

4 September 2025

Attention: Knowsley Council

SLR Project No.: 402.v08525.00024

RE: Planning Application 25/00228/FUL Land North of Cut Lane, Kirkby

Background

SLR has received the following feedback from the Local Authority(LA). The LA's comments are highlighted in ***italic bold***, with SLR's response below.

1. ***What are the justifications for stating a rating level of 5dB above the background noise level would be appropriate, when the report states a difference of around +5dB is likely to be an indication of an adverse impact?***

The justification is context which is allowed for in BS4142. With reference to the 5dBA limit the guidance states:

"A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context".

The impact with reference to context is discussed in Section 5.4.1.1 of the SLR Report (Ref: 402.v08525.00024 version 4 dated March 2024). It is concluded in the Report that the background and rating levels are low, the change in the ambient sound level would for most of the time be imperceptible, and with an open window at night, the total cumulative ambient sound level would not exceed the World health Organisation recommend limit of 30dBA. It is not expected that there would be an adverse impact.

2. ***The site layout plan details 14 battery units within the compound? Will all the units be run at the same time, or will there be periods when only half of the units are in use for example? What is the accumulated sound power level for all the units and if only several units in use how will this alter the sound power level? What are the operational hours of the equipment, will they be running for 24hrs or at certain times in the day? Would this effect intermittency sound characteristics?***

Table 5-2 of the Report presents the total sound pressure level at the Noise Sensitive Receivers when all the BESS units are operating (daytime at 80% fan speed, night-time at 50% fan speed. This is a typical operating capacity of the Site and may be considered a worst case, i.e., all units are operating, at times the Site will be quieter when charge/discharge is not occurring. The total sound power at source, assuming the 28 (not 14) units were acting as a single point source (which they wouldn't as they are not on to of each other), would be as follows:

- Daytime: 93dBA.
- Night-Time: 92dBA.

The above data has been provided as requested but it is not useful for assessment purposes.

3. *Has the sound power level for the DNO Substation, the LV auxiliary switch room, earthing and auxiliary transformer, BESS switchgear and the harmonic filter & resistor been accounted for within the noise assessment? What are the operational hours of the equipment, will they be running for 24hrs or at certain times in the day?*

In addition to the BESS units the Sungrow V1 Transformer and the Earthing and Auxiliary Transformer have been included. The following items of plant are not expected to be noise generating at the boundary of the Site:

- DNO substation.
- LV Auxiliary Switch Room.
- BESS Switchgear.

SLR has been provided with a sound level for the harmonic filter resister. The sound pressure level of the equipment is 57dBA at 1m. As this is significantly lower than the BESS units, and the source is adjacent to the acoustic fence, its contribution will not elevate noise levels at the Noise Sensitive Receptors.

4. *Please provide information on the noise attenuation kit, what is the reduction of sound power level when this is in place?*

The Table below details the sound power level of the Sungrow Power Titan 2 mitigated and unmitigated BESS Units at a temperature of 30 degrees. There is a clear reduction when the noise attenuation kit is integrated into the equipment.

Model	50% Fan Speed dBA	80% Fan Speed dBA
Unmitigated	91	98
Mitigated	78	79

The attenuation kit would sit on top of the BESS as shown in the image below.





5. ***A 3.5m acoustic barrier is proposed around the entire site within the assessment model, how will this work at the entrance – with gates proposed, would they be 3.5m high, would there be gaps associated with the gates? This would affect the integrity of the acoustic barrier.***

The gate would be 3.5m high and would be an acoustic rated gate with no gaps. As stated in the Report a 3.5m barrier would encompass the Site, and half would need to be absorptive to prevent reflection.

- For the reflective half it is recommended that the fence is rated in accordance with BS EN 1793-2 *Road traffic noise reducing devices. Test method for determining the acoustic performance. Intrinsic characteristics of airborne sound absorption*. The fence should be rated as B3.
 - For the absorptive half it is recommended that the fence is also rated in accordance with BS EN 1793-1 *Road traffic noise reducing devices. Test method for determining the acoustic performance. Intrinsic characteristics of sound absorption*. The fence should be rated as A3.
6. ***Have the tonality and impulsivity sound characteristics been assessed associated with the other equipment on site and how these runs with the battery units? Could these produce a different tone against the battery units for example?***

Tonal noise can be assessed in accordance with the 'objective method for assessing the audibility of tones in sound: one third octave method' contained in BS



4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound.

For a prominent, discrete tone to be identified as present, the time-averaged sound pressure level in the one-third-octave band of interest is required to exceed the time-averaged sound pressure levels of both adjacent one-third-octave bands by some constant level difference.

In accordance with the one third objective method, the level differences between adjacent one-third-octave bands that identify a tone are:

- 15 dB in the low-frequency one-third-octave bands (25 Hz to 125 Hz).
- 8 dB in middle-frequency one-third-octave bands (160 Hz to 400 Hz); and
- 5 dB in high-frequency one-third-octave bands (500 Hz to 10 000 Hz).

