Frasers BESS

Noise Assessment

Frasers Lane Development Pty Ltd

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Prepared by:

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SLR Project No.: 640.032213.00001

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Revision Record

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Basis of Report

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Frasers Lane Development Pty Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

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Executive Summary

This report has been prepared by SLR Consulting Pty Ltd (SLR) in support of the Development Application for the proposed Frasers Battery Energy Storage System (BESS) on behalf of Frasers Lane Development Pty Ltd.

SLR was engaged by Frasers Lane Development Pty Ltd to undertake a noise impact assessment of a proposed 109 MVA / 900 MWh BESS located at Frases Lane, Glengarry North, which is to be located to the south of the approved Frasers Solar Farm. The proposed site is located within farmland approximately 4 km north-east of the township of Glengarry.

The predicted noise levels of the Frasers BESS (including cumulative noise from the approved adjacent Frasers Solar Farm) were assessed against the various requirements of Victorian policy and guidelines (e.g. EP Act, EP Regulations, EPA Publication 1826 (Noise Protocol), Low Frequency Noise Guidelines and the General Environmental Duty).

The assessment indicates that compliance with the Noise Protocol noise limits is expected at all noise-sensitive receivers during all operating periods, subject to the implementation of the proposed acoustic mitigation measures. These measures include acoustic treatment of BESS battery and inverter units and the construction of purpose-designed noise barriers along the southern and western site boundaries. The cumulative assessment also incorporated updated assumptions for the solar farm inverter equipment based on current OEM selections, which do not include dedicated silencing treatment.

Low frequency noise was evaluated in accordance with the Victorian Low Frequency Noise Guidelines. The results indicate a low risk of adverse low frequency noise effects at the nearest receivers.

On this basis, the proposed development is expected to comply with the relevant Victorian regulatory requirements and is not anticipated to result in unreasonable noise impacts to the surrounding environment.

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1.0 Introduction

Frasers Lane Development Pty Ltd is proposing to develop a 109 MVA / 900 MWh (8 hour) Battery Energy Storage System (BESS) at Frasers Lane, Glengarry North, Victoria (the Project), which is immediately south of the approved Frasers Solar Farm.

SLR Consulting Pty Ltd (SLR) was engaged by Frasers Lane Development Pty Ltd to undertake a noise impacts assessment for the Project to support a Development Application submission.

2.0 Project Area

The proposed site is on rural Farming Zone (FZ) land approximately 4 km north-east of the township of Glengarry in the Latrobe City Council local government area.

The proposed 77 MW Frasers Solar Farm will abut the northern boundary of the Project. Access to the BESS will be via the solar farm.

The BESS is proposed to feed into the grid by either linking into the solar farm substation or a substation constructed within the BESS development.

The BESS is proposed to consist of the following equipment:

- 144 x Jinko SunTera G2 5 MWh battery containers with silencing treatment (or similar[1])
- 18 x Ingeteam INGECON SUN PowerStation FSK C Series skid mounted power stations[2], each consisting of:
    - 2 x INGECON Sun 3Power C Series HV 3.825 kVA inverters with silencing treatment.
    - 1 x LV/MV transformer
    - 1 x Auxiliary services transformer
    - 1 x MV switchgear
- Substation including a HV transformer and harmonic filters

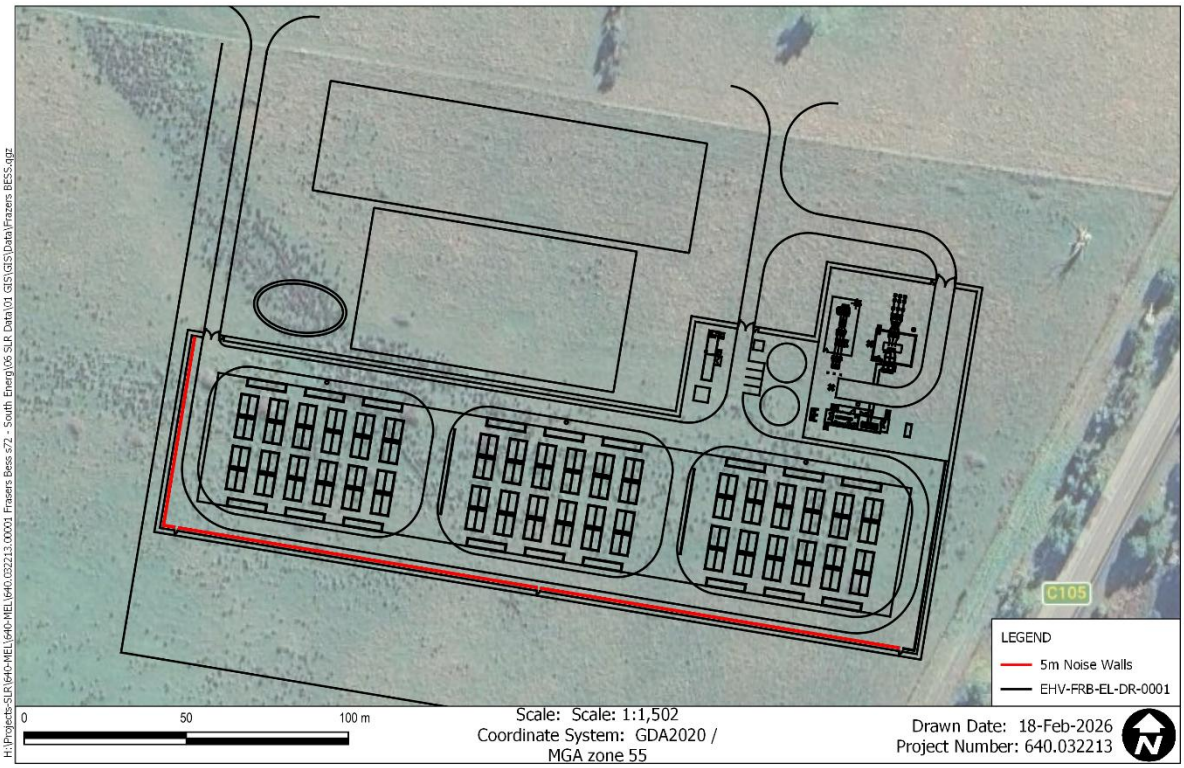
A 5 m high noise wall of approximately 290 metres in length total, runs along the south and western boundary of the BESS area. The walls will have a minimum surface mass of 15 kg/m^2 and a weighted sound reduction index of Rw30. The wall is assumed to be acoustically reflective. Two penetrations in the southern wall have been modelled to represent pedestrian escape routes in the event of a fire. Although they were modelled at slits in the wall, the penetrations may be constructed as doors, or overlapping offset walls, depending on the construction material of the wall.

