RISE URBAN

ORANGE SPRINGS BESS PROJECT

ENVIRONMENTAL NOISE IMPACT ASSESSMENT

JUNE 2026

OUR REFERENCE: 36558-2-26156

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FOR

RISE URBAN

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EXECUTIVE SUMMARY

Herring Storer Acoustics were commissioned to carry out an acoustic study of noise emissions for the proposed Orange Springs BESS located at Lot 5 (No. 237) Orange Springs Road, Orange Springs.

The proposed project includes 154 batteries, 77 inverters and 3 transformers.

This acoustic assessment is required for the approval process and is being undertaken based on the information provided for the current proposed equipment.

The nearest noise sensitive premises “R1” is situated approximately 1km to the west of the project.

Modelling was conducted with the noise level information provided.

For the most stringent time period (night) the assigned noise level at the nearest noise sensitive premise would be 35 dB(A). The highest predicted noise emissions for the nearest noise sensitive premise is 35 dB(A), including an adjustment of + 5 dB(A) for tonal characteristics which has been conservatively applied to the predicted noise levels.

The acoustic assessment shows that in the worst case, that noise received at surrounding premises is below the Assigned Noise Levels stipulated by the Regulations. Thus, noise emissions from the proposed Orange Springs BESS would be deemed to comply with the requirements of the Regulations.

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APPENDICES

1. INTRODUCTION

Herring Storer Acoustics were commissioned to carry out an acoustic study of noise emissions for the proposed Orange Springs BESS project, with the locality as shown in Figure 1.1 below.

The project consists of a BESS facility. The noise sources considered in our preliminary assessment consist of the following:

