Noise Assessment for:

Proposed Back-Up Electricity Generation Facility

Land at

Land at Mitchells Industrial Park,
Bradberry Balk Lane,
Wombwell,
Barnsley,
S73 8HR

Prepared By

Mercia Power Response

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POWER RESPONSE

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1 INTRODUCTION

1.1 General

1.1.1 The Applicant, Mercia Power Response (MPR), is proposing to install and operate a back-up electricity generation facility at land at land at Mitchells Industrial Park, Bradberry Balk Lane, Wombwell, Barnsley, S73 8HR. Hereafter referred to as the 'proposed development'.

1.1.2 Mercia Power Response has undertaken this Noise Assessment in relation to the proposed development. The plans submitted as part of the planning application shows the location of the Site (MPR-MIE-001 V3 and MPR-MIE-002 V1).

1.2 The Site description and proposed development

Site details

1.2.1 The proposed development 'Site' is located within an existing open yard used for storage of timber products and vehicles.

1.2.2 For identification purposes, the application Site is centred on OS Grid Reference SE392041.

1.2.3 The nearest residential properties to the application Site are located a distance of 135m from the Site boundary to the west and southwest on the A633 Barnsley Road. The houses are separated from the application Site by a large industrial unit. To the south the nearest residential buildings are on Barnsley Road, 176m from the Site boundary

1.2.4 Industrial premises lie surrounding the Site to the east, west and south on the existing industrial estate.

Proposed Development

1.2.5 The Applicant is proposing to install and operate a back-up electricity generation facility comprising 4 no. reciprocating engines and associated ancillary equipment.

1.2.6 The contractual operating hours for the facility would be between 07:00 and 22:30 daily, however, the more likely scenario would be that the facilities operation would be contained within periods of peak demand as summarised below:

- AM Peak Operation: between 07:00 and 14:00 approx.
- PM Peak Operation: between 16:30 and 22:00 approx.

1.2.7 Further to this it is noted that within the requirements of the National Grid's contract the facility would be required to have the capacity to operate throughout a 24hr period in an emergency '1 in 10 year' scenario. However, this is <u>not</u> envisaged to be a normal operational scenario of MPR and is purely a requirement of the National Grid Contract to prevent a "lights out"

scenario. It is noted that in the last 10 years, the relevant contract has not had recourse to operate this scenario at any point.

2 STANDARDS AND GUIDANCE

National Planning Policy Framework (NPPF, February 2019)

2.1.1 The National Planning Policy Framework determines the government's planning policy for England. The NPPF states that, with respect to noise, planning policies and decisions should aim to:

- Avoid Noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;
- Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from a new development, including through the use of conditions;
- Recognise that development will often create some noise and existing business wanting to develop in continuance of their business should not have unreasonable restrictions put upon them because of changes in nearby land uses since they were established; and
- Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.
- The guidance contained within the NPPF further determines that consideration should be given to the

BS 4142

2.1.2 BS 4142 describes a method of determining the level of noise of an industrial nature, together with the procedures for assessing whether the noise in question is likely to give rise to complaints from persons living in the vicinity.

2.1.3 The Standard is based around the premise that the significance of the impact of an industrial/ commercial facility can be derived from the numerical subtraction of the background noise climate level (not necessarily the lowest background level measured, but the typical background of the receptor) from the measured/calculated rating level of the specific sound under consideration. This comparison will enable the impact of said sound to be concluded based upon the premise that typically *"the greater this difference, the greater the magnitude of the impact*".

BS 4142 states that:

- A difference of around +10 dB or more indicates that complaints are likely.
- A difference of around +5 dB is of marginal significance.

- If the rating level is more than 10 dB below the measured background noise level, then this is a positive indication that complaints are unlikely

2.1.4 BS 4142 further states that *"where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact*" again depending upon the specific context of the site.

3 BACKGROUND LEVELS

3.1.1 Due to the separation distance between the reciprocating engines and the nearest residential properties (approx. 150m) and general industrial uses in the local vicinity it has been considered unnecessary at this stage to carry out a full set of background noise surveys.