The proposed BESS layout is shown in **Figure 1**.

[1] Next generation higher capacity 6.2 MWh batteries are in development and may be procured if available. These batteries are anticipated to have similar noise emissions per unit as the SunTera G2, but due to the higher energy density, fewer batteries are required. The assessment assumes the above quantity of 5 MWh battery containers, as a worst case. Variations of equipment selection are explored in **Section 5.2**

[2] Similarly to the battery model, Ingecon are developing the M Series power stations, these will have similar noise emissions as the C Series, but increased power load. The M Series layout will require 12 skid mounted power stations (two M Series inverters per skid), rather than 18 C Series power station.

Figure 1 Proposed BESS Site Layout



2.1 Frasers Solar Farm

The approved but not yet constructed Frasers Solar Farm represents the only other significant industry in the locality. To assess potential cumulative impacts, operational noise emissions from the Frasers Solar Farm have been incorporated into the predictive noise modelling and assessment for the Project.

The original noise assessment of the Solar Farm was completed by AECOM in 2020[3]. Since that time, the project design has been refined, including updates to the final layout and the selection of equipment manufacturers (OEMs). The cumulative assessment presented in this report reflects the current design assumptions based on the latest available project information.

The Frasers Solar Farm is understood to comprise the following principal noise-generating plant:

- 15 x INGECON Sun 3Power C Series 3.825 kVA power stations, each consisting of:
  - 2 x INGECON Sun 3Power C Series 3.825 kVA inverters
  - 1 x LV/MV transformer
  - 1 x Auxiliary services transformer
  - 1 x MV switchgear
- 1,515 x Tracker motors distributed around the solar array area

[3] Ref: 12 March 2020, Frasers Solar Farm Operational Noise Assessment, AECOM report number: 60618530.

- Substation including a HV transformer and harmonic filters

The solar farm layout is shown in relation to the Project and closest noise sensitive receivers is shown in **Figure 2**

2.2 Noise Sensitive Receivers

There are 10 identified closest noise sensitive receivers closest to the Project, one of which is project-involved (R1).

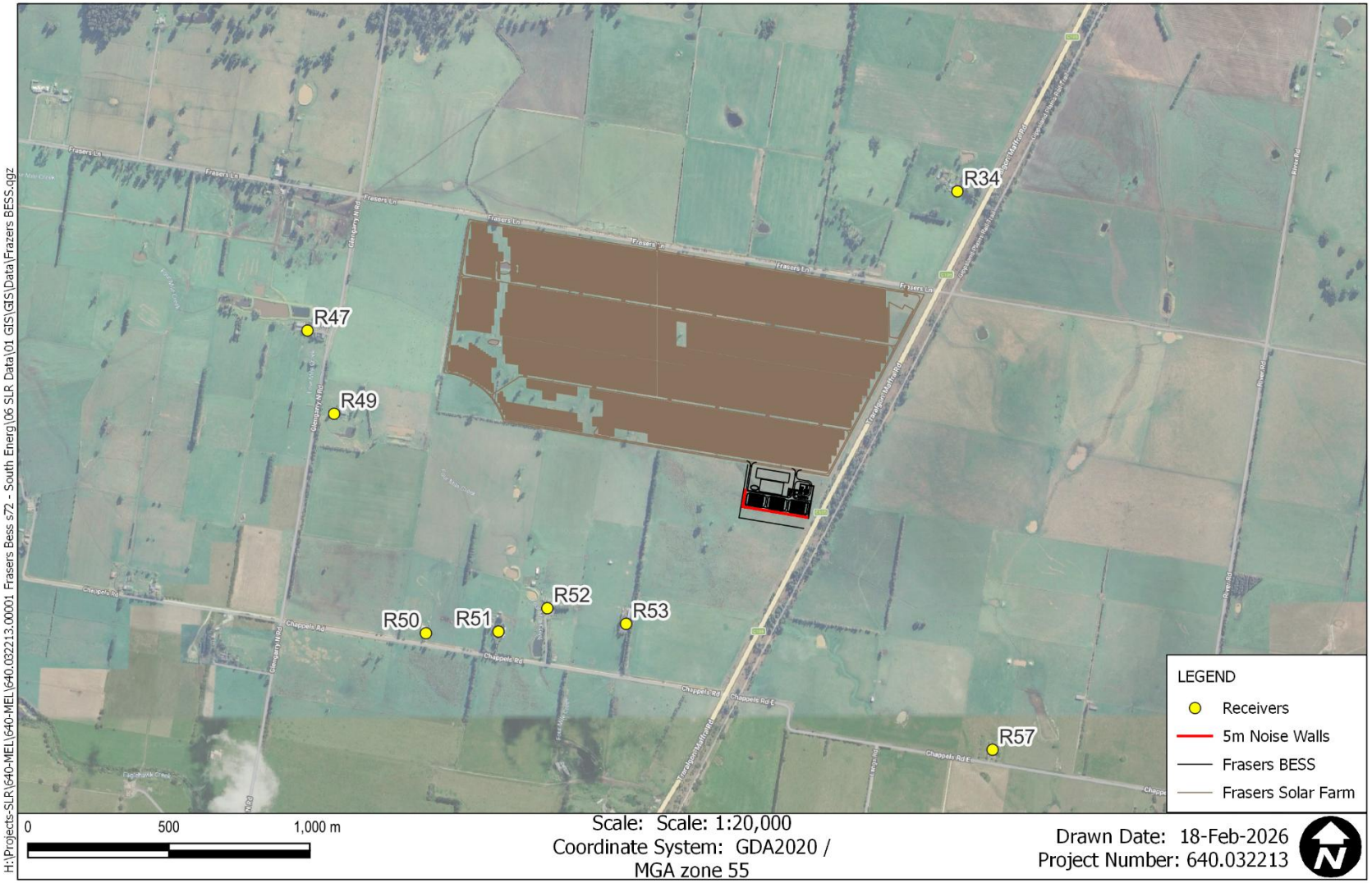
Table 1 summarizes the sensitive receivers and the distance to the boundary of the proposed project site. The easting and northing coordinates reference to GDA2020 MGA Zone 55.