To complete a tonal assessment, third octave data is required. Third octave data is available for the BESS units. A test has been run for the 80% fan speed at 30 degrees. The third octave data is presented in the Table below.

No tones have been identified.





Fre q.	20Hz	25 Hz	31.5 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1.0 kHz	1.25 kHz	1.6 kHz	2.0 kHz	2.5 kHz	3.15 kHz	4.0 kHz	5.0 kHz	6.3 kHz	8.0 kHz	10.0 kHz	12.5H z
dB	no data	80.6	78.8	79.3	80.0	80.5	75.0	74.7	72.0	71.4	71.4	68.7	68.0	67.4	69.2	69.3	70.4	74.2	69.5	68.8	66.9	65.6	64.2	61.5	59.8	56.7	53.0	48.5	no data



With regards to impulsivity, no sound sources at the Site are expected to be impulsive.

7. ***Table 5-3 states that the noise levels Sandy Brow Cottages will have an exceedance of +6 difference, however the text states a +8dB difference, which is correct?***

Thank you for highlighting this discrepancy, the Table is correct.

8. ***From the assessment the background sound levels at location 2 was typically 31dB with open windows the noise level within the properties will be significantly lower, the noise from the battery energy storage will have a great sound level difference than is proposed and will clearly be audible and have an adverse impact on the existing residents.***

When discussing the internal noise level, the relevant parameter to compare to recommended noise limits is either the $L_{Aeq,T}$ or the L_{Amax} . At night the recommended World Health Organisation $L_{Aeq,T}$ limit inside a bedroom is 30dBA.

Please refer to Figure 5-4 in the Report. This Figure is copied below.

The graph is relevant to the context discussion at Sandy Brow Cottages and Red Cut Lane.

Accounting for a partially open window reducing external noise by 10dBA (both existing noise and the specific noise from the Site), the internal total internal $L_{Aeq,T}$ noise level at night will meet the WHO limit of 30dBA for most of the time. Where the limit is exceeded, the exceedance is not caused by the operation of the BESS Site (as evidenced by the existing internal noise level also exceeding the 30dB line).

Whilst not shown on the graph the change in noise level between the existing and cumulative scenarios is less than 3dBA for 67 of the 96 comparable data sets (difference ranged between 0dBA and 6dBA). This is relevant as in accordance with the IEMA Guidelines¹ paragraph 2.7, for a sound level increase to be perceptible, the change in sound needs to be 3dB(A).

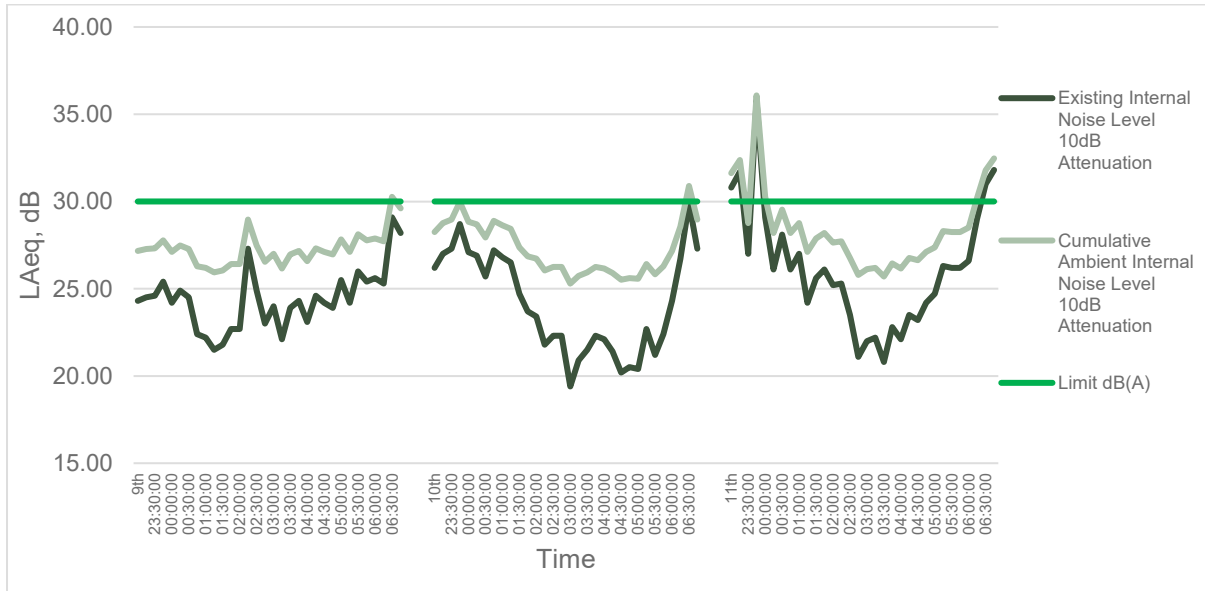
Where the difference was greater than 3dBA the time period was focussed on the early hours of the morning, thus not encroaching on the period where residents would most likely be looking to fall asleep or would be waking up. This is acknowledged in BS4142 where at Section 8-1 it states:

“Among other considerations, diurnal patterns can have a major influence on background sound levels, and, for example, the middle of the night can be distinctly different (and potentially of lesser importance) compared to the start or end of the night-time period for sleep purposes.”