- 154 batteries
- 77 inverters; and
- 3 transformers

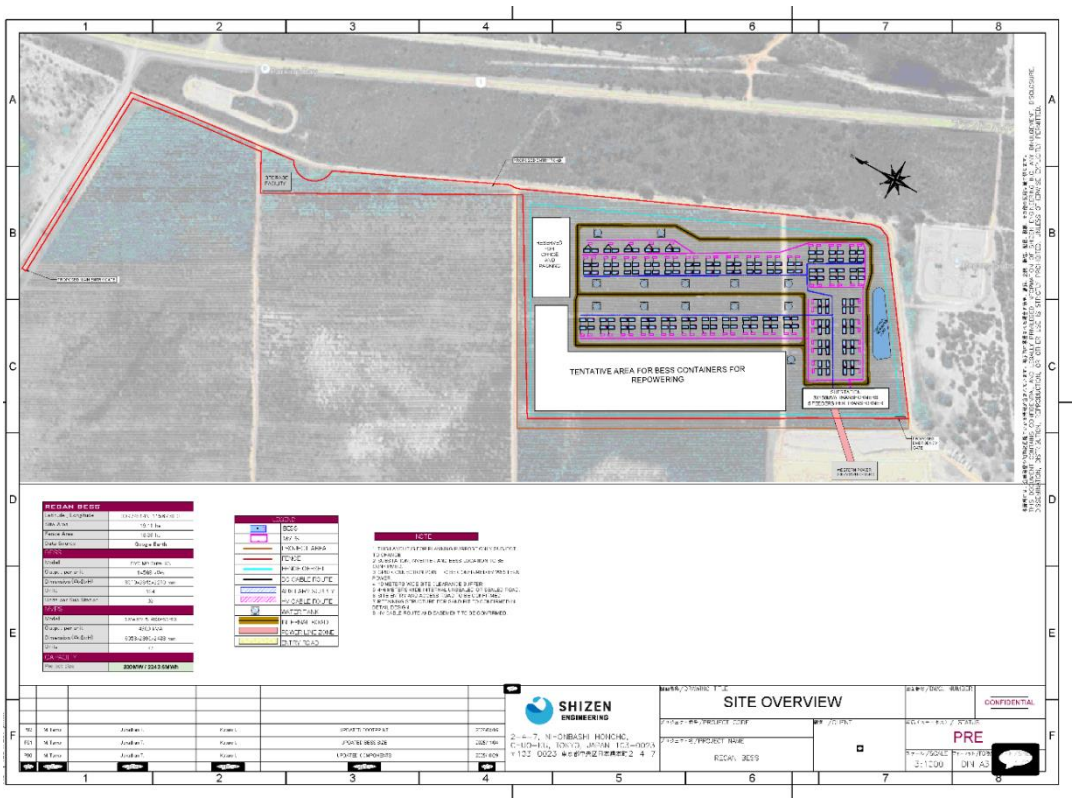

FIGURE 1.1 – SITE LAYOUT

FIGURE 1.2 – SITE SURROUNDS

The nearest noise sensitive premises have been identified as shown above in Figure 1.2, with the nearest noise sensitive premises being approximately 1 km to the west of the proposed development. It is noted that this location appears to include several houses – however has been represented by one location to simplify reporting, as the houses are an acoustically insignificant distance apart.

This report assesses night-time (worst case) noise emissions under maximum propagation conditions for the proposed development, based upon assumed noise levels for compliance with the requirements of the Western Australian *Environmental Protection (Noise) Regulations 1997* (WA) *(the Noise Regulations)*.

This work has been undertaken to accompany the development application for the project to ascertain if the project can comply with the Regulations. It is considered likely that a detailed assessment will need to be undertaken during the design development phase of the project in response to expected development approval conditions – at which time, equipment selections and the like would have been undertaken with finalised noise data able to be included in the modelled levels.

2. ACOUSTIC CRITERIA

The criteria used is in accordance with the *Environmental Protection (Noise) Regulations 1997.* These regulations stipulate maximum allowable external noise levels that can be received at one premises from another premises. For the highly sensitive area of a noise sensitive premises the allowable noise levels are determined by the calculation of an influencing factor. The influencing factor is calculated for the usage of land within the two circles, having radii of 100m and 450m from the premises of concern. For other premises (i.e. commercial and industrial premises), including other areas of a noise sensitive premises, the allowable noise

levels are fixed. Table 2.1 lists the baseline assigned noise levels for highly sensitive areas of a noise sensitive premises and the allowable noise levels for other premises.

TABLE 2.1 – ASSIGNED OUTDOOR NOISE LEVELS

Type of premises receiving noise	Time of day	Assigned level (dB)		
		$L_{A\,10}$	$L_{A\,1}$	$L_{A\,max}$
Noise sensitive premises: highly sensitive area (i.e. within 15m of a dwelling)	0700 to 1900 hours Monday to Saturday	45 + IF	55 + IF	65 + IF
	0900 to 1900 hours Sunday and public holidays	40 + IF	50 + IF	65 + IF
	1900 to 2200 hours all days	40 + IF	50 + IF	55 + IF
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays	35 + IF	45 + IF	55 + IF

Note: The L_{A10} noise level is the noise that is exceeded for 10% of the time.
The L_{A1} noise level is the noise that is exceeded for 1% of the time.
The L_{Amax} noise level is the maximum noise level recorded.
IF = Influencing Factor

It is a requirement that noise from the site be free of annoying characteristics (tonality, modulation and impulsiveness) at other premises, defined below as per Regulation 9.

Where the above characteristics are present and cannot be practicably removed, the following adjustments are made to the measured or predicted level at other premises.

TABLE 2.2 – ADJUSTMENTS FOR ANNOYING CHARACTERISTICS WHEN MUSIC IS NOT PRESENT

Where tonality is present	Where modulation is present	Where impulsiveness is present
+ 5 dB	+ 5 dB	+ 10 dB

The key receptors have been identified, as shown in Figure 1.2 above. This provides the closest in terms of distance to the project, with compliance at this location indicative of compliance at all others.

3. METHODOLOGY

Noise immissions[1] at the nearest neighbouring residential premises, due to noise associated with the proposed operations, were modelled using the computer programme SoundPlan. Sound power levels used for the noise modelling were based on noise level data provided by Rise Urban.

This acoustic assessment is required for the approval process and is being undertaken prior to the final design of the project being known. In the event that equipment selections change, this modelling exercise may need to be repeated with updated selections.