The project site and closest sensitive receivers are presented in **Figure 2**.

Table 1 Noise Sensitive Receivers

Receiver ID	Easting (m)	Northing (m)	Distance to Project Boundary (m)
R34	465701	5785524	1,220
R47	463395	5785031	1,650
R49	463490	5784736	1,480
R50	463815	5783958	1,210
R51	464073	5783964	970
R52	464246	5784046	780
R53	464525	5783991	580
R57	465825	5783545	1,050

Figure 2 BESS Area, Solar Farm and Sensitive Receiver Locations



3.0 Victorian Regulations

Appendix A provides a summary of the Victorian noise legislation with reference to the Environment Protection Act 2017 (EP Act).

3.1 Noise Protocol

EPA Publication 1826.4 "*Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues*", (the "Noise Protocol") is the primary assessment tool under the Regulations for the determination of unreasonable noise from commercial and industrial premises.

The Noise Protocol presents the methodology for determining the noise limit (maximum allowable level of noise emitted from a premise) when measured in a noise sensitive area. Noise sensitive areas are defined in the Regulations as that part of the land within the boundary of a parcel of land that is within 10 m of the outside of the external walls of a place where people generally sleep (homes, dormitories, hotels, hospitals, correctional facilities etc.), schools (including childcare centres) and tourist establishments in rural areas (campgrounds, caravan parks, etc.).

Noise is assessed over a 30-minute period during which the premises operate. The measured or predicted noise level is adjusted for duration, character (tonality, intermittency, and impulsiveness) and measurement position (reflection, indoor) to determine the effective noise level for assessment against the noise limit.

The setting of the noise limits depends on whether the sensitive receivers are within a major urban area, or a rural area. In this case receivers around the Site lie within the major urban boundary.

Table 2 presents the assessment periods prescribed by the Regulations.

Table 2 Assessment Period Definitions (Environment Protection Regulations)

Period	Day	Time
Day	Monday to Saturday (except public holidays)	7 am – 6 pm
Evening	Monday to Saturday Sunday and public holidays	6 pm – 10 pm 7 am – 10 pm
Night	Monday to Sunday	10 pm to 7 am

3.1.1 Rural Method – Noise Limits

Since all noise sensitive receivers are located outside of the Major Urban Area, the Rural Method is used to establish appropriate noise criteria for Frasers BESS.

The Noise Protocol noise limits for receivers in a rural environment normally takes into consideration the influence of zoning map categories (and changes in zoning categories), the distance between the zoning boundary and receiver (where different zones apply) as well as the background noise. However, there is a special consideration that applies for utilities.

Noise Limits in Rural Areas for Utilities

Section 2.6 of the Noise Protocol defines the method for determining noise limits in rural areas for utilities, which include electricity infrastructure, which is an appropriate classification for the BESS facility.

Clause 31 states that if the utility is located in a Farming Zone (FZ) and the distance adjustment is 0 dB (receiver is also in FZ), then the distance-adjusted level for each period is:

- Day: 45 dBA
- Evening: 39 dBA
- Night: 34 dBA

Since all sensitive receivers and the Project are located in a Farming Zone (FZ), the above levels are therefore the noise limits applicable for this project.

3.1.2 Cumulative Noise

Where noise from more than one industrial source contributes to the total sound level at a receiver, the applicable noise limits must account for cumulative noise emissions in accordance with Regulation 119 of the Environment Protection Regulations 2021. The proposed BESS site is located adjacent to the approved Frasers Solar Farm, which represents the only other significant industrial noise source in the locality.

The predictive noise modelling presented in this assessment incorporates operational noise emissions from both the Frasers BESS and the Frasers Solar Farm, with individual and combined source contributions detailed in **Section 0**. As the cumulative noise levels have been directly predicted and assessed, no further adjustment of the applicable noise limits for cumulative effects is required.

Accordingly, the applicable project-specific noise limits for the combined operation of the BESS and Solar Farm are the standard rural area noise limits for utilities under the Noise Protocol:

- Day: 45 dBA
- Evening: 39 dBA
- Night: 34 dBA

4.0 Noise Assessment

A 3D noise model was constructed within the modelling software SoundPLAN 8.2 to predict noise levels at the nearby sensitive receivers.

Noise modelling was conducted using the algorithms of ISO 9613-2[4] , which predicts the A-weighted sound pressure levels under meteorological conditions favourable to propagation from sources of known sound power levels. This enhanced propagation is equivalent to downwind propagation or a moderate ground-based temperature inversion. The model also includes attenuation due to air absorption, ground attenuation and shielding.

[4] ISO 9613-2:1996 *Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation*

4.1 General Modelling Assumptions

The following general assumptions have been adopted in the noise modelling, consistent with recognised best-practice methods and appropriate for the Project:

- A reflection order of three (3) was applied to account for building and barrier reflections.
- Source heights were assigned based on the physical characteristics and installation height of each item of plant.
- Receiver locations were modelled in the acoustic free field at a height of 1.5 m above local ground level, representative of outdoor amenity areas.
- All plant was assumed to operate continuously over the full 30-minute assessment period, representing a conservative worst-case operating scenario.
- Site topography was derived from publicly available 10-metre resolution digital elevation data obtained from the Victorian Government.
- Ground absorption was represented using the standard ground factor (G), ranging from 0 (acoustically hard, fully reflective) to 1 (acoustically soft, fully absorptive). The BESS and solar farm areas were modelled as hard ground (G = 0), while all surrounding areas were assigned a ground factor of G = 0.6, representative of rural farmland conditions.

4.2 Scenarios

The BESS is capable of charging and discharging at any time of day, with operations anticipated to occur with most charging occurring during the midday period and discharge typically occurring during periods of peak electricity demand, including morning and evening peaks. In contrast, the adjacent solar farm will primarily operate during daylight hours, with minimal output during the night period (10:00 pm to 7:00 am) and reduced output during the evening period (6:00 pm to 10:00 pm).

