MARSHALL DAY Acoustics

[redacted]

1 December 2021

[redacted]

APPLICATION FOR PLANNING PERMIT PA2101364
RANGEBANK (CRANBOURNE) BATTERY ENERGY STORAGE SYSTEM POWERLINE
REQUEST FOR FURTHER INFORMATION

Macquarie Corporate Holdings Pty Ltd (Macquarie) has previously commissioned Marshall Day Acoustics Pty Ltd (MDA) to undertake an acoustic assessment[1] for the proposed Battery Energy Storage System (BESS) at 280 Evans Road, Cranbourne West (the Acoustic Report).

The Acoustic Report demonstrated that the Cranbourne BESS can be designed and developed to achieve Victorian policy requirements for operational noise.

On 27 October 2021, Macquarie received a request for further information from the Department of Environment, Land, Water and Planning (DELWP) regarding the connection infrastructure associated with the BESS, specifically requesting:

> *Clarification from a suitably qualified person as to whether the proposed use and development will emit noise, and if so, assessment of the proposal against the relevant EPA noise standard to demonstrate the proposal can comply.*

It is understood that the Cranbourne Terminal Station 220 kV Bus number 1 is the likely connection location for the project, and the following equipment is proposed to be installed:

- 2 x rotary double break (RDB) disconnectors
- 1 x 220 kV circuit breaker
- Current Voltage Transformers (CVT)
- Cable Surge Diverters (CSD)

This document should be read in conjunction with the Acoustic Report.

[1] Rp 001 R01 20210002 - *Cranbourne BESS - Acoustic Report*, dated 16 August 2021

EQUIPMENT DETAILS

Limited manufacturers' data is available regarding the proposed connection infrastructure, however some qualitative commentary has been provided by Siemens Energy and Macquarie. Due to the bespoke nature of the development, limited existing data is available in the internal MDA database of noise measurements however database noise measurements have been reviewed where available.

Table 1 below summarises the available detail.

Table 1: Equipment details

Equipment	Detail	Basis
RDB disconnectors	Limited detail available, however based on the publicly available information noise levels for RDB disconnectors are expected to be nil or negligible	
220 kV circuit breaker	Impulse sound power level up to 129 dB L_{WAI} during closing/opening operations	Siemens email dated 16 November 2021
	Duration of closing/opening operation a maximum of 66 milli seconds	Macquarie email dated 17 November 2021
	Closing/opening does not occur unless there is a fault or isolation is required	
	It is expected that occurrences would be less than 1 per year	
CVT	Noise levels for instrument transformers are typically nil or negligible	Siemens email dated 16 November 2021
	Neither IEC nor Australian Standards prescribe noise measurement methodologies for equipment of this type	
CSD	Limited detail available, however based on the publicly available information noise levels for cable surge divertors are expected to be nil or negligible	

It is understood that the connection equipment is likely to be located as indicated in Figure 1 below, being approximately 310 m from the nearest receiver.

