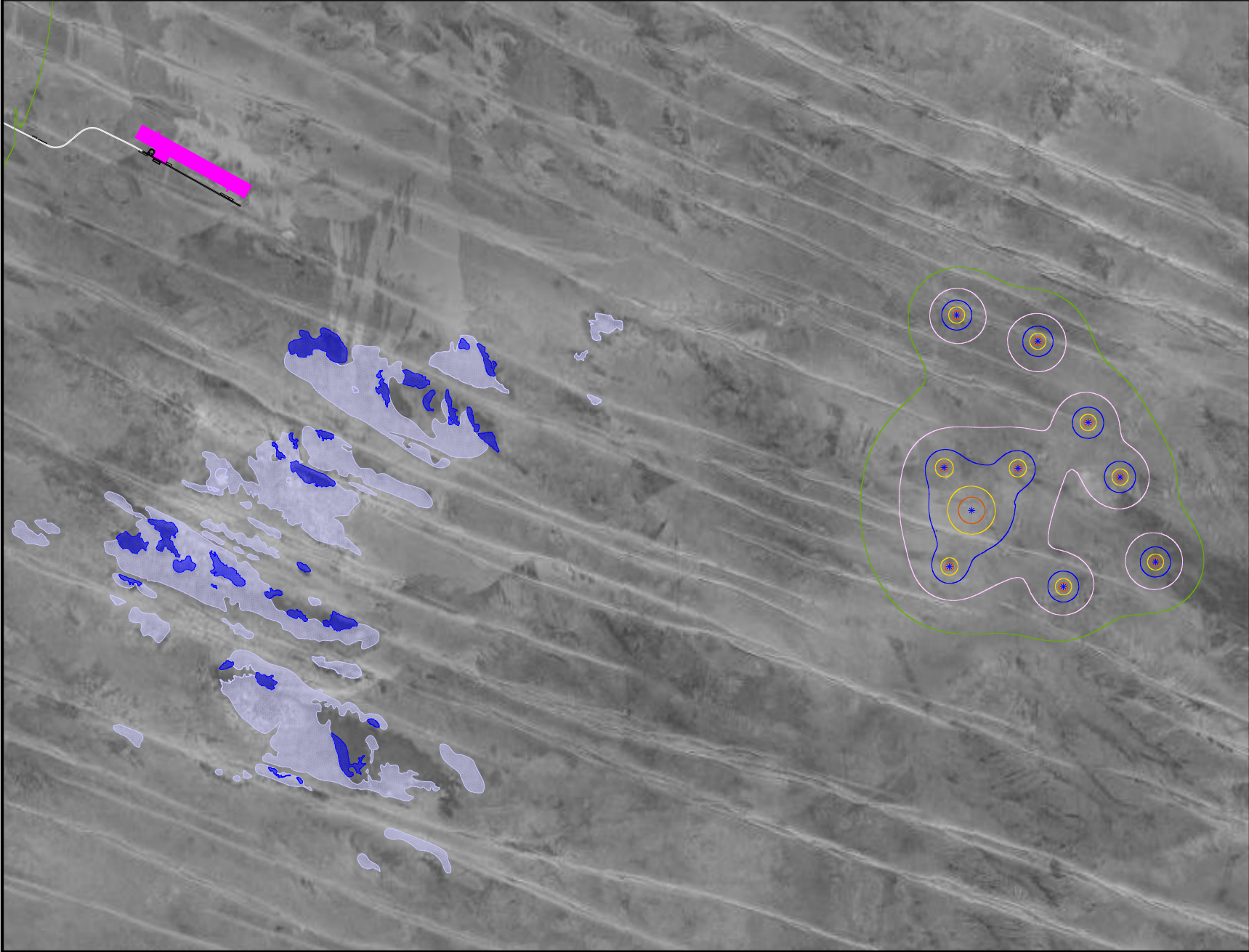
Project No: 24129774
Consultant: MM
Date: 17/09/2025
Algorithm: CONCAWE
SoundPLAN Version: 9.0



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Figure A2: Rimfire Bore Field, dB LA10

Winu Project, Western Australia



Predicted Noise level

- = 30
- = 35
- = 40
- = 45
- = 50

Legend

- * Generator Source
- Access Road
- ROM/Processing Plant
- Airport
- Night Parrot - Foraging
- Night Parrot - Roosting