Operational data from comparable solar farm projects reviewed by SLR indicate inverter loading of less than 10% prior to 6:00 am and approximately 40% between 6:00 am and 7:00 am. On this basis, solar farm inverter and cooling operation during the night period is expected to be substantially reduced.

For the purpose of conservative assessment:

- The BESS has been assumed to operate at full capacity, including maximum cooling demand, during both day/evening and night periods.
- The solar farm has been assumed to operate at full cooling load during the day and evening periods, and at 50% cooling load during the night period. This represents a conservative worst-case condition corresponding to the final hour of the night period, when the applicable noise limit is most stringent.

Accordingly, two operational scenarios were modelled to represent realistic worst-case conditions for each assessment period:

- **Scenario 1 – Day and Evening:** All BESS and solar farm noise sources operating at maximum capacity. Predicted noise levels at noise-sensitive receivers are assessed against the applicable day and evening noise limits (noting that Sunday daytime operations are assessed against the evening criteria).

- **Scenario 2 – Night:** BESS noise sources operating at maximum capacity, with solar farm inverter and cooling systems operating at 50% load. Predicted noise levels at receivers are assessed against the night-period noise limit, which represents the most stringent criterion.

4.3 Noise Sources

All plant items have been assumed to operate for the full duration of the 30-minute assessment period unless otherwise stated. Operational noise emissions from the BESS are expected to be dominated by cooling system noise, the magnitude of which varies with operating load (charge/discharge rate) and thermal conditions, including both ambient temperature and heat generated by the equipment. For assessment purposes, cooling systems have been modelled under worst-case operating conditions.

The sound power levels (SWLs) and quantities of the principal noise sources are shown in **Table 3**.

The current preferred original equipment manufacturer (OEM) is Jinko SunTera G2 battery units integrated with Ingeteam skid-mounted power stations. The 1/3 octave frequency spectra and sound power levels of the batteries and inverters were provided by the respective OEMs.

The BESS battery and inverter systems incorporate proprietary OEM acoustic treatment. In contrast, the Ingeteam skid-mounted power stations associated with the solar farm are not assumed to include additional silencing treatment. Solar tracker motor sound power levels are based on measurements of a representative unit from a comparable installation. Tracker motors have been assumed to operate intermittently, with a duty cycle of approximately 10 minutes within each 30-minute assessment period.

Both the BESS and the solar farm include a substation comprising a 90 MVA high-voltage transformer and associated harmonic filtering equipment. Transformer sound power levels were determined using empirical relationships based on the maximum levels specified in AS 60076.10:2016. The sound power level for the harmonic filter equipment was derived from SLR field measurements of similar installations.

Table 3 Equipment Sound Power Levels – BESS & HV Transformer

Qty	Item	Sound Power Level (SWL), per unit $L_{eq\ 30\ min}$, dBA
Frasers BESS Sources		
36	Inverter[1] INGECON Sun 3Power C Series HV (100% load with silencing treatment)	90
144	Battery Container Jinko SunTera G2 5 MWh (100% load with silencing)	82
1	90 MVA High Voltage Transformer	93[2]
1	Harmonic Filter	65
Frasers Solar Farm Sources		
30	Inverter[3] INGECON Sun 3Power C Series	Scenario 1 (100% cooling load): 94 Scenario 2 (50% cooling load): 83
1,515	Solar Tracker Motors	60[4]

Qty	Item	Sound Power Level (SWL), per unit $L_{eq\ 30\ min}$, dBA
1	13.5 MVA High Voltage Transformers	93[2]
1	Harmonic Filter	65

Notes:

1: 18 skids, with two inverters per skid. Note each skid contains a medium voltage transformer, auxiliary transformer and switch box. The sound power levels of these items are much lower than the inverters (of the order of 60 dBA) and are thus neglected

2: Based on AS 60076.10:2016 standard maximum (90 MVA rating).

3: 15 skids, with two inverters per skid. See note 1.

4: The sound power level of each tracker has been adjusted to account for 10 minutes of operation for the 30 minute assessment period (-4.7 dB adjustment)

4.3.1 Noise Characteristics

The Noise Protocol provides for the application of adjustments where noise exhibits undesirable characteristics such as tonality, impulsiveness or intermittency. Where one or more of these characteristics are present at a receiver, a penalty is applied to the predicted noise level prior to comparison with the applicable limit.

The potential for these characteristics to be associated with the operation of the BESS and solar farm has been considered for the assessed scenarios, as outlined below.

Tonality

A review of the manufacturer-supplied one-third octave band sound power spectra for the BESS and solar farm equipment did not identify prominent tonal components. Predicted receiver noise levels for Scenarios 1 and 2 similarly did not indicate the presence of tonal features. Accordingly, no tonal adjustment has been applied.

Impulsiveness

Impulsive noise is characterised by distinct sudden pressure peaks, a series of short-duration peaks, or bursts of noise with rapidly decaying amplitude. The dominant noise sources associated with the BESS and solar farm are cooling fans and electrical equipment, which generate steady broadband noise. These sources are not expected to exhibit impulsive characteristics, and no impulsiveness adjustment has been applied.

Intermittency

Intermittent noise is defined as noise that increases rapidly in level by at least 5 dB on two or more occasions within a 30-minute period and remains at the higher level for at least one minute. While cooling fans within the BESS may vary in speed in response to thermal demand, typical control cycles occur over periods longer than the 30-minute assessment interval and do not result in rapid step changes of this magnitude. Accordingly, the noise emissions are not considered intermittent for the purposes of the Noise Protocol.

On this basis, no adjustments for special noise characteristics have been applied to the predicted noise levels presented in this assessment.

5.0 Assessment Results

Predicted operational noise levels at the representative noise-sensitive receivers were assessed against the applicable day and evening criteria for **Scenario 1**, which assumes both the BESS and the Frasers Solar Farm are operating at maximum load.

Table 4 presents the predicted cumulative noise levels at each receiver, including individual contributions from the Project and the Frasers Solar Farm. Results are assessed against the more stringent evening period criterion, which also applies to Sunday daytime operations. The assessment demonstrates compliance with the relevant noise limits at all receivers.

The highest predicted cumulative level occurs at receiver R53, which represents the most affected location. At this receiver, a compliance margin of 3 dB is achieved relative to the evening criterion. For the day period, a compliance margin of 9 dB is achieved, reflecting the less stringent day period limit of 45 dBA.