3.1.2 This Noise Assessment of the proposed development therefore utilises typical background noise levels that have been recorded by MPR at other similar urban locations as part of planning application reports for their other generation facilities.

3.1.3 A conservative assumption has been made that background daytime noise levels in the vicinity of the residential property identified is typically 40 dBL_{A90}. Night time levels are typically in the region of 35 dBL_{A90}.

3.1.4 All values and subsequent noise modelling are recorded and presented with Frequency Weighting: “A”.

3.1.5 An assessment of the noise emissions from the proposed development has been undertaken using these assumed background noise levels.

3.1.6 All values are provided in Table 3 and Table 4.

4 NOISE MODELLING

4.1.1 The noise model was constructed within the commercially available computer noise mapping tool MASdBmap version 0.5.

4.1.2 Within the scope of this modelling exercise, acoustic propagation has been calculated in accordance with the following standards:

- ISO 9613-1: Acoustics - Attenuation of sound during propagation outdoors Part 1: Calculation of the absorption of sound by the atmosphere
- ISO 9613-2: Acoustics - Attenuation of sound during propagation outdoors Part 2: General method of calculation.

Foundation of the Model

4.1.3 The noise model was constructed utilising the following information:

- Scaled Google Earth aerial photography to provide details of surrounding buildings;

- Site layout plan detailed within MPR drawing ref: MPR-MIE-001. V3 and,
- Reciprocating engine noise data established at existing operational MPR facilities.

Modelling Assumptions - Noise levels

4.1.4 Information quantified at operational MPR facilities indicates noise levels associated with the key items of plant as detailed within Table 1.

Table 1: Operational Plant Noise Data

Plant	**Number**	**Description**	**Noise Data** Sound pressure level (SPL)
Reciprocating Engines (E1, E2, E3, E4)	4	Reciprocating engine housed within specifically designed acoustic container	63.2 dBA @10m
Ancillary equipment	various	Transformers, Gas kiosk, etc	No noise emissions

Character Corrections

4.1.5 Within the methodology of BS 4142 it is necessary to calculate a specific external noise level at each receptor location from the operations/site under consideration. This specific noise level then require converting to a *"Rating"* level in order to take account of tonal or noticeable characteristics of the source noise. It is noted that as is required by BS 4142 the assessment is undertaken on the basis of whole dB values with 0.5dB being rounded up.

4.1.6 The following has been concluded with regard to suitable character corrections for the operations under consideration.

Incorporated Mitigation

4.1.7 The assessment of noise associated with the proposed 4 reciprocating engine units was undertaken on an iterative process to conclude the level of mitigation, if any, that was required.

4.1.8 Within the scope of the planning application, additional mitigation was deemed to be necessary above that already inherent within the design of the reciprocating engine container units. A 5 meter height acoustic fencing was included in the design of the facility. Further details can be found in drawing MPR-MIE-013.

Table 2: BS 4142 Character Corrections			
Characteristic	**Subjective Perception**	**Justification**	**BS 4142 correction**
Tonality	None in this context	The noise generated by air cooled radiators has the capacity to generate some degree of tonal component. Given the separation distance between the site and receptors, and the current noise climate of the area it is considered that any tonal component would be only just perceptible.	+2
Impulsivity	None	Noise generated by the MPR site is not considered to be impulsive.	+0
Other characteristics	None	No 'other' characteristics associated with the MPR site are considered to be present.	+0
Intermittency	None	Once the MPR site is running it is at a constant output level. However, the facility would not operate constantly and only periodically as required. Whilst potentially there could be some level of intermittency associated with the facility this would not be clearly identifiable within an industrial setting such as that surrounding the Industrial Estate.	+0
		Total Character correction	**+0**

5 NOISE IMPACT ASSESSMENT

5.1.1 The noise contour plot presented in Figure 1 details the output of the noise model constructed to predict noise from the operation of the facility.