The design configuration for the proposed project is contained in Appendix A, with the provided noise data in Appendix B.
The overall sound power levels for individual equipment as shown in Table 3.1.

TABLE 3.1 – SOUND POWER LEVEL - NOISE SOURCES dB(A)

Noise Sources	Sound Power Level dB(A)
Batteries (144 off)	85
Inverters (77 off)	83
Transformers (3 off)	96.5

1 Immissions – noise received at a source
2 Emissions – noise emanating from a source and / or location

The on-third octave band data listed in Appendix B specifications has been utilised in our assessment, with the batteries being the “SCS 4600 UPS with Noise reduction Kit” The inverter has been based upon the data provided “with a noise reduction kit”, however, only overall sound power levels have been provided. Similarly for the transformers.

and transformer sound power level noise data has been provided as an overall sound power level only.

Based on the noise emissions associated with the above equipment, a noise impact assessment to the surrounding area was modelled.

The following is noted in regards to the development of the model:

Batteries and inverters have had the “physical” presence excluded within the model (essentially a “sea container” type object) with the sound power levels from each piece of equipment a single point noise source. It is our experience that the physical presence of the equipment in the noise model provides reasonable barrier effect to adjacent batteries/inverters – hence, the modelling is considered a conservative calculated of noise impacts.

It is noted that all equipment has been assumed to be operating at the same time, at maximum noise level conditions. It is understood that the noise emissions associated with batteries typically vary with temperature, hence, for the most stringent time period defined by the Regulations, this is likely to be conservative.

Weather conditions for modelling were as stipulated in the Environmental Protection Authority’s “*Draft Guidance for Assessment of Environmental Factors No. 8 - Environmental Noise”* as listed in Table 3.2. The CONCAWE algorithm has been utilised for this assessment, with the weather conditions as listed below.

A ground factor of 0.6 has been in the modelling.

TABLE 3.2 – WEATHER CONDITIONS

Condition	Night	Day
Temperature	15°C	20°C
Relative humidity	50%	50%
Pasquill Stability Class	F	E
Wind speed	3 m/s*	4 m/s*

* From sources, towards receivers.

It is noted that ‘worst case’ wind conditions refer to conditions where there is a temperature inversion in conjunction with light winds in the direction from noise source to receiver, resulting in the highest sound propagation towards receiver locations.

4. RESULTS

A summary of the calculated noise levels for scenarios are shown in Table 4.1.

TABLE 4.1 – CALCULATED NOISE LEVELS, L_{A10} dB(A)

Receiver Name	Calculated Noise Level
R1	30
R2	19
R3	20
R4	24
R5	24

A Noise contour plot for the above scenario is included in Appendix C.

5. ASSESSMENT

On the basis of the assumed noise levels, noise levels at the nearest noise sensitive premises have been calculated at up to 30 dB(A).

Given the noise sources associated with the proposed development, noise level emissions may contain tonal characteristics – however – it is noted that this is considered a conservative assumption, as at the noise levels predicted, any tonal characteristics that may be present could be masked by background noise levels.

Hence, a + 5 dB adjustment to the calculated noise levels has been applied to the calculated noise levels in accordance with the Regulations.

Based on this, Table 5.1 contain the applicable adjustments, and assessable noise levels at each of the identified noise sensitive premises.

TABLE 5.1 – APPLICABLE ADJUSTMENTS AND ASSESSABLE LEVEL OF NOISE EMISSIONS, L_{A10} dB(A)

Noise Measurement Location	Calculated Noise Level L_{A10}	Applicable Adjustments to Measured Noise Levels, Characteristics			Assessable Noise Level
		Where Noise Emission is NOT music			
		Tonality	Modulation	Impulsiveness	
R1	30	+5	-	-	35
R3	19	+5	-	-	24
R3	20		-	-	25
R4	24	+5	-	-	29
R5	24	+5	-	-	29

Hence, based on the most stringent time period – namely the night period - Table 5.2 assesses the noise impact of the proposed development.