Table 4 Scenario 1 Day & Evening Results

Receiver	Frasers BESS contribution, dBA	Solar Farm contribution, dBA	Cumulative Total, dBA	Evening Noise Limit, dBA	Compliance Margin dBA
R34	30	33	35	39	4
R47	23	31	31	39	8
R49	25	32	32	39	7
R50	27	29	31	39	8
R51	29	30	33	39	6
R52	31	31	34	39	5
R53	33	32	36	39	3
R57	29	25	30	39	9

The night period assessment results are presented in **Table 5**. For Scenario 2, the solar farm inverters have been assumed to operate at 50% cooling load during the final hour of the night period (6:00 am to 7:00 am), while the BESS is assumed to operate at 100% cooling load. This represents a conservative worst-case condition for the night period.

The assessment demonstrates compliance with the applicable night period noise limit at all receivers.

It is noted that typical night-time operating conditions are expected to be significantly less onerous than those modelled. In practice, the solar farm is likely to be non-operational during most of the night period, and the BESS cooling demand would generally be much reduced due to lower ambient temperatures and potentially lower operating loads. Accordingly, actual night-time noise levels are expected to be lower than the worst-case predictions presented.

Table 5 Scenario 2 Night Results

Receiver	Frasers BESS contribution, dBA	Solar Farm contribution, dBA	Cumulative Total, dBA	Evening Noise Limit, dBA	Compliance Margin
R34	30	28	32	34	2
R47	23	20	25	34	9
R49	25	21	27	34	7

Receiver	Frasers BESS contribution, dBA	Solar Farm contribution, dBA	Cumulative Total, dBA	Evening Noise Limit, dBA	Compliance Margin
R50	27	19	27	34	7
R51	29	20	29	34	5
R52	31	20	32	34	2
R53	33	22	34	34	0
R57	29	17	29	34	5

The noise contour plots of the assessed scenarios are provided in **Appendix B**.

5.1 Low Frequency Noise

Low frequency noise (LFN) is defined as noise containing significant acoustic energy in the one-third octave bands between 10 Hz and 160 Hz. Manufacturer-provided sound power spectra for the BESS and solar farm equipment were available over the frequency range of 50 Hz to 10 kHz.

The EPA *Noise Guidelines: Assessing Low Frequency Noise* (Publication 1996 June 2021) include a low frequency threshold level that are intended as a screening tool to identify the potential for adverse low frequency noise effects.

The assessment presented in this report is subject to two recognised limitations:

- Supplier spectral data were not available below 50 Hz; and
- The ISO 9613 propagation method is not specifically optimised for the prediction of very low frequency sound.

Notwithstanding these limitations, the predicted one-third octave band levels at all assessed receivers were compared with the EPA screening thresholds. No exceedances were predicted in the frequency bands between 50 Hz and 160 Hz, as summarised in **Table 6**.

On this basis, the proposed development is considered unlikely to present a risk of adverse low frequency noise effects at nearby receivers.

Table 6 Low Frequency Noise Assessment Results

Receiver	1/3 Octave Centre Frequency					
	50 Hz	63 Hz	80 Hz	100 Hz	125Hz	160Hz
LFN Threshold	**50**	**50**	**48**	**48**	**46**	**44**
R34	36	35	37	36	35	34
R47	32	31	32	32	30	30
R49	34	32	34	34	32	31
R50	34	33	35	33	32	31
R51	34	33	35	35	34	33
R52	36	35	38	37	36	35
R53	39	38	41	40	39	37
R57	34	34	36	35	34	33

5.2 Alternative Equipment Selection

The assessment presented in the preceding sections is based on the currently preferred inverter and battery technology. However, renewable energy and energy storage technologies continue to evolve rapidly. Next-generation equipment is expected to deliver increased battery energy density and higher inverter power ratings while maintaining similar unit sound power levels. As a result, equivalent project capacity may be achieved with fewer units, leading to an overall reduction in total acoustic emissions.

To illustrate the potential acoustic benefits of equipment optimisation, the following variations were evaluated:

- Variation 1: Reduction in the number of BESS power stations from 18 to 12 through substitution of higher-capacity M Series inverters in place of the S Series units.
- Variation 2: Reduction in the number of battery containers from 144 to 108, reflecting increased storage capacity per unit.
- Variation 3: Combined reduction to 12 power stations and 108 battery containers, incorporating both higher-capacity M Series inverters and higher energy density batteries.

The results, presented in **Table 7**, indicate that modest reductions in predicted noise levels can be achieved through equipment substitution alone. These calculations are based solely on adjustments to the number of noise sources. Further reductions may be achievable through associated layout optimisation, including increased separation distances and improved effectiveness of the proposed noise barriers.

Table 7 Expected Change in Predicted Noise Levels for Equipment Selection Variations

Receiver	Variation 1, dB	Variation 2, dB	Variation 3, dB
R34	0	0	-1
R47	0	0	-1
R49	0	0	-1
R50	-1	0	-1
R51	-1	0	-1
R52	-1	0	-1
R53	-1	-1	-1
R57	-1	-1	-1

6.0 Conclusions

This Noise Impact Assessment has been prepared to support the Planning Application for the proposed Frasers Battery Energy Storage System (BESS). The applicable noise criteria, assessment methodology and modelling results have been presented to demonstrate compliance with the relevant Victorian regulatory requirements.

Cumulative operational noise impacts were assessed by modelling emissions from the proposed BESS together with those from the adjacent approved Frasers Solar Farm. The results indicate that the applicable FZ Utilities noise limits are predicted to be achieved at all noise-sensitive receivers during all assessment periods. The assessment adopts conservative operating assumptions, with the BESS modelled at maximum cooling load for all scenarios and the solar farm modelled at maximum cooling load for the day and evening periods and at 50% load during the night period.

To achieve compliance, OEM acoustic treatment for the BESS battery containers and inverter units has been incorporated, together with the installation of a 5 m high noise barrier along the southern and western boundaries of the BESS site to provide shielding to the nearest receivers.

Low frequency noise was assessed in accordance with the EPA Noise Guidelines: Assessing Low Frequency Noise. The results indicate a low risk of adverse low frequency noise effects at the assessed receivers.