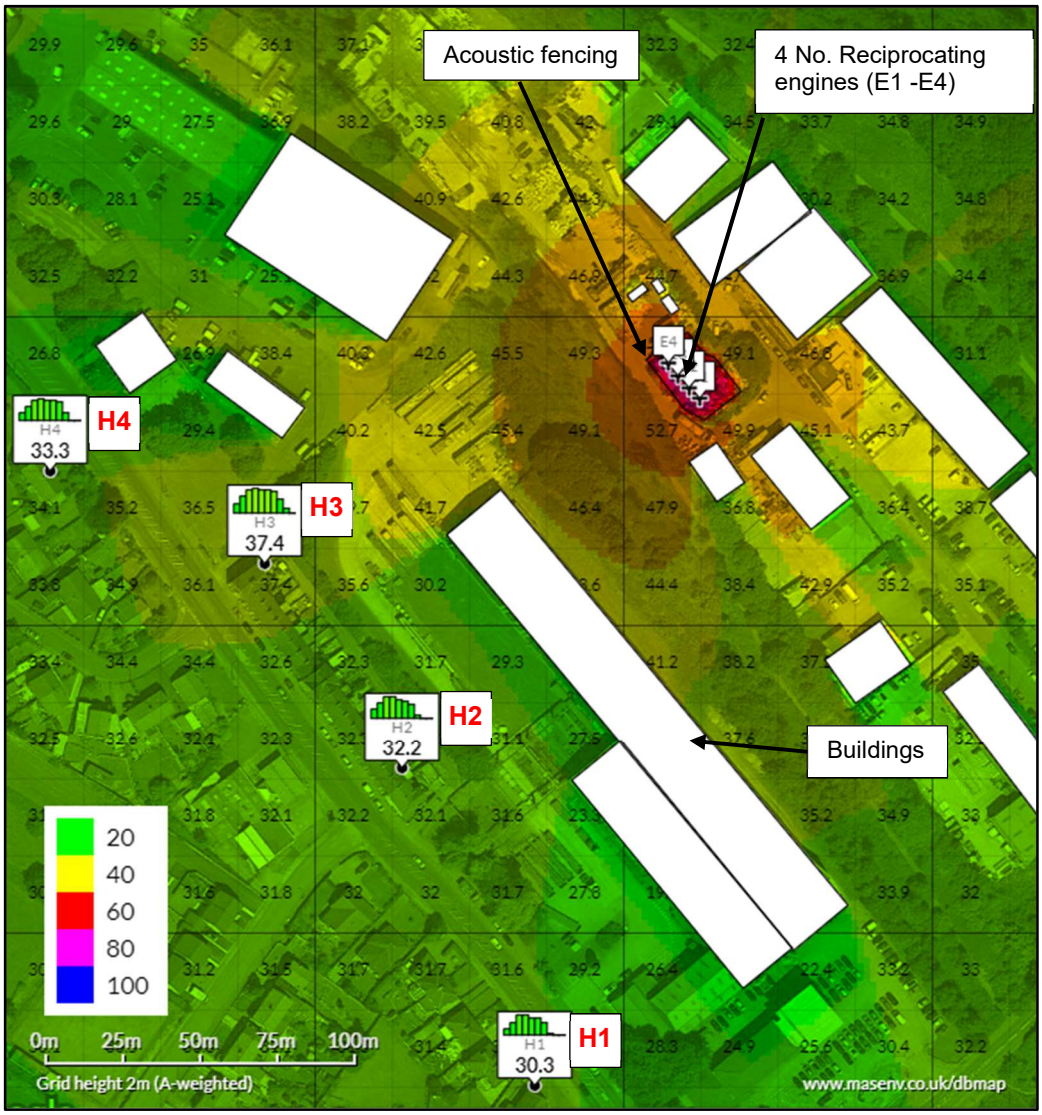


Figure 1: Grid Noise Map, all (4 No.) engines at full output (2m grid height)

5.2 Assessment Locations

5.2.1 4 No. noise receptors areas have been modelled (as per Figure 1 above). These locations represent the closest residential receptors to the proposed development. These assessment locations are referred to within the scope of this application as:

- H1 – Residential property on Barnsley Road. Approx. 250m to the reciprocating engines
- H2 – Residential property on Barnsley Road. Approx. 150m to the reciprocating engines
- H3 – Residential property on Barnsley Road. Approx. 150m to the reciprocating engines
- H4 – Residential property on Barnsley Road. Approx. 190m to

the reciprocating engines

5.3 Assessment results

Table 3: Daytime Period					
Assessment Location	Average L_{A90}, 'Background' noise level, [1], (dB) **Estimated Value*	Maximum predicted BS 4142 Specific Noise Level [1], (dB)	Corrected BS4142 Rating Level [1], (dB)	Difference (dB)	Likelihood of Complaints
H1	40*	30.3	32	-8	*'Indication of the specific sound source having a low impact'*
H2		32.2	34	-6	
H3		37.4	39	-1	
H4		33.3	35	-5	

[1] Note: Noise levels rounded to nearest whole dB in accordance with the guidance of BS 4142

5.3.1 It can be seen from the table above that the BS 4142 assessment indicates noise arising from operation of the 4 engines during the daytime period would be rated by the Standard as being:

- Between -8 dB and -1 dB below the existing estimated background noise climate of the area, depending upon assessment location. This would therefore be considered an acceptable impact and under the BS 4142 Standard as being an *'Indication of the specific sound source having a low impact'*

Night time - 1 in 10 year Emergency Operational Assessment

5.3.2 As previously detailed there is a requirement of the National Grid contract that in a 1 in 10 year emergency "lights out" situation all equipment feeding into the National Grid could be called to operate 24 hours a day. As such, assessment of the emergency situation has also been presented within this report assuming that all of the proposed engines would be required to operate.

Table 4: Night time Period , 1 in 10 year Emergency Operation				
Assessment Location	Average L_{A90}, 'Background' noise Level [1], (dB)	Maximum Predicted BS 4142 Specific Noise Level[1], (dB)	Corrected BS4142 Rating Level [1], (dB)	Difference (dB)
H1	35*	30.3	32	-3
H2		32.2	34	-1
H3		37.4	39	+4
H4		33.3	35	0

[1] *Note: Noise levels rounded to nearest whole dB in accordance with the guidance of BS 4142*

5.3.3 It can be seen from the table above that the BS 4142 assessment indicates noise arising from operation of the 4 engines during the night time period would be rated by the Standard as being:

- Between +4 dB above and -3 dB below the estimated existing background noise climate of the area, depending upon assessment location. This would therefore be considered under the BS 4142 Standard as being an indication of the specific sound source having either a low impact, at three properties, and a marginal significance at one property (H3).

5.3.4 However, it must be re-iterated that the overnight operation of the facility is not a normal operational requirement of the facility which would be between 07:00 – 22:00. The facility would only operate outside these timescales in a 1 in 10 year emergency operational scenario which is considered extremely unlikely.

5.3.5 The 1 in 10 yr. emergency lights out scenario operation of the STOR program has never been invoked during the history of the Contract Mechanism; and,

5.3.6 The alternative to the operational facility would be loss of power to the area and the adverse implications that this brings to modern life.

5.3.7 It should also be noted this assessment represents a worst-case assumption as it assumes all 4 No. gensets are operating at maximum output.

6 CONCLUSION

6.1.1 An assessment has been undertaken to consider the potential noise impacts associated with an electricity generation facility supplying 'back up' electricity to the National Grid. The Site is located at land at Mitchells Industrial Park, Bradberry Balk Lane, Wombwell, Barnsley, S73 8HR.

6.1.2 The noise assessment undertaken indicates that activities associated with the facility during the normal operational periods would be classified by BS 4142 to be at a level considered to provide an '*Indication of the specific*

sound source having a low impact'.

6.1.3 For emergency night time periods (not normal operational periods), noise would be considered under the BS 4142 Standard as being an indication of the specific sound source having a low impact at three properties and marginal significance at one property (H3).

6.1.4 Overall it is concluded, that based upon the information contained within this report there are unlikely to be any significant issues relating to normal operational noise associated with the proposed MPR facility that would be sufficient to deny the approval of planning permission on the grounds of noise.