Figure 1: Proposed connection infrastructure location

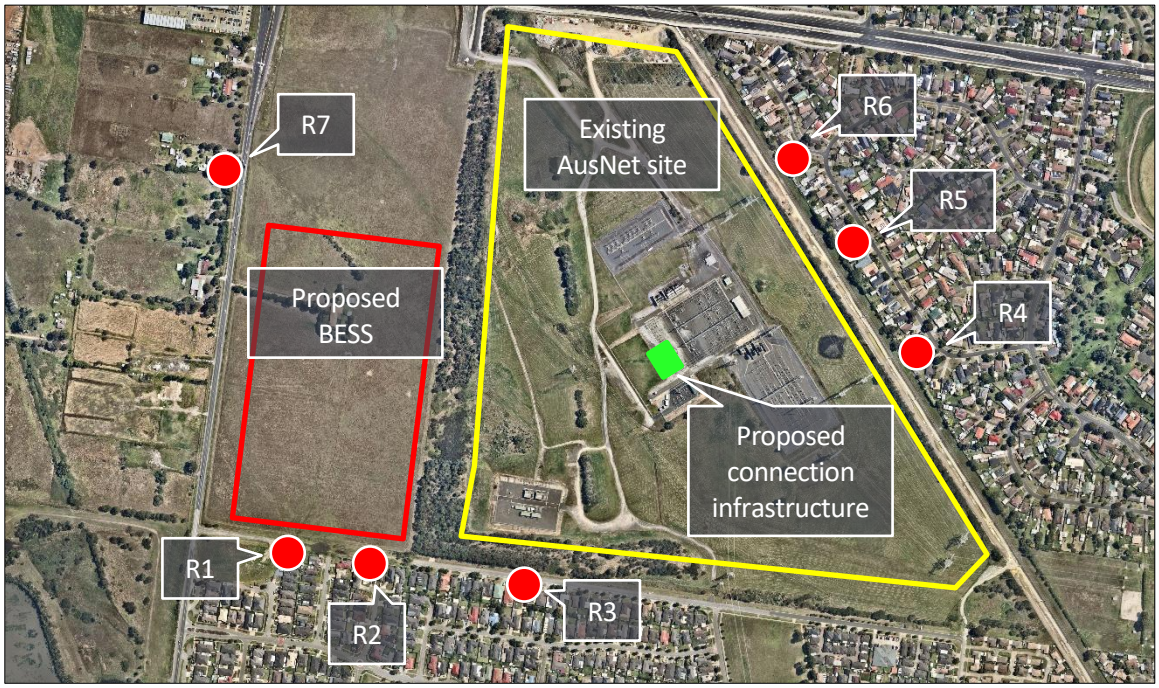

Table 2: Representative receivers

ID	Description
R1	15 Karwarren Way Single storey dwelling located approximately 570 m south-west of the proposed connection infrastructure
R2	7 Nandaly Place Single storey dwelling located approximately 500 m south-west of the proposed connection infrastructure
R3	51 Breens Road Single storey dwelling located approximately 310 m south-west of the proposed connection infrastructure
R4	18 Toirram Crescent Single storey dwelling located approximately 370 m east of the proposed connection infrastructure
R5	42 Toirram Crescent Single storey dwelling located approximately 310 m north-east of the proposed connection infrastructure
R6	3 Tamworth Court Single storey dwelling located approximately 350 m north-east of the proposed connection infrastructure
R7	305 Evans Road Single storey dwelling located approximately 700 m north-west of the proposed connection infrastructure *It is understood that this residence and the two residences located to the north are currently occupied, however are planned to be demolished and the land redeveloped as industrial/warehouse premises*

NOISE LIMITS

Noise from the site is subject to the requirements described in EPA Publication 1826.4 *Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues* dated May 2021 (Noise Protocol).

The Noise Protocol defines the method for setting the noise limits for new and existing commercial, industrial and trade premises and entertainment venues in Victoria.

It also outlines the steps that must be followed to undertake an assessment (measurement or prediction) of the effective noise level within a noise sensitive area or at an alternative assessment location. A comparison between the effective noise level and the relevant noise limits or the relevant alternative assessment criterion will determine whether the noise that is emitted from the premises is unreasonable under the Regulations.

The noise limits for commercial, industrial and trade premises are determined on the basis of land zoning and background noise levels, and are separately designated for day, evening and night periods.

Noise limits for the surrounding receivers have been derived in accordance with the Noise Protocol and are presented in Table 3.

Table 3: Applicable noise limits, dB L_{eff}

	Time Period		
Receiver	**Day**	**Evening**	**Night**
R1	53	47	42
R2	52	46	41
R3-R6	50	44	39
R7	52	46	41

Day: 0700 hrs to 1800 hrs Monday to Saturday
Evening: 1800 hrs to 2200 hrs Monday to Saturday, 0700 to 2200 hrs Sunday and Public holidays
Night: 2200 hrs to 0700 hrs 7 days

DISCUSSION

Circuit breaker noise

While the 220 kV circuit breaker has the potential to generate transient high noise level events, these are understood to coincide with emergency safety functions which are anticipated to occur rarely (less than one time per year). Further, the duration of such noise events would be very short (approximately 66 ms).

Based on the sound power level data available, the following indicative noise levels could be expected at the surrounding receivers based on a nominal noise source height of 2 m.

Table 4: Indicative predicted noise levels, dB L_{eff}

Receiver ID	Predicted noise level
R1	<10
R2	<10
R3	15
R4	15
R5	18
R6	15
R7	<10

Note: Includes duration correction for single operation of 66 ms within a 30-minute period

The effective noise level at the worst-affected receiver is predicted to be at least 20 dB below the lowest applicable noise limits as defined in the Table 3, and is therefore predicted to comply with the Victorian legislation and guidelines requirements. Noise emitted by the connection infrastructure is therefore not expected to have an impact on the compliance outcomes for the BESS as detailed in the Acoustic Report.

Existing AusNet noise levels

Section 6.3 of the Acoustic Report stated the following with regard to existing noise from the AusNet site:

> *During both attended noise measurement surveys noise from the AusNet site was inaudible at the representative receivers.*
>
> *During the first attended measurement survey corona noise from power lines on the AusNet site was audible at the southern boundary of the site at the corner of Breens Road and Calais Circuit. During the second attended measurement survey, corona noise was not audible at the southern boundary of the AusNet site. As corona noise is only generated during very specific weather conditions, this noise is not expected to be present at all times and can also be masked by the other sources of in the ambient noise environment.*

Considering the above and with the understanding that the proposed connection infrastructure would be considered like-for-like, it is reasonable to expect that the installation of the BESS connection infrastructure is unlikely to introduce noise sources that would affect the compliance outcome detailed in the Acoustic Report.

Post-commissioning noise mitigation

While not anticipated to be required, should commissioning measurements find exceeding noise levels associated with the proposed connection infrastructure, it is expected that a suitable noise control strategy can be implemented.

Equipment specific noise controls could include localised noise barriers and/or enclosures. The specific noise control strategy would depend upon which sources contribute to exceeding the noise limits.

CONCLUSION

DEWLP have requested that Macquarie provide clarification as to whether the proposed connection infrastructure associated with Cranbourne BESS is expected to emit noise and whether it would affect compliance with the relevant noise limits.

Limited specific detail regarding equipment noise levels is available, however MDA have conducted a high-level review of the available data and information about the infrastructure and reviewed previous noise measurements and observations of the existing AusNet infrastructure at the site.

Based on the available information and previous observations in the area, the installation of the proposed connection infrastructure is not expected to result in non-compliance with the relevant noise limits.

Yours faithfully

MARSHALL DAY ACOUSTICS PTY LTD

[redacted]