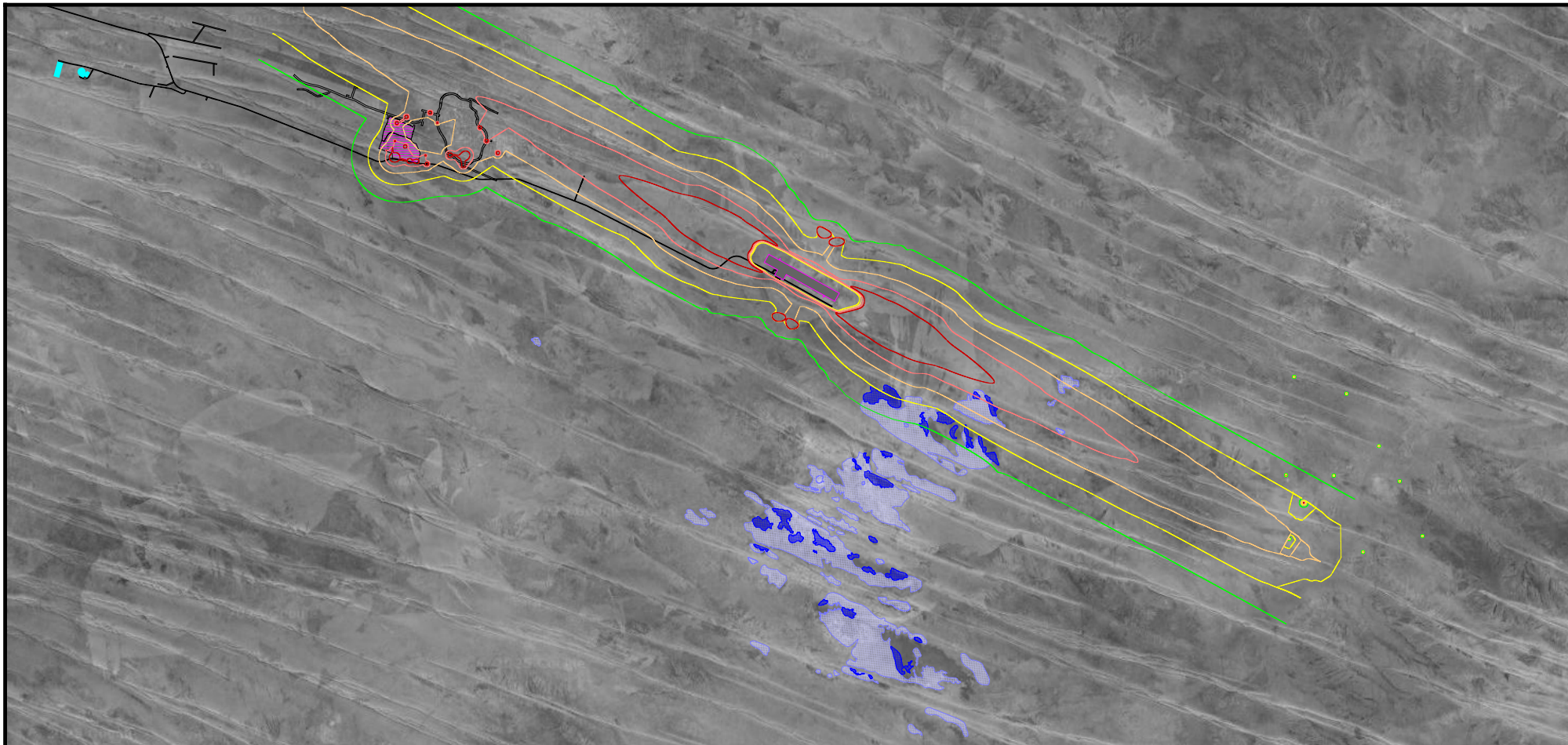


0 750 1500 3000 4500 m

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Winu Project Air field - Rio Tinto Mining Operations, Fokker 100 Aircraft and Rimfire Bore Fields

Noise Level Contours Based on AS2021 Aircraft Departure in both directions

SoundPlan v9.0

12 Sep 2025



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Scale 1: 200000



Figure A3

Signs and symbols

- Air Strip
- Access Roads
- Worker Camp
- ROM/Process Plant
- Night Parrot - Foraging
- Night Parrot - Roosting



Noise levels L_{max} dB(A)

- = 55
- = 60
- = 65
- = 70
- = 75

AS 2021:2015