Based on the conservative assumptions adopted, the Project is predicted to comply with the applicable noise criteria and legislative requirements and is not expected to result in unreasonable noise impacts at any nearby noise-sensitive receiver.

Appendix A Victorian Noise Regulations

Frasers BESS

Noise Assessment

Frasers Lane Development Pty Ltd

SLR Project No.: 640.032213.00001

11 March 2026

A.1 General Environmental Duty

The General Environmental Duty (GED) is at the centre of the EP Act, and it applies to all Victorians. GED states that a person who is engaging in an activity that may give rise to risks of harm to human health or the environment from pollution or waste must minimise those risks, so far as reasonably practicable.

The concept of minimising risks of harm to human health and the environment, so far as reasonably practicable, requires the person:

- to eliminate risks of harm to human health and the environment so far as reasonably practicable; and
- if it is not reasonably practicable to eliminate risks of harm to human health and the environment, to reduce those risks so far as reasonably practicable.

Under the Act, harm, in relation to human health or the environment, means an adverse effect on human health or the environment (of whatever degree or duration) and includes:

- an adverse effect on the amenity of a place or premises that unreasonably interferes with or is likely to unreasonably interfere with enjoyment of the place or premises; or
- a change to the condition of the environment to make it offensive to the senses of human beings; or
- anything prescribed to be harm for the purposes of the Act or the regulations.

Harm may arise due to the cumulative effect of harm arising from an activity combined with harm arising from other activities or factors.

To determine what is (or was at a particular time) reasonably practicable in relation to the minimisation of risks of harm to human health and the environment, regard must be had to the following matters:

- the likelihood of those risks eventuating,
- the degree of harm that would result if those risks eventuated,
- what the person concerned knows, or ought reasonably to know, about the harm or risks of harm and any ways of eliminating or reducing those risks,
- the availability and suitability of ways to eliminate or reduce those risks,
- the cost of eliminating or reducing those risks.

In the assessment of noise impacts with reference to GED, consideration must first be given to eliminating risks so far as reasonably practicable, and then to reducing those risks so far as reasonably practicable.

A.2 Noise Criteria

Certain types of noise within Victoria are regulated. The following sections provide an overview of how regulated noise is assessed in Victoria.

A.2.1 Environment Protection Act 2017

In Victoria, the Environment Protection Act (EP Act) prescribes that a person must not, from a place or premises that are not residential premises—

- Emit an unreasonable noise; or
- Permit an unreasonable noise to be emitted.

Unreasonable noise means noise that—

- Is unreasonable having regard to the following—
  - Its volume, intensity, or duration
  - Its character.
  - The time, place, and other circumstances in which it is emitted.
  - How often it is emitted.
  - Any prescribed factors, or
- Is prescribed to be unreasonable noise.

For the purposes of the above definition, 'frequency spectrum' is a prescribed factor.

The EP Act prescribes that, noise emitted from commercial, industrial and trade premises is prescribed to be aggravated noise if:

- in the case of noise emitted during the day period, the effective noise level exceeds the lower of the following:
  - 75 dBA
  - the noise limit plus 15 dB, and
- in the case of noise emitted during the evening period, the effective noise level exceeds the lower of the following:
  - 70 dBA
  - the noise limit plus 15 dB, and
- in the case of noise emitted during the night period, the effective noise level exceeds the lower of the following—
  - 65 dBA
  - the noise limit plus 15 dB.

A.2.2 Environment Protection Regulations and Noise Protocol 2021

The Environment Protection Regulations 2021 (Regulations) support the EP Act by providing clarity and further detail for duty holders on how to fulfil their obligations. Regulations are used to deal with matters in detail and may contain their own penalties for breaches.

In Victoria, noise emissions from commercial, industrial and trade premises are not permitted to be unreasonable or aggravated, and are subject to the provisions of the Regulations, and the "Noise limit and assessment protocol for the control of noise from commercial, industrial

and trade premises and entertainment venues", EPA Publication 1826.4 (the "Noise Protocol").

A.3 Low Frequency Noise Guidelines

EPA Publication 1996 "Noise guidelines: Assessing low frequency noise" (LFNG) provides guidance for acoustic consultants and other qualified professionals who assess low frequency noise (10Hz – 160Hz).

Frequency spectrum is a prescribed factor under the EP Act and subordinate legislation. The assessment of frequency spectrum applies to noise from commercial, industrial and trade premises only.

Low frequency noise emitted from commercial, industrial and trade premises should be assessed by comparing its frequency spectrum to the relevant threshold levels. Specifically, Z-frequency weighted (unweighted or linear) measurements in one-third octave bands from 10 Hz to 160 Hz are compared with low frequency threshold levels.

The threshold levels are not set limits. Rather, they are levels that indicate a potential risk of problematic low frequency noise. The disturbance from low frequency noise depends on the:

- noise level,
- characteristics that can increase annoyance with the noise, for example, tonality, frequency modulation,
- baseline noise levels in the absence of the noise of concern.

Table 8 details the outdoor noise threshold criterion to be used for outdoor measurements. The noise threshold level for outdoor low frequency is based on the assumed façade noise reductions given in Downey and Parnell (2017).

Table 8 Outdoor low frequency noise threshold levels

Outdoor one-third octave low frequency noise threshold levels													
Freq, Hz	**10**	**12.5**	**16**	**20**	**25**	**31.5**	**40**	**50**	**63**	**80**	**100**	**125**	**160**
Leq, dB	92	89	86	77	69	61	54	50	50	48	48	46	44