TABLE 5.2 – ASSESSMENT OF NOISE LEVELS

Receiver	Assessable Noise Level, dB(A)	Applicable Times of Day	Applicable L_{A10} Assigned Noise Level (dB)	Exceedance to Assigned Noise Level L_{A10} (dB)
R1	35	Night (22:00 to 07:00)	35	Complies
R2	24	Night (22:00 to 07:00)	35	Complies
R3	25	Night (22:00 to 07:00)	35	Complies
R4	29	Night (22:00 to 07:00)	35	Complies
R5	29	Night (22:00 to 07:00)	35	Complies

For the most stringent time period (night) the assigned noise level is 35 dB(A). The highest predicted, assessable, noise emissions for the nearest noise sensitive premise is 35 dB(A) at "R1". This includes all proposed plant associated with the project operating at 100%, and with an adjustment for tonal characteristics included in the noise level emissions.

The acoustic assessment shows that in the worst case, that noise received at a premise is below the assigned noise level. Thus, noise emissions from the proposed Orange Springs BESS would be deemed to comply with the requirements of the Regulations.

APPENDIX A

LAYOUT PLAN

REGAN BESS	
Latitude , Longitude	-30.974514N, 115.677033E
Site Area	19.11 ha
Fence Area	18.38 ha
Data Source	Google Earth
BESS	
Model	BYD MC Cube-XN
Output per unit	14568 kWh
Dimension (WxDxH)	8610x3845x3210 mm
Units	154
Units per Sub Station	02
MVPS	
Model	SMA MVPS 4600-S2-10
Output per unit	4600 kVA
Dimension (WxDxH)	6058x2896x2438 mm
Units	77
CAPACITY	
Project size	**300MW / 2243.5MWh**

LEGEND
BESS
MVPS
PROJECT AREA
FENCE
FENCE OFFSET
DC CABLE ROUTE
AUXILARY SUPPLY
HV CABLE ROUTE
WATER TANK
INTERNAL ROAD
POWER LINE ZONE
ENTRY ROAD

NOTE

1. THIS LAYOUT IS FOR PLANNING PURPOSE ONLY SUBJECT TO CHANGE.
2. SUBSTATION, INVERTER AND BESS LOCATION TO BE CONFIRMED.
3. GRID CONNECTION POINT TO BE CONFIRMED BY WESTERN POWER.
4. 10 METERS WIDE SITE CLEARANCE BUFFER.
5. 4~6 METERS WIDE INTERNAL UNSEALED OR SEALED ROAD.
6. SITE ENTRY AND ACCESS ROAD TO BE CONFIRMED.
7. RETAINING STRUCTURE FOR SAND PIT TO CONFIRMED IN DETAIL DESIGN.
8. HV CABLE ROUTE AND EASEMENT TO BE CONFIRMED.

P02	M. Tamo	Jonathan T.	Kotaro I.	UPDATED FOOTPRINT	2026/04/15
P01	M. Tamo	Jonathan T.	Kotaro I.	UPDATED BESS SIZE	2025/11/04
P00	M. Tamo	Jonathan T.	Kotaro I.	UPDATED COMPONENTS	2025/10/29

SHIZEN ENGINEERING
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CHUO-KU, TOKYO, JAPAN 103-0023
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図面名称/DRAWING TITLE: SITE OVERVIEW
図面番号/DWG. NUMBER:
CONFIDENTIAL
プロジェクト番号/PROJECT CODE:
顧客 /CLIENT:
状況（ステータス） / STATUS: PRE
プロジェクト名/PROJECT NAME: REGAN BESS
スケール/SCALE: 3:1000
フォーマット/FORMAT: DIN A3
シート/SHEET: 1/2

A3 - (420 x 297)mm

APPENDIX B

EQUIPMENT NOISE DATA

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Date 10.07.2025

Products: SCS 2930/3060/4400/4600 UP-S(-US)

Noise Performance of SCS UP-S Product Family

Dear valued customer,

SMA has launched the SCS UP-S product family into the market and product validation testing is currently entering its final stage. Preliminary noise test results have demonstrated its superior performance compared to the rest of SCS UP platform. This superior performance is due to the change in switching pattern of the semi-conductors used in the SCS UP-S product family, the Silicon Carbide (SiC) MOSFETs.
The following table shows test results of SCS 4600 UP-S at discharging direction, with Noise Reduction Kit installed, at 1450V DC voltage:

Frequency (Hz)	25	31,5	40	50	63	80	100	125	160	200	250	315	400	500	630
Tot.Pwr, A [dB, A]	42,5	45,7	51,3	58,1	60,4	62,1	65,5	60,9	62,4	66,2	66,1	70	68,6	68,7	67,9

Frequency (Hz)	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000		**A**	Z
Tot.Pwr, A [dB,A]	68,7	68,4	65,78	64,4	63,6	72,5	78,6	60,9	69,6	81,2	68,3	67,2		**84,8**	93,5

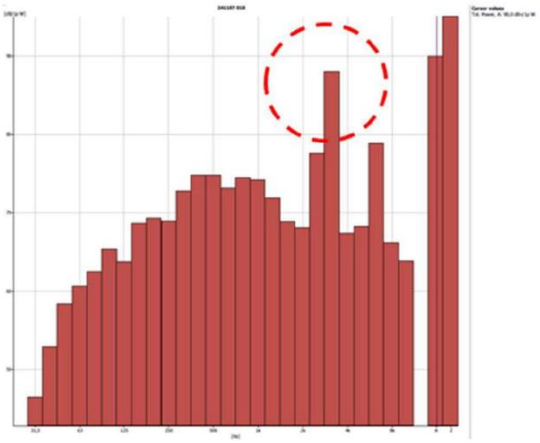
Based on these test results noise performance for the SCS UP-S product family is documented in product datasheet as follows:

	Sound Power LWA with rated power of inverter	Sound Power LWA with rated power of inverter with Noise Reduction Kit
SCS 2930 UP-S(-US)	89 dB(A)	83 dB(A)
SCS 3060 UP-S(-US)	89 dB(A)	83 dB(A)
SCS 4400 UP-S(-US)	91 dB(A)	85 dB(A)
SCS 4600 UP-S(-US)	91 dB(A)	85 dB(A)

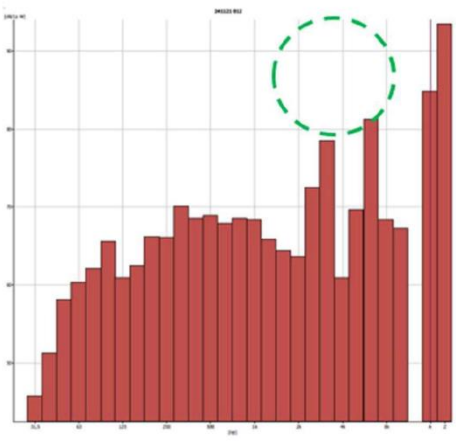
The following figures show comparison of noise performance of SCS 4600 UP-S to SCS 3950 UP-XT, detailed to the individual frequency bands. It is evident that due to change of switching pattern the 3kHz peak which is apparent with the SCS 3950 UP-XT is significantly reduced with the SCS 4600 UP-S.

Sound Power

SCS 3950 UP-XT, 4600kVA, max DC-Voltage



SCS 4600 UP-S, 4600kVA, max DC-Voltage



Detailed test report of noise performance of SCS 4600 UP-S at different power levels is due for publication in August 2025.

Best regards
SMA Solar Technology AG

i. A. Daniel Greger
Product Lead Power Conversion Products

i. A. Aris Gkountaras
Product Manager Sunny Central Storage

APPENDIX C

NOISE CONTOUR PLOT

Customer:
Rise Urban
Project: Regan BESS
Project-No. 26156

Rise Urban
AGILE PLANNING FOR THE NEW NORMAL

Map
1

Regan BESS - Using Overall dB(A) values - 2 June 2
Result number 7
Calculation in 1.5 m above ground

Project engineer: George Watts
Created: 3/06/2026
Processed with SoundPLAN 9.1, Update 27/05/2026

Levels LA10
in dB(A)

- = 25
- = 30
- = 35
- = 40
- = 45
- = 50
- = 55
- = 60
- = 65

N

Length scale 1:20000
0 150 300 600 900 1200 m

HERRING STORER ACOUSTICS