As a result of the assessment and the additional information provided here, adverse impacts are not anticipated.

¹ Guidelines for Environmental Noise Impact Assessment (2014).

Figure Error! No text of specified style in document.-1 Comparison Between the Existing Internal Ambient Noise Level with a Partially Open Window

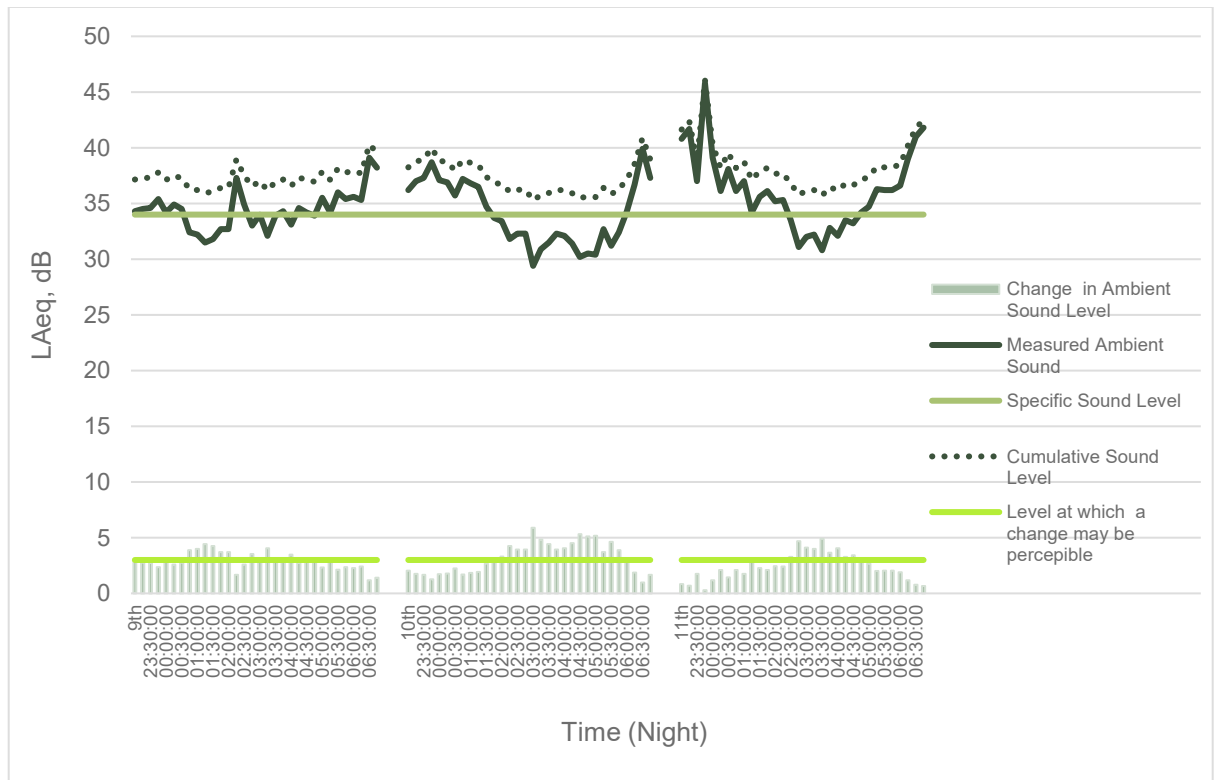


9. ***The report states that the site will elevate the total ambient noise level and may not be perceptible to residents, the noise will be different to what the residents are currently used to and therefore will be more evident particularly during the nighttime periods.***

The change in the ambient sound level is illustrated in Figure 5-3 of the Report which is copied below.



Figure Error! No text of specified style in document.-2 Comparison of Measured External Residual Sound Level with Predicted Specific Sound Level



As stated previously, the change is less than 3dBA for 67 of the 96 comparable data sets (difference ranged between 0dBA and 6dBA). This is relevant as in accordance with the IEMA Guidelines² paragraph 2.7, for a sound level increase to be perceptible, the change in sound needs to be 3dB(A).

Where the difference was greater than 3dBA the time period was focussed on the early hours of the morning, thus not encroaching on the period where residents would most likely be looking to fall asleep or would be waking up. This is acknowledged in BS4142 where at Section 8-1 it states:

“Among other considerations, diurnal patterns can have a major influence on background sound levels, and, for example, the middle of the night can be distinctly different (and potentially of lesser importance) compared to the start or end of the night-time period for sleep purposes.”

The BESS will be a new source of sound, but as demonstrated in the SLR Report and this letter, when considered in context, the impact is acceptable.

² Guidelines for Environmental Noise Impact Assessment (2014).



Closure

I trust this letter addresses the Council's concerns but please do get in touch if further information is required.

Regards,
SLR Consulting Limited

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