Appendix B Noise Contour Maps

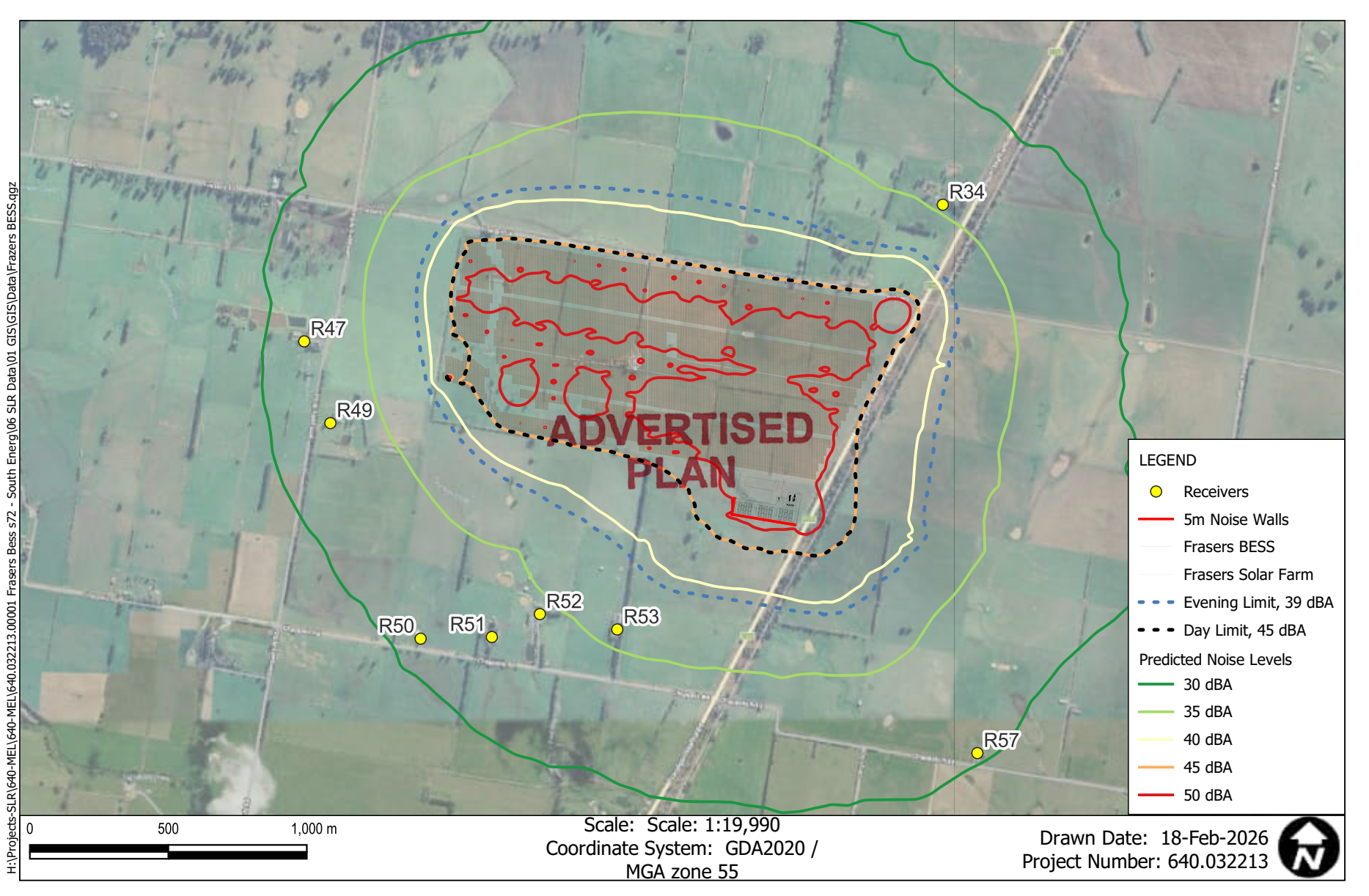
Frasers BESS

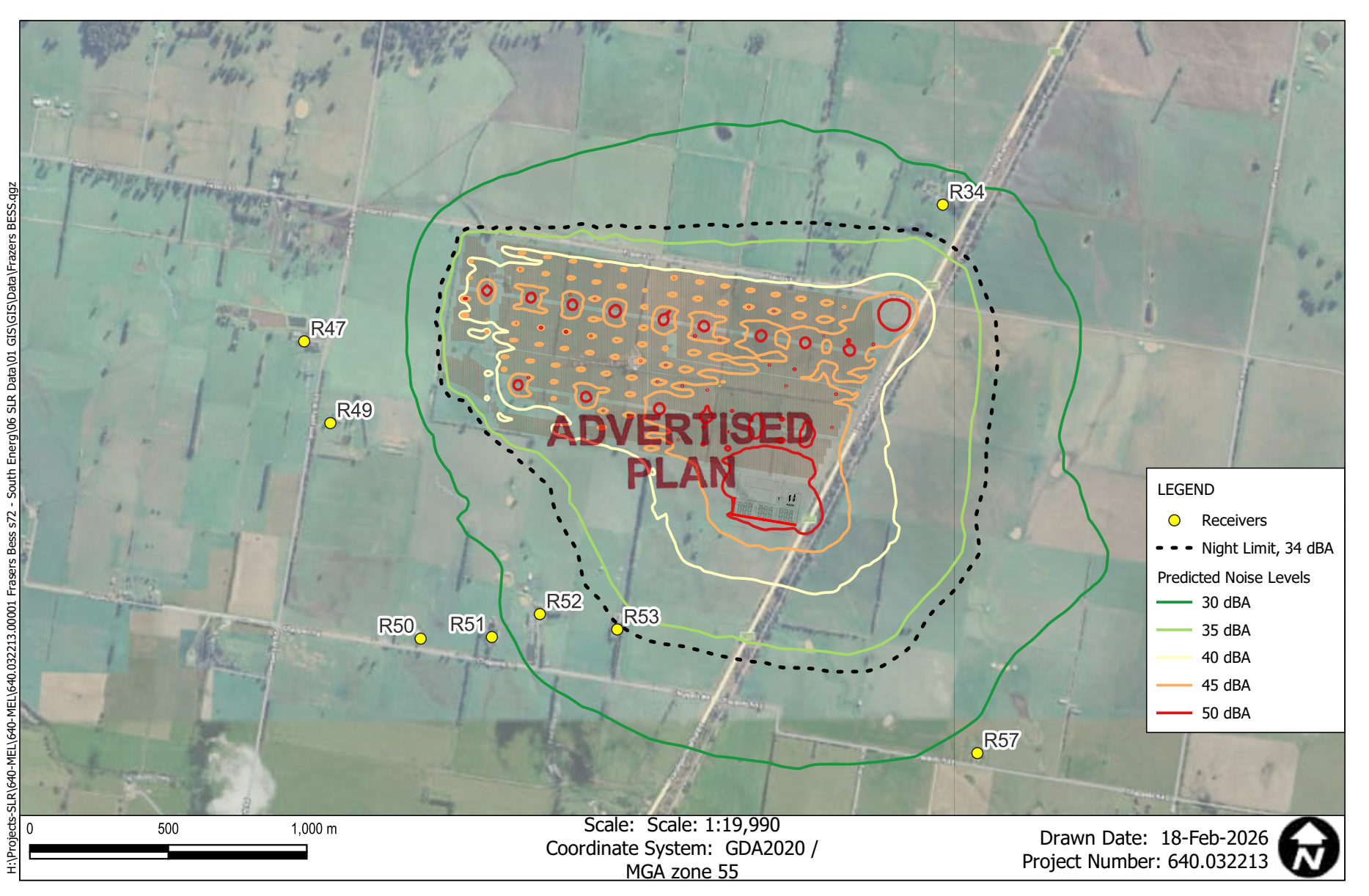
Noise Assessment

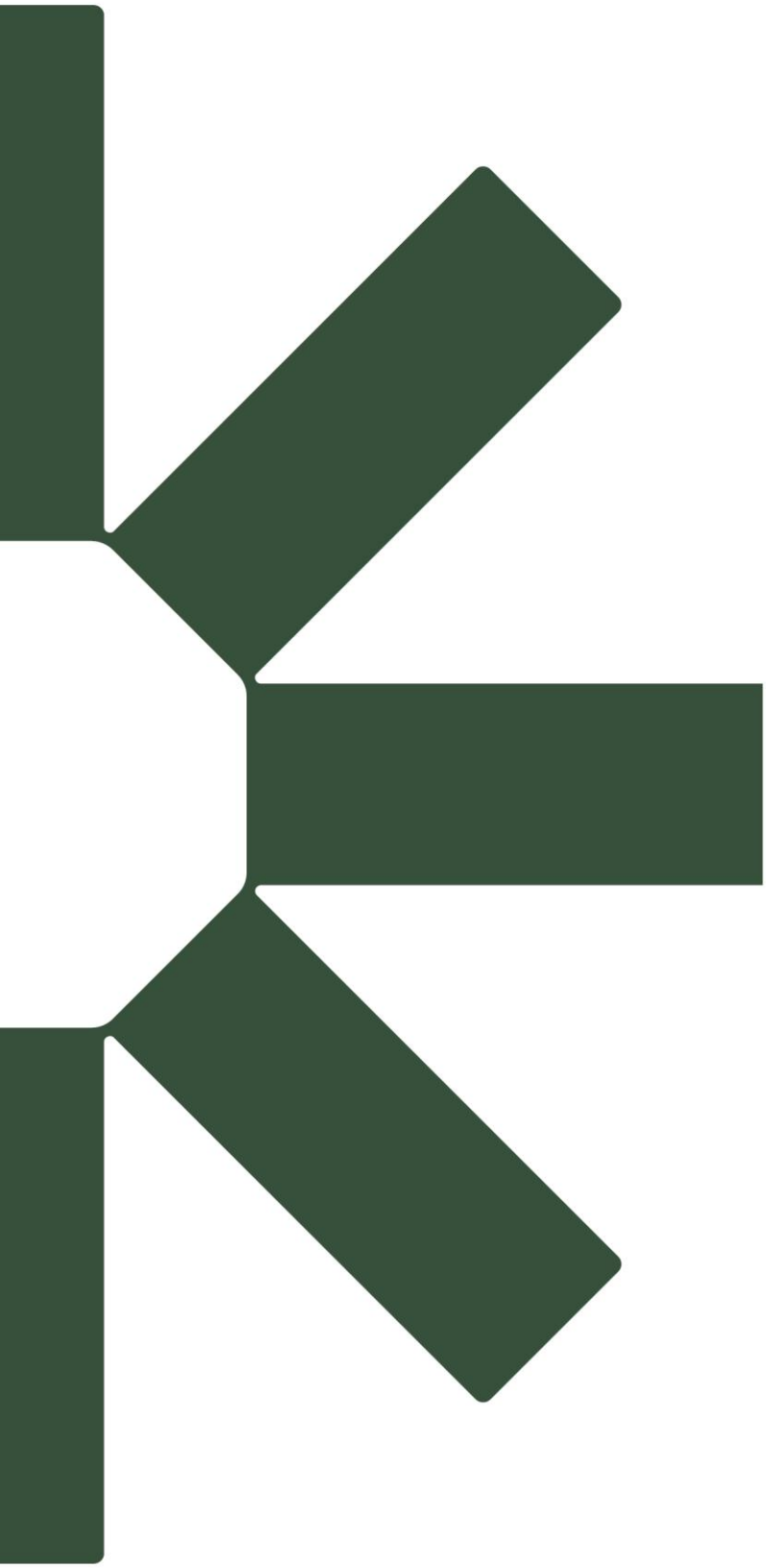
Frasers Lane Development Pty Ltd

SLR Project No.: 640.032213.00001

11 March 2026


R34
R47
R49
R50
R51
R52
R53
R57
ADVERTISED PLAN
LEGEND
Receivers
5m Noise Walls
Frasers BESS
Frasers Solar Farm
Evening Limit, 39 dBA
Day Limit, 45 dBA
Predicted Noise Levels
30 dBA
35 dBA
40 dBA
45 dBA
50 dBA
0
500
1,000 m
Scale: Scale: 1:19,990
Coordinate System: GDA2020 / MGA zone 55
Drawn Date: 18-Feb-2026
Project Number: 640.032213
H:\Projects-SLR\640-MEL\640-MEL\640.032213.00001 Frasers Bess s72 - South Energ\06 SLR Data\01 GIS\GIS\Data\Frazers BESS.qgz


R34
R47
R49
R50
R51
R52
R53
R57
ADVERTISED PLAN
LEGEND
Receivers
Night Limit, 34 dBA
Predicted Noise Levels
30 dBA
35 dBA
40 dBA
45 dBA
50 dBA
0
500
1,000 m
Scale: Scale: 1:19,990
Coordinate System: GDA2020 / MGA zone 55
Drawn Date: 18-Feb-2026
Project Number: 640.032213
H:\Projects-SLR\640-MEL\640-MEL\640.032213.00001 Frasers Bess s72 - South Energy\06 SLR Data\01 GIS\GIS\Data\Frazers BESS.qgz



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